Business education for a better world

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Business Education for a Better World

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Conference Proceedings of the XIIIth International Conference
Globalization and Higher Education in Economics and Business Administration

GEBA 2021

This volume reunites a selection of the papers presented at the
XIIIth International Conference "Globalization and Higher Education in Economics and
Business Administration – GEBA 2021", organized at Alexandru Ioan Cuza University
of Iasi, Faculty of Economics and Business Administration, in October 2021.

The papers published in Conference Proceedings are exclusively engaging authors. The
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THE ECOPRENEURIAL MINDSET – MOTIVATIONS & BELIEFS

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ABSTRACT

Environmental degradation and the unsustainable usage of natural resources have determined more and more entrepreneurs to be concerned about the impact they can have on the world. Thus, the rise of a different type of entrepreneur has emerged – the ecopreneur, also called the green entrepreneur or the environmental entrepreneur. We are aware of the fact that this type of entrepreneur is not really something new. The concern for the environment has been growing a lot since the 90's and a lot of businesses were built with purpose of being "green", while others went through the "greening process." However, we would argue that ecopreneurship should have more awareness nowadays and more entrepreneurs should engage in "eco" journeys which can benefit our society and the world we live in. What distinguishes ecopreneurship from simple entrepreneurship is, of course, the role of beliefs: the individual's/organisation's beliefs about the environment.

Keywords: entrepreneurship; ecopreneur; environmental behavior; beliefs.

1. INTRODUCTION

Environmental degradation and the unsustainable usage of natural resources have determined more and more entrepreneurs to be concerned about the impact they can have on the world. Thus, the rise of a different type of entrepreneur has emerged – the ecopreneur, also called the green entrepreneur or the environmental entrepreneur. We are aware of the fact that this type of entrepreneur is not really something new. The concern for the environment has been growing a lot since the

90's and a lot of businesses were built with purpose of being "green", while others went through the "greening process." However, we would argue that ecopreneurship should have more awareness nowadays and more entrepreneurs should engage in "eco" journeys which can benefit our society and the world we live in.

2. THE ECOPRENEUR

Ecopreneurs have received different labels over time. They have been identified with green activists, drivers of change (Walley and Taylor, 2002), social entrepreneurs and those people who are putting purpose and planet before profits (Kivirist and Ivanko, 2008).

2.1 Who is an ecopreneur?

It's probably expected from us to offer a definition right now and we could offer one, yet there is no general recommended definition and we can say that the meaning of the term "ecopreneur" is quite straightforward.

Still, we thought that at this point it might be more relevant to define the ecopreneur by presenting some profiles of people who have been engaged in entrepreneurial journeys with an "eco" twist.

Mansi Shah, an Indian woman entrepreneur, saw hundreds of national flags thrown to the ground after the Independence Day celebration. To solve the problem, she started to recycle flags with her venture GiftGreen. So she decided to introduce seeds into the disposable flags. Her venture, GiftGreen, seeds the handheld flags they create and encourages planting them after the celebrations and see it grow into a plant.

Australian-born and the co-founder and CEO of gDiapers, Jason Graham-Nye, wants the planet to be greener and healthier by having a environmentally friendly hybrid diaper company. Graham-Nye launched gDiapers with his wife Kim in 2005.

Juha Koponen is the co-founder of Netcycler, which offers a new way to make environmentally friendly consumption decisions by reducing purchases of new products. Netcycler supports using existing products until the end of their life cycle. When you no longer need something, the service will find someone who does. It's an alternative for consumption centred lifestyle, an easy way to minimize shopping while still getting everything you need.

Janneke Blake, a former primary school teacher who left the profession to pursue her environmental advocacy through her entrepreneurial spirit with her zero-waste, plastic-free lifestyle store called Shop Zero: www.shopzero.co.za. She is also a 5 Gyres Ambassador and Sustainable Ocean Alliance Ocean Leader, using her business's platforms to raise awareness about plastic pollution and climate change.

Nicolas Morin-Forest, Jérôme Caron, Antoine Davydoff and Gemma Lyons founded in 2019 in Paris, GOURMEY, the first French cultivated meat startup and the latest to break the food tech industry space with their lab-grown foie gras. Using cellular agriculture to cultivate foie gras, the fatty liver of a duck or goose, which will eliminate the animal cruelty and environmental footprint of the French delicacy. Traditionally, foie gras is produced via a cruel process, out of a liver of a duck or goose that has been force-fed or overfed. Beyond ethical welfare concerns, conventional animal agriculture is unsustainable – it generates a hefty carbon footprint, and causes contamination of our water, soil and air pollution. According to co-founder and CEO of GOURMEY, Nicolas Morin-Forest, three-quarters of French consumers are also uncomfortable with the force feeding involved in foie gras production.

Roxane Uzureau founded BarePack fights the abundance of disposable plastics consumed in Singapore. BarePack's practical day to day solution makes takeaway sustainable, fights disposables and the single-use waste culture.

Pat Brown is founder of Impossible Foods, a company which creates delicious „meat" from plants. When he was nearly 60, Pat Brown, a biochemist, left his job to pursue an entrepreneurial journey. His main concern was the destructive impact of meat production on the environment, so he decided to make a burger out of plants but with the same taste as meat. Pat's team created the Impossible Burger, and famous chefs started to feature it in their restaurants. In 2019, the Impossible Whopper launched at Burger King, and today Pat's company, Impossible Foods, is valued at nearly $4 billion.

2.2 What is an ecopreneur?

Going over these few examples of entrepreneurs with an "eco" twist, we can start into building up a definition of the ecopreneur. There is an obvious common thing in describing these entrepreneurial initiatives and that is their focus on environmental problems.

As Pat Brown was saying "If you can take a problem and figure out a solution that involves making customers happier, you're unstoppable". It is understandable that what motivated these people to become ecopreneurs was their desire to solve a problem that concerned them. Whether it's waste or overexploitation of natural resources, the entrepreneurs came up with innovative solutions for existing problems which are affecting the environment.

But why them and not others? What do they have that makes them ecopreneurs?

Looking into the work of Robert Isaak (2002) we found quite a comprehensive approach in defining the ecopreneur: „the ecopreneur decides that he or she will be better motivated and sleep well at night if whatever is done in business is not only a money-making concern but also a mission of social consciousness and political transformation in order to make Earth a more

sustainable place. The ecopreneur knows what to live for and that everywhere on Earth is 'home." We can also consider that the ecopreneur is on a mission to create an economy that respects the environment and its ecosystems.

One interesting addition is made by Isaak (1998) who differentiates between the green entrepreneur and the green-green entrepreneur. So, we are looking at two options: 'green businesses' and 'green-green businesses'. When talking about ecopreneurs we normally talk about 'green- green businesses' as defined by Isaak (1998). These businesses where from the beginning created to be green in their processes and products and were intended to change an industrial sector and behaviour of consumers towards a more sustainable model. This actually means that an ecopreneur builds its business trying from the start to solve an environmental problem. We can mention here GDiapers as an innovation for the disposable diapers which are an important source of waste, but also Impossible Foods which has actually opened a new market in the food sector. Going next to the green business type, we actually discovered that researchers considered it to be a business which went through the greening process, after becoming aware of the advantages they can have on the market by adopting such a strategy. We are talking about that type of business that is adding green options into their products and processes. For instance, we can mention here FoodPanda which is using bicycles for food delivery and partnering with barePack in Singapore to deliver using reusable packaging – both are eco-friendly options which were not part of the core business concept.

There is also a lot of literature that does not differentiate between the green entrepreneur, environmental entrepreneur or ecopreneur, so we believe it is important to clarify that this paper is about those entrepreneurs which from the start aim to solve an environmental problem and the core of their business is based on innovating in areas such as pollution control and treatment, waste disposal and collection, recycling and reuse, energy conservation, forestry and organic farming (Eastwood *et al.*, 2001). Our vision of the ecopreneur is similar to Beverdige and Guy (2005), meaning that the ecopreneur is the result of a strong mix between the conventional entrepreneur and the zeal of the environmental activist. We can also add that one of the definitions which is closer to our perspective belongs to Gwyn Schuyler (1998): "Ecopreneurs are entrepreneurs whose business efforts are not only driven by profit, but also by a concern for the environment. Ecopreneurship, also known as environmental entrepreneurship and eco-capitalism, is becoming more widespread as a new market-based approach to identifying opportunities for improving environmental quality and capitalizing upon them in the private sector for profit".

3. THE TYPOLOGY OF ECOPRENEURS

We looked into extensive literature in search of better understanding ecopreneurs and finding different typologies was a big step forward. But before

that, it is important to say the several scholars have insisted on strongly differentiating between ecopreneurs and entrepreneurs. Pastakia (2002) says that ecopreneurs are "a new breed of eco-conscious agents of change" and Isaak (2002) considers them to radically transform the economic sector having always in mind the concern for assuring long-term sustainability. For sure, Pat Brown with its Impossible Foods ventures is a very good example in this case, transforming the food sector by replacing meat with plants-based food which is a more sustainable option. Other agents of change are probably worth mentioning in areas such as renewable energy or urban mobility as well (to add more examples). A more comprehensive definition comes from Schaltegger (2002) which builds on the Schumpeter's (1949a) theory that entrepreneurship is a process of creative destruction. So, ecopreneurs are in fact destroying existing conventional production methods products, market structures and consumption patterns and create new products and processes for environmental progress (Schaltegger, 2002). We can definitely mention here Elon Musk with Tesla or Gourmey with their lab grown foix gras and barePack as well being a good example for the circular economy based on the concept of reuse (to add more examples).

There is also literature talking about entrepreneurs being more profit-oriented, while ecopreneurs having more idealistic and societal purpose in developing their business (Skoglund, 2017). Walley and Taylor (2002) explain that the green orientation can be an internal motivation, but also a result of a perceived market opportunity. The latter situation brings to light the opportunistic ecopreneur type which is actively searching for a green niche or just happens to find one. This opportunistic ecopreneur is called "the innovative opportunist" and together with the visionary champion, the ethical maverick and the ad-hoc enviropreneur form the typology which Walley and Taylor (2002) developed on the actions that the individuals take and the structures within which they act. They consider that the actions of an ecopreneur can be influenced in a "hard" way by government regulations, economic and moral demands from the consumers and in a "soft" way by family, friends, past experiences and personal networks. The same authors also say that there is a dynamic in the life of an ecopreneur, as they tend to reinvent themselves, so that means over time the ecopreneur can switch from one type to another. This in line with Pastakia (2002) which talks about internal forces for change such as ideological and strategic concerns and external forces like socio-economic regulations. Any of these can trigger change in the entrepreneurial journey.

The typology proposed by Walley and Taylor (2002) is in fact based on Thompson's (1999) four dimensions of entrepreneurship (Fig.1).

Hard, pragmatic, and opportunistic entrepreneur while spotting a green niche is what makes the innovative opportunistic ecopreneur type. Elon Musk developing Tesla can be a relevant example for this type.

Consistent with the sea change paradigm, the visionary champion is that type of ecopreneur which is intrinsically motivated, out to change the world, with a strong focus on sustainability. Pat Brown from Impossible Foods can be such an example.
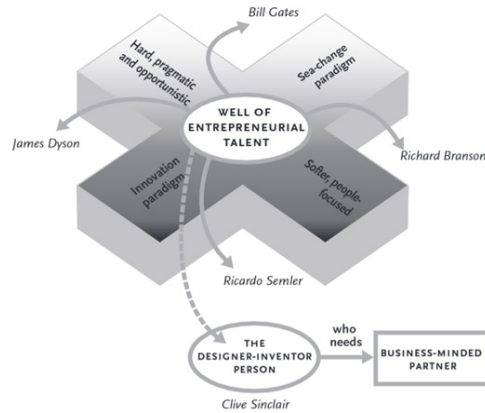
(Source: Walley and Taylor (2000))

Figure 1: The 4 dimensions of entrepreneurship (Thompson, 1999)

The ethical maverick belongs to the softer, people-focused entrepreneur category, being concerned about sustainability, but not aiming to make a difference in the world at a larger level, but choosing more of a lifestyle business type. The GreenGift business can be associated with this type of ecopreneur.

The ad-hoc enviropreneur is financially motivated and not driven by specific environmental values.
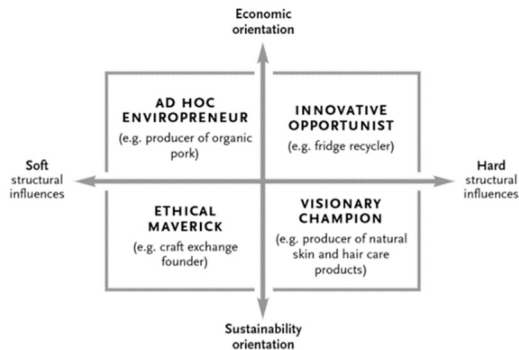
(Source: Walley and Taylor (2002))

Figure 2: The 4 types of ecopreneurs

We also found the typology of ecopreneurs of Lippmann *et al.* (2005) which is based on internal motivations and presents 4 types as follows:
-    The self-employer, is similar to the ethical maverick, choosing to setup a business to fulfil an entrepreneurial need with a green focus, yet not with great plans to change the world.
-    Non-profit business is usually build by an ecopreneur with high dreams and purpose to change the world and little financial orientation.
-    The opportunist has little environmental motivation and more financial interest
-    The successful idealist is the ecopreneur who has a strong desire to change the world, but also is focused on growing the business.

Looking at these different typologies, we noticed a strong pattern into differentiating between commercial ecopreneurs and social ecopreneurs. Commercial ecopreneurs are associated with corporations and viable business ventures that aim to innovate products and processes by taking opportunity of green innovation to significantly transform industry sectors.

4.   CONCLUSIONS

When trying to define what an ecopreneur is, we should look at the people around us, who have done amazing things for society and for nature. To be an ecopreneur is to have an interest in doing well, in helping others and in leading the people who choose to follow you. An ecopreneur is an example of a passionate leader, a person who thinks about the consequences of their actions and who thrives to change what doesn't work properly in this world. There are people who stepped in front, very popular faces, but there are also people that are not very famous, but who also did extraordinary things and who are worth to be mentioned.

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CHALLENGES IN ECO-BEHAVIOUR ADOPTION – FOOD WASTE AWARENESS AMONG ROMANIAN CONSUMERS

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ABSTRACT

Food Waste has become a significant issue for the 21st century, as it has harmful social, economic, and environmental implications that affect all living beings. Currently, more than half of the total food waste comes from developed countries in the consumption stage, mainly generated by consumers' attitudes and behaviours towards food. In developing countries, the waste is generated in the first stages of the food supply chain due to the lack of technology and infrastructure. This paper aims to develop an in-depth analysis of the phenomenon of food waste seen through the eyes of the sample of Romanian consumers by identifying the principal drivers of residential food waste and the current strategies to impact consumer behaviour, in-home and by the authorities. The results show that the respondents are aware of the food waste phenomenon, and they are concerned about wasting money and about the people that do not have access to healthy food. Besides the existing national policy for diminishing food waste, consumers still reported the need for Government involvement through policies and laws, as these measures are considered as being very impactful in reducing food waste at the consumption stage and that generated from the retail sector.

Keywords: food waste; consumer behaviour; supply chain; attitude**.**

JEL Classification: M31

1. INTRODUCTION

Food Waste has become a significant issue for the 21st century, as it has harmful social, economic, and environmental implications that affect all living

beings. Currently, more than half of the total food waste comes from developed countries in the consumption stage, mainly generated by consumers' attitudes and behaviours towards food. In developing countries, the waste is generated in the first stages of the food supply chain due to the lack of technology and infrastructure.

This paper aims to develop an analysis of the phenomenon of food waste in Romania by identifying the principal drivers of eco-behaviour in regards to residential food waste.

2. DRIVERS OF RESIDENTIAL FOOD WASTE

Many factors influence household food waste, but mainly it depends on consumers' values and attitudes and how people apply them in their everyday lifestyle (Hebrok and Boks, 2017; Parfitt *et al.*, 2010; Principato, 2018). Everyday life implies planning, shopping, cooking, storing food, each one of them being responsible for specific quantities of waste, and each one of them can be diminished to some extent (Principato *et al.*, 2020). In Romania, about 40% of one's monthly income is spent on food purchases, from which 30-50% of the food purchased ends up in landfills (Food Waste Combat, 2020).

2.1 Household food waste journey

Principato (2018) illustrated consumers' behaviour as a journey, with specific steps, each one being responsible for a particular amount of food waste (Principato, 2018). The first step in the "Household Food Waste Journey" is planning, which implies using shopping lists or meal planning, and which is considered crucial as a good share of food waste comes from buying food that is not needed or people do not have the intention to cook it, and therefore, in the end, it goes to landfills (Quested *et al.*, 2013). The second stage occurs inside the store, where buying decisions can be influenced by impulse or by marketing strategies (WRAP, 2009). A literature analysis done by Aschemann-Witzel *et al.* (2016), illustrated that in the large pool of studies analyzed, consumers reported that the packaging is too large, or the price promotion and product deals are encouraging methods for buying more food than needed (Aschemann-Witzel *et al.*, 2016). The following stages are taking place at home, where storing, cooking, consumption, and disposal happen. Principato (2018) mentioned food management and culinary skills as important aspects influencing food waste at home. Some people do not know how to place products correctly, depending on their temperature needs (Graham-Rowe *et al.*, 2014), or they do not have cooking skills, which lead to burning food, cooking too much food than needed, or they cannot transform the leftovers into new meals (Principato, 2018). For the disposal part, Secondi *et al.* (2015) demonstrated that consumers who are recycling or composting their kitchen waste tend to toss away less food compared to those that are not doing these practices (Secondi *et al.*, 2015). Some behaviours may originate from a set

of concerns. Lyndhurst (2007) found out that the respondents are concerned about wasting money, throwing away good food, or feeling guilty about wasting food (Lyndhurst, 2007). In addition to these three reasons, Graham-Rowe *et al.* (2014) illustrated a fourth one, which is that consumers consider food waste as being a "bad thing" from an ethical perspective (Graham-Rowe *et al.*, 2014). Environmental concerns about food waste turn out to be a small motivator to curb wasteful behaviour (Neff *et al.*, 2019). While consumers show environmental consciousness through their attitudes and behaviours, ecological impacts follow other factors to minimize food waste (Graham-Rowe *et al.*, 2014).

2.2 Food waste awareness

Considering the implication of food waste, in the past years, in Romania, people started to assess the importance of reducing food waste, and some local projects have been developed and implemented with the help of the European Union. One of them was implemented by Food Waste Combat, an NGO fighting to reduce the amount of food waste in Romania. They run educational projects about food waste in schools, they created the first Food Bank in Cluj-Napoca, meant to save food from the landfills and helping redistribute this food to people in need, and they have a partnership with a large chain of supermarkets, creating online educational campaigns meant to inform people about food waste and provide practical solutions (Food Waste Combat, 2020).

Likewise, the United States of America is implementing projects meant to inform consumers and to redistribute their food waste. "Feeding America" is one example of an NGO that, by 2016, succeeded in redistributing 4 billion meals to 46 million Americans with low incomes, working with over 200 food banks. By this, the organization can improve food security and "educate the public about food waste and hunger problems". Similarly, WRAP's campaign "Love Food, Hate Waste" focuses on awareness, working with the public and private sector to provide valuable tips to reduce food waste (Principato, 2018).

2.3 Action taking

At the same time, while making people aware of this concept of food waste, it is crucial to address solutions for solving the problem. As some causes of food waste were determined, and a general idea about them was made, many scholars and organizations tried to find solutions to solve the issues mentioned above. The FAO (2011) sustains that finding solutions should not be concentrated only to one segment of the FSC, but to address all the segments at the same time, as actions taken in one part will affect the others (FAO, 2011). In the same idea, Papargyropoulou *et al.* (2014) proposed the following framework for managing food and food waste:
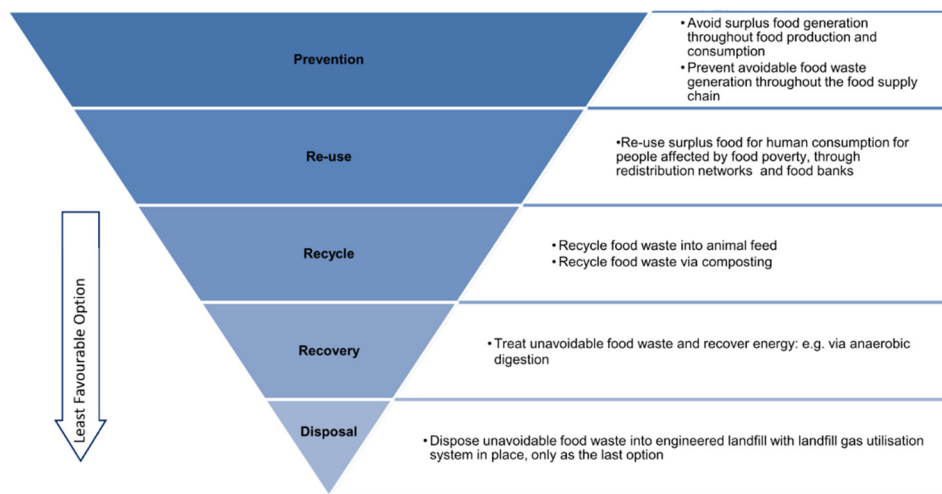
(Source: Papargyropoulou *et al.* (2014))

Figure 1 - The Food Waste Hierarchy

Other solutions include focusing on shortening the distance from farm to fork, by promoting and offering investment and support for local farming, as this can decrease the emissions from production, storing, and transportation (Pretty *et al.*, 2005), shifting towards plant-based diets, as with the same amount of land, a lot more people could be fed if they will shift to a vegetarian diet (Godfray *et al.*, 2010), or educating people through campaigns on how to prevent food waste (Jurgilevich *et al.*, 2016). Through communication strategies, consumers can be influenced to adopt more sustainable in-home practices, such as creating a shopping list, consuming all the food before buying something new, improving storing and cooking skills (Parizeau *et al.*, 2015) and buying only what is needed, practices that were found impactful in solving the issue of food waste (Kibler *et al.*, 2018).

In 2015, European Commission included food waste into the action plan for enhancing circular economy as the new strategy, by offering investments through EU's Horizon 2020 Research Programme, for innovative projects regarding food waste, as well as complying with the United Nations 17 SDGs (European Comission, 2015). Later on, Jurgilevich *et al.* (2016), proposed the Circular Economy as a viable solution because "Circular economy regarding the food system implies reducing the amount of waste generated in the food system, re-use of food, utilization of by-products and food waste, nutrient recycling, and changes in diet toward more diverse and more efficient food patterns" (Jurgilevich *et al.*, 2016). The concept of circular economy was also sustained by Garcia-Garcia *et al.* (2019), who mentioned the first step for successfully implementing a circular

economy to be the reduction of food waste as much as possible, followed by finding the best and the most sustainable solutions for handling the remaining debris. Prevention of food waste was mentioned by Papargyropoulou *et al.* (2014) as being impactful at any stage of the FSC, altogether with reuse, recycle, recovery and, in the end, and least favourable, disposal (Papargyropoulou *et al.*, 2014).

To sum up everything that has been stated so far, food waste represents a real challenge for our century. Solving the problem with food waste has benefits in three different areas: social, environmental, and economic areas.

3. EXPLAINING FOOD WASTE BEHAVIOUR

This paper aims to develop an in-depth analysis of the phenomenon of food waste seen through the eyes of the sample of Romanian consumers by identifying the principal drivers of residential food waste and the current strategies to impact consumer behaviour, in-home and by the authorities.

The data have been drawing from 12 in-depth semi-structured interviews conducted in an online environment with Romanian consumers over a period of two months, each having different household conditions, lifestyles, and demographic criteria. The interviews have been coded using NVivo, and the results are presented using a mind map.

3.1 The methodology

The main interest of this study is obtaining insights from Romanian consumers regarding in-home food waste practices and food waste awareness, an interview guide was created with questions adapted from Graham-Rowe et al. study (Graham-Rowe *et al.*, 2014). The approach was qualitative and collected data is based on in-depth semi-structured interviews conducted in an online environment with 12 representatives of Romanian households. During interviews and this methodological part, food waste is referred to as any food that was produced for consumer consumption but was thrown away due to specific reasons. This definition does not contain any inedible food parts, such as peels, bones, shells (FAO, 2014). The participants are residents of Romania, as this is the context this study is developing in, and they were selected based on their household characteristics, as household size and the presence of children were found as essential aspects in food waste analysis (Principato *et al.*, 2020). This thesis includes only women, as it is more common that women would be in charge of grocery shopping and cooking in most of the Romanian households where both genders are living together (Cantaragiu, 2019).

3.2 Results

Four broad categories of aspects that influence consumer behaviour regarding food waste were identified. The first one is (1) the context regarding Romanian culture and lifestyle; the second one is represented by (2) the level of

awareness a person might have when it comes to the quantity of food they waste, as well as the knowledge about the consequences of food waste; a third category is represented by (3) childhood influences, which depends on their parents' relationship with food during their childhood, or the place they lived in, either in the countryside or in the town; and the least one is (4) attitude towards food and food waste, as well as towards other actors in this particular phenomenon. These themes can be visualized in the mind map below.
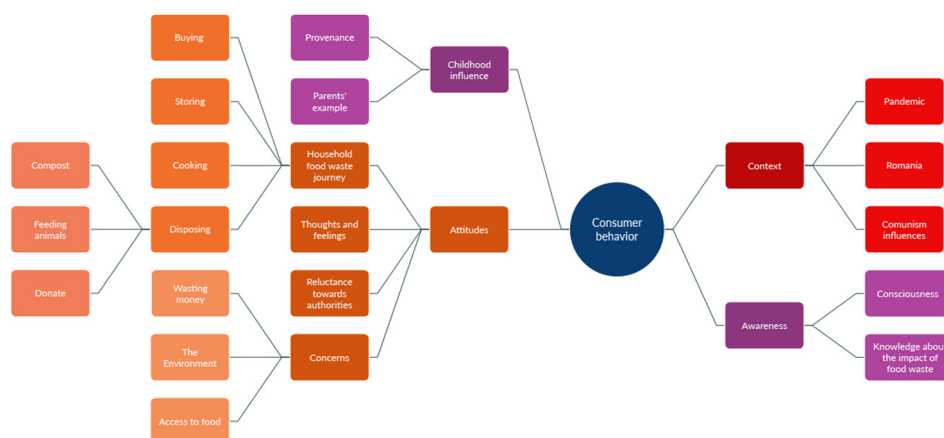
Figure 2 - Consumer behaviour mind map

Context

One aspect that appeared during the interviews was Communism and how this experience has effects nowadays. Even if the participants who brought up this topic were not born in that period, or some of them were children back then, they talked about their parents' or grandparents' experience. One of the participants said: "I had this conversation with my friends before, being a post-communist country, where we didn't have a lot of resources at that time, now, having so many options, we think that if we don't buy we might run out, starve to death." Besides this, another inconvenience which is mentioned is influencing older people to change their behaviour in terms of food waste.

Level of awareness

When they were asked why other people throw away food, many of the respondents were bringing into discussion the lack of awareness some people have: "I think they're not aware that they're throwing away the food. Or maybe there are some who are aware but don't make much change." On the same idea, awareness is correlated with the communication of this issues, which, from

another participant says is not sufficient: "What I can say… that it's about attention first and then awareness; that we have very little attention to what we do throughout the day."

Childhood

On one side, the natal place where the respondents grew up is important. Since most of the participants grew up in the countryside, they reported a higher connection with agriculture, as some of them were involved directly into getting their food: "I think since I was little, I was taught not to throw away food. I mean, to us I think it was a responsibility, it is an effort to procure your food, whatever that effort. From a personal point of view, it's an effort, you're working to get it, and then you throw it; that's a big warning sign." This idea is also shared by another participant, who exposes the act of throwing food as a disrespect towards the work they have done to procure the food: "And somehow, growing up in the countryside, everything we consumed was produced by us, and there's still my folks worrying that throwing the food it's like you're messing with work: working, producing those foods, and then cooking and throwing."

Attitudes

All the participants associated food waste with destructive emotions, directed either to themselves, or the person who ends up throwing the food ("I feel like a worthless person. I'm serious, and I'm not just talking about me but both of us, my husband and I, feel very, very bad because maybe we could control this better, and we're thinking that every action we take in our family has a long-term effect, or an effect that propagates on the entire planet."). The participants associated throwing food away with emotions such as frustration ("Frustrated, because I couldn't find a solution for the discarded food"), disappointment ("Look, one feeling is disappointment, and now it's a disappointment really led towards us, but also to this world of which we are a part, that we can afford, because in the end we all kind of afford it, we don't have some barriers, there are no laws or there are no explicit limits - we can afford to throw"), anger ("Well, if it was made by me, I'm angry because I know how hard I worked on it. If it's a large quantity, which lately I've been avoiding, and I've even managed to cook as little as I can, as much as we eat once, at most twice. I'm pissed off that I give the money and I throw it away, and I feel, how can I say, guilty of throwing, guilty because it's an expense and because it's work").

Shopping

When the participants were asked to exemplify a typical shopping trip, some participants related that they use a shopping list that includes a part of the shopping they need, based on what they already have at home ("When I go shopping, I choose to make a list before, but although I have the list with me, I choose to go

through all the shelves, I put in the cart what I need, and depending on the location where I am, I take more stuff which are not on the list"), and some of them said that they do not use a shopping list unless they have to ("I don't make shopping lists, unless I want to make a certain dish"), or they already know what they need to buy ("I don't usually make a list, but I have a list in my mind, that I follow when I do my shopping"). In terms of shopping frequency, most respondents stated that they go to the supermarket and/or to the farmers' market about one a week for more extensive shopping ("About once a week, I go to the supermarket and when it's summer and the farmers' markets are open, I go twice"). For example, one participant said that she prefers to keep stocks in the house which she buys twice a month, while the perishable foods, such as fruits and vegetables, she prefers to go and buy them many times a week, in smaller quantities.

Cooking

Cooking is another aspect that has roots from their childhood, either positive: "I don't cook much at once, and I think that's a habit from childhood, from my mom, when the food was always fresh and very rarely, she made a dish that was eaten all week." (P11), or negative: "Mom is not doing it very well. In our family, we don't really eat beans soup, but she still cooks it. There's only one person who eats this meal, and she cooks a lot, which will end up being thrown away." Besides their parents' example, the way the participants were taught at home about food and food waste, were mentioned as key drivers of their behaviour. Some important aspects have arisen during the discussions, such as the concern about other people having nothing to eat: "Besides, I also think about things that I've been taught at home, for example that some people have nothing to eat and we throw away the food.", or the idea that they must finish everything from the plate: "Probably this is due to the way I was raised, that you do not throw anything from the plate and finish everything from the plate."

Disposing

Regarding disposing of food, there were different approaches to this idea. For example, many of the participants who grew up in the countryside are used to feed the domestic animals with the leftovers ("Food waste is different in rural areas, than in urban areas, because I look at myself who I am used to keep the leftovers to give them to an animal. For example, I collect the leftovers, and I take them down to the puppies. Same at my house [in the countryside], we have chickens, puppies and the leftovers are given to animals"). Giving the leftovers to the animals does not produce any negative emotions, compared to throwing the food in the trash ("Well, for example, my mother gives the leftovers to cats and dogs, and she doesn't feel bad").

4. DISCUSSION

The primary purpose of this thesis was to identify the main drivers of food waste and highlight some effective strategies for reducing food waste at the household level that could be implemented either by consumers or authorities. The findings revealed four distinct categories of drivers: context, childhood influences, level of awareness, and attitudes. The findings were in line with the literature, as one can see below.

The context. It comprises the cultural factors, which have been found fundamental in assessing the amount of food waste produced at the level of the society (Thyberg and Tonjes, 2016). Pollan (2007) sustains that cultures with more vital traditions and values towards food procurement, preparation, and consumption are more connected with food, therefore, are less inclined to waste (Pollan, 2007). Romanian culture is still involved in agriculture in a high proportion; therefore, people are more connected with procuring and consuming food, at least in the countryside. Romanian culture, as well as any other culture which had been under Communist occupation, can experience the behaviour of bulk purchasing or over-purchasing. As Clit (2003) had written, "Two elements of everyday life in communist Romania during the eighties, the food shortages and the absence of house heating, are considered as causes of fear for most of the people" (Clit, 2003), the Communist period still affects Romanian culture. Nowadays, the fear of running out of food is somewhat disguised as the inconvenience of going shopping multiple times or not having the needed produce on hand (Graham-Rowe *et al.*, 2014).

Childhood influences. Ioniță (2017) developed a study with a sample of the aging population that experienced the Communism period and how that experience affected their behaviours regarding food and food waste after the period has ended (Ioniță, 2017).

Level of awareness. Graham-Rowe *et al.* (2014) explains that a lower level of concerns about the negative consequences of food waste on the environment could be explained by the lack of awareness about it (Graham-Rowe *et al.*, 2014).

Attitudes. Regarding the attitudes, the lifestyle and the household food waste journey are, as well a much discussed topic in the literature. The main sources of food waste are represented by the shopping, cooking and disposing habits each individual has. the Theory of Planned Behaviour introduced by Ajzen in 1991, which sustains that the most critical aspect is the intention of one individual of changing the behaviour and the harder the intention, the greater the performance of changing the behaviour (Ajzen, 1991), studies show that the behaviour of reducing food waste is influenced by one's attitudes towards food, household habits and intention to change (Quested *et al.*, 2013). However, this theory was extended by Collins and Mullan (2011), who added that for repetitive behaviours, the intention is no longer the only variable to consider, but also the past behaviours

as they have a significant role in predicting future behaviours (Collins and Mullan, 2011).

Shopping. Farr-Wharton *et al.* (2014) say that checking up the food stock in the house and communicating with household members about the food preferences are very important in duplicating the products Farr-Wharton *et al.* (2014). In line with this, (Jörissen *et al.*, 2015) found out that people who are making a shopping list before going shopping waste about 20% less food (Jörissen *et al.*, 2015). Additionally, people who are meal prepping and using shopping lists do not find themselves in a position of buying unnecessary products (Stancu *et al.*, 2016).

Cooking. One of the most frequently mentioned drivers of food waste at the household level are cooking too much or cooking more than a person needs for one meal. At the same time, Secondi *et al.* (2015) sustained that solving this issue, estimating better the meal sizes, would be very efficient in reducing the household food waste (Secondi *et al.*, 2015). In line with this, storing leftovers for later use instead of immediate throwing has been considered one of the best methods to reduce the food waste resulted from households (Secondi *et al.*, 2015). Stancu *et al.* (2016) and Stefan *et al.* (2013) demonstrated that people who are reusing their leftovers, in general, generate less food waste. However, in the case of leftovers from ordered food, they frequently end up being forgotten in the fridge, or people do not find them fresh and tasty enough, therefore they are still being thrown away.

Disposing. How food is disposed of also influences the amount of food that ends up in the landfill. In the countryside it is used to give the leftovers to domestic animals, or composting them, which are common disposing alternatives in the literature (Wenlock *et al.*, 1980). These alternative methods were proudly stated by the consumers because they consider that they do no harm by doing this (Neff *et al.*, 2015), and it is more ethical to feed a pet, for example than throwing the food in the bin.

5. CONCLUSIONS

The results show that the respondents are aware of the food waste phenomenon, and they are concerned about wasting money and about the people that do not have access to healthy food. Besides the existing national policy for diminishing food waste, consumers still reported the need for Government involvement through policies and laws, as these measures are considered as being very impactful in reducing food waste at the consumption stage and that generated from the retail sector. The majority of the respondents did not show any knowledge about national or local policies and actions taken for combating food waste, which explains the gap between theory and practice and highlights the need for a solid strategy to address this issue.

In conclusion, this paper represents a small step added in creating a broader pool of papers focused on Romania, which addresses food waste resulting from households. We consider that the mind map is a useful tool for researchers interested in the domain and also a good start for us to further develop our study with applied work. Future papers could also use qualitative and quantitative methods on relevant samples and data could also be collected longitudinal to follow the behavioural change as it happens. These further studies could also be a good foundation for developing strategies to reduce food waste. Still, some procedures involve strong participation of all actors, such as consumers, Government, Educational systems, and private companies, to ensure the introduction of a subject in schools or educational programs that address food waste, or to create an infrastructure for donating and composting the food surplus.

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THE EFFECTS OF WORKING TIME AND WORK DIMENSIONS ON INDIVIDUAL PRODUCTIVITY

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ABSTRACT

The standard length of the working day has remained unchanged for almost 100 years. But the type of work that we do nowadays has almost nothing in common with the production-line repetitive work that our ancestors were doing. Based on the premise that the optimal work schedule differs depending on the type of work being done, we present the steps taken to pre-test a semi-structured interview guide. The purpose of the instrument is to investigate the relationship between the length and structure of work time, the mental fatigue of the participants, the dimensions of their work, and their individual productivity with the purpose of providing some insight into answering the following research question: What is the optimal length and structure of work time for each dimension of work? First, we present the initial interview guide. Then, we present the results of a conceptual content analysis on data gathered through 6 in-depth semi-structured interviews, which place the optimal length of work time in the range of 6-7 hours per day. Last, we present the proposed final instrument, the limitations of the study, and its conclusions.

Keywords: working time; work schedule; individual productivity; emotion work; knowledge work; interview guide.

1.   INTRODUCTION

There has been great public interest in reducing the length of the standard working day over the last years (Bateman, 2022) (Stronge *et al.*, 2019). Such measures could have a huge impact on the quality of people's lives (Whillans *et al.*, 2017). This holds true especially in today's unusual context, in which the

COVID-19 pandemic has turned working from home into the "new normal" (Brynjolfsson *et al.*, 2020) leading to leading to a more and more ambiguous separation between professional and personal lives (Shimazu *et al.*, 2020).

There are organizations that have tested a reduced work schedule and concluded that it decreased employee productivity (Congregalli, 2018) (Barck-Holst *et al.*, 2017) (Anttila *et al.*, 2005) (Anttila, 2005) (Nätti and Anttila, 1999). However, there are also organizations that have adopted a reduced work schedule long-term, arguing that it leads to increased productivity. (Barnes, 2020) (Perpetual Guardian, 2019) (Kari, 2019) (Bråth, 2016). Therefore, there is no consensus, in practice, on the effects of the length of work time on employee productivity. This consensus is also lacking from a theoretical point of view. Despite the abundance of work-life balance research, there is still no complete and coherent theory to explain how, through what pathways, various structures of work time influence employee productivity, directly or indirectly (Kelly *et al.*, 2008). Moreover, research in this area does not differentiate sufficiently between the dimensions of work – physical, cognitive[i] or emotion work[ii] (Lee *et al.*, 2017). Another gap in the literature is the integration of research results on the effects of mental fatigue on productivity in recommendations for Human Resource Management (HRM) practice.

Most studies done on exogenous variations of the length of work time and its effects on employee productivity have been conducted on data collected during the first half of the 20th century (Dolton *et al.*, 2016) (Pencavel, 2015) (Nyl, 1995). They have placed the optimum length of the working time in the range of 8-9 working hours per day, while its structure should include frequent and short breaks, as well as at least one day off per week. It is called the optimal length because the interval of 8-9 working hours per day is the threshold above which the increase in working time length no longer led to an increase in productivity. However, this threshold cannot be generalized, as the nature of work has changed greatly since the 20th century (Barley *et al.*, 2017). The purpose of this paper is to provide some insight into answering the following research question: What is the optimal length and structure of work time for each dimension of work? We consider the optimal length to be the threshold that is associated with both high individual productivity and employee well-being and that can be maintained long-term.

We conducted in-depth semi-structured interviews on a sample of 6 participants with diverse backgrounds, jobs, job complexity, and work schedules. The purpose of the interviews was the pretesting of an initial interview guide build to investigate the relationship between the length and structure of work time, individual productivity, and mental fatigue of knowledge workers and employees in the service industry. We have chosen these categories of employees because we consider them to be representative of two dimensions of work: cognitive work and

emotion work. The data collected was then analysed through the conceptual content analysis method.

The content analysis results showed that the most common themes present in participants' answers were: the presence of a high level of fatigue at the end of the work schedule (5), the fact that time pressure is very tiring (5), and the fact that participants alternate types of tasks according to their fatigue level (4) as a coping mechanism with mental fatigue during work time.

The paper proceeds as follows. First, we will present the initial semi-structured interview guide, the participants' demographic characteristics, and the procedure that we have followed in collecting and analyzing the qualitative data. We will then present the themes and their frequencies that have resulted from the conceptual content analysis conducted on participants' responses. Last, we will present the final interview guide that we propose, the discussions and limitations of the study, as well as its conclusions.

2.   METHODS

To investigate the relationship between the nature and dimensions of work, the length of working time and its structure, individual productivity, and mental fatigue of participants, in this study, we used a qualitative research method based on semi-structured in-depth interviews. The purpose of this study was the pretesting of the interview guide that was used throughout the interviews.

2.1 Instrument

The instrument that we used throughout this study is the initial interview guide, presented in (Table 1). We used open-ended questions that were formulated based on the concepts targeted by this research: nature and size of work, variety, and complexity of tasks, structure, and duration of the work schedule, mental fatigue, and productivity. A mix of questions about the participants' experience, questions regarding their opinions, as well as imagination questions was used. All the interviews were conducted in Romanian, based on a Romanian interview guide. In (Table 1) the English interview guide is presented that was translated for this article.

Table 1. The initial interview guide

Themes	Questions
Introduction	
Introduction	1. For starters, please tell me a little bit about yourself. 2. What are your interests/passions? / What are your hobbies? a. How did you come to practice…? / What attracted you to…? / What do you like about…?
Transition to the topic	
Transition to the topic	3. How did you get to work in your current role? a. Please tell me more about your background.
Essential questions	

Nature and dimensions of work	4. What is the main purpose of your role?
	5. To what extent do you need to manage your emotions / emotional states at work?
	    a. How important is this aspect?
	    b. How much effort do you put into it?
	6. To what extent do your tasks require expertise / specialized knowledge?
	    a. To what extent do you learn new things at work?
	    b. To what extent do you generate new knowledge at work?
	    c. To what extent do you solve problems at work?

Variety and complexity of tasks	7. Please describe the types of tasks that you do.
	    a. How would you divide them into categories?
	    b. How much do they vary? / How repetitive are they?
	8. Which are the most important out of these?

The structure of working time	9. How would you describe a typical working day of yours?
	    a. Between what hours do you usually work?
	    b. How do you organize your schedule?
	10. How do you organize your breaks during your work time?

The length of working time	11. How much time of your schedule do you spend on tasks that contribute to your productivity directly? 12. What would the optimal working time look like for you, that would allow you to maintain the same productivity level? 13. What do you think about reducing the length of the working day? a. How would it influence your productivity?

Fatigue and productivity	14. How do you feel at the end of the working day?
	15. How would a productive day look like for you?
	16. How would a tiresome day look like for you?
	    a. Please tell me more about it.
	    b. How does fatigue influence your productivity?

Closing and thanks	

2.2 Sample

Both a convenience sample and maximum variation sampling were used to pre-test the interview guide. During the selection of the participants the aim was to interview subjects with complex roles and work programs as varied as possible.

As (Table 2) displays, a total number of 6 participants were interviewed in-depth. 5 of them were full-time employees, while one of the participants was a freelancer. 5 participants were female, and one participant was male. All participants interviewed were between 25 and 31 years old. Although all participants were Romanian citizens, 4 of them lived and worked in Iași in Romania, while one participant was re-established in Vierzon in France and one participant was re-established in the city of Sunderland in the United Kingdom. 2 of the participants were working at their workplace, 1 was working from home on a regular basis, and 3 of the participants were working, temporarily, from home because of the COVID-19 pandemic. The latter were invited, during the interview, to reflect on the pre-pandemic periods, in which they were working at their workplace.

All participants were graduates of higher education and were working in the fields in which they had completed their studies. 2 of the interviewees were working in marketing, 2 in the field of information technology (IT), one person in the pharmaceutical field, and one person in the field of electronics and telecommunications. As for the industries, 2 of the interviewees were working in the IT industry, 1 in the automotive industry, 1 in the artisanal manufacturing industry, 1 in the pharmaceutical industry and 1 interviewee was providing marketing services for a variety of industries. The roles of each participant were: Supplier Quality Management Engineer, Digital Marketing Manager, Software Engineer, Intern in the department of quality assurance - customer complaints management, Quality Assurance Engineer, and Marketing Specialist. A summary of the demographic data of the participants can be consulted in (Table 2).

Table 2. Participants' demographic data

Code	Type of emp	Age	Gen	Location	Studies	Role	Industry	Level, Experience
127F	Full-time	27	F	Iasi, Romania	Bachelor's degree (ETIT)	Supplier Quality Management Engineer	Automotive	Mid, 4 years
226F	Freelancer	26	F	Sunderland, UK	Bachelor's degree (Marketing& Journalism)	Digital Marketing Manager	N/A	N/A, 4 years
331M	Full-time	31	M	Iasi, Romania	Bachelor's degree (IT)	Software Engineer	IT	Senior, 7 years
425F	Full-time	25	F	Vierzon, France	Bachelor's degree (Pharmacy)	*Apprentice Assurance Qualité*	Pharmaceutical	Intern, <1 year
527F	Full-time	27	F	Iasi, Romania	Bachelor's degree (Automation &Comp)	Quality Assurance Engineer	IT	Mid, 5 years
628F	Full-time	28	F	Iasi, Romania	Master's degree (Marketing)	Marketing Specialist	Artisanal manufacturing	Mid, 2 years

2.3 Procedure

The targeted subjects were personally approached by the authors and invited to participate in the research by the means of a phone conversation. To obtain their informed consent, we explained the research theme of the study, we guaranteed their anonymity and confidentiality and we assured them that the refusal to participate would not affect in any way their relationship with the authors. Following the telephone approaches, the 6 subjects described above accepted the invitation to participate in the research.

We then scheduled the 6 interviews. They took place between the 2nd and the 8th of January 2021. We used the online interview method. The 6 interviews were recorded, and the participants' answers were initially transcribed using the Sonix software. However, as many words were not recognized by the software, we then did a manual transcription and summary of participants' responses. We organized the collected data based on the questions in the interview guide.

2.4 Data analysis

We used the method of conceptual content analysis to analyse the data collected through the in-depth interviews. The conceptual content analysis method aims to systematically transform a large amount of text into an organized summary of the key results. We used emergent coding because it offers greater flexibility regarding the codes, categories, and themes that we used. Information that was irrelevant to the research topic was ignored.

The content analysis involved a continuous process of coding, abstraction, and returning to the original text. We did that in order to assess whether all the

meanings of the participants' answers were included in the condensed meaning units, in the assigned codes and categories, as well as in the inferred themes. Throughout this step, we made an effort to not be influenced by our perceptions of the influence of working time on our productivity.

3. RESULTS

3.1 Content Analysis

The results of the content analysis that we conducted are presented further on. The following themes and frequencies were obtained, organized based on the concepts targeted by the research:

Emotion work: *Managing one's emotions is necessary when working with other people (4); Managing one's emotions is necessary in stressful situations and in situations with time pressure (2); The effort to manage one's emotions is moderate (2); The effort to manage one's emotions is low (1); The effort to manage one's emotions is high (1); Managing one's emotions is necessary when there is autonomy regarding one's work schedule (1).*

Cognitive work: *Tasks require specialized knowledge (4); Tasks require continuous learning (4); Role/industry requires continuous learning (2); The role is versatile, and it requires adaptation (1).*

Variety and complexity of tasks: *Tasks are mostly varied (2) and complex (1); Tasks are mostly repetitive (1); Tasks are mostly creative (1); Tasks are balanced (neither too varied nor too repetitive) (1); Tasks are divided into time pressure tasks and development/learning tasks (1).*

Length and structure of current work schedule: *Most tasks contribute directly to productivity (4); Schedule varies based on request (2); Works on average 7 hours a day (2); Works on average 6 hours a day (2); Half of the tasks contribute directly to productivity (1); Less than half of the tasks contribute directly to productivity (1); Tasks are organized by chronotype (1); Alternating work with socialization (1).*

Opinions about the optimal length of work time: *A 6-hour long work schedule would be optimal (3); A 7-hour long work schedule would be optimal (2).*

Opinions on reducing the length of work time: *It would be welcomed because one loses their concentration after a few hours (3); Concerned about the increase in the intensity of working time (2); Worried about the increase in stress levels (1); Worried about lack of time for socializing (1); Reducing the length would improve one's long-term productivity (1); It would be welcomed because then one would have time for personal projects (1).*

Mental fatigue: *The level of mental fatigue is high at the end of the workday (5); Time pressure is tiring (5); Fatigue has counterproductive effects (3); A high volume of repetitive tasks is tiring (2); A high volume of tasks is tiring (2); Changing priorities are tiring and demotivating (1).*

Productivity: *Alternates the types of tasks according to their fatigue level (4); Likes routine (2); Wants to work without time pressure (1); Organizes their tasks by chronotype (1); A balanced program is productive (1).*

As it can be seen, the most frequent and surprising themes were *the presence of a high level of fatigue at the end of the work schedule (5), the fact that time pressure is very tiring (5),* or the fact that participants *alternate types of tasks according to their fatigue level (4)*, as a coping mechanism with mental fatigue during work time.

3.2 The proposed interview guide

Following the 6 interviews, we made a series of changes to the initial interview guide. The first change was to reduce the number of introductory questions. During the interviews, we have found that the first 2 questions in the guide were sufficient to set a relaxed atmosphere and continuing the introductory discussion would not have helped us gather data relevant to the research problem. Therefore, only the first 2 introductory questions remained in the final interview guide, as can be seen in (Table 3).

The next change that we made to the guide was to delete questions no. 4, 8, and 10, respectively: *What is the main purpose of your role?, Which are the most important out of these (types of tasks)?* and *How do you organize your breaks during your work time?* During the interviews we have found that question no. 4 does not lead to relevant answers for the research topic, question no. 8 leads to similar answers as question no. 11, and most of the participants had already answered the 10th question through their answer to question no. 9, *How do you organize your work time?*

The last change that we did to the interview guide concerned question no. 11, *How much time of your schedule do you spend on tasks that contribute to your productivity directly?* This question was not understood by the participants. All 6 interviewees requested additional explanations before being able to provide an answer to this question. Thus, the question was rephrased as: *How much of your schedule do you spend on tasks that are part of your main role responsibilities?* The new interview guide proposed, which includes all these changes, can be seen in (Table 3).

Table 3. The proposed interview guide

Themes	Questions
Introduction	
Introduction	1. For starters, please tell me a little bit about yourself. 2. What are your interests/passions?
Transition to the topic	
Transition to the topic	3. How did you get to work in your current role? a. Please tell me more about your background.
Essential questions	

Nature and dimensions of work	4. To what extent do you need to manage your emotions / emotional states at work?
	     a. How important is this aspect?
	     b. How much effort do you put into it?
	 5. To what extent do your tasks require expertise / specialized knowledge?
	     a. To what extent do you learn new things at work?
	     b. To what extent do you generate new knowledge at work?
	     c. To what extent do you solve problems at work?

Variety and complexity of tasks	6. Please describe the types of tasks that you do.
	     a. How would you divide them into categories?
	     b. How much do they vary? / How repetitive are they?

The structure of working time	7. How would you describe a typical working day of yours?
	     a. Between what hours do you usually work?
	     b. How do you organize your schedule?

The length of working time	8. How much of your schedule do you spend on tasks that are part of your main role responsibilities? 9. What would the optimal working time look like for you, that would allow you to maintain the same productivity level? 10. What do you think about reducing the length of the working day? a. How would it influence your productivity?

Fatigue and productivity	11. How do you feel at the end of the working day?
	 12. How would a productive day look like for you?
	 13. How would a tiresome day look like for you?
	     a. Please tell me more about it.
	     b. How does fatigue influence your productivity?

Closing and thanks	

4. DISCUSSIONS AND LIMITATIONS

This study has both limitations specific to the research method and particular limitations. First, there is the risk of biased data collection and summary done on participants' answers. The authors, who have worked various lengths and structures of their work time felt that there were no significant differences regarding their productivity between working 6 hours per day, compared to working 8 hours per day. However, the authors were aware of their perceptions and made an effort to transcribe, as objectively and completely as possible, the meanings of the participants' answers.

Second, another limitation of the present study is the relationship between the interviewers and the interviewees, specific to convenience sampling. To combat the possible effects of this relationship, the authors used interviewing techniques such as active listening, encouraging participants to express their point of view, expressing an open attitude, expressing positive emotions, establishing a trusting relationship between interviewer and interviewee, and promoting a relaxed atmosphere throughout the discussion. These measures have also helped to combat the limitations of the online interview method.

Another limitation of this study is the sample used. The sample is small, homogeneous in terms of age, and not balanced in terms of gender or type of employment arrangements. Although part-time and freelance professionals were also approached, only the sample presented accepted the invitation to participate in the research.

However, we consider the final interview guide proposed by this study to be a valid instrument in collecting relevant qualitative data on the relationship between length and structure of working time, on the one hand, and individual productivity and mental fatigue, on the other hand, regarding participants that perform cognitive and emotion work.

5. CONCLUSIONS

In conclusion, this study's aim was to investigate the relationships between the length of working time, its structure, individual productivity, and mental fatigue of knowledge workers and employees in the service industry by pretesting a semi-structured interview guide formulated based on the concepts targeted by this research: nature and size of work, variety, and complexity of tasks, structure and duration of the work schedule, mental fatigue, and productivity.

In the first part of the study, the initial interview guide was constructed, based on the theoretical concepts targeted by the research. A series of 6 semi-structured in-depth interviews were then conducted with participants working in the fields of marketing, IT, pharmaceuticals and electronics, and telecommunications. The data collected was analysed using the method of conceptual content analysis.

The research results presented the new interview guide proposed for the subsequent interviewing of the subjects targeted by the research question. The

results of the research also showed the frequency of common themes that were found in participants' answers, such as *the presence of a high level of fatigue at the end of the work schedule (5)*, the fact that *time pressure is very tiring (5)* or the fact that participants *alternate types of tasks according to their fatigue level (4)*, as a coping mechanism with mental fatigue during work time.

Regarding the optimal length of the working day that would allow participants to maintain the same individual productivity as they do in the present, the interviewed subjects placed it in the range of 6-7 working hours per day. This value cannot be generalized due to the small number of participants included in the sample. It can, however, be used as a reference point for future research.

Further research on this topic is extremely important, as it could contribute to the adoption of measures that would benefit both organizations – by streamlining their work – and employees, by reducing their work-life conflict.

NOTES

[i] Cognition refers to the inner processes which consist of perception, memory, thought, and language. (Lee et al., 2017)

[ii] Emotion work (emotional labour) is defined as emotional regulation required to display organizationally desired emotions by the employees. (Zapf and Holz, 2006)

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SQL AND GRAPH DATABASE SERVERS. A PRELIMINARY STUDY ON THE QUERY PERFORMANCE

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ABSTRACT

With the Big Data advent, new tools and technologies have been provided for dealing with large volumes of data, generated with great velocity in a large variety of formats. NoSQL family of technologies was the first step to provide a flexible database schema and graph databases have been a major pillar of NoSQL. The most popular product in graph data stores has been Neo4j. But despite the enthusiasm of Neo4j preachers, no detailed data were provided on the performance improvement when migrating from an SQL/relational database server to a graph data store. This paper presents a preliminary study of processing performance of two flagship products in their category, PostgreSQL (relational) and Neo4j (graph). First the TPC-H benchmark database schema was migrated to Neo4j. Then a 50-query set was also converted from SQL (PostgreSQL) to Cypher (Neo4j) and executed on a tiny database (10MB). The duration of each query was collected and analysed providing a first glimpse into the comparative performance of two data stores.

Keywords: SQL database servers; Graph database servers; PostgreSQL; Neo4J; TPC-H benchmark.

JEL Classification: C61, C63, Y1

1. INTRODUCTION

Starting with the year 2000, NoSQL databases have emerged as an alternative to the SQL databases. These new database technologies were created in response to the increased demands of data storage for unstructured data and offer faster querying and increased flexibility over the traditional SQL technology (Cogean *et al.*, 2013).

Graph databases, part of the NoSQL family of technologies, could represent one of the answers to this challenge. Intuitive model, based on graph theory with solid mathematical fundaments, graph databases are flexible and can change not only the data inside but their structure too. This flexibility helps to adapt to the changes that data might suffer over time and together with the increased efficiency upon querying large data sets boost the graph databases to be one of the preferred data storage technologies in the last years. For a detailed presentation of graph database technologies, including their applications, see Besta *et al.* (2021).

In this paper, we investigated whether the Graph databases show increased performance over the traditional SQL databases when retrieving data (Stothers and Nguyen, 2020). The DBMSs used in this study were PostgreSQL and Neo4J. The dataset was migrated from a relational form to a graph structure using multiple automatic methods such as scripts or tools provided by Neo4j. After setting up the environment on a Windows Server 2019 Virtual Machine, 50 queries were on each database server in order to test the performance. The results were then collected and interpreted using R language.

2. BRIEF PRESENTATION OF POSTGRESQL AND NEO4J

PostgreSQL, also known as Postgres, is a free, open-source relational database management system. PostgreSQL supports transactions with atomicity, consistency, isolation and durability properties, which are intended to guarantee data validity despite errors, power failures or other technical or environmental incidents. It was designed to handle a range of workload from single machines to data warehouses or web services with many concurrent users.

PostgreSQL offers several advantages for developers looking to create scalable computing environments across their environments (IBM, 2021).

- Performance and scalability.
- Concurrency support.
- Multiple language support (Python, Java, C#, C/C++, Ruby, Perl, JavaScript).
- Business continuity.
- Open source.

Neo4J is a graph database management system; initially released in 2007, it's official 1.0 version was available starting February 2010. As well as for PostgreSQL, Neo4J transactions respect the ACID properties (atomicity, consistency, isolation and durability), however, Neo4J has a native graph storage and processing. Neo4J has been implemented in Java and can be utilized by applications developed in other languages by using the Cypher query language through either HTTP endpoint or bolt protocol. Bolt protocol is a connection-oriented network protocol used for client-server communication and was

developed for Neo4J graph database, inspired by the binary network protocol of PostgreSQL.

Being a graph database management system, everything in Neo4J is stored using the graph structure. Data and the connections between data are represented as nodes, edges (relationships), attributes and properties. Nodes and relationships can have any number of attributes and can be labelled in order to optimize searches. Among the most notable advantages that the use of Neo4J brings, we can list an increased performance over the relational databases as the performance of a graph database remains high even if the volume of data grows and increased flexibility as the structure and schema of a graph can be easily modified to align with the changes in an application (Gleb and Vlad, 2021), whereas a relational database is more change resistant due to its defined schema.

Previous papers on performance comparison of SQL and Graph Databases approach the subject from different perspectives such as their applicability in data provenance (Vicknair *et al.*, 2010), pedigree data sets (Kirby *et al.* 2013) and query performance analysis (Batra and Tyagi, 2012). All aforementioned papers confirm that Graph Databases prove increased performance when retrieving data as well as increased flexibility as new relationships can be added without the need to restructure the schema again and again. Graph Databases outperformed SQL ones in terms of storage efficiency, query execution time and ease of expressing graph-traversal queries (Kirby *et al.*, 2013). However, in one of the previous researches (Vicknair *et al.*, 2010), the authors pointed out an important aspect which represents a drawback for the Graph Databases. The need for securing user data is imperative and the lack of support in Neo4J as GDBMS (graph database management system) is a significant minus.

3. DATASET AND DATA MODEL MAPPING

In order to do the analysis of query performance for relational databases, TPC-H dataset has been. TPC-H is a data benchmark which has been created by the Transaction Processing Council (TPC), a non-profit organization founded in 1988. Its members include many of the largest database vendors, including Microsoft, Oracle and IBM. The scope of TPC organization is to provide industry users with relevant data and performance analysis. TPC also supports Business Intelligence systems which aims to help and analyse managerial decisions based on large sets of data.

TPC-H dataset is based on the business model of a parts supplier that it distributes globally. The database contains 8 tables with different types of relationships between its columns used (Fotache and Hrubaru, 2016). TPC-H dataset has served as data support for the queries created to test the performance of the two database servers. The query results were then sufficient to conduct an initial comparative case study.

Due to the dataset relational structure, the representation of data in form of tables with primary and foreign keys had to be transformed to a graph structure with nodes, relationships and attributes. In order to do the transformation and maintain data integrity and the relationships between the tables we have identified two methods:

•   Creating a script in SQL that will run and generate a Cypher script that will be run in Neo4J

•   Use Neo4J ETL tool to connect to the PostgreSQL database and let Neo4J automatically import data.

Data has been imported using both methods and several limitations of each method have surfaced. These two methods have been presented together with the limitations observed in the following rows in order to show how can these be used to transform a relational data model into a graph structured one.

3.1. Create a transformation script

Using the SQL syntax, a script has been created that results in a table consisting of Cypher lines – see figure 1. The respective table was then exported as a text file which was later saved as a .cypher file. Due to its increased size, the newly generated Cypher script has been divided into multiple, smaller scripts that have been imported in Neo4J. The use of SQL syntax to create Cypher scripts can be observed below by analysing the sample code from the script for nodes and relationships creation.

```
-- 1. Create `:Customer` nodes
  SELECT 1 AS order_in_result,
      'CREATE (customer_' || c_custkey || ':Customer {customerid:' || c_custkey ||', name:"' || c_name || '",
        address:"' || c_address ||'", c_nationkey:' || c_nationkey ||', phone:"' || c_phone ||'",
        accountbalance:' || c_acctbal ||', mktsegment:"' || c_mktsegment ||'", comment:"' || c_comment ||'"})'
      AS text
  FROM (SELECT * FROM customer ORDER BY c_custkey ) customer
```

Figure 1. SQL to Cypher script

The SQL script in figure 1 combines Cypher syntax with data from the PostgreSQL database in order to generate a Cypher script that will create nodes and relationships. Figure 2 shows a fragment of the SQL translation of table creation and population into Cypher.

```
CREATE (customer_1:Customer {customerid:1, name:"Customer#000000001", address:"IVhzIApeRb ot,c,E", c_nationkey:15, phone:"25-989-741-2988", accou
CREATE (customer_10:Customer {customerid:10, name:"Customer#000000010", address:"6LrEaV6KR6PLVcgl2ArL Q3rqzLzcT1 v2", c_nationkey:5, phone:"15-74
CREATE (customer_100:Customer {customerid:100, name:"Customer#000000100", address:"fptUABXcmkC5Wx", c_nationkey:20, phone:"30-749-445-4907", acco
CREATE (customer_1000:Customer {customerid:1000, name:"Customer#000001000", address:"hzM1shTwWlLuK", c_nationkey:22, phone:"32-730-275-2976", acc

MATCH (c:Customer), (n:Nation) WHERE c.customerid = 1 AND n.nationid = 15 MERGE (c) -[:customerFrom]-> (n) ;
MATCH (c:Customer), (n:Nation) WHERE c.customerid = 10 AND n.nationid = 5 MERGE (c) -[:customerFrom]-> (n) ;
MATCH (c:Customer), (n:Nation) WHERE c.customerid = 100 AND n.nationid = 20 MERGE (c) -[:customerFrom]-> (n) ;
MATCH (c:Customer), (n:Nation) WHERE c.customerid = 1000 AND n.nationid = 22 MERGE (c) -[:customerFrom]-> (n) ;
MATCH (c:Customer), (n:Nation) WHERE c.customerid = 1001 AND n.nationid = 21 MERGE (c) -[:customerFrom]-> (n) ;
```

Figure 2. Resulted Cypher script

In order to run the Cypher scripts, we used 2 methods: Cypher Shell and APOC.

Cypher Shell is a command-line tool that can be invoked from power shell to run Cypher scripts. Cypher Shell communicates with Neo4J via the bolt protocol. Figure 3 contains the screenshot after running scripts with Cypher Shell. Command was ran inside the directory where both cypher shell and the script were located in order to easily access the files.

```
PS C:\disertatie\cypher-shell> ./cypher-shell -d neo4j -u neo4j -p tpch -f nodes.cypher

0 rows available after 15452 ms, consumed after another 0 ms
Added 1500 nodes, Set 12000 properties, Added 1500 labels
0 rows available after 69 ms, consumed after another 0 ms
Added 25 nodes, Set 100 properties, Added 25 labels
0 rows available after 1214712 ms, consumed after another 0 ms
Added 15000 nodes, Set 135000 properties, Added 15000 labels
0 rows available after 23287 ms, consumed after another 0 ms
Added 2000 nodes, Set 18000 properties, Added 2000 labels
0 rows available after 17 ms, consumed after another 0 ms
Added 5 nodes, Set 15 properties, Added 5 labels
0 rows available after 237 ms, consumed after another 0 ms
Added 100 nodes, Set 700 properties, Added 100 labels
^CTerminate batch job (Y/N)? y
PS C:\disertatie\cypher-shell> ./cypher-shell -d neo4j -u neo4j -p tpch -f 11.cypher
11.cypher (The system cannot find the file specified)
PS C:\disertatie\cypher-shell> ./cypher-shell -d neo4j -u neo4j -p tpch -f li1.cypher
^CTerminate batch job (Y/N)? y
PS C:\disertatie\cypher-shell> ./cypher-shell -d neo4j -u neo4j -p tpch -f li1.cypher
0 rows available after 7889764 ms, consumed after another 0 ms
Added 15014 nodes, Set 240224 properties, Added 15014 labels
PS C:\disertatie\cypher-shell>
```

Figure 3. Running the Cypher scripts in Cypher Shell

APOC is a plugin for Neo4J that offers a lot of procedures and functions in Neo Browser. APOC can be installed from within Neo4J Desktop application. APOC can run scripts from specific directories by using specific functions. Once called, APOC runs each statement from the cypher script in the selected database.

The most important limitation observed while running the Cypher scripts with both tools is that it takes a huge amount of time to import the database using this method.

A less time-consuming method would have been to import data with the ETL tool, method which is describe further below.

3.2. Import the database using Neo4J ETL tool

This method involves connecting Neo4J to PostgreSQL so that Neo4J ETL tool can automatically detect nodes and relationships and import them. In order for the Neo4J ETL to be able to connect to the PostgreSQL database, a few connection details must be provided, such as hostname, port, database name, user and password. After setting up the connection, this tool automatically detects the structure of PostgreSQL database and translates it in a graph format. The limitation discovered while trying to import the database with the Neo4J ETL was that this tool does not offer any flexibility to re-arrange the nodes and relationships that will be imported in the Neo4J database. Given this limitation, the method was not fit for use in this case study.

APOC has been used as final method to load all the scripts to create the nodes and their relationships. TPC-H database has been successfully converted from relational to graph model and has the following structure:

Nodes: Nation, Region, Supplier, Customer, Part, Order, LineItem

Relationships: nationIsIn (Nation:Region), customerFrom (Customer:Nation), supplierFrom (Supplier:Nation), hasOrder (Customer:Order), hasLines (Order:LineItem), containsPart (LineItem:Part), liSuppliedBy (LineItem:Supplier), partSuppliedBy (Part:Supplier)

4. QUERY PERFORMANCE ANALYSIS

In order to perform data analysis, we created 50 SQL queries and 50 Cypher queries which tested the database performance against different parameters and clauses. The queries were run on TPC-H size 0.01GB database, in both relational and graph environments.

RStudio has been used to test the statistical relevance of the queries results. RStudio is an open-source application designed for R (R, 2021), a programming language used for statistics, data processing and analysis. Relationships between predictors and the outcome were examined using exploratory data analysis and the Mann-Whitney test for which test statistics, significance, confidence intervals and the effect size were reported (Hatcher, 2013).

Data analysis was performed with the R language (R, 2021) using mainly the tidyverse ecosystem of packages (Wickham *et al.*, 2019). The package ggstatsplot (Patil, 2021) provided support for the statistical inference.

Data used for analysis and tests were collected in an Excel file. After running each query, the number of the query, query's text and it's run time has been stored

in 3 different columns for each database server type, relational and graph. Data was then imported in RStudio in order to start data processing before running the statistical tests and perform exploratory data analysis. Data has been prepared by keeping only the relevant information and counting important clauses and keywords inside the query text that could potentially influence the performance of the database server when running queries.

The query text has been removed as it is not relevant as long as we have already summarized information from it, such as the number of joins (join_no), if the query uses group by or order by (grouping, ordering), if there is any filtering done on the data (filtering) and if the line item – field which contains the most records in both relational and graph databases - has been queried in that respective interrogation. These fields will help test the results that we got and perform exploratory data analysis.

Figure 4 displays (as histograms) the distribution of numerical variables in the dataset. As for duration, the majority of queries took up to 200 milliseconds to run, while there are few queries which took longer than that. A little more than half of the queries use a GROUP BY clause. JOINs distribution is influenced by the fact that Cypher queries do not use JOINs, thus all Cypher queries have been listed as 0 for join_no feature.
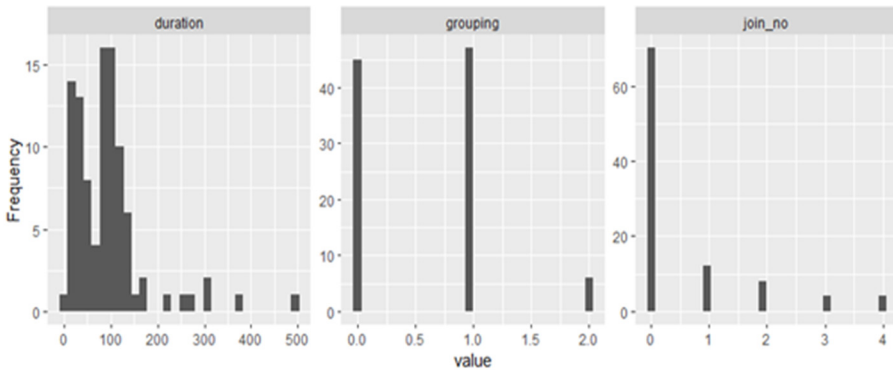
Figure 4. Histogram of numerical variables

Another method of showing the distribution of numerical values is the box plot – see figure 5. The box plot compares the duration of queries based on the db_server type (categorical feature). The chart confirms that the median duration of the queries in a Graph database (Neo4J) is shorter than the duration of SQL queries for the PostgreSQL database (Nan and Bai, 2019).
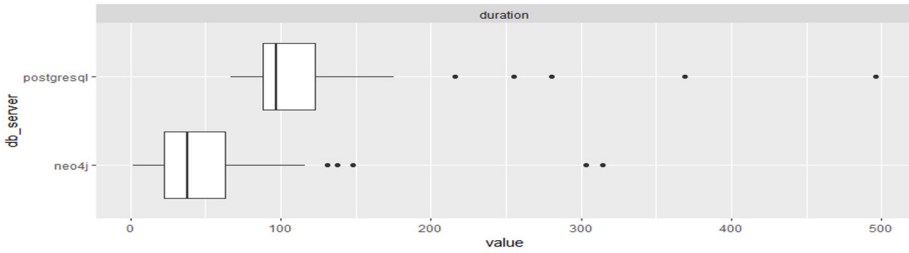
Figure 5. Box plot of duration by database server

Figure 6 compares the query performance of the two database server in the present of filtering predicates. Even though the distribution of duration of the queries where filtering was not used is represented on a slightly narrower range for Neo4J than where the filtering was used, its medium value is approximately the same. For the PostgreSQL server, the distribution of duration of the queries where filtering was not used is represented on a bigger range than where the filtering was used, but still with the approximately same medium value. This mean that the presence of filtering does not influence the duration of queries in our dataset.
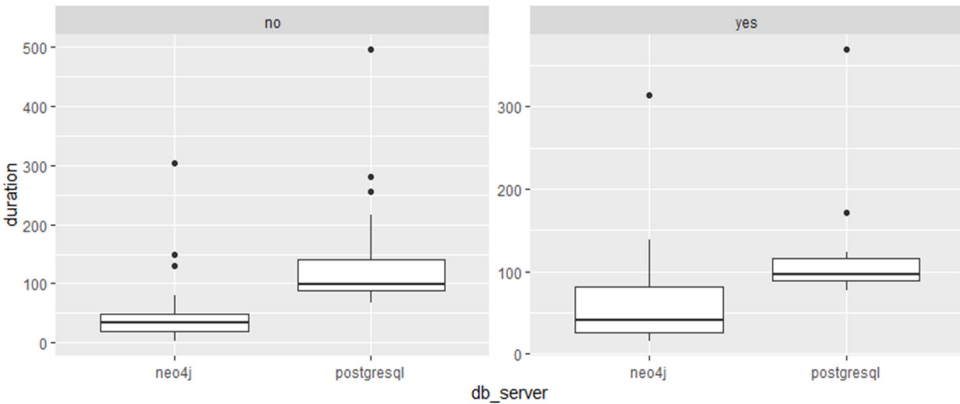
Figure 6. Box plot of duration by filtering predicate

The box plot in figure 7 compares the query performance relative to inclusion or not in the query of the largest table/node type – lineitem. The difference between Neo4J and PostgreSQL while querying lineitem is greater than querying other data. While cypher queries in Neo4J maintain their medium duration around the same values, in PostgreSQL the duration is obviously greater. This confirms that the graph database are faster for retrieving larger sets of data.
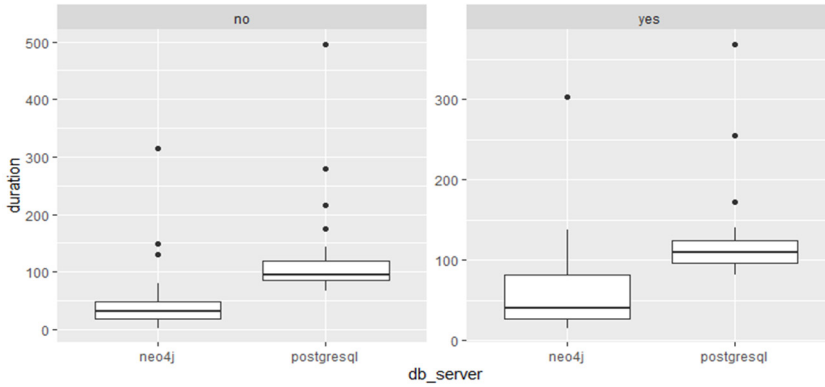
Figure 7. Box plot of duration by lineitem inclusion in the query

The results suggested by the exploratory data analysis were further tested for statistical significance.

Starting with the (research question) whether there is a correlation between the number of joins and query duration have which translates into the (H0) Null hypothesis: There is no correlation between the number of joins and query duration. The Pearson correlation coefficient which was equal to 0.05991712, a value which is very close to 0, indicating a very low relationship between these two features, number of join and query duration. In addition to the above coefficient, we also ran a test to calculate the Spearman correlation coefficient. Spearman correlation coefficient for these two features was equal to -0.02140545, a value which is very close to 0, but on the negative axis, indicating a negative monotonic relationship between the number of joins and query duration. Also the association was tested with the ggstatsplot package (Fig. 8) which also confirmed that there is no significant correlation between the number of joins and query duration.
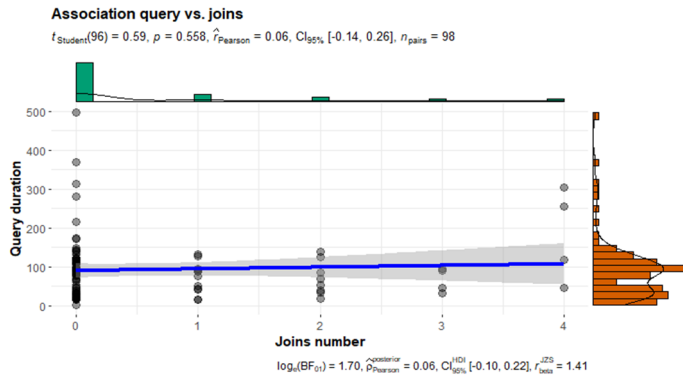
Figure 8. Query duration vs. number of joins relationship

Next question regarded if there is a significant statistic difference in the distribution of query duration between the two types of databases. As seen in figure 5, the median query duration for Neo4J server is significantly lower than the query duration for PostgreSQL.

Before testing the diffences, the normality of the distribution for variable duration was checked with the Shapiro test and whereas the distribution homogeneity was checked with the Ansari test. Shapiro test reported $W = 0.772$, p-value < 0.001 and the Ansari-Bradley test reported $AB = 972/5$, p-value < 0.001. The hypothesis that data are normally distributed was rejected.

Consequently, instead of using the parametric t-test, the non-parametric Mann-Whitney test was deployed. Results provided by the ggstasplot package are shown in see figure 9.
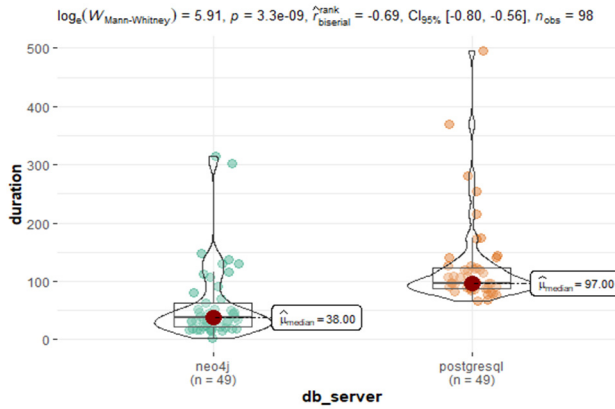
Figure 9. Mann-Whiney test for comparing performance of the two data server

Confirming the findings in figure 5, the non-parametric results (p-value $<$ 0.001, effect size $= -0.69$, the 95% CI for the effect size [-0.80, -0.56]) suggest once again that the query duration is influenced by the database server type, with Neo4J showing statistically improved performance over PostgreSQL server for the queries used.

5. CONCLUSION

This paper offers a starting point for the query performance comparison between relational and graph database servers. After a brief presentation of each database server and presenting the data set transformation techniques, this paper focused on a case study where the performance of each database server was tested against 50 queries, in order to understand what influences their performance and how.

After performing exploratory data analysis and variables correlation tests on the data generated by running the 50 queries in each database server, results

suggest the query duration is not influenced by factors such as the number of joins, the presence of clauses like ORDER BY or GROUP BY, nor by the presence of results filtering (using WHERE).

The final tests of the dataset showed that the query duration is clearly influenced by the database server type, with Neo4J having a significant improved performance when retrieving data over PostgreSQL. This confirms the initial statement in the theoretical part that graph databases are showing better response times when retrieving data (Batra and Tyagi, 2012).

The database setup, dataset transformation, running queries, exploratory data analysis and other statistical tests – have been performed on a Windows Server 2019 virtual machine hosted on the RaaS-IS cluster.

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SOCIAL MEDIA IMPACT IN MAINTAINING BRAND EQUITY OF A HIGHER EDUCATION INSTITUTION

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ABSTRACT

Social media was born as a way to interact with friends and family but was later adopted by companies that wanted to take advantage of a newly popular method of communication to reach customers. Brand equity is the value of a brand, as the market perceives it. This value is determined by the consumer's perception and experiences with the brand. If the company/institution is well perceived as one that delivers quality products and services, it has positive brand equity, and if, on the contrary, it constantly disappoints, it has negative brand equity. It is the mirror of the brand. The effects of positive brand equity are long-lasting. Companies with positive Brand equity can ask for a higher price for their products, transfer from this value to other products on the line, and help increase the price of stock quotes, where appropriate. If Brand Equity is the mirror of the brand, then Social Media is the brand's spokesperson. Higher education institutions are using Social Media as an integral part of the promotion process to attract more and more students. This paper will analyze the impact of using social media to maintain the brand equity of a higher education institution in Romania. The study was conducted on 400 respondents, students, and graduates of the faculty. Following this study, it was found that social media has a different impact on each component of brand equity. Therefore, in the case of this research, the use of social media has a medium impact on brand loyalty, high impact on brand recognition, very high on brand association, high on brand trust, and very high on perceived brand quality.

Keywords: social media; brand equity; higher education; branding; social media marketing.

JEL Classification: I29, M30, M37

1. THE CONTEXT AND PREMISES OF THE STUDY

What is Social Media Marketing

While traditional media allows the vertical flow of content from powerful conglomerates to isolated consumers, social media has allowed the horizontal flow of information between consumers (Rosen, 2006).

The most important principle of social media is the democratization of content when the same users create and distribute information. User-generated content is open to comments and criticism and easily accessible to other users, differentiating it from traditional marketing media. Social media uses web 2.0 and mobile technologies to create and share information and knowledge without geographical, social, political, or demographic boundaries through public interaction in a participatory and collaborative way.

1.1 Social Media Benefits for Marketers

The use of Social Media in the digital marketing strategy is based on the following advantages studied and used in recent years.

Cost advantages;

According to (Weinberg, 2011), the main advantage of social media marketing is related to costs. Most social networks are free to access, create a page, and post information. While traditional marketing campaigns can cost millions of dollars, many social media tools are accessible even for businesses.

The viral nature of social networks means that every person who reads the posts can spread the news further in their network to reach a large number of people in a short time (Weinberg, 2011).

Interactivity;

While interactivity can be simple in specific contexts (e.g., simply filling out forms by clicking on links), it can also be more involved and elaborate, allowing individuals to develop online content (Murugesan, 2007). Studies show that increased levels of interactivity can lead to greater involvement (Bucy, 2003) and better perceptions of websites (Kalyanaraman and Sundar, 2003; Hill and Moran, 2011), along with greater credibility of a source (Fogg *et al.*, 2003; Hill and Moran, 2011).

Possibility of more precise targeting compared to traditional media.

Social networks offer marketers the opportunity to target the public and consumers based on the personal interests of site users and what they like.

1.2 The Impact of Social Media in Educational Marketing

Many studies have attempted to illustrate how new technologies could help the educational process (Hung and Chin-Yuen, 2010; Dermentzi *et al.*, 2016).

Social networks are seen by many as a decisive factor of change for teaching and learning due to their characteristics, including openness, interactivity, and sociability (Manca and Ranieri, 2016).

- Consumers identify social media as a more reliable source of information than traditional marketing communication tools, allowing organizations to integrate social media marketing into their marketing mix to communicate with customers and get feedback (Karamian *et al.*, 2015).

- Over the last decade, higher education has been on a steep growth trajectory. The expectations of young people and their parents are high. Therefore, higher education has become one of the fastest-growing service sectors (Alwi and Kitchen, 2014). Recent changes in the context of higher education have forced institutions to reconsider their operational and strategic models, integrating market-based practices to remain competitive and maintain economic viability (Scullion and Molesworth, 2016; Tomlinson, 2015).

- Marketing theories and concepts, which were influential in the private sector, are now applied by many higher education institutions to gain a competitive advantage (Hemsley-Brown and Oplatka, 2006; Jan and Ammari, 2016; Royo-Vela and Hünermund, 2016). Various reasons make digital marketing the best way to reach the majority of today's student population. Some of these are:

- Pupils spend more time on the Internet than on other media (including television);

- Internet advertising is highly effective and outperforms traditional advertising methods;

- Potential students use the Internet to search for / select educational institutions and courses;

- Parents and guardians have started judging a school or college based on the website and its online presence;

- Students explore and compare institutions based on their online presence;

- Most institutions use the Internet for student applications and inquiry processes;

- Potential Erasmus students make the most of the information on the website and the presence in Social Media of a University in the admission process.

- Educational institutions need to be managed more compared to corporate brands (Whelan and Wohlfeil, 2006). Social networks are seen as a viable tool for university marketers due to their low cost, immediate nature, and used by many students (Kelleher and Sweetser, 2012). If we consider the flow of processes in higher education institutes, four critical processes start with promotion and admission.

- The promotion and admission process
- Interaction with students on the university campus
- Career development and insertion on the labor market
- Alumni networks and professional development

In all these processes, social networks can improve how higher education institutions can help students develop. Furthermore, different ways have been

identified through institutional departments' use of social media to communicate with different audiences (internal and external) about different university processes.

Social media marketing and brand equity are positively and significantly correlated; social media marketing helps organizations build positive customer relationships, improving the brand image. The essential elements of social networks positively affect brand awareness, brand association, brand loyalty, and perceived quality (Tresna and Wijaya, 2015). However, what is Brand equity, and why does it matter?

1.3 About Brand Equity

Brand Equity is defined as the difference in the consumer's choice between a branded product and an unbranded product with the same level of product characteristics (Yoo and Donthu, 2001).

Aaker (1991) defines Brand Equity as a "set of brand assets and liabilities related to a brand, the name, and symbol that add to or subtract from the value offered by a product or service to a firm and customers of that firm."Building brand equity is considered an essential part of building the whole brand (Keller, 1998). There are different dimensions of brand equity in the literature, and in this case, we have selected some of the most important.

Brand loyalty

Brand loyalty describes the characteristic of consumers, which demonstrates a solid commitment to a brand; because it considers that the mark is more satisfactory than the alternative ones, and this assessment is imprinted by repeated use.

Wood (2000) states that brand loyalty is one of the most critical components of brand equity, which explains why brand value for a company is determined by the degree of brand loyalty, as it involves a guarantee of brand flows—future income.

Brand awareness

It is defined as the consumer's ability to identify a brand in different situations/circumstances. Brand awareness includes recognizing the brand and remembering it. When consumers are exposed to a brand, the result is brand awareness. Therefore, the first step in building brand equity is to increase brand awareness.

Brand association

Any contact or experience that a consumer has with a brand can create, change, or strengthen specific favorable or unfavorable associations; for associations to positively affect brand equity, they must be unique, strong, and favorable (Keller, 2003). Trademark associations are defined as "anything that is linked in memory to a brand" (Aaker, 1991).

Brand trust

Chaudhuri and Holbrook (2001) define brand trust as "the desire of the average consumer to rely on the ability of the brand to fulfill its stated function." Trust is also a cornerstone in building a long-term business relationship and partnership (Rotter, 1967).

Perceived quality

Perceived quality is related to the consumer's judgment of a product or brand's superiority or general excellence (Zeithaml, 1988). The high perceived quality allows consumers to be convinced to buy the brand because it differs from competitors.

2. RESEARCH

2.1 The research problem and objectives

This paper aims to analyze the impact of social media use in maintaining Brand Equity for the Faculty of Economics and Business Administration in Iasi within the "Alexandru Ioan Cuza" University of Iasi.

The research objectives of this paper:
- Identify the importance of using Social Media for brand loyalty
- Finding out the importance of using Social Media in brand recognition
- Identify the importance of using Social Media in brand association
- Detecting the importance of using Social Media for brand trust
- Finding out the importance of using Social Media in the perceived quality of the brand

2.2 Methodology

Explanation of the method chosen for research.

2.1.1 Research design

We chose to carry out the marketing research through the quantitative method. An online questionnaire survey was used to conduct this quantitative research. We chose this method because we set out to find factual data from respondents through which we can concretize the way to solve the research problem.

2.1.1 Data collection

The data collection was performed with the help of members of the Facebook groups FEAA - Faculty of Economics and Business Administration, MASTER FEAA UAIC, UAIC IAȘI, FEAA - YEAR 1, FEAA Iași │ Year 1 (license & master) 2020-2021, FEAA - YEAR I (2020-2021), FEAA - YEAR II (2020-2021), FEAA - YEAR II (2020-2021), FEAA Graduates - Promotion 2016-2019, FEAA - PROMOTION 2020, FEAA - PROMOTION 2018. The questionnaire

was launched on June 9, 2021, at 18:59, and it took five days to collect the 400 answers (410 people answered, but ten answers were considered invalid) considered valid (people who are graduates or FEAA students on that date). It took an average of 5 minutes to complete a questionnaire.

2.1.2 Questionnaire design

In concretizing the questionnaire, we used questions as simple and easy to understand as possible, in simple terms, to have the highest possible response rate. We started the questionnaire with a greeting and a personal presentation, after which We indicated the research topic and the reason for which the research was carried out. After that, we asked for the cooperation of the respondents in completing the questionnaire, assuring them that it would not take more than 5 minutes of their time. For starters, we used a filter-type question to make a selection of respondents from the start. This is "Are you a student or graduate of FEAA Iasi?" After that, we divided the questionnaire into six sections that analyzed the questions for the five components of Brand Equity (Brand Loyalty, Brand Awareness, Brand Association, Brand Trust, and Brand Perception), and the last section is for the collection of socio-demographic data.

2.1.3 The sample

The Faculty of Economics and Business Administration within UAIC has no less than 7,976 students, as shown by the University's official website on May 18, 2021. The marketing research was conducted on a sample of 400 students and graduates of FEAA Iași. For the population sampling, we chose to use 5% of the total population of FEAA - 400 people.

2.2 Results

Objective 1: Identify the importance of using Social Media for brand loyalty

To achieve this goal, we used six questions to determine how loyal FEAA students and graduates are to the faculty.

**Table 1 - Summative table with questions and answers
from Brand Loyalty questions**

The question	Answers
1. Have you used #StudentlaFEAA at least once in a social media post?	77% - never 10.8% - once
2. Have you ever used a photo frame for your FEAA profile picture?	83% never 9.8% once
3. Do you have the profile that you study at FEAA?	80.8% - yes 19.3% - no
4. Did you recommend/intend to leave a recommendation on FEAA Facebook?	53.8% - no 46.3% - yes

The question	Answers
5. How often have you seen posts or stories with personalized FEAA objects on your colleagues' social accounts?	66.5% - more than twice (maximum possible) 15.2% - never
6. Do you recommend FEAA to loved ones?	84% - yes 16% - no

(Source: own processing)

We can see with the naked eye that an overwhelming proportion of over 77% does not use the hashtag #StudentlaFEAA in distributed or original posts on private Facebook or Instagram accounts. As a brief history, this # was introduced in the FEAA posts in 2018 and used intensively until 2020, when it was forgotten due to the Covid-19 pandemic. As a result, the possible causes of these responses are those related to forgetting and unfamiliarity with this hashtag by the 2020 generation. Moreover, the problem of the photo frame is similar to that of the hashtag. In 2018-2019, photo frames were made by the FEAA MEDIA Department and were used, but in 2020 they were put in a lower place, so over 83% did not use, because they did not have the opportunity.

On the other hand, over 80% of the respondents stated that they display the faculty where they study, which is a good sign because they could use the reputation of the University to display the institution where they study, but they chose FEAA. It is exciting to note that there are almost equal public reviews on the FEAA page. Although 53.8% said they did not intend and did not leave a review on the FEA page, a good part chose to do so. One possible cause for the few recommendations on the FEAA page is the relatively recent change in making recommendations by Facebook. Namely, less than two years ago, Facebook released the system of recommendations in the sense that you could offer 1-5 / 5 stars and a written recommendation. However, you are obliged to make a written recommendation if you want to leave a review, and this involves extra effort, which we know all too well is not so readily accepted as proof is the much higher number of faculty reviews on the Google My Business page, where the old system is still in operation, without being forced to leave a written recommendation. Furthermore, in the last two questions, those related to stories and FEAA recommendations to acquaintances, we notice a complete release of those who answered in the affirmative. With over 66%, we can say that brand loyalty combined with the pride of being a student at FEAA is observed in the stories posted by FEAA students and graduates. 84% of respondents who say they recommend FEAA to loved ones can only rejoice and strengthen the possibility of engaging in extra effort when it comes to a public recommendation written on the FEAA's Facebook page.

As a short conclusion for objective number 1 - the impact of Social media in maintaining brand loyalty, with 3/6 affirmative answers, we can say that Social Media has an average impact on loyalty.

Objective no.2: Finding out the importance of using Social Media in brand recognition

To achieve this goal, we used five questions to find out how easily FEAA students and graduates recognize college posts on Social Media.

Table 2 - Summative table with questions and answers from Brand Awareness

The question	Answers
7. Why do social media channels follow FEAA	98.8% - Facebook 48% - Instagram 13% - Tiktok 8.5% - Linkedin
8. Have you ever shared a FEAA post by sharing it on your account or screenshot to colleagues?	39.8% - both variants 32.5% - screenshot only 18% - no 9.8% - share only
9. Have you ever checked in at FEAA?	54.5% - no 45.5 & - yes
10. On average, how many posts do you see from the FEAA per week (regardless of the social media channel)?	47% - 1-3 posts / week 35.5% - 4-6 posts / week 17.5% - 7+ posts / week
11. On a scale of 1 to 5 (1 - very easy, 5 - very difficult), I recognize a post from FEAA ...	73.2 - easy or very light 16% - hard or tough 10.8% - neutral

(Source: own processing)

Almost all respondents follow the faculty on Facebook - the leading social media channel used by the faculty, by the way. It's no surprise that Instagram is in second place, implemented in 2018, along with LinkedIn. But what is very interesting is that several FEAA students or graduates responded that they are following the faculty on Tiktok, a recently appeared platform, as well as the FEAA presence there, from April 2020 to be more precise. The video content is far more attractive than the classic one, written in images, and the format of the videos posted on Tiktok is more casual, making the faculty account much more attractive than the posts in bitter notes for Linkedin.

We can see that a majority of 82% of respondents use the option to share FEAA posts, either by classic distribution or by screenshot. This tells us that most FEAA students and graduates recognize and help each other regarding FEAA posts.

Again, almost equal when it comes to college check-in. This may be mainly due to the pandemic, as students no longer had the opportunity to come to the college physically, so they did not even have to check in. 47% of respondents said they see between one and three posts from the FEAA per week - this is due to the decrease in organic reach by Facebook, as mentioned in the second chapter, but also the decrease in the frequency of posts by the MEDIA department FEAA, composed of volunteers, who at the time of data collection were in the entire session. However, the extra point comes from the fact that over 73% of students manage to quickly or even very easily recognize a post from FEAA - this may be due to maintaining the visual identity of the faculty (FEAA logo and official colors on the posted images).

As a short conclusion for objective number 2 - the impact of Social media in maintaining brand recognition, with 3/5 affirmative answers or positive notes, we can say that Social Media has a medium to high impact on brand recognition.

Objective no.3: Identify the importance of using Social Media in brand association

To achieve this goal, we used five questions to determine the importance of Social Media in brand association.

Table 3 - Summative table with questions and answers from the Brand Association

The question	Answers
12. I find the posts from FEAA rather (Boring - Funny)	49.3% - funny 41.8% - neutral 9.1% - boring
13. I find the posts from FEAA rather (Unpleasant - Pleasant)	73% - pleasant 23% - neutral 4.1% - unpleasant
14. I find the posts from FEAA rather (Stressful - Relaxing)	54.8% - relaxing 38.8% - neutral 6.5% - stressful
15. I find the posts from FEAA rather (Useless - Useful)	75.6% - useful 17.3% - neutral 7.3% useless
16. I prefer to see addresses like	81.8% - You 18.3% - Mr/Ms

(Source: own processing)

It can be seen that most respondents prefer an informal approach at the expense of the formal name "Mr/Ms". This can also be deduced from the fact that most people find FEAA posts fun, enjoyable, relaxing, and valuable rather than boring, uncomfortable, stressful, or unnecessary. If you are wondering how we chose these characteristics for questions, it is the method of the affective image (Russell and Pratt, 1980). We can conclude that FEAA students and graduates find the faculty posts on Social Media in a relatively upbeat tone.

As a short conclusion for objective number 3 - identifying the importance of using Social Media in brand association with 5/5 affirmative answers or positive notes, we can say that Social Media has a very high impact on brand association.

Objective no.4: Detecting the importance of using Social Media for brand trust

For the fulfilling this objective, we used five questions for the impact of Social Media on the trust in the faculty brand.

Table 4 - Summative table with questions and answers from Brand Trust

The question	Answers
17. I trust the jobs, tips & tricks posts, official announcements posted by FEAA	Jobs posted by FEAA - 90.75% - yes Tips & tricks posts - 84% - yes Official Announcements - 94.5%
18. Are you present in the Facebook groups of FEAA students? 19. Did you use FEAA's Social Media channels to send a private message to the page with a question related to college?	95.8% - yes 4.2% - no 63% - yes 37% - no
20. Have you ever commented on a Facebook post on FEAA, hoping that you will receive an answer to your college question?	56.3% - no 43.8% - yes
21. Do you consider that occasional posts from the faculty management on specific topics are necessary?	95.8% - yes 4.2% - no

(Source: own processing)

It can be seen that the type of posts that students trust the most are the official announcements, and the least trust is in the posts like tricks & tricks, which is somehow natural because the official announcements are taken from the faculty portal. We can also see that an overwhelming proportion of over 95% is members of the faculty groups, which indicates a sense of community, which can only benefit the faculty. By integrating and using students' Facebook groups into their communication strategy, the FEAA has only one thing to gain.

Interestingly, over 60% of the respondents stated that they use the messaging of the faculty's Facebook page to ask questions, but only 43% answered positively when it comes to asking questions in the public comments of the post. This may

be because they have noticed that they are not answered at all or are not answered promptly or for reasons related to the shame of being laughed at. The faculty should give much more important when it comes to interacting with its students online for several reasons, including the fact that it would reach more people posting due to the increased interaction, because these answers remain public forever, for that it would diminish the congestion in the secretariats and create a sense of trust.

An essential aspect of the brand trust component is the message of the official authorities, in this case - Mrs. Dean. Almost all respondents agree that there should be official messages, communiqués, and announcements from the faculty management on an occasional basis.

As a short conclusion for objective number 4 - identifying the importance of using Social Media for brand trust with 4/5 affirmative answers or positive notes, we can say that Social Media has a high impact on brand trust in Social Media.

Objective no.5: Finding out the importance of using Social Media in the perceived quality of the brand

To achieve this goal, we used four questions to find out the importance of using Social Media in the brand's perceived quality.

Table 5 - Summative table with questions and answers from Brand Perception

The question	Answers
22. From the current social media posts, I perceive the faculty as one	74.5% - friendly 45.3% - prestigious 38.5% - job-oriented 20.5% - with difficult exams 19.8% - accessible to graduate 4.5% - others
23. On a scale of 1 to 5 (1 - very useless, 5 - very useful), how useful do you find the current posts on FEAA social networks?	45% - useful or very useful 33% -necessary or very useless 22% - neutral
24. I would like to see more posts about	76% - jobs 73% - official announcements 56% - tips & tricks about students 38% - student conferences 29.5% - conversational posts 2% - something else

The question	Answers
25. How do you perceive #FEAALeadsOthersFollow?	50.7% - encouraging 46.5% - suitable 12.5% - funny 8.5% - confusing 7% - something else

(Source: own processing)

An essential and gratifying aspect is that most respondents perceive the faculty in the current posts as friendly. However, only 38.5% of them consider that it is job-oriented, and if we correlate with the 76% of the answers that say they would like to see many posts about jobs, we have a problem. Moreover, 45% of students find the current posts useful. A small percentage can be increased by a refresh of the editorial calendar, which we will also discuss in the fourth chapter.

Again, a gratifying aspect related to #FEAALeadsOthersFollow, #born in 2018, also as #StudentlaFEAA, is considered encouraging and appropriate by students, concluded in high perceived quality of the brand online. As a short conclusion for objective number 5 - finding out the importance of using Social Media in the perceived quality of the brand with 4/4 affirmative answers or on a positive note, we can say that Social Media has a very high impact on the perceived quality of the brand in Social Media.

In conclusion, does or does the use of social media have an impact on maintaining brand equity?

Short answer: yes. Longer answer: It depends. We can see from the research in this paper that social media has a different impact on each component of brand equity. Therefore, in the case of this research, the use of social media has a medium impact on brand loyalty, high impact on brand recognition, very high on brand association, high on brand trust, and very high on perceived brand quality. Therefore, the Faculty of Economics and Business Administration should continue and develop social media communication to maintain its positive brand equity and thus maintain its overall value perceived by future, current or former students. Moreover, 3/5 hypotheses formulated at the beginning of the research were accepted, reinforcing the importance of using Social Media in maintaining the FEAA Iași Brand Equity.

3. LIMITS OF THE RESEARCH
- The lack of real competition for the FEAA has made this research less relevant from a social media marketing perspective to maintaining brand equity.
- Difficulty in disseminating the questionnaire to the required number of respondents.
- Overlapping research activity with other academic and professional activities.
- Difficulty in motivating people to answer questions.

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PREDICTIVE MODELS ON THE INFORMATION SYSTEMS BACHELORS INTENTION TO PURSUE A MASTER PROGRAM IN COMPUTING

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ABSTRACT

After more than a decade of diminished enrolment, both bachelor and master programs in computing have experienced an increase in applicants and graduates. Computing education literature have explored the motivators of choosing a computing undergraduate and graduate program, and the factors of students' retention or dropout. But the intention of computing bachelors to continue their studies with a master's degree program in a computing-related area, i.e., graduates who remain "loyal" to computing programs, has not been a major topic of interest. This paper presents a series of Machine Learning models for predicting the intention of Information Systems bachelor graduates to pursue a master program in computing at the same faculty. The outcome variable was binary (enrolment or not in a computing-related master program) whereas the predictors referred to students' academic performance on groups of content-related courses, and to students' background, i.e., genre, milieu (urban or rural), and the concentration of graduated high-school class. A series of Machine Learning classification models were built and tuned showing acceptable performance (still, a bit disappointing, relative to initial expectations) and, through variable importance, suggested the most important predictors related to the intention to enroll in a computing master program.

1. INTRODUCTION

After a long period of stagnation and decline (Becker *et al.*, 2006; Huang *et al.*, 2008; van Leeuwen and Tanca, 2007; Luse *et al.*, 2014), the undergraduate (bachelor) and graduate (master) programs in computing have experienced a consistent increase in enrolment (Fisher, 2016). The trend is manifest not only in Western markets and institutions, but also in countries like Romania where the IT market largely relies on outsourcing (Fotache *et al.*, 2016). Recent studies revealed that in Romania there is a shortage of qualified IT personnel (Fotache *et al.*, 2020) and this shortage continues to attract many applicants into computing related undergraduate and graduate programs in Romanian universities.

Currently at Faculty of Economics and Business Administration in Alexandru Ioan Cuza University of Iasi (FEBA-AICU) there are four computing-related programs, one at bachelor level – i.e., Information Systems (IS) - and three graduate programs - i.e., Business Information Systems (BIS), Data Mining (DM), and Software Development and Business Information Systems (SDBIS).

In recent years, it was observed that 49% of IS bachelor graduates have enrolled in the three computing-related master programs at FEBA-UAIC (Fotache *et al.*, 2021). Data on the IS bachelors is incomplete since some graduates may enroll in computing-related programs in other institutions/colleges. Nevertheless, since 51% percent of the IS graduates choose not to continue in the same area and institution, which is considered a loss for the college and field, questions were raised on whether variables related to students' background and academic performance could be associated with the IS graduate's intention to continue or leave.

This paper develops the analysis in Fotache *et al.* (2021) by building a series of Machine Learning (ML) models for predicting IS graduates enrollment in BIS/DM/SDBIS master programs based on IS graduates' genre, background (their urban/rural social milieu and the concentration of the graduated high-school class), their academic performance (during the bachelor studies) on main groups of courses and their results at the final dissertation exam(s). The classification models were built and tuned with two popular ML techniques - Random Forest (RF) and Extreme Graduate Boosting (XGB) using repeated cross-validation. Models results concerned not only the prediction of IS graduates to continue in a computing program, but also the assessment of predictors importance for the outcome variability.

2. BRIEF LITERATURE REVIEW ON ENROLLMENT IN COMPUTING PROGRAMS

There is a consistent body of literature concerning subjects related to the evolution of enrollment in computing programs at both bachelor and master levels, main drivers of student's choice to pursue a computing program, gender gap in computing programs, students' dropout/retention, etc. But studies on bachelors'

intention to continue their formation with a master also in a computing area are scarce.

Faced with a shrinking pool of applicants, the literature of 2000-2010 tried to identify the factors affecting the enrolment decline in computing programs. Moore *et al.* (2009) found the decline perplexing since the job opportunities and salaries in computing-related positions had been considerable higher than in other areas. They ranked the misunderstandings and lack of necessary information as one the main drawbacks in attracting applicants. Similarly, Pollacia and Lomerson (2006) and Huang *et al.* (2008) found that the misperception and misunderstandings about IT programs and market to be important. Huang *et al.* (2008) additionally related the decline in IS enrolment to the IS outsourcing. In the same line, van Leeuwen and Tanca (2007) associated the lack of appetence for the computing programs with factors related to views and prejudices.

From the program's perspective, Koch *et al.* (2010) identified five practices for increasing IS enrolment: make IS enrolment a long-term priority, partner with external stakeholders (i.e., employers, students), incentivize students, maintain curriculum rigor and add value. Van Leeuwen and Tanca (2007) suggested working with (high) schools, finding better motivation for students (through contests/competitions), developing industrial links and reinventing the curricula.

A series of studies (Moore *et al.*, 2009; Luse *et al.*, 2014) investigated the students' main drivers in choosing a computing program. Generally, there are six main factors in choosing a higher-education program: interest in the subject, career advancement potential, job offer, aptitude for the subject, level of salaries, and the college's/program's reputation (Malgwi *et al.*, 2005).

Akbulut and Looney (2007) and Zhang (2007) reported as main factors for enrolling in a computing program: interest in IT; student's belief in her/his ability to harness computing coursework; financial prospects. According to Zhang (2007) teachers and family members play a role in choosing a program in computing.

Using the Social Cognitive Career Theory and Structural Equation Modeling (SEM), Luse *et al.* (2014) revealed that both interest and outcome expectations have a significant positive impact on choice to an IT major. Their model showed that interest in IT can be associated with the self-efficacy and the outcome expectations. SEM was also deployed by Rouibah (2016) who applied it in conjunction with the Theory of Reasoned Action and the Network Externalities Theory for investigating enrolment in Management Information System (MIS) major in an Arab country. The study found that subjective norms, number of enrolled students, easiness of the major, and IT anxiety have direct effects on students' intentions.

As already pointed out, current paper extend the analysis in Fotache *et al.* (2021) that examined the intention of IS bachelor graduates to pursue a master program in computing at the same faculty in association with predictors referring to bachelor dissertation grade (as a proxy for academic performance) and student's

background, i.e., genre, milieu (urban/rural) and the concentration of graduated high-school class. Using inferential statistics techniques (the Chi-square tests of independence, the Mann-Whitney test), Fotache *et al.* (2021) found that the dissertation point average is highly associated with the intention to enroll in BIS/DM/SDBIS programs, whereas the other three predictors - genre, social milieu and the concentration of graduated high-school are not significant factors for intention to pursue a master's in computing.

Relative to Fotache *et al.* (2021), new predictors were added, and the data analysis method was changed by building a series of ML models. Previously, ML models were put to work for student enrollment in Cirelli *et al.* (2018) to develop a data analytics model that can be used by universities and colleges to improve student admission and enrollment process. Historical data from a local university were modeled with logistic regression, neural networks, and decision trees.

3.   RESEARCH DESIGN

The main objective of this study is to develop machine learning models that predict the intention of IS graduates to continue their bachelor with a master program in a computing-related area at FEBA-UAIC. Data on academic performance (2013-2017) and background information for IS graduates (2016-2020) were provided by the University Management Systems (UMS).

The outcome variable (enrollment or not in a computing-related master program at FEBA-UAIC, labeled master_computing) was binary, and all subsequent models used classification. Predictor variables were: genre (genre), social milieu (urban_or_rural), the profile of graduated high school class (hs_concentration), and the year of enrollment in the master program, which in most cases is the same as the IS graduation year (master_year_of_admin), the point average for business-related courses during IS bachelor program (avg_business), the point average for core/technical (e.g. Programming, Databases, Computer Networks, IS Design) courses (avg_core_computing), the point average for soft-computing courses (e.g. Groupware, Enterprise Resource Planning), the point average for math and statistics courses (avg_stats) and the point average for the dissertation exam/presentation.

ML models were deployed with two of the most popular algorithms, Random Forest (RF) and Extreme Gradient Boosting (XGB). Both are developments of the classification or regression trees technique (Breiman *et al.*, 1984; Strobl *et al.*,2009). RF grows trees by split-variable randomization (Breiman, 2001) whereas boosting combines "weak" learners in many iterations to develop "strong" learners (Schapire and Freund, 1999). XGB (Chen and Guestrin, 2016) is one the most recent implementations of gradient boosting "family" with excellent results in both classification and regression. As a byproduct, the models estimated the predictor importance in accounting for the outcome variability.

R (R, 2021) was chosen as language for data preparation and exploration, mainly the tidyverse ecosystem of packages (Wickham *et al.*, 2019). RF and XGB models were fitted, assessed and tuned with the tidymodels framework (Kuhn and Silge, 2021) that used the ranger engine (Wright and Ziegler, 2017) for RF and the xgboost (Chen *et al.*, 2021) package for XGB. Variable importance was extracted and visualized with package vip (Greenwell and Boehmke, 2020).

4.   RESULTS AND DISCUSSION

After the curation of data provided by the UMS, 566 records were kept on IS graduates between 2016 and 2020 (most of them enrolled within 2013-2017 academic years).

Figure 1 displays the distribution of categorial variables. Two-thirds of IS graduates were females and one-third males. Of IS graduates, 63% lived in cities. Most IS graduates came from high schools with STEM concentration.
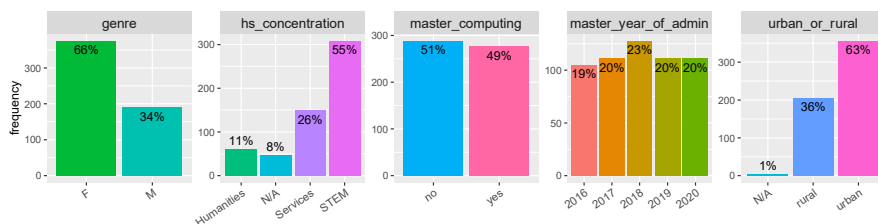
Figure 1. Nominal variables

Figure 2 shows the distribution of numerical variables both as histograms (left) and boxplots (right). With the [5.39, 9.67] range of values, technical/core courses seem the most challenging, recording an average of 7.43 and a median of 7.39. By contrast, best results were recorded for the dissertation points average whose values are distributed within [7, 10] range, and both mean and average about 9.
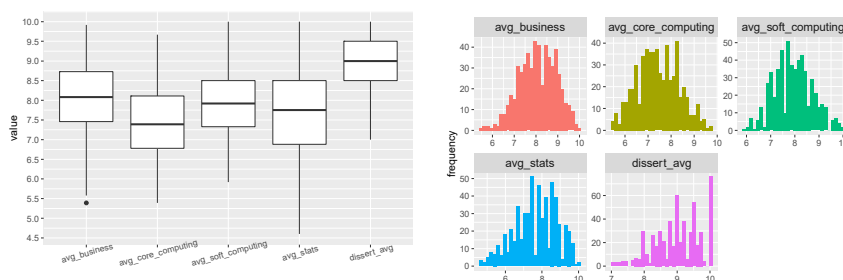
Figure 2. Numerical variables

Taking into account the variable distribution, the courses related to technical/core skills and the courses in math and statistics are more difficult that courses related to business subjects and soft computing courses.

As some predictive models may face problems because the predictors collinearity, next the correlation among numerical predictors was examined. Figure 3 reveals the largest correlation coefficient (0.81) for the avg_business – avg_soft_computing pair. The remaining coefficients were smaller than 0.80. Consequently, all the initial variables were kept in subsequent models, not least since variable importance estimation in the random forest algorithm is not distorted by collinearity (Cutler *et al.*, 2012).
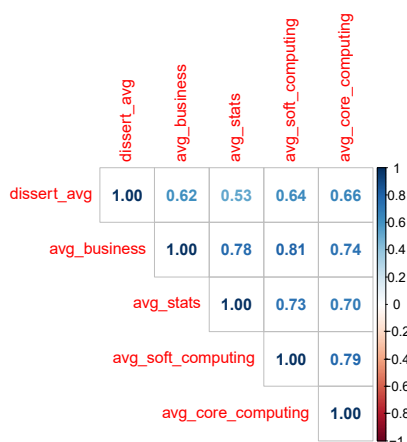
Figure 3. The correlation plot

Both RF and XGB algorithms have hyper-parameters, i.e., parameters which cannot be learned directly from the data, but they need to be tuned (Probst *et al.*, 2019). Subsequent models' performance was assessed using the repeated (10 times) 5-fold cross-validation for the main training set. Best RF and XGB models were selected among 100 combinations of hyper-parameter values chosen by grid search method, using the conservative grid_max_entropy option. Models' performance was compared with the ROC-AUC metric.

Two hyper-parameters were subject for tuning in the RF models, the number of random attributes used at each node split (mtry) and the minimum number of observations in a node for continuing the tree splitting (min_n). The number of assembled trees was fixed at 700. Figure 4 displays RF models performance, assessed with both accuracy and roc_auc metrics. Better results were associated with smally number of selected predictors but with a larger size of the minimal node.
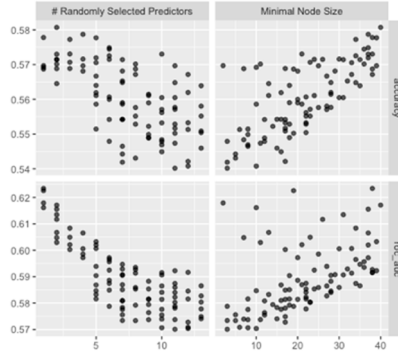
Figure 4. Random Forest models tuning

More numerous hyper-parameters were chosen to be tuned in the XGB models (see Fig. 5): the learning rate (learn_rate), the minimum reduction in the loss function in order to proceed to a further split (loss_reduction), the maximum depth of the tree (tree_depth), the size of the random samples (sample_size), and two other parameters also tuned in the RF models. All the XGB models used 1000 trees. Compared to RF models tuning, there is no clear pattern in examining graphically the influence of hyper-parameter values on the model performance.
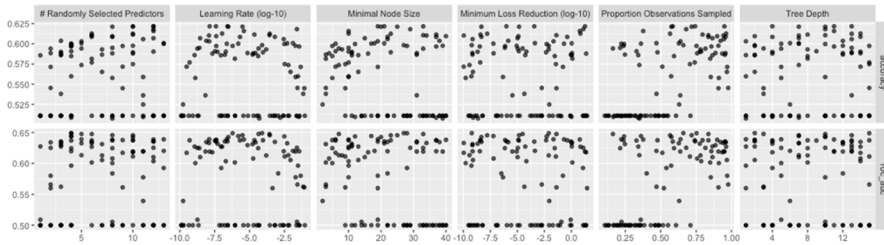
Figure 5. Extreme Gradient Boosting models tuning

Across the 50 training folds and 100 combinations of hyper-parameters, the best results for RF were recorded for the following configuration: mtry = 2, min_n = 40, whereas for the XGB models the best setup was: mtry = 11, min_n = 22, tree_depth = 4, learn_rate = 0.00000719, loss_reduction = 0.00000000142, sample_size = 0.799.

Naturally, the decisive check of the selected models depended on their performance when applying the models on new data (the main test set). With an accuracy of 0.65, the RF best model outperformed XGB best model which recorded an accuracy of 0.59. Also, for the roc_auc metric (Fig. 6), the RF model (0.664) performed better than XGB (0.621).
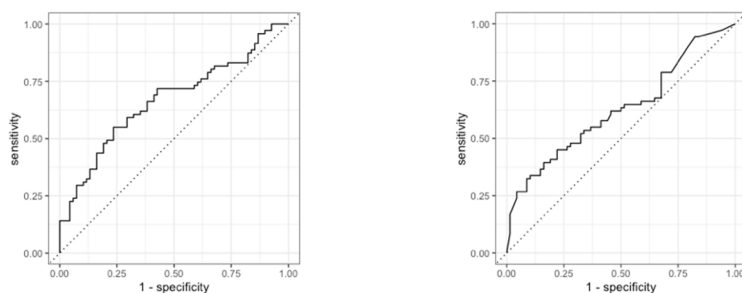
Figure 6. AUC ROC on the test data test for RF (left) and XGB (right) models

Overall results were weaker than expected. Compared with a pure random guess (e.g., flipping a coin) which would be "accurate" around 50%, an accuracy of 65% is notable, but not impressing.

Figure 7 presents the most important predictors, as assessed by both RF and XGB best models. First three most important predictors are identical, avg_core_computing, avg_soft_computing and dissert_avg. But RF ranked their importance as relatively close, whereas XGB the importance of avg_core_computing is very large compared with all other predictors combined.
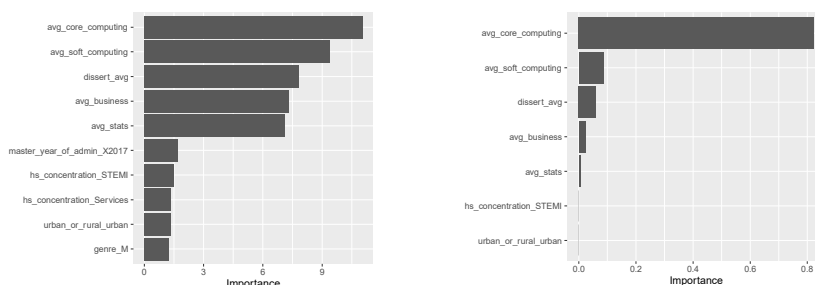
Figure 7. Variable importance for RF (left) and XGB (right) models

Similar to results in Fotache *et al.* (2021) no predictor related to students' genre and background was ranked as important in predicting the enrollment of IS graduates in BIS/DM/SDBIS programs.

5. CONCLUSIONS, LIMITS

Based on data provided by the University Management Systems on 566 IS graduates between 2016 and 2020 this paper built and tuned a series of Machine Learning for predicting the IS graduate's enrollment in a computing-related master program at the same FEBA-UAIC college. Additionally, ML techniques provided the predictors ranking (importance) in relation to the outcome variability.

Relative to techniques used in previous studies which are based on surveys and measurement scales for latent factors, Random Forest and XG Boost models processed data as they were provided by the UMS which are less subjective.

Despite grid search tuning and repeated and stratified cross-validation, model performance was far from exciting. Only the Random Forest models recorded an accuracy of 65% and a ROC AUC of 66.4 on the test set. Both series of models ranked the point average for technical/group of courses (e.g., programming, databases, networks, IS design) as the most important predictor. The RF model ranked as important also the point average for the group of coursed related to soft computing skills (e.g., teamwork/groupware, ERP) and bachelor final dissertation exam. No predictor related to students' genre and background was ranked as important in predicting the enrollment of IS graduates in BIS/DM/SDBIS programs.

Unfortunately, the IS graduates who enrolled in computing-related master programs in other colleges/institution were not identified, and this is a major limit of the study, since they were counted as non-computing master students. Nevertheless, according to the word of mouth, their number is small.

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ANALYSIS ON HOW ORGANISATIONAL CULTURE SUPPORTS AGILE METHODS IN A SOFTWARE DEVELOPMENT TEAM

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ABSTRACT

Using agile methods is an increasingly important area within the software development teams. Recent developments in researching this area have heightened the need of organisational culture to support agile principles within the software creation process. In this respect, this paper has the objective to identify if organisational culture supports applying agile approaches by using a questionnaire applied on five different teams that use the Scrum framework. Results are important as few studies are applied on outsourcing organisations and they may be used to optimise processes and improve performance.

Keywords: agile; cultural characteristics; software; value; optimization.

JEL Classification: M15

1. INTRODUCTION

Nowadays, technology evolves very fast and it's clear that we need innovation obtained within short periods. It is not proper anymore to make a feasibility plan for long periods of time because during several months the entire context could change. The IT industry was affected by technological evolutions and new trends, and it was forced to find more suitable solutions to develop products quicker. In this difficult context, a new approach related to IT product development that is based on short iterations between 1 to 4 weeks when parts of products are delivered to clients. This approach is known as the agile method and it is based on four values: individuals and interactions between them, collaboration with clients, adaptation to change, and providing a functional software. In addition, there are twelve behavioural principles: client satisfaction is a priority, changing requirements is welcomed, delivering a functional software is done frequently, a daily collaboration between business representatives and developers is mandatory, providing trust and support represent essential determinants, face-to-face communication is the main channel of communication, focusing on a qualitative development based on sustainability and durability, having a

continuous attention to all the aspects related to development, simplicity in thinking and acting, working with self-organising teams, and verification and adjustments that are done all the time during development (Sidky, 2020). Actually, all these ideas were gathered in 2001 by 17 independent professionals that formalised their experience into agile frameworks (Cockburn and Highsmith, 2001; Schwaber *et al.*, 2007). This approach has been successful and it is used within multiple economic areas, even in production.

But the environment is changing continually and other challenges appear. Now, globalisation is a fact and most organisations work with people located in different locations. Therefore, a team may now comprise individuals from different continents that work on the same project. The new challenge is to support agile methods in an international context.

2. ORGANISATIONAL CULTURE AND THE DEVELOPMENT OF A SOFTWARE WITHIN AN AGILE FRAMEWORK

Organisational culture supports agile methods if it's based on four characteristics: quality (it is delivered a product that has value for client), scope (all requirements and objectives are met), time (the product is delivered before deadlines) and cost (the product is delivered at the costs and by consuming the resources that were estimated initially) (Chow and Cao, 2008).

It's important for organisations to have the best policies related to work and have patience about implementing them as the positive effects are visible within a long-term horizon. These policies influence project efficiency, business success and the next actions taken by the team (Tam *et al.*, 2020).

Organisational structure may also represent an issue when the company intends to implement agile principles. In this respect, it may trigger an aversion to change which may be amplified by the lack of interest or support from management (Santos *et al.*, 2011).

Misra *et al.* (2019) highlights that developing an IT product is a process concentrated around team members that are part of it. Therefore, cultural differences that are determined by the international structure of the team influences the ongoing work and team performance. There are more studies that give examples related to these cultural differences such as values, beliefs and norms which are learnt and perpetuated by generations of people, and which are reflected into laws, policies and actions from a society (Thomas *et al.*, 2010). There is a cultural risk involved as employees having different cultural backgrounds could not agree on measures that could optimise processes and improve performance (Tam *et al.*, 2020).

Organisations working on developing IT products must apply measures to cover the cultural risk by implementing proper communication channels and using resources for supporting work from multiple locations, applying proper tools and

indicators to enhance performance, or for diminishing any negative effect generated by a different cultural background.

3. RESEARCH METHODOLOGY AND RESULTS

The objective of this research is to determine whether international structure of the team and the work made from more locations affect the quality of the work, if the organisation have policies that support remote work or from multiple locations, if employees' rewards are correlated with performance, if individual and team performance reviewing processes are made through relevant indicators.

In order to meet this objective, we applied a questionnaire on 80 people that are distributed within 5 teams and who are working on different positions such as Proxy Product Owner, Scrum Master, Technical Business Analyst, Tech Lead, Developer, WebOps, Front End, Quality Engineer Lead, Manual Tester and Automation Tester.

Respondents have five options to select for each hypothesis as follows: (1) – totally disagree, (2) – partially disagree, (3) – neutral (no agreement or disagreement regarding the hypothesis tested), (4) – partially agree, and (5) – totally agree. After discussing with several individuals that completed the questionnaire, I decided to consider the neutral answers as having concerns related to hypothesis being tested but the impact is very limited. Therefore, in these circumstances, solutions must be found to solve these issues too in order to have as many people as possible to confirm that agile principles are applied inside the organisation.

3.1 Hypotheses tested

We tested five hypotheses in order to establish if the organisational culture supports agile methods, as follow:

- Hypothesis no. 1: International structure of the team and the work made from more locations don't affect the quality of the work
- Hypothesis no. 2: Organisation policies support remote work or from multiple locations
- Hypothesis no. 3: Employees' rewards are correlated with performance
- Hypothesis no. 4: Reviewing process of individual performance is made through relevant indicators
- Hypothesis no. 5: Reviewing process of team performance is made through relevant indicators

3.2 Results of the analysis and solutions to improve processes

The first hypothesis tests whether the international structure of the team and working from different locations don't affect the quality of the work.

70.1% of respondents confirmed partially or totally this hypothesis, 26.3% preferred to avoid answering, whereas 3.8% didn't confirm. Results are

encouraging and confirm that the international structure of the team, working from different locations and on different time tables are not significant impediments. However, this could be improved by the decision-making factors to get better results. This could be done by establishing meetings that are crucial for the project progress at hours when all the team members are able to participate. In addition, team members should use tools for tasks/management tracking in order to assure transparency for all individuals.
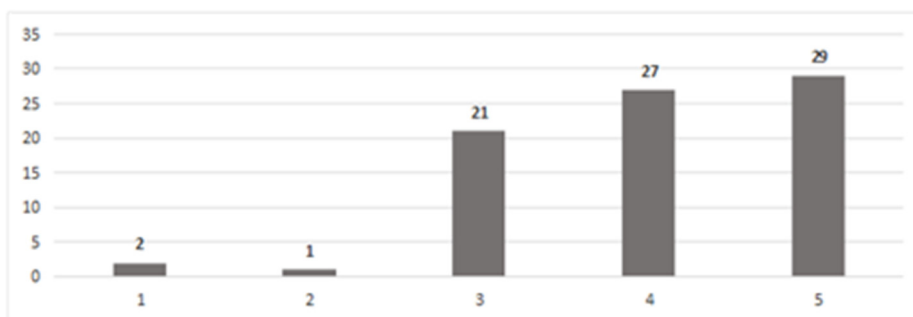
(Source: own calculations)

Figure 1. Frequency analysis after testing hypothesis no. 1

Decision-making factors should be aware of the cultural characteristics of their employees. This is important to assure a stable working environment. And this should be completed by explanations related to work and performance to be sure that every individual working within the team has the same standards. Each time when a new person joins the team, a program should be implemented to assure a large understanding of the working environment and what are the main expectations from them.

The second hypothesis tests whether organization policies support remote work or from multiple locations. One of the agile rules is to work from same location as the efficiency would be higher. Human interaction is a necessary component of agile method. However, the current epidemiologic crisis provoked by Covid-19 forced management to face a new challenge about incorporating new working procedures to allow people working from home and from different locations. To reach this purpose, team members must have a stable Internet connection and tools that allow communication and monitoring project evolution.

The results after second the second hypothesis are presented in the figure below:
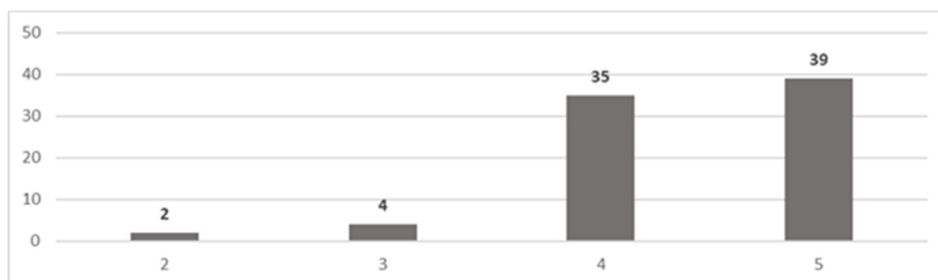
(Source: own calculations)

Figure 2. Frequency analysis after testing hypothesis no. 2

Our results confirm that most of respondents (92.5%) sustain that policies promoted by organization allow working from outside the office and from different locations. The rest of respondents have roles that implied to work form the office due to exceptional circumstances. Output obtained confirms that working from the same space is not a crucial factor that could affect optimizing processes and improving performance (Chow and Cao, 2008).

Misra *et al.* (2019) sustained that, under certain circumstances, working outside the office and from different locations affect individuals' sensitivity towards the other colleagues working on the same project. Therefore, they can be less communicative, less dynamic and less oriented towards progress, within a long-term horizon. All these issues could be improved through a higher working capacity of the team, assuring premises for supporting effective communication channels and implying the client more in the project (Tam *et al.*, 2020).

Through the third hypothesis is tested whether employees' rewards are correlated to performance and the results are presented below, in the figure no. 3. 55% of respondents confirmed that rewards are correlated to performance. However, 45% preferred to remain neutral or didn't agree to what the hypothesis tested. Therefore, we consider that there are small concerns related to the rewards system.

The current market is competitive and it sustains a permanent pressure from employees to find the best solution to stimulate performance. It is clear that an organisation that develops an IT product must establish clear performance objectives for both individuals and team. In addition, employees' evaluation should be based on transparent and clear objectives established at the beginning of the project or year that must be also explained. In this respect, at the end of the project or end of the year it would be easier for management to correlate performance to bonuses.
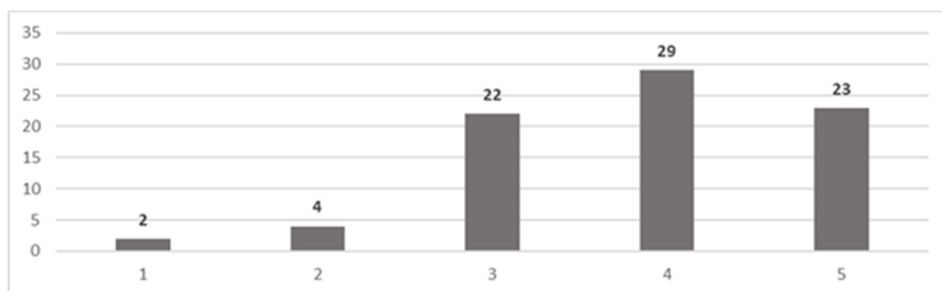
(Source: own calculations)

Figure 3. Frequency analysis after testing hypothesis no. 3

The fourth hypothesis tests whether evaluation of individual performance is made through the most relevant indicators and the results are presented in figure 4. 62.5% of respondents confirmed partially or totally that the organization managed to use indicators that reflect individual performances. However, 37.5% of them remained neutral or they didn't agree the hypothesis. In order to overcome these minor issues, organisations should establish and promote individual indicators depending on technical abilities of each individual or based on project requirements. Each team member should be aware of them to get know what are the main performance references that must be reached. In addition, the entire rewarding strategy should consider the ongoing feedback that is received permanently from employees.
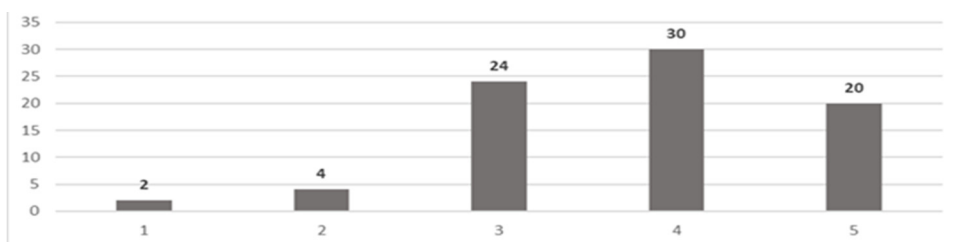
(Source: own calculations)

Figure 4. Frequency analysis after testing hypothesis no. 4

The fifth hypothesis test if reviewing process of team performance is made through relevant indicators.
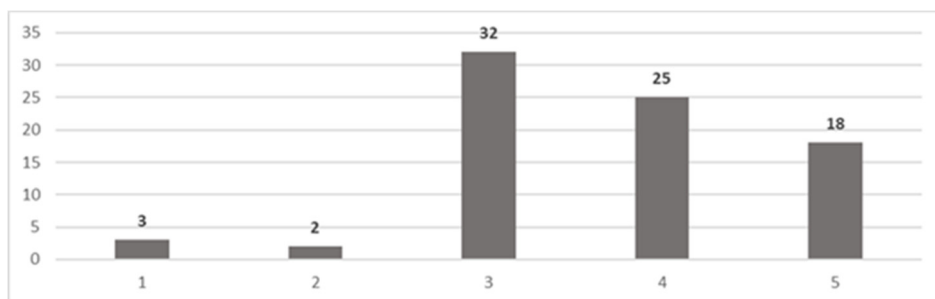
(Source: own calculations)

Figure 5. Frequency analysis after testing hypothesis no. 5

53.8% of respondents validated partially or totally the above hypothesis, but the percentage is lower compared to the previous hypothesis where the test was done for individuals. These results are explained by the fact that individuals understand easier the objectives related to their performance, compared to the indicators made for the entire team. The awareness of individuals related to performance indicators for the entire team could be enhanced by establishing meetings where everyone must participate to understand the vision related to team performance. Performance indicators must be explained to all participants. The most important rule when these indicators are established is to have references that can be reached through additional efforts, but it's not impossible to accomplish them. On the other hand, if these objectives are too easy to reach, then the team or individuals will perceive them as not being proper, and they won't perform as expected.

4. CONCLUSIONS

Results obtained in this study are more valuable as literature on agile methods is very limited in the area of outsourcing organisations (Krancher, 2020). The current framework involving IT product development is challenging as the same team may work with individuals with different cultural characteristics. Our results indicate that the international structure of the team and working from different locations don't affect work quality as long as the organisation has clear procedures about how the new employees will be integrated into the team, to understand easily and quickly which are the main expectations from them. Even if human interaction is a rule of agile method, working from home due to Covid-19 restriction, isn't an impediment for team members. This is in accordance with the results obtained by Chow and Cao (2008) who found that working from the same space is not a crucial factor that will affect processes of optimization. Rewards are important to stimulate performance and to assure an improved cohesion among members as each individual will perceive that this organisation is focused on

performance and cultural patterns are not important. The current market is competitive and each organisation must establish clear performance objectives both for individuals and teams. Communication among team members is important as each one should be aware of both individual and team performance to meet the expectations.

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THE INFLUENCE OF ENTREPRENEURIAL TRAITS OF RURAL TOURISM ENTREPRENEURS ON BUSINESS START-UP MOTIVATIONS

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ABSTRACT

Rural tourism entrepreneurship positively impacts tourists' satisfaction, as well as destination and community development. Despite the overall negative impact of the COVID-19 pandemic on the tourism industry, the pandemic also created opportunities for rural tourism development, lower tourist density destinations becoming more attractive. In order to stimulate local economic development, rural tourism entrepreneurship needs to be encouraged, and for that it is important to understand the factors that promote it. Hence, this research aims to explore the entrepreneurial traits of tourism entrepreneurs from the rural areas of Cluj County. The characteristics investigated in this study are need for achievement, locus of control, risk taking propensity, self-sufficiency/ freedom, self-confidence, creativity/ innovativeness. Our results show that rural tourism entrepreneurs who were motivated by the tourism demand can be characterized as having a lower level of locus of control, those who were motivated by ensuring employment for themselves and their families are less self-confident, while entrepreneurs who were motivated by the ownership of a property are less innovative.

Keywords: entrepreneurs; entrepreneurial traits; tourism; Cluj County.

JEL Classification: L26, L83

1.   INTRODUCTION

The tourism industry has been very dynamic and fast growing over the past three decades, becoming the largest industry worldwide in terms of number of jobs created and contribution to global gross domestic products (UNWTO, 2020). However, tourism was one of the most affected industries by the COVID-19 pandemic, international tourist arrivals dropping dramatically during 2020 (UNWTO, 2021). Nevertheless, the pandemic created opportunities to develop rural tourism, lower tourist density destinations becoming more attractive (Marques *et al.*, 2021; Vaishar and Šťastná, 2022).

This tourism sector has created opportunities in areas characterized by natural attractions, wildlife and wilderness habitats (Akpan and Obang, 2012). As a form of tourism, rural tourism occurs in rural areas involving the exploitation of natural and anthropogenic tourism resources of the area and the development of social and economic activities that generate benefits for local communities (Surugiu, 2008, p.13). It can contribute to rural development by attracting financial resources and by creating jobs, and at the same time it can eliminate social isolation and can be an important factor in resettling the country (Wilson *et al.*, 2001).

In several European countries rural tourism is a relatively important sector of the tourism industry. Rural areas still retain unaltered traditional and spiritual valences, especially related to ethnography, socio-economic life and the environment. These qualities of the rural areas enable rural tourism development which will have a great future, being in a direct relationship with other forms of tourism (Nistoreanu and Ghereș, 2011, p.113).

Small businesses and entrepreneurs lay the foundation of the tourism product in rural areas (Hall, 2005; Konu *et al.*, 2010), by delivering the tourism reality and making the region attractive, hence influencing the development beyond their own individual contribution (Ryan *et al.*, 2012).

Many studies have been conducted on specific entrepreneurial traits and personality characteristics conducted in different industries. However, studies on entrepreneurship in the tourism sector are limited (Jaafar *et al.*, 2011). Among the characteristics of tourism entrepreneurs identified by researchers are high internal locus of control, high achievement motivation and autonomy (Lerner and Haber, 2000), independence, and self-reliance (Schroeder, 2003), these being recognized as significant attributes that contribute to the success of an entrepreneur (Jaafar *et al.*, 2011).

2.   BRIEF LITERATURE REVIEW

Many dimensions of entrepreneurial traits have been investigated, such as achievement motivation, risk-taking propensity, preference for innovation (Koh, 1996; Stewart *et al.*, 1999), the capacity to adapt to and tolerate ambiguity as well as other dimensions (Koh, 1996; Markman and Baron, 2003) such as self-efficacy

(Koh, 1996; Markman *et al.*, 2002), high personal perseverance, high human and social capital, superior social skills (Baron and Markman, 2000), locus of control (Miller and Toulouse, 1986a, 1986b; Wijbenga and van Witteloostuijn, 2007), and need for achievement (Koh, 1996; Hansemark, 2003).

The entrepreneurial traits selected to be investigated in this study are: need for achievement, locus of control, risk taking propensity, self-sufficiency/ freedom, self-confidence, and, respectively, creativity/innovativeness. We will shortly discuss them below.

According to McClelland's theory of **the need for achievement,** individuals who have a need to achieve seek to excel, progress, and perform. Such individuals set high but obtainable targets and strive to attain them through their own efforts, are more concerned with the personal achievement rather than with the rewards of success, need regular feedback to monitor their progress of achievement and generally prefer to work alone or with other high achievers (Bezzina, 2010).

Begley and Boyd (1987) define **locus of control** as an individual's perception of his/her ability to influence events in life. Individuals with an internal locus of control believe they can influence events in life, whereas individuals with an external locus of control believe that events happen beyond their control. This belief has implications for entrepreneurship activities (Altinay *et al.*, 2012).

Risk taking propensity refers to the propensity of an individual to exhibit risk taking or risk avoidance, when confronted with situations which might involve an element of risk (Gurol and Atsan, 2006). Some empirical studies confirm the supposition that entrepreneurs are risk takers, but there is no consensus about the extent of risk taking in an entrepreneurship process (Altinay *et al.*, 2012). There are studies that conclude that entrepreneurs take calculated risks to avoid uncertain situations therefore can be considered moderate risk (Cunningham and Lischeron, 1991; Koh, 1996; Thomas and Mueller, 2000).

Self-sufficient individuals are independent persons who want to be their own boss, who want to be able to make their own choices and who want to set their own constraints (Bezzina, 2010). They want to take decisions themselves and want to have liberty to take action (Stoner and Fry, 1982).

Self-confidence is an individual's belief in his/her own resources and abilities. In general, individuals who believe they are able and that they can and will do well are more likely to be motivated in terms of effort, persistence and behavior than individuals who believe they are less able and do not expect to succeed (Pintrich, 2003). Self-confidence is very important in entrepreneurship because setting up a business and trying to be successful is not an easy task to do.

Innovativeness is an important element of entrepreneurship. Entrepreneurs are individuals who are full of creative and innovative ideas, being able to merge these ideas with the resources available in order to generate additional value (Bezzina, 2010). As research shows, compared to non-entrepreneurs, entrepreneurs are more creative, imaginative and innovative (Thomas and

Mueller, 2000), and entrepreneurially inclined individuals are more innovative than non-entrepreneurially inclined individuals (Gürol and Atsan, 2006; Koh, 1996).

3. RESEARCH METHODOLOGY

In order to stimulate local economic development, rural tourism entrepreneurship needs to be encouraged, and for that we need to understand the factors that promote it. Hence, this research aims to explore the entrepreneurial traits of tourism entrepreneurs from the rural areas of Cluj County. To achieve our goal, we applied a semi-structured interview to business owners.

According to the Ministry of Regional Development and Tourism's there were 97 active accommodation units (touristic chalets, villas, touristic boarding houses and agro-touristic boarding) acting in rural tourism in Cluj County, at the time of our study. The investigated sample comprised 24 units that accepted to participate in our study. Most of these units (46.2%) were classified in the category three daisies, followed by those in the category of two daisies. Over 50% of the businesses were established after 2006. The age of the owners was between 46 and 60 years for 57.7% of the units, and between 30 and 45 years for 26.9% of them. Predominant in our sample were women owners (61.5%) and owners with high school studies (42.3%) or undergraduate studies (34.6%). In terms of previous experience in tourism before starting the business, the majority (65.4%) declared they didn't have any experience, but 76.9% stated they received specialized training in tourism.

The entrepreneurial traits were measured using five points Likert scales, ranging from 1 = "totally agree" to 5 = "totally disagree". The scales included a total of 10 items: four sets of two items each, intended to measure need for achievement, risk-taking propensity, self-sufficiency/freedom, and creativity/innovativeness, and, respectively, two individual items directed at measuring locus of control, and self-confidence.

4. RESULTS AND DISCUSSIONS

One of the investigated entrepreneurial traits (see Fig. 1) was need for achievement measured by two items. Entrepreneurs have expressed, with a rate of 87.5%, the agreement ("totally agree" or "agree") about the fact that they aim to excel in all the activities they conduct. Also, the majority (95.83%) of them agree that they always try to learn from failures. Disagreement with both measures of achievement motivation was expressed by only 4.17% of the respondents. Thus, we can argue that the entrepreneurs possess the necessary motivational resources to overcome obstacles, find and utilize needed resources, compete, and improve their skills.

The self-efficiency trait was expressed in terms of preference for being one's own boss and, respectively, for being the single decision maker and having

freedom of acting. Here the results are interesting: while 87.5% of the entrepreneurs agree that they prefer to be independent, only 58.3% say they want to take decisions by themselves. This latter aspect registered the highest level of disagreement, namely 33.34%, among all the investigated measures reflecting entrepreneurial traits. We consider that a possible explanation for this is the fact that the participants in our study operated family businesses, and the decision-making process involves also their spouses and even their children.

With respect to self-confidence, the results show that the investigated entrepreneurs (91.66%) are confident in their capability to complete the projects they develop, meaning that they have the ability to overcome the potential obstacles they may encounter.

The two measures of innovativeness used in our research benefited of the same level of agreement among the entrepreneurs (83.33%), thus, on one hand, they are always trying to develop new projects and, on the other hand, they are curious people in search of new discoveries. This implies that they are motivated to continuously improve the services they provide for tourists and value new ideas.

The majority (91.67%) of the entrepreneurs participating to our study have an internal locus of control, considering that the outcome of their actions depends on their performance.

The last entrepreneurial trait evaluated in the case of rural tourism entrepreneurs from Cluj County refers to propensity of taking risks. A very important proportion (87.5%) of the entrepreneurs stated that they were willing to invest a significant part of the capital to exploit a business opportunity. A slightly lower percentage of entrepreneurs (70.84%) were inclined to assume greater risk for greater rewards. This dimension of risk taking was the second highest in terms of level of disagreement, 16.67% of the entrepreneurs manifesting reluctance in taking major risk even with the promise of important profits.

Figure 1. Entrepreneurial traits items/indicators

Computing the mean scores of the six investigated entrepreneurial traits we can argue that the entrepreneurs from our sample possess high need for achievement, high self-confidence, internal locus of control, high risk-taking propensity and are highly innovative (see Table 1). The lowest score was registered in the case of self-sufficiency, but its value is high enough to state that entrepreneurs have a good self-confidence.

Table 1. Descriptive statistics for entrepreneurial traits components

Entrepreneurial trait	Mean	Std. error of Mean	Std. deviation
Need for achievement	1.52	.114	.561
Self confidence	1.54	.159	.779
Locus of control	1.79	.170	.833
Risk taking propensity	1.96	.147	.721
Self sufficiency	2.15	.160	.786
Innovativeness	1.88	.128	.629

Further on, we investigated the differences in entrepreneurial traits using four main business startup motivations as grouping variables: the growing touristic demand, ensuring employment for the owner and his/her family, the ownership of a property, and, respectively, the attractive natural environment (Fig. 2).
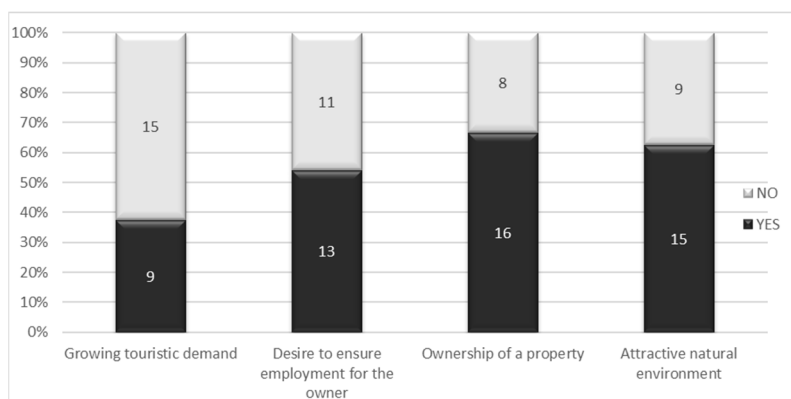
Figure 2. Business startup motivation of the investigated entrepreneurs

Given the fact that these motivations were measured as dummy/binary variables (according to whether entrepreneurs started their businesses considering or not considering a certain startup motivation), and due to the small sample size, the nonparametric *Kruskal-Wallis* test was considered as being appropriate.

Table 2. Differences in entrepreneurial traits using as grouping variable the growing touristic demand as business startup motivation *(Kruskal Wallis)*

	Need for achievement	Risk taking propensity	Self sufficiency	Innovativeness	Self-confidence	Locus of control
Chi-Square	.009	.682	2.494	.184	.261	5.678
df	1	1	1	1	1	1
p	.925	.409	.114	.668	.609	.017

As results in Table 2 show, there is a significant difference in entrepreneurial locus of control between those who started their businesses motivated by the growing touristic demand (locus of control mean value of 2.33), in comparison to those who did not consider this motivation when starting up their businesses (locus of control mean value of 1.47). Therefore, it can be stated that those entrepreneurs who were motivated by the growing tourism demand can be characterized as having a lower level of locus of control, as compared to the others.

Table 3. Differences in entrepreneurial traits using as grouping variable the desire to ensure family employment as business startup motivation *(Kruskal Wallis)*

	Need for achievement	Risk taking propensity	Self sufficiency	Innovativeness	Self-confidence	Locus of control
Chi-Square	1.350	.390	.031	.127	4.774	.345
df	1	1	1	1	1	1
p	.245	.533	.859	.721	.029	.557

The results comprised in Table 3 reveal the fact that there is a significant difference in entrepreneurial self-confidence between those who started their businesses in order to ensure employment for themselves and their families (self-confidence mean value of 1.85), in comparison to those who did not consider this motivation when starting up their businesses (self-confidence mean value of 1.18). Thus, it can be concluded that the entrepreneurs who were motivated by ensuring employment for themselves and their families are less self-confident than the other investigated entrepreneurs.

Table 4. Differences in entrepreneurial traits using as grouping variable the ownership of a property as business startup motivation *(Kruskal Wallis)*

	Need for achievement	Risk taking propensity	Self sufficiency	Innovativeness	Self-confidence	Locus of control
Chi-Square	.601	2.088	.024	4.434	1.587	.343
df	1	1	1	1	1	1
p	.438	.148	.876	.035	.208	.558

The tests' results from table 4 suggest that there is a significant difference in entrepreneurial innovativeness between those who started their businesses motivated by the ownership of a property (innovativeness mean value of 1.69), in comparison to those who did not consider this motivation when starting up their businesses (innovativeness mean value of 1.25). The mean values suggest that entrepreneurs who were motivated by the ownership of a property are less innovative, as compared to those who were not determined by this reason in establishing their businesses.

Table 5. Differences in entrepreneurial traits using as grouping variable the attractive natural environment as business startup motivation *(Kruskal Wallis)*

	Need for achievement	Risk taking propensity	Self sufficiency	Innovativeness	Self-confidence	Locus of control
Chi-Square	.080	.023	2.037	3.485	.261	2.488
df	1	1	1	1	1	1
p	.777	.878	.154	.062	.609	.115

Considering the fourth main business startup motivation, the results in table 5 show that there is no significant difference in entrepreneurial traits between those who established their business due to the attractive natural environment, as compared to those who did not consider this aspect when starting their own businesses.

Furthermore, we investigated the correlations between the six main entrepreneurial traits. Due to the way the variables depicting these traits were measured (averages of scores on scales from 1 to 5), and considering the small sample size, the nonparametric correlation coefficient *Spearman R* was considered as being appropriate.

Table 6. Correlations between entrepreneurial traits *(Spearman's R)*

		Self-confidence	Locus of control	Need for achievement	Risk taking propensity	Self sufficiency	Innovativeness
Self-confidence	R	1.000	.131	.154	.072	-.161	.351
	p	.	.540	.472	.739	.452	.092
Locus of control	R	.131	1.000	.432*	.175	.287	.408*
	p	.540	.	.035	.413	.174	.048
Need for achievement	R	.154	.432*	1.000	.362	-.103	.346
	p	.472	.035	.	.082	.631	.098
Risk taking propensity	R	.072	.175	.362	1.000	.209	.305
	p	.739	.413	.082	.	.328	.148
Self sufficiency	R	-.161	.287	-.103	.209	1.000	.112
	p	.452	.174	.631	.328	.	.603
Innovativeness	R	.351	.408*	.346	.305	.112	1.000
	p	.092	.048	.098	.148	.603	.

*Correlation is significant at the 0.05 level (2-tailed)

As results in table 6 show, there are two significant, strong and positive correlations between locus of control and need for achievement (R=.432; p<0.05), and, respectively, between locus of control and innovativeness (R=.408; p<0.05). The results also suggest some other possibly significant, medium and positive correlations between the need for achievement and innovativeness (R=.346; p<0.1), between innovativeness and self-confidence (R=.351; p<0.1), and, respectively, between need for achievement and risk-taking propensity (R=.362; p<0.1). Even though in these cases the p values exceed the standard value of .05, it is, however, below .1, which could represent an acceptable boundary for such a small sample size.

5. CONCLUSIONS

Entrepreneurship is considered to play an important role in promoting innovation, creating jobs and generating social and economic wealth in a country's economy (Wong *et al.*, 2005). Hospitality, leisure, sports and tourism can be seen as classic entrepreneurial industries consequently playing a key role in economic development (Altinay *et al.*, 2012).

Considering the role of entrepreneurs in ensuring the attractiveness of the tourism product we can argue that rural tourism in Cluj County benefits of a good development perspective. Our study's results show the entrepreneurs are responsible individuals looking to improve their skills, willing to make all the necessary efforts to succeed in their endeavors and searching for new ways to improve the product offered to tourists. We can conclude that the investigated sample of entrepreneurs can be characterized by high levels of most of the analyzed entrepreneurial traits (need for achievement, self-confidence, locus of control, risk-taking propensity, innovativeness), and a moderate level in what concerns self-confidence.

The analysis of the differences in entrepreneurial traits using business startup motivations as grouping variables revealed some interesting findings: entrepreneurs who were motivated by the growing tourism demand can be characterized as having a lower level of locus of control, as compared to the others; those who were motivated by ensuring employment for themselves and their families are less self-confident than the other investigated entrepreneurs; entrepreneurs who were motivated by the ownership of a property are less innovative, as compared to those who were not determined by this reason in establishing their businesses. Moreover, the study of the correlations between the six main entrepreneurial traits showed significant, strong and positive correlations between locus of control and need for achievement, and, respectively, between locus of control and innovativeness

The main limitation of our research is given by the small sample size. However, considering the fact that we managed to investigate 24 (24.74%) of the total of 97 accommodation units involved in rural tourism in Cluj County at the

time of our study, the conclusions can be considered statistically significant for the area. Of course, from the perspective of future research opportunities, it is important to regard this study as a pilot one, the entrepreneurs involved in rural tourism from other Romanian counties representing a potential statistical population to be investigated within future research.

ACKNOWLEDGEMENTS

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EVOLUTION OF REGULATIONS ON NON-FINANCIAL REPORTING AT INTERNATIONAL LEVEL

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ABSTRACT

With increasing efforts for sustainable development and changing the requirements and interests of stakeholders in terms of the information they want from organizations in order to make decisions, there has been an increase in the number of companies publishing non-financial information. In this context, at international level, the need to regulate the preparation of these reports was noted. Thus, at the international level, the emergence of numerous regulations aimed at non-financial reporting has been noted. The problem that arises with their emergence is the homogeneity and comparability of published non-financial information, using the various references available to reporting organizations. This paper highlights the characteristics, implications and forms of the Global Reporting Initiative (GRI) provisions. The research methodology involved the comparative and critical analysis of the GRI directives, highlighting the defining aspects of each one of these, at the structural level and at the content level. Following the analysis, it was highlighted that the GRI directives had a long evolutionary process, which occurred with the change in the socio-economic environment and aimed at adapting to new economic realities, culminating in the publication of GRI standards in 2016.

Keywords: GRI; non-financial reporting; corporate reporting; global reporting initiative.

JEL classification: M41, M42

1.　INTRODUCTION

In 1989, in Boston, USA was formed the non-profit organization CERES (Coalition for Environmentally Responsible Economies). The purpose of this organization was to solve the environmental crisis caused by the activities carried out at the level of the private sector (Hoffman, 1996). In a first phase, CERES issued a code of corporate conduct, consisting of a set of 10 principles, which aimed to make the companies' activities responsible for the impact on the environment. These principles were originally called the Valdez principles, and later acquired the name of CERES Principles. The emergence of these principles was a consequence of the ecological disaster that occurred in the Alaska area in

1989, when, following a breakdown of a oil tanker, more than 40 million liters of oil were discharged into the ocean. Following this event, with serious consequences at the level of the environment, a significant number of activists aimed at protecting the environment decided to set up an organization to ensure the protection of the environment in the context of the accelerated evolution of human economic activities. As mentioned before, this organization was called CERES. Its main objectives are to give greater importance to corporate reporting, which are considered to be a tool that could influence investor decision-making and for which the environmental performance of an economic entity was a factor of interest (Hoffman, 1996).

Based on the importance that corporate reporting has in influencing stakeholder decisions, in 1997, CERES created the GRI (Global Reporting Initiative). The creation of the GRI was done in partnership with the United Nations Environment Program, with the main purpose "of increasing the quality, usefulness and accuracy of sustainability reporting" (GRI, 2002). In the first phase, GRI launched a series of pilot reporting guidelines for the companies, in order to receive feedback at the public level and to test them by companies that would apply them. Thus, in the first phase, in the context of the early stage of sustainability reporting, GRI aimed to obtain information from companies, in particular, and from the interested public in general, so that the reporting guidelines would correspond to the requirements of all stakeholders. The GRI has been a pioneer in the development of directives and standards that help support efforts for sustainable development, aiming at raising awareness at the level of the private sector and the public sector of their impact on critical aspects of sustainable development, such as climate change, social well-being, equal opportunities, respect for human rights (GRI, 2018a).

Throughout its existence, GRI has issued a number of 6 guidelines to be followed by companies for sustainability reporting, culminating with the emergence of reporting standards in 2016. Since its creation, GRI has had as its main purpose to provide assistance to companies in reporting that supports efforts for sustainable development, a goal that it still fulfils today. However, with the passage of time, the scope of the GRI has expanded, aiming to harmonize the practices regarding sustainability reporting. Thus, GRI has become a reference point in terms of sustainability reporting, leading to its efficiency, as well as to the use of the information contained in these reports to improve the financial performance of a company (GRI, 2018a).

As mentioned before, GRI has issued over time 6 guidelines to follow by companies that applied the principles of sustainable reporting. The need to improve these guides amenable to the fact that it was intended to increase the international consensus on sustainability reporting, as well as to increase the accessibility to them. Thus, following negotiations, tests, feedback received or economic developments in the market, the GRI has always adapted to the new

requirements, issuing new guidelines that meet the information needs of users. It is therefore necessary to review the evolution of the GRI standards, from their appearance until now, from the point of view of the content of those directives and from the point of view of their structure.

2. GRI G1 GUIDELINES

The GRI G1 guide was launched in 2000, with the main aim of providing a conceptual framework highlighting the interdependencies between the social, environmental and economic components in the performance achieved by an economic entity (GRI, 1999) Specifically, those guidelines concerned aspects specific to each of the abovementioned components. For the environmental component, reference was made to water, air, natural resources, etc., for the social component it was referred to equal opportunities, improvement of working conditions, elimination of work performed by children, social inclusion, etc., and the economic component referred to the reduction of waste, to involvement in the community or to the balancing of demand with the offer of products and services (GRI, 1999).

Structurally, the G1 guidelines were composed of 3 sections.

The first section was called Preamble, which presented the structure of the guide, theareaof applicability, the reporting principles as well as other relevant information on their evolution.

Section two was called Guidelines. This part presented the data needed to assess sustainability performance, as well as explanatory notes highlighting the information to be reported. Section 2 was divided into 9 distinct parts: 1. Director's statement; 2. 13 key indicators; 3. Profile of the reporting entity; 4. System of leadership, policies and strategies; 5. Relationship with stakeholders; 6. Corporate governance performance; 7. Operational performance; 8. Performance of the production activity; 9. Sustainability overview.

Section three was called Appendices and was intended to provide additional information on the guide in question.

In this first variant of the GRI, the GRI principles for sustainability reporting, as set out in Table 1, were included.

Table 1. GRI G1 Principles

Qualitative characteristics	Assumptions
1. Relevance	1. Application of the principle of continuity
2. Credibility	2. Accruals accounting
a. appropriate description	3. The concept of materiality or materiality threshold
b. neutrality	4. Identity of the economic user
c. completeness	5. The concept of conservatism/precaution principle
d. prudence	
3. Intelligibility	
4. Comparability	
5. Opportunity	
6. Verifiability	

(Source: GRI (1999))

As can be seen from Table 1, the GRI G1 principles are divided into qualitative characteristics and working assumptions, which are considered by companies to be indispensable elements if the objectives of usefulness, verifiability or comparability of information are to be achieved (GRI, 1999).

3. GRI G2 GUIDELINES

In 2002, the second version of the GRI guides, entitled GRI G2, was launched, with the main aim of meeting the new information needs that have arisen at the level of stakeholders. They included 11 reporting principles and 97 indicators to assess the sustainability performance of an economic entity.

Structurally, the G2 Guide consisted of 5 sections.

Section 1 was called Introduction, which outlined the benefits of sustainability reporting, the motivations behind it, and trends in corporate reporting.

Section 2 was entitled Part A – Use of the GRI Directives, in which general rules for the use of the Guide were set out.

Section 3 – Part B: Reporting principles, which outlined the practices and principles to follow to promote sustainability reporting, as well as how to apply the guide.

Section 4 was called Part C – Content of the report, which contained elements such as:1. long-term strategy and vision, 2. economic entity profile, 3. corporate governance structure, 4. corporate management systems, 5. GRI index and 6. performance indicators.

Section 5, entitled Part D — Glossary and Annexes, which contained additional information for users.

As mentioned above, the GRI G2 Guide contained 11 principles to follow, set out in Part B: Reporting Principles. These 11 principles were grouped into 4 categories as follows (GRI, 2002):

Creating the conceptual framework for reporting (transparency, possibility of auditing, inclusion);

Establishing the information to be reported following an analysis of the data available (completeness, relevance, sustainability context);

Quality and credibility assurance (accuracy, neutrality, comparability);

Ensuring accessibility to the report (opportunity, clarity).

Looking at the G1 guidelines in comparison with the G2 guidelines, some differences can be seen between them.

A first difference can be seen at the section level, where the director's statement was included in the long-term strategy and vision, in Part C – Content of the report.

Then, at the level of performance indicators, a distinction is made between basic indicators, i.e. the most relevant indicators for companies, which are of the greatest interest to stakeholders (GRI, 2002) and additional indicators. New indicators of an economic and social nature have also been introduced.

On governance, new sections have been introduced to describe the economic, social or environmental issues addressed at the level of the decision-making process.

Finally, in the GRI index, a table was inserted in which each element within a GRI report was highlighted, ordered by section and indicators (GRI, 2002).

4.   GRI G3 GUIDELINES

The third edition of the GRI guides was published in 2006 and is called the GRI G3 Guide. This included 10 Reporting Principles, the General Reporting Standard, assistance in the reporting process as well as over 70 Performance Indicators (GRI, 2006).

These principles were aimed at helping companies to identify, in a clear way, the information to be contained in a report, taking into account their own objectives, but also the information needs of the stakeholders. The 10 principles contained in the G3 guidelines were divided into 2 categories: principles that highlighted the content that a report should have and principles to ensure the quality of a report. Thus, the first group of principles were aimed at highlighting the structure that a report must have, by presenting the issues and indicators that should be reported by an economic entity. These principles were materiality, stakeholder inclusion, the context of sustainability and completeness.

Defining the Principles defining the content of a report can be done as follows (GRI, 2006):

Materiality: represented the limit above which a problematic or an indicator became relevant enough to report;

Stakeholder inclusion: stakeholders should be identified in the reports issued by companies and explained how the report in question responded to their requirements and expectations;

Context of sustainability: the performance of an economic entity should be presented in correlation with the main defining elements of sustainability, respectively with the impact it had at the level of the environment, at the social level, at the microeconomic and macroeconomic level;

Completeness of the information: in the published reports, economic entities should publish that information and those indicators that prove to be material or significant, which must be sufficient for the stakeholders to assess the performance of an economic entity, namely the environmental impact, the social impact and the economic impact.

Greater attention should be paid to the principle of materiality, which is defined as the limit above which a problematic or an indicator became sufficiently relevant to report it. All indicators or issues that exceed the materiality /significancy limit will not be considered as being equally important, in the final report it must be clear which indicators or which problems are of more interest to users.

The second group of principles was aimed at ensuring the quality of the information presented in the reports. These principles were balance, comparability, accuracy, timeliness, clarity and verifiability.

The principles defining the quality of a report can be defined as follows:

Balance: a report should include both positive and negative elements on the performance achieved by an economic entity so that a fair analysis can be made by stakeholders;

Comparability: stakeholders should be able to compare information on the economic, social and environmental impact with past information of the same organization or even with information published by other entities in the same sector of activity or in distinct sectors of activity;

Accuracy: the information presented should be sufficiently accurate and detailed for an appropriate stakeholder analysis of the performance achieved by an organization;

Timeliness: Relevant information must be brought to the attention of stakeholders at the appropriate time so that they make informed decisions;

Clarity: the information submitted must be clear and comprehensible to all categories of stakeholders;

Credibility: the information presented in the reports must be carried out through a well-established process that allows it to be examined, which highlights the quality and materiality of an information

Regarding the comparison of the GRI G3 Guide with the GRI G2 Guide, a number of differences can be observed. First of all, much greater importance is given to stakeholders by creating the principles of materiality and verifiability.

Establishing the materiality of an element involves going through an entire process that starts from the thorough analysis of all the elements that may be relevant both for the stakeholders and for the organization as a whole. Materiality attempts were made to present that information which is necessary to substantiate the decisions of the stakeholders, by taking into account all the aspects that are of interest to them. Then, it can be seen that the principles of transparency, relevance, neutrality and auditability, as outlined in the G2 Guidelines, disappeared. These principles have not been explicitly defined in the G3 Guide and have been assimilated to the new principles. For example, the principle of neutrality in the G2 can be included as part of the G3 equilibrium principle.

On the structure of a report, according to GRI G3, a company should consider the presentation of 3 main sections (GRI, 2006):

The strategy and profile of the organization: the presentation of that information that allows understanding the entire context that defines the performance of an organization. The information should refer to 1. Long-term strategy and analysis; 2. Organizational profile of economic entities; 3. Reporting parameters, such as the scope of the report, the GRI Index, the Profile of the report and its degree of confidence; 4. Corporate governance, commitments made on external initiatives and stakeholder involvement.

Management strategy: highlighting the way in which various issues are approached, related to a certain topic, especially those related to sustainable development, in order to understand the performance achieved in a certain area.

Performance indicators: presentation of those indicators that allow the analysis and comparison of information referring to social, environmental or economic performance, in the context of international efforts to ensure sustainable development. Examples of such indicators can be: 1. Economic EC1-EC9 (economic performance achieved, presence in the market in which the entity operates and indirect economic impact in society) 2. Environmental EN1-EN30 (biodiversity, carbon emissions, products and services, water, energy, transport, etc.) and 3. social (respect for human rights (HR1-HR9), ensuring decent working conditions (LA1-LA14) and the responsibility had in the production process (PR1-PR9) and society (SO1-SO8)).

4.1 GRI G3.1 Guidelines

In 2011, a new guide was launched to target corporate reporting, the GRI G3.1 Guidelines. The differences between the two referential can be summarized as follows:

Particular emphasis is placed on diversity, with the section on Governance asking for information on the structure of governing bodies by gender, ethnicity or other criteria concerning disadvantaged groups;

Giving much greater importance to the issue of equal pay between women and men. If in the previous guide this issue was a briefly addressed one, in G3.1

it is a major point of interest, when working practices and ensuring decent working conditions are reported. New indicators were also created concerning human rights and society as a whole, namely LA15 and LA16.

The emergence of new performance indicators targeting the sections related to Society and Human Rights.

The G3 and G3.1 directives did not see any major differences in the structure or principles of reporting for sustainability. The main amendments were aimed at adjusting the elements to be contained in a report, and given greater importance to the reporting of social elements.

5.   GRI G4 GUIDELINES

In 2013, the GRI G4 Guide is launched. Compared to the previous guide, G3.1, GRI G4 is distinguished by changes both in content and in structure. The main objective of the G4 GRI was to help reporting organizations prepare sustainability reports that are helpful to stakeholders, containing relevant information about the most important aspects of the organization, related to the phenomenon of sustainable development; also, the GRI G4 aimed to make sustainability reporting a common practice in the activity of economic entities (GRI, 2013).

With the apparition of the G4 guide, a new approach was noted which aimed to make it as easy as possible for the reporting entities to apply the existing indications. GRI G4 comprises two main sections: Reporting Principles and Standard Disclosures; Implementation manual.

In the Section Reporting Principles and Standard Disclosures it is highlighted how this guide should be applied, the principles to be followed for reporting organizations, the reporting standard used (Specific Standard Disclosures or General Standard Disclosures), as well as the criteria that must be applied by an organization to prepare sustainability reports in accordance with the provisions of the guide.

With regard to the Implementation Manual section, here are included indications of application of the principles contained in the guide, suggestions on how the reported information should be presented and interpretations of some concepts existing in the Guide. As in previous editions, existing principles are grouped into two categories: the principles that define the content of the report and principles that define the quality of the information contained in a report.

The principles that define the content of a report are (GRI, 2013):

Stakeholder inclusion: stakeholders should be identified in the reports issued by companies and explained how the report in question responded to the requirements and expectations issued by them;

The context of sustainability: the performance of an economic entity should be presented in correlation with the main defining elements of sustainability,

respectively with the impact it had at the level of the environment and at the social level, at the microeconomic and macroeconomic level;

Materiality: a sustainability report should present elements that i) Highlight the impact of the organization at the environmental, social or economic level; ii) influences the decisions of stakeholders.

Completeness of information: In published reports should be published that information and those indicators that prove to be material or significant, which should be sufficient for stakeholders to assess the performance of an economic entity, namely the environmental impact, social impact and economic impact.

The principles that help define the quality of information are defined as follows (GRI, 2013):

1. Balance: a report should include both positive and negative elements on the performance achieved by an economic entity so that a fair analysis can be made by stakeholders;

2. Comparability: interested parties shall be able to compare information on the economic, social and environmental impact with past information of the same organization or even with information published by other entities in the same sector of activity or in distinct sectors of activity;

3. Accuracy: the information submitted should be sufficiently accurate and detailed for an appropriate analysis by stakeholders of the performance achieved by an organization;

4. Timeliness: The relevant information must be brought to the attention of interested parties at the right time so that they make informed decisions;

5. Clarity: the information submitted must be clear and comprehensible to all categories of interested parties;

6. Credibility: the information presented in the reports must be passed through a well-established process that allows it to be examined, which highlights the quality and materiality of the information presented.

Analyzing the section Reporting Principles and Standard Disclosures, it can be seen that the steps that a reporting entity must follow in order to draw up a sustainability report are presented, thus facilitating its application of the directives in the Guide. Thus, with this edition, GRI presents a clear and concise approach to how to draw up a sustainability report, with the reporting organizations being explained exactly how such a report should be drawn up. The main steps to follow for the preparation of a sustainability report existing in the guide are presented in Table 2.

Table 2. Steps to follow for a sustainability report

Steps to follow
1. Getting an overview of the organization
2. Choosing your preferred reporting option
3. Preparation for reporting the information referred to in the General Reporting Standard
4. Preparation for reporting the information referred to in the Specific Reporting Standard
5. Preparation of the sustainability report

(Source: GRI, 2013)

As a novelty, GRI G4 adds the highlighted elements to steps 2,3 and 4 of Table 2. Step 2, the choice of preferred reporting options, is an innovative element that emerged with the launch of the GRI G4, with reporting organizations having to choose from two reporting options mentioned in the guide. Thus, companies have 2 reporting options available: the basic option and the exhaustive option. The difference between them lies mainly in the way of determining the material or significant aspects, i.e. those aspects that highlight the impact of the organization at the environmental, social or economic level, or those aspects that influence the decisions of stakeholders (GRI, 2013). The basic option comprises the essential elements of a sustainability report, while the exhaustive option adds a number of additional elements relating to corporate governance, long-term strategies, ethical or integrity issues. It is also worth mentioning that for the exhaustive option, the reporting entity must present in the annual reports all the indicators and all the aspects considered material/significant, while in the case of the basic option it is mentioned that at least one indicator considered material/significant must be presented.

Regarding the basic option and the exhaustive option, for a better understanding of them it is worth mentioning that in the GRI G4 Guide, the Reporting Standards are divided into 2 distinct parts, as follows:

General Standard Disclosures, in which 58 elements to be reported by all reporting entities without exception are highlighted. This level is divided into 7 parts: 1. Long-term strategy and analysis; 2. Organizational profile of the economic entity; 3. Material elements identified; 4. Stakeholder involvement; 5. Reporting profile; 6. Corporate governance; 6. Ethical and integrity issues

Specific Standard Disclosures, in which the information to be reported is organized by categories and various issues that must be reported only if it was considered material/significant by the organization. This category also includes 91 indicators and the Management Strategy.

The numbers of information to report varies, largely depending on the reporting option chosen by the economic entity and the organization's process of determining the content of a report (GRI, 2013). To illustrate the above, when an

organization chooses the basic option, it will only have to report 34 of the elements contained in the General Standard, whereas in the case of the exhaustive option, the economic entity will have to take into account all 58 elements present in the General Reporting Standard.

After analyzing the content of the G3.1 and G4 Guides, it is also worth mentioning the differences that occur at the structural level between the two.

For the General R-contribution standard from GRI G4 it is noted the existence of the same elements in the General Reporting Standard in the GRI G3 Guide, but presented in a different manner. As mentioned in a previous section, the G3 GRI guide presented 3 elements that concerned the structure of a sustainability report, namely the Strategy and profile of the organization; Management strategy: Performance indicators. Thus, the Strategy and profile of the organization section of G3 corresponds to the General Reporting Standard in GRI G4. With this change, the number of items to be presented has increased from 34 in the G3 GRI to 58 in the G4 GRI.

Analyzing the above, the main differences between THE GRI G3 and THE GRI G4 refer to:

The organization of the elements to be reported by the economic entities: if in the G3 GRI they were classified as elements of some paragraphs, in the GRI G4 they have their own structure, being numbered from G4-1 to G4-58.

Separation of the Strategy and Profile of the Economic Entity in the G4 GRI G4 and ethical aspects.

The inclusion of a dedicated section for the governance part, asking for information on the composition and structure of the governing bodies, the role that governance has in establishing the objectives and values to which the organization adheres, the role played by the governance in risk management, the role to be played by the governance in the preparation of sustainability reports, as well as the role played by it in assessing social or environmental performance, as well as various remunerations and incentives offered.

Introduction of new elements to be commonly reported in the sections related to the Profile of the reporting organization and stakeholder involvement;

Relocation of Commitment requirements for certain external initiatives, GRI index and confidence.

There are changes both in the structure and in the level of the content of the G4 GRI, compared to the GRI G3. The most noticeable changes can be noted at the level of the Section on Governance, in the Section general reporting standard, where 12 new elements related to Governance have been introduced, which must be included in sustainability reports. In doing so, the GRI has tried to increase the transparency of the information published by the organizations, by presenting information on: who are the governing bodies situated on the hierarchical levels or the highest in an organization, responsible for the implementation of policies related to environmental protection, the achievement of objectives of a social and

economic nature; what is the process within the organization that leads to the delegation of activities concerning environmental protection, the achievement of social or economic objectives, at all hierarchical levels; how the interaction between the stakeholders and the governing body situated at the hierarchy level of higher hierarchy takes place, in matters concerning sustainable development; who is it deals with the approval and verification of the sustainability reports drawn up within the organization, as well as who is in charge of verifying the inclusion of all material/significant elements in these reports. Thus, the more detailed information presented by the companies, regarding the management and control bodies responsible for addressing the issues related to the ecological, social or economic aspects, can lead to the creation of practices in accordance with the directives in force regarding their elaboration, while ensuring the integration of the activities specific to sustainability in the business strategy.

With regard to the Specific Standard Disclosures, in GRI G4, a presentation by category of the specific elements that an entity should present can be observed. Elements are grouped into the following categories: economic, social and environmental. As regards the social category, it can be further divided into 4 other subcategories respectively, work practices and decent working conditions, society, human rights and responsibility of the production process (GRI, 2013). For each category, the G4 GRI highlighted issues that should be presented in the sustainability reports, if they are considered to be material. Also, within the specific reporting standard, the information that should be presented regarding the management strategy of the organization is highlighted, as well as a series of indicators.

The information on the management strategy has the objective to provide the economic entity with the opportunity to present how material elements related to the economic, environmental or social impact are processed and presented. With regard to the management strategy, the G4 GRI notes the possibility of reporting generic information or reporting specific information for a particular issue. Information of a generic nature may refer to any type of aspect, as specific information is intended to provide additional information when needed.

As regards the indicators, they shall provide information on the environmental, environmental or social performance or the impact of the reporting organization on issues deemed to be significant. They can be highlighted:

9 indicators referring to economic performance, noted from G4-EC1 to G4-EC9) covering 4 distinct aspects;

34 indicators referring to environmental performance, denoted G4-EN1 to G4-EN34), in which 12 aspects are highlighted;

48 indicators referring to social performance, grouped in 4 subcategories, each with its own specific aspects, as follows: work activities and decent conditions for carrying out the work performed by employees (16 indicators, denoted from G4-

LA1 to G4-LA16); human rights (12 performance indicators); responsibility of production (9 indicators); society (11 performance indicators).

6. GRI STANDARDS

In 2016, GRI launched the GRI standards, which brought new changes to the way sustainability reports are prepared, which became mandatory from 2018 onwards, although their adoption in advance had been encouraged. The GRI standards incorporate the key concepts and reporting rules contained in the G4 Guide, but in a new improved structure (GRI, 2016).

No new elements have been included with these standards compared to the GRI G4 Guide, the changes being more structural and less at the content level. Thus, the main changes in the GRI Standards, compared to the G4 GRI, are (GRI, 2018b): 1. New structure of a modular nature; 2. Revised terminology, numbering and format; 3. Clarifications on the content; 4. Greater flexibility and transparency in the way the Standard is applied; 5. Restructuration of certain elements; 6. Overall edits.

As mentioned before, this standard has a modular structure including (GRI, 2016):

- 3 Universally applicable standards for each type of organization: GRI 101, GRI 102 and GRI 103.

- 33 Standards specific to certain subjects; these standards are grouped into Standards addressing economic issues (GRI 200), Standards addressing environmental issues (GRI 300) and Standards addressing social issues (GRI 400).

The G4 Guide mentioned the steps to follow for drawing up sustainability reports, making them very easy to apply. In the version released in 2016, GRI highlights 2 working approaches to the use of the Standard. On the one hand, clear steps are provided for organizations to follow in compiling reports, as in the G4 Guidelines. On the other hand, economic entities can select what information to report using only certain parts of the Standards which are useful to them, depending on the subjects that prove material.

As mentioned before, this new Standard outlines steps to follow for companies in compiling sustainability reports. However, a remarkable difference from the GRI G4 is in that through this new version it proposes to start drawing up sustainability reports based on the Standards themselves.

Thus, the preparation of a sustainability report is made starting from the GRI 101 Standard, in order to apply the Reporting Principles, to identify the material/significant topics and then to choose the reporting option. Within this edition, GRI offers 2 existing reporting options in this Standard. The first is the basic option, which requires that the sustainability report presents minimum information necessary for the understanding of the organization, for the identification of material topics and their impact on the organization. The second option is called the exhaustive option containing the information in the underlying

option, but to which additional information on the entity's long-term strategy, ethical and integrity issues as well as corporate governance elements is added. Economic entities also need to present in a more comprehensive manner their economic, social or environmental impact (GRI, 2018b). With regard to the Reporting Principles, contained in GRI 101, it maintains the distinction between Principles that define the content of the report and Principles for defining the quality of the report.

The first category of principles, are those that define the content of the report, contains information on the content of a sustainability report. These are: stakeholder inclusion, sustainability context, materiality and completeness.

The second category of principles helps organizations to report quality information in their reports. These principles are accuracy, balance, clarity, comparability, credibility and timeliness.

As can be seen, the principles have remained unchanged from the G4 Guide. However, in the new Standards it can be noted that the principles are no longer just recommendations but mandatory requirements to be followed.

Regarding the GRI 102 – General Reporting Standard, it emphasizes that an entity will have to present in its report contextual information regarding the organization in question, as well as information on aspects related to sustainability reporting practices, but also information on the profile of the organization, its long-term strategy, stakeholder involvement, ethical or integrity issues, corporate governance, stakeholder engagement practices and the reporting process (GRI, 2018b). Standard 102 is the equivalent of the General Standard Disclosures in the GRI G4.

In terms of content, some of the information has been revised bringing new requirements to the reporting of organizations. These changes were;

The next Standard analyzed is GRI 103 – Management Strategy, which refers to the way in which an organization manages the material topics it discovers. Thus, the section of G4, "Information on the Management Strategy", was part of the Specific Standard Disclosures section, while in the GRI Standard this information was moved to the Universal Standards section. The application of GRI 103 for each subject considered material allows the reporting organization to provide more detailed explanations as to why a subject is considered material, where its impact takes place and how it manages its impact (GRI, 2018b).

This standard is grouped as follows:

General reporting requirements for the management strategy;

Section 103-1: Explanation of a subject considered material and its limitations

Section 103-2: Management strategy and composition;

Section 103-3: Evaluation of the management strategy.

Also included in Standard 103 are the Sections on Management Strategy in the G4 Guide, with certain new recommendations to follow as follows:

Sections 103-1-b and 103-1-c, Explanation of a subject considered material and its limitations, include the recommendations of G4-20 and G4-21, which have been merged, provide information on the explanation of material subjects and their limits. With regard to the Section on Material Subject Limits, contained in section 103-1-b, certain changes have been made to the effect that in the new edition a description of the place where the impact of that topic takes place and the role of the organization in managing the impact of these topics, are required for each material topic (GRI, 2017). When referring to the impact of material subjects, it is actually spoken of the effects of these subjects at the environmental, social or economic level, but not at the level of the reporting entity;

With regard to the Management Strategy and its components, certain changes can be noted such as;

Adding new requirements such as writing a statement on the purpose of the management strategy (103-2-b) as well as a description of some components of the management strategy such as: policies adopted, responsibilities, problem management mechanisms, goals and objectives or various processes, actions or programs to follow.

With regard to the problem management mechanism, all the elements mentioned in the G4 regarding it have been reviewed and moved to GRI 103: Management strategy. The only requirement for reporting organizations is to describe their problem-solving mechanisms on material topics (GRI, 2017).

After the application of the 3 Universal Standards (GRI 101, 102 or 103) and after identifying the significant subjects, we can proceed to the application of the Specific Standards for each topic. These standards are grouped into 3 respective categories, Environmental, social and economic standards. The use of these standards is shown in Figure 1.

The 33 Specific Standards for certain topics are:

GRI 200, which addresses the economic issue, comprising 6 Standards (GRI201-GRI206)

GRI 300, which addresses environmental issues, consists of 8 Standards (GRI301-GRI308;

GRI 400, which addresses social issues, comprising 19 Standards (GRI401-GRI419).

Each of these standards has certain requirements in relation to the information to be reported by the entities, specific to each issue addressed by that standard, ordered numerically. An example of this may be Standard 302, which addresses energy issues by presenting the information that needs to be reported by companies for this topic. Thus, it includes a section on the Management Strategy for energy issues and 5 sections specific to the subject (Section 302-1 Energy consumption in the organization, 302-2 Energy consumption outside the organization, 302-3 Intensity of energy used, 302-4 Ways to reduce energy

consumption and 302-5 Reducing energy needs in the production process or in the provision of services).

The structure of a section specific to a particular topic, in this case the Section energy consumption outside the organization, is structured as follows:

Name and section number;

Reporting requirements to be complied with by the organization, which are binding;

Recommendations that the reporting organization can take into account, which are not binding;

Instructions to follow, which provide explanations, examples, or general information to help organizations better understand what is required of them.

With regard to changes to the Standards addressing certain specific topics, the following changes can be identified:

For GRI 200, which addresses the economic subject, there were noted changes to subsection 202-1 The situation of the remuneration of new employees compared to the minimum wage, grouped by gender, where new requirements were introduced for the reporting organizations aimed at presenting the extent to which the workers who perform activities for the organization, but who are not employed by it, are paid.

For the GRI 300, which addresses environmental issues, changes have been noted to subsection 305-2, Indirect effects of energy use – the effect of greenhouse gases, which has been revised to meet the new international requirements and in subsection 306-4, Transportation of hazardous waste, where a new requirement has been introduced for organizations Respectively "Standards, methodologies and working hypotheses".

For the GRI 400, the following changes stand out:

Change in terminology used to describe the workforce working in the organization (403-1) and for external factors contracted (403-2-b);

For 414-1, New suppliers that have been selected according to certain social criteria, obtained by merging G4-LA-14, G4-SO-9 and G4-HR-10, organizations no longer have to submit separately information on working conditions, respect for human rights or the impact had at the level of society, being obliged at this time to present the share of new suppliers who have been selected analyzing their social performance;

For 414-2, Negative impacts on the supply chain and coercive actions, obtained by a merging G4-LA-15, G4-SO-10 and G4-HR-11, it is stipulated that organizations no longer have to submit separately information on working conditions, respect for human rights or the impact had on society, being obliged at this time to present the negative impact had on the supply chain and actions between caught to stop them;

For 419-1, Non-compliance with rules and directives addressing environmental and social issues, achieved through the integration of G4-SO-8 and

G4-PR9, it is stipulated that the reporting economic entities are obliged to report any such non-compliances with the rules and directives related to environmental and social issues.

7.   CONCLUSIONS

After the previous analysis of each GRI Guide from the G1 to the Standards, it is necessary to review the developments they have undergone over time, at the structural and content level.

At the content level, it can be said that the GRI G1 had a rather rudimentary, very counterintuitive structure. In 2002, with the launch of the GRI G2, there was an improvement in this regard, but it still cannot be said that there was a well-defined structure of the GRI. It is only in 2006, with the launch of the G3 GRI, that it can be said that the GRI had a clear and concise structure, something that has been further improved in the GRI G4 as well. The division of the General Standard Disclosures contained in GRI G3 into three sections, respectively, the Strategy and profile of the organization, the Management Strategy and performance indicators evolved into GRI G4, where there was a structuring of the guide into two components, respectively, the General Standard Disclosures and the Specific Standard Disclosures. The GRI G4 also places special emphasis on the term "process", the guide is also setting out the exact steps to be taken for the preparation of sustainability reports by the reporting entities. With the advent of GRI standards in 2016, a modular structure for the guide was adopted, thus becoming an easy-to-use tool for organizations, which could select certain specific standards, depending on the topic addressed, or certain parts of them for the preparation of reports.

With regard to the content, reference can be made to the evolution of the principles set out in the G1 GRI guidelines until the emergence of the GRI standard, and small changes to them can be observed starting with the GRI G3. An important aspect to mention with regard to the aforementioned principles is that with the advent of the GRI Standard, they have become mandatory. With regard to performance indicators, certain elements that have been given increased attention during the evolution of the GRI guidelines can be highlighted, as follows:

Presentation of governance issues (GRI G4), which aimed to assess the extent to which the reporting organization have integrated the principles of sustainability into their business strategy;

Introduction of new aspects (in GRI G4) or new topics (in Standards) about Problem Solvi ng Mechanisms, which can be correlated with the principle of Balance, which stipulates that all material elements of an entity must be reported, whether they are positive or negative;

How to choose suppliers: information is required on how organizations select their suppliers, i.e. whether their actions are analyzed at a social and environmental level;

Ensuring gender diversity by publishing in reports the proportion of the two genders in the organization, especially on their proportion in management positions;

Making changes with regard to social aspects, in particular to the terminology used.

As mentioned above, the evolution of the GRI and its guidelines was a direct consequence of the fact that it was intended to best meet the requirements of users, and constant feedback was obtained for this purpose in order to improve the guides. Thus, in the evolution of the GRI an important role was played by factors of an external nature.

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REVERSE CAUSALITY ISSUES. THE CASE OF FINANCIAL SATISFACTION VS. LIFE SATISFACTION. GLOBAL EVIDENCE FROM THE WORLD VALUES SURVEY

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ABSTRACT

In this paper, the author explored and analyzed the most relevant influences of financial and life satisfaction. They resulted from World Values Survey data between 1994 and 2020 (300K+ observations). Both Data Mining and Statistical methods supported this study. The first method used in this paper was the Adaptive Boosting in R via the Rattle interface. It benefited from the additional use of the LASSO package (Stata) to further focus on the most significant variables by performing random cross-validations and removing overfitting. Regressions such as binary and ordinal logit, probit, scobit, and Ordinary Least Square (OLS) served for further selections of the most robust predictors. Such choices stood on post estimations of collinearity, comparative accuracy, explaining power, and maximum probability via risk prediction nomograms. Some cross-validations on age, gender, and marital status additionally validated the results. All led to the same conclusion based on comparative models in which these two types of satisfaction had both roles: input and response, as indicated by all tests. As expected, financial satisfaction proved to be a cause of life satisfaction rather than vice versa.

Keywords: financial and life satisfaction; Adaptive Boosting; LASSO; regression analysis; collinearity removal; comparative accuracies; risk prediction nomograms; cross-validations.

JEL Classification: C53, C55, J17, Y10.

1. INTRODUCTION

The issue of reverse causality has concerned researchers in various fields. For instance, a management research paper (Katou, 2012) revealed tests of reverse causality between human resource management (HRM) policies and organizational performance through the intervening steps of employee attitudes. This author found the following. Although HRM policies do not directly lead to high organizational performance, mostly high-performing firms can afford HRM

policies. Tyagi and Wotruba (1993) explored the directions of causality between selected work-related variables and quitting intentions. They found the existence of reverse causality, indicating that such intent is more likely to affect the perceptions of variables corresponding to the organizational climate, job satisfaction, and organizational commitment. Moreover, Sohag *et al.* (2021) considered the potential reverse causality between institutional quality and information globalization de facto and de jure.

In medicine (oncology), Rezende *et al.* (2021) explained that cancer frequently persists for years or decades, and the often-prolonged trajectory toward disability and illness, strong predictors of death, is likely to increase sedentary behavior (reverse causation).

At the intersection of these two scientific fields, Krug and Eberl (2018) studied reverse causality issues for unemployment and health. They show that the unemployed are often in poorer health than their employed counterparts. Still, other research analyzing longitudinal data often indicates the selection of unhealthy workers into unemployment (reverse causality).

When comparing life and financial satisfaction, Van Praag *et al.* (2010) admitted that the latter is a narrower concept. Still, a study conducted in Europe (European Commision, 2016) suggested that one cannot analyze financial satisfaction if omitting variables that also predict life satisfaction. Moreover, in a study about Financial Self-Efficacy and Life Satisfaction, Hu *et al.* (2021) admitted no conclusion regarding causality or directionality. Consequently, the current paper tries to fill a research gap, and it empirically demonstrates which of the two concepts is more likely to be a predictor and which response variable. And this by starting from a large public dataset and a transparent approach (support for replication of results), using many convergent methods and techniques (triangulation), and validating the findings considering random and non-random dataset partitioning criteria (cross-validation).

2. DATA AND METHODS

The data used belongs to World Values Survey (the WVS TimeSeries 1981 2020 Stata v1 6.zip file available at https://www.worldvaluessurvey.org/ WVSDocumentationWVL.jsp and accessed on February 1, 2021) in the Stata format. In the beginning, all seven waves mattered, meaning 1981–1984, 1989–1993, 1994–1998, 1999–2004, 2005–2009, 2010–2014, and 2017–2020, and 100+ countries from all continents, more precisely a dataset with 426,452 observations and more than 1000 variables. After its export as.csv (comma-separated values format, 1.75 GB), it served for the first mining round (Adaptive Boosting) after deriving the binary type of the outcomes in the. dta (Stata) and .csv (exported).

For identifying the main influences of both financial and life satisfaction, many methods and techniques served. Among them:

- The Adaptive Boosting algorithm for decision tree classifiers (Karabulut and Ibrikci, 2014) in the Rattle data mining interface of R, acting as the 1st selection stage performed on a Windows Server Datacenter virtual machine with six Intel Xeon Gold 6240 Cascadelake CPU logical cores and ~24 GigaBytes of RAM, in a private cloud (https://cloud.raas.uaic.ro) managed using OpenStack on Ubuntu.

- Two forms of LASSO or Least Absolute Shrinkage and Selection Operator (Tibshirani, 1996), namely RLASSO (rigorous and penalizing LASSO to control overfitting), and CVLASSO (the LASSO which performs time-consuming cross-validation, more precisely the one with the LSE option, meaning the largest lambda for which the Means Squared Prediction Error or MSPE is within one standard error of the minimal MSPE) in Stata 16MP-64 bit (2nd selection stage).

- Elimination from correlated pairs (values near or less than 0.4 which indicate a low correlation between predictors) using additional post estimations such as maximum computed VIFs (Variance Inflation Factor) against maximum accepted ones for OLS regressions, AUCROC / AUROC / AUC as Area Under the Curve of Receiver Operating Characteristic (Hanley and McNeil, 1982) for logit and probit ones (3rd selection stage).

- Cross-validations (4th selection stage) using the mixed-effects technique (melogit) with variables to select as fixed effects and three criteria as random ones, namely the sex, age, and marital status (Tables 1 and 2).

- Smaller values of AIC-Akaike Information Criterion, and BIC-Bayesian Information Criterion (Dziak *et al.*, 2020), and larger ones for both GOF (the Goodness of Fit test), and p GOF (contradiction of the Ho hypothesis), all indicating a better fit of the model.

- Larger R-squared for a better explaining power of the models.

- Scobit (Nagler, 1994) regressions (Tables 3 and 4, model 8) usually as an alternative for logit and probit in case of disturbances to normal/logistic distributions served here for additional validations.

- To correct for any form of heteroskedasticity, robust standard errors were computed and reported for all types of regressions.

- Maximum probability scores (max P nomolog - Tables 3 and 4, models 1-6) for the most advantageous combination of predictor values. Such values resulted after generating binary logistic risk-prediction nomograms (Zlotnik and Abraira, 2015) and serve as additional performance metrics to support comparisons between models.

Table 1. Most relevant WVS items

Variable	Description	Coding
C006	Satisfaction with the financial situation of household: 1=Dissatisfied ... 10=Satisfied	1-10 scale
C006_bin	1 if C006 != Blank AND C006 >= 6; 0 if C006 != Blank AND C006 < 6 AND C006 > 0	0 or 1
A170	Satisfaction with your life: 1=Dissatisfied ... 10=Satisfied	1-10 scale
A170_bin	1 if A170 != Blank AND A170 >= 6; 0 if A170 != Blank AND A170 < 6 AND A170 > 0	0 or 1
A008	Feeling of happiness: 1=Very happy ... 4=Not at all happy	1-4 scale
A009	State of health (subjective): 1=Very good ... 5=Very poor	1-5 scale
A173	How much freedom of choice and control: 1=Not at all ... 10=A great deal	1-10 scale
X044	Family savings during the past year: 1=Save money ... 4=Spent savings&borrowed money	1-4 scale
X045	Social class (subjective): 1=Upper class ... 5=Lower class	1-5 scale
X047	The scale of incomes: 1=Lower step ... 11=Highest step	1-11 scale
X001	Sex: 1=Male,2=Female	1 or 2
X003	Age	13-103
X003R	Age recoded (6 intervals): 1=15-24,2=25-34,3=35-44,4=45-54,5=55-64,6=65 & more	1-6 scale
X007	Marital status: 1=Married,2=Living together,3=Divorced,4=Separated,5=Widowed,6=Single	1-6

(Source: https://www.worldvaluessurvey.org/WVSDocumentationWVL.jsp.)

Table 2. Descriptive statistics

Variable	N	Mean	Std.Dev.	Min	0.25	Median	0.75	Max
C006	411461	5.75	2.58	1	4	6	8	10
C006_bin	411461	0.54	0.5	0	0	1	1	1
A170	420669	6.7	2.42	1	5	7	8	10
A170_bin	420669	0.69	0.46	0	0	1	1	1
A008	417862	1.92	0.74	1	1	2	2	4
A009	414574	2.19	0.89	1	2	2	3	5
A173	405390	6.91	2.4	1	5	7	9	10
X044	351078	2.13	0.92	1	1	2	3	4
X045	359240	3.32	0.99	1	3	3	4	5
X047	389150	4.65	2.3	1	3	5	6	10
X001	421634	1.52	0.5	1	1	2	2	2
X003	421892	41.14	16.23	13	28	39	53	103
X003R	420638	3.14	1.58	1	2	3	4	6
X007	421264	2.66	2.18	1	1	1	5	8

(Source: Own calculation in Stata 16MP 64-bit using WVS's data.)

The proposed framework above includes both unsupervised (first two selection stages) and supervised steps (derivations and further selections – last two selection stages and additional considerations). Therefore, the framework is dual by its nature, and this seems to be an accepted practice in data science (Yao *et al.*, 2010).

3. RESULTS AND DISCUSSION

The first set of clues resulted after time-consuming (two and three hours, respectively) automatic explorations of possible predictors for both outcomes (financial and life satisfaction) converted in their binary format (C006_bin and A170_bin). These explorations started from a .csv export and relied on the Adaptive Boosting technique in R (via the Rattle interface). The preliminary results indicated the following predictors (Tables 1 and 2): (1) A008, A170, A173, E170_WVS7LOC, S017, S021, X025CSWVS, X044, X045, X047, X047R, X048ISO, and X048WVS when analyzing C006_bin; (2) A008, A009, A173, C006, E170_WVS7LOC, S017, S021, X025CSWVS, X048ISO, and X048WVS when analyzing A170_bin.

In the 2nd stage of selection (Stata), for the first outcome (C006_bin), both the CVLASSO (with the LSE option) and RLASSO preserved only six variables, namely A008, A170, A173, X044, X045, and X047 (Tables 1 and 2). For the second one (A170_bin), both types of LASSO retained only the first four above, namely A008, A009, A173, and C006 (Tables 1 and 2).

In the 3rd stage of selection (Stata), in the case of the first outcome (C006_bin), the maximum computed value of the variance inflation factor (VIF) assessed against the maximum accepted one as a ratio between the unit and $1 - $ model's R^2 (Vatcheva *et al.*, 2016) for OLS models and the correlation coefficients for pairs of predictors suggested multicollinearity between the following: A008 and A170 (a correlation coefficient of -0.4663) and X045 and X047 (a correlation coefficient of -0.4644), respectively. Consequently, A008 and X045 left the models (lower comparative accuracy of classification in binary logistic regression models when removing them versus their counterparts: A170, and X047, respectively, with the Not Null condition on the variable to drop). For the second outcome (A170_bin) same procedure did not eliminate anything (no collinearity).

Performing further cross-validations was the 4th stage of selection. It relied on the mixed-effects method (melogit) with those two sets of remaining four predictors for each outcome as fixed effects and the other three (gender - X001, age - X003R, and marital status - X007) as random ones (Tables 3 & 4, models 7-9). The results validated again the two strong predictor sets resulting after the 3rd stage.

Table 3. Models and cross-validations on age, gender, and marital status using the first response variable in its binary format (financial satisfaction – C006_bin)

Variable/Model — Regression type	(1) logit	(2) logit	(3) logit	(4) probit	(5) scobit	(6) OLS	(7) melogit	(8) melogit	(9) melogit
A170_bin	2.3165***								
	(0.0083)								
A170		0.4864***	0.4214***	0.2457***	0.4604***	0.0785***	0.4218***	0.4202***	0.4215***
		(0.0019)	(0.0023)	(0.0013)	(0.0051)	(0.0004)	(0.0109)	(0.0131)	(0.0175)
A173			0.1043***	0.0612***	0.1150***	0.0180***	0.1038***	0.1047***	0.1045***
			(0.0021)	(0.0012)	(0.0025)	(0.0004)	(0.0047)	(0.0023)	(0.0023)
X044			-0.3336***	-0.1982***	-0.3608***	-0.0592***	-0.3331***	-0.3301***	-0.3319***
			(0.0049)	(0.0029)	(0.0059)	(0.0009)	(0.0079)	(0.0165)	(0.0162)
X047			0.2247***	0.1316***	0.2464***	0.0395***	0.2244***	0.2287***	0.2235***
			(0.0021)	(0.0012)	(0.0032)	(0.0004)	(0.0040)	(0.0040)	(0.0028)
_cons	-1.4504***	-3.0675***	-3.6985***	-2.1505***	-3.6881***	-0.1656***	-3.6972***	-3.6982***	-3.7495***
	(0.0071)	(0.0132)	(0.0239)	(0.0137)	(0.0263)	(0.0036)	(0.0134)	(0.0872)	(0.0737)
ln alpha					-0.2375***				
					(0.0224)				
var(_cons[X001])							0.0003***		
							(0.0000)		
var(_cons[X003RJ])								0.0090	
								(0.0056)	
var(_cons[X007])									0.0058*
									(0.0026)
N	407082	407082	312107	312107	312107	312107	311929	311513	311531
chi^2	78754.6630	64019.0997	61608.1220	69781.7652	N/A	N/A	N/A	15495.9111	24422.3591
p	0.0000	0.0000	0.0000	0.0000	N/A	N/A	N/A	0.0000	0.0000
pseudo R^2	0.1740	0.1800	0.2386	0.2371	N/A	N/A	N/A	N/A	N/A
R^2	N/A	N/A	N/A	N/A	N/A	0.2854	N/A	N/A	N/A
RMSE	N/A	N/A	N/A	N/A	N/A	0.4214	N/A	N/A	N/A
max.Abs.Correl.Coeff. (in Predictors Matrix)	0.0000	0.0000	0.4075	0.4075	0.4075	0.4075	N/A	N/A	N/A
max. OLS Computed VIF	N/A	N/A	N/A	N/A	N/A	1.3995	N/A	N/A	N/A
max. OLS Acceptable VIF	N/A	N/A	N/A	N/A	N/A	1.2560	N/A	N/A	N/A
AUC	0.7228	0.7732	0.8135	0.8135	N/A	N/A	N/A	N/A	N/A
p GOF	N/A	0.0000	0.0000	0.0000	N/A	N/A	N/A	N/A	N/A
chi^2 GOF	0.00	11069.20	16157.43	16992.57	N/A	N/A	N/A	N/A	N/A
AIC	463658.0810	460276.0132	327981.7655	328660.1949	327890.5485	346251.6863	327780.9529	327078.4912	327311.6115
BIC	463679.9146	460297.8467	328035.0210	328713.4504	327954.4551	346304.9418	327802.2539	327142.3864	327375.5070
max P nomolog bigger than	0.6000	0.7000	0.9000	N/A	N/A	N/A	N/A	N/A	N/A

(Source: Own calculation in Stata 16MP 64-bit. Notes: Robust standard errors between parentheses. All raw coefficients significant at 5% (*), 1% (**), and 1‰ (***).)

Table 4. Models and cross-validations on age, gender, and marital status using the second response variable in its binary format (life satisfaction – A170_bin)

Variable/Model Regression type	(1) logit	(2) logit	(3) logit	(4) probit	(5) scobit	(6) OLS	(7) melogit	(8) melogit	(9) melogit
C006_bin	2.3165*** (0.0083)								
C006		0.4843*** (0.0019)	0.3951*** (0.0020)	0.2255*** (0.0011)	0.3804*** (0.0035)	0.0615*** (0.0003)	0.3951*** (0.0161)	0.3931*** (0.0097)	0.3958*** (0.0227)
A173			0.2116*** (0.0020)	0.1201*** (0.0011)	0.2038*** (0.0025)	0.0323*** (0.0003)	0.2117*** (0.0075)	0.2111*** (0.0037)	0.2109*** (0.0022)
A008			-0.7865*** (0.0068)	-0.4485*** (0.0038)	-0.7563*** (0.0094)	-0.1214*** (0.0010)	-0.7831*** (0.0242)	-0.7827*** (0.0210)	-0.7837*** (0.0185)
A009			-0.2152*** (0.0053)	-0.1261*** (0.0031)	-0.2076*** (0.0054)	-0.0328*** (0.0008)	-0.2217*** (0.0120)	-0.2476*** (0.0090)	-0.2225*** (0.0120)
_cons	-0.2213*** (0.0047)	-1.7668*** (0.0102)	-0.6068*** (0.0248)	-0.3256*** (0.0140)	-0.7169*** (0.0350)	0.4175*** (0.0039)	-0.6069*** (0.1612)	-0.5017*** (0.1076)	-0.5466*** (0.1527)
ln alpha					0.0897*** (0.0199)				
var_cons[X001])							0.0027*** (0.0000)		
var_cons[X003R])								0.0119* (0.0047)	
var_cons[X007])									0.0123 (0.0088)
N	407082	407082	386602	386602	386602	386602	382147	382075	385700
chi^2	78754.6637	67551.5933	76874.7104	85160.0312	N/A	N/A	N/A	5569.4240	249597.9384
p	0.0000	0.0000	0.0000	0.0000	N/A	0.0000	N/A	0.0000	0.0000
pseudo R^2	0.1930	0.2012	0.2865	0.2848	N/A	N/A	N/A	N/A	N/A
R^2	N/A	N/A	N/A	N/A	N/A	0.3097	N/A	N/A	N/A
RMSE	N/A	N/A	N/A	N/A	N/A	0.3832	N/A	N/A	N/A
max.Abs.Correl.Coeff. (in Predictors Matrix)	0.0000	0.0000	0.3666	0.3666	0.3666	0.3666	N/A	N/A	N/A
max. OLS Computed VIF	N/A	N/A	N/A	N/A	N/A	1.2725	N/A	N/A	N/A
max. OLS Acceptable VIF	N/A	N/A	N/A	N/A	N/A	1.4486	N/A	N/A	N/A
VIF	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
AUC	0.7570	0.8000	0.8445	0.8444	N/A	N/A	N/A	N/A	N/A
p GOF	N/A	0.0000	0.0000	0.0000	N/A	N/A	N/A	N/A	N/A
chi^2 GOF	0.00	8910.09	16523.99	17480.75	N/A	N/A	N/A	N/A	N/A
AIC	408443.8007	404280.1172	340140.8422	340933.2087	340123.0205	355437.5156	336921.0746	336516.8909	339119.2630
BIC	408465.6342	404301.9508	340195.1679	340987.5345	340188.2115	355491.8414	336942.7817	336582.0112	339184.4399
max P nomolog bigger than	0.7000	0.9000	0.9500	N/A	N/A	N/A	N/A	N/A	N/A

(Source: Own calculation in Stata 16MP 64-bit. Notes: Robust standard errors between parentheses. All raw coefficients significant at 5% (*),1% (**), and 1‰ (***).)
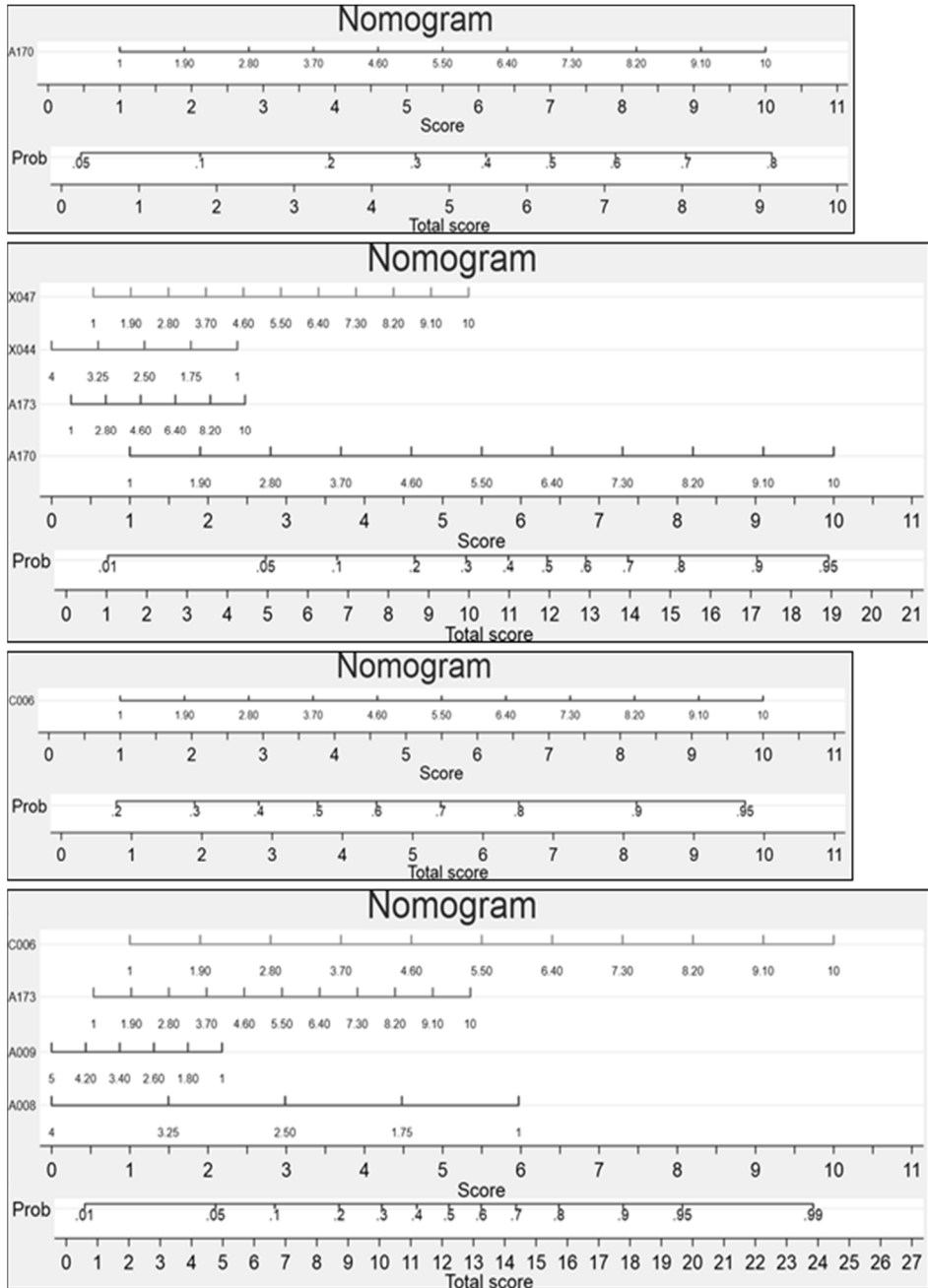
**Figure 1. Two pairs of comparable nomograms for predicting the financial (top –
models 2 and 3 in Table 3) vs. life satisfaction (bottom - models 2 and 3 in Table 4)**
(Source: Own calculation in Stata 16MP 64-bit.)

In addition, the first two opposite models, namely 1 and 2 in Table 3 vs. 1 and 2 in Table 4, clearly emphasize better accuracy (larger AUC), explaining power (larger pseudo-R^2), and better fit (lower AIC and BIC values) in the case of the second response variable (A170_bin – life satisfaction, Table 4). The latter suggests that financial satisfaction is more likely to be a cause and not an effect of life satisfaction. Moreover, the most comprehensive models (3-6) in Table 3 vs. Table 4 indicate better accuracy and explaining power for the models in Table 4 (second response variable). In addition, a lower maximum absolute value of the correlation coefficients of predictors (0.3666 in Table 4 vs. 0.4075 in Table 3) suggests lower collinearity for the same models in Table 4. The next step is to compare the maximum probability scores obtained after generating binary logistic risk-prediction nomograms (Fig. 1, using the nomolog command in Stata 16). And this applies by considering the most advantageous combination of predictor values (max P nomolog for models 2 and 3 in Table 3 vs. Table 4). It seems that all components of the second set of such probability values (Table 4 - life satisfaction as response variable) are better/higher. The latter argument strengthens the same conclusion above: financial satisfaction is more likely to be a life satisfaction predictor (not vice versa). And this seems to be in line with other findings in this interdisciplinary field (Vera-Toscano *et al.*, 2006) (Brzozowski and Spotton Visano, 2020) (Foong *et al.*, 2021).

Table 5. Bivariate correlation coefficients between each of those two studied outcomes and each from the reunion of their two corresponding sets of predictors

Response	Predictor	BCC	Abs.BCC	N
C006	A008	-0.34456	0.3446	406342
C006	A009	-0.25429	0.2543	406143
C006	A173	0.316752	0.3168	397353
C006	X044	-0.25752	0.2575	341398
C006	X047	0.331144	0.3311	377737
Average	**-**	**-**	**0.3009**	**385795**
C006_bin	A008	-0.28437	0.2844	406342
C006_bin	A009	-0.21958	0.2196	406143
C006_bin	A173	0.27334	0.2733	397353
C006_bin	X044	-0.22948	0.2295	341398
C006_bin	X047	0.302746	0.3027	377737
Average	**-**	**-**	**0.2619**	**385795**
Response	**Predictor**	**BCC**	**Abs.BCC**	**N**
A170	A008	-0.46634	0.4663	412630

Response	Predictor	BCC	Abs.BCC	N
A170	A009	-0.3003	0.3003	409115
A170	A173	0.404171	0.4042	403388
A170	X044	-0.167	0.167	347660
A170	X047	0.219899	0.2199	384423
Average	**-**	**-**	**0.3115**	**391443**
A170_bin	A008	-0.3796	0.3796	412630
A170_bin	A009	-0.25546	0.2555	409115
A170_bin	A173	0.33722	0.3372	403388
A170_bin	X044	-0.15862	0.1586	347660
A170_bin	X047	0.219853	0.2199	384423
Average	**-**	**-**	**0.2702**	**391443**

(Source: Own calculation in Stata 16MP 64-bit.)

This finding is also confirmed when comparing the average values of the bivariate correlation coefficients (as absolute values/modulus – Abs. BCC, Table 5). This correlation was a measure between each of the two studied response variables in both forms (original scale: C006, A170, and binary: C006_bin, A170_bin) and each input one from the reunion of the two sets of four predictors (except those two outcome variables), namely: A008, A009, A173, X044, X047, and also the average support (as the number of valid observations, N). This reunion above is justified because of the following. First - the contradiction (small p values) of the Null hypothesis (Ho: variables are exogenous) when performing the Durbin and Wu-Hausman's tests of endogeneity (Davidson and MacKinnon, 1993). This test applied to each of both studied outcomes when considering the other as endogenous. The latter means that it depends on a pair of specific instruments (A008, A009, and X044, X047, respectively). Moreover, an additional test called first-stage regression statistics also contradicted the Null hypothesis (H0: Instruments are weak). And this was because of the Cragg-Donald (1993) Wald F statistic being much higher (three orders of magnitude in both cases) than all Stock-Yogo's critical values. And this is for partial R^2 of 0.1643 and 0.0939, and adjusted R^2 of 0.3341 and 0.2688, respectively. More, if testing and comparing the output of regressions having all those five predictors above (reunion except the endogenous ones) for both outcome variables, the results are still supportive. The performance statistics of such models indicate again higher accuracy, explaining power, and maximum probability for life satisfaction as a response variable.

In terms of support, these models cover only the last five waves (from 1994-1998 to 2017-2020) because of the survey question corresponding to variable

X044 (not included in the first two waves), and 101 countries in the world (except for France, Israel, Portugal, and United Kingdom – one or more survey questions corresponding to variables in the models not included for these countries).

4. CONCLUSIONS

The paper emphasizes a robust methodology for identifying the most significant determinants of both financial and life satisfaction. The resulting models are very compact, indicating in both cases four major influences selected from an initial list of more than one thousand possible predictors from the WVS dataset. Moreover, both predict these two types of satisfaction with decent classification accuracy (more than 80%). Still, the accuracy, explaining power, and maximum probability are significantly higher when the response variable is life satisfaction, while the collinearity is lower. The same applies when having only the outcome (financial vs. life satisfaction) and just one input (life vs. financial satisfaction).

The entire methodological approach proposed and described in this paper stands on some scientific principles. It is about triangulation (Munafò and Smith, 2018), cross-validation, and reproducibility. The first one means that using various methods, techniques, and applications, convergent results emerged. The second stands on testing using many subsamples randomly (CVLASSO) and not randomly extracted from the entire dataset (clusters using three criteria describing the respondent type). The last principle means that the findings emphasized in this paper are replicable. And this is based on using a public dataset and reporting processing, selection, and analysis steps and results in details. Consequently, this approach helps explore and explain other complex socio-economic indicators and study different cases of reverse causality beyond this example of financial vs. life satisfaction.

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IMPACT OF COVID-19 ON THE FINANCIAL NUMBERS REPORTED IN THE CONSOLIDATETD FINANCIAL STATEMENTS BY THE AUTOMOTIVE INDUSTRY GROUPS

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ABSTRACT

In addition to sophisticated studies proposing solid econometric models to explain the impact of covid-19 on financial variables, a simple analysis of the evolution of relevant financial indicators in the 2020 financial statements compared to previous financial years may be interesting. I opted for the simple analysis of such evolutions for a number of 51 groups in the automotive industry, groups that have the most valuable brands in 2021, as they appear in the Brand Finance report (2021). Taking into account the previous findings from the literature and the the statistics of professional organizations, I selected from the financial statements of these groups some financial numbers, calculated the evolutions of the selected indicators and found that, in line with expectations, sales, net income and profitability rates decreased seriously in 2020, both compared to 2019, as well as compared to the three previous financial years (2017, 2018 and 2019). On the contrary, equity and cash reported in the balance-sheet show increases compared to the reference periods, which may suggest a prudent behaviour of firms - attracting significant funding (including through news contributions of the shareholders), lower dividend payments, and increases in the other comprehensive income. Despite the pandemic crisis, companies paid, on average, more in investing activities, as reported in the cash-flow statement, than in previous periods, which indicates a certain positive opportunism - taking advantage of the crisis to invest - a certain prudence - avoiding spending money - and optimism on returning to profitable business as soon as possible. A consequence of the divergent developments of the net income and the operating cash-flow is the massive decrease in total accruals, calculated as the difference between the two indicators analysed, a possible sign of better quality of the reported numbers.

Keywords: Automotive industry, covid-19 impact, profitability, cash-flows, prudence

JEL Classification: M41

1. INTRODUCTION

The global health crisis due to covid-19 had serious economic, social, financial effects. Significant limitation of the movement of people and goods has led to serious shutdowns or decreases in the activity of companies in many fields

of activity, but has also unprecedentedly stimulated activities in other fields that could - at least they and those involved - benefit from new health, social and economic conditions. It was a period of major uncertainty and at a different level than before (Altig *et al.*, 2020) for business people, employees and families, but also for public authorities at all levels and competencies. Statistical data show significant declines in GDP in most countries of the world, with an average contraction of 3.5% in 2020 (WB, 2021).

Among the activities affected by the pandemic is the automotive industry: ACEA (2021) notes that in 2020 there was the largest decrease in the history of vehicle sales (with over 3 million units), a trend that was expected to persist in the first part of 2021. Another organization of the automotive industry publishes statistics according to which, after a year 2019 in which there has already been a 5% decrease in the production of vehicles (cars, trucks and buses), after 10 years of continuous growth, the year 2020 comes with a massive decrease of 16%, bringing production to the level of 2010 (OICA, 2021). The importance of the car industry is also given by the number of employees it reports: in Europe, ACEA (2021) estimates that 6.7% of EU employees belong to this industry, and the European Parliament (2021) shows that this industry creates 5% of EU added value and advances the idea that it would employ 8.5% of manufacturing employees.

There are other industries affected by covid-19, in the same or a different direction than the automotive industry, with similar or different intensities: aircraft construction, air transport, oil and gas, energy, tourism (with all its components, intermediary, transport, hotels, restaurants, etc.), entertainment, the pharma industry (especially vaccines), courier, online commerce, video conferencing platforms, etc.

Our calculations relate to a list of groups in the automotive industry that hold the top 100 car brands presented as such by a Brand Finance (2021) ranking. I identified 51 groups (some have several brands) and extracted from their financial statements for 2020 and the previous three financial years a series of data that I processed in a simple way to see where the year 2020 - severely affected by the pandemic - is situated compared to the previous year, but also to the average of the previous three years. So, the aim of our study is to highlight the impact of covid-19 on key financial indicators of companies in the automotive sector.

The results are interesting, although in some cases they only confirm the statistical data published by various organizations or present in the literature. Thus, the sales, the net income and all three profitability ratios decrease compared to both references, although the decrease in sales is much more moderate compared to the decrease of the net income and of the profitability indicators. Less expected is the increase, on average, of equity in 2020 compared to 2019 and, with even greater intensity, compared to the previous three years, partly explained by the prudence with which the crisis period was approached, by less dividends payed

in 2020, more positive OCI (other comprehensive incomes) and, probably, new shareholders' contributions. The cash reported on the balance sheet is also growing massively compared to the reference periods, explained by the increase in the operating cash flow, as well as the increase in financing flows, despite higher investment payments in 2020 compared to the reference periods.

Finally, we can say that the income reported in 2020 seems to be of better quality than the previous ones, given that the total accruals (established as the difference between the net income and the operating cash flow) have decreased sharply.

In the following, I shall present a literature review, followed by the description of the sample and the methodology, results and discussions, conclusions and references.

2. LITERATURE REVIEW

The covid-19 pandemic has overlapped with older problems in the automotive industry, issues related to vehicle pollution and changing consumer profiles (European Parliament, 2021). So, the analysis of the automotive industry should also take into account the major changes in recent years, in the direction of hybrid and electric, at all levels of motor vehicles.

Profitability indicators are often present in the literature to analyse the situation of listed companies. It is natural to choose them in identifying the impact of covid-19. Achim *et al.* (2021), on a sample of Romanian companies and analysing the period between mid-2019 and mid-2020, find significant reductions in return on equity (ROE) and return on assets (ROA), equivalent to the significant reduction in net income reported by those companies, but they propose that it is useful to introduce discriminatory variables such as size or type of activity.

The impact of covid-19 on the 2019 financial statements (especially on those with the reporting date of December 31) appears mainly in the notes - as a post-closing event - but also, possibly, in the audit report. Such an analysis is provided by Crucean and Hațegan (2021), in the case of some Romanian listed companies. In the case of the interim (quarterly) financial statements disclosed after 31.12.2019, the entry into the pandemic was already clear and the presentation of information was much more detailed, with direct references to elements such as going concern, impairment of non-financial assets, re-estimation of residual value of fixed assets, impairment of financial assets, fair value measurement, impact on employee benefits and symmetrical obligations of employers, net realizable value of inventories, deferred taxes, post-closing events, extraordinary events, current/non-current classification, addition of other columns in the reporting tables, as well as providing additional details in the notes (Kegalj, 2021; Joshi, 2020).

Comparisons between the 2019 annual or interim reports and the 2020 interim or annual reports are also available in the literature. For example, Tibiletti

et al. (2021) analyses the situation of listed Italian companies, in terms of narrative data published in 2019 and in the interim situations of the first two quarters of 2020 and concludes that, in half of the cases, there are inconsistencies in information, i.e. inconsistencies between predicted and what was actually obtained and reported.

3.   SAMPLE AND METHODOLOGY

The number of companies involved in the production of vehicles is probably very large, so I made a selection, based on their notoriety. Brand Finance (2021) published in March 2021 a ranking of the most valuable brands in the area of car production. Following the evaluations made by Brand Finance (2021) resulted in a ranking of 100 brands, in descending order of the estimated value of the brand, from Toyota (1st place), followed by four German brands (Mercedes-Benz, Volkswagen, BMW and Porche) and a newcomer (Tesla), passing through many other established brands - popular or luxury - from Europe, USA, Japan or South Korea, with many Chinese presences (but also from Hong Kong or Taiwan) or Indian and up to Tofas in Turkey (on 99) and Tang (in China) on 100. Among the 100 brands, we should not expect to find only cars, but also trucks, buses and other commercial vehicles, military vehicles, motorcycles, scooters or other two-wheeled vehicles, electric, hybrid or fossil fuel.

The 100 brands are owned by companies or groups of companies and, given that most of these companies are listed on the stock exchange or are part of groups whose parent companies are listed on the stock exchange, it has been quite easy to identify the consolidated financial statements - given the obligations of transparency in the financial reporting that listed companies must meet. In only two cases, I could not find the financial statements - the respective companies are not listed and do not publish complete financial statements by virtue of other sets of obligations. Thus, 98 brands remained, some of which are owned by the same groups (see Appendix 1), so that the number of exploitable financial statements was 51. I retained four financial years (2017-2020), and it should be noted that the most companies close the financial year on December 31 (35 situations) or around December 31 (1 case - New Flyer in Canada has a 52 weeks financial year) and that the other 15 have March 31 as the closing date. From the perspective of the analysis I carry out in this study, it is possible that the three months difference counts, especially for the end of 2019: the information about COVID-19 was more detailed and surer when preparing financial statements by companies closing at March than for those closing in December. I take the risk of mixing them up, even if this could represent a bias. Geographically, the distribution in space is interesting, with most companies located in China (11), followed by Japan (8) and the USA (7), Germany (5), India (5), United Kingdom (4), Italy (3), France and South Korea (2 each) and, finally, Austria, Canada, Sweden and Turkey (1 each). Of course, the number of groups matters, but even more important are the size of

the asset or the sales, which we can only compare if we bring all the figures reported by the 51 groups in the same currency. I did not perform such a conversion (I found about 15 reporting currency, at various levels of rounding), choosing to calculate ratios for each group, indicators that became comparable.

The financial reporting rules applied by the analysed groups are diverse, with a prevalence of IFRS (86 observations out of 204), followed by US GAAP (34 observations), Indian Accounting Standards (24 observations), Hong Kong rules HKFRS (20 observations), Japanese GAAP (16 observations), Korean K-IFRS standards (8 observations), Accounting Standards for Business Enterprises (in China: 8 observations), and British and Turkish standards (4 observations each). The diversity of financial reporting rules can affect the analysis, although comparing relative sizes over time for each group, ensures consistency of comparison between figures obtained by applying the same rules: I have one exception here - and I assume the consequences - Toyota has moved to IFRS in 2019, so that the first two years of the analysed interval have US GAAP compliant figures and the other two years are IFRS compliant.

The auditors of the analysed groups belong, for the most part, to the Big 4 networks, with a few exceptions: in 28 observations (7 groups - all from Asia, although one is based in the United Kingdom), non-Big 4 auditors appear.

From the consolidated financial statements of the identified companies I extracted a series of information that I considered relevant in terms of characterizing the developments in 2020 in relation to the previous year, but also to the average of the previous 3 years. These data refer to total assets, cash reported in the balance sheet, equity, sales, net income, operating and investing cash flows. These indicators were analysed in dynamics, either as such or by their inclusion in classical indicators of profitability analysis, such as ROA, ROE or return on sales (ROS). I also tried to see if the accruals reported in 2020 are significantly different from what was reported in previous years.

The calculations consisted in establishing the relative change of the indicators in 2020 (or in the year 2020-2021, ended in March 2021) compared to the previous year and compared to the average of the three previous years. For this, I applied the following formulas:

$$variation\ 1 = \frac{I_{2020} - I_{2019}}{|I_{2019}|} \tag{1}$$

and

$$variation\ 2 = \frac{I_{2020} - I_{average\ 2017-2019}}{|I_{average\ 2017-2019}|} \tag{2}$$

where:

variation 1 represents the increase/decrease of the indicator in 2020 compared to the previous year;

variation 2 represents the increase/decrease of the indicator in 2020 compared to the average of the previous three years;

I_{2020} represents the value of the indicator in 2020: it was successively replaced by the cash reported on the balance sheet, equity, sales/revenues, net income (I did find the operating income in the financial reports only for about 70% of the analysed observations), the operating cash flow, investing cash flow, ROA, ROE, ROS, the difference between net income and operating cash, and other indicators;

I_{2019} represents the value of the same indicators in 2019;

$I_{average2017-2019}$ represents the average value of the indicators in the period 2017-2019.

The denominator indicator is set to absolute value to avoid irrelevant calculations generated by situations when the denominator and numerator are negative numbers (see also Gray, 1980).

For companies with the year ending in December, for the production of the 2019 financial statements, some information was already known about covid, although many groups published financial statements and audit reports before the state of emergency was declared (in 15 cases, audit reports are dated February). For the companies that closed in March, the details about covid and its possible implications were all the more known. Thus, we can assume that the indicators for 2019 (or 2019-2020) were somewhat influenced by prudent estimates of the future effects of covid, which may make the comparison 2020-2019 a little risky. For this reason, I chose to compare 2020 with a slightly more stable size for the effects of COVID, namely the average for the three years preceding the covid year (2017-2019 compared to 2020). In order not to completely ignore the three-month gap between the closing dates used by the analysed groups, I presented the results in total, but also grouping the observations according to the closing date.

Now, in the second half of 2021, we know quite a bit about the effects of pandemics, so we can assume that the evolution of the automotive business has been one of worsening performance and profitability indicators:

- decreases in sales, income and profitability indicators;

- increase in treasury, as a result of prudence and a possible decrease in investments generated by the uncertainty brought by covid;

- an increase in accruals, in order to adjust as much as possible the income reported by simple earnings management techniques.

Given the major differences between the companies analysed, in terms of size, access to finance and public aid, production structure, we can expect that the impact of covid-19 will not be uniform. However, in our analysis, I will average the indicators for all the analysed companies

4. RESULTS AND DISCUSSIONS

I grouped the results of my calculations on several large structures that will relate to balance sheet items such as cash reported in the balance sheet, equity, sales, profitability, operating and investing cash-flows and an accruals measure. In the case of outliers, I opted for winsorizing them at the 5th percentile and, respectively, at the 95th percentile.

4.1 Impact on some balance sheet numbers

I chose two indicators that come from the balance sheet: equity and cash. Given the significant decline in business in 2020, I expect a decrease in equity - as a result of the expected decline in net income. In table no. 1 I centralized the processed information regarding the evolution of the equity of the 51 automotive industry groups. I observe an average increase in equity, an increase I did not expect, in the context of the pandemic crisis of 2020. What could explain this evolution of equity, both compared to the previous year and compared to the average of the previous three years?

The year-on-year change in equity comes primarily from the addition or subtraction of the net income of the year to the initial equity. From Table 4 below, we see that the net income has decreased significantly, so this is not the source of the increase in equity. I continue to analyse other elements of the comprehensive income – i.e. changes in the company's net worth that correspond to the definition of revenues and expenses, but which are accounted for directly in equity, without going through income or expenses in the profit and loss account. For these OCI, I find an average decrease in 2020 compared to 2021 of 0.5862, but an average increase of 0.0593 in 2020 compared to the average of the previous three years. This could be a partial explanation of the increase in equity. We can also imagine that there were new contributions from the shareholders - I did not analyse this information from the balance sheet. At the same time, a systematic source of decreasing equity is the payment of dividends and, from the calculations made on the basis of dividends reported as paid in 2020 (information from the statement of cash flows), I found that, indeed, dividends paid in 2020 were significantly lower than those paid in the previous year (-0.2855, respectively -0.1934); the meaning is the same, regardless of the closing date.

Returning to the evolution of equity, we see smaller decreases in companies closing on March 31: this can be explained by the fact that these companies caught the declaration of the pandemic before closing in 2019-2020, i.e. had the opportunity to account for negative effects – decreasing equity - in the financial statements immediately prior to 2020: the reporting base was lower than in companies with a 31 December closing.

**Table 1 – Evolutions in equity for the automotive industry groups,
2020 to previous year/years**

Explanation	*Evolution 2020 to 2019*	*Evolution 2020 to 2017-2019 average*
Number of companies with increasing equity	36	37
Number of companies with decreasing equity	15	14
Average variation of equity	0.0779	0.1313
Average variation of equity, for companies closing at 31 December	0.0920	0.1688
Average variation of equity, for companies closing at 31.03	0.0648	0.0670

(Source: Author projection, based on the data provided by the financial statements of the companies analysed)

The cash in hand or in bank is an indicator that can also measure the prudence with which periods of crisis are approached, so that an increase in it would not be surprising. From my calculations - reported in Table 2 - it is very clear that a significant increase in the cash appears in 2020 both compared to the previous year and compared to the average of the previous three years. These results must be correlated with the evolution in net cash flows: in Table 8, we see that 2020 was a year in which the operating cash flow increased significantly compared to previous years. Also, the total cash flow experienced a massive increase (6.2145, respectively 22.0645). The analysis must also take into account the other components of cash flows: investing flows increased - higher amounts were paid in 2020, compared to previous years (0.5819 and 0.5717, respectively), which means that financing cash-flows increased massively in 2020. This result is confirmed by calculations: the financing cash flow increased significantly: the calculated variations are 1.3396 and 1.9573, respectively, with larger sizes for the companies closing at 31st of December. So, despite higher investment payments, operating and financing cash-flows were large enough to contribute to a significant increase in the cash reported in the balance sheets of companies in the automotive sector in the 2020 pandemic year.

Table 2 – Evolutions of the cash reported in the balance sheet by automotive industry groups, 2020 to previous year/years

Explanation	*Evolution 2020 to 2019*	*Evolution 2020 to 2017-2019 average*
Number of companies with increasing cash	41	41
Number of companies with decreasing cash	10	10
Average variation of cash	0.5709	0.6620
Average variation of cash, for companies closing at 31 December	0.6265	0.6348
Average variation of cash, for companies closing at 31.03	0.4143	0.5724

(Source: Author projection, based on the data provided by the financial statements of the companies analysed)

4.2 Impact on some profit and loss account numbers

The profit and loss account indicators analysed are sales and net income. Here the expectations are in the sense of significant decrease, taking into account the statistics published by the car manufacturers' associations.

Table 3 – Evolutions of the sales reported by automotive industry groups, 2020 to previous year/years

Explanation	*Evolution 2020 to 2019*	*Evolution 2020 to 2017-2019 average*
Number of companies with increasing sales	16	13
Number of companies with decreasing sales	35	38
Average variation of sales	-0.0555	-0.0426
Average variation of sales, for companies closing at 31 December	-0.0394	-0.0043
Average variation of sales, for companies closing at 31.03	-0.0860	-0.1303

(Source: Author projection, based on the data provided by the financial statements of the companies analysed)

Table 3 shows the evolutions regarding the sales that confirms the hypothesis from which I started; however, the average decreases identified based on the figures reported in the profit and loss accounts are not as spectacular as we might have expected. I did not retain the information in our calculations, but it would be useful to see to what extent these sales are accompanied by an increase in trade receivables, in order to identify something forced in the 2020 reports.

In the case of the reported net income, the decreases are very serious (table 4), as we could expect. However, as mentioned above, the average increase in equity may suggest that the decrease in net income was offset either by the increase in OCI or by contributions from shareholders to keep the company afloat during the crisis and provides a solid starting point in post-crisis recovery. This behaviour of the firms could be confirmed by the evolutions identified in the levels of the cash flows reported and even in the case of the net cash flow from the investing activities.

Table 4 – Evolutions of the net income of the automotive industry groups, 2020 to previous year/years

Explanation	*Evolution 2020 to 2019*	*Evolution 2020 to 2017-2019 average*
Number of companies with increasing net income	14	10
Number of companies with decreasing net income	37	41
Average variation of net income	-0.9087	-0.6271
Average variation of net income, for companies closing at 31 December	-1.0346	-0.5678
Average variation of net income, for companies closing at 31.03	-0.4265	-0.6636

(Source: Author projection, based on the data provided by the financial statements of the companies analysed)

4.3 Impact on profitability ratios

The net income may be subject to the influences of accounting options regarding the recognition of impairments, provisions and other estimates made in the event of various crises. A massive decrease in the net income can therefore be attributed to a big bath accounting: if users expect to have serious decreases in performance, then companies could recognize expenses that they would not otherwise take into account. Profitability ratios, which also takes into account net income, could better reflect the situation of companies. I chose to present all three classic indicators, by reporting the net income to total assets (ROA), equity (ROE) and sales (ROS).

In Table 5, the ROA figures confirm the significant decrease in profitability, and we can say that the main cause is the covid 19 health crisis. I did not test the hypothesis of a big bath accounting made possible by this crisis, but this could be taken into consideration, as a future research direction.

**Table 5 – Evolutions of ROA for companies in automotive industry,
2020 to previous year/years**

Explanation	Evolution 2020 to 2019	Evolution 2020 to 2017-2019 average
Number of companies with increasing ROA	10	6
Number of companies with decreasing ROA	41	45
Average variation of ROA	-0.9397	-0.9652
Average variation of ROA, for companies closing at 31 December	-1.0478	-1.0053
Average variation of ROA, for companies closing at 31 March	-0.4879	-0.8100

(Source: Author projection, based on the data provided by the financial statements of the companies analysed)

The return on equity (Table 6) is also decreasing, which is perfectly consistent with the decrease in earnings and the increase in equity. The average decrease in ROE 2002/2019 is very similar to the decrease compared to the three years' period 2017-2019. In the case of all three profitability ratios, we could identify a smaller decrease 2020/2019 for the companies closing at 31 March, probably explained by the fact that these latter companies have already taken into account some effects of the crisis in the net income reported for the 2019 financial year.

**Table 6 – Evolutions of ROE for companies in automotive industry,
2020 to previous year/years**

Explanation	Evolution 2020 to 2019	Evolution 2020 to 2017-2019 average
Number of companies with increasing ROE	11	7
Number of companies with decreasing ROE	40	44
Average variation of ROE	-0.8723	-0.8678
Average variation of ROE, for companies closing at 31 December	-0.9052	-0.8330
Average variation of ROE, for companies closing at 31 March	-0.5469	-0.8422

(Source: Author projection, based on the data provided by the financial statements of the companies analysed)

In Table 7, a clearer picture of the evolution of the company's sales performance in 2020 appears: the very moderate decrease in sales, corroborated with the massive decrease in the net income lead to a serious decrease in ROS.

Table 7 – Evolutions of ROS for companies in automotive industry, 2020 to previous year/years

Explanation	*Evolution 2020 to 2019*	*Evolution 2020 to 2017-2019 average*
Number of companies with increasing ROS	14	11
Number of companies with decreasing ROS	37	40
Average variation of ROS	-1.0939	-0.7930
Average variation of ROS, for companies closing at 31 December	-1.2767	-0.7458
Average variation of ROS, for companies closing at 31 March	-0.4557	-0.8098

(Source: Author projection, based on the data provided by the financial statements of the companies analysed)

4.4 Impact on cash-flows

I commented above on the increase in the operating cash flow and on the fact that it explains, in part, the increase of the cash in the balance sheet of the analysed companies.

Table 8 – Evolutions of operating cash-flows for companies in automotive industry, 2020 to previous year/years

Explanation	*Evolution 2020 to 2019*	*Evolution 2020 to 2017-2019 average*
Number of companies with increasing operating cash-flows	32	32
Number of companies with decreasing operating cash-flows	19	19
Average variation of operating cash-flows	0.2712	0.5705
Average variation of operating cash-flows, for companies closing at 31 December	0.1969	0.5053
Average variation of operating cash-flows, for companies closing at 31 March	0.4846	0.7975

(Source: Author projection, based on the data provided by the financial statements of the companies analysed)

Increasing investment means more money coming out as a net investment flow; to keep the signs in Tables 8 and 9, I multiplied the variations in the investing

cash flow by -1. Significantly higher payments made for investments are ensured by the increase in operating cash-flows, of which a large part, however, remains in the cash balance, but also by the extraordinary increase in financing flows reported by the analysed companies (1.3396, respectively, 1.9573, with much higher figures for companies that close on December 31).

Table 9 – Evolutions of investing cash-flows for companies in automotive industry, 2020 to previous year/years

Explanation	*Evolution 2020 to 2019*	*Evolution 2020 to 2017-2019 average*
Number of companies with increasing investing cash-flows	22	25
Number of companies with decreasing investing cash-flows	29	26
Average variation of investing cash-flows	0,5819	0,5717
Average variation of investing cash-flows, for companies closing at 31 December	0,6091	0,5624
Average variation of investing cash-flows, for companies closing at 31 March	0,6135	0,6857

(Source: Author projection, based on the data provided by the financial statements of the companies analysed)

4.5 Impact on total accruals

Periods of crisis can lead listed companies to more intense manipulation of accounting numbers. Aljawaheri *et al.* (2021) confirms this trend for the companies they analysed and found a negative effect of the covid-19 crisis on the quality of the reported incomes. There are many techniques for measuring the degree of manipulation of accounting figures, especially the net income. I had available data that allow us to establish differences between the net income (I did not find the operating income in a number of 64 observations) and the operating cash flow. Following Do and Nabar (2018), which adapts the formula proposed by Givoly and Hayn (2000), I calculate total accruals as the difference between the net income and the operating cash flow. The data reported in Table 10 show a significant decrease in total accruals in 2020 compared to the previous year/years, which may suggest a better quality of the reported income or, at least, a closer relation between the accounting income and the operating cash flows. However, this decrease in total accruals is foreseeable, given the decrease in net income and the increase in operating flow. The figures calculated by us in Table 10 should be supplemented by a separation from the total accruals of the discretionary accruals, in order to be able to draw a better sustained conclusion.

Table 10 – Evolutions in the difference between net income and operating cash-flows (total accruals) for companies in automotive industry, 2020 to previous year/years

Explanation	Evolution 2020 to 2019	Evolution 2020 to 2017-2019 average
Number of companies with increasing total accruals	16	12
Number of companies with decreasing total accruals	35	39
Average variation of total accruals	-1.6945	-1.7201
Average variation of total accruals for companies closing at 31 December	-1.3058	-1.3994
Average variation of total accruals, for companies closing at 31 March	-2.4164	-2.0320

(Source: Author projection, based on the data provided by the financial statements of the companies analysed)

5. CONCLUSIONS

The purpose of this study is to see, in one of the simplest ways, how companies in the automotive industry have been affected by the covid-19 pandemic. I was interested in comparing the figures reported in the financial statements from 2020 with the equivalent in 2019, but also from the average of the previous three years.

I selected the analysed companies based on the notoriety of car brands, as they appear in the Brand Finance survey (2021). Out of the first 100 brands present in that ranking, I found 51 groups - some groups have several brands. As most of these groups are listed, access to their financial statements is quite easy. I have simplified by averaging the indicators for all observations, although some entities close on March 31, compared to the others – the majority - which close on December 31; however, I report separately the results, to identify possible differences between the two groups of companies - differences that may be important, given that the pandemic became official after the closure on 31 December, but before the closure on 31 March.

Dividing the difference between the 2020 level and the 2019 level, respectively the average of the years 2017, 2018 and 2019, of some financial indicators, to the absolute value of the indicators in 2019, respectively of the average 2017-2019, I calculate some relative values of the change for each of the analysed indicators. The main results can be summarized as follows:

- equity increases, which, in the face of a significant decrease in the net income for the year, suggests that OCI increased and/or companies benefited from new contributions, respectively decreased dividend distributions;

- the cash reported in the balance sheet increased, the explanation consisting - according to the figures analysed by me - in higher operating cash flows, as well as in much higher financing flows in 2020 compared to the reference periods;

- in the profit and loss account, the sales seem to have decreased slightly, while the net income has significant decreases, which leads to equally large decreases in profitability rates (ROA, ROE, ROS);

- in addition to the increase in net operating cash flow, the cash flow statement also shows that investment payments have increased significantly, given the increase in amounts from financing activities and the decrease in amounts paid as dividends;

- finally, perhaps as a result of the cumulative effects of the individual developments of the two indicators, we see a drastic decrease in the difference between net income and operating cash flow, i.e. the indicator called total accruals and which may suggest an improvement in quality of the reported accounting figures.

The limits of the study consist mainly in the short period analysed as a basis for the comparison of the 2020 figures, in the use of simple indicators and without sophisticated statistical processing. It would also be useful to compare the situation of companies in the automotive field with companies in other industries more or less affected by covid-19. At the same time, it would be useful and interesting to compare the effects of the 2020 pandemic crisis on the car industry with the effects of the global financial crisis that began in 2008.

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Appendix 1 – Brands belonging to automotive groups and ranked
by Brand Finance (2021)

Group	Country	Brands and the position in the Brand Finance ranking (2021)
Toyota	Japan	Toyota (1), Lexus (16), Daihatsu (35), Hino (42)
Daimler Benz	Germany	Mercedes-Benz (2), Smart (96)
Volkswagen	Germany	Volkswagen (3), Audi (10), Skoda (27), Scania (33), Bentley (44), Lamborghini (45), Seat (58)
BMW	Germany	BMW (4), Mini (39), Rolls- Royce (47)
Porsche	Germany	Porche (5)
Tesla	USA	Tesla (6)
Honda	Japan	Honda (7), Acura (50)
Ford	USA	Ford (8), Lincoln (48)
Volvo	Sweden	Volvo (9), Mack (84)
Nissan	Japan	Nissan (11), Infinity (79)
Renault	France	Renault (14), Dacia (62)
Ferrari	Italy	Ferrari (15)
Subaru	Japan	Subaru (17)
Jaguar Land Rover	United Kingdom	Land Rover (18), Jaguar (40)
Kia	Japan	Kia (20)
Mahindra	India	Mhindra (24)
Great Wall Motor	China	Haval (25), GWM (63), WEY (92)
Suzuki	Japan	Suzuki (26), Maruti Suzuki (32)
PSA (from January 2021 it joined Stellantis group)	France	Peugeot (28), Citroen (46), Opel (48), Vauxhall (77)
Mazda	Japan	Mazda (29)
BYD	China	BYD (30), Tang (100)
Polaris	USA	Polaris (31)
General Motors (GMC)	USA	Chevrolet (12), Buick (22), Cadillac (23), GMC (34), Baojun (69)
Isuzu	Japan	Isuzu (37), UD Trucks (94)
McLaren	United Kingdom	Mc Laren (41)
Fiat Chrysler (FCA), renamed Stellantis	USA	Jeep (19), Ram Trucks (38), Fiat (43), Dodge (59), Maserati (67), Chrysler (90), Tofaș (99)
Bajaj Auto	India	Bajaj Auto (49)
Harley-Davidson	USA	Harley-Davidson (51)
Yamaha	Japan	Yamaha (52)

Group	Country	Brands and the position in the Brand Finance ranking (2021)
CNH Industrial	Italy	Iveco (54)
NIO	China	NIO (56)
Aston Martin Lagonda	United Kingdom	Aston Martin (60)
SAIC Motor Corporation Limited	China	Roewe (61), MG (81)
PACCAR	USA	Kenworth (65), Peterbilt (71), DAF (80), PACCAR (88)
Tata Motors	United Kingdom	Tata (66), Land Rover (18) Jaguar (40)
Sinotruk	China	Sinotruk (68)
Dongfeng	China	Dongfeng (73)
KTM - Pierrer Mobility-Austria	Austria	KTM (74)
Guangzhou Automobile Group Company	China	GAC (76)
TVS Motor Company	India	TVS (82)
Wuling Motors	China	Wuling (83)
Piaggio	Italy	Piaggio (91)
Yulon	China	Yulon (93)
BAIC Motor Corporation	China	Foton (64), Beijing (97)
Tofaş Türk Otomobil	Turkey	Tofaş (99)

Certainly, some of the groups analysed have other brands, which do not appear in the first 100 reviewed by Brand Finance (2021) and which do not appear in the table above.

EVOLUTIONS IN THE REPORTING OF THE PROVISIONS BY THE ROMANIAN LISTED COMPANIES

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ABSTRACT

Provisions reported in the financial statements of the Romanian listed companies, both as liabilities in the balance sheet and as net expenses, in the profit and loss account, may represent useful information for characterizing the behaviour of these companies, from the point of view of the application of the accounting prudence. The analysis of companies listed both on the regulated market (over 1,400 observations) and on the AeRO market (almost 3,200 observations) allows the visualization of significant differences between the two categories of companies, especially in terms of the share of those recognizing provisions and the evolution of this share: firms listed on the regulated market are much more inclined to report provisions and the trend over time is clear in terms of increasing the number of these firms, but also the ratio of provisions in the total assets, unlike the AeRO market, where the share is half and slightly decreasing, even if here too we identify, for the last years, a slight increase in the ration of provisions in total asset. The size of the companies significantly influences the share of provisions, although on AeRO, the differences are smaller than on the regulated market; while better profitability leads to more consistent balance sheet provisions on the regulated market, and higher leverage seems to correspond to higher balance sheet provisions for all listed firms. The category of auditor (international or local) seems to significantly influence the weight of provisions, if we take into account all the observations, while the clean opinion is associated with more consistent provisions only on the regulated market and only for the balance sheet. Finally, statistical tests show that the CFO gender has a significant influence only on the weight of the provisions on the balance sheet and only on the alternative market AeRO.

Keywords: Provisions; total assets; revenues; Romanian listed companies; accounting conservatism.

JEL Classification: M41

1. INTRODUCTION

Provisions are part of the liabilities reported by entities and their accounting recognition is made as a result of meeting the specific criteria in identifying liabilities. The particularities of the provisions are related to the existence of uncertainties regarding the estimated probability of future outflow of resources,

the actual maturity of the debt or the actual amount of payment. The recognition of the structures of the financial statements - including the liabilities - represents one of the components of the theoretical frameworks retained by the standardization bodies in the elaboration of the accounting/financial reporting standards. The application in Romania, for ordinary enterprises, of two different sets of accounting standards has the potential to create divergences in the recognition and the presentation of some structures of the financial statements. However, at a general level - in principle - the Romanian Accounting Standards (RAS - OMFP 1802/2014, at present) have taken over the definitions of assets, liabilities, income and expenses from the penultimate variant of the conceptual framework of the IASB. Thus, in the definition given to the liabilities in OMFP 1802/2014, we find the classic recognition criteria: a) current obligations, b) result of past events, c) from which resource outflows are expected and d) which can be evaluate credibly. These four criteria are presented in the RAS in a theoretical way, because in the detailing rules, there are numerous exceptions justified, probably, by the materiality principle. We can expect such exceptions not to be met when international standards are systematically applied. However, the definition of the liabilities (but also the related recognition criteria) has undergone some updates in the latest version of the IASB's conceptual framework. This last definition is as follows: *a present obligation of the entity to transfer an economic resource as a result of past events; on obligation is a duty or responsibility that the entity has no practical ability to avoid* (ACCA, 2018; Shkulipa, 2021). What differs from the previous definition can be summarized as follows (IFRS, 2018): the separate definition of economic resource, to highlight the fact that the transfer refers to an economic resource and not to the final economic benefits; disappears formulation *expected outputs* - it is not necessary for the output of resources to be secure; instead, the criterion is introduced according to which the entity does not have the practical possibility to avoid the outflow of those economic resources. These updates to the definition of liabilities were also made in IAS 37, when defining provisions, as liabilities characterized by an uncertainty about the timing of the due date or the amount. In fact, references to uncertainty are common in the literature on accounting prudence (Barker and Penman, 2020).

Another conceptual aspect that we identify in the literature, regarding the role of prudence in IFRS, is highlighted by André *et al.* (2015): the conceptual framework promotes conditional conservatism, trying to limit unconditional conservatism. This preference for conditional conservatism can also be explained by its favourable effects on economic growth, as opposed to unconditional conservatism, which has almost no effect on economic growth (Do and Nabar, 2018). The differences between IFRS and the European directives, despite the fact that the RAS takes as such some definitions from the IASB conceptual framework, remain important and it is understandable the opinion of some authors that the application of IFRS in Europe, even if it is mandatory only for consolidated

financial statements. - with many states extending this obligation to other categories of entities - also has the role of limiting the possibilities of European companies to create quasi-reserves by setting up provisions at the limit of justification (Walton, 2011, quoted by André *et al.*, 2015). Moreover, the differences between the various accounting standards have always been sources of reconciliation between the information provided by companies that have to meet the demand for financial information from investors in different markets. Provisions were at the top of the adjustments needed to make the information comparable in two different accounting frameworks (Mura and Roberto, 2014).

Conceptual aspects, such as those related to definitions, classifications, qualitative characteristics, objectives, users, reporting entities, evaluation bases, etc. are the subject of numerous studies that approve, challenge, develop, discuss, put in various contexts, the notions presented in the conceptual framework. For comments on liabilities, we can refer to Coetsee (2021), which considers - citing a rich literature - that the details provided by the conceptual framework on the criteria for recognizing liabilities, but also by IAS 37 on the uncertainties that may accompany the existence of a provision, were, before 2018, insufficient or unclear; the conceptual framework 2018 clarifies a large part of the ambiguities and creates the premises for a better identification and presentation of debts, including those represented by provisions.

The recognition of provisions is framed as a consequence of conditional conservatism (André *et al.*, 2015), although, in some cases, the emergence of those provisions is related to the adoption of specific accounting policies or the effective application of detailed rules established by the standard setter and, therefore, some provisions are the result of unconditional conservatism. In the case of Romanian companies applying RAS, the provisions for provisions for employee participation in profit or even some provisions for employee benefits, which do not depend too much on the estimates made at the date of incorporation, can be considered as belonging to the latter category, resulting from clear and unavoidable events prior to closure.

The direct link between accounting conservatism and provisions should be emphasized, it is also useful to see whether the evolution of the way in which accounting standardization is defined and accepted by accountants has effects on the way firms understand to recognize provisions. Conway (2014) identifies a decrease in the level of prudence associated with risks (litigation) and agency costs, in the case of British firms, after the elimination of the explicit presentation of prudence in the 2010 IASB conceptual framework. In turn, Lobo and Zhou (2006) points out that the introduction of the Sarbanes Oxley Act in the USA has led to an increase in the level of prudence in financial statements, both by reducing discretionary accruals and by recognizing losses more quickly.

The present study is essentially descriptive and aims to calculate and interpret two indicators that include accounting provisions, in order to highlight their role

in the financial reporting of listed Romanian companies. The main results consist in identifying completely different profiles of companies listed on the two segments of the Romanian financial market, in the sense that the regulated market seems to be more conducive to the recognition of provisions reported in the balance sheet and in the profit and loss account. We can comment in the sense that the standards applied by the companies on the regulated financial market - IFRS -, the manner in which these norms are applied and certified lead to a greater prudence in the financial reporting. Within each segment, in the case of the categories of companies established according to various criteria, we concluded that the dimensions influence the reported provisions, the profitability does not have significant effects on the weights of provisions, leverage generates differences only on the provisions reported in the balance sheet, if we we take into account all the analysed observations, the audit opinion has effects only on the balance sheet of the companies listed on the regulated market, and the gender of financial director does not matter at all in the reporting of provisions.

In the continuation of this study, we will present a literature review, followed by the description of the populations analysed and the methodology used, after which we propose a section of results and discussions, followed by the conclusions and the references.

2. LITERATURE REVIEW

In this study, we do not intend to measure in any way the level of conservatism in financial reporting, by using classical techniques in this regard - as I said, I limit myself to descriptive elements. However, the use of provisions as a proxy for measuring the level of conservatism or the level of uncertainty associated with the financial reporting of some firms is a constant in the literature. Feleagă *et al.* (2010) calculate the ratio reported provisions to total liabilities and concludes that the transition to IFRS has not completely eliminated cultural influences in the application of accounting and financial reporting rules. A similar conclusion is proposed by Klimczak (2017) who, following the analysis of the provisions presented in the IFRS financial statements of large companies in three European countries (Germany, UK and Poland), find different levels of compliance with IAS 37, but also differences in the quality of the presentation of the provisions in notes. Hu *et al.* (2020) also divide provisions to total assets to build a variable to be put in a model, to measure, along with other variables, the level of prudence in the financial reporting of some Chinese companies.

Mașca (2015) analyses the level of prudence in the financial reporting of Romanian companies listed on the BSE, by identifying and studying the impairments recognized by these companies over a period of two years. Also regarding the companies listed on BSE, Robu and Toma (2015) identifies the use of prudence by Romanian listed companies in reporting the elements of equity and liabilities, with an overestimation of liabilities when receiving bad news from the

market. The behaviour of Romanian companies listed on BSE is analysed in numerous studies that introduce in the regression models various variables, including size, leverage, economic or financial profitability, auditor category, audit opinion (as Carp and Georgescu, 2019). Another study (Neag and Adorjan, 2016) in which provisions are used as a proxy for the analysis of prudence in financial reporting refers to 40 companies listed on the regulated BSE market and retains data for two years (2014 and 2015); Neag and Adjoran's (2016) conclusion is that the companies in the analysed sample behave prudently, in terms of the provisions made, but also from the perspective of dividend distribution.

In the case of other emerging countries, Ahlem and Hallam (2021) identifies a preference of Algerian accountants towards the recognition of tax deductible provisions and of provisions generated by the legal obligations of companies, once the recognition of asset impairment. In his study, Suer (2014) analyses the provisions constituted by the Turkish non-financial companies listed on the Istanbul Stock Exchange and which enter BIST100 index and finds that the most frequent are those for litigation, along with six other large categories of provisions recognized.

Accounting prudence, in general, including the recognition of provisions, could also have explanations related to the fiscal impact. To the extent that the provisions are recognized for tax purposes, their recognition could provide a temporary advantage, in the sense of deferring in time the payment of a part of the income tax. I do not take this aspect into account in the present study, because I did not intend to identify the types of provisions constituted by the Romanian listed companies.

3. POPULATION AND METHODOLOGY

The study refers to the individual financial statements of Romanian companies listed on the Bucharest Stock Exchange (BSE), both on the regulated market (for the period 2001-2020) and on the alternative market AeRO (for the period 2010-2020). The periods retained for each category of companies are different, due to the data availability. Throughout the period, the companies listed on the AeRO alternative market applied the Romanian accounting and financial reporting standards (RAS), while the companies on the regulated market had a different evolution from this point of view:

- in the first part of the period (2001-2005) rules harmonized with the IAS and the European directives were applied, i.e. a kind of mix of standards which was difficult to implement due to the major novelties brought by the IAS and the insufficient training of those who had to apply these rules (Istrate, 2006);

- in a second sub-period (2006-2011) RAS were applied, in accordance with the European directives;

- starting with 2012, the Romanian standard setter activated the option offered by the European regulations by which it forced the companies listed on

the regulated market to apply IFRS in the individual financial statements as well as in the consolidated financial statements.

I expect that the way in which Romanian companies (we refer here only to those listed on the regulated market) understand to constitute and report provisions will evolve significantly with the change of the accounting framework. For example, I can estimate an increase in provisions with the transition to IFRS, given that this moment has led, for the Romanian listed companies involved, to a significant decrease in the net income reported for 2011 (Săcărin, 2014; Istrate, 2014): the 2011 RAS net income is available in the 2011 financial statements, while the 2011 IFRS net income is available in the 2012 financial statements as comparative values. We can attribute this decrease in the reported net income for the year 2011 to a more accentuated prudence of IFRS in relation to the previous RAS. It would not be the only situation in which IFRS leads to greater prudence: Madah Marzuki and Abdul Wahab (2016) find a similar evolution, in the sense of a positive effect of IFRS on prudence in measuring the accounting net income, for a sample of Malaysian companies.

The number of observations for each year is different, due to the availability of data, but also due to new listing of delisting every year. Tables 1 and 2 also present the data on the number of observations per year, as well as the accounting standards applied by companies each year. I chose to eliminate financial companies, due to their particularities in financial reporting, but also in setting up provisions.

From the financial statements of the companies, I use the information on the provisions presented as liabilities in the balance sheet and I divided them to the total assets of each company. From the profit and loss account, I have taken over the net expense with provisions that may appear with the plus sign (net expense), if the company recognize higher provisions during the year than those it cancelled/decreased, or with the minus sign, if the cancellation/decrease of the provisions are higher than the expenses with the initial recognition/increase of such liabilities. In calculating annual, multiannual averages or depending on the grouping of entities according to various criteria, I chose to use the absolute value of net expense with the provisions, to avoid offsetting positive and negative amounts. This net charge was divided to sales. As expected, among the calculated weights, both in the ratio of provisions to total assets and in the ratio of net provisions expense in sales, there were some outliers that I winsorized by bringing them to the 5th percentile, respectively at the 95th percentile. Even if we can expect similar evolutions of the two series of ratios - given that most provisions are recognized on directly on expenses - Table 1 shows that this is not the case, for reasons related to the fact that, in the profit and loss account, we have compensated recognitions/derecognitions of provisions, but also because some provisions are not recognized/increased charging them, but by their inclusion in the cost of some fixed assets or by their direct recognition in other comprehensive income.

The two series of ratios involving the provisions/net expenses with provisions, are analysed longitudinally, but also according to variables such as company size (total assets), firm profitability (measured by economic profitability - ROA = net income/total result), leverage (total liabilities/total assets), auditor category, audit opinion, gender of financial director. In all cases, I compared, on each segment of the financial market, two sub-sets (large vs. small, more leveraged vs. less leveraged, profitable vs. unprofitable, international auditor vs. local auditor, clean opinion vs. modified opinion, male CFO vs. female CFO). To determine if any differences between the mentioned subset sets are significant, I applied the statistical t-Test, as provided by MsExcel.

Unlike Neag and Adorjan (2016), in our analysis we took into account only the total value of provisions, respectively of net expense, not presenting the particular types of provisions constituted by companies listed on BVB that form the population and their maturity.

4. RESULTS

4.1. General considerations on the role of the provisions in the financial statement of the Romanian listed companies

Tables 1 and 2 show quite clearly that there are major differences between companies in the two segments of the financial market: on the regulated market, the share of companies reporting provisions is double the share of companies listed on AeRO. Also, on the regulated market there is an obvious increase in the share of companies with provisions (a doubling between 2001 and 2020), with two significant thresholds generated, most likely, by the change of the accounting standards applied:

- the transition from IAS to RAS (2005 - 2006) led to an increase of more than 15 percentage points in the share of companies on the regulated market that report provisions in the balance sheet, from 49.30% to 65.28%;

- the transition from RAS to IFRS (2011 - 2012) led to an 8% increase in the share of companies with provisions, from 67.95% to 76.32%.

If we take into account the financial crisis started in 2008, we also notice a threshold here, although the magnitude of the increase in the number of companies with provisions is smaller than in the other two: a change from 66.67% in 2008 to 70.51% in 2009. Also, on the same occasion, the ratio provisions to total assets also increases significantly. Corroborating these data with those from the last columns - the latter showing, first, a significant increase in 2008 compared to 2007, after which a decrease in the share of net expense with provisions in sales in 2009 and 2010, we can imagine that the share of provisions in the balance sheet is due not only to the recognition of new provisions, but also to the decrease of the reporting base, i.e., the reported assets.

Returning to AeRO, the application of only the RAS (slightly adjusted starting with 2015, to take into account the European Directive 35/2013) leads to a slight decrease in the number of companies that recognize provisions, from 39.38% in 2010, to 33.73% in 2020.

For the two categories of companies, I report the following values:

- in the case of companies listed on the regulated market, the average of the ration provisions to total assets (PTA) is 1.35%; also, if we take into account only the companies that reported provisions, the average reaches 2.01%;

- for the companies listed on the alternative market AeRO, the average share of PTA reaches 0.43%, and if we retain only the companies reporting provisions, we have 1.25%.

In all cases, it seems that companies listed on the regulated market are more careful to make significant provisions appear in the balance sheet, compared to companies on AeRO (1.35% >0.43%). This conclusion is also valid if we look only at companies that report provisions, ignoring those with zero values in the balance sheet; at this indicator: on the regulated market, we have a share of 2.01%, higher than the 1.25% on the AeRO market.

Regarding the evolution over time, on the regulated market we find an increase in the share of provisions in total assets, although, after a maximum in 2015 (1.92%, respectively 2.50%), we find a slight decrease. Here, too, the main threshold seems to be the transition in 2006 from the ambiguous norms harmonized with the IAS and the European directives, to the RAS in accordance with the European directives.

For the companies on AeRO, the evolution is quite linear, the ratios not moving too much from one exercise to another or from the beginning to the end of the interval.

Table 11 – Number of observations and characteristics of companies listed on the regulated market, regarding the reporting of information on provisions

Year	Standards applied	Total, from which	Reported provisions in the balance sheet		Ratio provisions on total assets, winsorized (%)		Ratio net provisions expense to sales, winsorized, absolute values	
			N	%	For total observations	For the observations with provisions # 0	For total observations	For the observations with provisions # 0
2020	**IFRS**	67	54	80.60	1.65	2.05	0.62	0.85
2019	IFRS	68	52	76.47	1.70	2.23	0.61	0.82
2018	IFRS	69	54	78.26	1.91	2.45	0.58	0.81
2017	IFRS	71	53	74.65	1.80	2.41	0.59	0.79
2016	**IFRS**	74	59	79.73	1.86	2.34	0.63	0.81
2015	IFRS	73	56	76.71	1.92	2.50	0.82	1.13
2014	IFRS	74	56	75.68	1.71	2.26	0.59	0.89
2013	IFRS	76	55	72.37	1.61	2.22	0.54	0.75
2012	**IFRS**	76	58	76.32	1.56	2.04	0.58	0.84
2011	RAS	78	53	67.95	1.36	2.00	0.52	0.79
2010	RAS	78	54	69.23	1.27	1.84	0.40	0.58
2009	RAS	78	55	70.51	1.24	1.76	0.48	0.73
2008	**RAS**	78	52	66.67	1.07	1.61	0.56	0.88
2007	RAS	79	54	68.35	1.15	1.69	0.51	0.78
2006	RAS	72	47	65.28	1.30	2.00	0.46	0.76
2005	IAS	71	35	49.30	0.84	1.70	0.46	0.83
2004	**IAS**	70	32	45.71	0.66	1.45	0.33	0.65
2003	IAS	61	27	44.26	0.72	1.63	0.29	0.55
2002	IAS	51	23	45.10	0.57	1.26	0.27	0.50
2001	IAS	44	18	40.91	0.61	1.49	0.26	0.62
Total	**-**	**1,408**	**947**	**67.26**	**1.35**	**2.01**	**0.52**	**0.79**

(Source: Author projection, based on the data provided by the BVB sites)

Turning to the profit and loss account, the absolute value of the ratio net provisions expenses to revenues (NPER) is, after the normalization of the extremes, quite low:

- 0.52% for companies on the regulated market (0.79%, if we take into account only those with non-zero values of net provisions expense);

- 0.30% for companies on AeRO (respectively 0.91% retaining only companies with net provisions expenses other than zero).

The general trend is also to be found in the figures reported as NPER: companies in the regulated market have higher values than those on AeRO.

Table 12 – Number of observations and characteristics of companies listed on the AeRO market, regarding the reporting of information on provisions

Year	Number of observations				Ratio provisions on total assets, winsorized (%)		Ratio net provisions expense to sales, winsorized, absolute values	
	Stan-dards applied	Total, From which	Reporting provisions in the balance sheet		For total observa-tions	For the observa-tions with provisions # 0	For total observa-tions	For the obser-vations with provisions # 0
			N	%				
2020	RAS	252	85	33.73	0.46	1.37	0.29	0.94
2019	RAS	269	88	32.71	0.45	1.39	0.25	0.81
2018	RAS	281	91	32.38	0.37	1.14	0.26	0.84
2017	RAS	286	93	32.52	0.39	1.20	0.29	0.94
2016	RAS	293	96	32.76	0.40	1.24	0.30	0.89
2015	RAS	293	97	33.11	0.40	1.20	0.29	0.96
2014	RAS	303	101	33.33	0.40	1.22	0.27	0.87
2013	RAS	305	105	34.43	0.41	1.21	0.30	0.95
2012	RAS	305	111	36.39	0.42	1.16	0.32	0.93
2011	RAS	299	115	38.46	0.49	1.28	0.32	0.85
2010	RAS	292	115	39.38	0.54	1.36	0.36	1.03
Total		**3,178**	**1,097**	**34.52**	**0.43**	**1.25**	**0.30**	**0.91**

(Source: Author projection, based on the data provided by the BVB sites)

Given the fact that provisions are a technique that ensures the accounting recognition of the consequences of uncertainties, we can verify whether the uncertainties regarding local and general elections (which take place in Romania in the same year, every four years, being separated by a few months) have any influence on the share of provisions reported by listed Romanian companies. Following Dai and Ngo (2021) which identifies an increase in accounting conservatism in election years in the US, I look at Table 1 and note that, to some extent, for companies listed on the regulated market, the share of those that constitute provisions is higher than in the previous year in all years preceding the elections (2003 compared to 2004, 2007 compared to 2008, 2011 compared to 2012, 2015 compared to 2016, 2019 compared to 2020).

The systematic long-term increase in the ratio PTA could be a signal of an increase in prudence over time, an increase caused by changes in accounting and financial reporting rules, but also by changes in the behaviour of companies listed on the regulated BSE market. The use of classical indicators to measure accounting prudence could tell us more about this trend, following the model proposed by Givoly and Hayn (2000).

In Tables 1 and 2, the columns referring to non-zero observations contain only the non-negative observations identified for the balance sheet, separately from the profit and loss account. In the following, however, for the analysis of the ratios, we chose to present the two rows of calculations and tests, as follows: first we dwell on all observations, after which we will remove the observations where the provisions are missing from the balance sheet and profit and loss account. So, further on, when we talk about positive provisions, we refer to those observations for which the ratio is different from zero either in the balance sheet or in the profit and loss account. Thus, for the regulated market I eliminate 357 observations, reaching 1,051 valid rows (74.64% of the total initial observations), while for the alternative market, I eliminate 1,889, leaving 1,293 observations (40.63%) with positive provisions in the balance sheet or in the income statement.

4.2. Taking into account the companies size

If we consider the size of companies listed on the regulated market (table 3), there are significant differences between small companies (with total assets below the median of 135,741,489 lei) and large ones, with total assets above the median, given the ration PTA, winsorized:

- for large companies, the average for total observations is 1.58%, and if we take into account only the observations with positive provisions, the average reaches 1.96%;

- for small companies, the average for total observations is also 1.13%, to reach 1.67% for the observations with positive provisions.

And in terms of ratio NPER, the results of the calculations give us different levels for the two categories of companies listed on the regulated market (large and small), after winsorization and taking into account the absolute values of those numbers:

- for small firms, 0.42% taking into account all observations and 0.66% for only firms with net provisions expense other than zero, the only insignificant difference, according to t-Test;

- for large companies, 0.61% and 0.72%, respectively, statistically significant difference.

And in the case of companies listed on AeRO, the size seem to have a significant influence on the ratio PTA; after winsorization and taking into account all available observations, PTA is double in the case of large companies, compared to small ones (the median total assets is 20,394,863 lei). If we consider only the companies that report provisions, the weights are also significant: 0.97% (for small companies), compared to 1.14%, for large ones. Going to the ratio NPER and taking into account the absolute values of these expenses, the results confirm the previous observations: large firms have more provisions and net provisions expenses (0.41% compared to 0.18%, respectively 0.77% compared to 0.68%); in

all cases, t-Test shows us that the differences between large and small companies are significant.

Table 13 –PTA and NPER average ratios, according to the firm size

Indicators		Regulated market (2001-2020)		AeRO market (2010-2020)	
		Big companies (above the median)	*Small companies (below the median)*	*Big companies (above the median)*	*Small companies (below the median)*
PTA	Total observations	1,58	1,13	0,59	0,26
		t-Test: significant differences		t-Test: significant differences	
	Observations #0	1,96	1,67	1.14	0,97
		t-Test: significant differences		t-Test: significant differences	
NPER	Total observations	0,61	0,42	0,41	0,18
		t-Test: significant differences		t-Test: significant differences	
	Observations #0	0,72	0,66	0,77	0,68
		t-Test: insignificant differences		t-Test: significant differences	

(Source: Author projection, based on the data provided by the BVB sites)

4.2. Effects of companies' profitability on the reported provisions

I choose to calculate the profitability as a ratio between the net income and the total assets, because the information on the two indicators seems more stable in terms of the possibility of comparison in time and space. After calculating the ROA, I identified the median and separated the two categories of companies: above the median and below the median. Comparing the medians of the two categories of companies, depending on the market on which they are listed, we observe a better profitability of companies on the regulated market, compared to those listed on AeRO (median of 2.38%, compared to a median of 0.40%, while the ROA averages are 2.24% for the regulated market, respectively -0.34% for AeRO).

It is also confirmed here (table 4) that the companies on the regulated market have higher ratios PTA than those on the AeRO. For the regulated market, I also find higher (and statistically significant) weights of the provisions in the balance sheet at more profitable companies, given that the share of net provisions expenses is about the same, regardless of size (statistically insignificant). On AeRO, the average weights I have found allow us to clearly state that the most profitable companies differ significantly from the unprofitable ones, in terms of provisions, but only if we take into account all the observations; only the share of net expenses

with provisions for companies with below-average profitability seems to be slightly higher than companies with above-average profitability, in the case of companies with provisions other than zero.

Table 14 – PTA and NPER average ratios, according to firm profitability

Indicators		Regulated market (2001-2020)		AeRO market (2010-2020)	
		Profitability above the median	Profitability below the median	Profitability above the median	Profitability below the median
PTA	Total Observations	1,53	1,17	0,51	0,35
		t-Test: significant differences		t-Test: significant differences	
	Observations #0	2,04	1,58	1,10	1,01
		t-Test: significant differences		t-Test: insignificant differences	
NPER	Total Observations	0,52	0,51	0,31	0,29
		t-Test: insignificant differences		t-Test: insignificant differences	
	Observations #0	0,69	0,69	0,67	0,82
		t-Test: insignificant differences		t-Test: significant differences	

(Source: Author projection, based on the data provided by the BVB sites)

4.3. The influence of leverage on provisions

Another variable frequently used in the analysis of companies' financial behaviour is leverage. I calculated it as the ratio between total liabilities and total assets. Here, too, the median represented the proposed limit between more leveraged and les leveraged companies. The firms on the regulated market are, on all the analysed periods, significantly more leveraged than those on the AeRO market: an average of 46.54% (median of 36.67%), compared to an average of 35.19% (median 25.68%).

If we first analyse the ratio NPER, we notice that it does not seem to be significantly influenced by leverage.

In both segments of the Romanian financial market, the meaning is clear, although with smaller differences between weights - the more leveraged companies have significantly higher PTA ratios than the less leveraged companies.

Table 15 – PTA and NPER average ratios, according to leverage

Indicators		Regulated market (2001-2020)		AeRO market (2010-2020)	
		Leverage above median	Leverage below median	Leverage above median	Leverage below median
PTA	Total observa-tions	1,58	1,13	0,51	0,35
		t-Test: significant differences		t-Test: significant differences	
	Observa-Tions #0	2,07	1,55	1,10	0,88
		t-Test: significant differences		t-Test: significant differences	
NPER	Total observa-tions	0,53	0,50	0,30	0,29
		t-Test: insignificant differences		t-Test: insignificant differences	
	Observa-Tions #0	0,67	0,72	0,65	0,81
		t-Test: insignificant differences		t-Test: significant differences	

(Source: Author projection, based on the data provided by the BVB sites)

4.4. Auditor category, audit opinion and provisions

The link between auditing and accounting prudence is well documented in the literature. For example, Crockett and Ali (2015) identify many studies on this topic and find no evidence of an association between auditor independence and the level of accounting prudence in the financial reporting of a sample of Australian firms. In general, in the relevant literature, auditors are divided into two broad categories: Big N and non-Big N (until 20 years ago, N = 4). However, the specifics of the Romanian audit market, as well as the relatively low weights of Big N auditors would suggest a classification that takes into account at least three categories (Păunescu, 2015; Istrate *et al.*, 2020): Big N, non-Big N internationally affiliated and local non-Big N networks. As for us, we choose to put together the first two categories - under the name of internationally affiliated auditors (whether or not they belong to Big N) - and continue to use this grouping to compare it with local auditors. The number of observations with auditors belonging to the two categories is not equal to the total number of observations analysed so far, due to the fact that information on the auditor was not available in 70 observations on the regulated market (4.97%) and in 431 observations on the AeRO market (13.54%). Another interesting observation that appears in the literature on financial audit at BSE is the calculation of the share of internationally affiliated auditors (including Big N). It is true that, on the regulated market, they audit most large companies, with top market capitalizations, but in number, the observations with internationally affiliated auditors are less than those in which

we find local auditors: on the regulated market, we have only 40.92% international auditors (568 observations, compared to 770 observations with local auditors), while on AeRO, the share of international auditors decreases to only 14.94% (411 observations compared to 2,340 observations with local auditors).

Table 16 – PTA and NPER average ratios, according to the category of auditors

Indicators		Regulated market (2001-2020)		AeRO market (2010-2020)	
		Internationally affiliated auditors	Local auditors	Internationally affiliated auditors	Local auditors
PTA	Total observa-tions	1,60	1,24	0,67	0,43
		t-Test: significant differences		t-Test: significant differences	
	Observa-Tions #0	1,91	1,77	0,91	1,10
		t-Test: insignificant differences		t-Test: significant differences	
NPER	Total Observa-tions	0,61	0,47	0,49	0,30
		t-Test: significant differences		t-Test: significant differences	
	Observa-tions #0	0,68	0,70	0,67	0,75
		t-Test: insignificant differences		t-Test: insignificant differences	

(Source: Author projection, based on the data provided by the BVB sites)

We can expect companies audited by internationally affiliated auditors to have a higher PTA and NPER. This is true for the regulated market, taking into account all the observations: in the case of positive provisions, the meaning is the same, but t-Test tells us that the difference is insignificant. For companies listed on AeRO, there are also significant differences between the companies audited by the two categories of auditors, in terms of PTA, but the meanings are different as we take into account all observations or only those with explicitly reported provisions.

Audit standards state that two major types of audit opinion can arise: modified and unmodified. In the populations analysed by us, in a number of observations, we did not find the audit opinion: for 81 observations on the regulated market (5.75%) and for 474 observations on AeRO (14.90%). The justification for the modified opinions often includes references to the manner in which the annual closing works were carried out, including the inadequacy of impairment adjustments or provisions (Istrate et al., 2020). In our situation, on the AeRO market there do not seem to be differences between the approaches to provisions by companies that receive modified opinions compared to those that receive clean opinions. On the contrary, on the regulated market, but only in terms

of balance sheet, companies that received a clean opinion have significantly higher PTA ratios than companies that received a modified opinion. In the profit and loss account, the weights change their meaning, but the differences are statistically insignificant

Table 17 – PTA and NPER average ratios, according to the audit opinion

Indicators		Regulated market (2001-2020)		AeRO market (2010-2020)	
		Clean opinion	Modified opinion	Clean opinion	Modified opinion
PTA	Total Observations	1,52	1,13	0,47	0,47
		t-Test: significant differences		t-Test: insignificant differences	
	Observations #0	1,98	1,49	1,05	1,05
		t-Test: significant differences		t-Test: insignificant differences	
NPER	Total Observations	0,51	0,57	0,33	0,32
		t-Test: insignificant differences		t-Test: insignificant differences	
	Observations #0	0,66	0,76	0,73	0,72
		t-Test: insignificant differences		t-Test: insignificant differences	

(Source: Author projection, based on the data provided by the BVB sites)

4.5. The gender of the CFO and the provisions

Muttakin *et al.* (2019) stated that the characteristics of the CFO (they refer mainly to tenure and to the membership of the board of directors) influence the level of prudence in financial reporting. I also propose, considering once again that the provisions are a manifestation of accounting prudence, to see to what extent their recognition is related to the gender of the CFO, in the case of companies analysed in this study. Identifying the type of the CFO (of the person who signs the financial statements in this capacity) for Romanian companies is relatively easy, because the name of this person appears explicitly, most of the time, in the format sent to the tax authorities. Thus, we identified a higher share of women as CFO, both on the regulated market (56.06%) and on the AeRO market (80.74%). The difference in observations (Table 8) is explained by the fact that the name of the CFO was missing or, instead of a natural person CFO, the name of an accounting firm appears in the financial statements.

Unlike all the previous situations, even if in table 8 we see that the average PTA and NPER ratios is systematically higher for companies whose CFOs are men, only the differences related to the AeRO market in the case of the PTA are statistically significant.

Table 18 – PTA and NPER average ratios, according to the CFO gender

Indicators		Regulated market (2001-2020)		AeRO market (2010-2020)	
		Male CFO	Female CFO	Male CFO	Female CFO
PTA	Total observations	1,44	1,23	0,63	0,41
		t-Test: insignificant differences		t-Test: significant differences	
	Observations #0	1,89	1,62	1,38	0,98
		t-Test: insignificant differences		t-Test: significant differences e	
NPER	Total observations	0,56	0,51	0,36	0,31
		t-Test: insignificant differences		t-Test: insignificant differences	
	Observations #0	0,73	0,67	0,78	0,72
		t-Test: insignificant differences		t-Test: insignificant differences	

(Source: Author projection, based on the data provided by the BVB sites)

5. CONCLUSIONS

The presence of the provisions in the balance sheet, together with the presence in the profit and loss account of the net provisions expense can be considered as a manifestation of the accounting conservatism. This form of prudence results from regulation, but, as with other accruals-generating techniques, it often depends decisively on the estimates made by the enterprise and can be framed in earnings management techniques. In fact, the provisions are placed by the literature in the field of conditional conservatism (news dependent), although according to RAS, we could also identify influences of unconditional conservatism (especially in the case of provisions related to some transactions with the employees.

Taking into account financial data provided by the individual annual financial statements of Romanian companies listed on the two current segments of the capital market, for the period 2001-2020 (in the case of companies on the regulated market) and for the period 2010-2020 (in the case of those listed on the alternative market AeRO), I aimed to identify the ratio of provisions to total assets (PTA), respectively the ratios of net provisions expense to revenues (NPER).

After winsorinzing the outliers, the main results can be summarized as follows:

1) the share of companies with provisions in the balance sheet is double on the regulated market compared to the AeRO market, and the evolution on the regulated market is clear in the sense of significantly increasing the share of companies reporting provisions, with two significant thresholds (2006 and 2011);

the financial crisis that began in 2008 also has effects on the share of companies with provisions; on the contrary, the AeRO market seems quite calm in the sense that the share of firms with provisions remains relatively the same, with a downward trend even over the whole period;

2) the size of the companies (estimated by total assets) significantly influences the ratio PTA of companies listed on both markets, as well as the NPER; the only insignificant difference being recorded on the regulated market, at the profit and loss account and only if we retain only the observations with reported provisions;

3) companies on the regulated market have much better average profitability than those on the AeRO market; the share of provisions in the balance sheet is higher for more profitable companies, only for the regulated market and, partially, for AeRO;

4) the average leverage of the companies on the regulated market significantly exceeds the leverage of those on the AeRO; in both cases, more leveraged firms appear to report more provisions in the balance sheet than those with below-average leverage; on the other hand, the ratio NPER do not differ according to the leverage;

5) the presence of internationally affiliated auditors contributes somewhat to reported some more provisions;

6) the clean audit opinion is significantly associated with higher provisions only on the regulated market and only for the PTA;

7) taking into account the CFO gender, the ratios PTA and NPER are systematically higher for the companies whose financial directors are men; however, the differences are statistically significant only for the PTA on the AeRO market.

The main limitations of the study consist, first of all, in its strictly descriptive character, i.e. in the absence of establishing correlations between variables that take into account the weights of provisions and that ensure the econometric explanation of the meaning of influences. Also, a limit can be the mixture between the listed companies on the two categories of the Romanian financial market, which makes the studied population a little heterogeneous.

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GLOBALIZATION OF INFLUENCER MARKETING AND ITS MACROMARKETING IMPACT ON SOCIETY

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ABSTRACT

Influencer marketing is increasingly growing in social media because when it comes to influencing consumer's intention to buy, this marketing strategy has proved to be very efficient in recent years. Thus, the scientific literature has talked a lot about the ways marketers could use opinion leaders' influence to shape the attitudes and behaviors of their potential customers. But consumers' persuasion techniques affect people beyond the decision-making process, in various ways like cognitive, mental, behavioral, psycho-social etc. Given the expansion of influencer marketing, these effects also require certain responsibilities that both brands and opinion leaders have towards their audience and towards the whole society in general. The present essay aimed to highlight, from a macromarketing perspective, some serious influencer-related social media trends that have a strong impact on consumer's behavior. This impact, identified by analyzing research articles, but also blog posts, vlogs, and press articles, could be the subject of future research papers, considering that as far as we know, there is a lack of studies approaching the subject from the macromarketing perspective.

Keywords: Influencer; opinion leader; influencer marketing; micromarketing; moral responsibility; brand responsibility; business ethics.

JEL Classification: M30, M31, M37, M39, E71

1. INTRODUCTION

Marketing is the "center of the universe" nowadays and without it, you can only "sell mediocre things to mediocre people" (Godin, 2021). But for businesses, getting potential consumers' attention into the information overflow is quite difficult. However, in recent years, opinion leaders (influencers) have managed to

get people's attention on social media and proved to be very efficient in influencing their buying behavior (Kwon and Song, 2014). Therefore, influencer marketing is currently the fastest growing area in marketing, with 59% of marketers saying that they plan to increase their budget for this field because influencer marketing campaigns earn $ 6.5 for every dollar spent (Digital Marketing Institute, 2018).

With their strong impact on people's buying decisions, opinion leaders were analyzed a lot in the scientific literature (Hudders *et al.*, 2020; Huhn Nunes *et al.*, 2018; Saito *et al.*, 2015; Kwon and Song, 2014; Bakshy *et al.*, 2011; Eck *et al.*, 2011; Momtaz *et al.*, 2011), but it is considered that there is still an urgent need for additional research papers on this topic (Taylor, 2020, p. 889). Almost all the studies consulted for this essay approach the subject from a micromarketing perspective, talking about the activity of influencers (Hudders, *et al.*, 2020) and about how their influence is produced in the brand-influencer-consumer sphere (Kwon and Song, 2014), in order to suggest influencer marketing strategies based on some key elements in consumer's persuasion techniques (Huhn Nunes *et al.*, 2018; Saito *et al.*, 2015; Bakshy *et al.*, 2011).

Knowing influencers' impact on consumer's behavior and their buying intention is useful for marketers. But with constant growth (Kádeková and Holienčinová, 2018, p. 90), influencer marketing is a phenomenon that goes beyond simply influencing buying decisions. As Andrew Stephen suggests, experts should also consider the long-term effects of digital marketing activities (and also influencer marketing activities), by looking at more consumer outcomes, including psychological constructs (Stephen, 2016, p. 20). All these effects "may be subtle but cumulatively important" (Stephen, 2016, p. 20). Hence, this paper will try to raise awareness of some macromarketing effects that influencer marketing has on society in order to attract researchers' attention for further investigations. Some of these effects were highlighted in research papers but others seemed to be neglected. As a consequence, we expanded our research sources and we will also present some of the effects that were interestingly pointed out in vlogs, blog posts, press articles and documentaries, considering that they could be more seriously analyzed in future research.

1.1 Motivation

Analyzing and being aware of the effects of influencer marketing activities on society from a macromarketing perspective can be useful to the business environment for multiple reasons. First of all, knowing and understanding such aspects is a business intelligence element, as it provides an overview of the effects that, cumulatively, certain influencer marketing activities could produce over time. This can be an early warning system for possible mass changes in consumer behavior, especially since inevitably, by being always around us, marketing "changes us all" (Godin, 2021). Secondly, for a solidarity-oriented economy, and

under the aegis of a social responsibility that has become a global trend (Gorokhova, 2020, p. 449), the economic objectives are not (anymore) the only ones through which marketers should think their strategies. Marketing is almost everything around us (Godin, 2021), which means companies have a responsibility for what and how they do, how they bring what they do to the customers and what are the side effects of such activities (Hubspot, 2019). Moreover, marketing should be about doing "better" and about changing something through such activities, not just about selling (Godin, 2021).

2. LITERATURE REVIEW

2.1 Definitions

Influencer marketing is a marketing strategy that uses key individuals with a strong influence on a large number of people (Bakshy, *et al.*, 2011, p. 1) to promote brands, products, or services (Charlesworth, 2018, p. 42). Such people with a strong influence (influential people) are named in various ways: influencers (or influentials), opinion leaders, market mavens, or key players (Momtaz *et al.*, 2011, p. 45). Some experts consider that these terms express the same thing, while others find some differences between them.

According to Lawrence Feick and Linda Price, there would be a difference between opinion leaders and market mavens. Opinion leaders would have a strong influence because they know very well a certain category of products they use and interact with, while market mavens' influence would be correlated with their expertise when it comes to the market in general. Market mavens are considered to know a lot of products, stores, and other aspects of the market, without necessarily using all the products they can talk about (Feick and Price, 1987, p. 84).

There could also be a difference between influencers and what we call key opinion leaders (KOLs) according to other researchers. Influencers would have gained this status only through social media, where they have become "micro-celebrities" because they have worked on "self-celebration" by sharing aspects of their personal life with others (Hudders *et al.*, 2020, p.7). Therefore, they are often paid for social media advertising partnerships. Key opinion leaders would rather be the celebrities (even if, according to other authors, celebrities were, in fact, the first influencers – Unimedia, n.d.). Celebrities are popular on social media due to the fact that they work into another field where they have the expertise and through which they have gained their fame (journalism, politics, acting, sports, business, fashion etc.). There is an assumption that celebrities do not deal with social media advertising as much as influencers do (Influencity, 2018). Celebrities could be considered more authentic and their recommendations would only concern brands that align with their values and from the fields they have knowledge about (so they could be considered prescribers) (Kolsquare, n. d). However, not all these

delimitations between influencers and KOLs apply. This is why some authors consider these two terms the same thing (Casalóa *et al.*, 2020, p. 510), and others just offer very general definitions (e.g. influencers are all those who post on social media in exchange for compensation – *apud*. Hudders *et al.*, 2020, p. 7). According to Carter, influencers are individuals with credibility and a large number of followers on their social media accounts (*apud*. Hudders *et al.*, 2020, p. 7). The number of followers is often used by marketers as a way to identify opinion leaders, because the higher the number of followers, the more people could see the (commercial) message; and that would generate word-of-mouth (De Veirman *et al.*, 2017, p. 1). Therefore, given the information discovered in the academic literature and the various situations where all the concepts seem to overlap, we will accept the next definition for all the terms (influencers, opinion leaders, market mavens): active and strong social media users, seen by others as reliable sources (*apud*. Hudders *et al.*, 2020, p.7).

2.2 The power of influencers

The effectiveness of opinion leaders first attracted researchers' attention during the 1940 U.S. presidential election, when opinion leaders were considered those who, through interpersonal communication, had a stronger influence on others in terms of voting decisions than the media (Lazarsfeld *et al.*, 1944 *apud*. Trepte and Scherer, 2010, pp. 119). Opinion leaders were having the capacity to determine certain attitudes and behaviors to those they were interacting with, due to a wide range of contacts and social skills (Winter and Neubaum, 2016, p. 2).

Over time, the concept of opinion leader was no longer limited to the political field, because it started to interfere with marketing. Experts soon realized that when it comes to the buying process, people seem to prefer to have a trusted person to inform them and guide them to make decisions. This was also highlighted in the bounded rationality theory of Herbet Simon (1982) (*apud*. Momtaz *et al.*, 2011, p. 45). Thus, opinion leaders can be considered a way to reduce potential shopping risks (Nunes *et al.*, 2018, p. 58), due to the advices they give on the use of certain products, but also life in general. They serve as models to be copied (Nunes *et al.*, 2018, p. 58), a fact also supported by Albert Bandura's social learning theory (*apud*. Lim *et al.*, 2017, p. 21). Therefore, these individuals seen as "behavioral models" should be aware of the long-term side effects of their activity.

3. THE MACROMARKETING IMPACT OF INFLUENCERS ON SOCIETY

Consumer behavior and buying behavior are strongly influenced by social media (Bandara, 2020, p. 478), and people's lives are considered "omni-social" (which means that from a marketing perspective, almost every single part of the purchase decision process is influenced by social media – Appel *et al.*, 2020, p.

82). Thus, a significant number of the articles consulted for this essay identified certain side-effects of social media usage that should not be neglected. Not all of them are directly related to influencer marketing, because many only focus on the impact of social media as a communication channel on its users. Some of the consequences of using social networks identified by specialists deserve to be mentioned here: unsustainable food consumption (Simeone and Scarpato, 2020), the tendency to spend more money (Becker, n. d.), and the degradation of mental health (Parnell, 2017), interpersonal communication (Subramanian, 2017), self-image (Henriques and Patnaik, 2020; Kleemans *et al.*, 2016) and self-esteem (Chen *et al.*, 2019; Jan *et al.*, 2017). But to an extent, these could also concern influencer marketing, social media marketing and digital marketing in general, especially since in recent years social media has become less about the social interaction of the users of these platforms and more about marketing, as people can be considered the "products" that sell their time to the marketers (The Social Dilemma, 2020).

According to Emarketer, in 2019, there were more than 500,000 influencers on Instagram alone ("influencers" accounts were considered the ones with over 15,000 followers), which means about 39% of all existing Instagram accounts (Droesch, 2019). It also seems that being an influencer is a status desired by many other social media users. According to a CNBC study, 86% of U.S. youngsters would like to post content on social media for money (Locke, 2019) (Fig. 1).
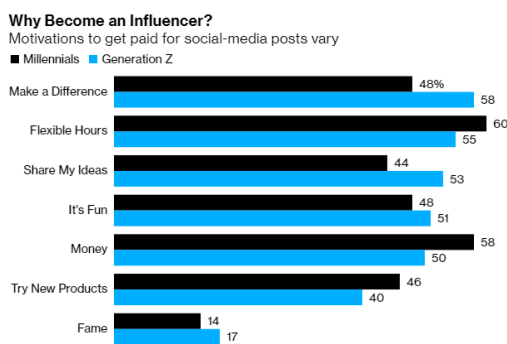
(Source: Townsend, 2019)

Figure 1. The main reasons youngsters want to become influencers

All these reasons could be correlated with a much more complex phenomenon. It is called *flex culture*, which refers to the idea of showing off the wealth (even the opulence) and success that someone has (Ferg, 2019a). Thus, to maintain their fame on social media, many opinion leaders try to attract their audience with an out of ordinary and extravagant content, because people tend to follow those who are (or seem to be) successful (Smith, 2020). Influencers that like to flex would share their material possessions, luxury-brand clothes, exclusive

ways of spending free time and everything related to excess and especially the excess of "new money" (i.e., the money earned from the "new" jobs, for example, through social media – Ferg, 2019a). These are intangible things to ordinary people that could lead to the false impression that influencers have a perfect life (Ferg, 2019b).

Although attractive, this type of content can make those who see it compare their lives to those of others, feel envious, and lower their self-esteem (Jan *et al*., 2017, p. 337). Besides that, it encourages FOMO (fear of missing out). FOMO can have two meanings:

(a) the fear of not losing opportunities, connections, or events on social media (Parnell, 2017), an aspect related less to influencer marketing, but more to the use of social media in general (so it does not directly concern the present paper);

(b) the fear of not being socially validated by others in terms of possessions. The immediate consequence of this thing is consumerism (which can cause stress and degrade the environment and the moral values – Scott, 2017). As a consequence, people tend to but things not necessarily because they need them, but because they try to stop this fear of not being in trend with others and especially with their favorite influencers (SMF Wealth Management, 2019).
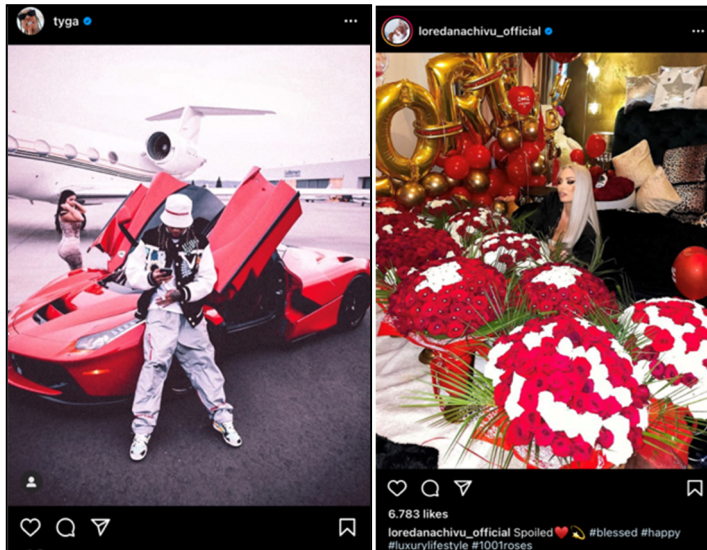
(Source: Instagram @Tyga, left / @loredanachivu_official, right)

Figure 2. Flex culture

(Source: Zaworski, n.d)
Figure 3. Flex culture

Opinion leaders encourage what psychologists call social validation (SMF Wealth Management, 2019). In order to be like their favorite influencers, people have developed some kind of "shortcuts" (e.g., a video called *10 Ways to Look Expensive on a Budget* has 1.5 million views on YouTube – Smith, 2020). These kinds of shortcuts into getting the influencers' fame and success are also embraced by influencers with fewer followers (microinfluencers), so they can grow their metrics. For example, in Los Angeles, there is a studio that mimics the interior of a private jet where people can take pictures with themselves for a certain fee. Several influencers were exposed on social media because they were all posing in the same setting (where certain details revealed that the location was, in fact, a studio and not a private jet). Some of them admitted that they were in a photo studio after that (Lucas, 2020). Here, we can also talk about the Bow Wow Challenge. The name of this trend started from the American rapper Bow Wow, who had once posted on his Instagram account a photo with a private jet, claiming that he was going to travel to New York. However, a fan saw the artist in a normal plane, flying economy class. The fan took a picture with the rapper and posted it on social media, reminding people of the artist's initial post (Farokhmanesh, 2017).

Another thing that needs to be mentioned here are the websites that sell empty boxes and bags from various luxury brands that can be used in photos meant to expose opulence on social media (Stockel-Walker, 2020). These things do not necessarily mean that all opinion leaders practice such activities, but the idea we

want to refer to is related to the impact of such content on society and consumers' mental health. Social media often only shows a highlight reel of people's lives (which means, as in sports, the best moments in an athlete's life put all together in a short film). Thus, people end up facing self-insecurity, comparing their normal life (behind-the-scenes) with the highlight reel of others (Parnell, 2017). The desire to have the life of influencers is also fueled by the idea that by spending and buying more you can get closer to them, hence the problem of consumerism (Becker, n. d). Another problem identified by specialists with this *fake flexing* is that it encourages the idea that education is not necessary to get the so-called new money (Lorenz, 2019).

Influencers' activity on social media also has other repercussions for the mental health of those who follow them. Photo editing applications have gained a great popularity in recent years among Internet users and, implicitly, among influencers, because for them, the photos they post are supposed to get them likes and engagement (thus a lot of them try to post beautiful, "perfect" pictures). One in four girls and one in ten boys admit using such applications to change the appearance of their face or their body (Wright, 2020). Even without retouching techniques, the posture of the body can turn a normal picture into what seems to be the perfect one (or at least, the better one). These things often create intangible beauty standards.

Although not real, such photos make social media users, and especially adolescents, compare themselves to others and feel dissatisfied with their physical appearance, and lower their self-esteem (Kleemans *et al.*, 2016). This is also amplified by the fact that in most cases, there is no mention of using any photo-editing application (10% of the photos on Instagram with the hashtag #nofilter are, in fact, edited with at least one filter – Petterson, 2017). This creates the false impression that people look in real life like they do in pictures and. More and more teenagers experience anxiety and fear of showing their appearance when they realize that they cannot meet such beauty standards.

To imagine how strong the impact of edited photographies can be, the "Redefine Pretty" experiment discovered, in 2018, that showing women retouched photos with other women generates, in the cerebral amygdala, an activity that is similar to the post-traumatic syndrome brain activity (My Pale Skin, 2018), making the viewer not satisfied with their own image.

(Source: Applied Consumer Neuroscience, 2018)

Figure 4. Amygdala activity in response to retouched photographs during the Redefine Pretty Experiment

If in photos such techniques are more easily observable, there are also the *live filters*, which can be applied when a person makes a video. The filters move almost in the same way the face does. James Welsh is a well-known content creator on YouTube, Instagram, and Facebook, where he often posts videos explaining how people can easier notice such filters so they will not be tricked by the influencers: nose, chin or waist reduction, enlargement and lightening of the eyes, enlargement of the bust or arms (often used by men) (Welsh, 2020).

In addition, it seems that the use of these filters contributes to the normalization of the cosmetic surgery or other cosmetic procedures (Chen *et al.*, 2019). It seems that social media users can have a stronger desire to go through cosmetic procedures. In fact, in the United States, in 2017, 229,000 cosmetic procedures were performed on patients between the ages of 13 and 19, and the number is constantly growing (Paul, 2018).

4. CONCLUSIONS, RECOMMENDATIONS, AND FUTURE RESEARCH

Given the strong connection of social media influencers with their communities, both marketers and opinion leaders should seriously analyze the long-term effects of the influencers on consumer's behavior. Their efficiency in marketing can also have a serious impact on consumers' mental health and on the environment, effects that should not be neglected.

Raising the awareness of the implications that influencer marketing has on society from a macromarketing perspective could be the first step to avoid such problems. In addition, a recommendation for both brands and ordinary social media users would be to align with authentic opinion leaders. An example of such influencer is Danae Mercer (2 million Instagram followers) (Fig. 5). On her YouTube channel and her Instagram account, she posts content that encourages people to appreciate themselves as they are and to stop aspiring to the false perfection they see on social media, exposing the inauthentic part of all these networks.

Further research should analyze and point out how marketers could improve or change their influencer marketing strategies to reduce potential *social harm*. It is clear that influencers are effective when they promote brands, but it is also clear that there is a strong need of rethinking the ways they make people act and feel.
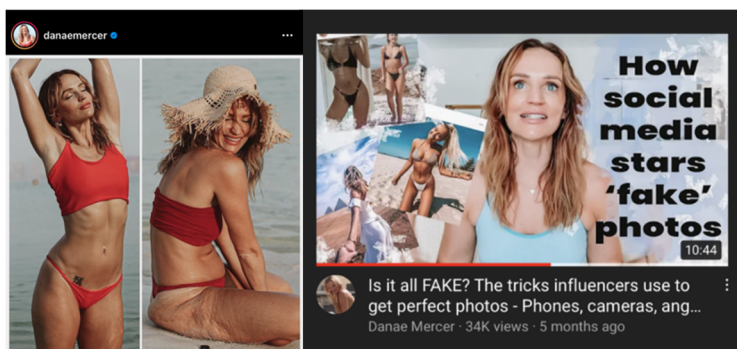
(Source: Left – Instagram @danaemercer. Right – YouTube Danae Mercer)
Figure 5. Responsible influencers

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VISUAL BRAND COMMUNICATION ON INSTAGRAM. A STUDY ON CONSUMER ENGAGEMENT

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ABSTRACT

In today's online social networking, visual communication carries a crucial role in corporate and public communication. With its penetrating features, social networking has the capacity to pull countless individuals to interact with others and it has the ability to change engagement behaviours on social media, additionally tallying to sales. High quality visuals can boost a brand's image on SNS and are starting to become a main feature in the organization's activities. Therefore, this study will aim to discover in what manner visual communication affects the consumers' engagement process with brand related content on social media platforms. In order to get more specific results, Instagram social platform will be used as a central focus point, the reason for this choice is that Instagram the platform is widely popular and is mostly a visual content sharing platform, making it most adequate for this research.

Considering the consumers' tendency toward social media platforms, brands have no choice but to follow and master the ways of communicating with them in these new circumstances. To achieve said engagement, brands have to identify what type of visual content triggers the most favourable reaction. Thus, this study will focus on understanding the factors that make users engage with certain visual content and on how said engagement changes they interaction with brand related content.

Keywords: visual communication; consumer engagement; social media platforms; Instagram; brand visual communication.

JEL Classification: M30, M31

1. INTRODUCTION

Along with the increase of innovations in technology, digital photography and digital communication, increase in request of aesthetics has started a remarkable shift in visual communication adopting diverse media over the former two decades (Boomgaarden *et al.*, 2016). In nowadays internet community, visual communication is regarded as the main element in corporate and public communication. Social media with its active features has enticed millions to enrol on Social Networking Services (SNS) in order to interact with others.

Considering that social media users depend strongly on visual contents to interact, visual communication can be regarded as a fundamental method used to increase social media engagement, audience and sales. Expressions such as "visual content is king" or "a picture is worth a thousand words" are to be believed veracious when messages transmitted through visual communication on SNS are intensely appreciated. But with all importance, imagery does carry a significant amount of power, particularly for brands, on social platforms given that visual elements enable marketers to create stronger connections with consumers (Neher, 2014).

The increasing popularity of social media platforms such as Facebook, Instagram, Twitter, Pinterest, Reddit, YouTube etc., has pushed brands to form their social media presence and constantly seek engagement with prospective customers in order to maintain an affable relationship with them. This enables followers to reveal their opinions through likes, comments or shares (Schivinski *et al.*, 2015). Sharing brand-related content became an essential part of the activities carried out on social media and this major shift of interests for visual content has viably changed the understanding of individuals among themselves and the environment around them (Russmann and Svensson, 2017). Visual content has been recognised as being more effective than text content in communication, being a powerful tool in helping brands to increase their social media presence (Brubaker and Wilson, 2018). Since visuals deliver clear and actual depiction of information and are easily available to an individual's memory, making recall and processing quicker (Jakus, 2018), they can be beneficial for

corporates to develop stronger connections, enhance believability and further nurture communication (Neher, 2014).

Out of the newer social media platforms, those with visual content sharing features such as Instagram, have gathered great success and captivated a massive following (Neher, 2014). The notion is simple; sharing images with pears and other users adding little to no text to the posts. Instagram was able to keep its user base quite consistent over the year 2019, around 1 billion people have been reported to actively use the social media platform (Chen, 2020). The reality is that consumers are increasingly leaning towards using visual platforms, and brands should not disregard this. Recent studies are showing that over 25 million brands are actively using Instagram for promotion, and 90% of the platform's users are following at least one brand (Chen, 2020).

There are multiple reasons for Instagram's popularity, the platform came up with something different at the time when it was launched, keeping its concept simple and concentrated on its main feature; visual content sharing (Eler, 2020). Additionally, it has drawn onto the field of visual communication, where imagery tells a story and users can share their lives through pictures (Walter and Gioglio, 2020). Visual communication was by no means a new concept at the time the platform was launched, but it did rose in popularity through the use of it in such context (Eler, 2020).

Billions of people use social media daily, making it the defining technology of the past two decades. Worldwide, as of January 2020, the social media usage rate reached 49 percent, and by 2025 is estimated that the total of social media users will count 4.41 billion (Tankovska, 2021). Provided that social media offer a massive prospective audience that spends hours daily consuming content on a variety of platforms, it is understandable that brands have adopted said platforms as a means of communication.

The social media subject has been adopted by academics as well, setting bases for an extensive framework of research on both social media and other connected subjects. Despite of what scholars and specialists have explored and learnt over the last two decades, because of the rapidly changing character of social media, it is possible that the future usage patterns of social media to not be just an extension of what it is already known. A popular trend in social media is the increase in visual information exchange (Chua and Banerjee, 2015). Namely, platforms based on imagery, such as Pinterest or Instagram are rapidly gathering users' and brands' interest.

2.   METHODOLOGY

The purpose of this study is to investigate the main factors that influence consumers in interacting with brand related content on social media, more exactly on the platform Instagram and how does this content affect them. By observing the activity of 10 the most followed brand pages on Instagram, we want to

understand what aspects influence the level of interaction of users with their posts. As Instagram's popularity is increasing among users and brands alike, so is the need to understand the drive of users to engage with different types of visual content.

To reach the aim of this paper, the following questions will be examined:

• What type of content do the most popular brands post on Instagram?

• What effects do selected posts have on people's level of interaction?

Despite the diverse collection of social media platforms in order to fit the limited coverage of this study, only one platform was chosen for analysis, specifically Instagram. One of the social media platforms with the fastest growth, Instagram reached since its commence in 2010, approximately 1 billion active users each month (Kemp, 2021). Given its popularity many brands recognised the potential Instagram has as a communication channel. This study will analyse content from top ten most followed brand content creators on Instagram as of 2020, and they are as follows:

• Nike is the most followed brand on Instagram with over 127 million followers at the beginning of 2021. The company designs, develops, manufactures and sells sportswear and equipment worldwide, sponsoring at the same time prominent athletes under the highly recognised trademarks of "Just Do It" and the "Swoosh" logo.

• Victoria's Secret although on the second place, it has half of Nike's followers, keeping a constant of 68 million followers for the past year. The lingerie, beauty and clothing retailer has been struggling since 2016, because of changes in customers' preferences and continuing controversy with corporate leadership's business practices.

• Huda Beauty, the cosmetics line launched in 2013 by Huda Kattan, makeup artist and businesswoman, counted at the beginning of 2020, 48 million followers on its Instagram page. Rather than pictures with their products, Huda keeps her followers' interest with pictures and videos with educational content covering makeup tips and tutorials, and reposts with uploads from her followers using the brands' products.

• Chanel, luxury clothes brand, takes the second place in the fashion sector with almost 43 million subscribers. Like most fashion brands, they follow the trend of posting images and videos with their products, behind the scenes footage from fashion shows and celebrity endorsements.

• Gucci follows closely behind with 42.5 million followers. This luxury brand is well-known for manufacturing handbags, shoes and accessories, but it also produces cosmetics and perfume, in addition to home décor.

• Zara, fast fashion producer, found the perfect platform to reach its audience, that being Instagram. The platform works well with Zara's captivating content and well organised influencer campaigns, fact obvious when looking at the number of followers, 42.3 to be more exactly.

• Louis Vuitton Malletier, generally recognised as Louis Vuitton, has a wide range of products in its portfolio. This luxury fashion brand is loved by many across the globe, fact shown with the steady increase in its Instagram followers, the brands' page reaching almost 42 million subscribers.

• H&M (Hennes & Mauritz AB) is another fast fashion producer and retailer, which targets mostly a lower to middle class audience with its products. The brands' Instagram page has around 36.5 million followers.

• Adidas Originals is part of a sport and casual clothing line created by German multinational Adidas. Despite the fact that the main branch has its own Instagram page, the Adidas Originals subcategory seems to have dragged more attention, considering the difference between the two of almost 10 million followers. With its retro old school vibes products, the brand gathered 35.4 million subscribers on the platform.

• Dior is another luxury brand that captured the attention of users on Instagram, its page having 34 million followers. The brand's posts appeal to a specific niche, translating its offline campaigns into online ones with pleasant aesthetics and eye-catching content.

The objectives of the study are:

• To identify the engagement levels of the ten brands' Instagram pages in terms of followers count in 2020;

• To classify the chosen posts in view of post elements and to measure the engagement levels of each of the major categories in connection with the number of likes;

• To categorise the types of comments under each post analysed in order to determine the general tendency of users' feedback on brand-related posts.

The method we used is the content analysis, which is recommended for many types of text, for example, article, letters, blogs, and speeches, both in physical and digital formats, as well as for text in form of visual media, such as photos, video or film. It is also suitable for analysing the latent and the manifest content of a text. Latent content, referring here to the message that lies beneath the manifest content, while the manifest content includes the evident elements of a message.

We created a codebook, in which we added all possible characteristics of a post on Instagram. The codebook's main purpose is to code the elements of a post into different categories, for example, if the picture contains people or a product, if the picture is related to the brand or not, or if it is a call to action. If a post stimulates the use an explicit hashtag, the diffusion of said hashtag will be counted in the number of posts uploaded. Because each post has elements from more than one category, the categories are coded individually. By utilising content analysis, we aim to determine which are the factors influencing customers' interaction with brand content positively or negatively.

The data compiled regarding the posts have been gathered into Excel and further analysed. The results are illustrated in form of charts and tables in order to be clear and explicit. In the first subchapter of the analysis, we present and explain general data about the brands, regarding engagement rates in form of 'likes' or 'followers'. Later on, the major findings regarding the posts are analysed and compared and lastly, the correlation between the elements of the posts and engagement rates are tested with the idea of finding further information on the reasons why the users engage with certain types of content.

To generalise a sample, we must select it randomly (Neuendorf, 2017). The posts chosen for the analysis are top 9 posts with most likes in 2020 on the brands' profiles, in total 90 posts. For each post, ten comments have been analysed to further measure the impact of the posts on the users. The comments were chosen based on a skip interval calculated separately for each post. The skip interval method was adapted to every post separately in order to give each comment an equal chance of being selected for analysis (Neuendorf, 2017).

A test study was performed to ascertain coder reliability and validity. Following the test study, before using the codebook in the actual gathering of materials the codebook was adjusted. Given that all material was manifest, it was reasonably simple to code the content thus making coder reliability trustworthy (Neuendorf, 2017). All variables by which the posts were categorised are clearly outlined in the codebook to avoid misunderstandings throughout the coding.

As stated formerly, the primary objective of the codebook was to encompass all probable features of a post on Instagram. Though, when the coding began, it became obvious that not all categories were applicable. For instance, it was not possible to determine if the posts were showing nature or urban settings, if a brand tag was visible or not, or if a post contained information. Hence, the analysis of these categories will not be extended.

3. FINDINGS

3.1 Followers

As stated previously, the brands selected for the analysis are the most followed brands on Instagram as of the end of 2020, according to the public statistical database from SocialBlade.com.

Followers 2020 (total)
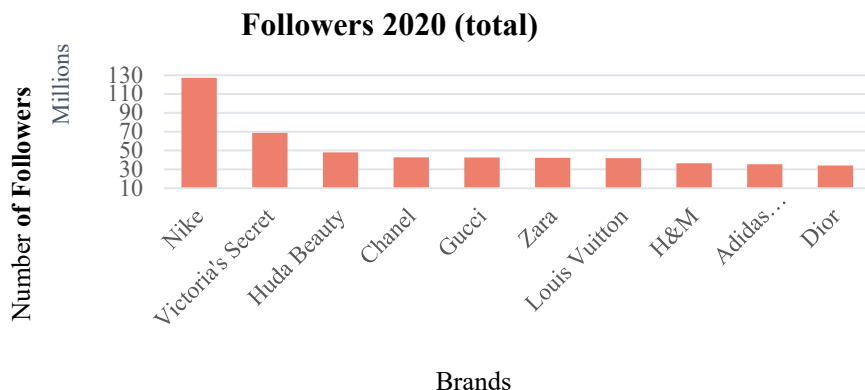
(Source: own processing)

Fig 1. Number of followers for each brand

The total count of followers for each brand at the moment of coding is illustrated above (Fig. 1). As shown, in the first place with almost 130 million followers, Nike surpasses the next nine brands by far. On the second place, Victoria's Secret Instagram page totals almost half of Nike's followers, at 68.8 million followers. The followers' distribution between the next 5 brands is of smaller difference, with 48 million followers for Huda Beauty in third place, and 42 million followers for Louis Vuitton on 7th place. The last three brands H&M, Adidas Originals and Dior, share a similar number of followers, 36.5 million, 35.4 million and 34 million respectively.

Growth Rate (2019 - 2020)
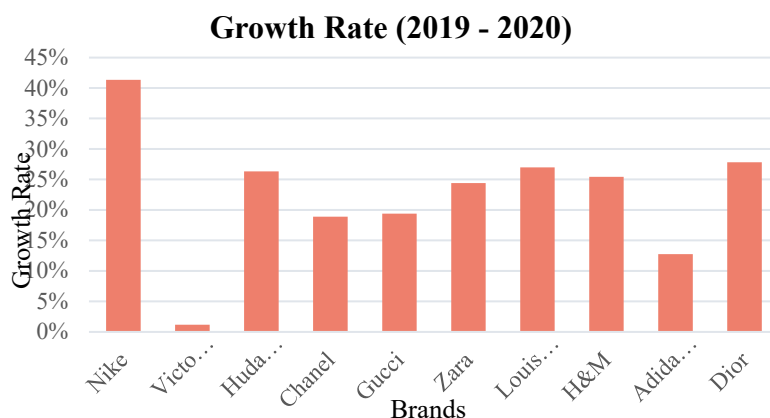
(Source: own processing)

Fig 2. Followers Growth rate, from 2019 to 2020 for each of the 10 brands.

By comparing data regarding followers from 2019 to those from 2020, we can calculate the followers' growth rate for the ten brands. As depicted (Fig. 2), Nike is in the first place with a growth rate of 41%, in the past year gaining over 37 million followers. With growth rates between 24% and 28%, we can see Zara, Huda Beauty, H&M, Dior and Louis Vuitton. Chanel and Gucci share the same rate at 19%, while Adidas Originals reached a growth rate of 13%. With the lowest rate, Victoria's Secret reaches only 1% growth, 80000 followers were added to the total count over the past year. Considering the evident gap between the growth rates of Victoria's Secret and the other nine selected brands, we should take a closer look at the motives behind such discrepancy. Multiple factors affected the popularity of the brand, mostly in the last 4 years. Starting with the inability to ride the new flow of customers' preferences, from push-up and padded bras to sports bras and bralettes, as well as failing to adapt to recent trends regarding body positivity.

Table 1. Representation of post elements.

Post elements	N	Yes	No	% of positive answers
Product	90	71	19	79%
People	90	67	23	74%
Celebrity	90	38	51	42%
Information	90	36	54	40%
Object	90	33	57	37%
Brand tag	90	31	59	34%
Behind the scenes	90	23	67	26%
Shop Link	90	21	69	23%
Social awareness	90	10	80	11%

(Source: own processing)

Above (Table 1) we can see the distribution of elements between the posts chosen for the analysis. As in one post we can find multiple elements at once, the overall percentage surpasses 100%. The table illustrates that posts including products from the brands and people, are the most frequent, 79% and 74% respectively. The 'product' category emphasizes the fact that Instagram is widely

used by companies to spread information about their products to the audience, while the 'people' element highlights that almost all of the ten brands used for the analysis are from the fashion industry, making the use of models to showcase their products a principle.

Table 2. Comparison between posts perspectives and likes

Perspective	N	Mean of likes	% out of total posts
Close-up	31	793 018	34%
Wide-shot	41	328 383	46%
Both	18	493 228	20%

(Source: own processing)

Additionally, 67 posts out of the 90 analysed, had a close-up or a wide-shot viewpoint. Theoretically speaking a close-up is "a photograph or movie shot taken at close range" while a wide-shot or long shot refers to "a video or photograph with the camera positioned to observe the most detail" (2020). As it can be seen above (Table 2), 34% of the pictures analysed were taken from a perspective of close-up, while 46% were wide-shots. On the other hand, when taking a look at the mean number of likes per each type of post, close-ups have twice as many likes compared to wide-shots.

It is possible to attribute this discrepancy among the total number of likes, to the fact that Instagram is mainly used on smartphones, and they have smaller screens compared to other devices, meaning that posts, where details of products are easier to discern might attract the attention of more users.

3.2 Engagement levels

Social media is a great marketing tool for developing customer relations as well as brand recognition. Nonetheless, it is not sufficient to just post content that adheres to the structure of conventional marketing strategies. Brands must upload material customised to the medium and their targeted audience in order to attract active and committed users, who engage with the brand on their own choice.

Table 3. Average engagement rates in 2020 for the ten chosen brands

Brand	Followers	Average likes/post	Average comments/post	Engagement rate
Nike	127 200 000	729 200	7 717	0.60%
Victoria's Secret	68 800 000	62 592	170	0.09%
Huda Beauty	48 000 000	114 178	8 013	0.25%
Chanel	42 800 000	66 273	201	0.16%
Gucci	42 500 000	57 449	205	0.14%
Zara	42 300 000	28 835	169	0.07%
Louis Vuitton	41 900 000	108 726	389	0.27%
H&M	36 500 000	94 913	303	0.26%
Adidas Originals	35 400 000	90 132	363	0.25%
Dior	34 000 000	50 373	167	0.15%
Page X	100 000+	-	-	1.7%

(Source: Data retrieved from audit platform speakrj.com (Jain, 2020), accessed at January 2021)

It is necessary to state that it is impossible to determine if the users that engage with content on Instagram through 'likes', 'comments' or 'hashtags', are following the profiles on which the content was posted since brands' pages are public and users are free to interact with their posts regardless of their status. Despite this, for this segment of the analysis we chose to relate the number engagement elements to the number of followers the brands' pages have since we do not have access to further data that might give us more insight.

The engagement rate is a measuring tool used to track the audience's level of interaction with specific content and respectively finding the effectiveness of the campaign of a brand or its social strategy. A commonly used method to calculate the engagement rate is by summing the total number of likes with the total number of comments, diving them by the number of followers and multiplying all with 100:

Engagement Rate = (Likes + Comments) / Followers x 100 [1]

In the table above (Table 3), we can see the engagement rates of all ten chosen brands at the fin of 2020 as well as the average engagement rate for pages with over 100.000 followers based on the examination of over one million Instagram profiles (Jain, 2020). It is obvious the fact that none of engagement rates of the brands chosen for the analysis reach the average rate based on their number of followers. Nevertheless, Nike still holds the first position in this ranking, with a rate of 0.6%, while the next brand, Louis Vuitton, reached only 0.27%. Following closely H&M's profile had an engagement rate of 0.26%, almost as high as Adidas Originals and Huda Beauty, which both achieved a rate of 0.25%. The profiles of Chanel, Gucci and Dior had an engagement rate of roughly 0.15%, whereas Victoria's Secret and Zara did not even reach a rate of 0.1%.

One way of raising the level of engagement on Instagram is the usage of hashtags. By creating hashtags related to their brand, companies encourage users to further interact with their posts but also to create new content (Kaplan, 2012). All of the brands analysed use hashtags, but some have more success than others. Two hashtags with some the highest penetration levels of all, are 'nikeshoes' from the sportswear brand Nike and 'lvbag' from the luxury brand Louis Vuitton.

At the end of 2020, there were 5.3 million posts uploaded under the 'nikeshoes' hashtag that making 4% of Nike's followers on Instagram. The hashtag 'lvbags' counted 2.3 million uploads, that being 5% out of Louis Vuitton's followers. By encouraging followers to use these hashtags, Nike and LV inspire their audience to create new content and further engage with the brand. By featuring posts uploaded under the 'nikeshoes' hashtag on their account, Nike "leverages the web 2.0 interconnectedness" by compelling their audience to willingly take part in the brand's marketing campaign while they get exposure (Safko, 2010). Content uploaded under specific hashtags is also a fragment of the word-of-mouth marketing technique since these posts can be exposed to non-followers of the brand. A brand that is effectively engaging the followers to use their hashtags can expand their network and therefore, their audience. Moreover, while brand and follower create together content, they can form greater relationships and achieve deeper involvement, thus developing brand recognition.

It is essential to mention that it is difficult to determine if all the posts containing the hashtags analysed are connected with the brands themselves. Nevertheless, there are examples of hashtag take-over, meaning that even posts uploaded with other intentions than those of the brands' are helping in spreading brand awareness.

3.3 Product posts

One main reason as of why companies create an Instagram profile is to showcase their products to a larger audience. All of the brands chosen for the analysis upload content with their merchandise, but are they the type of content users look for on the platform?

Out of the 90 posts coded, 71 were showing products, while only 19 were posts with content unrelated to the brands. But if we take a look at the engagement levels of the two types of content (Table 4), it is visible that posts not containing merchandise are way more popular among users. Such posts received on average 111% more likes and 171% more comments.
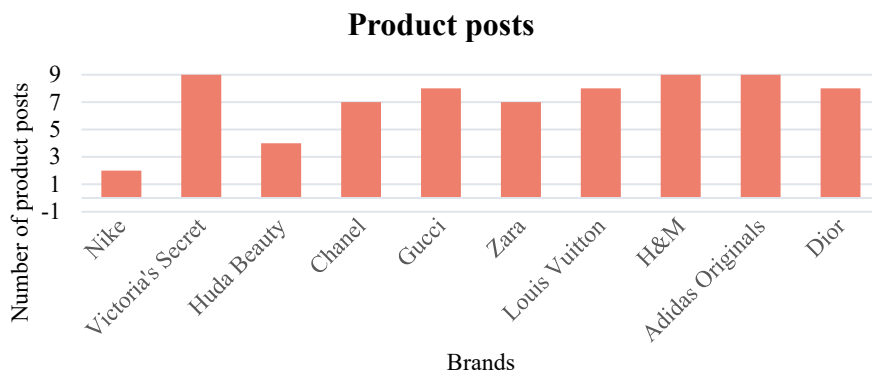
(Source: own processing)

Fig 3. Number of product posts for each brand

Table 4. Engagement levels on product posts

Product Posts	N	Mean of likes	Mean of comments
Yes	71	422 320	3 072
No	19	891 716	8 345

(Source: own processing*)*

Taking a look at the correlations value as well, we can observe that value r = -0.7669948 indicates a negative linear relationship of medium intensity between the number of likes and product posts, meaning that a decrease in posts with products will result in an increase in the number of likes.

That being said we can further affirm that Instagram users prefer content that offers them a stronger sense of belonging. Product posts are easy to come across a multitude of channels, most of them are created for shopping websites or campaigns, and users do not find them particularly exclusive.

Backstage content

Backstage content refers to posts that are not associated to the sale of products directly, they are posts that contain different perspectives of a brand's values or

purposes in such way that users evolve their opinion of the brand. Examples of such content are backstage footage from fashion shows or ateliers and scenes with celebrities in unusual circumstances.

Behind the scenes

By 'behind the scenes' posts we understand content that customers do not generally get in contact with. While coding we came across a few of such posts, for example, footage of early stages of creating new pieces for Dior 2020 spring collection, or blueprints of Louis Vuitton bags and behind the scenes footage from Harry Styles' photoshoot for Gucci. It is possible to understand that Instagram users find this type of content appealing, since brands can use their profiles to give customers a greater perception of their products by showcasing the process through which the final, polished materials are created. Access to this type of content is part of the World Wide Web's "world flattening" abilities, given that users can interact with and participate in events that may transpire hundreds of kilometres away (Kaplan, 2012).

Behind the scenes posts
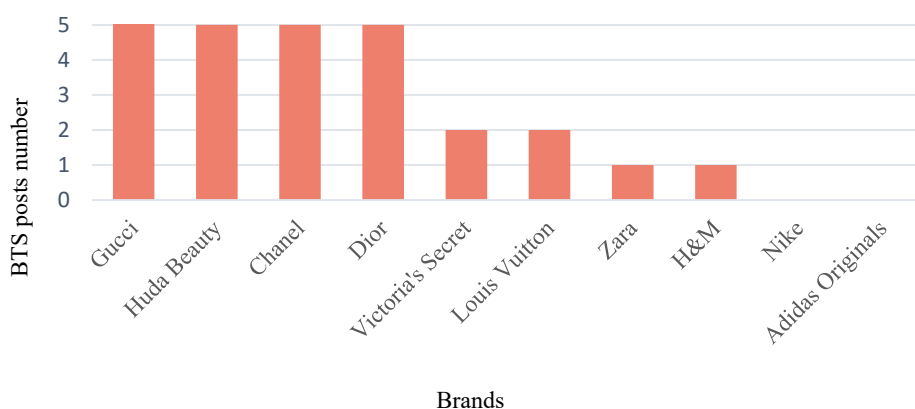
(Source: own processing)

Figure 4. Number of behind the scenes posts for each brand

Seven out of the ten brands studied had behind the scenes content in one of the nine analysed posts. The profile of the luxury brand Gucci displayed most of these types of uploads, followed by Huda Beauty, Chanel and Dior with an equal number, 5 posts. Nike which is the most followed out of the ten brands, had no post with behind the scenes content, but so did Adidas Originals' profile that is on the 9th place by number of followers.

Table 5. Engagement levels on behind the scenes posts

BTS	N	Mean of likes	% out of total posts
Yes	23	457 557	26%
No	67	543 336	74%

(Source: own processing)

Despite the belief that behind the scenes footage is appealing to users, posts coded that contained such content generally collected less likes than posts from other categories, as seen in Table 5. One motive for this fact might be that behind the scenes posts are generally posted in bundles, in a limited time frame since the events showed are taking place in the span of a few hours or at most a couple of days. An example for this, is Dior's updates from the fashion show Dior Cruise 2021, that took place on 23 of July 2020. In the span of a few hours, a total of 24 posts have been uploaded on the brands' Instagram profile. However, because of the constant flow of content, each post got less exposure time before being overtaken by another, explaining the reason why these types of posts would have fewer likes than other posts.

The correlations value between likes and posts containing behind the scenes content is $r = - 0.272173$, that indicates a negative linear relationship of low intensity between likes and behind the scenes posts. This means that a decrease in celebrity posts might result in a positive increase in number of likes.

Nonetheless, having access to immediate updates of backstage activities of major events, can be perceived one motive, which draws almost 43 million users to follow Dior's profile on Instagram. Moreover, it offers users a sense belonging and connection with a brand's matters, which can create an advanced brand community, customer and brand creating value together (Seraj, 2012).

3.4 Celebrities' posts

Posts showing celebrities are another part of backstage content.

Table 6. Engagement levels on celebrities' posts

Celebrities	N	Mean of likes	Mean of comments
Yes	38	694 997	5263.8
No	52	394 565	4229.8

(Source: own processing)

As seen above (Table 6), out of the 90 total posts analysed 38 of them had at least one celebrity in them, while the 52 were either pictures of products or they were with generally unknown individuals. When comparing the engagement levels between the two types of content, we can observe that posts with celebrities received 76% more likes that those without, as well as almost 20% more comments. It is possible that the differences are due to the elevated feel of inclusion that comes with the immediate access to information that is usually not available.

To dive further into the relationship between engagement levels and celebrity posts, we can take a look at the correlations value of the two. Here we can notice that the value r = 0.7389103 indicates a positive linear relationship of medium intensity between likes and celebrity posts. This means that a positive increase in celebrity posts results in a positive increase in number of likes.

Through Instagram brands can create a community around their name, for example by giving followers a different angle on their products by portraying them in diverse settings. As affirmed earlier, this type of content opens users to a deeper perception of the company. Taking into consideration that all of the top ten brands' profiles post behind the scenes content, it is to be believed that this is a reason of their success (Kaplan, 2012).

The positive environment on Instagram

Despite the low rates of engagement, users still interact to some levels with brands' content on Instagram. Out of the 900 comments that were coded, 66% of them were positive, fact that supports the platform's optimistic climate. Social media gives users the authority to affect brands by making their thoughts visible (Sashi, 2012). On Instagram, brands receive instant feedback and they can utilise the users' opinions to adapt content in order to be more suitable to their taste.

Yet, there were negative comments as well, more exactly 4% of the total. One such post that received negative feedback is a post from Dior's profile, more exactly the post with the most likes for 2020, despite the large number of likes, the post was not received entirely well by the audience. Most of the comments complained about the lack of diversity in the material promo for the Autumn-Winter 2020-2021 Haute Couture collection showed in the post. Comments such as "This is beyond stunning…too bad it is so tone-deaf" or "I just wish you guys

had put more diversity into this", show clearly the opinion of their audience and trends in preferences, hence they can use it for future references when creating new content.

4.   CONCLUSIONS

In conclusion, results from this study strengthen the statement that visual communication is well received by social media users in general. Instagram is a channel through which brands can approach a more personal communication strategy that is appreciated by users. As stated by Walter and Gioglio (2020), this perceived familiarity to the brands, makes them appear more approachable to users, thus bringing the users closer to the company and possibly become more sensitive to brand communication.

The main purpose of this study was to find what types of visual brand communication do users of Instagram prefer and how they engage with such content. Top ten most followed brand pages as of 2020 were taken into account and their most liked posts were analysed in order to discover the reasons behind their high level of engagement. From the results, it is evident that brands use Instagram mainly as a marketing channel, through which they can display their products and further information about the brand to a larger audience, in the same way, they use other social media platforms as well. However, such content does not seem well received by Instagram users, meaning that brands had to adapt their content to be better shaped for the platform.

Most of the posts uploaded by companies on Instagram consists of content related to their products or information about events or ongoing campaigns. But as results are showing, users do not engage fully with such content, preferring on the other hand a more personalised content. Moreover, Instagram is a great tool through which brands can connect to a more targeted audience and reveal a different side of their journey.

One element that can help users to feel more involved, is backstage content. For example, as seen in the analysis posts showing celebrities are better received by users, getting higher levels of engagement both in terms of likes and comments. This is a classic method for brands to gain exposure, celebrities can bring forth massive support for all types of businesses, being sought out by many brands to advertise their products, and apparently, it works as well on Instagram as on any other channel. Another element of backstage content is behind the scenes footage. Television might have made possible the following of events from anywhere around the globe for the past 80 years or so, but social media take things further and offer users the possibility to follow said events deeper into their creation process (Oh *et al.*, 2017).

A company's main objective is to make consumers aware of their brand. The predominant positive environment of Instagram and the possibility to engage users with ease, through liking, commenting or reposting, provides brands with an

idyllic channel through which they can build customer loyalty. In comparison with Twitter or Facebook, Instagram is not a platform on which brands to receive extensive feedback. Both of the social media platforms mentioned, use mostly text, or text combined with visual aids, as a mean to transmit information and correspondingly users are more perceiving and open in giving extended feedback. On Instagram users do not tend to get as involved when they state their opinions as they do on Facebook, Twitter, or other similar platforms, where their feedback gets further penetration, thus making it a more positive climate for brands.

When talking about engagements behaviours on Instagram it is evident that the most frequent display of agreement with certain content is by linking it. As Peters Kay discusses (Peters *et al.*, 2013), 'liking' is the least valuable of all the levels of engagement on social media, because of the comparatively low amount of effort needed. As the results show, users are more willing to like posts rather than comment on them, a fact visible from the massive discrepancies in the total number of likes and the total number of comments, even though the two are still closely correlated. However, if it is to take a look at the engagement levels on the brands' profile, we can see that despite the ease with which users can engage through 'liking' a post, the profiles' followers do not engage at all, meaning that even 'likes' as easy as they are to share, still hold meaning to the users' preferences.

Overall, this study further affirms that Instagram is a beneficial tool for brands to raise awareness when used properly. Brands can reach their targeted audience with ease and have a great opportunity at creating and sharing visual information that speaks to users personally and evokes increased emotional response thus ultimately reaching its target. Conclusive predictions about users' behaviour are difficult to formulate, nevertheless, results show that the more personal and touching content is, the more effective it becomes and users are more likely to engage with it.

As mentioned before, in order to understand what type of content is favoured by each user category, brands need to research previous data on posts and engagement levels and analyse feedback from users. Brands need to acknowledge that not all content will be successful in the long run, strategies that are efficacious for big names in the industry could not necessarily be received as well if applied by lesser brands. Working on different strategies based on previously gathered data and adapting content around feedback from users seems to be a favourable method through which brands can communicate on Instagram.

In this paper the study of the subject of visual brand communication was limited in many regards, that being said future studies are possible to reach further into the depths of engagement and consumer behaviour on social media platforms. Expanding the data collection area, and analyse more content as well as more brands, might offer a better understanding of users' behaviour regarding brand content on Instagram. The possibility to approach a qualitative method for the

analysis is also potential, to offer additional meaning to the numbers that are accessible through a quantitative approach.

A broaden research could be held with the idea of comparing visual brand communication on other social media platforms, such as Facebook or Twitter, and find differences between consumers behaviour on different platforms.

One more aspect that was not included in this thesis is the influence that this consumer engagement with brand-related content on social media has on follow through actions. It would be helpful to study how likely are users to further engage with brands outside social media and actually purchase their products.

It is important to note that social media platforms are developing at a rapid rate and theoretical studies regarding its usage and benefits are updated frequently as the years pass, that being said it is possible that with the introduction of new platforms, Instagram will lose its popularity and slowly it will become meaningless in terms of brand communication.

NOTES

[1] "How to Calculate Instagram Engagement Rates" (Sonnenberg, 2020), accessed at January 2021.

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USING COBIT-2019 FRAMEWORK (CONTROL OBJECTIVES FOR INFORMATION TECHNOLOGIES) FOR IT AUDIT RISK ASSESSMENT

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ABSTRACT

COBIT (Control Objectives for Information Technologies) it is a framework developed by the ISACA (Information Systems Audit and Control Association) for IT governance and management, not limited to the IT function of an organization but a framework that sustain a governance system for IT and related technologies. For assurance professionals, COBIT 2019 could be used to evaluate the operating effectiveness of controls in preventing or detecting and correcting material weaknesses. Using as pillars ISA 315, 330 and 500 (International Standards on Auditing) and 2110 International Standards for the Professional Practice of Internal Audit requirements, in this study we present how COBIT 2019 can be used as benchmark for risk assessment in assurance missions providing assurance regarding enterprise risk level. The main objective of our article is to explore the applicability of COBIT 2019 in perform risk assessment: how an enterprise can identify risks and respond to them. We will present ISACAs updated COBIT 2019 framework and walk through a use case on how to leverage its value in assurance/audit assignments. Our study research method is qualitative, and the use case provides a practical approach for assurance professionals. Case presented is an invitation for researchers to explore de sustainability of COBIT framework in IT risk audit process in assurance missions or as continuous process for internal auditors.

Keywords: Assurance; COBIT/ Control Objectives for Information Technologies; enterprise; IT audit risk assessment; IT governance.

JEL Classification: G32, C61, M48, D81

1.   INTRODUCTION

The current research deals with a growing topic of discussion both in academic, regulatory bodies and board meetings: risk. It is a truism that, no matter their size, organizations are dependent on information and technology (I&T) to support and improve their business processes and to meet customer needs. Nowadays all businesses face changes due to the digital transformation. Expectations of I&T has grown steadily in recent years and now we face two realities: IT form the basis for the entire business model (known as "IT service provider") or I&T does merely support the business processes.

For the first situation AICPA (American Institute of Certified Professional Accountants) has developed 3 different engagements regarding reporting on service organization controls (SOC 1, SOC 2, and SOC 3). For that reason, in our article we discuss only the second situation. Terms like assurance, review, examination, audit are used interchangeably by management even if they do not have the same meaning. If we refer to Certified Public Accountants (CPA) assurance is the umbrella under which we found audit, examination and review all three assuming testing controls and then assessing the findings to support an assurance opinion. For the rest of our paper the term "assurance professional" refers to professionals who perform assurance services.

Organizations design, manage and evaluate their internal controls based on legal requirements or select them from frameworks, best practices or standards (Table 1):

Table 1. Relevant best practices, standards and regulations

	Best Practices	Standards	Regulations
Corporate governance/Internal control	God Selskabsledelse, COSO	ISO/IEC 37000	Sarbanes-Oxley (SoX)
IT Governance & Management	COBIT, MoV , MoP	ISO/IEC 38500	
Risk management	COSO ERM, MoR	ISO/IEC 31000	
Enterprise Architecture	TOGAF, Zachman	ISO/IEC 42016	
IT Service Management	ITIL, eTOM, VeriSM, SAFe	ISO/IEC 20000, IT4IT	
Information Security and Privacy	ISF	ISO/IEC 27000	Data protection acts, GDPR
Quality Management	LEAN, EFQM, Six Sigma, Test	ISO 9000	
Process Maturity	CMMI, TIPA	ISO/IEC 33000	
Project and Program Management	PRINCE2, MSP, PMBOK		
Industry Specific	GAMP		FDA requirements, PSD2, Basel II, Solvency II

In USA, the trigger for increasing the importance of use of such frameworks seems to be the imposing of the Sarbanes–Oxley Act and the Public Company Accounting Oversight Board's (PCAOB) Auditing Standard No. 2 (AS2). According to Tuttle and Vandervelde (Tuttle and Vandervelde, 2007) for assurance professionals, the use of a framework to assess the design of internal controls results in more comprehensive, reliable, and complete assessments, but at the same time it is a challenge because of the complexity of the frameworks and diversity of standards. For example, COSO 2013 Framework (COSO, 2013) presents 17 internal control principles by internal control component of which we mention here two of them: identifies and analyzes risk and selects and develops general controls over technology.

As premises for our research paper, from the beginning we are referencing the International Standard on Auditing 315 definitions (Revised 2019) (IFAC, 2019):

• Controls – Policies or procedures that an entity establishes to achieve the control objectives of management or those charged with governance.

• IT environment – The IT applications and supporting IT infrastructure, as well as the IT processes and personnel involved in those processes, that an entity uses to sup-port business operations and achieve business strategies.

• Risks arising from the use of IT – Susceptibility of information processing controls to ineffective design or operation, or risks to the integrity of information (i.e., the completeness, accuracy and validity of transactions and other information) in the entity's information system, due to ineffective design or operation of controls in the entity's IT processes (see IT environment).

• Risk assessment procedures – The audit procedures designed and performed to identify and assess the risks of material misstatement, whether due to fraud or error, at the financial statement and assertion levels.

Also, AU-C Section 315 - Understanding the Entity and Its Environment and Assessing the Risks of Material Misstatement mentions that internal control is composed of: the control environment; the entity's risk assessment procedures; control activities; information and communication; and monitoring of controls (AICPA, n.d.).

The approach of this topic by the authors considers the great importance of auditing in performing high-performance activities (Bostan, 2005), (Bostan, 2010), (Bostan and Grosu, 2010), (Dascalu *et al.*, 2009), (Marín-López *et al.*, 2020), (Carvalho *et al.*, 2019), and through the content and structure of our work we try to challenge professionals to understand and apply the framework we refer to. The remainder of this paper is divided into three sections: section 2 provides related works and short resume of COBIT (Control Objectives for Information Technologies) evolution and its components; section 3 provides the re-search hypothesis and the demonstration as a use case based on COBIT 2019 components

in the case of risk assessment. Finally, section 4 provides the conclusions, our results, and future works.

2. COBIT - LITERATURE REVIEW

IT sustainability through standards and frameworks implies the need to comply with set of principles, methodologies, and a sustainability maturity model (Standing and Jackson, 2007).

According to (Erek *et al.*, 2012), (Machado *et al.*, 2017) sustainable IT governance is achieved by identifying and assessing sustainability related risks as well as by accounting for the resource management and the implementation of an effective sustainability controlling.

Being an open framework, in continuous evolution and development, COBIT is a topic of interest for theoretical and practical research for the sustainability of IT processes (Moeller *et al.*, 2013) within organizations, some authors conclude that previous versions do not assure a sufficient level of maturity (Merhout and O'Toole, 2015).

In the context of sustainability, COBIT is treated in the literature most often as support for assuring Green IT objectives (Patón-Romero *et al.*, 2017), reminding that the framework is allowing organizations to address intrinsically common issues such as strategic alignment, generation of value, mechanisms for performance improvement, risk management and resource management (Rivas-Asanza *et al.*, 2018).

COBIT 2019 is the last version of ISACA's globally recognized and utilized governance framework. As a framework for the governance of enterprise information and technology, COBIT helps assurance professionals to manage dependency on external service providers, get assurance over IT, and ensure the existence of an effective and efficient system of internal controls (ISACA/Information Systems Audit and Control Association, 2018). There are various ways of using COBIT in IT governance and IT risks assessment and management, as independent framework (Astuti *et al.*, 2017), or combined with SCRUM methodology (Ozkan, 2015).

In 1996 ISACA (Information Systems Audit and Control Association) published the first version of COBIT as a set of control objectives to support the financial auditors in their missions (ISACA, 2016), (De Haes and Van Grembergen, 2015).

In 1998, COBIT 2 has become the second edition being updated with an implementation tool set and high level and detailed control objectives (ISACA, 1996) and expanded it in 2000 as COBIT 3 by adding management guidelines (ISACA, 1996). In 2005, ISACA released COBIT 4, which has been formulated as an IT governance framework (ISACA, 2005) an updated two years later as COBIT 4.1 with a reduced set of control objectives (ISACA, 2007).

In 2006, Val IT Framework has been published for the first time to enable enterprise to deliver maximum of value from IT and being updated in 2008 as Enterprise Value: Governance of IT Investments - The Val IT Framework 2.0 (ISACA, 2008). In 2009, ISACA released Risk IT framework to mitigate the value of IT associated risks, and to make an integrated risk management strategy for IT Governance (ISACA, 2009).

Year 2012 is the year of integration: ISACA combined COBIT 4.1, Val IT 2.0 and Risk IT a published COBIT 5 - A Business Framework for the Governance and Management of Enterprise IT (ISACA, 2012) and in the next two years the rest of guides.

From a practical point of view COBIT users found it hard to locate relevant framework contents for their needs and perceived version 5 as more complex and challenging to apply in practice (Neto and Dos Santos, 2014), (Maseko and Marx, 2016), (Bartens *et al.*, 2015), (Thomas, 2018). In the late of 2018 ISACA introduced COBIT 2019, this time the up-graded being aligned with the latest industry standards and best practices (ISACA, 2018).

In conducting an assurance assignment, the assurance professional will be re-quired to assess the subject matter and the criteria against which the subject matter is to be assessed. Because COBIT contains controls identifiable at the time of publication, the framework can be used as benchmark against which the assignment is to be con-ducted (standards) and against which the subject matter is to be assessed (criteria).

The stakeholders of the COBIT 2019 Framework are presented in Figure 1.
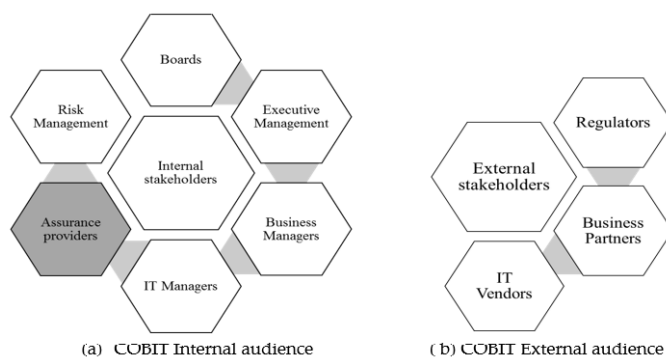
Figure 1. COBIT 5 stakeholders

Now COBIT 2019 has four core publications/guides:

• Introduction and Methodology. The core of the COBIT framework incorporates and expanded definition of IT governance and updates COBIT principles while laying out the structure of the overall framework. New concepts are introduced to help enterprises to establish a governance program based on

COBIT Core Model and 40 governance and management objectives. Also describes the updated performance management model (maturity/capability).

• Governance and Management Objectives. The second publication contains the de-tailed description of the COBIT Core Model and its 40 governance and management objectives. Each objective and its purpose are defined and then matched up with the related process (ISACA, 2019).

• Designing an Information and Technology Governance Solution. The publication it is a "how to" prescriptive description of design factors, describing the potential impact of these factors have on implementation of a governance system (ISACA, 2018).

• Implementing and Optimizing an Information and Technology Governance Solution. This guide support in an easy and practical manner the implementation of the governance system (ISACA, 2019).

The cornerstone of the COBIT development is OECD Principles of Corporate Governance: "corporate governance also provides the structure through which the objectives of the company are set, and the means of attaining those objectives and monitoring performance are determined" (G20/OECD, 2015).

Information and technology contribute to the achievement of a company's objectives only if the governance and management objectives are achieved. To be achieved, any objective is based on a process, with inputs, outputs, tasks, responsibilities, procedures, etc. These components interact with each other and together they form an enterprise governance system for information and technology (ISACA, 2018) (Fig. 2).

Figure 2. Components of a governance system

The terms "governance practice" and "management practice" used in COBIT refers to controls designed to provide assurance that business objectives will be achieved. COBIT Core Model includes 231 governance and management controls (Fig. 3).
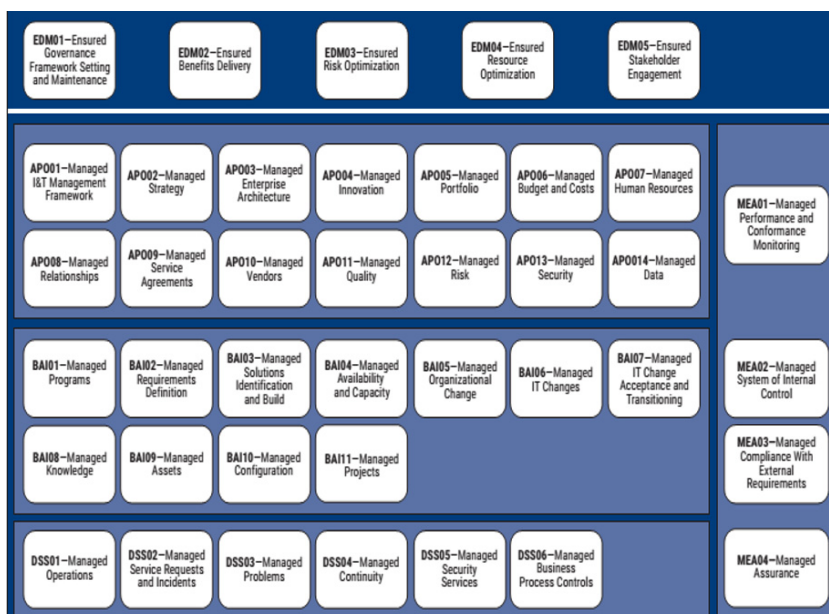
Figure 3. COBIT 2019 Core Model (ISACA, 2019)

These controls corresponding to 5 governance objectives and 35 management objectives grouped in one governance domain and 4 management domains (Table 2).

Table 2. Controls corresponding to governance objectives and management objectives (ISACA, 2019)

No.	Governance objectives	Management objectives
1	Evaluate, Direct and Monitor - EDM (Governance)	Evaluates strategic options, directs senior management on the chosen strategic options and monitors the achievement of the strategy
2	Align, Plan and Organize - APO (Management)	Addresses the overall organization, strategy and supporting activities for I&T
3	Build, Acquire and Implement - BAI (Management)	Treats the definition, acquisition and implementation of I&T solutions and their integration in business processes
4	Deliver, Service and Support - DSS (Management)	Addresses the operational delivery and support of I&T services, including security
5	Monitor, Evaluate and Assess - MEA (Management)	Addresses performance monitoring and conformance of I&T with internal performance targets, internal control objectives and external requirements

Because there is no "silver bullet" as governance system, COBIT uses the concept of "design factors" to describe the mix of elements that influence the enterprise governance system (Figure 4).
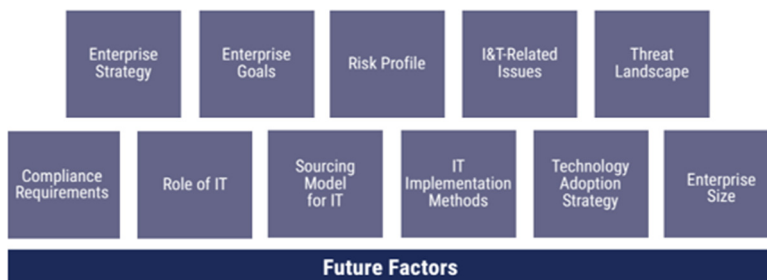
Figure 4. The three driving forces that support the systematic effort of companies to achieve disruptive social innovations (ISACA, 2019)

As a continuation of this research, the purpose of this paper is to present a case study of using COBIT in design of IT Risk assessment.

3.   RESEARCH DESIGN

According to Yin (Yin, 2009) and Creswell (Creswell, 2014) case study is a qualitative design method in which the researcher develops an in-depth analysis of a case. We start designing our use case using the findings from the 2019 Global IT Audit Benchmarking Study, conducted by ISACA and Protiviti (ISACA, 2019).

In Figure 5 are presented "Yes" answers per regions to the question: Has your IT audit activity completed an evaluation and assessment for your organization's IT governance process, in accordance with the following standards?
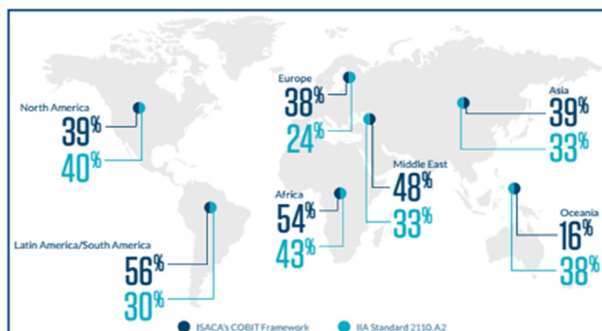
Figure 5. COBIT vs. IIA Standard (ISACA, 2019)

To develop the use case, the following set of premises were formulated:
- The number of organizations using a governance framework is still low.
- There is no integration of a single framework and companies use multiple frameworks/standards/best practices.

- Even if used, application of frameworks/best practices is inconsistent.
- Assurance professional must understand the current processes used in the IT organization.

The purpose of this study was to explore how assurance professional could use COBIT 2019 in assurance missions for risks management assessment. To test this hypothesis, we will translate COBIT into practice building the use case in which we identify how an assurance professional could interact with the COBIT publications to accomplish the goal of risk management: the business risk related to IT is managed. We design our use case as a three-step workflow based entirely on COBIT 2019 publications (Fig. 6).
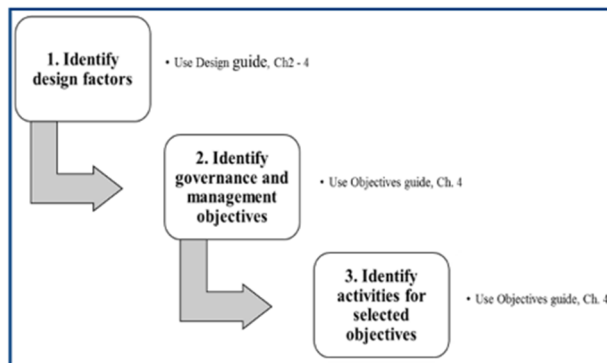
Figure 6. Workflow steps in the use case design

Included here: (1) Identify COBIT 2019 relevant design factors suitable for the assessment and obtain an understanding of design factors – we use as referential COBIT 2019 Designing an Information and Technology Governance Solution; (2) Identify relevant objectives and processes – we use as referential COBIT 2019 Governance and Management Objectives; (3) Identify activities for relevant objectives – we use as referential COBIT 2019 Governance and Management Objectives.

A. STEP 1 - DESIGN FACTORS

In the first step, based on our professional judgement, we identify what are the relevant design factors for risk management and should be included in our scope to understand the risk context of the organisation. Using COBIT 2019 Design Guide we found two relevant design factors (ISACA, 2019).

Risk profile: the sort of IT related risk to which the enterprise is currently exposed and indicates which areas of risk are exceeding the risk appetite. It includes a list of 19 risk categories and examples of risk scenarios for each category.

I&T-related issues (also called pain points)—which I&T related issues an enterprise currently faces, or, in other words, what are the I&T common risk that

have materialized. Based on the risk scenarios from the list mentioned previously, the assurance professional should select all relevant risk scenarios and issues applied and assess the impact for the enterprise if the scenario materializes. To understand the audit universe as accurately as possible, the other factors must be also analyzed.

B. STEP 2 - GOVERNANCE AND MANAGEMENT OBJECTIVES

Regarding risk management, COBIT Core Model distinguishes two principal objectives (corresponding to two principal controls) (ISACA, 2019).

EDM03-Ensured Risk Optimisation:" Ensure that I&T-related enterprise risk does not exceed the enterprise's risk appetite and risk tolerance, the impact of I&T risk to enterprise value is identified and managed, and the potential for compliance failures is minimized".

APO12—Managed Risk:" Integrate the management of I&T-related enterprise risk with overall enterprise risk management (ERM) and balance the costs and benefits of managing I&T-related enterprise risk".

Depending of the type of the enterprise (large or SME) and the complexity of the IT organizations we refine the initial scope identifying additional governance and management objectives (controls) to be considered during the assurance engagement (ISACA, 2019):

- EDM01 Ensured Governance Framework Setting and Maintenance;
- APO01 Managed the IT Management Framework;
- APO03 Managed Enterprise Architecture;
- APO07 Managed Human Resources;
- APO09 Managed Service Agreements;
- APO10 Managed Vendors;
- APO13 Managed Security;
- BAI02 Managed Requirements Definition;
- BAI06 Managed IT Changes;
- BAI08 Managed Knowledge;
- BAI09 Managed Assets;
- BAI10 Managed Configuration;
- DSS01 Managed Operations;
- DSS02 Managed Service Requests and Incidents;
- DSS04 Managed Continuity;
- DSS06 Managed Business Process Controls;
- MEA01 Managed Performance and Conformance Monitoring;
- MEA02 Managed System of Internal Control;
- MEA03 Managed Compliance with External Requirements.

C. STEP 3 - GOVERNANCE AND MANAGEMENT PRACTICES (CONTROLS)

Components that support the achievement of governance or management objectives are identified and described in COBIT as (Table 3):

Table 3. Description of components that support the achievement of governance or management objectives (ISACA, 2019)

No.	Components that support the achievement of governance or management	Described in COBIT
1	Processes	Describe an organized set of practices and activities to achieve certain objectives and produce a set of outputs that support achievement of overall IT-related goals
2	Organizational structures	The key decision-making entities in an enterprise
3	Principles, policies and frameworks	Translate desired behavior into practical guidance for day-to-day management
4	Information	Includes all information produced and used by the enterprise. COBIT focuses on information required for the effective functioning of the governance system of the enterprise
5	Culture, ethics and behavior of individuals and of the enterprise	Are factors in the success of governance and management activities
6	People, skills and competencies	Are required for good decisions, execution of corrective action and successful completion of all activities
7	Services, infrastructure and applications	Include the infrastructure, technology and applications that provide the enterprise with the governance system for I&T processing

In the last step, for the objectives (controls) selected in step 2, we will define which of the components mentioned above are in the scope of review. In the context of this use case, we will not detail each objective and the related components, but we will exemplify with APO12—Managed Risk. This management objective has six key management (process) practices (ISACA, 2019):

- APO12.01 Collect data;
- APO12.02 Analyze risk;
- APO12.03 Maintain a risk profile;
- APO12.04 Articulate risk;
- APO12.05 Define a risk management action portfolio;
- APO12.06 Respond to risk.

Each of the processes mentioned above has their own activities. For example, management practice (process) APO12.01 has the following activities: "(i) Establish and maintain a method for the collection, classification and analysis of I&T risk-related data; (ii) Record relevant and significant I&T risk-related data on the enterprise's internal and external operating environment.; (iii) Adopt or define a risk taxonomy for consistent definitions of risk scenarios and impact and likelihood categories; (iv) Record data on risk events that have caused or may cause business impacts as per the impact categories defined in the risk taxonomy; (v) Survey and analyze the historical I&T risk data and loss experience from externally available data and trends, industry peers through industry-based event logs, databases, and industry agreements for common event disclosure".

They can also be included here, also as an example:" organize the collected data and highlight contributing factors, determine the specific conditions that existed or were absent when risk events occurred and the way the conditions affected event frequency and loss magnitude or perform periodic event and risk factor analysis to identify new or emerging risk issues and to gain an understanding of the associated internal and external risk factors".

Each process activity mentioned above has an associated level of capability (rating 0-5) that indicate the minimum level accepted to demonstrate that a process is implemented and functioning.

Regarding Organizational Structures we can use a RACI (Responsible-Accountable-Consult-Inform) chart that map each governance or management practice with generic roles within enterprise IT-related business responsibilities.

For the rest of the components (Principles, policies, and frameworks; Information; Culture, ethics, and behavior of individuals; People, skills, and competencies; Services, infrastructure, and applications) the professionals will continue with the identification of all applicable elements to the scope of assurance mission.

4. CONCLUSIONS

Any assurance engagement is governed by professional standards and should use relevant criteria for subject matter assessment, but the proliferation of various IT standards and best practices creates great challenges for professionals to understand and apply these frameworks. Even if there is no standardization in developing a risk assessment to support the development of the audit plan, in this article we demonstrate that the framework COBIT 2019 sustain assurance professionals to identify and assess risk relevant to the area under review.

Being written in a non-technical language, COBIT fills the gap between business and IT within organization and, as we demonstrate, it may be used as referential for enterprise risk management assessment.

In agreement with other researchers (Cooke, 2019), (Braga, 2015), we emphasize that by adopting and adapting the COBIT framework, organizations will be able to ensure compliance more easily with regulatory requirements and internal policies and to achieve sustainability.

A better understanding of how COBIT is used could lead to an increase in the number of organizations or companies that would adopt these standards. Increased adoption while refining good practice in the field, while improving communication between business and IT departments and the sustainability of companies' development strategies.

The fact that the risks in general and the IT ones are in a continuous evolution, urges us to believe that the subject is far from exhausted. In the future we intend to develop a schematic work material for different processes within the companies, following the model of the workflow described in this research paper.

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THE ANALYSIS OF MOBILE USERS' AWARENESS REGARDING THE GDPR MEASURES DURING COVID-19 PANDEMIC

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ABSTRACT

This article is part of a larger study that investigates the behavior and awareness of GDPR rules by users of mobile devices. For this purpose, in the study, the components of the PMT model on the profile of mobile device users in Romania were analyzed comparatively (during the pre-Covid-19 period versus the Covid-19 pandemic). The study aimed at analyzing the results collected through an online questionnaire, over a period of five years, respectively pre-Covid-19 and Covid-19 period. The results reveal differences between the behavior and awareness of mobile device users, depending on several variables according to the PMT model.

Keywords: GDPR awareness; mobile users' behavior; GDPR threats in pre-Covid-19 and Covid-19 period; protection motivation theory.

JEL Classification: M10, M15

1. INTRODUCTION

In the context of the Covid-19 pandemic, there was an exponential increase in the use of mobile devices to carry out human activity. This situation has led to

accessing a wide range of online services (educational, entertainment, public services, etc.). In this context, more than ever, the issue of information security threats that is affecting the mobile users has been raised. At the same time, however, there is an imbalance between the way threats are perceived and the level of users' training.

The present paper is a part of a broader study that intends to replicate the PMT (Protection-Motivation Theory) when using mobile devices by end users in the context of GDPR (General Data Protection Regulation) and Covid-19 based on Furnell's conclusions. Furnell and Thomson (2009) are arguing that individual perception of information security influences the risk awareness and threats. The current paper displays the study results in the context of Covid-19 pandemic (pre and during Covid-19).

Consequently, the research comprises the responses of more than 1000 users of mobile devices within the period 2017-2021. We also analyzed whether the perception of respondents is different depending on certain variables (such as gender, age, level of education and IT profile) in time, to verify previous research, McGill and Thompson (2018), and to investigate the perception that regular users of mobile devices have regarding information security threats. Due to the limitations of space, in the current paper a synthesis of our research is included. The extended version, that will also comprise the feedback (comments and suggestions) obtained from the Conference participants, will be published later.

2. STATE OF THE ART IN LITERATURE

The current study focuses on the concept of perceiving the security of mobile devices in the case of mobile users and analyzes how the perception of threats and fear affects the mechanisms / tools for protecting mobile devices.

Firstly, to obtain the list of most representative papers, in Open Knowledge Maps were used the keywords "protection motivation theory" and Covid-19. The list displayed 44 representative papers. Secondly, the above list was analyzed and the papers that did not fit with the scope of the study were removed. Thirdly, the remaining list of papers was read, and the literature review was built.

2.1 The PMT model

The analysis of the selected papers shows that very few studies approached the variables of the PMT model and Covid-19. Regarding the PMT model (Burns *et al.*, 2017) define psychological capital (PsyCap) as abilities and resources that incorporate work-related motivational resources. The study analyzes the relationship between PsyCap and PMT without introducing and testing new hypotheses in the PMT model. (Posey *et al.*, 2014) analyze the mentality of employees regarding the organization's efforts to ensure information security and compares it against the mentality of information security professionals. The study concludes that ordinary employees have a behavior influenced by society.

In the research performed in 2018, ENISA (European Network Information Security Agency) reviewed, among others, 30 articles studying PMT. The ENISA, 2018, study concludes that there is more evidence that improving the assessment of coping, especially both self-efficacy and response effectiveness, improves user behavior and intentions (ENISA, 2018).

Based on 28 surveys (Sommestad *et al.*, 2015) suggests that the PMT explains information security behavior better if the behavior is voluntary; the threat and coping method is concrete, and the information security threat is directed to the person itself.

2.2 PMT under Covid-19 impact

The worldwide emergence of Covid-19 as a global pandemic has had the effect of increasing the use of mobile devices. For instance, some authors (Ribeiro-Navarrete *et al.*, 2021) identified 13 technologies through which information was collected from mobile devices to track the situation of Covid-19 or to answer questionnaires for the purpose of pandemic research. In the situation of tracking Covid-19 data, (Smidt and Jokonya, 2021) analyzes the risks of security and confidentiality of personal data as well as the ways of governing these risks. There was a general consent that mobile technology provides valuable and invaluable support to governments and health agencies in their efforts to spread the Covid-19 virus, but government surveillance has raised privacy concerns.

(Wirth *et al.*, 2020) analyzes the balance between privacy and pandemic control. Among the dimensions discovered, the most interesting correlations are between existing applications on smartphones, the technology used to collect spatial data, existing diseases, and data protection measures.

(Farooq *et al.*, 2020) are using the PMT as a framework and the study proposes a model outlining the effects of cyberchondria and information overload on individuals' perceptions and motivations. (Alsaad *et al.*, 2020) developed a context-driven model of the key characteristics of pandemics from the perspective of protection motivation theory (PMT).

The approach in our study is different from the research identified in the literature as it analyses the perception of mobile users' awareness toward the PMT components in the period before and during the Covid-19 pandemic.

3. RESEARCH METHODOLOGY

Research has shown that protective behavior depends on people's privacy concerns and attitudes, knowledge, skills, experience, education, gender, and age. The aim of our research is to test the validity of PMT for end users of mobile devices during and before the Covid-19 pandemic.

The study is based on quantitative research using an on-line questionnaire which measured the variables included in the PMT model. The questionnaire was delivered online to a target audience (students and graduates of the Faculty of

Economics and Business Administration, from Alexandru Ioan Cuza University of Iași, Romania). The questionnaire distribution collected a total of 1007 valid responses.

One of the study's objectives was testing the main hypotheses (H1) and the secondary ones, SH11 and SH12, respectively:

H1: In the pre-Covid-19 period and in the Covid-19 Pandemic, there were differences in the perception of mobile application users regarding the six threats, according to the PMT:

SH11: the differences in respondents' perception are based on Gender, Age, Education and IT profile

SH12: as well as at the level the entire population.

Aiming to test the hypotheses, the SPSS version 25 platform was used and a series of non-parametric (Chi-square, Wilcoxon, Mann-Whitney) tests were applied to the data.

3.1 Data collection and instrument design

The projected questionnaire includes 15 questions that were answered in the range:

- April 2017 - October 2019 (pre-Covid-19 period),
- November 2019 - April 2021 (Covid-19 period).

The questionnaire used was divided into two sections
- The first section measures the educational and demographic background of the respondents, the type of mobile OS and the categories of applications used (8 questions);
- The second section contains the questions that measure the constituent elements of the PMT model (15 questions).

To generalize the conclusions of the study, the target group is represented by faculty students, users of mobile devices with diverse levels of education (undergraduate, master's or doctoral studies) and knowledge about information security and personal data protection.

The questions in the questionnaire were tested for the degree of internal consistency, and the result of the Cronbach Alpha test is 0.918 showing strong reliability for the answers provided in the 5 value Likert scale questions.

The statistical tool included 15 questions composed based on the PMT variables according to the model (Rogers, 1975), respectively: Perceived Threat Vulnerability (PTV), Perceived Threat Severity (PTS), Self-Efficacy (SE), Response Efficacy (RE), Fear (F), Protection Motivation intention (PMI).

4.   RESULTS AND DISCUSSIONS

During the testing process of the secondary research hypothesis (SH11 and SH12), a series of patterns were observed, which we state below, in correlation with the hypothesis subject to the testing process.

4.1 SH11 Hypothesis

The results analyzed according to the two periods (pre-Covid-19 and Covid-19), reveal the following particularities summarized in Table 1.

Table 1: Results of analysis

PMT variables	Pre-Covid-19 (before 2019)	Covid-19 (after 2019)
Perceived Threat Vulnerability (PTV)	Different perceptions on all four variables (gender, age, education, and IT profile)	Different perception depending on the level of education
Perceived Threat Severity (PTS)	Different perception depending only on gender and age	Different perception depending on gender, age, and IT profile
Self-Efficacy (SE)	Different perceptions depending on age, education, and IT profile	Different perception by respondents according to gender, age, and level of education
Response Efficacy (RE)	Different behavior by gender, age, and education	Age and level of education differentiate the way of perception
Fear (F)	Different behavior by gender, age and education	Different perception by gender and age
Protection Motivation Intention (PMI)	Differences in perception of respondents depending on age, education, and IT profile	Differentiates the responses of responders according to gender and level of education

Based on the results summarized in Table 1, we can conclude with an assumed risk of 10% that the secondary hypothesis SH11 is confirmed. Consequently, the results prove that there are differences in users' perception of mobile applications regarding the six threats of the PMT theory, based on Gender, Age, Education and IT profile.

4.2. SH12 hypothesis

The results obtained after testing the SH12 hypothesis show that, in the pre-Covid-19 period compared to the Covid-19 period, there are differences between the general perception of the respondents. During the analyzed period, the differences of perception at the level of gender and education variables predominate and the contrasts are observed in the groups of respondents with IT vs non-IT profile. These results allow us to observe that:

- pre-Covid-19 respondents give the highest scores for the variables Perceived Threat Vulnerability and Self-Efficacy.
- Covid-19 respondents give the highest scores for the variables Perceived Threat severity, Response Efficacy, Protection Motivation intention and Fear.

Thus, the results obtained from the tests of statistical significance allow us to conclude, with an assumed risk of 10%, that the secondary hypothesis SH12 is confirmed.

The confirmation of the two secondary hypotheses leads to the confirmation of the main hypothesis according to which, in the two analyzed periods (pre-Covid-19 vs Covid-19) there are differences among the respondents (both on the four variables and, in general, for the entire population), regarding the components of the PMT model. In this way, the degree of awareness of the respondents is different in the two analyzed periods.

5. CONCLUSIONS

The profile of respondents who scored higher (or equal) than 3.5 (on scale 1-5 where 5 is the maximum value) for all six components of the PMT model is presented, in a comparative manner, below. We observe that the profile of the respondents:
- from the pre-Covid-19 period are mostly female (56%) aged 18-22 (72%), master students (53%) of FEAA (28%) or Social Sciences (22%), have a non-IT profile (59%), use mobile equipment equipped with Android OS (100%) for 3-4 hours a day in order to communicate via social media (SM) platforms and e-mail;
- from the Covid-19 period are mostly female (78%) aged 18-22 (85%), undergraduate students (85%) of FEAA (59%), have a non-IT profile (92%), use mobile equipment equipped with iOS (52%) for 3-8 hours a day for the purpose of online shopping, SM communication and e-mail.

From the above information we notice as significant differences that most respondents:
- in the period pre-Covid-19 are graduate students who use mobile devices equipped with Android OS and used the Internet on average 3-4 h/day for communication (SMS, e-mail);
- while in the period Covid-19 predominant are undergraduate students, who use mobile equipment equipped with iOS OS and use the Internet 3-8 h/day not only for communication (SM, e-mail) but also for online shopping and performing various professional activities (working from home and accessing online education).

As a **general conclusion**, we may state that *the Covid-19 Pandemic determined students to invest in high quality mobile devices (equipped with iOS OS) to keep up with the challenges of working and studying from home*. Compared to pre-Covid-19, the respondents use their devices not only to communicate vias SM and e-mail but also to access a wide range of online services, such as shopping and public services. As for the PMT analysis, *we noticed that the level of awareness was passed from the master students (in the pre-Covid-19 period) to*

the undergraduate students (in the Covid-19 period) due to the receptivity to the public media messages that they face during this period.

ACKNOWLEDGEMENTS

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ORGANIZATIONAL SUPPORT PROVIDED TO EMPLOYEES DURING THE PANDEMIC

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ABSTRACT

The situation generated by the COVID-19 pandemic, an unpredictable medical phenomenon, or a Black Swan as Taleb (2007) [1] would say, has entirely affected both the professional life and the personal life of the employees. The organizations had to adapt, trying to find solutions to continue the activity in a framework characterized by uncertainty, contradiction, limitation, tension. Employees had to face a double pressure: the one induced by the medical crisis, on the one hand and the one generated by the new organizational requirements, on the other hand. In trying to find solutions, organizations have understood, perhaps more than ever, that survival depends on the responsibility they assume, first and foremost, with respect to employees. As a result, changes have taken place, support has been provided. In this article we aim to analyse how Romanian organizations have supported employees during this period, based on direct and mediated data collection. Our interest is mainly focused on the solutions found by companies, beyond the imposed legal provisions and sanitary norms. We also present several recommendations on what organizations might consider in developing measures to support organizational management in general, human resource management in particular, in the context of the current crisis.

Keywords: Covid-19 pandemic; organisational support; employees; remote working; working from home.

JEL Classification: M12, M21

1. INTRODUCTION

The Covid-19 pandemic has affected both the lives of people and organizations, because it has changed, for a long time, mobility and, as a result,

the way people interact, as they were forced to give up the lifestyle to which they were accustomed, the friends, the events and to quickly adapt to a new way of performing their tasks at work (Vyas and Butakhieo, 2020). The organizations, in turn, faced an unprecedented situation: some were forced to close down temporarily and, most of them, to operate under completely different conditions. The challenges they had to face were materialized in the management of a much lower sales volume or, on the contrary, much higher (in the case of stores that sell goods of strict necessity, information technology companies, banking system, etc.), in the conditions of the need to ensure the safety and health of their employees and to comply with the specific measures imposed by governments. These changes have been reflected in the management of organizations, in particular in human resource management activities aimed at finding appropriate ways to support employees to adapt to the new working conditions. More precisely, the companies were forced to adopt strategies to reduce physical/psychological and financial risk in order that the activities could be carried out and, moreover, to find new ways of working. Flexible working arrangements, related to organizational practices that refer to the flexibility of the place and period of work (Green *et al.*, 2020, p. 5), have become a good option and many companies have resorted to them. Some had experience in this regard, others adopted them without training, but not all had this possibility or simply did not show any interest in this. However, these arrangements gained a much greater share during this period along with many measures related to digitization and the use of artificial intelligence. If, for example, before the pandemic, about 10% of EU employees worked from home every day, in April 2020 their percentage reached 37% (Iorganda and Roman, 2020).

We also notice, in the literature, the interest shown for the advantages and disadvantages of alternatives to work with physical presence according to an established schedule, as employees were in a position to solve tasks in a new manner, without access to organizational resources, considering, at the same time, all sorts of restrictions, new information, sometimes contradictory, related to the external environment. Not coincidentally, some researchers (Campo-Arias *et al.*, 2020) have been concerned about analysing the impact of measures taken to manage the pandemic on emotional well-being. Other researchers (Forbes *et al.*, 2020) analysed how managers, forced to manage remote staff during the quarantine period, changed their perspective on teleworking and flexible hours, drawing the following conclusions:

- most managers have come to have a much more positive attitude towards teleworking/flexible schedule, due to noticing positive aspects such as increased productivity, focus on tasks or achieving a better work-life balance, regarding them and their employees;

- most managers have taken steps to support work from home (providing computers, online dating software, support for using new tools, managing well-

being and mental health) and have expressed their intention to encourage teleworking and flexible work arrangements in the future.

The pandemic has highlighted the need to invest in digital solutions and to develop digital skills, so that technological innovations and new ways of working, appropriate in this context, can be used. Therefore, teleworking, flexible work schedule, digital transformation, rapid training/retraining according to these changes have been and continue to be organizational issues that require attention. Studies (Soares *et al.*, 2021) show that about 17.4% of the total global workforce worked from home in the second quarter of 2020, with large variations between high-income countries, where the percentage of was on average 25.4% and those with a low level of income, with an average percentage of 13.6%. However, it also depends on the areas in which the work takes place, some authors (Dingel and Neidman, 2020), showing that 37% of jobs could be done entirely from home during the pandemic: it is about financial work, business management, professional and scientific services, while work in health, tourism and agriculture sectors can be done almost exclusively on-site. For Romania, a small percentage of the workforce (18%) covers jobs that allow teleworking, but there are other impediments, such as new legislation on teleworking or lack of digital skills (Iorganda and Roman, 2020). The organizational management supported the activity of these employees, that faced every day very high physical risks, but also the fear of financial losses and/or jobs.

2. APPROACHING THE ISSUE IN THE LITERATURE

2.1. Considerations regarding the need for organizational support during the Covid-19 crisis

The COVID-19 pandemic, due to the physical and economic threat, but also to the disruption of activities in almost all industries, affected the work and psychological well-being of employees (Hamouche, 2020; Charoensukmongkol and Phungsoonthorn, 2020, McKibbin and Fernando, 2021).

Regarding work, many changes have taken place, including: reconsideration of working procedures so as to comply with new regulations, allocation of new tasks and/or increasing workload, dealing with situations in which they have found it difficult to provide an answer due to passing through an uncertain period, lack of familiarity with online working or lack of an adequate training process, in some cases, difficulties related to the transition from traditional organizational communication to digital communication, difficulties in solving interdependent tasks, the need to cope with tensions due to fear to travel/perform tasks for those with positions that require physical presence, some in the very first line (Charoensukmongkol and Phungsoonthorn, 2020, Chong *et al.*, 2020, Zito *et al.*, 2021).

Regarding the psychological well-being of individuals, the crisis has had negative effects due to stressors, such as: perception of safety, threat and risk of contamination, avalanche of data/misinformation and lack of secure information, quarantine, stigma and social exclusion, financial losses, job insecurity (Hamouche, 2020).

During the pandemic, many companies decided to transfer the activity to teleworking/ full-time work at home, as a solution for jobs that do not require physical presence. But this solution did not mean eliminating the problems. There are studies (Chong *et al.*, 2020) that highlight the stress generated by this medical crisis that leads to depletion of individual resources, with effects on teleworking/work at home, hence the need for organizational support in this case. An idea that is to be considered is related to the difference between working from home as an individual's choice and/or as a strategy to create a balance between professional and personal life, as it worked before the pandemic, and mandatory teleworking, as a solution for the new context that generated a lot of uncertainty and did not allow the possibility of training the employees for this type of arrangement, where there was no pre-existing practice of remote work, hence negative effects of an emotional and behavioural nature (Chong *et al.*, 2020). Teleworking has also affected employees that were familiar to this practice, such as those in the IT field, studies indicating problems related to psychological wellbeing (Prasad *et al.*, 2020).

Other researches indicate that, although work at home seems to facilitate the combination of roles at work and at home, the reality is that larger conflicts may arise in the home space. Thus, when employees interrupt their professional activities to solve their problems at home, during working hours, conflicts at home diminish, but greater conflicts appear at work, and vice versa, when employees solve problems outside of working hours, conflicts at work are avoided/diminished, but those at home occur/intensify (Delanoeije *et al.*, 2019).

The disadvantages of working from home in a non-pandemic context were noticed, including problems with task management, social isolation, lack of boundary between professional and personal life, technostress due to constant connectivity, overload, complexity of necessary skills, permanent changes, etc. (Ragu-Nathan *et al.*, 2008, Hamouche, 2020), and the newly created situation generated a lot of anxiety, tension, against due to restrictions, organizational changes, instability. Companies came up with new requirements for employees, many of them unfamiliar with teleworking/working from home, but there was also uncertainty about keeping the job, especially after investing in digitalization.

In addition to these challenges, employees with children had to juggle job and school-related tasks and manage family resources, including workplaces, so that everyone could work (Green *et al.*, 2020).

To sum up, among the problems faced by employees in the context of the pandemic, are:

- lack of digital skills needed for remote work;
- lack of necessary infrastructure for remote work;
- personal confrontation of a family member/family members with the disease;
- lack of necessary organizational information;
- poor communication;
- poor coordination in the case of interdependent tasks;
- fear, stress, fatigue, nervous and physical exhaustion;
- lack of sanitary materials / equipment needed to ensure good protection;
- poor role / time management;
- the feeling of isolation: the lack of human interaction, of social exchange.

Employees in Romania faced the same problems. An EY Romania study (Coheci and Buga, 2021) shows that Romanian employees were, during the pandemic, more considerate to the organizational capacity to manage the crisis, to the transparency and the manner of organizational communication, being generally satisfied with the health and safety measures protocols at work and have expressed the desire for the employer to provide them with the resources needed for teleworking. However, they were reserved for additional resources that could be provided (financial, working tools, stress management measures, etc.). Among the benefits expected by respondents in this study there are medical, flexible hours, training, career development and financial benefits. The transformations that took place and are still taking place during the pandemic will affect the future of work. The pandemic has accelerated the pace of technological change, but also the perception of them. Due to the instability of the period, we are going through and the performance of studies at different times, on different samples, some information seems to be contradictory. Thus, it is estimated that in the post-pandemic future, the activity will be carried out in a hybrid system for positions that do not require on-site presence, this being stated by 9 out of 10 directors, in a McKinsey study [2] (2010) conducted on 100 managers in different industries. Another study (MKOR [3], 2021) shows, following the survey of 500 executive global leaders, *the new reality*, from their perspective: the call of the authorities to return to normal and the vaccination rate determine the decisions, the intention to reduce the physical presence in the company decreased, in comparison with the previous period (only 3 out of 10 leaders consider the hybrid system), cyber security has become the main concern of leaders, their agenda has developed from the point of view of sustainability and corporate social responsibility.

Such issues have required and continue to require appropriate strategies and management practices to ensure the continuity of organizational processes and to support employees in their work, including in the post-pandemic period.

2.2. Solutions and recommendations to support employees during the COVID-19 pandemic

The solutions found by organizations to support employees during the COVID-19 pandemic can be seen as corporate social responsibility actions. In a study (Mahmud *et al.*, 2021) that had as research topic the analysis of the way in which the top position American companies, as corporate citizens, responded to the pandemic crisis, there were presented the following measures related to employees: donations to finance employee support programs, additional payments for employees involved in volunteering, bonus / bonus packages for front-line workers, paid leave and sickness medical assistance, health assessment and quarantine, use of personal protective equipment, cleaning conventions and hygiene protocols, work at home / distance work policies.

In other specialized studies, the following recommendations for pandemic crisis management were specified (see Table 1).

Table 1. **Employee support recommendations during the COVID-19 pandemic**

Recommendations	Authors
- encouraging an innovative, change - oriented climate that allows rapid adaptation - providing support from supervisors to reduce employee perceived uncertainty and avoid emotional exhaustion	Charoensuk-mongkol and Phungsoonthorn, 2020
- increasing the level of organizational support perceived by employees by developing a strategic component that focuses on organizational communication, with information and employee involvement, for good work management, to reduce the stress caused by uncertainty and to create a sense of belonging - encouraging informal communication and participation, supporting the development of new skills and the construction of new roles	Zito *et al.*, 2021
- offering organizational assistance for the accomplishment of tasks through teleworking - providing necessary information in a timely manner, technological support, relevant working materials, decision-making authority	Chong *et al.*, 2020
- support and training for employees - intensive communication through technology, to improve collaboration and prevent social isolation feelings - the creation of organizational policies that allow employees to disconnect from work tasks in order to prevent overwork - rather the use of the hybrid work model, in order to counterbalance the negative effects of work at home - adapting the management style and managerial communication to the distance work style (relationship-oriented behaviours, clear	Green *et al.*, 2020

Recommendations	Authors
and frequent communication, multiple communication channels, etc.) - ensuring working conditions at the employees' home (occupational health and safety, equipment, etc.)	
- stress management (management techniques: relaxation exercises, breathing, music, etc.) - work at home with the provision of technological support - providing information on hygiene and protection measures and providing the necessary materials - strengthening communication with the help of technology/interactive platforms for communication	Wong *et al.*, 2020

Source: own systematization according to the authors indicated in the table

Perhaps more than ever it is noteworthy the importance of human resources management in the context of COVID-19 which involved considerable efforts to manage the crisis as such, but also an impressive volume of employees who switched to teleworking. A KPMG survey (2020, a), which also included almost 1,300 human resources managers, shows that 88% of respondents believe that HR has played a leading role in managing the impact of the pandemic and that some transformations are needed to make the transition from analog to digital mentality and to increase the commitment and positive experiences of employees, having in view that they work more individually and management is based on online meetings. Recommendations for HR include: improving the culture and experience of employees working remotely, redefining organizational skills (including those related to remote management and technical/automation and AI), understanding the need for talent and projecting the necessary labour force in the future.

Other recommendations for HRM, in order to reduce the negative effects of the pandemic on the mental health of employees, but also to cope with future changes are offered after conducting research whose purpose was to provide solutions for organizational management (Hamouche, 2020):
- Optimize communication and transparency
- Prevention of stigma (non-discrimination policies)
- Training (for employees, in relation to the behaviours necessary to prevent the spread of the virus, anti-discrimination policies, the use of technology; for managers, in connection with crisis management, virtual teams, etc.)
- Management of teleworking and prevention of social (communication with colleagues and supervisors about expectations, progress, availability / organization of work schedule, etc.)
- Social support (creating a support environment, by developing support programs - regular meetings in virtual teams, continuous contact between employees and managers, etc.)

- Development of return-to-work plan (discussions about the company's expectations and future plans)

In addition, it is recommended to pay more attention to employees whose tasks have a high level of interdependence, to those who feel a high level of exhaustion due to the daily confrontation with unpredictable situations arising from the COVID-19, but also to employees belonging to vulnerable categories. (Chong *et al.*, 2020).

3. METHODOLOGY THAT WAS USED

Our research approach is a qualitative one. As our interest was focused on the inventory of the ways that provide organizational support to employees in Romania, during the pandemic, but also on providing recommendations, we resorted to direct and mediated data collection. For the direct data collection we used the focus-group technique in which 12 employees from different fields of activity participated.

In addition to the information collected directly, we also systematized data on the actions of companies related to supporting employees during the pandemic in company communications, press articles, websites mentioned in bibliographic sources.

4. ANALYSIS OF COLLECTED DATA

4.1. Supporting Romanian employees during the pandemic

A study conducted on 243 private companies in Romania (MKOR, 2020 [4]) reports that 90% of companies took survival measures immediately after the onset of the emergency, with another 5% adapting later. Some measures were positive in terms of the impact on employees (ensuring hygiene conditions, flexible/offset work schedule, work from home, use of online platforms, etc.), others greatly affected their well-being (reduced wages, technical unemployment), more chosen in the SME sector, which is among the most affected economic sectors (Antonescu, 2020). There are also companies that have come to support the solution of organizational problems, such as Romanian Software, the leader of the Romanian software solutions market dedicated to human resources departments. The colorful.hr platform developed by this company helps HR departments to better manage their workload and keeps employees working from home connected to the organization. Numerous HR solutions are available and some of them were designed during the pandemic to meet the needs of the new reality.

As examples, those generated in connection with the planned timekeeping (setting the program in advance), the demand for telework (setting the working address and the remote working period) and onboarding (fast communication with employees, facilitating integration/increasing employee autonomy with a virtual assistant) – Popescu, 2020, [5]. On the same platform (Color HR) we find

numerous HR applications [6] (Staff Management Software; Electronic Timekeeping Software; Document Management; Employee Virtual Space; Salary Calculation Software) or digital e-learning/distance learning tools [7].

Table no. 2 summarizes the main measures taken by Romanian companies, based on the analysis of public information made released by managers or communicators in various interviews, press releases or websites. Consequently, one can note that there are four types of measures:

- ensuring the health and safety of employees, by reorganizing the space and working in order to respect the physical distance between employees, by purchasing medical equipment, by informing on national and international research, by vaccination campaigns, by partnerships with medical clinics for information sessions on this topic, etc.;

- emotional support for employees;

- financial support, bonuses, salary increases for employees at work and the payment of sick leave for those who contracted the disease;

- training sessions to communicate online, work in a team, perform tasks in a new way;

- general measures focused on reorganizing activities, transferring activities online, motivating employees.

Table 2. Measures of Romanian companies to support employees during the pandemic (organizational data)

The main category	Measures	Company
1. Employee health and security - physical health - mental heath	- reorganization of break schedules and working time, reducing the personnel direct contact, the hygiene of spaces, etc - social distances measures and protective masks and gloves. - partnership with a medical clinic / monitoring the research for updating the research about the virus and the specific measures for employees` protection - 24/7 nurse line and emotional support counselling sessions - working from home (all employees who can work from home) - mobile work concept - access of the employees and their family to an online coaching in wellness platform. - sanitary measures - the branches located din crowded shopping centres adopted new schedules or they have been closed	Cigna (2020) Arctic (2020) OMV (2020) McDonald`s (Carouthes, 2021) Banca Transilvania (2021) Continental (Pescaru, 2020) Raiffeisen Bank (2020)

The main category	Measures	Company
	- monitoring the social distance inside the working space - the employees at risk have been encouraged to work from home; - online psychological counselling programme - a medical counselling centre for employees - opportunities for employees to making test for Covid-19, screening for other diseases and to make flu vaccine - Passport for Health Initiative, Online Festival of Health; - vaccination campaign; - cognitive therapy, software for maintaining the emotional equilibrium, mindfulness sessions, agility webinars	Novartis (2020)
2. Employee well-being: - financial well-being support	- low-cost loans - debt and counselling - student loan assistant tools and counselling - virtual coaching session with a retirement counsellor - increased financial package for frontline employees - support for employees` children care during the remote work - 12 extra- days paid leave for non-remote workers. - increased days salary for medical reasons (in support of the employees with Covid diagnostic); - full health insurance for every employee; - increased day salary for medical reasons (in support of the employees with Covid diagnostic); - extra time off with pay for employees diagnosed with the illness; - a special thank bonus for the employees - 18 employees have been transferred to a pharma company to help to produce drugs for people with illness. - financial support for the temporary ley-offs; - covering their medical costs etc.; - development and adaptation to the new lifestyle and workstyle sessions; - financial education sessions for employees and their children;	Cigna (2020) Banca Transilvania (2021) McDonald`s (Carouthes, 2021) Novartis (2020) OMV (2020) Amazon Romania (Seoawords,2021) IKEA Romania (2020) Banca Transilvania (2021)

The main category	Measures	Company
3. Training/ Development	- access to career advising services and opportunity to learn English as a second language for employees - financial programe (tuition) for high school education and college education	McDonald`s (Carouthes, 2021)
	- access to online training programmes; - virtual training sessions for fist line managers	Novartis (2020)
	- setting up an online knowledge platform: how to maintain the employee motivation, how to reduce stress and anxiety, providing feedback to employees.	Banca Transilvania (2021)
	- Time2Upskill: working from home, work – life balance and wellbeing, abilities for digital work etc.	OMV (2020)
	- training sessions in e-learning platform Coursera;	Continental (Pescaru, 2020)
	- developing of the new software for BT e-learning platform, training session for the internal trainers team for improving their abilities of teaching online, switching to the online format of some programs, developing of an online learning content	Banca Transilvania (2021)
4. General measures	- operational transformation plan - hiring of new employees and drivers - a very quick reaction to the new situation	McDonald`s (Carouthes, 2021)
	- new platforms have been added for communication with the blue collars: Kazala and Teams;	Amazon (Seoawords,2021)
	- integration of the new legal changes that have emerged "overnight". - use of existing internal concepts of flexible work as well as new legal options, in response to declining production; - transforming the HR process (it started before the pandemic crisis): digital HR; Employee Self-Service via MySuccess SAP Platform; HR2GO platform;	Continental (Pescaru, 2020)
5. non-financial measures to increase employees` motivation	- thank you letter for company team. - flexible work and mobile work concept - readjustment of the long-term strategy with immediate effects - financial support for the temporary ley-offs;	Amazon (Seoawords, 2021) Continental (Pescaru, 2020) IKEA Romania (2020)

Source: Authors' processed collected data

The data collected directly within the focus group revealed the concrete measures taken by the organizations in which the respondents work and allowed us to classify them (see Table no. 3):

Table 3. **Measures taken by organizations in Romania during the pandemic**
(focus group)

What did the organization you worked for to support its employees during the pandemic?	
Staff management measures	"Technical unemployment instead of dismissal"
Legally imposed protection measures (masks, materials, protocols, circuits)	"Began to carry out activities so that all employees could come to work" "They provided masks and materials needed to protect against the virus; started protocols for pandemic situations and circuits to reduce the risk of infection "
Attempts to avoid unemployment	"The only benefit was when they didn't fire us during the state of emergency, even though we didn't have a job."
Additional small amounts	"They financed the employee with a small amount, they sent some gifts for the big holidays"
Decisions and measures for switching to teleworking	"They gave us the opportunity to work from home" "Providing home office equipment; Internet service settlement" "They offered a bonus for furniture or any equipment that would have been useful at home to perform tasks" "They purchased technology and made working from home functional"
Decisions to improve communication	"Implementation of a higher recurrence of team meetings for better human interaction"
Greater autonomy for the creative organization of the activity	"They offered the freedom of creativity throughout the organization of activities"

Source: Authors' processed collected data

Analyzing the collected data, as it results from their inventory from different sources, we notice that organizations have implemented various measures to manage activities in the context of the medical crisis, focusing primarily on those related to health and safety at work, and secondarily on those of reorganization of work and rethinking of benefit programs, according to the field of activity, financial capacity, management interest, etc.

4.2. Recommendations regarding the support of Romanian employees

As recommendations for organizational support, which can be offered in future, the consulting companies and employees suggested the following (Table no. 4):

Table 4. Recommendations on supporting employees during the health crisis

Measures recommended by companies		
Category of measures	**Description of activities**	**The Company/Source**
Health and security at work measures	Safe working environment (equipment, medical supplies, disinfection, self-monitoring of health) Good information of employees from credible sources Meetings with health specialists Revision of medical leave policies Clear rules and obligations for exposed employees Psychological assistance	Deloitte, https://www2.deloitte.com/ua/en/pages/human-capital/articles/impact-of-covid-19.html
Staff management measures	Temporary succession plans Technical unemployment Reduction of working time Unpaid leave, etc.	
Task management measures	Focus on the most important tasks Flexibility of low priority tasks Flexible schedule, remote work Multifunctional teams/temporary successors in case of force majeure	
Communication measures	Internal communication channels Efficient and consistent communication	
Measures regarding benefit programs	Creating remote working conditions - Settlement of expenses (electricity, internet service, purchase of desks, office supplies, stationery, consumables, software solutions, etc.) Emotional health - Virtual yoga sessions - Digital team-building development - Online training - Learning platforms (courses, virtual libraries, etc.) Financial assistance	KPMG, 2020 (b), https://home.kpmg/xx/en/home/insights/2020/08/redesigning-the-future-of-work.html Colorful HR, 2020, https://www.colorful.hr/cum-s-au-schimbat-programele-de-beneficii-in-timpul-pandemiei/

Measures recommended by companies		
		Deloitte, https://www2.deloitte.com/ua/en/pages/human-capital/articles/impact-of-covid-19.html
Measures regarding HR digitalization	- Investments in technologies that support remote work - Investments in HRM systems - Automation of human resources processes ecruitment software • Communication software • Payroll software/timekeeping applications • Budgeting software • Evaluation software • Software for personnel management • Software for document management, etc.	Romanian Software, (Ilie, 2020), https://www.colorful.hr/digitalizare-accelerata-in-hr-cum-sustin-platformele-de-automatizare-lucrul-de-la-distanta/
Measures regarding the way of working	Virtual collaboration Virtual evaluation Reduction of working time	Ernst and Young, https://www.ey.com/ro_ro/covid-19/covid-19-and-pandemic-planning--how-companies-should-respond
Measures recommended by employees (focus group)		
What else could the organization you work for do to support its employees during the pandemic?		
Financial measures	"To maintain the salary level" "A study on the consumption of electricity, Internet, etc., for proper financing" "Settlement of the heating agent during the winter, at least partially"	
Measures regarding a better communication and management of relations	"To bring a greater contribution to understanding and communication" "More discussions about us as people, about needs" "More empathy and communication"	
Work-life balance measures	"Granting days off for overtime hours"	

Source: Authors' processed collected data

It is worth to note that five of the participants in the focus group mentioned that in this special situation the companies they work for did very well and that they could not have done more, considering the real possibilities. The other seven respondents suggested recommendations related to financial measures and, most strongly, measures related to communication and emotional support. This may be due also to the fact that the feeling of insecurity can be experienced more strongly in countries with increased avoidance of uncertainty, such as Romania (Hofstede *et al.*, 2012; Onea, 2011), hence the need to pay more attention to emotional issues of employees.

5. CONCLUSIONS

As in all countries, also the Romanian organizational environment experienced the hard effects of the medical crisis and most companies have found out solutions to deal with the situation. The analysis of the inventoried data from different sources reveals that the organizations took various steps to manage the activities in the context of the COVID-19 pandemic, focusing first on those related to occupational health and safety, then on those of work reorganization and rethinking benefit programs having in view the field of activity, financial capacity, management interest, etc. Thus, many companies have transferred the activity to the online environment, where the type of activities allowed to the employees to work from home, looking for quick solutions for them to adapt to the new way of working. For employees whose work tasks could not be transferred home, the companies resorted to financial measures, by granting bonuses, paid sick leave for people who contracted the virus, salary increases, support for raising their children, etc. The companies also took steps that involved reorganizing work, integrating concepts used until then in the form of benefits (never flexible, for example), finding IT solutions for a range of activities, training employees to cope with the new way of working and other steps to motivate employees to remain on the team.

The large companies and the consulting companies provided models/suggestions for solving problems and consequently there is a wide range of interests in the area of management. Numerous recommendations offered by the literature and by the consulting companies and that were presented in this article, may represent the basis for future decisions. The need for better communication and stress management is highlighted and this fact was noted by the employees. Also, some financial benefits and a good work-life balance can contribute to their mental and physical well-being.

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EARLY ADAPTIVE MECHANISMS USED BY ROMANIAN COMPANIES TO COPE WITH THE CRISIS GENERATED BY COVID-19

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ABSTRACT

This study focuses on early adaptive mechanisms that Romanian companies implemented in order to cope with the crisis generated by COVID-19, during the economic lockdown in Romania, in the first two months of the pandemic, between 16th of March and 16th of May 2020. In the foreground, we highlight the relationships between variables that refer to these mechanisms, such as introducing new activities that are in demand, the existence of written business plans, cases of employees infected with COVID-19, trainings,

estimated duration to fully restore the activity in the company after lifting the restrictions regarding the movement of people, affected customers and demand lower than under normal conditions, insufficient cash flow. We conducted a quantitative study, using both descriptive and correlation analyses for data analysis and interpretation. Data has been collected from 203 company decision-makers. Some of our main results show that there is a positive correlation between the estimated duration for the full restoration of companies' activities after lifting the restrictions regarding the movement of people and the fact that the customers of the companies were affected, and the demand is lower than under normal conditions. We also identified a positive correlation between the estimated duration for the full restoration of companies' activities after lifting the restrictions regarding the movement of people and the fact that the cash flow for maintaining staff and the companies' actions is insufficient. The most present early adaptive mechanisms are: introducing methods of physical distancing between the employees that are present at headquarters; giving up some activities that could no longer be done during the analyzed period; part of the staff work through teleworking in order to allow physical distancing at the company's premises.

1. INTRODUCTION

This is the second article published for disseminating the results of a research conducted in Romanian companies during the COVID-19 economic lockdown, in the first two months of the COVID-19 pandemic outbreak in Romania (16th of March – 16th of May 2020). In the first article, published in 2020, about the relations between low demand, cash flow problems, employee dismissals and temporary leaves during the COVID-19 economic lockdown (Turnea *et al.*, 2020), we argued on the fact that the average linear revenue of companies has been decreasing as cash flow became less sufficient, workers more absent from work, buyers/customers getting affected and demand going lower than normal. We concluded that employee dismissals, dismissal intentions and employee temporary leaves (furlough) have been a consequence of insufficient cash flow in companies.

In this second article we embrace a new perspective, focused on a set of variables describing the situation of Romanian companies during this economic lockdown, with a potential to explain the adaptive mechanisms triggered by that economic crisis. For understanding the changes implemented by the companies, we considered some endogenous variables, describing situations within the company, and some exogenous variables, describing evolutions in the company's environment, searching for correlations between them. We have conducted a quantitative study by using descriptive and correlation analyses, data being collected from company decision-makers (managers, shareholders, company

owners, administrators, etc.) during the state of emergency established in Romania after COVID-19 outbreak.

2. LITERATURE REVIEW

2.1 Problems and opportunities generated by COVID-19 crisis in the economic world

Starting with March 2020, economists speculated that there will follow a slowing down economy in the world, with no specific end date (Ahmad *et al.,* 2020). Besides the economic problems generated by COVID-19 crisis, politics and power are susceptible to be changed these times (Açikgöz and Günay, 2020). Low mortality in this pandemic is strongly influenced by states' policies applied on medium and long term (Lupu *et al.,* 2020).

The COVID-19 crisis has generated global threats such as: insufficient supply chain, banking crisis, more travel restrictions, more custom restrictions, food prices inflation, more failed countries, etc. (Açikgöz and Günay, 2020; Joshi *et al.,* 2020). Other economic problems revealed are cash flow problems, operations disruptions and no possible foresighting to find out business directions in the future (Ahmad *et al.,* 2020). Hailu (2020) stated that this pandemic has also a negative impact on food processing economic activities because of the shocks in the demand and supply (Hailu, 2020). In this pandemic, problems in supply and demand occurred in many fields of activity, but especially in agriculture (Gregorio and Ancog, 2020).

The rising of inflation and interest rates are also extremely important negative effects of this crisis (Tokic, 2020). It is possible that consumption habits to change in this period (Tokic, 2020). Restricted taking-out dinner, the on-line education or working remotely represent some changes in this pandemic (Neștian *et al.*, 2021; Tokic, 2020). In the labour market some disruptions occurred, since many employees were transferred to the informal sectors or into underemployment ones (Zemtsov, 2020). A negative effect on the massive spreading of teleworking is that it is quite difficult to install adequate equipment to workers at their homes (Belzunegui-Eraso and Erro-Garcés, 2020). However, we think that governments and institutions could facilitate this infrastructure.

However, it seems that this pandemic has generated opportunities as well: more workforce protection, new working conditions, new supply chain mechanisms, more digitalization, more hygiene, and safety rather than more profits, etc. (Açikgöz and Günay, 2020). We think that many of these opportunities were quick responses provided to the threats occurred. Also, there are jobs that are supposed to reach high demand in this period, such as: warehouse workers, cleaning staff, nurses, food delivery workers, while others like Uber drivers might register a decrease in demand, becoming insecure jobs (Spurk and Straub, 2020).

2.2 Changes generated by COVID-19 in different countries

In a study conducted in Malaysia between 18-31 March 2020, on Small and Medium Enterprises (SMEs), most of the respondents declared that they are worried about the disruptions that occurred because of the COVID-19 crisis (Ahmad *et al.,* 2020). As businesses functioned at a reduced scale, respondents declared they are prepared to assure business continuity about 3-6 months with no sales or with cash flow problems (Ahmad *et al.,* 2020).

In Turkey bankruptcies appeared, closures of factories and workplaces, which become visible in a high unemployment rate, which is expected to continuously increase especially in the service sectors and among the blue-collar employees (Açikgöz and Günay, 2020). Also, in the same country it is expected a food prices inflation because of the whole world inflation (Açikgöz and Günay, 2020).

In Canada it is expected a reduction in the demand for food, if income is reduced (Cranfield, 2020). Moreover, the reduction in expenditure could be proportionally with the reduction in the expenses (Cranfield, 2020). Yet, the last economic crisis from 2008-2009 revealed that consumers made a higher degree of economizing in the food, which can be translated into giving up to some foods that are not essential or finding cheaper substitutes (Cranfield, 2020).

India supports costs of around USD 120 bn after lockdown, and in services and manufacturing many blocks in supply chain management occurred (Joshi *et al.,* 2020). This crisis generates serious economic problems in this country (Joshi *et al.,* 2020). The African countries are more affected by COVID-19 economic crisis than other regions (Ozili, 2020). Citizens were socially and economically affected, having anxiety and becoming more exposed to health problems (Ozili, 2020). Thus, many African countries received financial support consisting in international loans, grants, or donations (Ozili, 2020). In China it is expected that travellers' consumption patterns such as, wellness tourism, luxury trips, free travels, etc. to change (Wen *et al.*, 2020).

2.3 Mechanisms used in practice

The major problem generated by this crisis is related to unemployment. Thus, specialists consider that service, retails and also the industrial sectors need support in this regard (Ceylan *et al.,* 2020). Also, as a preventive measure, it is necessary that healthcare services to be prepared for such events, because prevention costs less than recovery itself (Ceylan *et al.,* 2020). Unemployment is a priority, and governments, organizations and universities should find out immediate solutions (Blustein *et al.*, 2020).

In what concerns disruptions, purchasing for later brings obviously a benefit in the discount rates (Cranfield, 2020). But this type of consuming is difficult to be applied in periods with cash flow problems. Hobbs (2020) agrees that multiple policy implications will be developed these times to assure the economic

continuity (Hobbs, 2020). Policymakers also represent a key point in solving social anxiety (Ozili, 2020; Zhang *et al.*, 2020).

Leaders should follow the advice of those who have expertise in the pandemic (Wilson, 2020). People have to change their behaviour and lockdowns have to be held in place if a macro recovery is generally wanted (Bell and Blanchflower, 2020). There is need of equilibrium in what concerns the balance between the negative aspects from public health and the other negative things from society and economy in general (Kraemer *et al.*, 2020). Also, the activities from tourism should be completely reconsidered with this pandemic, and should become sustainable on long term (Gössling *et al.*, 2021; Ștefănică *et al.*, 2020).

When managers want to ensure the continuity of a business, they use Business Continuity Plans, which have the role to give support to activities when disruptions occur (Fani and Subriadi, 2019). This way, employees, processes, and assets can quickly get recovered, the risk being mitigated (Fani and Subriadi, 2019). Also, the business continuity management (BCM) processes have to be designed and updated, by defining the concept of BCM, identifying and defining the key elements of BCM and implementing BCM in organizations in the context of risks (Krell, 2006). The pandemic risk can be mitigated using steps that predict the effects of an epidemic (Business Continuity Demand Planning, 2007). These steps need to be adapted in pandemic (Business Continuity Demand Planning, 2007). When disasters occur, BCM represents a strategic tool that assures continuity in activity and value preservation (Herbane *et al.*, 2004). The concept of "risk" is associated with potential danger, while risk management is being associated with the rational activity of finding solutions for reducing the likelihood of the potential danger, and measures for mitigating it in case of happening (Bernstein, 1998; Brătianu *et al.*, 2020). Preplanning is considered to be a decision at strategic level that can help fighting against uncertainties (Shafi *et al.*, 2020).

Considering that in the pandemic generated by COVID-19 the demand for products/ services has changed and that only based on a written continuity plan companies were able to quickly adapt their offer of products/ services, the following hypothesis was formulated:

Hypothesis 1: There is a positive correlation between introducing new activities that are in demand during this period and the existence of a written business plan for continuity.

Stress affected employees' mental health when this pandemic appeared in the world (Hamouche, 2020). There are many categories of stressors that induced stress to employees: safety' perception (related to panic and fear of disease); infobesity and the unknown (related to the excessive quantity of negative information); quarantine and confinement (connected with anxiety, irritability and increased productivity); social exclusion and stigma (connected with the avoidance of the people infected with COVID-19); financial loss and job

insecurity (related to loses of jobs, decreased wages, unemployment and reduced benefits) (Giorgi *et al.*, 2020; International Labour Organization, 2020a; Lund *et al.*, 2018).

According to Health Unit (2021), the stress from the job during the COVID-19 pandemic can generate several problems to employees, such as: physical symptoms (difficult sleeping, dizziness, burnout, etc.); emotional symptoms (lack of motivation, nervousness, depressions, etc.); behavioural symptoms (poor judgement, reduced work performance, etc.) (Health Unit, 2021).

Despite all these negative effects that bring stress when working during this pandemic, employees have not beneficiated of too much anti stress trainings (Wolor *et al.*, 2020). This fact appeared since many employees work remotely and technology is involved in communicating with others (Wolor *et al.*, 2020).

It is more than obvious that employees were affected by stress at work during this pandemic. Considering that they should benefit from some anti-stress management programs, the following hypothesis was formulated:

Hypothesis 2: There is a positive correlation between the existence of cases of employees infected with COVID-19 in the company and training employees with practices for stress management.

It is quite probable that a significant number of Romanian companies were unprepared to deal with changes in the market that happened in a very short time, because of that state of emergency.

In European countries, decreases in consumers' demand have been present in the early stages of the COVID-19 pandemic. Thus, according to a report published in April 2020 by Hatami *et al.* (2020), 45% of the consumers in United Kingdom planned to reduce their discretionary spending for the following two weeks at that time, 44% in France, 34% in Italy and 28% in Germany.

The decreases in demand need to be seen in correlation with restrictions on the mobility of people and with the temporary closure of some of the economic activities. In the case of Romania, the state of emergency had been established on 16th of March 2020, through a decree issued by the President of Romania (DECRET nr. 195 din 16 Martie 2020, 2020) and was later extended by another month (DECRET nr. 240 din 14 aprilie 2020, 2020). Thus, the state of emergency continuing for two months, there were certain measures that were taken and that had an immediate economic impact: people arriving from areas of risk were isolated or quarantined; state borders closed; traffic on road, rail, sea, river or air prohibited; restrictions of movement of people and vehicles; cafes, restaurants and clubs temporary closed (DECRET nr. 195 din 16 Martie 2020, 2020).

Considering all these factors, it was inevitable that part of the companies had to reduce or even temporarily close their activity. Due to the uncertainty that characterized the COVID-19 pandemic outbreak in Romania, some questions worth asking are how long until affected companies would fully restore the activity in the company after lifting the restrictions regarding the movement of

people and how does this issue correlate with aspects such as the fact that the customers of the companies were affected and the demand is lower than under normal conditions or that the cash flow for maintaining staff and the company's actions is insufficient.

The first step for companies is considered to be reimagining and transforming the business and the second is addressing consumer anxiety, since, for example, 44% of global consumers were more likely to do grocery shopping online because of the pandemic (Ernst & Young Global, 2020). Thus, we can see that even for basic products, such as groceries, significant changes in consumer behaviour were likely to occur.

Since both consumers and companies have been affected by the economic lockdown, we can assume that there is a link between the fact that consumers have been affected and demand has fallen, on the one hand, and the duration needed for full restoration of the companies' activities. Thus, the following hypothesis is proposed:

Hypothesis 3: There is a positive correlation between the estimated duration to fully restore the activity in the company after lifting the restrictions regarding the movement of people and the fact that the customers of the companies were affected and the demand is lower than under normal conditions.

SMEs have been severely affected by this pandemic, since cash liquidity has been destabilized (Anton and Afloarei Nucu, 2020). For example, in Romania, now it is necessary to offer support to such type of companies to obtain financing (Rusu (Cigu) and Afloarei Nucu, 2020). But with these changes, Romania accelerates its digitalizing side because of the robotics, artificial intelligence and clouds used intensively in this period (Dospinescu and Dospinescu, 2020).

However, insufficient cash flow is an issue that needs to be considered when estimating the duration needed for full restoration of the companies' activities.

An important aspect in planning and responding following the pandemic is related to capital and strategy, some of the relevant steps being: adapted operations and increased resilience, more effective forecasting or adapting to shifting expectations (Ernst & Young Global, 2020). All these are steps to be considered when talking about business recovery but, nevertheless, when considering the duration needed for full restoration of companies' activities after lifting the restrictions regarding the movement of people, cash flow should be taken into consideration. Thus, the following hypothesis was formulated:

Hypothesis 4: There is a positive correlation between the estimated duration to fully restore the activity in the company after lifting the restrictions regarding the movement of people and the fact that the cash flow for maintaining staff and the company's actions is insufficient.

3. METHODOLOGY

This research is based on an online survey that we have conducted in over 200 Romanian companies, by using a questionnaire that we translated and adapted from the International Labour Organization (ILO) (International Labour Organization, 2020b). The data were collected between the 1st and the 16th of May 2020, from decision-makers (directors, administrators, owners, branch managers) from Romanian companies. A number of 203 responses have been collected: 96 responses through the Chamber of Commerce and Industry of Iași (CCI) (through direct and official e-mails sent to companies) and 107 responses through messages that have been sent by the research team to companies' managers, using e-mail, LinkedIn or social networks. Full confidentiality of the responses has been assured.

The purpose of our study is to describe the relations between certain variables referring to early adaptive mechanisms that Romanian companies had to implement in order to cope with the economic situation generated by the first two months of the pandemic outbreak in Romania. The variables include aspects such as introducing new activities that are in demand, the existence of written business plans, cases of employees infected with COVID-19, trainings, estimated duration to fully restore the activity in the company after lifting the restrictions regarding the movement of people, affected customers and demand lower than under normal conditions, insufficient cash flow.

Thus, this research is part of a larger project. Early results of the data collected have been presented in May 2020 in a non-scientific public report, prepared for the Romanian business community (Camera de Comerț și Industrie Iași, 2020). Also, based on the questionnaire that we used, part of the results has been published in another research paper (Turnea *et al.*, 2020).

The registered offices of the respondents' companies totals a number of 14 counties, however a majority of answers come from Iași County (119 respondents out of 203). A percentage of 18.22% respondents from a total of 269 sectors (some of the respondents mentioned more than one sector of activity for their company) declared that the company is from the IT sector, 14.50% declared the company to be active in commerce/ sales, and many other sectors of activity with lower percentages have been checked (construction, hotels/ tourism, food, and beverage industry, etc.). Finally, there were situations when companies declared several sectors of activity in which they operate.

4. RESULTS AND DISCUSSIONS

Given the fact that one of the aspects of interest of the present research are the correlations between certain variables that are eloquent to the situation of Romanian companies during the economic lockdown that took place during the 16th of March and 16th of May 2020, with a potential to explain the early adaptive mechanisms triggered by that economic crisis, the first results that we are going

to focus on are those obtained from the correlation analysis. These results are presented in a combined manner with a descriptive analysis, to ensure an image as comprehensive as possible, and also to offer explanations regarding the strengths of the correlations.

Later, our results will focus on an additional descriptive analysis, in order to provide a clear context regarding the analyzed period (16th of March – 16th of May 2020). In order to do this, we used other variables from the questionnaire.

For hypotheses testing, correlation analysis was used. Taking into consideration the nature of the data related to the variables used in our analysis – more precisely, the fact that the data are nonparametric – the Spearman's correlation coefficient was used (details in Table 1). Thus, in the following section, we are going to present the results of the correlation analysis.

Table 1. Testing the hypotheses (N=203)

Hypothesis	p values	Spearman coefficient	Type of correlation	Hypothesis testing
H1	0.005 *	0.197	Very weak, positive correlation	H1 accepted
H2	0.005 *	0.195	Very weak, positive correlation	H2 accepted
H3	0.000 *	0.323	Weak, positive correlation	H3 accepted
H4	0.000 *	0.278	Weak, positive correlation	H4 accepted

* Correlation is significant at the 0.01 level (2-tailed).
(Source: Data processed using the output from SPSS version 21.0)

Regarding the H1 hypothesis, the results of the correlation analysis show a positive, but very weak, correlation between introducing new activities that are in demand during this period and the existence of a written business plan for continuity. The correlation coefficient is equal to 0.197, while the associated p value, which is equal to 0.005, shows that the correlation between the two variables is statistically significant (the correlation is significant at the 0.01 level, 2-tailed). The H1 hypothesis is validated.

The weakness of this positive correlation may be especially explained by (1) the relatively small size of the sample (only 203 respondents, given the short time of 16 days for data collection); (2) the differences in the answers given by the respondents for the two items which form these two variables and (3) a very short time to adapt to the economic lockdown. Thus, while almost half of the respondents (97 out of 203 respondents; 47.78% of them) mentioned that their companies have a written business plan for continuity, a lower proportion of the

respondents (15.27%) mentioned that their companies have introduced new activities that were in demand during the analysed period, namely during the economic lockdown imposed by the state of emergency (details in Table 2). The result obtained for this correlation, which highlights that there is a positive, but very weak, correlation between the existence of a written business plan for continuity and introducing new activities in demand during the first two months of the COVID-19 pandemic outbreak in Romania (16th of March – 16th of May 2020), most likely shows us that even the companies that have a good focus on planning, and thus have written plans regarding their business, might have felt discouraged to introduce new services or products. This is caused by the very short time to adapt to the pace at which the start of the pandemic and the state of emergency imposed changes in the market, such as drops in demand.

Considering the second hypothesis, H2, which refers to the relationship between the existence of cases of employees infected with COVID-19 in the company and training employees with practices for stress management, the results highlight a positive, but very weak correlation. The Spearman's correlation coefficient has a value of 0.195. The associated p value (equal to 0.005) shows that the correlation between these two variables is statistically significant (correlation is significant at the 0.01 level, 2-tailed). Hypothesis H2 has been validated.

While only 22 respondents (10.84%) mentioned that in their companies trainings for employees with practices for stress management are taking place (Table 2) and the number of respondents that mentioned the existence of cases of employees infected with COVID-19 is even lower – only 7 respondents (also see Turnea *et al.*, 2020) – but close in value with the other variable, the very weak strength of this correlation may be due to the small size of the sample.

The results regarding testing the H3 hypothesis highlight a weak, positive correlation between the estimated duration to fully restore the activity in the company after lifting the restrictions regarding the movement of people and the fact that the customers of the companies were affected and the demand is lower than under normal conditions. The Spearman's correlation coefficient has a value of 0.323. The associated p value, which has a value of 0.000 shows that the correlation has statistical significance (correlation is significant at the 0.01 level, 2-tailed). Hypothesis H3 has been validated.

Regarding the estimated duration to fully restore the activity in the company after lifting the restrictions regarding the movement of people, most of the respondents (58 respondents, which is equivalent to 28.57% of them) mentioned an interval of 31 to 90 days. A number of 41 respondents (20.20%) mentioned between 91 and 180 days, and also a number of other 41 respondents (20.20%) mentioned over 181 days. A number of 29 respondents (14.29%) mentioned less than 7 days, 26 respondents (12.81%) mentioned between 8 and 30 days, while

only 8 respondents (3.94%) mentioned that they considered the activity closed temporarily or permanently (details in Table 2).

Regarding the customers and the demand, the results show that over 80% of the respondents (164 respondents out of 203, which means 80.79% of them) agreed that their customers have been affected by the situation generated by the state of emergency and that the demand is lower than normal (also see Turnea *et al.*, 2020).

The strength of the correlation, namely a weak correlation, may be due to the fact that the respondents' opinion regarding the estimated duration to fully restore the activity in the company after lifting the restrictions regarding the movement of people are quite divergent, while a great majority of the respondents (over 80%) mentioned that their customers were affected and the demand is lower than under normal conditions.

The H4 hypothesis analyzes the correlation between the estimated duration to fully restore the activity in the company after lifting the restrictions regarding the movement of people and the fact that the cash flow for maintaining staff and the company's actions is insufficient. The results show a positive, but weak, correlation between these two variables, the Spearman's correlation coefficient having a value equal to 0.278. The associated p value has a value of 0.000, which means that the correlation is statistically significant (correlation is significant at the 0.01 level, 2-tailed). Hypothesis H4 has been validated.

While the descriptive results for the estimated duration to fully restore the activity in the company after lifting the restrictions regarding the movement of people have been presented for the previous hypothesis, the results regarding insufficient cash flow for maintaining staff and the company's action show that over 60% of the respondents (126 respondents, namely 62.07%) have considered that the company's cash flow was insufficient (also see Turnea *et al.*, 2020).

The weakness of the correlation from hypothesis H4 might be due to the fact that, while a majority of the respondents (over 60%) mentioned that their company's cash flow was insufficient, the opinions regarding the estimated duration to fully restore the company's activity after lifting the restrictions regarding the movement of people were quite divergent.

After presenting the correlation results in a combined manner with a descriptive analysis for the variables involved in the correlation analysis, we are going to focus on an additional descriptive analysis, containing more of the variables from the questionnaire, in order to explain the changes or the early adaptive mechanisms that the companies implemented in order to cope with the situation, and also to offer a clearer and more broader context for our research. The variables are included in Table 2 below.

Table 2. Frequency distribution in our sample (N=203)

Questions	Items	Frequency	Valid Percent	Cumulative Percent
Does your company have a written business plan for continuity?	"No"	106	52.22	52.22
	"Yes"	97	47.78	100.00
How long do you think it will take to fully restore the activity in your company after lifting the restrictions regarding the movement of people?	"I consider the activity closed temporarily or permanently"	8	3.94	3.94
	"Less than 7 days"	29	14.29	18.23
	"Between 8 and 30 days"	26	12.81	31.03
	"Between 31 and 90 days"	58	28.57	59.61
	"Between 91 and 180 days"	41	20.20	79.80
	"Over 181 days"	41	20.20	100.00
The following questions have been assessed on a scale from 1 to 5 (1 – minimum, 5 – maximum) and require the appreciation of some statements about the organizational environment in the respondents' companies after the crisis generated by COVID-19				
The overall stress level is high	"Not true at all"	12	6.09	6.09
	"Somewhat true"	54	27.41	33.50
	"Neutral"	37	18.78	52.28
	"True"	65	32.99	85.28
	"Very true"	29	14.72	100.00
Employees are stressed that they will become infected with COVID-19 at work	"Not true at all"	30	15.23	15.23
	"Somewhat true"	48	24.37	39.59
	"Neutral"	52	26.40	65.99
	"True"	47	23.86	89.85
	"Very true"	20	10.15	100.00
Employees' families are worried that they will become infected with COVID-19 from the employees' workplace	"Not true at all"	33	16.75	16.75
	"Somewhat true"	49	24.87	41.62
	"Neutral"	55	27.92	69.54
	"True"	40	20.30	89.85
	"Very true"	20	10.15	100.00
The following items refer to changing the way the companies' activities are carried out/the provision of services in order to protect the company from COVID-19. The items refer to specific changes.				
We introduced methods of physical distancing between the employees that are present at headquarters.	"No"	82	40.39	40.39
	"Yes"	121	59.61	100.00
Part of the staff work through teleworking in order to allow physical distancing at the premises.	"No"	117	57.64	57.64
	"Yes"	86	42.36	100.00

Questions	Items	Frequency	Valid Percent	Cumulative Percent
We have brought new activities that are in demand during this period.	"No"	172	84.73	84.73
	"Yes"	31	15.27	100.00
We gave up some activities that can no longer be done during this period.	"No"	110	54.19	54.19
	"Yes"	93	45.81	100.00
We have reshaped our core business.	"No"	194	95.57	95.57
	"Yes"	9	4.43	100.00
We got involved in activities of social responsibility that are useful in this time of crisis.	"No"	154	75.86	75.86
	"Yes"	49	24.14	100.00
We introduced the online environment in the management of the company's activities.	"No"	135	66.50	66.50
	"Yes"	68	33.50	100.00
We trained employees with practices for stress management.	"No"	181	89.16	89.16
	"Yes"	22	10.84	100.00
We provided technical support to employees so that they could work from home.	"No"	142	69.95	69.95
	"Yes"	61	30.05	100.00

(Source: Questions and items adapted after ILO (International Labour Organization, 2020b). Data processed using the output from SPSS version 21.0)

Looking at the variables presented in Table 2, one aspect that we need to pay particular attention to is that referring to the stress level in companies during the economic lockdown in the first two months of the pandemic breakout in Romania. With reference to the organizational environment, the questionnaire contains two items referring to the stress level (overall stress level and stress at employee's level) and one item referring to the concerns of the employees' families.

Regarding the overall stress level, if we cumulate the response options "True" and "Very true", we can see from Table 2 that 47.71% of the decision-makers who completed the questionnaire consider that the overall stress level is high (32.99% of the respondents answered "True", plus 14.72% for the response option "Very true"). Thus, almost 50% of the respondents perceive the overall stress level following the onset of the crisis generated by COVID-19 to be high in the organizational environment.

Regarding the employees' level of stress concerning the risk of getting infected with COVID-19 at work, the results are a little more optimistic. Focusing

again on the response options "True" and "Very true", in a cumulative manner, only 34.01% of the respondents (23.86% of them answered "True" and 10.15% "Very true") consider that employees are stressed that they will become infected with COVID-19 from their workplace.

The third item in the questionnaire regarding the organizational environment refers to the concerns of the employees' families. The obtained results are very similar to the previous item. Cumulating the response options "True" and "Very true", 30.45% of the respondents (20.30% of the respondents answered "True" and 10.15% "Very true") appreciate that employees' families are worried that they will become infected with COVID-19 from the employees' workplace.

Considering the three analyzed items from a general perspective, although only the first one has a high percentage for the answers that involve an agreement regarding the existence of high stress levels, the percentages that indicate that one third of the employees and almost one third of the employees' families are stressed or worried are not small percentages at all.

Thus, based on these results, we can see the usefulness of changing the way that employees work – such as methods of physical distancing or teleworking – and also the usefulness of trainings on themes related to stress.

The results of our analysis show that a majority of the decision-makers that completed the survey (59.61%) have introduced methods of physical distancing between the employees that are present at headquarters. Another change implemented by the companies refers to teleworking, for allowing physical distancing at the companies' premises. A percentage of 42.36% of the respondents stated that part of the staff work through teleworking in order to allow physical distancing at the premises. Also, 30.05% of the respondents stated that the companies provided technical support to employees so that they could work from home.

Aside from the adaptive mechanisms mentioned above, as it could be seen in the correlation analysis, a very small percentage of respondents (10.84%) mentioned that trainings for employees with practices for stress management are taking place in their companies. The small percentage of companies that adopted this change, regarding the implementation of trainings with practices for stress management, could be explained by application of the other three already mentioned changes on a larger scale (physical distancing, teleworking, technical support for working from home).

Another type of change, which can be seen as an early adaptive mechanism triggered by the crisis generated by the first two months of the pandemic outbreak is giving up some activities that could no longer be done during that period. From our 203 respondents, 45.81% of them have mentioned implementing this change.

Another change refers to introducing the online environment in the management of the company's activities. A percentage of 33.50% of the respondents mentioned implementing this change in their companies.

A percentage of 24.14% of the respondents mentioned that their companies got involved in activities of social responsibility that are useful in this time of crisis.

A change that has been implemented by very few companies involves reshaping the core business. Only 4.43% of the respondents mentioned this adaptive mechanism to be implemented.

5. CONCLUSIONS, LIMITATIONS AND FUTURE RESEARCH

The outbreak of the COVID-19 pandemic in Romania and the establishment of the state of emergency brought a situation of crisis. Thus, during the economic lockdown in Romania, companies had to come up with early adaptive mechanisms in order to cope with the crisis generated by COVID-19, during the economic lockdown in Romania.

Some of the economic problems revealed by the COVID-19 crisis are cash flow problems, operations disruptions and no possible foresighting to find out business directions in the future (Ahmad *et al.,* 2020).

Aiming to see the relationships between variables that highlight either certain issues generated by the economic lockdown during the first two months of the COVID-19 pandemic outbreak or certain early adaptive mechanisms that Romanian companies implemented in order to cope with the situation, we identified positive, but weak or very weak correlations between our variables of interest.

Thus, two positive but very weak correlations were identified, between:
• Introducing new activities that are in demand during this period and the existence of a written business plan for continuity;
• The existence of cases of employees infected with COVID-19 in the company and training employees with practices for stress management.

Two weak and positive correlations were identified, between:
• The estimated duration to fully restore the activity in the company after lifting the restrictions regarding the movement of people and the fact that the customers of the companies were affected and the demand is lower than under normal conditions;
• The estimated duration to fully restore the activity in the company after lifting the restrictions regarding the movement of people and the fact that the cash flow for maintaining staff and the company's actions is insufficient.

Therefore, all the hypotheses have been validated. Positive correlations have been found between the considered variables, although they are weak or very weak. These weak correlations might be interpreted as weak signals, showing the directions that adaptations took during the first two months of the pandemic. However, a formal explanation for the weakness of the correlations is the relatively small size of the sample, formed of 203 respondents, and also the very short period that companies had to adjust. The state of emergency in Romania had

been established for one month and 15 days at the time that we started collecting our data. Also, the completion of our data collection was at the same time with the end of the state of emergency.

Focusing further on the early adaptive mechanisms that Romanian companies have implemented, a method introduced by a majority of the companies aims the physical distancing between the employees that are present at headquarters. Some of the companies have at least a part of their personnel working through teleworking. Some of these companies also provided the technical support needed in order to work from home. These are changes regarding the human resources, thus they cover a social dimension of the crisis generated by COVID-19. Companies started to perceive that they needed to make changes in order to reduce the stress at the employee level. Almost a quarter of the companies got involved in activities of social responsibility that are useful in this time of crisis.

Other changes implemented by Romanian companies refer at giving up some activities that could no longer be done during that period. Unfortunately, almost half of the companies were in this situation, according to the decision-makers from our sample. However, a proportion of about 15% of the respondents mentioned that their companies introduced new activities that were in demand during the economic lockdown imposed by the state of emergency. Corroborating this result with the fact that almost half the respondents mentioned that their companies had a written business plan for continuity, we can conclude that the companies that had a continuity plan started to stand out from the others, adapting a bit faster by introducing new activities. Also, almost 5% of the respondents mentioned applying an adaptive mechanism referring to reshaping the core business. All of these aspects outline an economical dimension of the COVID-19 crisis. These aspects are also related to each company's internal policy and they may indicate a direction of the adaptations. We consider these to be early adaptations.

A majority of over 80% of the decision-makers that participated in the survey mentioned that their customers have been affected by the situation generated by the state of emergency and thus the demand is lower than normal (also see Turnea *et al.*, 2020) and over 60% of them mentioned that the company's cash flow was insufficient (also see Turnea *et al.*, 2020). Even though these two variables are weakly correlated with the variable for the estimated duration to fully restore the activity in the company after lifting the restrictions regarding the movement of people, these two factors are economically stressful for decision makers in Romanian companies.

Therefore, a conclusion that we can extract is the fact that companies had begun to perceive the connection between the magnitude of the decline in demand and the time needed for recovery and, respectively, the connection between the magnitude of the decrease in the level of cash flow and the time needed for recovery. Regardless of the size of the companies in our sample, all of these

highlighted perceptions can be considered early reactions, taking into account the very short time of just one and a half - two months that the analyzed period had.

Regarding the limitations of our study, the main one is given by the sample – in the short period of time for our data collection, a number of 203 decision makers answered our questionnaire. Out of 203 responses, 119 were from only one county (Iași). Thus, the results cannot be generalized for Romanian companies, the more so as we did not apply a specific sampling scheme, due to time constrains and difficulties in data collection. Another limitation is the fact that our study is cross-sectional. Similar studies, but longitudinal in nature, could be useful.

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STATISTICAL ANALYSYS OF MIGRATION FROM THE REPUBLIC OF MOLDOVA TO OECD COUNTRIES AND THE RUSSIAN FEDERATION

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ABSTRACT

In the article the authors analyse the migration from the Republic of Moldova to the OCDE countries and the Russian Federation. The statistical data on migration for the last 3 years and the main reasons for migration are studied. Among the reasons of migration are highlighted: poverty, low wages and pensions, high unemployment, economic crisis, high inflation rate, poor governance, political crisis, inefficient laws etc. In order to see the standard of living of the countries where Moldovans leave for, the Global competitiveness report 2019 presented annually by the World Economic Forum (WEF) was examined. According to this study on many indicators, among which financial system, macroeconomic stability, ICT adoption, labour market and innovation capability, Moldova is positioned significantly lower than countries where Moldovans leave. This factor can be considered one of the reason why people migrate from Moldova. Moreover, in the article were analyzed such indicators like: GDP, life expectancy, MIPEX (Migrant integration policy index) and languages spoken in these countries. It was concluded that Moldovans go to well-developed countries, with a stable economy, developed infrastructure and strong political institutions.

Keywords: Migration, the Republic of Moldova; GDP; OECD; the Global Competitiveness Index.

JEL Classification: F22, F24, F66.

1. INTRODUCTION

The migration of population is a complex socio-economic phenomenon that is associated with various aspects of economic and socio-political life of society.

Migration is related to the modification of the economic structure, the dispersion of the productive forces, with the increase of the social mobility and of population's labor force.

The economic, social and political transformations in recent years within the Republic of Moldova have created conditions due to which many citizens of the Republic of Moldova have been forced to leave the country in search of a better life. If we analyze the migration of the population starting with 2017 until 2019, then we can observe that from year to year the emigrated population of the Republic of Moldova is in continuous growth. Moldovans were leaving and oftentimes, they left the country due to lack of jobs, and a future perspective, and in recent years also due to an unfavorable social environment (Ciochina, 2015). If in 2017 from Moldova to OECD member countries (Organization for Economic Co-operation and Development) and the Russian Federation have left 554,660, then in 2018 left - 680,695 people and in 2019 - 742,199 people have left the country. Those 37 OECD members (out of which most states are located in Europe - 24) are developed countries, holding over 70% of global production and trade and 90% of global foreign direct investment (Ministery of Foreign Affairs of Romania, 2021).

2. METHODS OF RESEARCH

The research methodology is based on a set of economic and statistical methods, as well as political, systemic and comparative methods of knowledge.

3. RESULTS AND DISCUSSIONS

If we analyze the countries where Moldovans go more often, then here we can highlight the following states for which Moldovans have left - on the first place the Russian Federation, where in 2019, according to the data of the diplomatic and consular missions of the Republic of Moldova, about 356,761 citizens; Italy - 128,979 citizens; USA - 47,767 citizens; Poland - 37,338 citizens; Portugal - 24,000 citizens; Germany - 20,375 citizens; Israel - 18,915 citizens; Spain - 18,537 citizens; Great Britain - 18,000 citizens; Canada - 17,620 citizens; France - 17,000 citizens (Bureau for Migration and Asylum, 2017-2019). Why do Moldovans choose these states?

Table 1. Estimated number of Moldovan citizens abroad, persons

Country	2017	2018	2019
Australia	...	...	1160
Austria	1284	1287	1409
Belgium	1408	1428	2000
Canada	17565	17605	17620
Chile	...	...	...
Colombia	...	...	...

Country	2017	2018	2019
Costa Rica	...	...	...
Czech Republic	5368	5763	5903
Denmark	...	273	1194
Estonia	600	600	204
Finland	...	...	448
France	3127	3609	17000
Germany	16945	172245	20375
Greece	9085	9004	7394
Hungary	350	350	680
Iceland	...	...	...
Ireland	2000	1987	1987
Israel	16000	16000	18915
Italy	135661	131814	128979
Japan	156	156	186
South Korea	...	...	...
Latvia	300	332	325
Lithuania	300	475	751
Luxembourg	...	...	...
Mexico	...	...	...
Netherlands	460	350	1366
New Zealand	...	...	...
Norway	257	1103	1667
Poland	1200	1209	37338
Portugal	6125	5210	24000
Slovakia	...	...	287
Slovenia	...	...	...
Spain	17688	16273	18537
Sweden	301	254	1333
Switzerland	524	641	671
Turkey	6918	7502	7942
United Kingdom	15000	9000	18000
United States	47554	40577	47767
Russian Federation	248484	235648	356761
Total	554660	680695	742199

(Source: data presented by the diplomatic and consular missions of the Republic of Moldova in the host countries at the end of 2017 and 2019 (Bureau for Migration and Asylum, 2017-2019))

Dynamic of Population Migration

**Figure 1: Dynamics of population migration from the Republic of Moldova
to OECD countries and the Russian Federation in 2017-2019**

In 2018, the International Republican Institute (IRI) conducted a survey in which respondents answered a series of questions about the environment they live in the Republic of Moldova. According to respondents, the most important problems that Moldova is facing includes: low wages/ pensions (34%), unemployment (32%), corruption (31%), emigration (16%), poverty (15%), poor governance, high prices/ inflation (10%), bad roads (9%), economic crisis (6%), government indifference (4%), "stolen billion" (4%), communal services/ expensive housing (4%), low standard of living (3%), indifference of the citizens (3%), high crime rate (3%), health system (3%), conflicts between politicians (2%), political crisis (2%), inefficient laws (2%), the educational system (2%). These problems are some of the most serious that the citizens of the Republic of Moldova face at home and these problems are often the causes of Moldovans leaving the country (Rusu and Ryazantsev, 2020)

Key Issues affecting citizens of the Republic of Moldova in their country
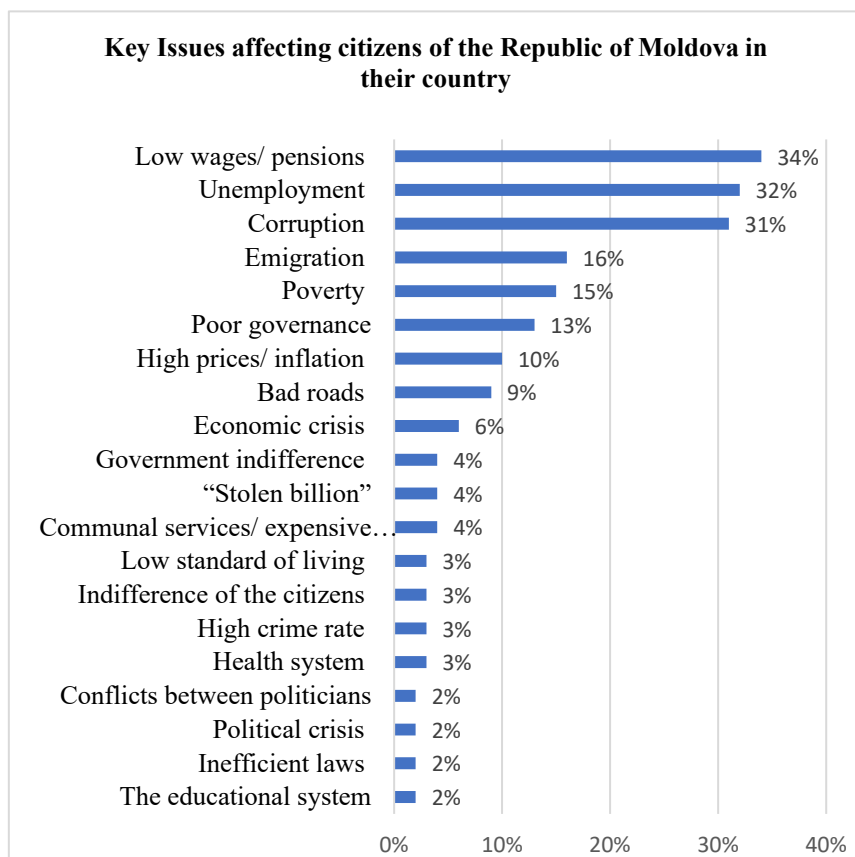
(Source: data presented by International Republican Institute (Опрос, 2018))

Figure 2: Key Issues affecting citizens of the Republic of Moldova in their country

In order to see the standard of living of the countries where Moldovans leave for, the Global competitiveness report 2019 presented annually by the World Economic Forum (WEF) was analyzed (World Economic Forum, 2019). Competitiveness is defined as a set of institutions, policies and factors that determine a country's level of productivity. Productivity, in turn, determines the level of well-being of an economy at a given time as well as its potential for future growth.

The report sets out the main strengths and weaknesses of countries, and identifies the key priorities for policy reform. The ranking of countries by level of global competitiveness is based on economic data from 142 countries and a study conducted among 15,000 business leaders.

The Global Competitiveness Index (GIC) assesses the competitiveness of the studied economies based on a wide range of factors that are affecting the business

environment, grouped into three sub-indices, which in turn fall into 12 pillars (World Economic Forum, 2011-2012).

Table 2. The position of the Republic of Moldova according to the 12 pillars of competitiveness 2019

Pillar	Score	Rank
Institutions	51.4	81
Infrastructure	66.2	76
ICT adoption	66.8	48
Macroeconomic stability	73.4	94
Health	71.9	94
Skills	61.5	74
Product market	55.0	68
Labour market	61.9	56
Financial system	46.8	124
Market size	36.1	127
Business dynamism	60.1	68
Innovation capability	29.9	130

(Source: data presented by World Economic Forum, 2019)

According to the Global Competitiveness rating in 2019, the Republic of Moldova was ranked 86th out of 141 countries. With a population of 3.5 million inhabitants, with GDP per capita - $ 3,217.7, the average annual growth rate of GDP for the last 10 years - 3.8% and the unemployment rate - 3.4% (World Economic Forum, 2019). If we analyze these data we can also make a conclusion according to which the citizens of the Republic of Moldova are forced to go to the OECD countries and the Russian Federation, whose ratings are several times higher than that of Moldova. The position of the Republic of Moldova during the reporting period is a result of the variations of the position on each of the three sub-indices of competitiveness.

However, in order to further strengthen competitiveness, we need to improve aspects that are weaknesses for the reporting year, namely: political instability, corruption, access to finance, government bureaucracy, inadequate infrastructure, tax regulations and inflation.

Table 3. The position of OECD countries and the Russian Federation according to the 12 pillars of competitiveness 2019

Country	Rank	Institutions	Infrastructure	ICT adoption	Macroeconomic stability	Health	Skills	Product market	Labour market	Financial system	Market size	Business dynamism	Innovation capability
Australia	16	72.9	79.2	73.6	100	94.9	80.6	71.4	69.1	85.9	72.6	75.3	69.5
		17	29	29	1	17	13	5	23	13	25	16	18
Austria	21	73.5	89.0	65.6	100	95.1	79.4	66.1	67.2	75.0	64.6	69.3	74.5
		14	10	50	1	15	16	17	29	30	43	30	14
Belgium	22	69.5	87.3	67.0	100	92.6	79.3	62.6	63.8	79.5	69.3	74.4	71.4
		23	14	47	1	30	18	27	43	24	33	19	17
Canada	14	74.1	80.8	70.3	100.0	95.3	81.1	63.8	75.2	87.1	76.9	76.5	74.0
		13	26	35	1	14	12	24	8	9	16	12	16
Chile	33	63.9	76.3	63.1	100.0	89.7	69.8	68.0	62.8	82.0	63.2	65.3	42.5
		32	42	56	1	37	47	10	53	21	46	47	53
Colombia	57	49.3	64.3	49.9	90.0	95.0	60.5	52.7	59.2	64.6	66.7	64.2	36.4
		92	81	87	43	16	80	90	73	54	37	49	77
Costa Rica	62	57.1	68.7	60.0	74.3	93.2	69.0	59.4	59.1	60.2	46.5	56.3	40.3
		54	63	63	85	25	51	41	74	70	88	92	58
Czech Republic	32	60.9	83.8	68.4	100.0	85.6	72.9	57.3	63.3	67.6	64.8	68.7	56.9
		44	20	42	1	48	29	55	48	47	42	32	29
Denmark	10	77.4	87.1	83.3	100.0	92.6	85.7	66.9	78.2	86.8	59.9	80.0	76.2
		1	15	9	1	29	3	12	3	11	55	3	11
Estonia	31	70.2	75.8	78.8	100.	84.5	79.4	62.0	70.2	65.2	42.8	69.9	52.1
		21	45	16	1	52	15	29	19	52	99	27	34
Finland	11	81.2	83.4	80.4	100.	93.0	85.7	66.3	71.5	89.7	57.8	78.1	75.8
		1	22	13	1	27	2	15	17	5	60	7	12
France	15	70.0	89.7	73.7	99.8	99.2	71.9	62.2	62.9	85.9	81.6	71.4	77.2
		22	9	28	36	7	35	28	50	14	9	24	9
Germany	7	72.4	90.2	70.0	100.	92.3	84.2	68.2	72.8	79.1	86.0	79.5	86.8
		18	8	36	1	31	5	9	14	25	5	5	1
Greece	59	50.5	77.7	64.7	75.0	93.5	70.5	53.8	52.7	49.0	59.6	58.8	45.1
		85	37	52	64	23	41	81	111	115	57	76	47
Hungary	47	55.7	80.7	64.2	90.0	80.6	69.0	52.4	58.6	61.5	62.7	58.1	47.4
		63	27	54	43	70	49	91	80	66	48	83	41
Iceland	26	74.1	76.4	85.3	100.	97.7	83.4	59.0	74.9	71.3	32.3	77.1	65.1
		12	41	7	1	10	8	45	10	36	133	8	23
Ireland	24	73.0	77.0	66.6	100.	94.9	77.2	60.9	76.0	68.8	64.6	76.9	65.5
		16	40	49	34	18	21	35	6	42	44	10	21
Israel	20	65.6	83.0	67.6	100.	98.1	79.6	61.8	71.1	80.6	59.8	79.6	74.2
		27	23	45	1	9	14	32	18	23	56	4	15
Italy	30	58.6	84.1	64.5	84.7	99.6	70.4	61.9	56.6	67.6	79.3	65.7	65.5
		48	18	53	63	6	42	31	90	48	12	43	22
Japan	6	71.7	93.2	86.2	94.9	100.	73.3	70.4	71.5	85.9	86.9	75.0	78.3
		19	5	6	42	1	28	6	16	12	4	17	7
	13	65.8	92.1	92.8	100.0	99.0	74.0	56.1	62.9	84.4	78.9	70.5	79.1

(Source: data presented by World Economic Forum, 2019)

If we analyze the most popular destinations for emigration of Moldovans according to the 12 pillars of competitiveness, we will understand why these countries are preferred by Moldovans. For example:

The Russian Federation ranks 43rd globally in the competitiveness rating. In 2019 in particular, the macroeconomic environment (43rd place) improved substantially (+2.5 compared to the previous year). Inflation is up to 3% and public finances are sustainable (43rd place). In addition, Russia improved its

Country												
South Korea		26	6	1	1	8	27	59	51	18	14	25
Latvia	41	59.3	76.0	79.7	100.	76.8	76.3	58.6	67.3	57.1	44.4	65.9
		47	43	15	1	84	22	47	28	85	95	40
Lithuania	39	63.3	77.0	81.5	100	76.0	75.7	56.3	68.8	58.3	50.5	65.6
		34	39	12	1	85	24	58	24	75	76	45
Luxembourg	18	75.9	85.0	78.1	100.	92.8	79.3	67.7	74.2	87.0	50.0	65.8
		9	17	20	1	28	17	11	12	10	77	42
Mexico	48	48.3	72.4	55.0	97.8	82.0	58.3	57.7	55.8	61.8	80.8	65.8
		98	54	74	41	60	89	53	96	64	11	41
Netherlands	4	78.6	94.3	76.3	100.0	94.2	84.6	69.9	74.9	84.6	74.3	80.6
		4	2	24	1	21	4	7	11	17	20	2
New Zealand	19	78.8	75.5	77.7	100	90.8	82.1	72.0	76.7	76.7	54.2	75.8
		3	46	21	1	34	10	3	5	28	66	13
Norway	17	76.9	75.8	83.1	100.0	94.5	83.8	60.9	73.3	82.0	61.4	76.9
		8	44	10	1	20	6	36	13	20	50	11
Poland	37	56.4	81.2	65.4	100.0	83.8	72.1	58.1	59.9	64.1	74.1	62.0
		60	25	51	1	54	34	50	70	57	22	59
Portugal	34	64.5	83.6	71.2	85.0	94.2	70.0	59.7	63.2	70.0	60.5	69.7
		30	21	34	62	22	43	39	49	39	51	28
Slovakia	42	56.3	78.6	69.2	100.0	82.3	69.9	52.7	60.7	64.4	58.2	62.8
		61	30	39	1	57	45	89	64	56	59	55
Slovenia	35	63.4	78.1	69.2	100.0	89.8	74.9	61.9	64.5	63.8	48.5	70.1
		33	33	40	1	36	26	30	41	61	82	26
Spain	23	65.1	90.3	78.2	90.0	100.0	71.6	61.0	61.1	77.5	77.0	67.3
		28	7	19	43	1	37	34	61	26	15	34
Sweden	8	75.2	84.0	87.8	100.0	96.6	83.7	66.3	69.4	88.0	65.4	79.4
		10	19	4	1	11	7	16	22	8	40	6
Switzerland	5	77.5	93.2	78.6	100.0	99.9	86.7	63.8	79.5	89.7	66.2	71.5
		6	4	17	1	5	1	25	2	4	39	22
Turkey	61	53.9	74.3	57.8	61.3	87.1	60.8	54.1	52.9	61.2	79.0	58.8
		71	49	69	129	42	78	78	109	68	13	75
United Kingdom	9	74.4	88.9	73.0	100.0	91.6	81.9	64.6	75.0	88.1	81.8	77.0
		11	11	31	1	33	11	21	9	7	8	9
United States	2	71.2	87.9	74.3	99.8	83.0	82.5	68.6	78.0	91.0	99.5	84.2
		20	13	27	37	55	9	8	4	3	2	1
Russian Federation	43	52.6	73.8	77.0	90.0	69.2	68.3	52.9	61.0	55.7	84.2	63.1
		74	50	22	43	97	54	87	62	95	6	53

innovation capacity pillar by 2.2 points (32nd place) due to the increased quality of research institutions (9th place) and constant expenditures on research and development (1.1% of GDP, 34). Innovation is also supported by a higher adoption of ICT (+4.9 points, 22nd place), due to the extremely fast diffusion of the Internet, which is used by 81% of the population (39th place) (World Economic Forum, 2019).

In the international ranking of the Global Competitiveness Index, **Germany** is ranked 7t[h] and 3rd in Europe, followed by the Netherlands (4th place) and

Switzerland (5th place). Germany's performance remains strong globally: the country is in the top 10 out of the seven pillars, ranking first in two of them, and beats the OECD average on all pillars, with one notable exception, the adoption of ICT. For the second year in a row, Germany boasts the best innovation capacity (1st place) in the world, with a score of 86.8 (-0.7 points), preceded by the United States (84.1) and Switzerland (81.2). Other strengths include infrastructure (90.2, 8th place), macroeconomic stability, for which it earns the perfect score of 100, market size (86.0, 5) and health (92.3, 31st place). Germany can also rely on young people with higher education (84.2, 5), but it is necessary to address skills gaps by updating skills and retraining the current workforce and improving the employability of graduates (68.4, 13th place) (World Economic Forum, 2019).

Italy ranks 30th globally. Italy's performance this year is mainly determined by small advances in the financial system (+3.3 points, 48th place), where non-performing loans are gradually absorbed (-2.7% this year), and access to finance for both SMEs as well as for venture capital - is slightly improved (+4.5 and +4.8, respectively), although it starts from a low base (119 and 111, respectively). Similarly, the efficiency of the legal framework recorded slightly higher scores (+5.1 points, again from a low base, 132nd place), and the adoption of ICT (+4.2, 53rd place) and infrastructure (+1, 18th place) have gradually improved in recent years. At the same time, Italy maintains competitive advantages in terms of innovation capacity (65.5, 22nd place) and health standards (99.6, 6th place) (World Economic Forum, 2019).

United Kingdom, with a score of 81.2 is ranked 9th. Among European countries, it is on the 5th place preceded by the Netherlands (82.4, 4th place in the world), Switzerland (82.3, 5th in the world), Germany (81.8, 7th place) and Sweden (81.2, 8th place). The Great Britain is in the top 10 of six of the 12 pillars. Its strengths include macroeconomic stability - where it reaches the maximum score of 100 on the related pillar - infrastructure (88.9, 11th place) and financial system development (88.1, 7th place). The country can rely on a higher education workforce (81.9, 11th place), but there is room for improving the employability of graduates (62.3, 29th), digital skills among the workforce (65.6, 29th place) and training and retraining opportunities (62.7, 29th place). Last year saw a weakening of business momentum (-2.0 points, 77.0, 9) and innovation capacity (-1.0 points, 78.2, 8), as well as a sharp decline in market efficiency, which is the weakest category in the United Kingdom (64.6, 21st place), due to lower domestic competition (–4.1 points, 64.3) and the opening of trade (–5.2 points, 64, 9, 25). The quality of public institutions is evaluated less positively this year (-2.4, 74.4, 11th place, decreasing by 4 places). Finally, the adoption of ICT, although increasing, remains low if comparing with OECD standards: the country ranks 31st in the world and only 16th in Europe, with a score of 73.0 points (World Economic Forum, 2019).

Israel ranked 20th in 2019. The country is a hub of innovation, ranking 15th in terms of the pillar of innovation capacity due to a well-developed ecosystem. 4.3% of GDP is spent annually on research and development. Entrepreneurial culture in the country is one of the strongest compared to other states. Israel can also rely on a highly educated workforce with an average of 13 years of schooling (12th place) (World Economic Forum, 2019).

Turkey ranks 61st globally. Among the most developed sequences can be mentioned: ICT adoption (+4.3 points, 69), infrastructure (+1.7, 49) and labour market (+1.7 points). These improvements, in addition to the large market size (13), support the performance of Turkey's competitiveness. In terms of infrastructure, Turkey can rely on very strong air transport connectivity (12th) and road networks (+3.9 points, 27). When it comes to its labour market (109), where it remains in position 99, there have been some minor but important improvements, including the ease of employment of foreign workers (+4.1 points, 63), workers' rights (+7.4, 109) *women's participation* on the workforce *market* (+3.4 points, 112) (World Economic Forum, 2019).

United States ranked second in the top of the most competitive economies in the world. Uncertainty among business leaders affects the performance of nine of the 12 pillars of the Global Competitiveness Index (*GCI*) of this year, but some areas are declining more visibly than others. In terms of human capital, health conditions or ranked 55th, which means that 3.5 points were lost compared to last year. The skills of American graduates remain strong (71.2, 5), business leaders consider them less effective for market needs (the indicator score is about 10% lower than last year). In addition, under the labour market pillar (4th place), business leaders rate retraining programs as less effective (12.2 points lower) and more restrictive employment regulations (-7.8 points compared to 2018). Despite this, the United States remain one of the most competitive economies in the world. It is still an engine of innovation, ranking 2nd in the innovation capability pillar and 1st in terms of business dynamism, having the second largest market and hosting one of the most dynamic financial systems in the world (score 91.0, 3rd place) (World Economic Forum, 2019).

Canada in the global competitiveness rating it ranks 14th, losing two places and 0.3 points since the 2018 evaluation. Canada's economy has been hit by external shocks caused by global trade tensions. The less favorable economic environment was reflected in the somewhat more negative opinions of business leaders on several dimensions. For example, Canadian business leaders have reviewed their views on two important aspects of competition: competition in services (where the country ranks 62nd, losing 2.5 points in the score), and the labour market ranks 54th in terms of internal labour mobility. Moreover, although the hope for a healthy life remains among the top 14 countries in the world (70.5 years) per this indicator. Despite a slight decline in these aspects, Canada remains a competitive economy with very stable macroeconomic conditions (100, 1), a

sound financial system (87.1, 9), good institutions (74.1, 13) and well-developed human capital. In terms of technology and innovation, Canada's performance in terms of ICT adoption pillars (70.3, 35) and capacity for innovation (74.0, 16) indicates that it is almost in the forefront, but still has chapters to work on (World Competitiveness Ranking).

Table 4. GDP ($) and MIPEX by country

Country	GDP	Life expectancy (years)	MIPEX (Migrant integration policy index)	Spoken languages
Australia	52,825	83.94	65(Slightly favourable- Top 10 (Comprehensive)	English Australian
Austria	48,154	82.05	46(Halfway favourable - Temporary Integration)	German English French Italian
Belgium	44,529	82.17	69(Slightly favourable - Top 10 (Comprehensive)	English French German Dutch
Canada	43,278	82.96	80(Favourable - Top 10 (Comprehensive)	English French
Chile	12,990	80.74	53(Halfway favourable - Equality on paper)	Spanish German English
Colombia	5,336	77.87	-	Spanish
Costa Rica	11,982	80.70	-	Spanish
Czech Republic	22,279	79.85	50(Halfway favourable - Comprehensive Integration)	Czech
Denmark	60,416	81.40	48(Halfway favourable - Temporary Integration)	Danish English German
Estonia	23,330	79.18	50(Halfway favourable - Comprehensive Integration)	Estonian Russian German Swedish
Finland	48,981	82.48	85(Favourable - Top 10 (Comprehensive)	Finnish Swedish Russian
France	39,907	83.13	56(Halfway favourable - Temporary Integration)	French
Germany	45,733	81.88	58(Halfway favourable – Temporary Integration)	German
Greece	17,670	82.80	46(Halfway favourable - Equality on paper)	Greek English
Hungary	15,820	78.23	43 (Halfway favourable - Equality on paper)	Hungarian Germany Slovak

Country	GDP	Life expectancy (years)	MIPEX (Migrant integration policy index)	Spoken languages
Iceland	59,634	83.52	56(Halfway favourable - Comprehensive Integration)	Icelandic
Ireland	94,392	82.81	64(Slightly favourable - Top 10 (Comprehensive)	Irish English
Israel	43,689	83.49	49(Halfway favourable - Comprehensive Integration)	Hebrew English Russian
Italy	31,288	84.01	58(Halfway favourable - Temporary Integration)	Italian
Japan	40,146	85.03	47(Halfway favourable - Immigration without integration)	Japanese
South Korea	31,497	83.50	56(Halfway favourable - Comprehensive Integration)	Korean Japanese
Latvia	19,916	76.41	37(Slightly unfavourable - Equality on paper)	Latvian Russian Ukrainian Belorussian
Lithuania	8,111	75.73	37(Slightly unfavourable - Equality on paper)	Lithuanian Russian Polish
Luxembourg	116,921	82.79	64(Slightly favourable - Comprehensive Integration)	French German
Mexico	8,421	75.41	51(Halfway favourable - Equality on paper)	Nahuatl Maya Zapotec (Diidzaj)
Netherlands	52,248	82.78	57(Halfway favourable - Temporary Integration)	Dutch English
New Zealand	41,127	82.80	77(Slightly favourable - Top 10 (Comprehensive)	English
Norway	65,800	82.94	69(Slightly favourable - Comprehensive Integration)	Norwegian English
Poland	15,654	79.27	40(Slightly unfavourable -Equality on paper)	Polish Silesian Kashubian English German Belarusian
Portugal	22,489	82.65	81(Favourable - Top 10 (Comprehensive)	Portuguese English
Slovakia	19,071	78.00	39 (Slightly unfavourable - Equality on paper)	Slovak
Slovenia	25,211	81.85	48 (Halfway favourable - Equality on paper)	Slovene Italian German
Spain	27,132	83.99	60 (Slightly favourable - Comprehensive Integration)	Spanish
Sweden	51,796	83.33	86 (Favourable - Top 10 (Comprehensive)	Swedish Finnish

Country	GDP	Life expectancy (years)	MIPEX (Migrant integration policy index)	Spoken languages
				German English
Switzerland	86,849	84.25	50(Halfway favourable - Temporary Integration)	German French Italian
Turkey	8,548	78.45	43(Halfway favourable - Comprehensive Integration)	Turkish English
United Kingdom	40,406	81.77	56(Halfway favourable - Temporary Integration)	English
United States	63,416	79.11	73 (Slightly favourable - Top 10(Comprehensive)	English
Russian Federation	10,037	72.99	31 (Slightly unfavourable – immigration without integration)	Russian

(Source: data presented by
International Monetary Fund and the Migration Policy Group)

Why do Moldovan migrants choose these countries? One of the causes is the level of GDP. For example, in Italy - 31,288 $; USA - 63,416 $; Poland - 15,654 $; Portugal - 22,489 $; Germany - 45,733 $; Israel - 43,689 $; Spain - 27,132 $; Great Britain - 40,406 $; Canada - 43,278 $; France - 39,907 $. Compared to GDP of the Republic of Moldova which constitutes - $ 3,217.7 the GDP of these countries is several times higher which means that the standard of living in these countries is several times higher than in the Republic of Moldova (Worldometer, 2020). If we are to analyze Life expectancy in the countries where Moldovans go, then the age there is higher than in the Republic of Moldova. For example, if in Moldova the average age is - 72.30 years, while in such countries as Italy - 84.01 years; USA - 79.11 years; Poland - 79.27 years; Portugal - 82.65 years; Germany - 81.88 years; Israel - 83.49; Spain - 83.99 years; Great Britain - 81.77 years; Canada - 82.96 years; France - 83.13 years; the Russian Federation - 72.99 years. So, if we make an analysis of the most popular destinations we can see that the average in the countries that Moldovans leave for, the life expectancy varies from 6.81 years to 11.71 years. The smallest age has been set in the Russian Federation (Worldometer, 2020).

If we talk about the integration of migrants in the destination countries, here according to the MIPEX index in the top countries entered: Australia, Canada, Finland, New Zealand, Portugal, USA, Ireland, Finland and Belgium. Russia, one of the most popular destinations has been found to have an unfavorable environment for migrants, here immigration is possible without integration. Italy, Israel, Germany, Greece, France and the United Kingdom constitutes a favorable environment, only that the integration can be temporary or complete (MIPEX, 2020).

Another criterion according to which migrants choose their destination country is the spoken language. For example, Russian as one of the two languages spoken on the territory of the Republic of Moldova makes Moldovans go to the

Russian Federation where they can settle down faster and find a job in a shorter time. Due to the fact that Italian, French, Spanish and Portuguese are from the same language group with the Romanian language and are similar to each other, these languages can be learned by Moldovans easier which makes Moldovans choose these destinations. We just have to mention that on average to learn a language at a beginner level a citizen needs from one month to three months of intensive study. Some citizens choose to take classes at home, then leave, while others leave and learn the language in the destination country. Because many migrants do not know the language at first, they are forced to take lower paid jobs, but this does not stop them from leaving, because even these salaries are several times higher than those in the Republic of Moldova.

4. CONCLUSION

In today's globalized world, migration is a natural *process* of functioning and development of human society. From year to year the number of population in the Republic of Moldova decreases, a cause of which being the emigration of the population from the country. According to the above analysis, Moldovans go to well-developed countries, with a stable economy, developed infrastructure and strong political institutions. Most of the chosen countries are placed on high places in the rating of competitiveness compared to the Republic of Moldova which means that in these countries our compatriots can lead a more stable and better life.

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ICT AGAINST COVID-19:
IS PRIVACY A COLLATERAL VICTIM?

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ABSTRACT

The paper analyses the ICT-based solutions that complemented the administrative measures used in the global crisis generated by Sars CoV-2 virus. The solutions are categorized in: adapted (repurposed) smart cities' infrastructures, contact tracing mobile applications, and other (supporting) technologies. Based on a literature review, several problems associated with the smart technologies used as a response to Covid-19 are identified: the reluctant adoption of technological tools, their non-inclusive nature, high costs and inefficiency in use, data integrity problems generated by errors, inconsistencies and incompatibilities between technologies and systems, lack of standardization and collaboration in solutions' development. As significant concerns regarding the use of sensitive personal data are expressed in many publications, the paper focuses on the impact of smart cities networks, data collection hubs and contact-tracing applications on individuals' privacy, discussing the related challenges. Some measures for privacy assurance, intended to increase users' trust in ICT-based solutions for fighting the pandemic, are highlighted at the end of the article.

Keywords: smart city infrastructure; contact tracing applications; data privacy; Covid-19.

JEL Classification: L86, M15

1. INTRODUCTION

Information and communication technologies (ICTs) interact closely with their users, potentially affecting the right of individuals to have personal data protected. Privacy is defined as *the ability of an individual to control the collection, storage, processing and transmission of own personal data, in order*

to be protected from unwanted public attention. Personal data refers to any information related to an identified or identifiable natural person, such as: a name; an identification number; location data; an online identifier; other factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that person. Privacy is important because it allows individuals to build their identity and manage their reputation (Wladawsky-Berger, 2016), to maintain appropriate social boundaries, to have autonomy and control over their own lives, to think and express themselves freely, and to participate without impediments in social and political activities. Also, respect for privacy reinforces individuals' trust in third parties such as doctors, governments, private companies, and limits their power over people (Solove, 2014). Ensuring the right of every person to control the way their identity is constructed and perceived is a very important part of cyber-ethics and an important condition of a sustainable digital environment (Osburg and Lohrmann, 2017). In the Digital Competence Framework for European citizens, a distinct part refers to their ability to protect personal data and privacy in digital environments (Carretero Gomez *et al.*, 2017).
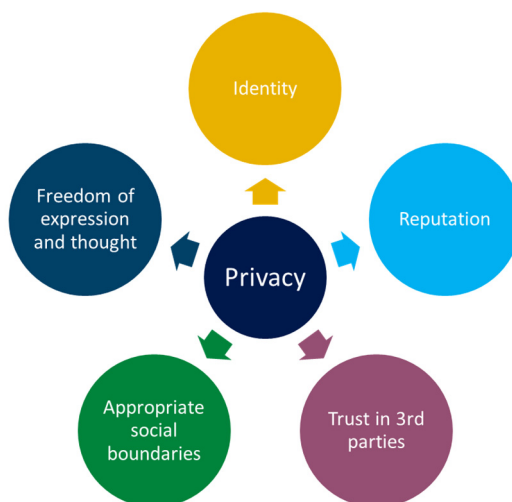

Figure 1. Dimensions of privacy

To ensure the benefits they promise their users, some ICTs are highly intrusive. Ubiquitous and ultra-connected digital devices and applications collect, store, and transmit to third parties an impressive amount of data about every citizen of the digital world. The life of an individual can be recorded, in extremis, 24/24 and 7/7 by new companions such as smart phones, smart wearables (watches, bracelets, glasses or clothes) or smart appliances (refrigerators, robotic vacuum cleaners, TV sets or coffee machines). The individuals are surveilled not only in their homes and offices, but also in auto and pedestrian traffic, where smart

cars, busses, lights or even smart streets are used. Many of the smart objects have a uniquely identifiable online presence - cyber health transmitters for health and fitness trackers, smart watches, or implantable medical devices, or global cyber identifiers such as cyber license plates of smart cars (Sadiku, *et al.*, 2018), which are collected and processed by the various parts involved in the administration of the smart infrastructure. As observed by Padyab and Ståhlbröst (2018), Jayesh *et al.* (2015), Naarttijärvi (2018), and Rubisz (2020), this perpetual collection of data allows tracking users' actions (by identifying them, their precise geographical position and their behavior) and obtaining sensitive information about individuals. Subsequently, the derived information can be used not only by the technology itself but also by third parties such as private companies, hackers and governments. A far too precise identity is constructed and disseminated (potentially) on a global scale, sometimes to an unknown audience, without notifying users or obtaining explicit/informed consent from them.

During data collection, storage, processing and transmission, the unclear responsibilities of parties involved, the indifference of digital fatigue users, vulnerabilities associated with short-range transmission technologies, and lack of adequate security mechanisms in digital devices and software, can cause undesirable effects such as: location tracking, third-party access to data, sale of data to third parties, collection of demographic data, device access to sensitive user information, and exposure to hackers. In this context, the individual does not have the power to extract himself from the digital world and to oppose surveillance. An individual can be easily located by different third parties: mobile operators, Internet service providers, financial institutions, public transport operators, local and national governments, etc. (Riguidel, 2009). This type of monitoring can cause anxiety among citizens, who feel that they lose a part of their private life and are constantly watched in a Big Brother manner (Rubisz, 2020). As Hoeyer (2020) points out, digital platforms create inevitable proximity, and people cannot avoid generating traces of data that can be seen and used by others. In addition, the impact of ICTs on privacy is often not perceived or understood. People have been using smart devices for a long period of time (the clearest example here is the smart phone, progressive and concentric seconded by personal digital assistants, such as watches, scales, vacuum cleaners, or smart TVs) and have become accustomed to their friendly and useful functionalities. The adoption of comfort-generating objects in the lives of citizens is easy, optimistic, usually characterized by a lack of awareness and caution.

On this background, the acceptance of ICT-based solutions for various human problems is natural, at hand. Immediately after the onset of the Covid-19 pandemic, a wide variety of ICT solutions were developed to support the measures put in place by the authorities. Without minimizing their role in the fight against the Sars CoV-2 virus, this paper analyzes the challenges that accompany their adoption, focusing on privacy concerns.

2.   ICT-SOLUTIONS FOR FIGHTING SARS CoV 2. A TYPOLOGY

The ICT solutions created or adapted for the fight against Covid-19 are diverse. In smart cities, **existing digital infrastructure has been adapted to respond to the impact of the pandemic**. *In-place data platforms* and *command and control centers* were *repurposed* and used for planning access to public spaces, tracing of infected individuals and their contacts, keeping distance between people, avoidance of crowded places, encouraging staying at home and communicating location to the authorities, modeling and predicting people density in a given area, monitoring and real-time detection of congestions and non-essential travel, traffic surveillance, visualization and monitoring of high-density areas and Covid-19-vulnerable population, tracking the mobility of pedestrians and vehicles during lockdown periods etc. Data collected by publicly managed digital infrastructures from various sources, such as citizens, public administrations, NGOs, public health institutions, transport companies, environmental monitors, utilities providers, insurance companies and emergency medical services (Allam and Jones, 2020; Millard, 2020; Scassa, 2021), were, in some cases, correlated with data provided by police, mobile operators and/or financial institutions such as banks and credit card companies. The literature mentions the use of *location data from mobile/GPS operators* in tracking individuals, in order to determine their route more accurately than on the basis of their own statements (Korea Centers for Disease Control and Prevention, 2020), *digital check-in and check-out systems* that record the entry and exit of individuals in public transportation stations, offices, schools, universities, malls or other high-traffic locations (Das and Zhang, 2020), and the use of personal financial data from payment instruments (Sonn *et al.*, 2020) (Glosserman, 2020). In addition, *closed circuit television (CCTV) networks* tracked the routes individuals take, checked the wearing of protective face coverings, and helped assess exposure risk by identifying the number of people an individual has met (Korea Centers for Disease Control and Prevention, 2020). In some places in China, cameras were installed even at the doors of apartments, to check whether citizens are leaving their homes (Kummitha, 2020). *Wireless positioning systems* measured the distances between individuals and alerted them when they were too close to each other (Nguyen *et al.*, 2020). In addition, *biometric solutions based on facial recognition* were used to verify the accuracy of data collected by smart cities platforms (Glosserman, 2020).
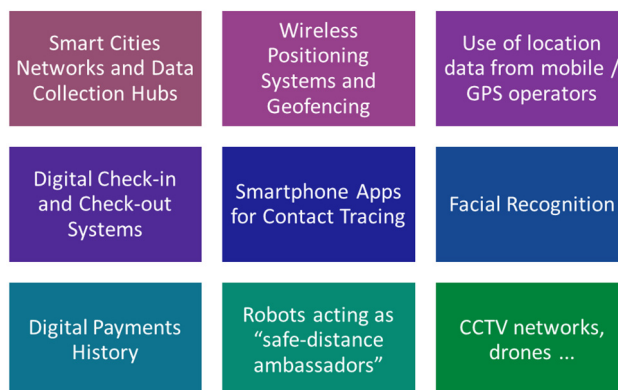
Figure 2. ICT solutions for fighting Covid-19

Different COVID-19 mobile applications appeared quickly after the pandemic started. *Contact tracing/exposure notification applications* worked by identifying persons infected with Sars CoV-2 and determining their close contacts in an automatic or manual way (Ajmal Azad *et al.*, 2020). In some countries, they were also used to track travelers arriving from abroad. For example, in Hong Kong, people entering the country received a bracelet with a QR code and were trained to download the StayHomeSafe mobile application. Bedi mentions the launch of such mandatory applications in Argentina, India, South Korea, Poland, and Russia (Bedi, 2020). The mandatory form is presented as a success by China (Das and Zhang, 2020). The applications can be in private or governmental property (Ajmal Azad *et al.*, 2020). The private apps were created by either individual programmers/small teams of developers or large corporations (Apple/Google) (Howell O'Neill *et al.*, 2020). Another classification divides applications into centralized and decentralized. In the first case, user device identification data is collected by a central authority, and when an infection occurs, the trusted centralized system informs all contacts and interested third parties. In the second type, the phone identifier of a person, along with the positive test result, are uploaded to the centralized system, where they can be viewed by other users of the application, who decide for themselves whether or not they have come in contact with that person. If the user has previously met a positive-tested person, he or she will be alerted, but the location and proximity of the infected person are not transmitted to the centralized system. Health organizations or governments can use shared data to understand the spread of the infection in the community but will not have detailed information about users (Ajmal Azad *et al.*, 2020). To the two distinct categories mentioned above, Nadeem et al. add the

hybrid category (Nadeem *et al.*, 2020). Some applications with different purposes as *apps for self-assessment of symptoms* and *apps that inform users about the pandemic evolution* were also used (Khan *et al.*, 2021).

Other related solutions mentioned in the literature are *remote temperature monitoring systems (thermal cameras)* and *real-time heatmaps of crowding in public spaces* (Hasija, 2020). *Drones* were used for disinfection, delivery of food or medicines, collection of samples for tests, the mass transmission of messages (audio, with loudspeakers, or video, with digital displays) or *as mobile laboratories* (Hasija, 2020) (Khan *et al.*, 2021). Different *robots* were also present in the fight against the new coronavirus: robots that sterilize with UV light, used in hospitals, office or government buildings, hotels, airports, or universities (Bedi, 2020) (Khan *et al.*, 2021), robots used for drug delivery, supervision or follow-up of patients. In public spaces, social robots are used to help people keep their distance from each other and to monitor the wearing of face coverings (Hasija, 2020) (Khan *et al.*, 2021). Khan *et al.* also mention *wearable robot technology* - a smart headset for temperature monitoring (Khan *et al.*, 2021). An important source for bottom-up collection of data is represented by all-day *wearables*. Although they are not specifically designed to detect the presence of the coronavirus, they are able to track other associated parameters, such as heart rate, blood pressure, body temperature and other variables, which can provide valuable information when analyzed (Allam and Jones, 2020). *Artificial Intelligence (AI) techniques applied to Big Data* are mentioned both as stand-alone and support technologies in fighting Covid-19. Machines learn and improve their performance using data collected by Internet of Things (IoT) sensors in smart cities as input. This way, AI-based techniques can provide support in discovering trends and patterns in pandemic evolution, making predictions about the risk of infection, the need for drugs, analyzing test results, etc. (Nguyen *et al.*, 2020; Kummitha, 2020; Allam and Jones, 2020; Khan *et al.*, 2021; Naseem *et al.*, 2020). By integrating *blockchain* and *quantum cryptography* in anti-Covid-19 ICT-solutions, a better security can be ensured for medical and IoT-collected data.

Other ICT-solutions, proposed by academics in various research papers, are: Mots, an AI-assisted robotic solution for contactless meal order and takeout service (Lin *et al.*, 2021), an intelligent surveillance system for people tracking and social distancing classification based on thermal images and deep learning, carried by drones (Saponara *et al.*, 2021), a deep learning-based solution for the efficient monitoring of social distancing through mass video surveillance and bounding boxes (Shorfuzzaman *et al.*, 2021), an IoT geofencing for Covid-19 home quarantine enforcement (Tan *et al.*, 2020), etc.

3. CHALLENGES IN THE ADOPTION OF ICT SOLUTIONS FOR FIGHTING THE COVID-19 PANDEMIC

In developing ICT-based solutions to control and reduce the expansion of Covid-19, various challenges were noticed by different authors. In the following section, the paper discusses the deepening of digital divide on different levels, the reluctant adoption of technological tools and their non-inclusive nature, high costs and inefficiency in use, data integrity problems generated by errors, inconsistencies and incompatibilities between technologies and systems, lack of standardization and collaboration in solutions' development.

Digital divide deepening in case of vulnerable groups	Data integrity issues	Possible improper use after pandemic
Closed, proprietary solutions	High costs	Inefficiency

Figure 3. Challenges in the adoption of ICT solutions for fighting the COVID-19 pandemic

Morishita-Steffen *et al.* (2021) show that people with certain professions do not have the option to use technologies to work from home and are more exposed to economic risks and to the misinformation that accompanied the coronavirus pandemic. Also, access to learning from home is not equal for all children. Many people would not be able to adapt their behavior accordingly if they were informed about a possible exposure to Sars-CoV 2, due to socioeconomic factors and other vulnerabilities (Sapiezynski *et al.*, 2020; Lee and Lee, 2020). Regarding the access to ICT-based solutions, estimates show that over half of the global population does not have modern smartphones and/or unlimited Internet access. Das and Zhang report the vulnerability of digital outcasts relative to other citizens in the case of access to digital solutions that emerged in the attempt to manage the Covid-19 crisis. They analyze the situation in Singapore, pointing out the *unequal access to technology* in the cases of foreign workers, for whom proper access to information and the observance of distancing rules proved to be difficult. Among the solutions adopted by the Singapore government, the authors list: a wearable device (token), which solves the absence of a smart mobile phone or the incompatibility of the TraceTogether application with certain types of phones, and the alternative of using the identity card by those who do not have a mobile phone in the case of SafeEntry, a mandatory digital check-in and check-out system (Das

and Zhang, 2020; Lee and Lee, 2020). Naseem *et al.* (2020) find that AI-based tools are used mainly in high-income countries and emphasize the importance of their use in low-middle income countries. Kelly and Mouritz (2020) talk about inclusion from a Chinese perspective, stating that smart technologies should be invisibly embedded in the lives and actions of all smart city inhabitants and, as a result, allow for an extremely inclusive and equal form of decision-making. The impact of Covid-19 has not been unitary at the global level: densely populated urban communities have been more severely affected than rural ones, and poor, marginalized, vulnerable groups have suffered more (Sharifi and Khavarian-Garmsir, 2020). In Söderström (2020), the author points out that while the use of platforms imposed by central and local governments raises questions about privacy, respect for civil rights, the size of individual surveillance and social sorting, initiatives launched by companies or citizens are more socially oriented, helping citizens in creating support networks for the vulnerable persons. Proper solutions, adapted to real needs of the users and communities, should be developed using social innovation (Clerici Maestosi *et al.*, 2021).

People rarely choose to install tracking applications unless they are constrained in some way. *The mandatory nature of some apps* raises serious concerns about civil liberties and the long-term impact of surveillance systems (Sapiezynski *et al.*, 2020). Although the technology-based approach may be productive for identifying, isolating, and quarantining infected individuals, it may also suppress and censor citizens' views (Kummitha, 2020).

Sometimes, ICT-based solutions can be *costly* and/or *inefficient*. For example, viewing and analyzing data on the route of an infected person who developed symptoms later than the time of infection, via CCTV, based on the history of payment transactions or location determined based on mobile phone use can take a long time (Korea Centers for Disease Control and Prevention, 2020). Scassa (2021) considers the contact-tracing apps rather simple individual-focused exposure-notification apps, as they are not integrated with public health contact-tracing activities.

The versatility of the ICT-based solutions raises questions about the *purposes of their possible subsequent use* after the pandemic is over. Governments - for example, in South Korea - declared that the smart technology launched will only be used during the coronavirus pandemic. However, some authors notice that a declaration or assurance is not a legal guarantee, and it is difficult to imagine governments giving up new surveillance capabilities without being forced by massive opposition and protests (Chandler, 2020; Leprince-Ringuet, 2020). The risks of keeping some of the technologies for the subsequent surveillance of citizens in formerly technology-free public spaces have been stated by several authors, as mentioned in Scassa (2021).

Data integrity issues have also been reported. When using data from mobile operators/GPS to track individuals, location data are not very accurate and various

errors can occur - for example, if the phones were purchased in another country than the one where the location is determined. Errors have also been signaled when using bank identification data to identify the location of individuals (Korea Centers for Disease Control and Prevention, 2020). Ankel (2020) also claims that in the case of tracking software installed by China in Alibaba and WeChat, the way the system classifies individuals is not transparent, and some users have reported seeing how their color codes changed without explanations. The exclusive use of automatic contact tracing methods leads to the generation of systemic errors. Even the perfect operation of devices and software in the model based on the proximity of the devices can lead to errors. For example, in a block of flats with floors, in which the apartments are similarly structured, a person can be at a distance of a few meters from the neighbors next door, below or above, but without coming into physical contact with them. The same thing happens with people blocked in traffic. In such contexts, the accuracy of big data is altered, and the work of competent interpreters is therefore indispensable to clean and understand the data and to draw non-biased conclusions (Kouřil and Ferenčuhová, 2020; Lee and Lee, 2020). Errors in the data processing cycle result in limited information and knowledge derived from data (Wang *et al.*, 2021), and false positive results of tracking applications would cause unnecessary alarming of individuals and loss of time for data processing institutions (Sapiezynski *et al.*, 2020).

While voluntarily developed applications and some government applications have been open source from the beginning - for example, Trace Together, the solution adopted in Singapore (Lee and Lee, 2020), many other products are *proprietary solutions*, understood only by their producers and by those who use them to provide smart services. Improvements in the health sector can only be achieved if different products are designed to support standardized protocols. Open protocols, proper data confidentiality, integrity and availability measures are required during the entire life cycle of data processing (Allam and Jones, 2020). Failure to share data and information between urban entities can undermine the control of the disease (Glosserman, 2020). Equally, more efforts should be made to provide accurate information to the public, by clearly defining standards for the publication and reporting of patient information for community benefit when an infectious disease prevails (Korea Centers for Disease Control and Prevention, 2020).

4. INVESTIGATING PRIVACY ISSUES OF ICT-BASED ANTI-COVID-19 SOLUTIONS

Medical secrecy protects the individual interests of patients in terms of their privacy, but also a public interest: trust in medical services. As the European Court of Human Rights observes, the protection of personal data, in particular medical data, is of fundamental importance for a person, as guaranteed by Article 8 of the

Convention. Respect for the privacy of health data is a vital principle in the legal systems of all parties of the convention (Zuiderveen Borgesius *et al.*, 2017; Valcke *et al.*, 2018). Concerns about the extent of monitoring in the case of Covid-19 and the question of whether it is worth sacrificing a person's privacy to detect a disease, especially when talking about vulnerable people, are expressed in Flick *et al.* (2020). The authors warn that profiling - the use of medical data in correlation with data regarding the commercial activities of the user or the intentions of medicine manufacturers and health care providers, is inadmissible and point out the need for measures to respect privacy and ensure the security of personal data. Trencher and Karvonen (2019) find that data-driven approaches to health management risk to affect social norms.

From the perspective of confidentiality, Nadeem *et al.* (2020) classify the data used by the ICT solutions developed against Covid-19 into three categories: i) identification data of individuals (e.g., names, telephone numbers, test results, etc.), ii) contact messages (pseudonyms switched between devices) and iii) social/proximity graphics that indicate the interactions between users and the people they have met. Each category of data has different privacy implications.

While some applications require only data that are strictly necessary for functioning, and data use is intentionally temporary, others are invasive, excessive and require permanent access to sensitive user data - China's system, for example, captures data such as citizens' identities, location and even the history of online payments, so that local police can track those who break the quarantine rules (Howell O'Neill *et al.*, 2020). The Quarantine Watch application used in Karnataka, India, required the user to download, install, complete a registration form, and then upload it every hour during the daytime a selfie photo, together with GPS coordinates. The photos were checked with facial recognition software, and if it appeared that they did not belong to the registered user, he could be called or visited by local authorities. Datta (2020) denounces this process of violating domestic privacy, raising questions about the use of data by third parties, trust, visibility, and respect for individuals' intimacy. The use of methods that objectively verify patient statements regarding their routes (through medical records, GPS, card transactions, and CCTV) for Covid-19 contact investigations in South Korea provided accurate information about the patient's location, exposure time, and contacts, as well as other details, thus reducing omissions in determining a patient's route due to incomplete recall. However, publishing an individual's route violates privacy (Korea Centres for Disease Control and Prevention, 2020). Most tracing applications collect personal information such as name, device ID, and location. In addition, some applications require access to resources and functionalities such as SMS, microphone, camera, and device storage. Ajmal Azad, *et al.* (2020) point out that such permissions are not mandatory for the proper functioning of applications and should therefore not be required by developers. In addition, the authors observe that several applications

share data with third parties, with only a small number of them obtaining user permission prior data transfer (Ajmal Azad *et al.*, 2020).

In the analyses performed on trace & track applications, questions arise about: 1) the nature of the data to be collected, 2) the necessary minimization of collection, processing, storage and transmission of data, 3) the role and actions of third parties that will access data, 4) transparency in present and future use of data, 5) the voluntary or mandatory nature of data collection, 6) the embedded security measures, 7) compliance with ethical principles (Howell O'Neill *et al.*, 2020; Lakshané, 2020; Kouliaridis *et al.,* 2020; Scassa, 2021). The authors note a wide variety of approaches in terms of surveillance and transparency, as well as deviations in both application permissions and the use of potentially invasive APIs.

5. MEASURES TO ENSURE PRIVACY IN ICT-BASED SOLUTIONS USED IN COVID-19 PANDEMIC

Appropriate technical, legislative, and administrative measures are needed to prevent, monitor, and minimize the risks associated with the privacy breaches outlined above. The measures must be accompanied by actions to raise public awareness by providing detailed and easy-to-understand information on the conditions of the collection and processing of personal data (Rubisz, 2020).

In adopting and adapting legislative measures to ensure the basic principles of personal data processing (lawfulness, transparency, fairness), the collaboration of experts in various fields is needed: IT lawyers, computer and data scientists, security experts, engineers, sociologists, or economists. This collaboration is often difficult to achieve, due to contextual factors or lack of time (Valcke *et al.*, 2018). The technical measures involve compliance with the principles of privacy by design and privacy by default. *Privacy by design* involves considering the confidentiality of private data from the very beginning, in the design phase of the hardware or software product. Software development must be done proactively, with confidentiality integrated into the design as the default setting. Any product/solution must provide total data protection throughout its entire life cycle. The solution must be explained to the user to ensure its visibility and transparency. As a corollary, the entire development cycle must be user-oriented. *Privacy by default* involves the default application of the strictest security settings. Only the necessary data will be processed and only for as long as necessary. Developers must have knowledge of legislation and security and must adhere to ethical principles. Communication with the user is very important. Documentation of data protection has to be done through clear policies, guidelines, and work instructions. The technologies used must allow the anonymization, pseudo-anonymization, and encryption of sensitive data.

The Covid-19 tracing applications use data collected by different sensors of the smartphone (GPS, Bluetooth), such as name, address, gender, age, contact

data, call history, and contacts. Applications either interact automatically with the national health system to upload citizens' test results or rely on the manual provision of test results by citizens to the medical organization (Ajmal Azad *et al.,* 2020). Some applications identify a person's contacts by tracking the movement of their phone (via GPS or triangulation) and then searching for other people's phones who have spent time in the same place. Proximity tracking through Bluetooth short-range technology is based on the exchange of encrypted tokens between smart phones. In this case, anonymization is easier and the level of privacy higher. DP-3T (decentralized privacy-preserving proximity tracing) is an open-source protocol for Bluetooth-based tracking in which the contact history of an individual phone is stored only locally, so no central authority can know who was exposed (Howell O'Neill *et al.,* 2020). The Exposure Notifications (ENS) system developed in partnership with Apple and Google generates a random identifier for the user's device, an identifier that changes every 10-20 minutes, to reduce the chances of identifying the user's location. Nearby phones exchange these identifiers with each other via Bluetooth. Periodically, the user's phone checks for random identifiers associated with Covid-19 infection. In the event of a match, the user receives a notification and instructions from the public health authority. To help maintain privacy, ENS relies on 1) voluntary use, which may be discontinued at any time, 2) non-use of phone location data, 3) non-disclosure of user's identity to Google, Apple or other users, 4) exclusive use by public health authorities, after demonstrating that they meet specific criteria related to privacy, security and data use (Google, 2020). Also, in some cases, instead of rapidly using technologies to monitor citizens or access their mobile phones, governments have turned to mobile operators to share anonymous and aggregated data on the concentration and movements of citizens in areas where Covid-19 was predominant (Kummitha, 2020).

6.   CONCLUSIONS

The mobilization of ICT professionals during the Covid-19 pandemic was remarkable and led to the emergence of solutions that proved their usefulness and, in some cases, efficiency. For some technological tools, mass media, the public, NGOs, academia, and other actors have expressed their concerns about their compliance with ethical principles, in particular individuals' right to privacy. In conclusion, the technological measures to combat the virus must be collaborative, and proactive, based on data sharing and a higher degree of communication between all relevant actors. Data sharing protocols need to be calibrated to remove all obstacles to collaboration, ensuring transparency, accessibility, and quality of data for all the involved parts. A mix between top-down, state-led solutions and bottom-up, human-driven solutions is needed. On the one hand, the intensive collection of data and the collaboration between the various actors involved (public health authorities, city managers, and private companies developing

solutions) is desirable for a fast and efficient response to the different challenges created by the coronavirus pandemic. On the other hand, the right of individuals to privacy must be respected and the ethical principles of data processing have to be observed.

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CHALLENGES OF APPLYING AGILE PRACTICES
IN HIGHER EDUCATION

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ABSTRACT

During the last decades, agile methodologies have been widely applied in the software industry. As a consequence of their remarkable success, in recent years, agile concepts, techniques, and practices have also been adopted and used in different other fields, including the educational processes at both secondary and tertiary levels. This paper examines how agile practices can be implemented in teaching and learning to increase students' engagement and help them improve their knowledge and skills in a manner more appropriate to the characteristics of new generations. As young learners will work in a very dynamic market, constantly facing the need to adapt to the changes generated by a perpetual technological evolution, an educational approach based on agile values and principles can support the building of a proactive and creative attitude needed to succeed.

Keywords: agile methodology; education; agile frameworks; Scrum.

JEL Classification: O31, A23

1. INTRODUCTION

The first proposals to use agile practices in education emerged in the same period when the Agile Manifesto was published and consisted in the use of lean concepts for the transformation of the university system (Alp, 2001). As agile frameworks became increasingly popular, their specific practices were adopted and applied in many fields. Starting from the idea that people, environment, organizations, and processes are constantly changing, an approach that would naturally accept and encourage change has been seen as potentially successful. According to Rigby, Sutherland, and Takeuchi (2016), even the concept of

innovation has evolved following the large-scale agile use: not only new products and services are created, but innovation is also present in functional processes due to the rapid spread of digital technologies. These transformations influence education processes, making change easier and increasing the collaboration level between educators, learners and managers. The growing popularity of nanodegrees is just an example (Lemoine and Richardson, 2015). They allow access to courses in various fields offered by universities and companies through online platforms. Without replacing the degrees offered by universities, their role is to train specialists in industries that experience an acute shortage of workers (Sindre, 2019). According to Wijnands and Stolze (2019), it is no longer enough for the education system to provide knowledgeable employees. It should provide leaders and highly adaptive thinkers, and also encourage collaboration, communication, critical thinking, creativity, development, and use of relevant ICT skills, etc. As memorizing facts by learners has become less and less significant, agile methodologies respond very well to these changes due to their intrinsic values and practices.

Agile is an "umbrella" term for a set of project management methodologies, such as Scrum, eXtreme Programming (XP), Kanban, Feature-Driven Development (FDD), Dynamic Systems Development Method (DSDM), Adaptive Software Development (ASD), Crystal, Lean Software Development (LSD), etc. These are alternatives to traditional methods with better quality, faster and more satisfying results. Initially proposed for software development, agile methodologies are now applied in many other fields, such as research and education, organizational culture, marketing, human resources, banking sector, distribution, government, pharmacological industry, etc.

In education, agile methodologies have been adopted to improve the process of information and knowledge transmission and assimilation by students. Due to frequent changes, the education system must adapt both to the requirements of the labor market and the characteristics of the new generations. Given the special attention to people factors and their focus on the talents and skills of individuals (Salza *et al.* 2019), agile methodologies are considered suitable for teaching and learning processes. Adaptability, transparency, value maximization are characteristics of agile frameworks that make them appropriate not only for the educational process but also for the evaluation and administrative processes (Kamat, 2012). These changes may lead to removing redundant and unnecessary activities in education, generating cost and time reduction and an increase in efficiency.

The application of agile methodologies in education implies the adoption of the values and principles proposed by the Agile Manifesto but interpreted from the perspective of the particularities of the education system. The idea is not new, but it is constantly evolving, with more and more courses in various fields being taught in an agile manner. First, agile methodologies were applied in software

engineering courses, where the teacher manages teams of students involved in real software projects (Alfonso and Botia, 2005). Subsequently, they proved effective in teaching other courses, such as mathematics (Duvall *et al.*, 2017) or chemistry (Vogelzang *et al.*, 2020).

This paper examines how agile practices can be applied in teaching and learning to increase student engagement and help them improve their knowledge in a manner more appropriate to the characteristics of new generations. The rest of the paper is organized as follows: Section 2 reviews related research in the field. Section 3 presents the main particularities and challenges of agile methodologies adoption in the education process. Section 4 presents a practical example of using Scrum in the classroom. The last section is devoted to providing the fundamental conclusions.

2. BACKGROUND

Organizations became interested in increasing the agility of their processes and teaching their workers to be agile since it was proved that agility accelerates the delivery of business value (Guzmán and López, 2019; VersionOne, 2017). Characterized by a wide diversity of practices, all agile methodologies are based on a set of values and principles set out in 2001 in the Agile Manifesto. Their initial aim was to find solutions to reduce the number of failed, late, and/or over-budget projects in the Information System domain, a field where the failure rates are usually estimated at 30-40%, and planned budgets are exceeded sometimes with up to 200% (Keil *et al.*, 2000; Pinto, 2014). Sometimes, the implementation of specific practices requires a change of the organizational strategy, which is a costly and time-consuming process. As the agile approach offered a new, more flexible vision of project management, making the change accessible and easier throughout projects, it is considered one of the best options. The selection of an agile framework may become a challenge. Their adoption adds value since they are focused on the considered most valuable components and provide visible results faster than traditional project management methods. They are based on values and principles, not on processes and groups of processes having a longer execution time. This approach has a significant contribution to their success. Agile methodologies encourage team-based and iterative development to reduce resource waste, time, and effort (Salza *et al.*, 2019). Product development implies going through several cycles consisting of the following stages: requirements analysis, design, development, testing, and deployment. There are differences between agile frameworks regarding the number and order of phases, the roles of the people involved in the project, the duration of each iteration, etc. However, all promote the collaborative leadership style that encourages exploration and builds adaptable teams. Accepting the change of requirements during the implementation of the project was the characteristic that most influenced the success of agile methodologies.

Agile methodologies have been documented and tested in the education process in face-to-face learning and online courses at the graduate and undergraduate levels. Fronza, Ioini and Corral (2017) proposed a framework for teaching and assessing computational thinking in the context of K-14 education. Kastl, Kiesmüller and Romeike (2016) presented four case studies with 140 students in high schools from three different federal states of Germany in computer science education who experience project development with agile. Masood, Hoda and Blincoe (2018) have experimented with agile practices in higher education at the University of Auckland. The study was conducted on 135 students enrolled in the Agile and Lean Software Development course. The results highlight the main challenges of implementing agile methodologies in education, along with the necessary changes to meet the particularities of this field. The collaboration with companies allowed students to work in a simulated real-world environment. Another experiment was conducted by Kropp and Meier (2013) in a Software Engineering course at Zurich University of Applied Sciences. Based on the results, the authors concluded that agile methodologies should be integrated into other courses like programming, object-oriented analysis and design, algorithms, data structures, etc. According to Masood, Hoda and Blincoe (2018), agile methodologies have been used in software engineering since they build social and ethical skills in addition to technical ones.

Some authors have proposed agile models adapted for online courses. For instance, Ashraf, Shamail and Rana (2012) proposed a model for e-learning students' final year projects that mixed the waterfall and agile modes. The first semester is completed using the waterfall model, and the second semester is completed using agile. In the second semester, two groups were created: group A applying waterfall and group B applying Scrum. After three weeks, the number of students in group B who delivered completed functionalities was two times higher compared to the number of students in group A. The authors concluded at the end of the study that applying the Scrum model improves the results as well as the understanding of project requirements and social skills and prepares better the graduates to meet employers' expectations in practice (Ashraf *et al.*, 2012). Noguera, Guerrero-Roldán and Masó (2018) tested the adaptation of agile principles to online higher education with students enrolled in the course entitled Collaborative Learning in Virtual Environments at the online Open University of Catalonia. The goal was to improve the learning process and generate new theories of online collaborative learning. The study results showed that "the agile strategies incorporated into project-based learning facilitated team regulation and project management, although students' satisfaction and overall learning outcomes did not increase." The authors identified the following challenges for teachers: (1) the monitorization of the students that work autonomously and in self-organized teams, (2) supporting students in finding a balance between autonomous and

collaborative learning and (3) helping teams maintain balance in group stability, level of involvement and frequent communication (Noguera *et al.*, 2018).

Scrum framework is the most widely used in teaching agile methodologies or other courses using agile concepts and practices (Wijnands and Stolze, 2019; Werner *et al.*, 2012; von Wangenheim *et al.*, 2013; Duvall *et al.*, 2017). eduScrum was inspired by the original Scrum guide. The authors adapted Scrum roles, events, artifacts, and rules to the educational environment. eduScrum makes the transition from teacher-driven education to student-driven and student-organized education. In an effective and efficient manner, students learn to cooperate, get to know themselves better, and be co-creative (Wijnands and Stolze, 2019). eXtreme Programming practices have also attracted the attention of education specialists (Lembo and Vacca, 2012; Lui *et al.*,2016; Umapathy and Ritzhaupt, 2017). Pair Programming and Test-Driven Development were the most tested approaches, with significant positive results. In medical education, Educational Kanban has been proposed to increase the efficiency of self-directed adult learning. According to Goldman (2009), "the educational equivalent of the Kanban system would be a process that monitors the trainee and educational context to develop explicit goals for each student on each rotation, coupled with the real-time collaborative monitoring needed to direct teaching resources to ensure a well-educated trainee". Hybrid frameworks have also been developed and tested in university education. For example, Matthies (2018) proposed the Scrum2Kanban model. It starts with Scrum to familiarize students with agile values, principles and practices and continues with Kanban, which is more permissive and less prescriptive. The students are encouraged to visualize workflow and work-in-progress (WIP) limits appropriate to the end of the semester when they move from feature development to a "bug fixing and polishing" mode (Matthies, 2018). These practices increase the dynamics of the activities and allow product changes before finishing the sprint.

3. PARTICULARITIES OF THE ADOPTION OF AGILE METHODOLOGIES IN EDUCATION

The values of the Agile Manifesto have been adapted to reflect important aspects of the educational process. From the various interpretations, we have selected two representative approaches, proposed by Kamat (2012) and by Stewart *et al.* (2009). They are presented in the following figure (Fig. 1). The aim is to inspire teachers in designing the teaching process. They must prioritize the activities that bring value to the students as knowledge and experience.

Similarly, the 12 agile principles were reinterpreted by Stewart, DeCusatis, Kidder, Massi and Anne (2009) to match the expectations and activities specific to the educational system. The main priority is to meet the needs of students by providing early and continuous meaningful learning (Salza *et al.*, 2019). Students will be motivated to work individually and as members of a team. Working

deliverables are the measure of progress. The teams are self-organizing, and their members collaborate and try to do the same amount of work. Creating a collaborative environment where everyone can learn through individual study and teamwork is considered the basis for long-life learning skills. During the semester, at regular intervals, teams self-analyze and identify how they can become more efficient and adapt their behavior to the observations. Periodically, students receive feedback from the teacher/instructor to increase efficiency. Project-based learning is encouraged. Each team must identify the simplest solutions to problem-solving concerning the rigors of technical excellence and useful design. The interaction between the teacher and the groups of students is iterative and face-to-face. They can adapt anytime to the changes.
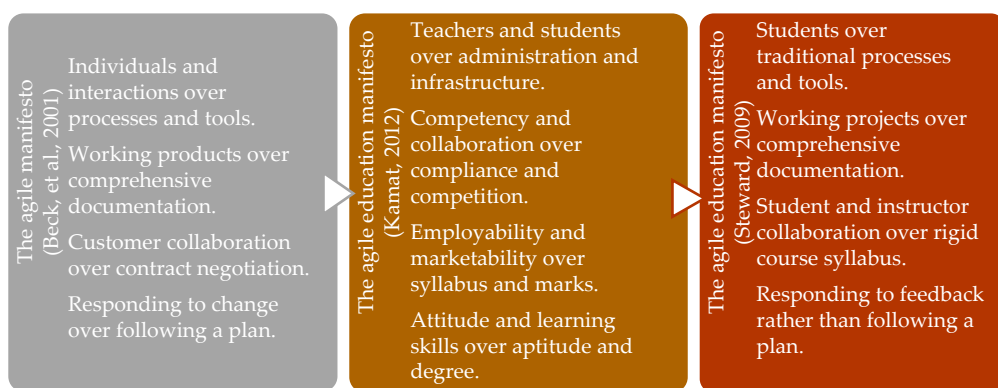
The agile manifesto (Beck, et al., 2001)	The agile education manifesto (Kamat, 2012)	The agile education manifesto (Steward, 2009)
Individuals and interactions over processes and tools.	Teachers and students over administration and infrastructure.	Students over traditional processes and tools.
Working products over comprehensive documentation.	Competency and collaboration over compliance and competition.	Working projects over comprehensive documentation.
Customer collaboration over contract negotiation.	Employability and marketability over syllabus and marks.	Student and instructor collaboration over rigid course syllabus.
Responding to change over following a plan.	Attitude and learning skills over aptitude and degree.	Responding to feedback rather than following a plan.

Figure 1. Agile Manifesto from industry to education

The implementation of agile practices in the educational process by teachers is not enough. The students have the primary need to be agile (Sindre, 2019), as they will work in a very dynamic market and will have to adapt constantly to the changes generated by technological evolution. Learners need to change their attitude (Wijnands and Stolze, 2019), to be more involved and proactive. The way they will carry out their professional activity will go through numerous changes, some even radical, throughout their career. They have more alternatives and more difficulties in selecting the field that suits them best.

There are many challenges in transforming classical education into an agile one, such as increasing the teachers' workload or costs. Agile teams are small. In Scrum, for example, each team consists of 3-9 members. Universities work with large series. The division into smaller series implies either a substantial increase in the teachers' workload or the hiring of new teachers. Either of the two options naturally leads to increased costs. It is also expensive for universities to allow students to individually select courses, especially if they want to combine

elements from various directions within and across their field. From the students' point of view, the risk of making inappropriate choices increases, or certain access limits may appear. It is the case for over-requested courses with a limited number of places due to special conditions (such as laboratories). In addition, students must be well informed about the prerequisites for each course they intend to choose. The extreme flexibility of the education process requires frequent communication between teachers, students, and industry representatives to adapt the options in each semester that follows. This continuous dialogue is difficult to ensure since it requires available time for each category of participants and subsequent synchronization of their schedules. At the same time, the change of the university curricula requires time and prior preparation that is impossible to be achieved in the short term, from one semester to another. This approach may be more suitable for collaboration between industry and MOOC providers and less for universities.

A more feasible and realistic solution for adopting agile methodologies in education is to keep traditional, plan-based university studies and adopt agile practices within each course. Even in these conditions, a big challenge remains to build the overall picture of the field studied. The delimitation of activities in iterations with brief time intervals could limit the understanding of the course as a whole and establish the connections between the knowledge acquired in each of those time intervals. The role of the teacher is essential in minimizing this risk.

4. SCRUM FRAMEWORK IN CLASSROOM – A PRACTICAL EXAMPLE

This section presents the results of our experiment of using the Scrum framework in the classroom. The events, artifacts, and roles must be adapted to the particularities of the course and the environment. In the case of the eduScrum framework, for example, the following events are recommended for each sprint (Wijnands and Stolze, 2019): (1) planning meeting takes place at the beginning of the sprint and aims to create teams, set learning goals and work plan; (2) stand-ups last 5 minutes and occur at the beginning of each class to synchronize activities and plan them until the next meeting; (3) sprint review is conducted at the end of each sprint to highlight/identify what students have learned during the sprint and (4) sprint retrospective and personal reflection is an opportunity to analyze the process and possible improvements, self-assessment and evaluating colleagues as well as actions/attitudes that need to be eliminated. The teacher has a hybrid role between the Product Owner and Scrum Master (Wijnands, 2020). One of the team members plays the role of team captain, who has similar attributions to the Scrum Master, but with some limits since some tasks and responsibilities of the Scrum Master are assumed by the teacher. The Student Team is self-organizing and must deliver learning results iteratively and incrementally.

In our case, we used the Scrum framework within the Agile Project Management course, taught to second-year master's students. The groups of students were very heterogeneous in terms of background (undergraduate studies, jobs). A small number of them were familiar with the subject, being members of agile teams (approximately 20%). Their contribution was significant due to the feedback provided and the additional information offered to their colleagues. We used Scrum practices to present the theoretical concepts. First, we decomposed the syllabus into users' stories that we arranged on a board with three columns (Open, In Progress and Done) made in YouTrack (Fig. 2).
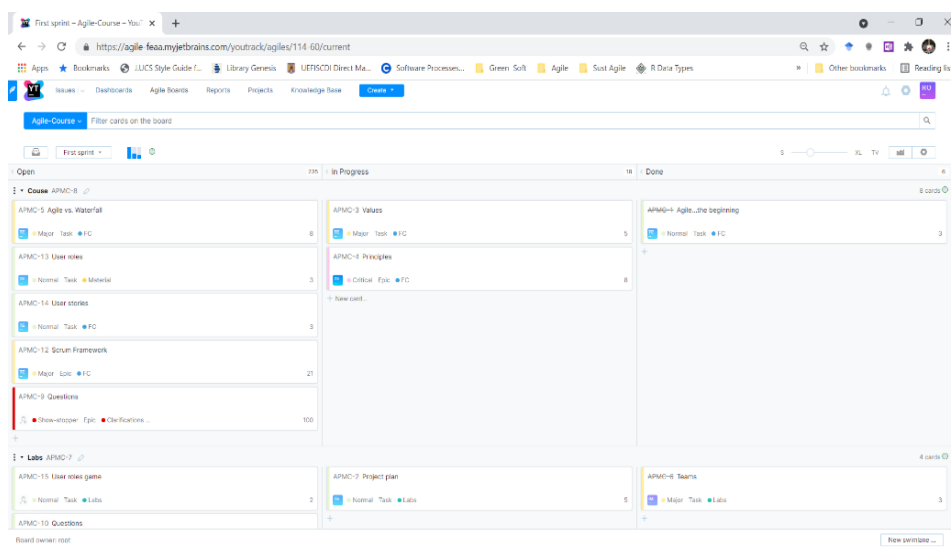

Figure 2. Agile Board for courses and seminars

Each user story was presented and discussed and moved through each of the columns mentioned before. At the beginning of each course, we discussed the issues related to the concepts presented in the previous meeting (10 minutes) on the model of sprint review. Students that had questions or ambiguities about a user story (concept, practice, etc.) were encouraged to create a new task linked to that user story. Similarly, we organized the activities during the seminars for creating teams, selecting the themes of projects and their presentation. For the project, the students had to write the product backlog, user stories and tasks, estimate them in story points, respectively in hours, plan the sprint, etc. Thus, they applied all the practices discussed from a theoretical point of view in the project development activities.

In the first part of the course, we discussed general concepts about agile methodologies (context, values, principles, etc.) and differences from other

models, such as waterfall, spiral, incremental, etc. Next, we discussed the agile practices, roles, stages of the project and the most used frameworks (Scrum, eXtreme Programming, Kanban). In parallel, we illustrated the concepts discussed through practical examples and games. These helped the students to understand better the importance of collaboration and communication, create project teams and select the subject of the project based on their previously acquired knowledge. Choosing the theme of the project was a challenge for some students. Students had to apply agile practices and deliver tangible or visible results at the end of each sprint regardless of the topic chosen for the project. Selected themes were from various fields: websites, mockups, written tutorials, video tutorials, dashboards for sales, production, personal evaluation, etc.

The project implementation was divided into one-month sprints. Given the weekly frequency of meetings, we considered that two weeks would be too short for visible progress. At the beginning of each course, one team organized a 5-minute stand-up in front of all colleagues. The aim was to stimulate the whole group's interest. Subsequently, each team continued with its stand-up to synchronize activities and establish the plan for the next period. The questions used during the stand-ups were those recommended by the eduScrum Guide (Wijnands, 2020):

- What have I done to help the team since the last class (meeting)?
- What am I going to do during this meeting to help the team?
- What are the obstacles that stand in my or my team's way?

User stories estimation is challenging for the teams that apply agile methodologies. The estimation techniques were presented as games. Subsequently, students estimated tasks and user stories. Every year, from one sprint to another, the accuracy increased visibly. We did not identify some rules about overestimation or underestimation of the user stories at the first meeting. The expectations of the team's members regarding the grades, their enthusiasm, and interest can be some reasons. Each sprint ended with the presentation of the project, followed by a sprint review and sprint retrospective. Progress reviews were more frequent to have the possibility to offer feedback to the students and to establish the future direction of development. Each member of the team has successively assumed the role of Scrum Master as already mentioned.

5. CONCLUSION

Agile methodologies have been adopted in many fields, including education. Their practices must be adapted to fit the specific conditions of the schools' environment. Some studies have shown that a hybrid model can be the most appropriate in this context. For example, daily stand-ups can turn into weekly stand-ups for the courses or laboratories planned once a week. Also, the duration could be shorter to have enough time to organize a stand-up with the whole group and stand-ups separately on each team. A big challenge of applying agile practices

is using the students' knowledge and experience to maximize the results reflected in the project. Agile teams are cross-functional. They include experts in various fields that must collaborate, communicate, and focus on value delivery. The project themes must value their previous knowledge and, at the same time, stimulate them to accumulate new knowledge. Team members should change roles throughout the project.

Learning through games has proven to be an effective technique for new generations. Students gained information about the practices of agile methodologies through games such as Planning Poker or Team Draw. Issues related to the application of agile-at-scale or the importance of team collaboration and collective ownership were presented using these interactive methods. Another challenge was setting a sustainable pace. Some teams implemented all tasks a few days before the deadlines. In these cases, students understood the importance of constant project development only after the first sprint. Together we analyzed the Burndown Chart and discussed the importance of continuous project development.

The application of agile methodologies in education has advantages and disadvantages. It brings many other challenges related to student motivations, limited time for applying practices, diversity of students' activities and profiles, etc. It is a challenge for teachers who must adapt their teaching, interaction with students and assessment methods.

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THE HEALTH CARE RENUNCIATION
OF PREGNANT WOMEN

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ABSTRACT

The paper aims to assess the determinants of health care renunciation of pregnant women. A sample of 512 women that gave birth at "Cuza-Voda" Maternity from Iasi has been surveyed. The following methodological approach allowed to attain the paper's objectives: (1) the assessment of the degree in which pregnant women renounce to health care; (2) the identification of the factors that influence the health care renunciation. The results of this study highlighted that socio-demographic factors, psychological factors, and health-risk behaviour factors have significant influence on health care renouncement of pregnant women.

Keywords: vulnerable population; health-care renunciation; socio-demographic factors; psychological factors; at risk-behaviour factors.

JEL Classification: C12, I14, P36

1. INTRODUCTION

Pregnant women are one of the most vulnerable populations. The importance of studying the characteristics of such a population has been highlighted mainly by the analysis of the effect of health-risk behaviour (smoking, alcohol drinking, unbalanced alimentation) on the health of mothers and their new-borns. However,

a new dimension emerged through the analysis of the determinants of healthcare renunciation on pregnant women (Ancelot *et al.*, 2017).

The aim of the paper is to assess the profile of pregnant women that have renounced to health care due to financial reasons. The descriptive statistics has been used to assess the degree in which pregnant women renounce to health care. The association analysis and Chi square test have been used to identify and assess the determinants of health care renunciation of pregnant women.

The case study is completed on a sample of pregnant women from Romania. The demographic situation in Romania shows that fertility had a decreasing trend after 1990, though the economic situation and the health insurance system does not creates sufficient conditions for supporting and stimulating the health care of pregnant women (Jaba *et al.*, 2013). Moreover, the migration of women in their fertile age has become more intense.

The paper is structured in five sections. After Introduction, in the literature review section, we explore the recent studies on healthcare renunciation, in general, and in the case of pregnant women, in particular. In the third section, we describe the sample, the variables and the methods. The fourth section presents the main results concerning the influence of the determinant factors on health care renunciation of pregnant women. The fifth section presents the main conclusions of the study.

At the sample level, 25.59% of pregnant women have renounced to health care. There are different types of factors that explain the women's behavior related to health care, among which the most important are socio-demographic factors, psychological factors and at risk-behaviour factors.

2. LITERATURE REVIEW ON HEALTHCARE RENUNCIATION

Studies on the healthcare renunciation of pregnant women are less frequent.

In France, recent studies on health status of pregnant women have analysed the effect of precarity and poverty on the perinatal pathologies and prematurity (Lejeune, 2008). Gayral-Taminh *et al.* (2005) revealed that deprivation is an important perinatal medical risk factor. Deprivation is associated with more difficulties during pregnancy and the perinatal period. Moreover, using data of French National Perinatal Survey, Ancelot *et al.* (2018) have analysed for the first time the impact of health care renunciation of pregnant women on the health status of their new-borns.

A French-Romanian comparative study (Ancelot *et al.*, 2020) has underlined the inequalities in use of health care during pregnancy. The unmet need for health care during pregnancy is measured considering both the World Health Organization (less than four visits to a health specialist and two ultrasounds) and the Haute Autorité de la Santé had less than seven prenatal visits, no more than two ultrasounds) recommendations for pregnancy monitoring. For both countries,

there was found a relationship between perinatal health care abandonment and social, informational and psychological of inequalities.

In the United States, Howell and Blondel (1994) have identified a strong relationship between socio-economic and cultural precarity and perinatal pathologies. Rustgi *et al.* (2009) underline that women have more problems accessing needed care because of cost than men. Moreover, several studies have proved, for United States, weak evidence that the extension of health insurance coverage Medicaid to higher income groups of women led to declines in infant mortality (Howell, 2001).

In the last years, there has been a growing interest in studying healthcare renunciation for financial reasons. The healthcare renunciation is influenced by the cumulating effect of different dimensions of precarity. Healthcare renunciation is correlated with different characteristics: positive correlation with the fact of being women, with education level, social support; and negative correlation with the income, age, good health status and health insurance coverage (Després *et al.*, 2011; Dourgnon *et al.*, 2011; Litaker and Love, 2005; Mollborn *et al.*, 2005; Allin *et al.*, 2010). Other studies, for Switzerland (Guessous *et al.*, 2012) and for Canada (Thompson *et al.*, 2014), have shown that women renounce more often than men to dental healthcare for financial reasons.

In France, studies on healthcare renunciation have shown the existence of two types of renunciation: the barrier renunciation and the refusal renunciation (Dourgnon *et al.*, 2012; Després, 2013; Ancelot *et al.*, 2017). These two types of renunciation go along in situations of great precarity.

Chaupain-Guillot *et al.* (2014) identified for French population, between 2004 – 2007, that main determinants in the decision of renunciation to healthcare services and dental care services are: household income, age, health status, and marital status (especially for women).

Analyzing the SHARE database for 16 European countries, Bouba-Olga and Vigé (2014) have identified that total healthcare renunciation is correlated with the following factors: negative correlation with age, education level, the fact of living in a couple, the number of children, the social network and the chronic illnesses; and positive correlation with the fact of being a man, being unemployed and the fact of being a person staying at home.

Baggio *et al.* (2017) have investigated the reasons for healthcare renunciation among young adults in higher education in France. The following characteristics are associated with higher level of healthcare renunciation: older, less educated students are more likely to renounce; markers of adulthood, not having enough money, bad health satisfaction, chronic illness, being depressed, and feeling isolated.

For Switzerland, Guessous *et al.* (2012) identified that forgoing healthcare for economic reasons is associated with the following socioeconomic factors: lower income, female gender, smoking status, lower job position, having

dependent children, being divorced and single, paying a higher deductible, and receiving a premium subsidy.

Considering previous studies on health care renunciation and its effect on new-borns health, the following hypotheses have been stated, for the present study:

H1: The health care renunciation of pregnant women hinge on the characteristics (socio-demographic, psychological, etc.) of this population;

H2: Among the determinant factors of health care renunciation of pregnant women, the following factors may be considered: education, income, marital status, psychological factors, and alcohol and cigarette consumption.

In order to verify the hypotheses of the paper, the proper statistical methods have been applied on data collected through sample survey on pregnant women.

3. DATA AND METHODOLOGY

The data have been obtained from a sample survey of pregnant women that have been hospitalised at "Cuza Vodă" Maternity in Iasi. The "Cuza-Vodă" Maternity is one of the most important maternity in Romania, and the main maternity from the North-East region of the country.

This study has been realised within the collaboration between University of Poitiers, France and University Alexandru Ioan Cuza of Iaşi, Romania in the research project PRaSoP (*Precarity, Healthcare Renunciation and Perinatality: a French-Romanian comparison*).

The questionnaire has been constructed following the questionnaire used in the French National Perinatal Survey from 2010. The questions have been grouped into three sections: (1) socio-demographic situation; (2) pregnancy and (3) birth and the new-borns. The questionnaire have been pre-tested both in a theoretical and practical framework. After pre-testing the questionnaire on 30 women during the post-partum period, we have reconsidered the answers variants for certain questions.

The questionnaire has been completed by face to face survey during the period 01.04. 2015 – 17.05.2015. A total number of 513 questionnaires have been filled-in of which 512 have been validated.

The variable that express the subjective renunciation to health care services during pregnancy corresponds to the following question: *During pregnancy, have you been constraint to renounce to consultations, medical investigations or dental treatments due to financial reasons?* The question has two possible answers: *Yes* (1) and *No* (0).

For studying the relationship between the health care renunciation due to financial reasons and the socio-demographic characteristics, psychological and behavioural characteristics of pregnant women, the following tests have been applied: (1) the Chi square test – for analysing the association between two

categorical variables; (2) the Student test for independent samples – for testing the differences in the means of the two populations for numerical variables.

4. RESULTS AND DISCUSSIONS

4.1 The association between the socio-demographic characteristics of pregnant women and the renunciation of health care services

The social and demographic characteristics of pregnant women in relation to health care renunciation are presented in Table 1. The results show that more than a quarter of the pregnant women in the sample from the North-Eastern region of Romania (25.59%) have renounced to examinations, medical exams or dental care for financial reasons, while 74.41% of the pregnant women in the sample have not renounced to health care.

We have analysed the association between the following social-demographic characteristics and the health care renunciation: age, education, place of residence, marital status, employee status, monthly revenues and medical coverage at the beginning of the pregnancy.

For all the socio-demographic characteristics the values of the chi square test are statistically significant. Therefore the socio-demographic profile of the two groups of pregnant women, that have renounced to health care and that haven't renounced, is statistically different.

Considering age, it can be seen that by applying the independent samples t test, the Student statistics is significant. The women that have renounced to health care have an average age (26.09 years) that is statistically smaller than the average age of women that haven't renounced (28.87 years).

There is a significant association between the marital status and the renouncement to health care: only 16.10% married women have renounced to health care services during their pregnancy due to financial reasons, while 53% of the unmarried women have renounced to health care. The women from rural areas have renounced to health care services due to financial reasons in a higher extent than women from urban areas. Moreover, the women less educated (without education, primary and secondary education) have renounced in a greater measure to health care services than women with higher education.

Table 1. The relationship between socio-demographic characteristics and health care renunciation of pregnant women

Social and demographic characteristics of pregnant women	Total	Health care renunciation		Test Statistic
		No	Yes	
No. of observations (%)	512 (100%)	381 (74.41%)	131 (25.59%)	$t = -11{,}004$; ***
Age; Mean ± Std. Dev.	28.16 ± 6.43	28.87 ± 5.97	26.09 ± 7.25	$t = 3.947$; ***
Education level; N (%)				
Primary education	29 (5.66%)	8 (27.6%)	21 (72.4%)	
Lower secondary	135 (26.37%)	68 (50.4%)	67 (49.6%)	
Upper secondary	150 (29.3%)	115 (76.7%)	35 (23.3%)	$\chi^2 = 123.110$; ***
Short-cycle tertiary	16 (3.13%)	15 (93.8%)	1 (6.3%)	
Bachelor / master / doctoral degree	182 (35.55%)	175 (96.2%)	7 (3.8%)	
Place of residence; N (%)				
Urban	272 (53.12%)	238 (87.5%)	34 (12.5%)	$\chi^2 = 52.189$; ***
Rural	240 (46.88%)	143 (59.6%)	97 (40.4%)	
Marital status; N (%)				
Unmarried	132 (25.78%)	62 (47.0%)	70 (53.0%)	$\chi^2 = 70.357$; ***
Married	380 (74.22%)	319 (83.9%)	61 (16.1%)	
Employee status, at the end of pregnancy; N (%)				
Employed	254 (49.9%)	136 (53.5%)	118 (46.5%)	$\chi^2 = 116.638$; ***
Unemployed	255 (50.1%)	243 (95.3%)	12 (4.7%)	
Monthly household income; N (%)				
Less than 800 RON	139 (27.15%)	54 (38.8%)	85 (61.2%)	
800 – 1.600 RON	114 (22.27%)	84 (73.7%)	30 (26.3%)	
1.600 – 3.200 RON	142 (27.73%)	134 (94.4%)	8 (5.6%)	$\chi^2 = 149.156$; ***
3.200 RON and over	86 (16.80%)	85 (98.8%)	1 (1.2%)	
Variable income	31 (6.05%)	24 (77.4%)	7 (22.6%)	
Health insurance coverage; N (%)				
Public health insurance	362 (70.84%)	309 (85.4%)	53 (14.6%)	
Private health insurance	37 (7.24%)	27 (73.0%)	10 (27.0%)	$\chi^2 = 78.728$; ***
Without health insurance	112 (21.92%)	44 (39.3%)	68 (60.7%)	

Note: *** for P < 0.001; ** for P < 0.01: * for P < 0.05.
(Source: Own calculations in IBM SPSS 22.0)

Among pregnant women that have a health insurance coverage (either public or private) only 14.6% of them have renounced to health care from financial reasons, while for the category of women that do not have a health insurance coverage, the occurrence of health care renunciation is more important (52.3%).

4.2 The association between the psychological characteristics of pregnant women and the renunciation of health care services

During pregnancy, more than half of pregnant women (51.76% of women) were well surrounded by those close to them and 42.97% of women have received some protection. The percentage of women who had little or no support during pregnancy is 5.27%. There is a significant relationship between the protection that pregnant women have received from their family during their pregnancy and health care renunciation: 70.4% of pregnant women that have received either little or none protection from their family have renounced to consultations, medical examinations or dental care due to financial reasons (Table 2).

The majority of women were happy with the timing of that pregnancy (73.19% of women). At the same time, 7.83% of women would have preferred to become pregnant earlier. However, 11.15% of women would have wished to become pregnant later and 7.83% of women would have chosen not to be pregnant at all. Moreover, the state of mind when finding out about this pregnancy has influenced the health care renunciation: 62.5% of women that have had preferred not to be pregnant have renounced to health care for financial reasons. Also, 38.60% of women that would have preferred to be pregnant later on have renounced to health care for financial reasons.

The women that have had a good psychological mood during pregnancy are predominant (79.49% of women), while only 13.09% of women have had a fair mood. The percentage of women who had a bad mood was 7.42%. Among the pregnant women that had a good psychological mood during this pregnancy, only 22.1% have renounced to health care. A higher percentage of women that have renounced to health care is observed among those that had a fair psychological mood (43.3%) or a bad mood (31.6%).

There is a significant difference in health care renunciation conditional on the number of children prior to this pregnancy. The women that have renounced to health care have a statistically significant higher number of children compared to women that have not renounced to health care.

Moreover, a higher percentage of women that have renounced to health care is observed among the women that have had an abortion on request (either by surgical or medication).

Table 2. The relationship between psychological characteristics and health care renunciation of pregnant women

Psychological characteristics of pregnant women	Total	Health care renunciation		Test Statistic
		No	Yes	
Protection received during the pregnancy from the close persons; N (%)				
Substantial	265 (51.76%)	230 (86.8%)	35 (13.2%)	$\chi^2 = 60.009$; ***
Some	220 (42.97%)	143 (65.0%)	77 (35.0%)	
Little or none	27 (5.27%)	8 (29.6%)	19 (70.4%)	
Abortion on request during previous pregnancies; N (%)				
No	428 (83.92%)	327 (76.4%)	101 (23.6%)	$\chi^2 = 5.017$; *
Yes	82 (16.08%)	53 (64.6%)	29 (35.4%)	
State of mind when finding out about this pregnancy; N (%)				
Happiness for occurring right now	374 (73.19%)	294 (78.6%)	80 (21.4%)	
I wished it had happened earlier	40 (7.83%)	36 (90.0%)	4 (10.0%)	$\chi^2 = 42.202$; ***
I wished it had happened later	57 (11.15%)	35 (61.4%)	22 (38.6%)	
I wished I wasn't pregnant	40 (7.83%)	15 (37.5%)	25 (62.5%)	
General psychological mood during the pregnancy; N (%)				
Good	407 (79.49%)	317 (77.9%)	90 (22.1%)	$\chi^2 = 14.317$; **
Fair	67 (13.09%)	38 (56.7%)	29 (43.3%)	
Bad	38 (7.42%)	26 (68.4%)	12 (31.6%)	
No. of children prior to this pregnancy; Mean ± Std. Dev.				$t = -4.742$; ***
	0.96 ± 1.427	0.74 ± 1.091	1.61 ± 1.990	

Note: *** for P < 0.001; ** for P < 0.01: * for P < 0.05.
(Source: Own calculations in IBM SPSS 22.0)

4.3 The association between the behaviour at risk of pregnant women and the renunciation of health care services

The results show that cigarette smoking behaviour is associated with the health care renunciation of pregnant women (Table 3). More women that have declared they have been smoking during the 3rd trimester of pregnancy have renounced to health care due to financial reasons comparing to non smoking women.

The majority of women have not consumed alcoholic beverages during their pregnancy. However, 10.74% of pregnant women have drunk alcohol once a month or less than one a month, and 3.91% of women have drunk alcohol twine a month or more often. It can be observed that a higher preference for alcohol consumption during the pregnancy is associated to health care renunciation.

The women that have not declared their pregnancy at a medical unit or that have deferred to declare their pregnancy have been more disposed to health care renunciation comparing to women that have declared their pregnancy early on. Therefore, 81% of women that have not declared their pregnancy stated they have renounced to health care services.

Table 3. The relationship between at-risk behavioural characteristics and health care renunciation of pregnant women

Risk behavioural characteristics of pregnant women	Total	Health care renunciation		Test statistic
		No	Yes	
Cigarette smoking during the 3rd trimester of this pregnancy; N (%)				
No smoking	460 (89,84%)	356 (77.4%)	104 (22.6%)	$\chi^2 = 21.116$; ***
1 – 9 cigarettes	40 (7,81%)	19 (47.5%)	21 (52.5%)	.
10 cigarettes and more	12 (2,34%)	6 (50.0%)	6 (50.0%)	
Alcohol consumption during this pregnancy; N (%)				
Never	437 (85,35%)	336 (76.9%)	101 (23.1%)	
Once a month or less	55 (10,74%)	36 (65.5%)	19 (34.5%)	$\chi^2 = 12.812$; **
Twice a month or more	20 (3,91%)	9 (45.0%)	11 (55.0%)	
Pregnancy declaration period				
the 1st trimester	393 (76.76%)	328 (83.5%)	65 (16.5%)	
the 2nd trimester	72 (14.06%)	36 (50.0%)	36 (50.0%)	$\chi^2 = 81.383$; ***
the 3rd trimester	26 (5.08%)	13 (50.0%)	13 (50.0%)	
No declaration	21 (4.10%)	4 (19.0%)	17 (81.0%)	

Note: *** for P < 0.001; ** for P < 0.01: * for P < 0.05.
(Source: Own calculations in IBM SPSS 22.0)

5. CONCLUSIONS

This paper aimed to assess the degree of health care renunciation among pregnant women. The case study has been completed on a sample of pregnant women from Romania.

In order to highlight the profile of pregnant women that have renounced to health care due to financial reasons, the following statistical methods have been used: the descriptive statistics to assessing the extent to which pregnant women renounce to health care; the association analysis and test statistics to identifying and assessing the determinants of health care renunciation of pregnant women.

The results of this study highlight that socio-demographic factors, psychological factors, and health-risk behaviour factors have significant influence on health care renouncement of pregnant women. Both research hypotheses have been verified and are consistent with previous studies (Ancelot *et al.*, 2018).

The main results show that health care renunciation for pregnant women has been found to be associated with the socio-demographic characteristics of women. Unmarried women renounce more to health care than married women. The higher the level of education and the monthly income, the less pregnant women renounce to health care. Women in rural areas renounce more than women in urban areas to health care due to financial reasons.

The health care renunciation for pregnant women has also been found to be associated with the psycho-social characteristics of women. The more pregnant women are better surrounded by their loved ones, the less they give up on care. The more the feelings vis-à-vis the current pregnancy are positive, the less women renounce to health care. Women who felt psychologically bad or somewhat bad during their pregnancy have renounced more than women who felt psychologically well.

The cigarette smoking and alcohol consumption are health-risk behaviours associated with the health care renunciation of pregnant women.

Future studies could focus on measuring the effects of the determinant factors on the health care renunciation of pregnant women.

ACKNOWLEDGEMENTS

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PUBLIC EXPENDITURE MANAGEMENT IN TERMS OF RESPECT FOR ECONOMIC, SOCIAL AND CULTURAL RIGHTS IN THE REPUBLIC OF MOLDOVA: PROBLEMS AND SOLUTIONS

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ABSTRACT

Human rights represent the norms that are meant to protect all people far and wide from serious political, juridical and social abuses. There are three major types of norms regarding human rights: civil and political, socio-economic and that of collective development. The economic, social and cultural rights (ESCR) are materialised through public goods and services, which are produced and provided, respectively, through public expenditure. The observance of economic, social and cultural rights in the Republic of Moldova is affected by the unsatisfactory evolution of public spending, namely, by the poor management of public spending at the system level and by their categories. The research is based on the approaches dedicated to the field of human rights, in particular ESCR, with the main focus on the connection between these rights and public expenditure management. The quality of public expenditure management with an impact on respecting ESCR is evaluated through the prism of basic objectives of public financial management, namely the following: maintaining strict financial discipline, allocating public financial resources in conformity with government's priorities, efficient provision of public services. The research argues a positive effect which can be made by improvement of public expenditure management on respecting ESCR in the Republic of Moldova.

Keywords: allocative efficiency; fiscal discipline; human rights; national public budget; operative efficiency; public expenditure.

JEL Classification: H41, H50, H53, H60, I3

1. INTRODUCTION

A right is a demand, justified from the moral and/or legal point of view, to have or to do something (Stanford Encyclopedia of Philosophy, 2019). Human rights represent the norms that are meant to protect all people far and wide from serious political, juridical and social abuses (Twiss, 2004). From another perspective, human rights are the rights assigned to all human beings only on the

basis of their humanity (Donnelly, 2003). The classification offered by Karel Vašák suggests the concept of three generations of rights. According to this grouping, there are three major types of norms regarding human rights: civil and political, socio-economic and that of collective development (Vašák, 1977). The first two types, which represent the potential things demanded by individuals from the state, are the norms that are firmly accepted and identified in international treaties and conventions. The third type, representing the potential things demanded by peoples and groups from the state, is the most debated one and does not have any juridical and political recognition.

Table 1. Representation of economic, social and cultural rights in the legislation of the Republic of Moldova in comparison with the International Covenant on ESCR

International Covenant on ESCR	Constitution of the Republic of Moldova
The right to work (art. 6)	**The right to work and labor protection (art. 43); Prohibition of forced labor (art. 44)**
The right of everyone to the enjoyment of just and favourable conditions of work (art. 7)	
The right of everyone to form trade unions and join the trade union of his choice (art. 8)	**The right to establish and join trade unions (art. 42); The right to strike (art. 45)**
The right of everyone to social security, including social insurance (art. 9, 10)	**The right to social assistance and protection (art. 47); Protection of the family and orphaned children (art. 49); Protecting the mother, children and young people (art. 50); Protection of people with disabilities (art. 51)**
The right of everyone to an adequate standard of living for himself and his family (art. 11)	
The right of everyone to the enjoyment of the highest attainable standard of physical and mental health (art. 12)	**The right to health care (art. 36)**
The right of everyone to education (art. 13)	**The right to education (art. 35)**
The right of everyone to take part in cultural life (art. 15, a)	
The right of everyone to enjoy the benefits of scientific progress and its applications (art. 15, b)	**Freedom of creation (art. 33)**
The right of everyone to benefit from the protection of the moral and material interests resulting from any scientific, literary or artistic production of which he is the author (art. 15, c)	**Freedom of creation (art. 33)**
	The right to a healthy environment (art. 37)

(Source: elaborated in accordance with the International Covenant on ESCR and the Constitution of the Republic of Moldova)

The category of economic, social and cultural rights from *The International Covenant on Economic, Social and Cultural Rights* includes the right to work assigned to any person; the right to social security, including social insurance; the right of any person to the standard of living that is sufficient for them and their family; the right to enjoy the best physical and mental state that can be attained; the right to education; the right to participate in cultural life; the right to benefit from the scientific progress and its applications (OHCHR, 1966).

Table 1 represents the result of applying the comparative approach on the ESCR contained in the International Covenant on ESCR and in the Constitution of the Republic of Moldova.

ESCR are materialised through public goods and services, which are produced and provided, respectively, through public expenditure. The functional classification of public expenditure permits to correlate economic, social and cultural rights with corresponding functional groups of public expenditures.

2. APPLIED METHODS

From the theoretical-scientific perspective, the research has been done in the context of a complex and systematic approach to modern economic and social concepts.

The complexity of social, economic and financial phenomena, which have been studied, necessitated the use of *statistical* methods, namely the *correlation and simple regression* analysis. At the same time, the comparative analysis was used for the same purpose.

The research is based on the approaches dedicated to the field of human rights, in particular ESCR, with the main focus on the connection between these rights and public expenditure management. There is examined the relationship between the Human Development Index (HDI) and the Budget Transparency Index, the latter representing one of the basic parameters of public expenditure management and the relationship between HDI and the Index of Strength of Auditing and Reporting Standards. HDI is a summative measure of realizing the key dimensions of human development: health, education and standard of living. Although HDI simplifies and reflects only a part of the aspects regarding the human development, we will consider this index as an aggregate parameter which has the capacity to quantify, in a more or less ample way, the level of respecting economic, social and cultural rights.

3. RESULTS AND DISCUSSIONS

Public expenditure management is a process which permits governments to be responsible, from the fiscal point of view (to spend only what they can afford), for spending on the correct things and benefiting at the maximum from limited public resources (Allen and Tommasi, 2001).

Public expenditure management aims to achieve the following three key objectives (Schick, 1998):

▸ *maintaining strict financial discipline*, which refers to the effective control of the budget totals through the establishment of some ceilings for income and expenses imposed on the whole level as well as on individual entities which raise and spend public funds. An effective budget system is the one which has disciplined totals (in contrast to periodic adjustments).

▸ *allocating public financial resources in conformity with government's priorities*. Allocative efficiency is determined by the capacity to set priorities within the budget, to distribute the resources according to government's priorities and the efficiency of the programs and to divert resources from the achieved objectives to new ones, or from less productive activities to more productive ones. The efficiency of the use of resources, which reflects the extent of fulfilling the objectives of a policy, program or activity, is predetermined by the justification of decisions concerning their allocation.

▸ *efficient provision of public services*. Technical or operational efficiency in using budget resources refers to the capacity to implement the programs in the respective fields and to provide services at the lowest price.

These three objectives are complementary and interdependent. These three key objectives mustn't be pursued in an isolated way.

The Republic of Moldova remains the poorest country in Europe: in 2020 GDP per capita was $4,551.1 (according to the World Bank). The evolution of the budgetary process on the level of the central public administration and local public administrations suggests that the quality and performance of public expenditure management in the Republic of Moldova are affected by the following categories of issues: *poverty:* determines lack of resources to meet increasing demand for /expectations of public services; *economic instability:* has as a consequence an inadequate potential to deal with cyclical shocks and other crisis episodes; *reduced income basis:* amplifies vulnerability to unfavourable changes of product prices, commercial conditions and reduced access to capital markets; *informal economy:* a great part of economic activity is beyond the law, not respecting formal rules and regulations; weak application of proprietary rights and contracts results in relatively high corruption levels; *informal public sector:* formal norms regarding public services, public expenditure and public procurement tend to be ignored or broken; *reduced political mobilization:* inadequate development of interest groups to express public opinion and monitor government performance; *corruption:* to a great extent, the above mentioned issues are determined and amplified through the corruption generalized on the level of the entire society of the Republic of Moldova.

International experience in public expenditure management demonstrates that these issues are often common for the countries that confront an insufficient level of development (Tommasi, 2009).

Table 2 demonstrates the system of public expenditure in the Republic of Moldova represented in ten principal groups of functional classification.

Out of ten groups of public expenditure regulated by the functional classification, those which can be directly connected with ESCR are the following:

- Functional group 05 "Environment protection" corresponds to the right to a healthy environment (the right reflected in the Constitution of the Republic of Moldova in art. 37);

- Functional group 06 "Housing services and public utilities" corresponds to the right of every person to the standard of living which is sufficient for them and their family;

- Functional group 07 "Health protection" corresponds to the right to enjoy the best physical and mental state that can be attained;

- Functional group 08 "Culture, sport, youth, cults and recreation" corresponds to the right to participate in cultural life, the right to recreation, the right to enjoy the best physical and mental state that can be attained;

- Functional group 09 "Education" corresponds to the right to education and the right to benefit from the scientific progress and its applications;

- Functional group 10 "Social security" corresponds to the right to social security, including social insurance.

At the same time, the right to work and the rights related to it, expressing the rights of employees in the public sector, are reflected in all the groups of public expenditure.

Table 2. The structure of the national public budget of the Republic of Moldova in terms of expenditure and non-financial assets

	2017		2018		2019		2020	
	mil. lei	%	mil. lei	%	mil. lei	%	mil. lei	%
Expenditure and non-financial assets, mil. lei	**54 522,40**	**100,0**	**59 608,90**	**100,0**	**65 975,60**	**100,0**	**73 269,80**	**100,0**
State services of general interest	5 679,10	10,4	5 551,70	9,3	6 183,90	9,4	6 590,80	9,0
National defence	568,30	1,0	643,30	1,1	611,20	0,9	650,20	0,9
Public order and national security	4 041,50	7,4	4 376,20	7,3	4 322,20	6,6	4 770,40	6,5
Services in the field of economy	5 424,90	9,9	6 615,70	11,1	7 206,50	10,9	8 885,50	12,1
Environment protection	146,70	0,3	115,40	0,2	165,00	0,3	253,70	0,3
Housing services and public utilities	1 315,30	2,4	1 523,40	2,6	1 552,50	2,4	1 780,40	2,4
Health protection	7 268,70	13,3	7 799,00	13,1	8 635,00	13,1	9 990,20	13,6
Culture, sport, youth, cults and recreation	1 333,40	2,4	1 519,10	2,5	1 839,60	2,8	1 733,20	2,4
Education	9 681,30	17,8	10 462,10	17,6	12 121,20	18,4	12 583,10	17,2
Social security	19 063,20	35,0	21 003,00	35,2	23 338,50	35,4	26 032,30	35,5

(Source: elaborated on the basis of the information of the Ministry of Finance)

In the structure of expenditure and non-financial assets (further – expenditure) of the national public budget during the period 2017-2020 the greatest share belongs to the functional group "Social security" (approx. 35% out of the total), followed by "Education" (approx. 17-18% out of the total), "Health protection" (approx. 13-14% out of the total), "Services in the field of economy" (approx. 11-12% out of the total).

The most evident changes (measured in percentage terms in comparison with the previous year) were recorded in the period 2017-2019 in the context of state services of general interest (a considerable increase in 2019 compared with 2018), national defence and public order and national security (a considerable decrease in 2019 in comparison to 2018), environment protection (an increase in 2019 compared with 2018 and 2017, but not reaching the level of 2016); education, social security, culture, sport, youth, cults and recreation (a significant increase in 2019 in comparison with the previous years).

It is necessary to examine separately the changes in public expenditure in 2020, the year when the changes of budget indices were affected by the COVID-19 pandemic crisis. Thus, the most significant increases (in percentage terms in comparison with 2019) were characteristic of: environment protection (53.8 p.p.), services in the field of economy (23.3 p.p.), health protection (15.7 p.p.), housing services and public utilities (14.7 p.p.), social security (11.5 p.p.), public order and national security (10.4 p.p.). The smallest relative increases as compared to 2019 were recorded in the field of public expenditure related to education, namely 3.8 p.p. Actually, it represents the smallest value of the annual growth rhythm of public expenditure on education in the period 2016-2021. Culture, sport, youth, cults and recreation represents the only functional group which was subject to the decrease of related public expenditure (-5.8p.p.).

To conclude, over the analysed period, judging by the evolution of public expenditure, the following economic, social and cultural rights have been affected especially by the impact of the COVID-19 pandemic crisis: the right to work, the right to culture, the right to recreation, the right to health, the right to education.

To make this conclusion more concrete and elaborate it is necessary to carry out a more detailed study using other research techniques as well.

Financial discipline. A favourite instrument in the field of fiscal discipline in developing countries, including the Republic of Moldova, is rationalization of public expenditure. It follows from Table 3 that the growth of the share of public income in GDP is modest and far below the level of growth of the share of public expenditure in GDP.

Table 3. The evolution of income, expenditure and non-financial assets related to the national public budget of the Republic of Moldova

	2017	**2018**	**2019**	**2020**
Income, mil. lei	53377,6	57995,9	62949,2	62650
Share of income in GDP, %	29,8	30,1	29,9	30,4
Expenditure and non-financial assets, mil. lei	54522,4	59608,9	65975,6	73269,8
Share of expenditure and non-financial assets in GDP, %	30,5	31,0	31,4	35,5
Deficit (-) / Surplus (+), mil. lei	-1144,8	-1613	-3026,4	-10619,8
Share of budget deficit in GDP, %	-0,64	-0,84	-1,44	-5,15

(Source: elaborated on the basis of the information of the Ministry of Finance)

Limited possibilities of the extension of the taxable base and continuous reductions of public expenditure have placed the Republic of Moldova far below the level of public expenditure (measured as a percentage in GDP) recorded in developed countries.

Generalising the problems of aggregated fiscal discipline observed at the level of the budgetary system in the Republic of Moldova, the following can be mentioned:

▸ *unreal budgeting*. As a rule, the national public budget of the Republic of Moldova is not implemented in the way it was initially approved, because it authorises a greater volume of expenditure as compared to what can be afforded by the central public administration and local public administrations (table 3 supports this conclusion);

▸ *black budgeting*. A "real" budget (actual revenue and expenditure) is known only to a limited group of people from the interior, or only in retrospect – after completing a fiscal year;

▸ *escapist budgeting*. Unreal budgets generate escapist budgets: the government consciously authorises significant public expenditure realizing from the early stage of the development of a budget project that they are not going to be effected, so as to make an impression that it reacts to demands for social improvement (table 4 supports this conclusion);

▸ *repetitive budgeting*. In the Republic of Moldova, the national public budget, including its components, is frequently and repeatedly rectified over a year in response to economic or political conditions.

Table 4. The national public budget of the Republic of Moldova (functional aspect): adjusted and executed levels of expenditure and non-financial assets

Indicator	2019				2020			
	Adjusted (the level after the last rectification), mil. lei	Executed, mil. lei	Absolute difference (executed – adjusted), mil. lei	Relative difference, % (absolute difference as against the adjusted level)	Adjusted (the level after the last rectification), mil. lei	Executed, mil. lei	Absolute difference (executed – adjusted), mil. lei	Relative difference, % (absolute difference as against the adjusted level)
Expenditure and non-financial assets	**70 631,3**	**65 975,6**	**-4 655,7**	**-6,6**	**78 750,1**	**73 269,8**	**-5 480,3**	**-7,0**
State services of general interest	7 286,5	6 183,9	-1 102,6	-15,1	7 447,4	6 590,8	-856,6	-11,5
National defence	631,5	611,2	-20,3	-3,2	656,4	650,2	-6,2	-0,9
Public order and national security	4 569,3	4 322,2	-247,1	-5,4	4 934,5	4 770,4	-164,1	-3,3
Services in the field of economy	8 006,6	7 206,5	-800,1	-10,0	9 676,2	8 885,5	-790,7	-8,2
Environment protection	246,6	165,0	-81,6	-33,1	313,7	253,7	-60,0	-19,1
Housing services and public utilities	1 954,4	1 552,5	-401,9	-20,6	2 197,8	1 780,4	-417,4	-19,0
Health protection	9 214,9	8 635,0	-579,9	-6,3	11 273,5	9 990,2	-1 283,3	-11,4
Culture, sport, youth, cults and recreation	2 015,5	1 839,6	-175,9	-8,7	2 001,8	1 733,2	-268,6	-13,4
Education	12 875,8	12 121,2	-754,6	-5,9	13 482,5	12 583,1	-899,4	-6,7
Social security	23 830,2	23 338,5	-491,7	-2,1	26 766,3	26 032,3	-734,0	-2,7

(Source: elaborated on the basis of the information of the Ministry of Finance)

Allocative efficiency. The Government of the Republic of Moldova is relatively more successful in consolidating fiscal discipline than in providing the efficient use of public expenditure in conformity with strategic priorities. The decisions on allocation of expenditures among the sectors do not reflect government priorities.

An important aspect of allocating expenditures is flexibility. Governments, with the purpose of protection against shocks, must have sufficient flexibility in their annual allocative decisions. If some expenditure positions are protected, being incorporated in the category of nondiscretionary expenses (nondiscretionary expenses include staff expenses, social benefits and interest payments), and if the share of nondiscretionary expenses in the overall expenditure is increased,

adjustment can become difficult during adverse periods, or it can reduce disproportionally unprotected expenses, which are important for a long-term growth (public expenditure on education, research, culture, etc.). The field of public expenditure in the Republic of Moldova, as it follows from table 5, is relatively inflexible, and over time, under the influence of the COVID-19 pandemic crisis, it will become even more exposed to potential external and internal shocks.

Table 5. Nondiscretionary expenses in the overall expenditure and non-financial assets related to the national public budget of the Republic of Moldova

	2016	**2017**	**2018**	**2019**	**2020**
Staff expenses, mil. lei	10 966,6	12 505,4	13 733,1	15 649,0	17 214,4
Social benefits, mil. lei	16 404,1	17 964,5	19 949,0	22 302,6	25 007,9
Interests, mil. lei	1 811,7	1 959,1	1 525,9	1 641,1	1 706,7
Nondiscretionary expenses, mil. lei	29 182,4	32 429,0	35 208,0	39 592,7	43 929,0
Share of nondiscretionary expenses in the overall expenditure and non-financial assets, %	60,2	59,5	59,1	60,0	60,0

(Source: elaborated on the basis of the information of the Ministry of Finance)

Summarizing practical aspects and results of the budgetary process in the Republic of Moldova, the following issues of allocative efficiency become evident, which is, actually, characteristic of other poor countries:

▪ *short-term budgeting*. Although the medium-term budgetary framework reflects budgetary indices for the following three years, this budgetary exercise is rather superficial. In reality, the budgetary process emphasizes a short-term perspective, not taking into account medium-term implications of the decisions made by the central public administration and local ones.

▪ *escapist planning*. Planning is important from the political point of view. At the same time, the planned level reflects the promises to citizens made by politicians. These promises, when they get to the execution of the public budget, are not often backed financially;

▪ *distorted priorities*. Limited resources are spent on demonstrable projects which produce reduced social viability, whereas the objectives aimed at the development of human capital (health, education, etc.) are underfinanced.

Technical or operative efficiency. The analysis of the quality of public expenditure management denotes the following problems of operational efficiency encountered by the Republic of Moldova and other developing countries:

▪ *compensatory expenditures*. One of the effects of improving the labour force participation rate is "inflating" the scale of public services with a concomitant reduction of the salary level in the public sector;

▪ *productivity reduction*. The phenomenon of ghost-employees, insufficient investment in staff training and information technology, poor work conditions and other similar practices degrade operational efficiency;

▪ *detailed budgets and formal controls*. Formally, expenditure control is extremely centralized, there are detailed rules regarding public function (numerous classifications and evaluations), external control of procurement and other expenditure articles. However, in reality, these formal controls are often broken in practice;

▪ *informal management*. Informal arrangements coexist along with formal rules. The arrangements which are beyond the legal framework determine the way the government work: the way public officials get work places or promotions, their salary scale, the way acquisitions are made etc.;

▪ *corruption*. When formal rules are inefficient, the government, using the means beyond the law, incite corruption growth. There are numerous opportunities for corruption, which is often undetected and undeclared, yet popular.

One of the basic prerequisites with a significant potential in ensuring financial discipline, as well as allocative and operational efficiency, is budget transparency (World Bank, 1999). Budget transparency refers to complete disclosure of all the relevant fiscal information in a timely and systematic manner. It is a multidimensional concept related to clarity, exhaustiveness, reliability, topicality, accessibility and usability of public reporting regarding public finance, as well as citizen participation in the budgetary process.

Figure 1 quantifies the impact of the Budget Transparency Index, produced and measured by the World Economic Forum in The Global Competitiveness Report 2019, on HDI.

It follows from the graph, through the application of the simple regression method, that a value of the Budget Transparency Index which is close to 100 (100 means the best value denoting the maximum budget transparency) determines a value of HDI which is close to 1 (1 means the best value denoting the maximum level of human development).

The Republic of Moldova, registering an unfavourable value of the budget transparency index (equal to 58), has a value of HDI equal to 0.75. For comparison, in New Zealand the Budget Transparency Index is 89, whereas the value of HDI equals 0.931; in Sweden the Budget Transparency Index equals 87, whereas HDI is 0.945. Among the countries included in the analysis, Norway has the highest value of HDI (0.957), which registers a value of 87 for the budget transparency index.

It can be assumed in a well-argued manner that the insufficient transparency at the level of the public budgetary process and its components (the state budget, the social security budget, the mandatory health insurance funds) is indirectly reflected on the quality of respecting ESCR in the Republic of Moldova.
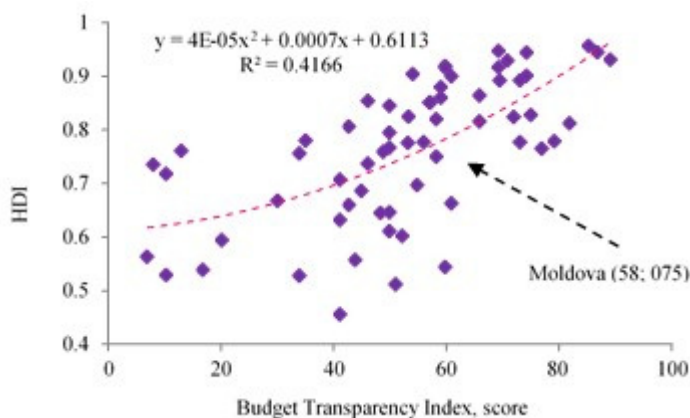
(Source: developed according to (UNDP and WEF, 2019))

Figure 1. Relation between the Human Development Index and the Budget Transparency Index, 2019

A significant impact on the budgetary transparency and responsibility and, eventually, on respecting ESCR is made by the quality of the system of internal control and internal audit.

According to the reports of the Court of Auditors of the Republic of Moldova, the systems of internal control within public entities in Moldova confront at least the following problems:

▪ superficial implementation of the components of the internal managerial control system;

▪ lack of documented procedures as to reporting suspicions related to discrepancies, frauds and corruption;

▪ insufficient implementation of managing risks (financial, operational, those related to fraud and corruption, etc.).

In addition, human resources and stuff fluctuation create deficiencies in the process of implementation and development of the internal managerial control system and of the internal audit function.

In the context with the above-mentioned ideas, figure 2 quantifies the impact made on HDI by the Index of Strength of Auditing and Accounting Standards regarding the efficiency of auditing and accounting standards, which was produced and measured by the World Economic Forum in The Global Competitiveness Report 2019.

It follows from the graph, through the application of the simple regression method, that a score of the Index of Strength of Auditing and Accounting Standards which is close to 100 (100 means the best score denoting the complete implementation of audit and accounting standards) determines an HDI value which is close to 1 (1 means the best value denoting the maximum level of human development).

Moldova (54,4; 0,75)

$$y = 1E\text{-}05x^2 + 0.0062x + 0.3348$$
$$R^2 = 0.4467$$

HDI

Strength of auditing and accounting standards
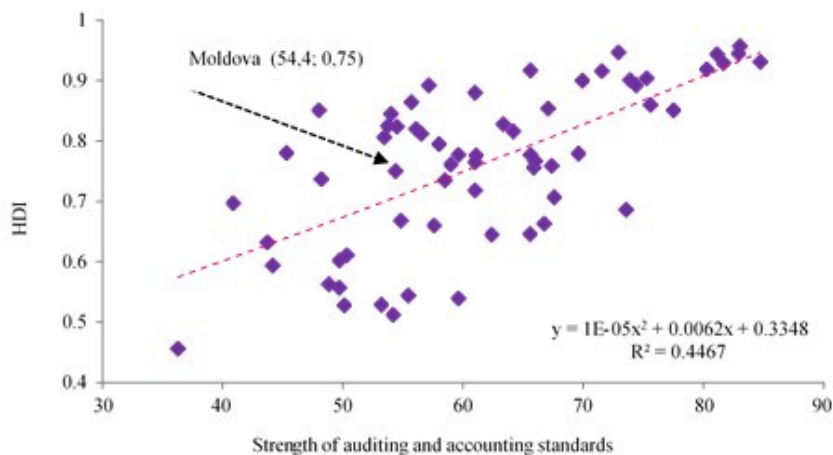
(Source: developed according to (UNDP and WEF, 2019))

Figure 2. Relation between Human Development Index and the Index of Strength of Auditing and Accounting Standards, 2019

The Republic of Moldova, registering an unfavorable score on the efficiency of auditing and accounting standards (equal to 54.4), has an IDU value equal to 0.75. For comparison, in New Zealand the Index of Strength of Auditing and Accounting Standards is 84.7, whereas the value of HDI equals 0.931; in Sweden the Index of Strength of Auditing and Accounting Standards equals 82.8, whereas HDI is 0.945. Among the countries included in the analysis, Norway has the highest value of HDI (0.957), which records the score of 83 for the index on the efficiency of auditing and accounting standards.

4. CONCLUSIONS AND RECOMMENDATIONS

ESCR are materialised through public goods and services, which are produced and provided, respectively, through public expenditure.

To a great extent, respecting economic, social and cultural rights in the Republic of Moldova is affected by the unsatisfactory evolution of public expenditure management.

The central public administration and local public administrations in the Republic of Moldova are relatively more efficient in consolidating fiscal discipline than in providing the efficient use of public expenditure in conformity with strategic priorities.

The following solutions have the capacity to improve public expenditure management with a positive impact on respecting ESCR:

- improving the quality of macroeconomic and fiscal foresight aimed at providing budget preparation on the basis of a real and foreseeable macro-budgetary framework;
- preparing the national public budget and its components in conformity with the legal framework, providing the allocation of public financial resources in a close correlation with policy priorities, expenditure limits established in the medium-term budgetary framework;
- increasing the efficiency and transparency of the process of preparing and implementing the national public budget, including its components, through the corresponding implementation of budgeting based on performance, avoiding superficial approach;
- improving and modernizing treasury management, providing efficient control and adequate monitoring at every stage of expenditure, establishing an adequate system of accounting and reporting in conformity with international practices;
- developing a system of internal control and audit in the public sector in conformity with the international practice with the purpose to provide efficient usage and transparency of public funds;
- upgrading the mobilization of public revenue through increasing the capacity of public authorities responsible for their management, especially regarding fiscal and customs revenues;
- developing a modern system of public procurement in conformity with the standards of the European Union;
- continuous development of institutional capacity at the level of central and local public administration authorities and the subordinate institutions, which is necessary for the budget implementation in terms of programs and performance;
- strengthening the capacities to analyse budgetary and fiscal risks, fraud and corruption risks, as well as to provide financial monitoring of self-managed public authorities/institutions, state/municipal enterprises and trading companies with the integral or majority public capital.

ACKNOWLEDGEMENTS

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DESIGN SCIENCE POTENTIAL FOR COMPUTING AND BUSINESS DISCIPLINES

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ABSTRACT

Design Science paradigm has emerged in computing disciplines, like Software Engineering/Development and/or Information Systems, to complement the mainstream of the research methods by emphasizing a more practical (rather than theoretical) problem-solution approach. In this paper, we try to answer some questions regarding design science potential for computing disciplines revealed in the past decades from Alan R. Hevner's seminal paper. Interestingly enough, not only the impact of the Design Science research paradigm on Software Engineering and Information Systems domains is important, but also its notable presence in business disciplines.

Keywords: Design Science; Research Methods; Software Engineering; Information Systems.

JEL Classification: L8, L86, C8, C88

1. INTRODUCTION

Design Science in computing disciplines research areas is not a new idea anymore, but the paradigm per se evolved and increased its impact over the last years.

The paradigm of design science implies a problem-solving approach inspired by the engineering disciplines (Hubka *et al.*, 1996). Consequently, the software engineering domain appeared as a matching candidate to apply such principles of artifact design (Vaishnavi and Kuechler, 2015). At the same time, the information systems field started a principled debate about the limitations of the behavioral-science paradigm, coming from natural science, vs. design science paradigm

taking into account some system design development aspects (Hevner *et al.*, 2004, Dresch *et al.*, 2015). Both these computing domains emphasize the importance of design in their practical but also in their theoretical aspects.

Historically, Hevner's paper (Hevner *et al.*, 2004) was one of the seminal papers or primary studies that formally proposed the approach of design science method for such a domain as the information systems (IS). The author proposed an information systems research framework accompanied (Fig.1) by a set of guidelines. The framework points out the relationship between the IS research and the environment which will provide a problem context (business needs) and where a solution (an artifact) will be evaluated and implemented. Also, there is another complementary relationship that targets the knowledge base that will provide the theoretical and practical base for design and that could receive new theories or practical methods generated by the IS research process. So the design science paradigm motivates the IS research process with the environmental needs that will generate not only practical solutions as artifacts but also knowledge as theories, frameworks, constructs, models, formalisms, etc.
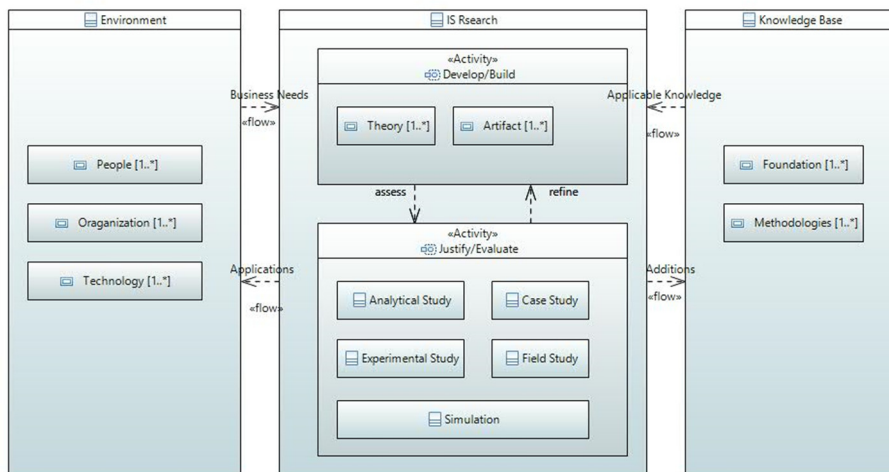
Figure 1. IS research framework, (Hevner *et al.*, 2004) vision

In the following years, the IS design science framework was invoked in several IS or SE-specific studies, but also the theoretical foundations of this paradigm were further debated and extended. Another seminal paper that could also be considered a primary study was authored by K. Peffers (Peffers *et al.*, 2007). The author's objective was to develop an articulated and sound methodology for design science. They refined the initial framework proposed by Havner into a "DSRM Process Model" with several activities starting with problem identification, defining objectives and solutions, design and

development, demonstration, evaluation, and communication (Fig. 2). The first four activities could provide "possible research entry points" to generate new knowledge.
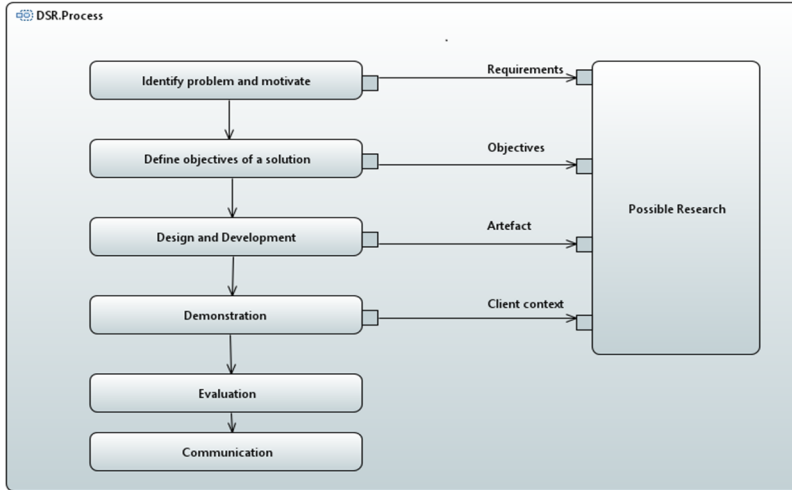

Figure 2. DSRM Process Model, (Peffers *et al.*, 2007) vision

In 2010, Hevner published again this time in extenso, a more comprehensive study (Hevner and Chatterjee, 2010), one of the first representative studies to approach a deep analysis on *science for the design of software-intensive systems* and also the topic of *design science in the management disciplines*. In this paper, Hevner proposed a design science framework (Fig. 3) based on three "inherent research cycles": relevance cycle, design cycle, and rigor cycle.
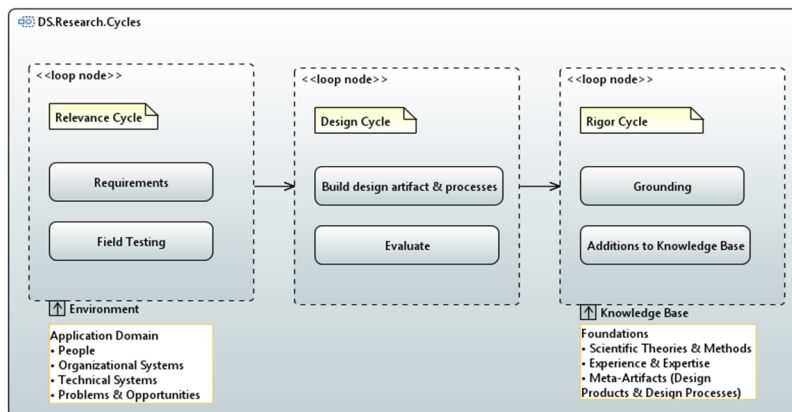
Figure 3. Design Science framework, (Hevner and Chatterjee, 2010) vision

Also, Hevner and Gregor published an evaluation article on design science (Gregor and Hevner, 2013) in MISQ Journal where they argued the *roles of knowledge in design science research* as a knowledge contribution framework, classifying these contributions in these categories:
- *improvements* as innovative solutions for existing problems;
- *inventions* as innovative solutions for new problems;
- *exaptations* as extending tested solutions but for new domains.

Design science could generate contributions to the two major knowledge areas: descriptive knowledge and prescriptive knowledge, and the most significant impact will be in prescriptive form by the means of design artifacts as constructs, models, methods, and instantiations.

These ideas concerning how to apply design science to the IS and IT domains were continued by (Johannesson, 2015) who proposed *a method framework for design science research* (Fig. 4) partially inspired by the developing methods for software systems. The input and output of the research process will be the initial problem and the evaluated artifact, and the activities are structured as: explicit problem, define requirements, design and develop an artifact, demonstrate artifact, and evaluate artifact.
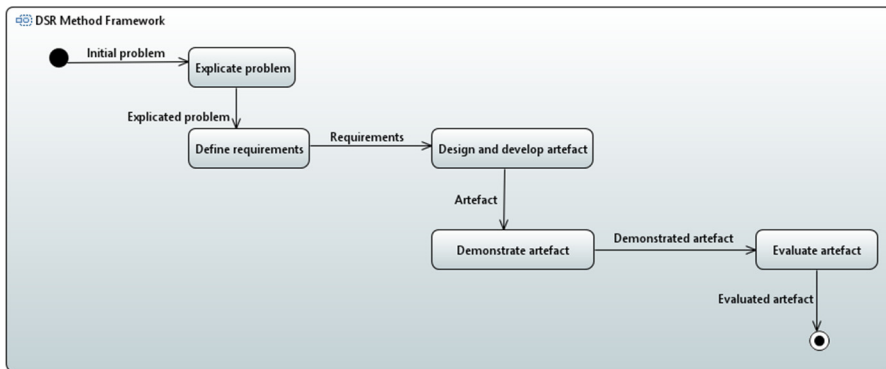

Figure 4. Method framework for design science, (Johannesson, 2015) vision

One of the most insightful studies on design science research method and methodology is the one authored by Wieringa (Wieringa, 2014). This study emphasizes two intermingled cycles: the design cycle and the empirical cycle.
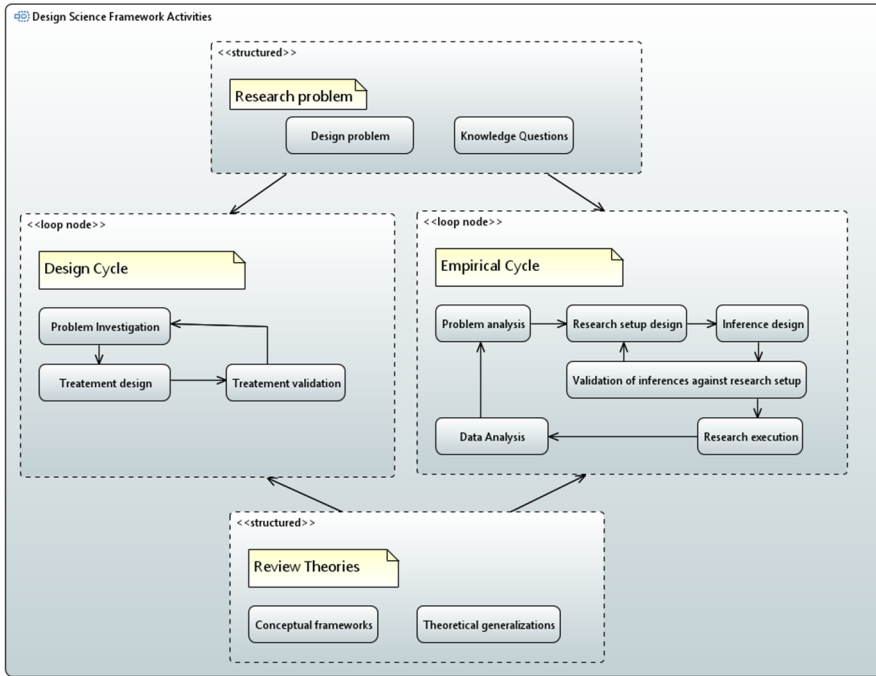
Figure 5. Design science framework, (Wieringa, 2014) vision

After presenting the DSRM Process Model, Peffers and his fellow research colleagues continued their pursuit in design science proposing a "genre classification" of IS Design Science Research (DSR), specializing and adapting the more generic DSR process and model to the identified genres (Peffers *et al.*, 2018). Among the potential IS DSR genres, each one with a specific research process and model, they enumerate:

- IS design theory;
- Design Science research methodology;
- Design-oriented IS research;
- Explanatory design theory;
- Action design research.

2. SYSTEMATIC MAPPING MICRO-STUDY

In this section, we will try to do a (limited) assessment of the *design science* paradigm evolution and of the impact on the computing disciplines research domain. Our analysis is based on data resulting from querying the Science Direct/Elsevier database of scientific articles.

In short, our *objectives* are the following:

- analyzing the design science articles trends over last years;

- identifying some of the most representative categories (domains);
- identifying top journals accepting design science articles.

2.1 Research Questions

RQ1: Find out if there is a significant positive trend in publishing design science papers in the domains related to computing disciplines like computer science, information systems, software engineering, or information technology.

RQ2: Identifying the most representative categories or topics in the fields related to computing disciplines.

The dataset to be analyzed targets scientific papers from Science Direct/Elsevier articles database covering Elsevier Journals' content.

In order to answer these research questions, we used the research methodology that Petersen designed on the Systematic Mapping Study method subject. (Petersen *et al.*, 2008), (Petersen *et al.*, 2015).

2.2 Inclusion and Exclusion Criteria

Our base *query predicate* is based on *title, abstract, keywords* fields containing the "design science" value. Also, after the initial query, we applied several inclusion and exclusion criteria on the initial dataset containing research papers' metadata.

Table 1. Including criteria

Including criteria name	Accepted values	Statistics
Article Language	English	237
Subject Areas	Computer Science Business, Management, and Accounting	171 135
Article Types	Research Articles Book chapters	236 1
Years	2004-2021	239

Table 2. Excluding criteria

Excluding criteria name	Rejected values
Article Language	other than English
Article Types	Review Articles Conference Info
Subject Areas	Decision Sciences Engineering Social Sciences Environmental Science Energy Psychology Arts and Humanities Medicine and Dentistry

Query result after applying these including and excluding criteria consist of 237 research papers.

2.3 Mapping/Classification

To accomplish our mapping/classification endeavor we did the manual and semi-automatic process described in fig. 6. Our systematic mapping review consisted of a review and a peer-review analysis and took into consideration the following metadata: title, keywords, abstracts, and journal name.

Figure 6. Mapping (micro)Study Research method

We proposed as the main research categories:
- Computing Areas;
- Business Areas;
- Design Science.

Computing Research Areas were our main concern in the mapping process and the main subcategories were inspired by the ACM classification of computing disciplines (CC2020, CS2013, IS2020, IT2017) [1].
- Computer Engineering;
- Computer Science;
- Cybersecurity;
- Information Systems;
- Information Technology;
- Software Engineering;
- Data science.

Another major research area presented recurrently in our dataset is the *design science theory* and we proposed as the main sub-categories:
- Conceptual Framework (design science theory);
- Research Methods;
- Research Flow and Cycle.

Also, we observed that *business research areas* cover a significant proportion of the research papers described by our analyzed dataset and we empirically extracted the following subcategories:
- Finances
- Marketing
- Management
- Sales
- Human Resources
- Supply Chains
- Customer Relationship Management
- Environment
- Education
- Government
- Healthcare

2.4 Data Analysis (statistics)

First of all, we observed a significant increase in the number of articles over years with a steeper (positive) slope in the last 5 years.

Table 1. The number of Design Science research papers over 2004-2021 years

Year	Art.count
2021	52
2020	29
2019	27
2018	20
2017	25
2016	15
2015	12
2014	10
2013	11
2012	7
2011	12
2010	6
2009	3
2008	5
2007	1
2005	1
2004	1
TOTAL	**237**
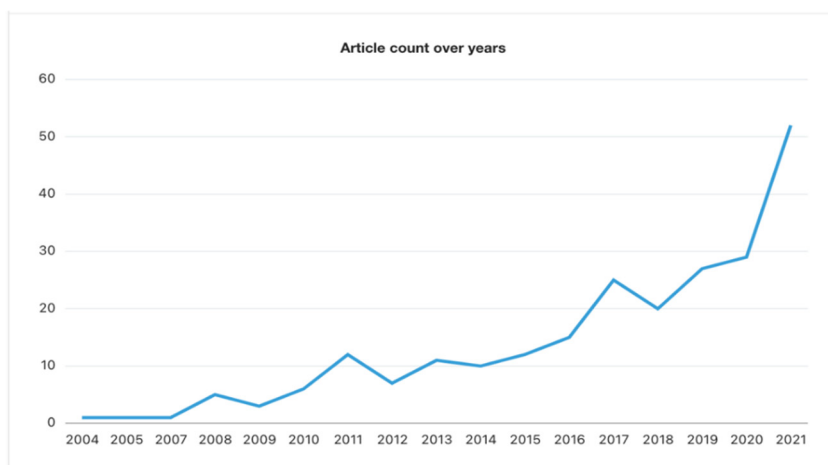
Figure 7. Trend of Design Science research papers over 2004-2021 years

Responsible for this steady growth is a set of journals covering approximately 60% of articles from our dataset.

Table 2. Journal top list covering Design Science topics

Publication title	Art.count
Decision Support Systems	36
Procedia Computer Science	21
Information & Management	13
Design Studies	13
Information and Software Technology	12
International Journal of Accounting Information Systems	12
International Journal of Information Management	8
Computers in Industry	7
Government Information Quarterly	7
Electronic Commerce Research and Applications	7
TOTAL	**136**
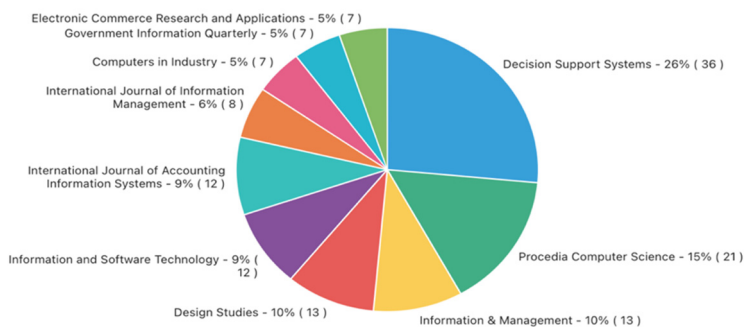
Figure 8. Proportions of the top journals covering Design Science topics

The analysis of the main categories revealed that the computing areas were the main research areas where Design Science is presented: 71% of research papers came from this sector.

Table 3. Main mapping categories

Category	Category Count
Computing Areas	169
Business Areas	49
Design Science	19
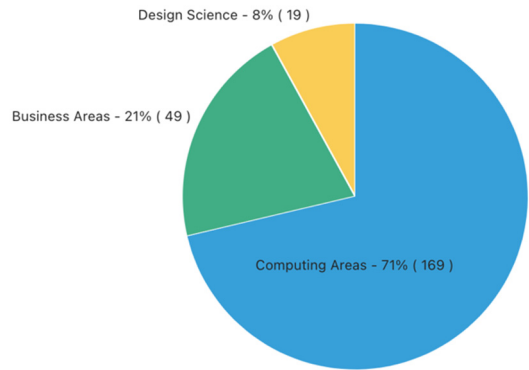
Figure 9. Proportions of the main mapping categories

Within the Computing Areas category, the Information Systems research area (40%) is the most prominent.

Table 4. Subcategories for Computing Area

Computing Subcategory	Subcategory Count
Information Systems	67
Software Engineering	33
Information Technology	29
Data science	20
Cybersecurity	14
Computer Science	6
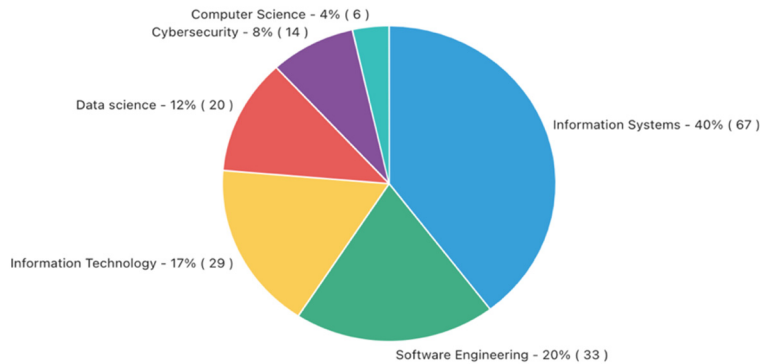
Figure 10. Proportions of the mapping subcategories within the Computer Areas main category

Also, the proportions within the Design Science (Theory) category revealed some significant interest in research methods and conceptual framework categories.

Table 5. Subcategories for Design Science (DS) theory

Research Flow and Cycle - 16% (3)

Research Methods - 47% (9)

Conceptual Framework - 37% (7)
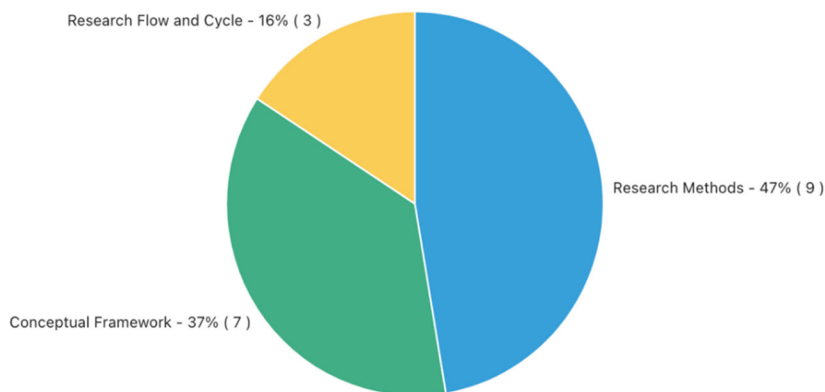
Figure 11. Proportions of the mapping subcategories within the Design Science main category

DS Subcategory	Subcategory Count
Research Methods	9
Conceptual Framework	7
Research Flow and Cycle	3

3. LIMITATIONS

We consider our study just a micro-study because of the main limitation: we used a dataset based solely on the Science-Direct/Elsevier database of scientific articles. We intend to extend the mapping study so that our dataset will cover also the following sources:
- Clarivate Web of Science database;
- IEEE Xplore;
- ACM Digital Library;
- SCOPUS.

The journal's top list is limited only to those published by Elsevier, but the top 10 of them are the most recognized in the field with very high AIS and IF scores (Table 6).

Table 6. Top list journal scores from Clarivate/Web of Science

Publication title	JCR Category	IF 2020	AIS 2020
Decision Support Systems	OPERATIONS RESEARCH & MANAGEMENT SCIENCE - SCIE COMPUTER SCIENCE, ARTIFICIAL INTELLIGENCE - SCIE COMPUTER SCIENCE, INFORMATION SYSTEMS - SCIE	5.795	1.398
Design Studies	ENGINEERING, MANUFACTURING - SCIE ENGINEERING, MULTIDISCIPLINARY - SCIE	3.09	0.94
Information & Management	INFORMATION SCIENCE & LIBRARY SCIENCE - SSCI MANAGEMENT - SSCI COMPUTER SCIENCE, INFORMATION SYSTEMS - SCIE	7.555	1.75
Information and Software Technology	COMPUTER SCIENCE, SOFTWARE ENGINEERING - SCIE COMPUTER SCIENCE, INFORMATION SYSTEMS - SCIE	2.73	0.795
International Journal of Accounting Information Systems	BUSINESS, FINANCE - SSCI BUSINESS - SSCI MANAGEMENT - SSCI	4.4	0.675
International Journal of Information Management	INFORMATION SCIENCE & LIBRARY SCIENCE - SSCI	14.098	2.04
Computers in Industry	COMPUTER SCIENCE, INTERDISCIPLINARY APPLICATIONS - SCIE	7.635	1.109
Government Information Quarterly	INFORMATION SCIENCE & LIBRARY SCIENCE - SSCI	7.279	1.631
Electronic Commerce Research and Applications	BUSINESS - SSCI COMPUTER SCIENCE, INTERDISCIPLINARY APPLICATIONS - SCIE COMPUTER SCIENCE, INFORMATION SYSTEMS - SCIE	6.014	1.039

Each research paper/article was mapped only into a single category, but several papers could be included in more than one category. The reason for such an approach is due to the objective to be able to produce a percentage-based analysis and diagramming where summing data points does not exceed 100%.

Another limitation consists in the limited number of levels of our classification system/hierarchy. We used only 2 levels: main category - research area and sub-categories (e.g. Information Systems or Management), but the labeling process used could be modeled in order to provide a more elaborate and comprehensive classification system.

4. CONCLUSIONS

Our first conclusion is that design science is characterized by a steadily growing interest especially in the past 5 years (RQ1) and our opinion is that this growing interest appeared after some very necessary conceptual and methodological clarifications made in the early period (after the Hevener seminal paper).

Our analysis clearly revealed that Information Systems remains the main driving force behind the design science interest in the computing research area (RQ2), but the Software Engineering, Information Technology, and Computer Science research areas also closely follow the IS discipline in this regard.

Also, we must emphasize Design Science's considerable presence in the business research area (business disciplines) and a more comprehensive study in this direction could further reveal some very interesting analytic details.

NOTES
[1]   ACM Curricula: https://www.acm.org/education/curricula-recommendations

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THE BOOMERANG EFFECT OF CORPORATE GOVERNANCE ON PUBLIC MANAGEMENT – REALITIES FROM ROMANIAN ACADEMIC ENVIRONMENT

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ABSTRACT

The study aims to illustrate how the principles of corporate governance can be adapted to the university management system, based on a comparative analysis of the characteristics of entities specific to the public and private sectors. Through an extensive documentation and a content analysis, we highlighted, on the one hand, the main aspects regarding the pillars of the regulatory system of the university environment, and, on the other hand, the key elements of the university management that generated the criticisms of the society. Moreover, it's worth to mention that the university management could benefit from the good practices of the corporate governance. The results of the analysis reveal differences between the analysed universities, but at the same time they prove the existence of improvements for all the analysed universities regarding the transparency, the orientation towards the social partners and the operationalization of the codes of ethics.

Keywords: Corporate Governance principles; university management; institutional social responsibility.

JEL Classification: I23, M14

1.   INTRODUCTION

The orientation of the companies towards the corporate governance was determined by the necessity to ensure a balance between the interests of the stakeholders, the organizational transparency and the decrease of the quantity and the impact of the financial scandals. The principles of corporate governance started from a system of values specific for the entities from the public system, but, paradoxically, they have been subjected to acceleration in terms of practices and operationalization, so that currently they can exert a significant influence on the management of public institutions in the sense of orienting them towards ethics and social responsibility.

The borrowed practices returned as a boomerang in public management, including the university management, exceeding the declarative level, operationalized in the form of new tools - activity reports, apply or explain statement - and causing structural problems to the traditional management.

Although the public, private and non-profit domains are well individualized, with well-defined structures and objectives, border areas can also be highlighted (Arustei *et al.,* 2014), in which entities or initiatives borrow principles and tools from the adjacent sector, in order to cover their objectives and solve the multiple problems they face in a society with ever higher expectations. Corporate governance is also located in this border sector, a specific orientation of the private sector entities (to a very small extent even oriented towards large companies, listed on the stock exchange), but with principles and practices taken from the public sector.

The place of universities in this framework has not been widely debated in the literature. A search for the keywords "university" and "corporate governance" in the WOS core collection reveals a number of 291 publications, and for Romania there are only three papers dealing with this subject.

A clearer orientation was from the public sector towards the private one, by taking over the efficiency objectives and including the entrepreneurial practices, initiatives that can be included in the model of the "new public management". Another challenge for universities has been the focus on the civil society sector.

The public – non-profit border sector is characterized by initiatives that are specific for „new public governance" paradigm, that supports the superiority of the networks between the state institutions and the civil society ones. Thus, the state institutions permanently promote social aim initiatives through which they go beyond the sphere of their own attributions (institutional social responsibility).

The clearest orientation in this regard in the academic field was illustrated by the term sustainable university.

Our study aims to illustrate how the principles of corporate governance can be adapted to the university management system, based on a comparative analysis of the characteristics of entities specific to the public and private sectors. At the

same time, the most common practices at the level of Romanian universities are illustrated, which place them in the paradigm of sustainability.

An integrated approach to actions within the common public - private - non-profit interference area belongs to the multi-stakeholder model. The specific entities of this model are business incubators, clusters, local and regional initiatives groups, where universities can play a central role, and thus are proving the possibility to capitalize on the synergy of the mechanisms used by the three sectors.

2. CORPORATE GOVERNANCE AND SUSTAINABILITY – TRANSVERSAL APPROACH

Corporate governance is best defined based on the principles that govern it - ensuring the basis for an effective framework, the rights of shareholders, the equitable treatment of shareholders, the role of stakeholders, disclosure and transparency, the responsibilities of the board. These principles, although enunciated for large companies, listed on the stock exchange, entities representing the private sector, have undergone transformations and attempts at organizational adaptation, in order to better meet the expectations of the specific public (Table 1). They were interpreted at the general level, of all organizations and adapted to the public system.

Table 1. Adapting the principles of corporate governance

Concept	Definition	Principles
Corporate governance	- the system by which business corporations are directed and controlled. - specifies the distribution of rights and responsibilities among different participants in the corporation - spells out the rules and procedures for making decisions on corporate affairs.	- Effective framework - Equitable treatment of shareholders - Sound incentives throughout the investment chain - Role of stakeholders - Disclosure and transparency - Responsibilities of the board
Governance in organizations	- to allow the board and management the freedom to drive their organization forward but to exercise that freedom within a framework of effective accountability	- strong commitment to ethical values and respecting the rule of law - ensuring openness and comprehensive stakeholder engagement - outcomes in terms of sustainable economic, social, and environmental benefits - interventions necessary to optimize the outcomes
Good Governance in the Public Sector	- to ensure that the intended outcomes for stakeholders are defined and achieved.	

Concept	Definition	Principles
	- to ensure that entities achieve their intended outcomes while acting in the public interest at all times.	- developing the entity's capacity - managing risks and performance through robust internal control and strong public financial management - good practices in transparency, reporting, and audit

(Source: Adapted from: OECD, 2015b; CIPFA and IFAC, 2014; Fung, 2014)

A global model of corporate governance is considered inappropriate and inapplicable (Siems and Alvarez-Macotela, 2017). However, the OECD maintains, through extensive discussions with the actors involved, the updated principles and adapts them to the enterprises in which the state is the majority shareholder (OECD, 2015a).

Although good institutions, good governance and good leadership are considered as necessary conditions to support the development effort of a country or region (Talmaciu, 2014), social, cultural and economic differences play a role both in the country and in the applicability of corporate governance. Thus, the principles are considered inadequate for economic environments dominated by inefficient formal institutions, where corruption, accountability and opacity in business management predominate (Jesover and Kirkpatrick, 2005). Developing countries would have clear advantages in the privatization process if they adopted a corporate governance perspective - greater efficiency and fewer problems, especially in the long run. Implementing these principles is difficult, given the variety of institutions that affect information and responsibility (Dyck, 2001).

An essential element of corporate governance is transparency and disclosure, which has progressed from the availability of information to proactive information for all stakeholders. Regulators have imposed regulations on the timely transmission of financial and non-financial information to support decisions and ensure performance monitoring (Fung, 2014). In this sense, the IT governance framework consolidates the objectives of transparency and traceability, thus consolidating the corporate governance system (Juiz *et al.,* 2014).

Many national and organizational factors, especially cultural ones, intervene in the corporate governance approaches, which influence the corporate structures and strategies. There is no "one-size-fits-all" approach to corporate governance, the reflection of the principles in regulations in voluntary initiatives or in "comply or explain" tools being an expression of this diversity.

An integrated concept of corporate governance emerges through the explicit inclusion of sustainability, companies belonging to a management and control system that ensures value creation and covering the interests of long-term stakeholders (World Business Council for Sustainable Development, 2019).

A challenge in this context is the possibility of measuring corporate sustainability, appearing the need to collect, record, analyse and transmit

information about the economic effects of environmental and social activities. Company-specific indicators are constantly being developed by various international organizations in order to achieve an international standard. The best known initiative is the Global Reporting Initiative (GRI), which focuses on standardizing a Sustainability Report. There are often different interpretations of the best means of applying reporting standards, even within the same field (Kocmanová *et al.,* 2011).

The advantages of specialization, the ideas according to which each sector must pursue only specific objectives are the arguments most often encountered against mixed entities and initiatives. However, an individualized analysis illustrating the advantages and disadvantages of borrowing methods and tools specific to other sectors is the basis for ensuring the coverage of the interests of larger groups and the growing expectations of today's society.

3. CORPORATE GOVERNANCE IN UNIVERSITIES AND ORIENTATION TOWARD SUSTAINABILITY

In recent decades, more and more universities have focused on integrating and institutionalizing sustainability in their own systems. Sustainability is becoming a new paradigm in universities ecosystem (Lozano *et al.,* 2013b). The desire for sustainable development is considered an innovative idea in many universities, not being adopted / mastered in all fields (disciplines) by all researchers and university leaders (Lozano *et al.* 2013a, Larrán Jorge *et al.* 2015).

Universities are seen as appropriate disseminators of knowledge and best practices in terms of environmental protection, maintaining social cohesion and promoting economic prosperity. The contradictory objectives of excellence, innovation, cooperation and sustainability require a fragile balance, extremely difficult to maintain. There is a need for a clear and coherent position in favour of sustainable practices and the abandonment of some of the traditional university objectives in order to assume the leadership towards a sustainable society (Lukman and Glavic, 2007). The fact that universities are not explicitly committed to implementing sustainability at all levels can be explained by the lack of clear policies and commitments (statements) to promote sustainability in universities (Bottery, 2011; Hancock and Nuttman, 2014). Thus, university stakeholders will not be encouraged and motivated to support sustainable development initiatives in higher education (Lee *et al.,* 2013).

Sustainable university models are diverse (Table 2). Some start from the economic - social - environmental triad, others refer to the central aspects of the university - research.

Table 2. Models of sustainable university

Model / author / source	Main elements	Component elements
Sustainable university (https://www.green officemovement.org/ sustainable-university/)	- Education - Research - Operations - Community - Governance	- empower global citizens for sustainable development - answers to important social questions - zero footprint for campus operations - empower students and staff to act on sustainability - sustainability a priority for the organisation
Sustainable campus https://www.osc. hokudai.ac.jp/en/what-sc	- Environment and campus - Local economy and university management - Local society and social responsibility of university	- public space for students and staff (green, open space, energy reduction) - sectorial shift in economy, innovation - lifestyle shift, public service
Sustainability university excellence Hussain *et al.* (2019)	- Approaches - Mechanism - Resources - Impact and performance	- visionary and effective leadership; transparent, fair and accountable governance - quality management system - human, intellectual, financial - social, environmental, economic

There are also strict guidelines towards the integrity of the research (Mejlgaard *et al.,* 2020), the good practices aiming at: prevent hypercompetition environment; clear guidelines for PhD supervision; training and mentoring; review procedures for different types of research; incentives and infrastructure to curate and share management data; sound rules for transparent working with industry and collaboration international partners.

Most approaches in terms of sustainability are integrated, resulting in best practices:

• sustainability in research, teaching and partnerships - projects, programmes, centres, research institutions, competitions

• sustainable campus - providing the facilities and services needed for teaching and research with as low emissions and as high material efficiency as possible; practices and procedures - socially, ecologically, culturally and financially responsible.

• financial sustainability - stable and balanced finances enable the university to fulfil its duties (solid financial foundation, responsible investment, fundraising)

• cultural responsibility - duties with national importance, significance of cultural events

• social responsibility - equality and diversity, staff and student welfare, fairtrade university

In order to highlight the results of the orientation towards sustainability, hardly ever included in the criteria of traditional university hierarchies, specific mentions were introduced for certain aspects considered critical, such as:

• Athena SWAN (Scientific Women's Academic Network) is a charter established in 2005 that recognizes and promotes good practices in higher education and research institutions towards the advancement of gender equality.

• The logo for the 'HR Strategy for Researchers' is granted to those universities and research institutions that align their human resources policies to the 40 principles of the Charter & Code (European Charter for Researchers and Code of Conduct for the Recruitment of Researchers).

At international level, there have been attempts to implement sustainability-oriented university rankings, for example GASU - the Graphical Assessment of Sustainability in Universities (Lozano, 2006) or the ESPRIT project (Enhancing the Social Characteristics and Public Responsibility of Israeli Teaching through a HEI-Student Alliance), as a result of which a tool for measuring Academic Social Responsibility resulted, which, however, did not succeed in a wide dissemination.

The literature highlights some obstacles to the sustainability orientation of universities: lack of support from their administrators; lack of interest, care and involvement; shortcomings of training activities on sustainability, lack of incentives, lack of adequate performance indicators, lack of time, insufficient financial resources, resistance to change and insufficient interdisciplinary research.

Unlike the corporate environment, there are fewer mechanisms in universities to apply the principles of governance and sustainability. Federalism is significant - on the part of faculties and departments - and the budget structure is complex. People who manage budgets often have limited options for influencing to reduce consumption. Although a culture of openness is projected, transparency is reduced, even at home (Denneen and Dretler, 2012).

Most universities have not yet developed strategic documentation aimed at sustainability, they have not encouraged effective relationships with stakeholders inside and outside the university (Veiga Ávila *et al.,* 2017). Sustainability should be incorporated into relations with external partners to unlock investment opportunities in education, infrastructure and technological research.

In some countries, governments have taken steps to try to stimulate the sustainability of universities. Thus, in Spain the government has resorted to

allocating public funding to universities based on results rather than inputs, in an attempt to improve the quality of management and responsibility. As a result of this measure, a greater number of strategic plans and sustainability reports have been developed and published online by universities. Another measure taken was to encourage debates on university governance and accountability, so that universities become responsible institutions that support students, encourage debates on ethics and contribute to socio-economic development (Larrán Jorge *et al.,* 2015). The specific legislation on the implementation of sustainability in the context of university education has also been improved.

Among the factors that influence the implementation of sustainable practices in universities, highlighted in the literature are: public or private nature of institutions, size, university leadership and political orientation, reflected in preference for individuals with liberal thinking with a higher degree of social concern, than those with conservatory thinking (Shriberg, 2002; Ferrer-Balas *et al.,* 2008).

The quality of governance and ethics management in universities is reflected in the performance obtained in customer relations, reflecting their satisfaction. Applying the customer orientation paradigm is not easy in the university environment, due to the diversity of stakeholders who can be considered clients of academic services (Sallis, 2005): primary clients (students), secondary clients (parents, family, relatives, sponsors, etc.), tertiary clients (employers, government authorities, society as a whole) and internal clients (teaching and research staff, administrative and support staff). Analyzing the relationships between the categories of university stakeholders, the concept of "moral university" can be defined based on the "ethical or moral content" of the organization (Kaptein, 1998), consisting of a number of qualities or virtues of academic institutions: clarity / transparency, consistency (lack of ambiguity of moral standards and compatibility with other values), penalties (positive or negative motivation methods applied to teaching and support staff), feasibility (the extent to which responsibilities and ethical standards can be put into practice), endurance (support from staff for the proper use of university goods and services, close cooperation with colleagues and managers, or students), visibility (if the effects of teaching and support staff actions are visible), criticality (encouraging critical debates on ethical and moral issues facing staff).

The ethical culture of an organization is the aspects of organizational culture that affect the way employees think and act in situations related to ethics / morality. Ethical culture is a source of good practice that guides and can influence employees to do what is right or wrong (Treviño and Nelson, 2017). Through its current practices (moral context or university environment), an institution also stimulates its members to adopt a moral conduct. Ethical culture is created and maintained through a complex interaction of formal organizational systems (executive leadership, selection system policies and codes, orientation and

training, performance management, authority structure and decision processes) and informal (norms, language, stories, etc.).

A study conducted by a group of researchers on sustainable practices in public and private universities in Spain (Larrán Jorge *et al.*, 2015) highlighted the frequency of their implementation at different levels (Table 3).

Table 3. Frequency of sustainable practices implemented in universities

Thematic area	Frequently implemented practices	Practices implemented moderately	Poorly implemented practices
Corporate governance	- responsible management of resources (austerity plans or responsible consumption policies)	- statements of vision or mission oriented towards sustainability - long-term strategies, - benchmarking between universities - political responsibility regarding sustainable management	- administrative / political structures focused on sustainability issues - codes of good governance or directly applicable codes of conduct / ethics - interest in the sustainability of the university's senior management - annual objectives based on sustainability
Students	- structured process for registering complaints - compliance with the organic law on data protection - adequate and accurate information about curriculum and social activities - involvement of students in university management - assistance for special needs	- scholarships - educational psychology service - improving teaching (content, curricula), skills training process, independent activity - improving sustainability training	
Employees	- policies aimed at equal opportunities / professional careers - improving dialogue channels for internal communication in universities	- staff participation in management teams - structured process for registering complaints - compliance with the rules for the prevention of occupational hazards	- implementation of training activities on sustainability issues

Thematic area	Frequently implemented practices	Practices implemented moderately	Poorly implemented practices
		- working environment for people with disabilities and social actions - improving research activities - reconciling professional and family life - policies for career plans - improving the general training of teaching and support staff	
Society	- cultural and sports activities - participation in the initiatives of non-governmental organizations - supporting cooperation and development activities	- volunteering and social assistance programs - training programs for the elderly - programs on migration and interculturalism - improving the dialogue with stakeholders	- assessing students' satisfaction with social attitudes - increase sustainability research - basing financial investments on sustainable criteria
Environment		- reduction of energy consumption, use of private vehicles - raising environmental awareness and encouraging environmental research - improving environmental maintenance and conservation activities - environmental certification - procedures for defining, managing and reporting environmental indicators - increasing student involvement in the development of	- regular quantification and reporting of hazardous waste, including fertilizers used on campuses - providing information on the quantity and use of recycled water - noise reduction measures - incorporation of waste from university canteens - regular reports on expenditure resulting from fines and penalties for environmental damage

Thematic area	Frequently implemented practices	Practices implemented moderately	Poorly implemented practices
		environmental initiatives.	
Business environment / companies	- research networks between universities and companies to create, share and transfer knowledge to society	- scientific, humanistic and / or technological dissemination - facilitating outsourcing procedures	- purchasing ecological products from local suppliers - sustainable criteria in contracting and selecting suppliers - the purchase of products that have reduced the impact on the environment and information on their percentage - information on the percentage of contracts respected - special recruitment programs for the integration of groups at risk of social exclusion
Continuous improvement		- accreditation and infrastructure - management and services - structured processes for complaints and suggestions from different categories of stakeholders	- assessment of incidents of discrimination - assessment of complaints about privacy and data protection - policies regarding the regular evaluation of the catering services employed, on sustainable criteria

(Source: Adapted from Larrán Jorge *et al.*, 2015)

The orientation towards the implementation of sustainable practices in universities is far from strong, but is perceived as moderate. Among the dimensions of the orientation towards the adoption of sustainable practices of universities according to the study, the best located are the student-oriented practices, followed by the practices oriented towards: society, staff, continuous improvement and corporate governance. On the last two places, among the least implemented sustainable practices are those on the natural environment and the business environment (Larrán Jorge *et al.*, 2015).

The orientation towards sustainability is gradually created, by developing a sustainability vision for the university; sustainability committee (creating policies, targets, and objectives); sustainability strategies, stages supported by networks and audits (Velazquez *et al.*, 2006).

4.   SUSTAINABLE ORIENTATION OF ROMANIAN UNIVERSITIES

The more accentuated orientation of the Romanian academic environment towards the institutionalization of ethics in universities was determined by the public conscience. Thus, higher education institutions have adopted various measures to institutionalize ethics: codes of ethics, ethics commissions and committees, training activities with university staff, ethics audit, inclusion of ethics studies in the university curriculum, etc. An important role in improving the quality of governance in the university environment has this orientation, which places universities on a path of morality and contributes to the improvement of decision-making processes, procedures and academic structures (Gurgu, 2018).

According to a study attended by 76 managers of public and private universities in Romania on the implementation of ethics management in higher education institutions, it highlighted their recognition of the important role they play in improving the ethical climate in universities, but also that they do not know very well the tools they can use to improve the level of ethics in the institutions they coordinate. Thus, the most commonly used tools are codes and ethics committees, but the methods of disseminating the rules established by them have a very low frequency. More effective tools such as: ethics training courses, ethics audits, ethics expertise, ethics communication channels or the protection and encouragement of ethics advocates; they are less well known by most managers (Puiu and Ogarcă, 2015). Under these conditions, the poor knowledge and implementation of ethics management favours the lack of integrity, corruption and poor quality of governance of Romanian universities.

Starting with 2008, the Romanian Academic Society started to publish the University Integrity Report in Romania, which analyses the state of integrity in state universities. So far, 3 editions of the report have been published (2008, 2010 and 2016), the last one being elaborated with the support of the National Alliance of Student Organizations in Romania and a grant from the Swiss government. The report analyses the problems of integrity in the university system on 6 thematic areas: transparency and administrative fairness, academic correctness, quality of governance, financial management, meritocracy and anti-discrimination. The results of the evaluation carried out in the last edition of the report prepared in 2016 are summarized in Table 4.

Table 4. Synthetic results of the university integrity assessment in Romania

	Average score (out of 10)	Number of universities		Critical aspects
		Above average	Below average	
Transparency	7.58	36	12	posting wealth declarations, purchases, competitions for vacancies
Academic correctness	5.46	23	25	inefficiency of administrative mechanisms, bailing of the works of some convicted of corruption, plagiarism
Quality of governance	6.32	24	24	nepotism, rigged contests, politicization
Financial management	6.51	25	23	lack of an administrative control system to prevent corruption, wealth declarations that raise suspicions of self-government.
Meritocracy	3.20	16	28	guaranteeing the quality of scientific work of fraudulently purchased, plagiarized or compiled academic papers, validation by teachers of academic fraud
Average academic integrity score	5.9	20	24	

(Source: Romanian Academic Society, 2016)

The best situation is in the case of the criterion of transparency and administrative fairness, with a score of 7.58, 36 of the evaluated universities obtaining scores above average and 12 below average. Critical are the criteria of academic correctness, with a score of 5.46, with 25 universities below average and 23 above average, with a significant number of critical elements identified and the meritocracy criterion, with the lowest score, of 3.2, with 28 universities below this average score and only 16 over.

5. METHODOLOGICAL ASPECTS, RESULTS AND DISCUSSIONS

The premise of our research consists in a moderate application of the principles of good governance in the Romanian university environment and a reduced orientation towards sustainability. This premise is convergent with the results of other studies, both nationally and internationally. The research methodology had both a quantitative and qualitative orientation. The quantitative approach consisted in highlighting the extent to which certain items are present at the level of universities, in a comparative approach, based on the categories of universities included in the study, mainly by type of property (state or private).

The qualitative approach involved a content analysis of the elements identified in the documentary analysis - mission statements, vision and strategic / operational reports. We have identified and highlighted the elements that imply a direct or indirect orientation towards sustainability.

Institutions taken into analysis (https://www.edu.ro/institutii-invatamant-superior):
- civil state higher education institutions (47)
- state higher education institutions with military profile (7)
- accredited private higher education institutions (38, of which 8 in liquidation)
- private higher education institutions with provisional accreditation (9).

We eliminated from the analysis the state higher education institutions with military profile, with a high specificity of the activity, as well as private higher education institutions with provisional accreditation, for which the information is difficult to access.

Through an extensive documentation and a content analysis, we highlighted, on the one hand, the main aspects regarding the pillars of the regulatory system of the university environment, and, on the other hand, the key elements of the university management that generated the criticisms of the society.

The issues considered in the study were:
- gender diversity at the level of management bodies (rector, management team - vice-rectors, president of the university senate);
- the presence of the orientation towards sustainability at the level of the mission, vision and within the strategic documents (assumed objectives); the levels of this variable were clear / partial / insignificant orientation.
- the typology of the aspects taken into account in the reports of the ethics commissions;
- the existence of sustainable initiatives at university level.

Analysing the structure of the network of the Romanian university system (table 5 and table 6), we can see a decreasing evolution of the number of universities and faculties, as well as of the number of students, during the last 10 years. A more pronounced decrease can be observed in the case of private universities, and the largest discrepancy between the two forms of ownership appears in the number of students - over 6 times smaller in the case of private universities, while at the beginning of the analysed period (2011) it was about a third of the number of students from the state education.

This situation leads us to the premise of the role of locomotives of the state education, there is a greater tradition in this regard, but also to a greater emphasis and orientation to the needs of students in the case of private universities.

Table 5. The network of the national higher education system

	2011/ 2012	2012/ 2013	2013/ 2014	2014/ 2015	2015/ 2016	2016/ 2017	2017/ 2018	2018/ 2019	2019/ 2020
Number of universities, of which:	**108**	**107**	**103**	**101**	**99**	**97**	**95**	**92**	**90**
- state owned	57	56	56	56	56	56	56	55	55
- private owned	51	51	47	45	43	41	39	37	35
Faculties number, of	**614**	**596**	**590**	**583**	**567**	**560**	**554**	**545**	**546**
- state owned	410	405	405	403	409	405	406	406	407
- private owned	204	191	185	180	158	155	148	139	139

(Source: Ministerul Educației, 2020)

Table 6. Number of students enrolled in undergraduate higher education (thousands)

	2011/ 2012	2012/ 2013	2013/ 2014	2014/ 2015	2015/ 2016	2016/ 2017	2017/ 2018	2018/ 2019	2019/ 2020
Number of students in the first cycle, of which:	**108**	**107**	**103**	**101**	**99**	**97**	**95**	**92**	**90**
- state owned	57	56	56	56	56	56	56	55	55
- private owned	51	51	47	45	43	41	39	37	35

(Source: Ministerul Educației, 2020)

Some facts of our analysis:
- Gender issues

At the rector level, at the state universities there is a number of 6 women rector in the 47 analysed universities (12.8%), while at the private universities 8 female rector in the 38 analysed universities (21.1%). At the level of the management team - vice-rectors, president of the senate, things are more balanced, in most situations there are 2-3 positions occupied by women in teams of 4-7 members, but we also have situations of teams made up entirely of men.

The situation is convergent with the results of other studies at the Romanian university level (Apostoaie *et al.,* 2019; Percic and Manolescu, 2021) and with international statistics in the field. Interestingly, the situation is no different at the top universities in the national rankings, which is confirmed again internationally - just 14 percent of the top 200 universities in the world are led by women (https://www.timeshighereducation.com). Statistics show that the university environment has major gender imbalances, especially in certain areas and at the top of university careers and managerial positions. By comparison, soft and hard law for female board representation specifies mandatory quotas (e.g., France - 40%, Germany - 30%), and lower voluntary targets (e.g. UK - 33%, Netherlands - 30%).

- Transparency

It is at a much higher level in state universities. The information regarding the management and structure of the university, the documents such as activity and strategic reports, are easily accessible on the websites of all state universities. A number of 3 private universities do not offer public information (in most cases they are universities with programs in liquidation). The accessibility of management structures and activity reports is problematic in many of the private universities analysed.

- Orientation towards sustainability

The mission, vision and strategic objectives of the universities were analysed. The results were classified into "clear orientation" (there is a clear assumption and concrete elements that reveal the orientation towards sustainability), "partial orientation" (several elements can be identified); insignificant orientation (there are no elements or they are not clearly identifiable). There were also situations when the respective elements were not identified at the university level (no data). The results of the quantitative analysis and of the content analysis (statements / expressions / keywords) can be found in the Table 7.

Table 7. Synthesis of the analysis of the mission, vision and strategic objectives orientations

University type	Clear	Partially clear	Insignificant	No data
Mission university orientation				
State university	7 (15%)	7 (15%)	33 (70%)	-
Private university	3 (8%)	3 (8%)	21 (55%)	11 (29%)
Statements / expressions / keywords	knowledge broker and skills trainer are to promote excellence and the principles of sustainability in education and research in a wide range of disciplines; active involvement in socially, economically and culturally sustainable local, regional, national and European development; training of graduates with a civic spirit and social responsibility, who will manifest themselves as active European citizens in the community and society			
Vision university orientation				
State university	8 (17%)	6 (13%)	9 (19%)	24 (51%)
Private university	2 (5%)	-	5 (13%)	31 (82%)
Statements / expressions / keywords	European benchmark for sustainable, resilient and smart construction; Entrepreneurial behaviour doubled by responsibility in resource management; Institutional environment combining attractiveness and responsibility for university students and ensuring equal opportunities in their access to opportunities; Transforming education into a vector of individual, community, sustainable development			
Strategic objectives orientation				
State university	16 (34%)	14 (30%)	15 (32%)	2 (4%)
Private university	5 (13%)	7 (19%)	13 (34%)	13 (34%)
Statements / expressions / keywords	will continue its efforts in a sustainable manner, in order to provide society with efficient educational and research solutions; Engage in various other activities with the business and education communities in Eastern Europe that promote economic sustainability and growth; Optimization of maintenance costs and identification of renewable energy resources.			

The results are convergent with other studies (Larrán Jorge *et al.*, 2015), reflecting a moderate orientation towards sustainability. However, the correlation between the declarative level and the degree of implementation of the elements found in the university reports must be analysed, in the public domain there may be a high level of remaining at the level of declarations (Manolescu *et al.,* 2019).

- Ethics issues

From the analysis of ethics reports, we can mention an excessive orientation towards descriptive approach, on insignificant issues. Also, most conclusions are

evasive - "it is not within the competence of the ethics commission", "there are mitigating circumstances", "the notification term has exceeded the determined period" etc.

- Environment reports - none

None of the analysed universities has a separate report on environmental issues. Most often these aspects appear in the general reports, where the specific activities are presented - some eco - activities, mainly in the paragraphs related to student activity. Organizational initiatives are at an early stage (selective waste collection; encouraging cycling).

6. CONCLUSIONS

The higher education institutions – universities - and the research centres are considered, in general, entities that lead the way in technical and social progress (among many other aspects). However, the orientation towards sustainability and towards the application of the principles of corporate governance can make them problems of adaptation and alignment to the strategic objectives considered traditional - competition and excellence. The results of the analysis reveal differences between the analysed universities, but at the same time they prove the existence of improvements for all the analysed universities regarding the transparency, the orientation towards the social partners and the operationalization of the codes of ethics.

Analysing the situation of Romanian universities in terms of orientation towards sustainability, we can place them in phase 1 - sustainability outside of the board's agenda; there is little to no discussion of sustainability risks and opportunities and the responsibility of any sustainability projects lies with small isolated teams. The transition to phase 2 - Governance for sustainability and phase 3 - Integrated governance requires a consistent positioning and assumption of the objectives and organizational changes assumed by them. The external environment is considered non-supportive and legislative initiatives restricted the possibilities for progress. There is an alignment with Western practices in terms of scientific performance indicators, but circumvention of transparent practices. Changing is a long-term, continuous process; however specific, clear, measurable objectives should be developed in order to enhance the research / other activities impact. Some of the strategic actions already exist within the universities; however a better implementation is needed.

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UNPACKING CULTURAL INTELLIGENCE IN THE BUSINESS ENGLISH CLASSROOM

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ABSTRACT

This paper starts from the premise that awareness and understanding of cultural differences constitute essential elements of the skillsets that (business) students need to acquire in order to secure their academic and career success in the present-day 'global village'. Therefore, drawing on the construct of cultural intelligence and the increased spotlight on developing globally-engaged and multiculturally-trained citizens who are able to interact competently across borders, our investigations will look into the ways in which such competences can be assessed and developed, with a focus on business students. We argue that business English training, particularly through its intercultural (business) communication component, contributes significantly to improving students' ethnorelativism and, thus, increases their cultural intelligence.

Keywords: cultural intelligence; ethnorelativism; business English; intercultural communication.

JEL Classification: A22, D83, I25, J61, J62

1. INTRODUCTION

The present day business environment is turning increasingly global, which means that even domestic companies may employ workers with different cultural backgrounds. Moreover, as shown in a report by the SHRM Foundation, 90% of executives surveyed from a number of almost 70 countries mentioned 'cross-cultural management' as one of the most significant challenges they were faced with in working across (cultural) borders (2015).

This state of affairs has put a spotlight on the need for developing multicultural skills in citizens all over the world and engaging them in cross-cultural learning experiences as much as possible. Therefore, developing intercultural competence in (business) students is turning into a prerequisite in order to prevent possible pitfalls. However, teaching with cultural intelligence and developing cultural intelligence constitute both a challenge and an opportunity for teachers and students alike.

1.1 Rationale

Fact is that our world is getting more and more interconnected and interdependent, not only economically, but also socially. Employers are expanding their workforce across the globe, which entails that the staff be globally knowledgeable and competent from a cultural point of view. Thereby, education systems all over the world need to reconsider their curricula, in order to make sure that graduates are equipped with the skills needed to meet the demands of the global labour market and increase their employability.

Globalization has revamped the business environment, building on its highly dynamic, complex and competitive character. Consequently, the ability to adapt to and work effectively in a variety of cultural contexts has become more important than ever for organizations. This entails that awareness and understanding of cultural differences are no longer optional, but essential elements of the skillsets that business students need in order to secure their academic and career success in the present-day 'global village'. Therefore, starting from the construct of cultural intelligence and the increased spotlight on developing globally-engaged and multiculturally-trained citizens who are able to interact competently across borders, we will be looking into the ways in which such competences can be developed, with a focus on business students. We argue that business English training, particularly through its intercultural (business) communication component, contributes significantly to improving students' ethnorelativism and, thus, increases their cultural intelligence.

Culture draws on the values, beliefs, patterns of behaviour, etc. that regulate people's behaviour, and in so doing, it differentiates the members of a given community from other groups (Hofstede, 2001). In other words, subconsciously, culture guides our thoughts and our behaviours, including our attitude towards work, our effectiveness and motivation, but also our sense of belonging to the organization we are a part of. Growing awareness and knowledge about the cultural differences between the members of the same organisation increases work efficiency, as well as the quality of social interaction and relationships established between co-workers. This is precisely where cultural intelligence (CQ) steps in, as it puts a spotlight on the quality of interaction, on the degree to which individuals are able to work effectively and interact across cultures.

Cultural differences are present everywhere, and may easily turn into minefields for managers and employees alike. Attitudes towards time and scheduling, hierarchy, power relations, or teamwork are often sources of confusion and may well generate misunderstanding unless they are dealt with correctly. Let us imagine a scenario where Company X is negotiating with Company Y (an international partner). The discussions have been going on for more than half a year and, finally, when the contract is on the table and things seem to settle, Company Y walks out, puts everything on hold and informs Company X they will resume discussions presently. How should Company X

respond to such a situation? Or, consider another example: let us assume that while discussing with one of your co-workers (who comes from a different country), you notice that (s)he does not look you in the eye. Would you interpret this as a cultural difference, or would you attribute it to personal characteristics? Would you know how to deal with such a situation?

In order to provide an adequate response to such situations, individuals (business students, business professionals, or other people involved in intercultural interactions) need to acquire an essential skillset, namely *(inter)cultural competence*, "a set of cognitive, affective, and behavioural skills and characteristics that support effective and appropriate interaction in a variety of cultural contexts" (Bennett, 2015, p. xxiii). In our analysis, the main emphasis will be on *cultural intelligence* (CQ), understood as one of the building blocks of effective intercultural communication in business or in daily interaction.

2. CULTURE AND CULTURAL INTELLIGENCE

2.1. What is culture, and why is ethnorelativism relevant to cultural intelligence?

While the concept of *culture* is still considered to be a word in search of a definition, for the purposes of the present paper, we will be relying on the definitions put forth by Geert Hofstede, the Dutch anthropologist who dedicated extensive research on cultural differences in the workplace. Hofstede *et al.* define culture as made up of "patterns of thinking, feeling, and potential acting that were learned throughout the person's lifetime" (2010, p. 4) acquired mostly during one's early childhood, which the scholars associate with "mental programmes" making up the "software of the mind" (*Ibid.*, p. 5). From an organisational perspective, culture may also be defined as 'the way in which we do things around here', which translates into the ethos and the style of an organisation, or even as "national customs and foods, or even the latest trends in fashion, movies and music" (Livermore and Dyne, 2015, p. 2). In our paper, *culture* is understood as the beliefs, norms, values and attitudes that distinguish the members of one group from another, and which are reflected in their organisational behaviour, thus influencing their motivation, their work-effectiveness as well as their interaction and communication style. Consequently, the ability to communicate and work effectively across cultures constitutes an important asset, as it may well serve as a source for creativity and innovation.

As far as *ethnorelativism* is concerned, given the diversity of the world we live in, it is of outmost importance to keep an open mind in relation to our cross-cultural encounters. While ethnocentrism constitutes a significant danger as it "is to a people what egocentrism is to an individual: considering one's own little world to be the centre of the universe" (Hofstede *et al.*, 2010, p. 387). Therefore, in order to avoid an ethnocentric mindset, which "builds fences between cultures

and thus creates barriers for intercultural communication" (Liu *et al.*, 2019, p. 67), an ethnocentric perspective has to be established. Ethnorelativism is grounded in the "assumption that cultures can only be understood relative to one another and that particular behaviour can only be understood within a cultural context. There is no absolute standard of rightness or "goodness" that can be applied to cultural behaviour. Cultural difference is neither good nor bad, it is just different . . . One's own culture is not any more central to reality than any other culture, although it may be preferable to a particular individual or group." (Bennett, 1993, p. 46)

Consequently, in order to avoid the dangers of overgeneralisation and essentialisation of cultures, precisely by looking at the surrounding world through the narrow lens of ethnocentrism, one must build cultural intelligence, as part of the essential skillset required in order to operate adequately and effectively in the global marketplace.

2.2. Cultural intelligence

Drawing on the work of Sternberg and Detterman (1986), Earley and Ang (2003) put forth the construct of *cultural intelligence (CQ)*, which is defined "as an individual's capability to function and manage effectively in culturally diverse settings" (Ang *et al.*, 2007, p. 336). The authors further explain that "CQ is a multidimensional construct targeted at situations involving cross-cultural interactions arising from differences in race, ethnicity and nationality" (Idem).

As shown above, cultural intelligence is a multifaceted and multidimensional concept, which consists of four mental and behavioural 'capabilities', namely metacognition, cognition, motivation and behaviour (Ang *et al.*, 2007; Crowne, 2008; Ang and Van Dyne, 2008). As research shows, the four facets encompassed by CQ are metacognitive CQ, cognitive CQ, motivational CQ and behavioural CQ.

Metacognitive CQ reflects the culture-related "mental processes that individuals use to acquire and understand cultural knowledge" (Ang *et al.*, 2007, p. 338). As Triandis (2006) shows, a high metacognitive level means that people endowed with high metacognitive CQ are capable of questioning overgeneralisation and cultural assumptions; they are aware that cultural preferences may differ (which impacts communication) and, consequently, are able to adjust their interaction patterns accordingly. The second CQ facet – *cognitive CQ* – infers the knowledge and understanding of the various norms, conventions and practices pertaining to the different cultures, which are unlike one's own (Ang *et al.*, 2007). This knowledge is acquired through specific education, but also through the personal experience of the unfamiliar. Triandis (1994) includes in the category of cognitive CQ the acquaintance with the social, economic or legal systems prevailing in a given culture. A high level of cognitive CQ means that the individual acknowledges cultural differences and similarities, is able to understand different cultural values and patterns of behaviour, which is

likely to lead to successful intercultural interaction. *Motivational CQ* expresses the capacity to guide one's interest, energy and drive towards learning how to cope with difference in cross-cultural encounters. As emphasised by Deci and Ryan (1985), high motivational CQ is correlated with intrinsic motivation that drives energy towards intercultural situations. Finally, *behavioural CQ* refers to the ability to respond adequately to situations of intercultural communication, by relying on the appropriate verbal and nonverbal actions. Cultural competence translates not only in the individual's mental ability to understand difference, but also in the capacity to display adequate behaviours (through verbal and nonverbal cues) (Hall, 1959); in other words, cultural competence allows us to respond correctly to specific situations of communication and adhere to the cultural norms and values required. As pointed out by Gudykunst *et al.*, 1988, high behavioural CQ equals the ability to use the right tone and the right gestures in addition to appropriate words.

2.3. Why do we need CQ? Or, better said, why do our students need it?

As we have seen, cultural intelligence evaluates the person's capacity to assess and react accordingly to cultural experiences that are outside one's sphere of familiarity. Research has shown that it draws on emotional intelligence (EQ), but goes a little further. As shown by Asser and Langbein-Park, while high EQ level facilitates understanding of our inherently human traits, CQ enables people to decipher the "implication and meaning of value differences and handle the various implications and potential polarity of cognition, emotion, and motivation in different cultures successfully" (2015, p. 165). However, psychologist Daniel Goleman noticed a core common feature of CQ and EQ, namely the "propensity to suspend judgment—to think before acting". (Goleman, cited in Earley and Mosakowski, 2004, p. 140).

So why do our students need to build cultural intelligence?

On the one hand, there is the increased spotlight on internationalization in higher education. From this perspective, CQ is assumed to guarantee students' academic success, and, why not, for some, even open up avenues for an academic career. In addition, we could argue on this point that internationalisation without CQ guarantees as little cross-cultural effectiveness as does the very lack of internationalisation.

On the other hand, there is the fact that our world needs citizens who can relate and work effectively across cultures. In our particular case, students need to build specific skillsets that will secure their successful insertion in the job market. In order to join the international labour force and in order to be successful, students need to be internationally mobile, they need a correct worldview, and to acknowledge cultural difference. This is best achieved when students are

confronted with a diverse international population, either through internalisation in the form of student mobility programmes, or through internalisation at home, through intercultural communication classes. Exposure to cultural differences creates students who are independent thinkers; by acknowledging cultural difference, they become more self-aware, challenge their own assumptions and understand better their own culture.

And how do we work on the 'ability to function effectively in various cultural contexts'? How can we help our students build these skillsets and grow into globally engaged and multiculturally trained citizens?

Individuals can improve their CQ by means of a variety of intercultural experiences; one such opportunity is international travel (Van Dyne, *et al.*, 2008). It is through experiences outside one's national borders that individuals acquire cues for learning, especially by means of direct observation. According to Earley and Peterson (2004), international experiences allow people to observe others, but also to observe themselves and continually reshape their worldviews. Learning occurs precisely because one is forced to acknowledge the 'different' and challenge one's own thinking patterns and assumptions.

Student mobility programmes are therefore legitimate alternatives, as they allow students to enrich their CQ through experiential learning, both within an academic setting (through the courses they attend) and in their daily life.

However, cultural intelligence can be also developed by relying on an internalisation at home approach (IAH), through programmatic elements in undergraduate and graduate business degree programs, more precisely, through intercultural communication courses. As shown by Beelen and Leask, "Internationalization at Home is not an aim or a didactic concept in itself, but rather a set of instruments and activities 'at home' that aim to develop international and intercultural competences in all students" (2011, p. 5).

In other words, teaching and educational activities are likely to equip students with the necessary cross-cultural competencies, and train them for the international labour market.

3. THE STUDY

3.1. Needs analysis

The first step was to assess our students' strengths and weaknesses in terms of cultural intelligence, with a view to identify their CQ level, and decide upon a starting point in our CQ training. To this purpose, we applied Earley and Mosakowski's CQ self-assessment instrument (2004). The tool is a 12-item questionnaire, designed to assess the 3 core CQ elements, cognitive CQ, physical CQ, and emotional or motivational CQ. The questionnaire was applied to a sample

of 62 students (male and female) enrolled in undergraduate studies at the Faculty of Economics and Business Administration, within the "Alexandru Ioan Cuza" University of Iasi. The questionnaire application was carried out at the beginning of the second semester of academic year 2020-2021.
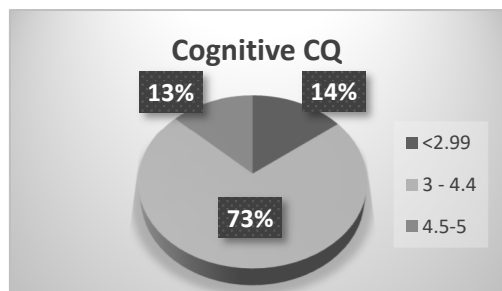

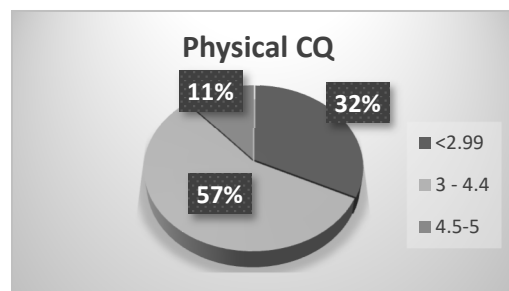
Fig. 1. Cognitive CQ – Initial Stage
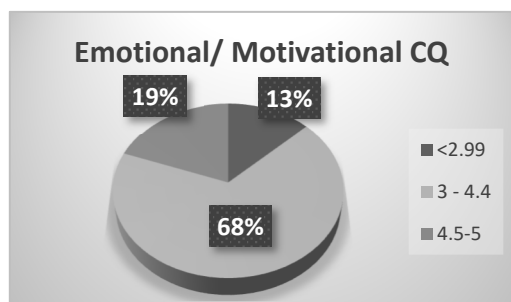

Fig. 2. Physical CQ – Initial Stage

Fig. 3. Emotional/ Motivational CQ – Initial Stage

As conceived by Earley and Mosakowski's assessment instrument, averages lower than 3 obtained for any of the three components point to an area that needs improvement, while averages above the value of 4.5 point to a high level of cultural intelligence in that respective area.

The results collected after the initial application of the questionnaire indicate that, while more than half of the students included in the sample obtained at least average scores on Earley and Mosakowski's scale, there are still areas that need improvement, especially as far as physical CQ is concerned: 32% (or 20 students) scored below 3. In terms of cognitive and emotional CQ, the scores below 3 accounted for 14% (n=9), respectively 13% (n=8) of the students in the sample. At the opposite pole, the emotional/ motivational CQ recorded the highest percentage of scores above 4.5, showing that as many as 12 out of the total 62 students could be qualified as having high emotional/ motivational CQ.

3.2. CQ Training in the Business English Classroom

The second stage consisted in the application of CQ training to the sample of selected students. As Earley and Mosakowski show, "unlike other aspects of personality, cultural intelligence can be developed in psychologically healthy and professionally competent people." (2004, p. 146). The researchers identify three core elements of CQ (cognitive CQ, physical CQ and emotional/ motivational CQ) which correspond to three body parts – the head, the body and the heart.

The first component, Cognitive CQ, corresponds to the head. While rote learning might turn out to be helpful in acquiring knowledge about customs, beliefs, or taboos of the foreign culture, it will never truly prepare students for every possible situation (if anything will), and, most definitely, will not prevent them from making cultural *faux pas*. It is through observation of behaviours specific to different cultures that students will gain deeper knowledge and acquire CQ. The types of training selected for improving our students' cognitive CQ include short videos (e.g. *Ads about culture*: https://www.youtube.com/watch?v=ALWwK7Vz4gY, which explores different cultural norms in a number of cultural contexts), or documentaries (e.g. Archer and Silver's 1997 documentary, *A World of Differences: Understanding Cross-Cultural Communication*), which explores (verbal and nonverbal) ways in which people belonging to different cultures can fail to understand one another.

The second component, Physical CQ (the most problematic in our case), corresponds to the body. The mere knowledge of culture-bound behaviours and customs will not guarantee successful intercultural interaction. The acquisition of physical CQ will be visible in one's actions and body language, whether in the form of greetings, or in the way in which one stops a taxi. "By adopting people's habits and mannerisms, you eventually come to understand in the most elemental way what it is like to be them". (Earley and Mosakowski, 2004, p. 141), and, besides, you will demonstrate interest in their culture and eventually gain their trust. As training material suitable for improving the physical CQ, we mention again the use of videos and documentaries, or even films that explore patterns of behaviour and elements of non-verbal communication in business, as well as role plays and case studies.

The third component, Emotional/ Motivational CQ, corresponds to the heart. The key to acquiring higher levels of CQ is confidence, which is gained through the mastery of different situations. Thus, in order to build upon the emotional/ motivational CQ, we need to help students become more confident – both in terms of the language they use, and the non-linguistic and cultural elements involved in their training. The training materials that are best suited for enhancing emotional/ motivational CQ are case studies complemented by debates and role-play activities.

Thus, in this stage of our endeavour, we tried to select training material that focused on the identified weaknesses. For low physical CQ, we focused on role-

play, for low cognitive CQ, we focused on case studies, which were later discussed in class, in an attempt to distil their main ideas and key principles. For low motivational and emotional CQ, the training materials focused on activities that required students to act out very simple tasks and exercises, such as asking for directions, finding out how to get to the train/ bus/ tram station, or to the airport, or practising greetings. These activities can be considered to be warm-up activities for more demanding actions (or functions), such as giving feedback/ carrying out performance review.

Sample exercise:

> "Sales representatives from Germany and Britain are in a difficult negotiation. Things are getting tense. Franz Bauer sits upright and is disturbed as Jim Banks relaxes in his chair. Franz Bauer feels that Jim is not taking the negotiation seriously. Jim feels that Herr Bauer is getting more and more aggressive." (Gibson, 2009, p. 29)

Such an exercise is useful for enhancing the students' physical CQ, as it draws their attention to the fact that body language varies widely across cultures, and lack of awareness in this area could give rise to misunderstandings. In the example above, Bauer's upright posture is a sign of his commitment and seriousness regarding the difficult situation. On the other hand, the British partner's relaxed position is indicative of his desire to take the sting out. Lack of cultural awareness leads the two interactors to misinterpret the situation, and, hence, to an escalation of the conflict.

As Earley and Mosakowski show, "human actions, gestures, and speech patterns a person encounters in a foreign business setting are subject to an even wider range of interpretations, including ones that can make misunderstandings likely and cooperation impossible". (2004, p. 139) Exposing students to such 'critical incidents' gives them access to a wider pool of knowledge, to a whole world of differences, developing not only their cultural awareness, but also their critical thinking. A similar approach is taken by Ciortescu in *A Guide to Business Communication* (2020); the study emphasises the paramount need to build awareness and self-awareness in business students, as key ingredients for successful intercultural interaction, providing highly engaging classroom activities on the dangers of stereotyping (2020, p. 158-171).

3.3. Results

At the end of the semester, the newly developed skills were reassessed via the same questionnaire applied at the beginning, complemented by feedback gathered from peers, our own assessment (teacher feedback), as well as the students' opinion regarding their own progress.
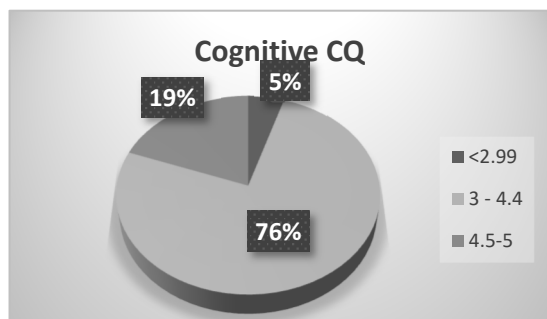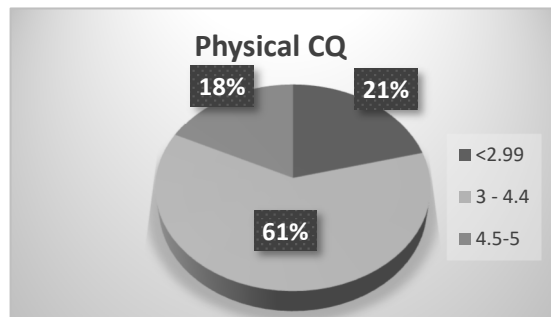
Fig. 4. Cognitive CQ – Final Stage

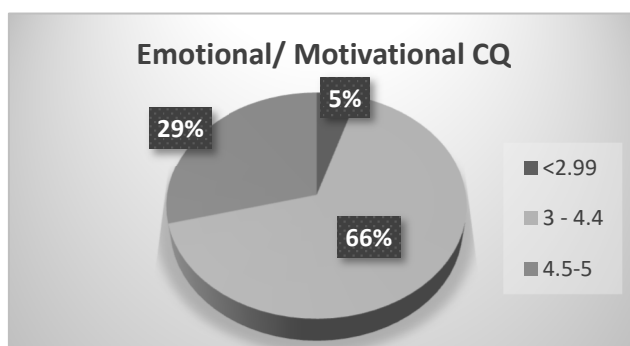

Fig. 5. Physical CQ – Final Stage

Fig. 3. Emotional/ Motivational CQ – Final Stage

The results obtained point to an obvious improvement in all three components of cultural intelligence. In the most problematic area, that of physical CQ, the percentage of students who scored below 3 decreased by a little more than 10%, while the percentage of students who scored above 4.5 rose by 7%. In terms of cognitive CQ, we notice that the percentage of students who scored below 3 dropped from 14% to 5%, and the percentage of those who scored above 4.5 increased to 19%. Finally, positive changes were attained in the area of emotional/ motivational CQ, with a 10% increase in the number of students who scored above 4.5, and a 7% decrease in the number of those who scored below 3.

Indeed, there are people who have innate CQ, which allows them to handle cultural difference quite easily; there are others who struggle when faced with unfamiliar situations. Besides the vast literature dedicated to the topic, our own observations have shown that the key to understanding and responding (correctly) to such situations lies in CQ – whether innate or cultivated. Based on the results above, we could argue that CQ is a skill that can be developed and improved.

4. CONCLUSIONS

In our present world, crossing geographical boundaries has become commonplace. Therefore, CQ is a vital skill, one that should be acquired by people doing business internationally, and regular citizens alike. Foreign cultures are no longer relegated to geographical constraints; they permeate all areas of life, all sectors of the industry, multinational companies being just one example. As such, effective interaction with co-workers requires perceptiveness, alertness, motivation and adaptability. Earley and Mosakowski argue that the more attached we are to our culture, the more difficult it is for us to understand and embrace a foreign culture, pointing out that "people who are somewhat detached from their own culture can more easily adopt the mores and even body language of an unfamiliar host" (2004, p. 142).

The experiment carried out during the second semester of the academic year 2020-2021 with students enrolled in undergraduate courses at the Faculty of Economics and Business Administration within the "Alexandru Ioan Cuza" University of Iasi allows us to draw some preliminary conclusions. Although there are CQ characteristics that are inborn, one can also attain a decent level of cultural intelligence, provided one is motivated enough. Moreover, given the current internationalisation of the business environment, building intercultural competence, and implicitly CQ, is no longer an option, but an absolute must. One valid alternative for building CQ in our students is Internalisation – abroad, through mobility programs, or in-house, through lectures and seminars. Internationalisation with CQ not only enhances effectiveness, but it also opens a whole range of opportunities to leverage cultural differences in innovative and sustainable ways. If internalization through mobility programmes is not possible – or less accessible for various reasons – courses can complement this lack, acting (to some extent) as "experience equalizers." Courses grant access to the less internationally mobile students, giving them the opportunity to "catch up" with their peers and, as such, reducing the gap between the two categories, at least in terms of intercultural competence. It is however quite possible that cross-cultural communication courses enhance more the cognitive and metacognitive cultural intelligence compared to the behavioural and motivational CQ.

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TACIT KNOWLEDGE TRANSFER FOR MANAGERIAL POSITIONS – SUGGESTED DESIGN FOR HIGHER EDUCATION INSTITUTIONS

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ABSTRACT

Tacit knowledge utilization and transfer in organizations are critical for maintaining a competitive advantage and for successful coopetition, in the case of educational institutions. Acquiring, extracting and transferring tacit knowledge are difficult tasks, due to the complexity of the tacit knowledge itself, to the myriad of influence factors and the lack of appropriate methods for particular contexts. The process is even more difficult when the tacit knowledge transfer takes place – or should take place – at power level, for various managerial positions – yet without such a transfer, valuable time and resources are wasted (not all transferred experiences have to be used, some might need to be unlearned!). Higher education institutions are the forefront of knowledge transfer, yet preaching and living the preached values remains a delicate endeavor, especially during crises.

The present study, conceptual and exploratory in nature, aims to identify influence factors for tacit knowledge transfer in higher education institutions, as well as potential methods for the tacit knowledge transfer effectuation. It uses literature review based on critical thinking together with participant observation and exploratory introspection in order to suggest a potential design for the future testing and utilization of the identified factors and methods.

The main identified influence factors are: national culture dimensions and professional culture, organizational structures, culture, leadership, and commitment, distributive and procedural justice, transparency, personality traits, cooperativeness, emotional intelligence, interpersonal trust, altruism, attitude towards mistakes. Among these factors we can identify the most frequent barriers, which are physical and professional distance, lack of trust, lack of appreciation for others' ideas, lack of value for one's intuition, unawareness of own knowledge, unwillingness to share, lack of retention, lack of motivation.

The main possible methods for tacit knowledge transfer for managers in higher education institutions are: observation and reflective practice, formal and informal socialization meetings, storytelling, role rotation, mentoring for managers, training of successors, teams of learning managers, goal-directed interviews at the moment of power transfer, worse practices learning communities, managerial thumb-a-lift.

1. INTRODUCTION

The present material is developed having in mind the simple, well known statement of Michael Polanyi: "I shall reconsider human knowledge by starting from the fact that *we can know more than we can tell*." (Polanyi, 1966). From all categories of knowledge, tacit one is the most volatile, elusive and unmanageable, at least through classical approaches. Knowledge management (KM), categorization and sharing have been subject for a huge number of studies in time, from the ancient philosophy of Plato and Aristotle to the nowadays literature, even if the syntagm KM itself was created only in the 20th century, through the initial efforts of Polanyi, Nonaka, Davenport and Prusak (Polanyi, 1966; Nonaka, 1994; Nonaka and Takeuci, 1995; Nonaka and Konno, 1998; Davenport and Prusak, 1998). Most of the literature that follows deals with knowledge sharing inside business organizations, in master-trainee, experienced worker-apprentice or teacher-student contexts, when knowledge is transmitted inside various entities within different hierarchical levels; when peer-to-peer knowledge sharing is analyzed, the peers are rarely managers, and most often not at the top of the pyramid. However, the transmission of knowledge - especially the tacit one - at managerial level, when transition from one manager or team of managers to another one occurs, as a transfer of power, is much less studied, at organizational level in general, and in higher education institutions in particular. Higher education institutions are the forefront of knowledge transfer, yet preaching to others and living the preached values internally remains a delicate endeavor, especially during challenging times – the ones we've been living in lately. This is why the aim of the present study, conceptual and exploratory, was to identify potential influence factors for tacit knowledge transfer in higher education institutions, as well as potential methods for the tacit knowledge transfer effectuation at managerial level (deans and vice-deans, rectors and vice-rectors etc.). As methodology it uses literature review (64 articles obtained as intersections for the key terms tacit knowledge, higher education and managerial power transfer) based on critical thinking, together with participant observation (as academic member holding several managerial positions in time) and exploratory introspection in order to suggest a potential design for the future testing and utilization of the identified factors and methods.

2. TACIT KNOWLEDGE DEFINITION AND IMPORTANCE

The logic of the present study is simple: knowledge management is necessary, knowledge sharing is important, tacit knowledge sharing is vital, yet less investigated in the case of managerial transfers of power, and even less in

higher education managerial transfers. Thus, we need to find out how we can define, improve, change the process of tacit knowledge sharing at managerial level in higher education institutions.

Higher education institutions, more than any other type of organization, are challenged lately to reconsider their "business model", their role in society as members of complex networks and in contexts for which the change is exponential and internal resources were trained rather linearly (Schutz *et al.*, 2019; Carayannis and Campbell, 2012).

The importance of knowledge management and sharing was already demonstrated, at both theoretical and practical level (Ku, 2019; Benyahya, 2017; Asrar-ul-Haq *et al.*, 2016; Cabrera *et al.*, 2006; Witherspoon *et al.*, 2013; Lin and Lee, 2004; Zaiţ, 2004; Argote *et al.*, 2000; Davenport and Prusak, 1998; Nonaka and Konno, 1998; Szulanski, 1996). As types or categories of knowledge, the literature usually identifies explicit, implicit and tacit knowledge (Polanyi, 1966; Vaughan, 1979; Nonaka, 1994; Nonaka and Takeuci, 1995; Brockmann and Simmonds, 1997; Nonaka and Konno, 1998; Davenport and Prusak, 1998; Sternberg *et al.*, 1999). Knowledge can be shared and transformed from one category to another, in a process labelled by Nonaka and Takeuci (1995) as the knowledge spiral or SECI model: socialization (from tacit to tacit), externalization (from tacit to explicit), combination (from explicit to explicit) and internationalization (from explicit to tacit).

Explicit knowledge is based on documented information and it is easy to codify, write down, store and exchange or share. Implicit knowledge comes from applied information and consists of learned skills and know-how, and it is still shareable in a certain degree. Tacit knowledge originates in the mind of "knowers", comes from personal experiences and is intangible and fluid, rather understood than ever stated, difficult to express, and sometimes even difficult to be perceived or realized – because one cannot be necessarily aware of it. This is a huge reservoir of knowledge from which very little is used, as Vaughan stated, *"At any given moment one is conscious of only a small section of what one knows. Intuition allows one to draw on that vast storehouse of unconscious knowledge that includes not only everything that one has experienced or learned either consciously or subliminally, but also the infinite reservoir of the collective or universal unconscious, in which individual separateness and ego boundaries are transcended."* (Vaughan, 1979).

Various organizations are trying to get this type of tacit knowledge to light, and share it so that it could be utilized, because even small portions of this incredible knowledge resource could help managers to develop better strategies, make better decisions and significantly increase organizational performance (Brockmann and Simmonds, 1997). A part of this tacit knowledge might get incorporated, with time, in organizational practices, habits and norms, but most of it continues to exist within people, remains unobservable, complex and

unpredictable, a type of company asset less definable and much harder "to pin down" (Davenport and Prusak, 1998), not to say it can be easily lost when people leave the organization.

According to Sternberg *et al.*, tacit knowledge is the one that makes the difference between less and more practically-successful individuals, in general, and managers, in particular, and has three key features, related to: the conditions under which it was acquired, its cognitive structure, and the conditions of its use. Sternberg discovered that managers with more tacit knowledge are performing better and receive higher performance ratings (Sternberg *et al.*, 1999).

The sharing of tacit knowledge is a delicate subject not only because it's difficult to define and quantify, but also because sometimes it's hard to say which part of this tacit knowledge should be encouraged and which one should rather be forgotten. In certain challenging contexts, when organizations need to change, "evil" or negative or "burden" type of tacit knowledge might be easier or more willing to be transferred, due to conditioning effects and norms' pressures, while it should be rather "unlearned", for the sake of progress. As Bonchek noticed, a lot of attention is given to learning processes in organizations, although most of the time the problem is not that of learning, but the unlearning, because the mental models with which the organization operates are obsolete and a new logic is needed (Bonchek, 2016). There are also voices against the concept of unlearning, just apparently borrowed from psychology (Howells and Scholderer, 2016), yet it is quite clear that this process of change through unlearning old habits and learning new ones is of crucial importance. The unlearning process is not about forgetting or somehow "deleting" knowledge from the individual's or organization's memory, but about the ability to choose an alternative mental model or a new, different behavioral paradigm. (Bonchek, 2016).

3. INFLUENCE FACTORS FOR TACIT KNOWLEDGE SHARING

If tacit knowledge is so important, why aren't we using more of it? What motivates people to share tacit knowledge? The extant literature suggest a vast array of influence factors in the process of tacit knowledge sharing, starting at macro, national level (national culture influences) and ending at individual, personality traits level. Sharing tacit knowledge requires a lot of private feelings disclosure, a loss of intimacy in a certain way, and sometimes even recognizing what could be apparently decisional weaknesses or errors. While such a behavior is seen as normal, appreciated and encouraged in some cultures, it is perceived as a weakness and rather disrespected in others, depending on such cultural

dimensions as being neutral versus affective (showing or not emotions), specific versus diffuse (mixing or not personal and professional issues), individualism versus communitarianism (focus on individuals or on the team) or achievement versus ascription (accomplishments or status, especially for promotions) (Trompenaars and Hampden-Turner, 2004). The national culture is the highest layer, but inside there are other cultural layers – regional, organizational, professional, and generational – and all these carry influences in the process of sharing tacit knowledge.

The type of organizational culture, the organizational structures and motivation mechanisms, the professional culture, the leadership style and organizational commitment, organizational transparency, relational social capital and the distributive and procedural justice (perceived fairness of outcomes or resource allocations, respectively perceived fairness of rules and decision processes used to determine outcomes) were previously found to influence tacit knowledge sharing in various types of institutions (Szulanski, 1996; Argote *et al.,* 2000; Eraut, 2000; Bartol and Srivastava, 2002; Bock *et al.*, 2005; Foos *et al.*, 2006; Holste and Fields, 2010; Joia and Lemos, 2010; Mohd Soieb, 2010; Suppiah and Singh Sandhu, 2011; Xue *et al.*, 2011; Kingston, 2012; Peet, 2012; Salleh, 2012; Chug, 2013; Matoskova *et al.*, 2013; Witherspoon *et al.*, 2013; Ku, 2019; Goobins and Dooley, 2021).

At individual level, the main factors of influence for the tacit knowledge sharing were found to be personality traits in general, degree of cooperativeness, cooperation bias, emotional intelligence, subjective age, level of interpersonal trust, altruism, perceived personal identity, temporal focus (past, present or future), willingness to learn and share and attitude towards failures or mistakes (Argote *et al.*, 2000; Baumard and Starbuck, 2005; Cabrera *et al.*, 2006; Jain *et al.*, 2007; Holste and Fields, 2010; Joia and Lemos, 2010; Casimir *et al.*, 2012; Gog and Sandhu, 2013; Carter, 2016; Benyahya, 2017; Lazazzara and Za, 2020; Fuller, 2021; Lu *et al.*, 2021).

Several studies were found for the case of higher education institutions, but dealing with the tacit knowledge transfer between peer academics (teachers or students) or between teachers and students. No studies were found for the transfer at managerial level, internally, nor for the tacit knowledge transfer between university partners, at managers' level. The extant literature dealing with tacit knowledge management and sharing at university level treats the same factors already identified for other type of organizations, as well – those we already mentioned at national, organizational or individual level (Jain *et al.*, 2007; Cheng *et al.*, 2009; Peet *et al.*, 2010; Salleh, 2012; Wijetunge, 2012; Chug, 2013; Fullwood *et al.*, 2013; Goh and Sandhu, 2013; Chug, 2015; Djikhy and Moustaghfir, 2019; Nurkka, 2019).

4. METHODS FOR SHARING TACIT KNOWLEDGE

Once factors identified, we were trying to answer the question How is tacit knowledge transferred? Which are the methods used for the tacit knowledge sharing? The starting point was the original Nonaka and Takeuci article from 1995, explaining the knowledge spiral and the SECI model. Here, the tacit knowledge is transferred into other tacit knowledge through various socialization processes, those in which individuals have the chance to meet, spend time together, discuss and debate, and thus share knowledge. The list of socialization methods identified in previous studies concerning tacit knowledge sharing includes collaboration and social networks, either face-to-face or online, recordings of "lessons learned", storytelling, mentoring approaches for guided experience sharing, observation and listening, workshops, seminars and apprenticeships, conferences, brainstorming without criticism, role rotation, goal-directed interviews at the moment of power transfer, generative knowledge interviewing, teams of leaders and conversations with leaders, learning from failures through worse practices learning communities, blogs, managerial thumb-a-lift (Reamy, 2002; Hedlund *et al.,*, 2003; Baumard and Starbuck, 2005; Janson, 2007; Mccallum, 2008; Martin-Niemi and Greatbanks, 2010; Peet *et al.*, 2010; Kingston, 2012; Wijetunge, 2012; Panahi *et al.*, 2013; Benyahya, 2017; Buunk *et al.*, 2019; Caulier, 2020).

These methods can be applied considering organizational and professional contexts, as well as situational ones. In higher education the extant literature deals with the role that universities have and how they should encourage tacit knowledge use and sharing for students and teachers. Universities should serve more as borderland spaces – "novel, challenging, permissive and liminal, destabilizing traditional power hierarchies" (Hill *et al.*, 2016). In such liminal, transitional spaces, students could be trained for critical thinking and reflective judgment, for collaborative learning by breaking traditional power relations and hierarchies of higher education. If such a method works with students, it should moreover be used for academics and for university managers.

In general, universities encourage – at least at a declarative level, but most of them in reality, too – the transfer of tacit knowledge, through open communication, peer-trust development, ethical behavior and unrestricted transparency and sharing of knowledge by managers (e Cunha *et al.*, 2010; Chugh 2013; Chugh 2015). Several areas require improvement, especially for spreading the tacit knowledge to all internal and external stakeholders, despite time and resources constraints. In challenging times the usual university rules might become inadequate, requiring for a questioning of old frames and elimination of potential downward spirals; as e Cunha noticed, sometimes leaders are led by contingencies instead of leading them (e Cunha *et al.,* 2010), and they get involved into less clear areas, marked by gray principles, so that leaders may feel "trapped", not knowing what to do, having a reduced capacity for leading ethically in difficult

conditions, and especially not communicating the gray issues to various governing bodies – and thus not sharing the tacit knowledge anymore, since even the explicit one is not entirely shared.

Newly appointed managers are often in liminal spaces, including in higher education. To be in a liminal space means to be in between something old and something new, in a transition from one position to another one - physically, emotionally, or metaphorically – and they go through specific rites or rituals of passage (e Cunha *et al.*, 2010; Croft *et al.*, 2014; Hawkins and Edwards, 2015). Similar thresholds, traps and rites for novices are found in supervision stories (especially for graduation theses or doctoral ones) (Carter, 2016), and they can be extended to the situation of the newly appointed (either through elections or through hiring competitions) deans or rectors of higher education institutions. Such threshold experiences are troublesome and transformative, and may become overwhelming for the learner, especially in nowadays educational challenges, when people speak about "a crisis of inherited institutions and philosophies, which were meant for a different kind of reality" (Stein, 2017). Benefiting from the sharing of tacit knowledge from the previous managerial teams could relief this burden and reduce the transitional state – the tacit knowledge needed has to be defined, identified, collected and codified, and then transferred and used – dealing with barriers for transmission, as well as barriers for acquisition (Szulanski, 1996; Sternberg *et al.*, 1999; Matoskova *et al.*, 2013; Benyahya, 2017)

5. CONCLUSIONS: REFLECTIONS AND FUTURE DIRECTIONS FOR THE HIGHER EDUCATION CASE

Three important lessons from the previous literature can be adapted for the case of higher education institutions: the paradox of professional amateurs from the army (Mccallum, 2008), professional hybrids in medical institutions (Croft *et al.*, 2014) and the trickster archetype from folklore and religion (Edwards *et al.*, 2021). Universities frequently assume, explicitly or tacitly, that being teaching institutions they are also learning ones, entirely, and that academics should be able to learn how to be good managers in the same way they learned how to become teachers. However things are not as easy as they might seem, because becoming managers, academics get away for their basic profession, and enter liminal spaces in which they can lose identity and become inefficient professional hybrids, amateurs for the "profession of managing".

The first lesson is that of army officers delegated for assignments in which they had no previous training, neither technical, nor regulatory (McCallum, 2008). The term used by McCallum to describe their situation is "Army of professional amateurs". Speaking from his own experience and that of close colleagues, he states: *"For branch-specific jobs, the Army provided me excellent training, but every time I had to perform a staff job— which became more frequent as I was promoted to higher ranks—I became an amateur again, having to learn new*

policies, regulations, office networks/relationships, and the large-scale frameworks supporting Army programs." The situation is surprisingly appropriate for describing what happens in higher education institutions when well-prepared academics are nominated on managerial positions. The new managers were not prepared for the new job, and they rarely have a tacit knowledge sharing opportunity from previous ones. To prepare them in advance or immediately after being appointed, schoolhouses, rotations, simulations, eLearning net-based oral histories, mentor-protégé interviews and discussions would help. As McCallum notices for the army," the lack of core leadership training in knowledge management principles and technologies hinders the transition to a knowledge-based organization" – and this is entirely true for many higher education institutions, as well.

The second lesson comes from the medical sector, where nurses or physicians get promoted to managerial positions and discover that they lose identity and become so called "professional hybrids" (Croft *et al.*, 2014). Professional hybrids are people situated between managerial and professional groups who usually undergo an identity transition process in order to overcome the conflicts associated with dealing with two distinct organizational realms, their own profession and the manager profession. Identity conflicts appear and there are no recipes for positively solving them. From their study on nurses, Croft et all discovered that in order to have influence across multiple groups (professional and managerial) people need to construct a positive liminal space, otherwise the identity transition is stopped and the effectiveness as hybrids is undermined. In contrast, we demonstrate how nurse hybrids occupy a perverse liminal space, perpetuating identity conflict, preventing identity transition, and undermining their effectiveness as hybrids. However, sometimes a professional resistance to what Croft et all labelled as "managerialism" appears, hybrids are not able anymore to navigate between the leadership position and the values specific to their previous professional identity, and they fail to accomplish their mission.

The third lesson is that of the trickster archetype (Edwards *et al.*, 2021) Edwards et all use this concept in order to problematize the role of the educator/facilitator identity in leadership learning. A trickster is a permanent resident in liminal spaces and a mixture of good and bad, of wisdom and manipulation, of specialist and jolly joker, with various valences in different cultures. According to Edwards, the trickster archetype can be used to think more critically, reflectively and reflexively about the role and practices of educators, and the same is true for the case in which educators become managers.

Our exploratory approach ends with some more reflections for the future. Tacit knowledge sharing has to be rediscovered in higher education institutions, not only for basic teaching activities, but for managerial processes, as well. The identified influence factors need to be analyzed, so that positive ones are nurtured

and barriers for the sharing are removed. The list of identified methods can be also put into practice in universities, for managerial transfers.

If we want higher education institutions to be leaders of change in society, we should reconsider the tacit knowledge sharing processes for their internal leaders – the people who take managerial positions. The liminality of managerial positions in higher education should be seriously investigated and results openly shared. A careful distinction is needed between what managers need to learn in the process of tacit knowledge sharing and what they need to unlearn. Local, culturally influenced perceptions of the trickster archetype need to be harnessed and used in the process of power transition. Finally, more attention should be paid to the process of professional hybridization, so that good professionals in their basic field of activity could overcome identity conflicts and transform into good managers.

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