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DIGITAL SUSTAINABLE DEVELOPMENT AS AN EMERGING CONCEPT

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ABSTRACT

Climate change and environmental degradation are an existential threat to Europe and the world. To overcome these challenges, the European Green Deal intends to transform the EU into a modern, resource-efficient and competitive economy. Today, we are facing two megatrends: Digitalization and Sustainability. During pandemic period of COVID-19, digitalization serves as an accelerator to overcome consequences of the crisis for all economic actors. The debates around the two concepts: digitalization and sustainability create new approaches that take into consideration both concepts from different angles. This paper is a review of a state-of-the art in the field of digitalization and sustainability with the purpose of establishing the main trends in terms of new concepts that include both of them, and trying to define the borders between the new concepts emerged.

Keywords: sustainability, digitalization, sustainable development, digital sustainability, sustainable digitalization.

JEL classification: M00, Q59, D89.

1. Introduction

Recently, the global scenario has radically been transformed due to the ongoing pandemic of coronavirus disease and the economic fallout generated by the lockdown in different countries. It seems that the embracing of digitalization and the transformation of business organizations integrating digital technologies, have become paramount for the survival of companies. Moreover, there is a positive trend to become environmental responsible concerning the climate change, environment protection, greening and cleaning the production. In this context, digitalization is considered an efficient tool to support sustainable environmental, social, and economic development. In the same time, the digitalisation process needs to be sustainable. Only achieving this characteristic, digitalisation contribution to the organisation development increase.

In the last years, there was an increased interest for topics in the area of digitalization as digital economy, digital technologies, digital society, digital innovations, on the one hand, and on the other, many concerns about sustainability, sustainable development, sustainable future, climate change and environment protection and preservation. Even

if apparently these two topics seems to be divergent, today, they are discuss together, as converging to a common objective as for example Sustainable Development Goals [5]. Even more, they are merging in different new topics of interest for international organizations, institutions, large but also medium or small size companies and academia, as digital sustainability [7], sustainable digitalization [19], digital technology sustainable development [12], digital technologies for a sustainable development and other variations of these two concepts.

To investigate the scientific debates located in the both concepts' convergence area, we have performed an exploratory research based on a mix approach that allow us to explore this new subject, which has not been studied in depth yet. Few studies address the issue of the integration of sustainability and digitalisation [7]. Thus, the paper contributes to the development of knowledge by revealing the academic research trends in the disruptive area of digitalisation and sustainability, highlighting the main themes, and bibliometric details of the papers analysed. Moreover, the paper launches some questions that might be considered as a call for further research in this new area.

The paper continues with methodological aspects of the conducted research, and then quantitative and qualitative results are presented, followed by discussions and conclusions.

2. Methodology

Aiming to investigate an emerging topic which is not clearly defined we choose to perform exploratory research. This type of research sustains a better understanding of the existing debates around the topic and create a favourable context to identify issues, that can be the focus for future research. Thus, a literature review was performed with the purpose to provide a broad approach to the topic area, to identify the trends and growth of research.

The papers were selected from database Clarivate Analytics Web of Science Core Collection, the widely recognized and used database in social and technical sciences that includes highly reputable journals (Bartolacci et al, 2019). The sample construction followed the PRISMA [22] procedure described below, a methodological approach adopted in many studies [25, 10].

The search was targeted to title of the papers, and to capture all the possible relevant articles were used in parallel three search strings of keywords, replacing "z" or "s" with "?" to

collect British and American literature in the area of digitalisation and to collect all articles related to sustainable, sustainability and other forms it was used "sustainab*". As filters included only articles in English, no other filters as period, or document type were applied, because being an emerging topic the debates are actual and some of them represent work in progress published in conference proceedings.

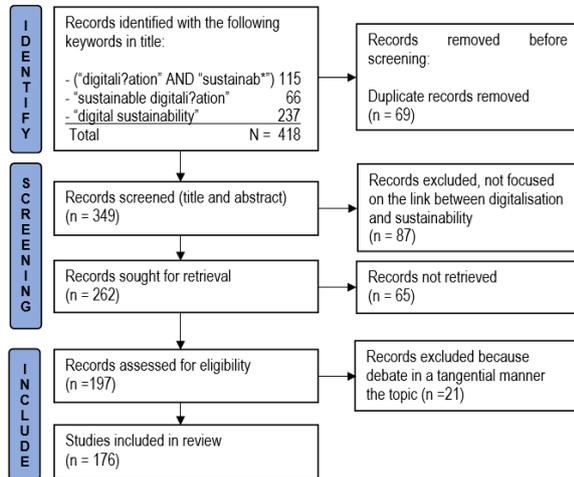


Figure 1. Steps performed to collect the sample of articles for the literature review

Over the recent past, some scholars started to perform bibliometric analyses on sustainable development [23] or digitalization [6] as individual topics, not as our study intends to capture the relation between them. Using bibliometric tools, we performed a quantitative analyse in term of research area, year of publication, document type and publications, authors, country and keywords, followed by a

qualitative analyse in term of topic's evolution and science mapping allow us to develop a comprehensive picture of knowledge and ascertain future potentialities in this promising scientific area. We chose Bibliometrix package, because provides a set of easy-to-use tools for quantitative research, that work with data extracted directly from the Clarivate Analytics Web of Science [2]. Some of the arguments for selecting bibliometric analysis are the follows: avoids subjectivity being transparent and reproducible and providing reliable results [2]. Moreover, it provides the potential to organize a scientific subject by merging performance inquiry and science mapping in a simple method [24]. Bibliometrix tool performs a bibliometric analysis, builds data matrices for co-citation, coupling, scientific collaboration analysis, and co-word analysis.

3. Results

The most prolific area of research in term of published articles based on the sample analyse are Environmental science ecology with 76 records (43,18%) Science technology with 62 records (35,23%) and Business Economics with 35 records (19,89%). The interest of researchers on topics that combine digitalisation with sustainability rise only recently and increase vertiginous. The topic started slowly with one/year article in the period 2007-2014. Starting with 2015 the interest increased each year. If in 2017 there were four publications, and in 2018, the number is almost doubled (7), the next period is incomparable with 32 records in 2019, 57 records in 2020 and 71 records in 2021, representing 40,34% of the total articles in the sample.

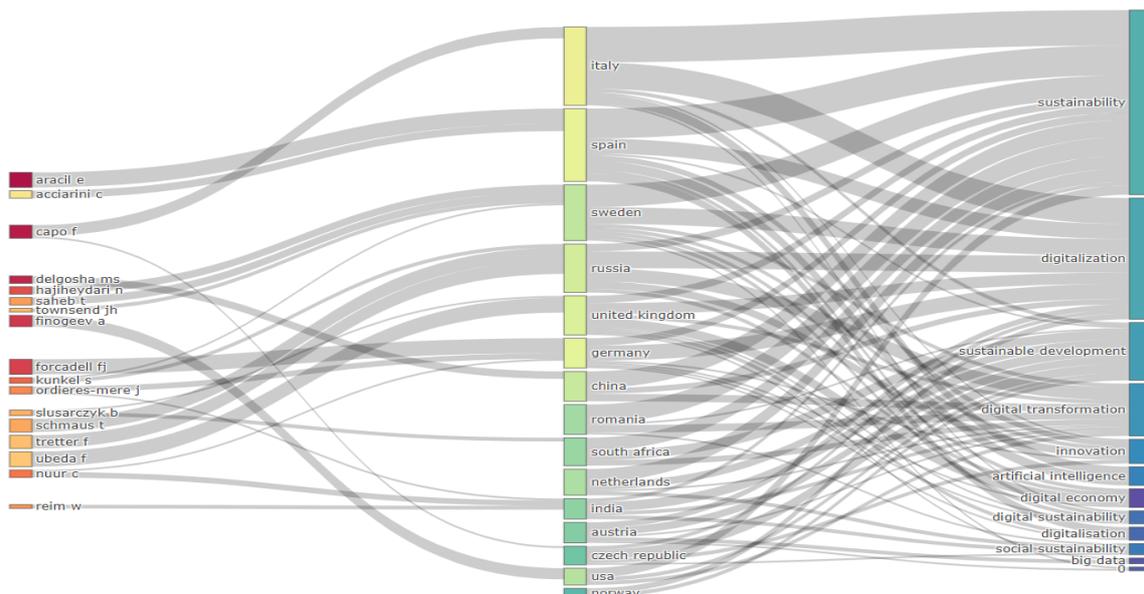


Figure 2. Evolution of the number of articles

In term of document types, the sample include 123 articles, 29 proceedings papers, 14 editorial materials and 10 book chapters. The journals open to these debates based on our sample analyse are: Sustainability (42), Journal of Cleaner

Production (7), Digital Policy Regulation and Governance (4), Gaia Ecological perspectives for science and society (4) Sustainability science (4), Business strategy and the environmental (3) Information systems frontiers (3).To

analyse the connections between the most important scientific fields, we visualize them using Three Field Plots. These allowed us to analyse the main items from the selected fields (authors, countries, papers' keywords) and to interpret how they are related, based on a Sankey diagram. It represents the relevant elements with different coloured rectangles that are proportionate to the value of the relationships that exist between them [18]. The most prolific authors are from European countries, on topics mainly focused on sustainability, digitalisation, sustainable development, digital transformation and other related topics as the following graph reveals.

In term of author's cooperation, as the map shows, there is a worldwide interest to develop research in the emerged area of digitalisation and sustainability, which confirm the topic relevance and actuality.



Figure 3. Author's cooperation

To visualize the research hotspots in digitalization and sustainability literature, we employed a co-occurrence network analysis of authors' keywords. This method was useful to identify the relationships between concepts in a research field, thus observing how the science developed towards specific themes [18].



Figure 4. Keyword co-occurrence network

The circle size of the circles in Figure 4 indicates their relative relevance and corresponds to the number of occurrences of the keywords determined using the degree of centrality metric; hence, larger labels indicate linkages to more publications. The keyword co-occurrence network highlights the close interrelationships among the topics covered in this review, emphasizing how the perspectives of 'sustainability' and 'digitalization' were approached in the research and highlights their interaction and various facets [21]. Furthermore, it borders the new concept of "digital sustainable development", as the opportunities that digitalization can provide towards building the sustainable society of the future, to achieve sustainable development goals.

The main two clusters representing the main stream of research "sustainability" and "digitalization" include both terms borrowed from the other one. The term "sustainable development" mentioned for the first time in 1987 (Brundtland Report, 1987) gained in time crucial relevance among worldwide nations, together with its two derived concepts: "sustainability" and "sustainable development goals". Sustainability assimilate to the organization's governance objectives environmental, social and economic aspects and sustainable development goals represents main areas of concerns concerning a sustainable development of the society, problems affecting and will affect our planet in the years to come. The SDGs target a development that faces the needs of the present generations and ensures future generations face their own needs. For example, the sustainability cluster include topics related to digitalization, ICT, digital transformation, digital economy, digital technology and digital transformation.

In addition, digitalization cluster includes articles that debate the relation between digitalization, industry 4.0 and specific technologies as artificial intelligence and big data and sustainable development, circular economy. The digitalization concept includes all emerging technologies as blockchain, big data analytics, artificial intelligence, Internet of Things (IoT), and other developments [27] and favours the creation of new open business models [7]. Furthermore, technologies and digital processes are functional catalysts to the achievement of the sustainable development goals [26] and sustainability in general [8, 13].

Analysing the evolution of debates in the figure below indicates whether in the early stage of the debates the focus was on sustainability or on digital sustainability, as representing the use of technologies in regular business applications to enhance the environment [26]. Starting with 2018 new developments of both concepts conducts to new areas of research as social sustainability, environmental issues as climate change, different digital technologies and at the convergence of all of these is innovation. In the last period in the top of the interest is digital transformation. A specific area refers to the agriculture being the most affect sector by the environmental changes that occurred in the last years [16]. In addition, how digitalization can pave the way towards sustainable development [21] and the sustainable development topic becomes one of the most studied.

To discover other facets of digitalization - sustainability research tandem, was employed a Multiple Correspondence Analysis (MCA) of the keywords included in our dataset. The conceptual structure of the keywords associated with the resilience articles included in this study are show in Figure 6. It compresses large amounts of data with many variables into a low-dimensional space to create a simple two-dimensional graph that employs plane distance to show keyword similarity. Keywords that approach the Center point have gotten a lot of attention in recent years [29]. The findings are evaluated using the relative locations of the points and their distribution along the dimensions; the closer words are depicted in the map, the more similar their distribution is [2].

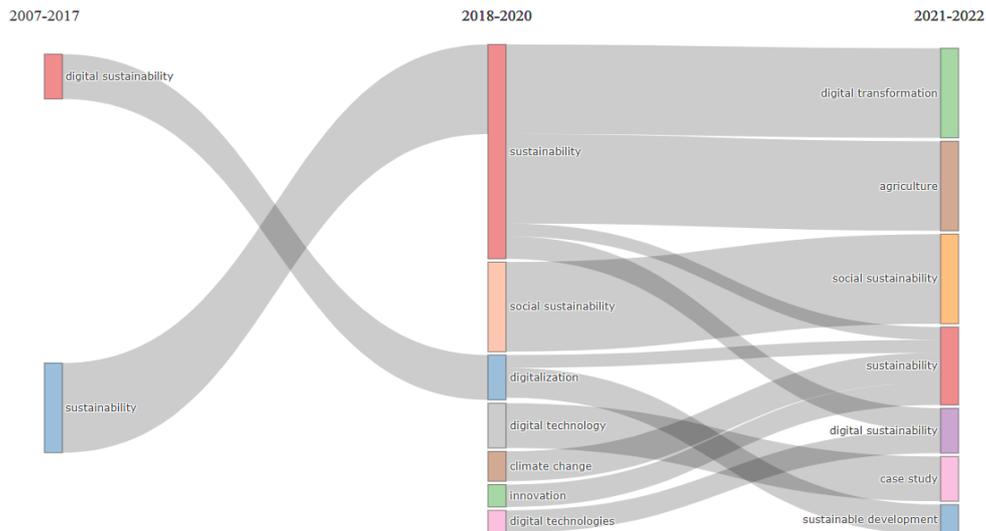


Figure 5. Evolution of topics

The map reveals three clusters coloured differently. The red one is the more comprehensive and refer to research concerning digitalization corporate sector. To achieve digital sustainability, organizations innovate, and one possibility refers to include digitalization in their business model. Bohnsack et al. (2021) and Hellemans et al. (2021) analyse the intended and unintended consequences of digital technologies for sustainable development at the different levels at which they arise, and show their relation in an organizing framework. Businesses that choose digital sustainability as a goal can employ digital processes, tools, and forecasting models to weigh possible advantages against the environmental effect of their achievement.

These same firms may then endeavour to reduce any possible environmental effect of their operations while still providing valued goods and services to consumers.

However, the evolution of the digital transformation presents new challenges and many new opportunities, and provides unique solutions for sectors and regions, thus Esses et al. (2021) analyse the relationship between digitalization transformation and sustainability together at state level taking the example of Visegrad Cooperation. Ghobakhloo et al. (2021) have highlighted that in many cases the technology acts as a catalyst, for least developed countries, to accelerate the process of economic modernization.

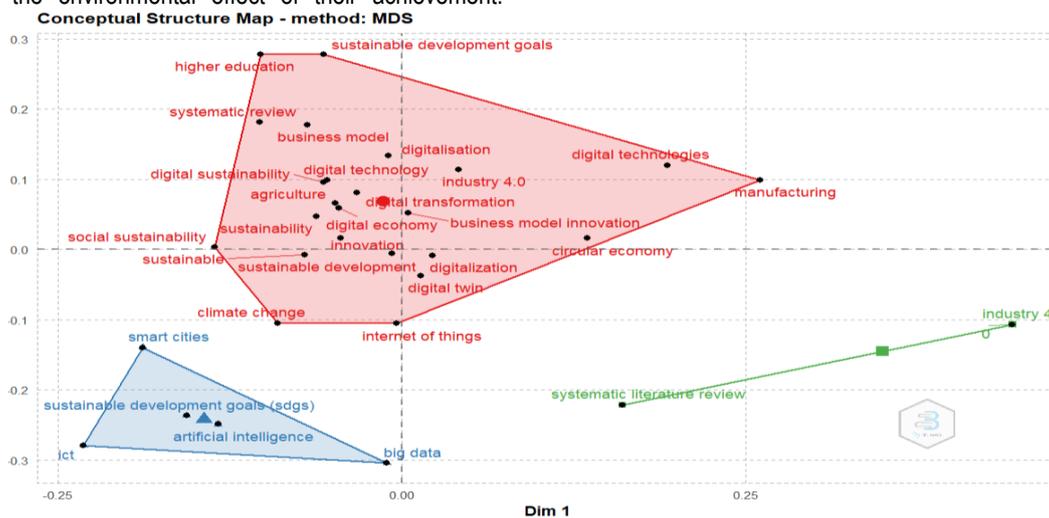


Figure 6. Factorial analysis of conceptual structure map-method

Higher education institutions (HEI) play a pivotal role in producing knowledge and preparing the labour force in line with the market requirements and newest trends as digitalization and sustainability. Moreover, due to their role in the society, HEI represent an example of good practices for others. There are evidences, highlighting the fact that HEI's digitalization results in its long-term growth and efficient use of energy [28]. Moreover, educational practices

are embracing and promoting the new digital technologies and sustainable development ideas [17].

The second cluster, coloured in blue, refers to cities, that by taking into consideration the opportunities offered by digitalization and aligning their strategy to the sustainable development goals may offer a sustainable development of the community in a smarter manner [14]. ICTs related to smart and sustainable city initiatives and sustainable

assessment [20]. The use of citizen science and big data creates a double-edged sword for sustainable urban development [4]. While these technologies encourage public involvement and save taxes, they also create privacy issues, as personal information is stored in the cloud (Cappa et al., 2021).

4. Conclusions

We can conclude that in recent years, sustainability and digitalization have become crucial aspects of the global economy. Numerous studies focus on the link between environmental, social, and economic aspects of sustainability and digitalization.

Our paper contributes to the development of knowledge in the following ways. First, introduce in the debate a new concept, not defined yet, "digital sustainable development" as the way that digitalization can be used towards achieving the organization sustainable development goals. Second, the study addresses the integration of sustainability and digitalisation. an insufficient explored area, full of potential. Third, as methodology was used a new open-source tool for quantitative research that includes all the main bibliometric methods of analysis.

On a corporate level, it is crucial to keep track of not just the immediate effects of digital transformation on a focus firm's production and coordination processes, but also the ramifications for users, suppliers, rivals, workers, and society. While it is critical to investigate how digital technologies might improve the sustainability of wealth generation and capture, a thorough examination should also uncover possible trade-offs such as rebound effects in energy usage or privacy problems associated with artificial intelligence.

At the same time, all the organisations may be aware about the impact of digitalisation and the general demand of the society for a sustainable development and act consequently in a smart, innovative manner by transforming their activities to contribute to the organisation's digital sustainable development.

To outline possible avenues for future research on the intersection of digitalization and sustainability, on digital sustainable development, we consider the analyses bidirectional relation between digital technologies and sustainability at individual level, organizations, sector, country, region and whole society, taking into consideration both positive and negative aspects in a balanced manner. Furthermore, post implementations good practices and case studies from different organizations, sectors and countries may contribute to a better understanding of the phenomenon and encourage others to embark itself into the journey toward a digital sustainable development, beneficial for their organization, their community and to the whole society. In this way, all we can contribute for a better sustainable future for all of us.

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LABOUR MARKET EVOLUTION IN ROMANIA: ASPECTS AND EFFECTS

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ABSTRACT

The authors have been studying labour market issues for more than three decades, with the highly complex aspects involved. The approach of this paper is a synthetic and dynamic one regarding the evolution of the issues and how to solve them during the period subject to our analysis (1990-2020).

In our approach, the labour market issues are regarded from two perspectives, which we consider essential:

1. demand, created with the process of capital privatisation and the setting up of private companies, as well as those with mixed (state and private) capital;
2. labour supply, structured, adapted or acting in anticipation to meet the level, quality and evolution of demand. The effects can be seen in the quality of the personal and professional life of the suppliers of labour, but also in the efficiency and quality of the companies' activity.

Our analyses are based on statistical data, sociological surveys and case studies, and the conclusions relate to the quantitative and - above all - the qualitative aspects of the use of the labour force, as well as the evolution of labour relationships in the companies studied: technical and structural unemployment, knowledge management and creativity, the creation and development of an organizational culture based on trust, as well as the existing contradictions in the organizational framework.

Keywords: competence and creativity, emotional intelligence, high trust organization, knowledge management, unemployment and brain-drain.

JEL classification: O, O15.

1. Introduction and literature review

The labour market, i.e., the area in which the buying and selling of the labour force takes place, involves particularly complex issues at macro- and micro-economic level.

After a long period of study (more than three decades) on human resources, the main activity agent in all fields, the only creative and creating resource capable of harnessing all the other resources (material, financial, technical, informational, etc.), we propose a synthetic and dynamic approach to the evolution of certain issues and how to solve them. We have tracked the evolution of the issues and the movement of the labour force (1990-2020) in three stages:

1. the 1990-2000 period, immediately after the social, political, administrative and economic transformations that began in 1989;
2. the 2001-2010 period, during which a stabilisation of democracy and a normal evolution in the entire social life was expected;
3. the 2011-2020 period, until the sad and serious events (social conflicts caused by economic and political issues, as well as the pandemic during 2019-2020) that affected the physical and social health of all countries in the world, with the solutions to be expected.

In our approach, the labour market issues are seen from two perspectives, which we consider essential: skills and behaviours of the labour force owners, the main resource of human society (on the one hand) and the characteristics, attitudes and actions of employers, the representatives of the capital (actual or only potential) using this resource (on the other hand). The effects consist of the quality of life of the suppliers of labour (both personally and professionally), as well as the efficiency and quality of the companies' business, with benefits for employers, managers and employees, as well as for the economy and culture of society. Among these phenomena and processes, there is the stimulating effect: that of the demand for professionally trained, active and creative labour force, but also that of the supply at a high technical level and under modern and civilised conditions for the use of the valuable resource.

"Competencies represent the language of performance" (Armstrong, 2006, p. 159). The path to competence involves a broad and complex process of initial training in schools and continuous improvement within the organization (Câmpeanu-Sonea & Sonea, 2011, p. 18-20). It is this difficult and lengthy process that ensures performance in organizations, embodied in effectiveness and efficiency (Abrudan, 2012, p. 104-108). People represent the most valuable form of capital a company has - intellectual capital, i.e., "knowledge that can be converted into value" (Sveiby, 2001, apud Brătianu et al, 2011, p. 202). Research on the concept of knowledge starts from data, moves on to the concept of information, then to understanding, insight, learning and wisdom (Russell, 2012, p. 11).

But businesses face two issues: identifying the best ways to create knowledge and actually using it (Hawryszkiewicz, 2010, p. 74). People need to understand the importance of competence to the organization and, first and foremost, to believe in their own competence (Shockley-Zalabak et al, 2010, p. 47-76).

On the other hand, organizational competence is the result of an ongoing process of communication and learning (Shockley-Zalabak, 2015), of an effective collaborative relationship between its members, of trust between collaborators, providing quality services and encouraging customer trust and loyalty. People will not be willing to share knowledge with those whom they do not trust (see: Armstrong, 2006 and Dygert & Jacobs, 2006). An open culture can encourage people to share their ideas and knowledge.

2. Aspects and effects in the stages of labour market evolution

In our research over several decades, we have focused on certain quantitative aspects of the evolution of Romania's human resource: unemployment and the exodus of the intellectual elite (highly educated people), but also of the less trained labour force (skilled or even unskilled workers for construction sites and agriculture). All these are closely linked to qualitative issues: the primary and secondary labour markets, respectively.

The primary market comprises the labour force demand of companies with high technical and technological resources, a good financial situation and expectations for high quality labour force. As a rule, these companies provide good working conditions, the relationships with and between employees are conducive to increasing efficiency, motivating people materially and morally, and stimulating creativity and professional development. The supply of labour force on the primary market comprises people with training corresponding to the highest level of technology available at the time, with the physical and mental qualities needed to adapt to sustained, sometimes even stressful activities, with openness to continuous improvement and creativity. People with insufficient training, skilled in fields or occupations unsuited to a modern economy, or people who lack the ability to orient and adapt themselves will only be able to meet the demand of the secondary labour market, i.e., firms that offer few benefits and prospects.

2.1. 1990-2000: Private capital and labour market creation

The demand on the labour market in Romania was created during the process of capital privatisation and the setting up of private companies, of those with mixed capital (state and private) and of subsidiaries of foreign companies (Western European, American etc.). Labour market relations are becoming increasingly complex as exclusively state-owned enterprises continue to operate in areas of great importance to the economic and social life. Labour force supply structures itself, adapts and in some cases acts in anticipation to meet the level, quality and evolution of demand.

For the 1990-2000 period, we have carried out a labour market study, as part of a CNCSU Project, based on a sociological survey and a large number of case studies. We have drawn conclusions about the evolution of unemployment and its causes, as well as about possible ways to improve the situation.

Human labour capacity cannot be stored, so not using it means a definitive loss for society, as well as an incomplete use of other resources (material, technical, informational). Not using labour resources is a loss in two senses: for the individual and for the society. From the point of view of a person, the lack of a job appropriate to the training acquired means: the impossibility of using and recovering the costs of qualification, the loss of skills and competences instead of their consolidation and improvement on the job, as well as the psychological degradation due to failure. For society, the cost of training a person "pays for itself" in 4-5 years, and for the rest of his/her working life (about 30-35 years), this person creates net income.

In Romania, in 1996, the general level of education of the employed population was: the percentage of people with higher education - 8.1% (national average); for people aged 25-34 - 9.4%; and for people aged 35-49 - 11.7%. In the same age groups, the most important for social activity, the level of high school education was 51.9%; and 26.8% (compared to the national average - 29.0%), and the level of vocational education - 26.0%; and 27.6% (national average - 21.0%) (C.N.S., 1998, p. 128).

Table 1. Registered unemployed¹ and unemployment rate in Romania

	Total the unemployed					
	1991	1992	1993	1994	1995	1996
The unemployed	337440	929019	1164705	1223925	998432	6575664
Unemployment rate (%)	3.0	8.2	10.4	10.9	9.5	6.6

¹ Offices of the labour force and unemployment
Source: Ministerul Muncii și Protecției Sociale.

The general level of education, as well as the professional training acquired in Romanian schools, was also appreciated by foreign investors, who used these labour resources, as well as by people from abroad involved in granting scholarships, developing collaborations, exchange of experience, etc.

The creation and development of the market economy in Romania, based on the privatisation of capital, has also

made it possible to track by specific methods the amount of unused human resources in society - unemployment, which has increased since 1990, as shown in Table 1.

According to the data in Table 1, it would seem that there is an improving trend in the use of available labour resources until 1996, but in the following period the percentage of the unemployed in the total working population increases again:

the unemployment rate reaches 8.1% in 1997 and 11.1% in 1999 (C.N.S., Monthly Statistical Bulletin No. 1, 1999).

For the period 1990-2000, as well as for stage II (2001-2010), we have observed the phenomenon known as “brain-drain” (intelligence exodus or loss of labour force), which affects the economic, social and cultural situation of

Romania severely. Not only can Romania not recoup the cost of training its labour force, but it provides net income and creativity to foreign companies. The fact that the labour force trained in our country is valued abroad is demonstrated by the large number of emigrants, only a small proportion of whom have repatriated (see Table 2).

Table 2. Number of emigrants from Romania and returnees

	Year					
	1991	1992	1993	1994	1995	1996
Emigrants	44160	31152	18446	17146	25675	21526
Returnees	3443	3077	3257	3304	5507	6265

Source: C.N.S., Anuarul Statistic al României, 1999, p. 117-118.

Labour market issues and the loss of labour force due to the non-utilisation of existing resources, as well as the exit - temporarily or permanently - of a large number of people from the country, have affected the situation of domestic and mixed capital companies, and foreign investment has not been able to neutralise the imbalances.

2.2. 2001-2011: Qualitative aspects of human resources

An analysis based on statistical data as well as case studies has revealed, especially in the second stage, a very serious issue - furlough and structural unemployment.

Our research on people who cannot find a job after graduation or who have jobs that are useless in the light of technical and technological progress has revealed that graduates with higher education are willing to attend two or more universities, to pursue master's and doctoral studies, while tradesmen with secondary or vocational education do not want to take further training, retraining or specialisation courses to become suitable for a job in a modern or modernised enterprise (Câmpeanu-Sonea, 2000, p. 178-186). On the other hand, the school and vocational guidance system, the education system, as well as the legislation in Romania did not provide conditions for the proper orientation of young people on the labour market, for the capitalisation and development of their physical and intellectual qualities from which our economy could have benefitted (Câmpeanu-Sonea, 2000, p. 187-206). The research of the 1990-2000 period have led us to the conclusion that profitable development and increased employment in Romania can be achieved through the development of the service sector (Câmpeanu-Sonea, 2000, p. 86-87), which actually had a positive evolution in the years 2001-2019.

Individual skills, creativity and capacity for innovation

As part of a CNCSIS (National Council for Research in Higher Education) research project, we have carried out a study on the prospects that highly educated and trained young people offer for solving issues in the Romanian economy. Highly educated young people provide forward-looking individual skills to a company. Creativity and the ability to innovate is a potential that young people offer to a greater extent than older people, even if the latter have more experience.

Moreover, an interesting issue is the correlation between the initial training of young people, i.e., that provided by schools, up to the level of acquiring a qualification, and the continuous training, which companies offer for further improvement, specialisation and multi-skilling required by specific activities in different fields.

On the other hand, we have found it useful to investigate the labour market opportunities available to young people with a high level of initial training, how they adapt to the employers' requirements and how further training and creativity are stimulated.

Following a sociological survey involving 518 students from a large university in Cluj, we have created a picture in this respect. Thus, the overwhelming majority of the students already interviewed had a job before graduation (in economics, technology, law, natural sciences, social and political sciences, etc.) and did not face discriminatory attitudes from employers. However, although some of them have already attended several schools successively or in parallel, it is difficult for them to find a job that matches their qualifications (in terms of level and specialisation). That is why many students accept a job in a different field or one that requires a different level of qualification than the one achieved after completing their studies.

There are also entrepreneurial minds, who start their own business, although prevalingly of modest size or at an early stage of development. Young people, especially those who pursue several degree programmes, postgraduate and master's studies, are willing to improve their professional training, to further their education, to pursue a specialisation or even requalification. The main challenge faced by young people on the labour market is particularly the lack of experience, as well as the gaps in practical and applicative training during their studies. Young people who know and use one or more foreign languages easily stand the best chances of finding a good job, under advantageous conditions, with prospects for promotion and career development.

There is a serious concern for innovation. The young people with sound professional training have a keen interest in innovation, while the employers who are looking to secure the sustainability and welfare of their business, encourage creativity and the implementation of new ideas. We could see a very clear link between the employers' motivational

system and the employees' openness to professional development and creativity.

On the basis of the answers to the questionnaire, we drew up a "sketch" of the employee in our studied group. This person can be described as follows:

- female, up to 25 years of age; university degree in economics; grade point average between 8 and 9;
- with full-time employment, in the central and northern area of Transylvania; with a normal level of competence, i.e., a qualification appropriate to the requirements of the technical equipment of the workplace and to the tasks required by the employer;
- a person who wants to further his/her professional training and is encouraged to do so by the employer;
- a creative person who is intrinsically motivated to innovate and who has also made some attempts in this field;
- this person is concerned with professional career development, knows and meets the criteria of promotion to a higher hierarchical level and is stimulated by the motivation system designed by the employer, which in its turn makes advancement on the corporate ladder conditional on the competence, professional performance and creativity of the employees (Câmpeanu-Sonea et al., 2014).

As concerns the quality of students' training, especially in terms of practical work skills and application of the acquired theoretical knowledge, but also for stimulating entrepreneurship, creativity and openness to innovation, we have conducted an analysis, based on another sociological survey, by using a questionnaire designed by the authors of the current study, applied to a number of 626 students (497 - full-time education and 129 - distance education). The conclusions, based on the respondents' opinions, provide an optimistic view of the preparedness for a modern labour market. Students with long-term work experience rate the

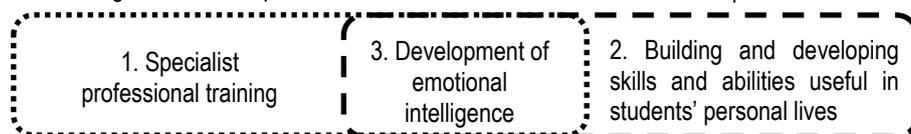


Figure 1. The relationship between students' specialist professional training and general education

Source: Sonea et al., 2015

Even if so far educational institutions have not shown a sustained concern or implemented programmes for the development of emotional intelligence in children and young people, we consider that many of the shortcomings of family or pre-university education are compensated by the knowledge and skills that students can acquire during the studies conducted at the university subject to our survey.

The development of emotional intelligence consists of: orientation on the labour market (finding a lucrative job, integration within the organization, career development), development of skills and abilities related to organization,

training and guidance of teachers at the analysed university as effective and adequate.

The content of the study materials, the behaviour of the teachers and the methods used were appreciated, at different but satisfactory levels, with reference to: the promotion of critical thinking, the development of individual thinking, the usefulness of the knowledge provided for professional training, business development and personal life (Câmpeanu-Sonea et al., 2013a).

Multiculturality and competitiveness on the labour market

Concerning the advantages of a multicultural approach in university training, we have analysed a sample of 496 students, of which 390 on the Romanian line of study, 43 on the English line, 38 on the Hungarian line and 25 on the German line.

The most important differences across the four lines of study are related to the manner in which the instructional activity and the teacher-student communication process unfold. Overall, the teachers' attitude in awarding grades in a fair manner is positively rated, similarly to the balanced relationship between course and seminar work, which reflect professionalism, pedagogical talent and competence on the part of the teachers. In our opinion, the results of the survey also captured some influences of national and organizational cultures, in the behaviour and thought system of the teachers of the 4 lines of study, as well as in the demands of employers represented by the Romanian or foreign companies where students are employed (Câmpeanu-Sonea et al., 2013b).

Professional specialisation and emotional intelligence

The university professional specialisation also involves an implicit educational process, contributing to the development of young people's emotional intelligence, and multiculturalism bears beneficial effects on students' specialised training while building specific skills and abilities, which are useful in their personal life as well.

leadership, decision-making, risk-taking, conflict control, communication, negotiation, etc.

But, as shown in Figure 1, specialised professional training correlates with the educational process in pre-university school, with the behavioural skills and the knowledge acquired in the family, in society, in peer groups and, last but not least, with skills and abilities created thanks to the models of behaviour and attitude represented by teachers and educators in schools (Sonea et al., 2015).

2.3. 2011-2020: Quality of human resources and social conflicts

The studies carried out by us in Romanian companies, in the 2005-2010 period, but also after 2011, have shown a correlation between the evolution of privately-owned companies (with foreign and mixed capital) and the development of the primary labour market and a certain trend of stabilisation of the “brain-drain” phenomenon.

The analysis of the process of creation and development of organizational culture in Romanian companies, as well as of what the literature calls “high trust organization”, based on sociological surveys, has created an optimistic view of the employer-employee relationship and the situation of the Romanian labour force.

Knowledge management and organizational culture

We have analysed some cases designed with the input of master students, who are employed in various companies during their university studies. We analysed 36 cases, including 9 multinational companies based in other countries, and with subsidiaries in Romania. The starting point was a guide of questions for all those involved, enabling us to draw some general conclusions. More specifically, in order to deepen and improve the training of students, we have tried to establish: methods of identifying the knowledge necessary to achieve the objectives of the activity and methods of disseminating this knowledge in companies for the most effective achievements.

On the one hand, the knowledge required is linked to the achievement of the company’s objectives, and on the other hand, the identification of this knowledge results from the practical approach on two levels: (1) analysing the roles, competencies and skills of the company’s employees, and (2) “learning from the customer” to meet the customer’s demands.

As it is normal, companies can only spend resources of time and money on learning with the aim of improving the business and the quality of service provided to the customer, in order to increase business effectiveness and profitability.

A general issue that arises in all cases is that of communication within the company. Communication is at the heart of the entire knowledge management process, involving the use of specific procedures and tools, as well as an appropriate technique (Shockley-Zalabak, 2015).

Most of the companies we have studied give due importance to the process of continuous training in organizations and understand the role of improving professional competence through knowledge management. There are differences in the ways of integrating and disseminating in organizations the knowledge needed for good provider-customer relations and of capitalising on human resources.

Importance is given to the competence of human resources and the stimulation of creativity for the quality of the performance offered, and the ways of identifying the necessary knowledge are established and improved by each company, according to the specifics of the activity, the resources used and the experience of the decision-makers. In all cases, there is a concern to design and redesign jobs

and roles in the organization according to the objectives pursued and the customer’s requirements.

Most companies understand the need to treat people in the organization as internal customers, for whom appropriate working conditions are created (including specific training opportunities) and who are fairly remunerated according to their responsibilities and achievements. Integration in the organization is based on the initial training and accommodation needs, the professional training at the beginning of the job, followed by the continuous training (and specialisation). Specific methods of communication with customers are used to design, refine and renew products.

Our belief is that collaboration is what best stimulates the development of competence through the transfer of knowledge within the organization. But there are also cases of stimulating competition, by using developed methods, for the improvement of the skills and abilities in the performance of the services for the customer (Câmpeanu-Sonea & Sonea, 2016a, p. 84-92).

High trust organization

The study of organizational trust highlights aspects of primary labour market demand and explains the evolution and structuring of supply as immediate and prospective effects. A model adopted from the devoted literature (Shockley-Zalabak, et al, 2010) and adapted by us (Sonea et al., 2016), applied to a sample of 751 people, has allowed us to reach some conclusions in this respect. 93.0% of the subjects surveyed work in Romanian companies (of which 85.6% in Transylvanian counties) and 5.6% abroad. All the companies researched are privately owned, of which: 44.6% - Romanian capital and 51.4% - foreign and mixed capital (Sonea & Câmpeanu-Sonea, 2016).

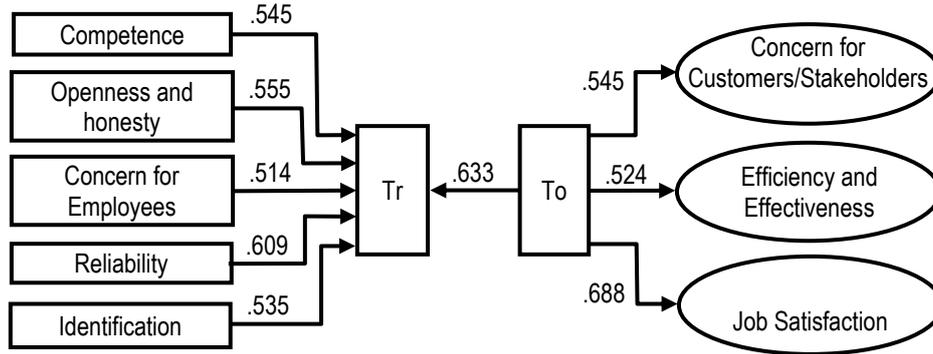
The model we have designed and applied (Figure 2), includes the Pearson correlation coefficients between To (level of organizational trust) and Tr (global result of the trust-based activity), as well as between To and the defining elements of the global result (on the one hand) and between Tr and the five “key drivers”, i.e. the defining elements of trust-based organizational culture (on the other hand).

To (organizational trust) is defined, according to our understanding, by: Q1; Q2; Q3; Q4 and Q5 (five “key drivers”), and Tr (the global result of the organizational trust) - by Q6; Q7 and Q8, with the following meanings: Q1 - Employees’ and managers’ competence; Q2 - Openness and honesty; Q3 - Concern for the company employees; Q4 - Reliability – safety and stability; Q5 - Identification with the organization; Q6 - Concern for the customers and the other stakeholders; Q7 - Efficiency and effectiveness and Q8 – Employee’s job satisfaction (Sonea, 2014; Sonea et al., 2016, rewritten apud Shockley-Zalabak, et al, 2010).

All correlation coefficients above the average and with maximum significance level prove the existence of a trust-based organizational culture in the companies we have researched, which means: a high level of competence (employees and managers), relationships based on openness and honesty, communication and care for the employees on the part of the company’s management, but

also security, stability and identification with the organization on the part of the employees. All this generates work efficiency, care for customers and other stakeholders and

work satisfaction, which means demand and supply of resources for the primary labour market.



Pearson correlation coefficients

Correlation is significant at the 0.01 level (2-tailed)

Figure 2. Model of organizational trust (To) and the global result (Tr)

Source: based on the survey subjects' opinions (Sonea & Câmpeanu-Sonea, 2016).

According to our study, the subjects surveyed, regardless of their field of work, consider that they have shortcomings especially in theoretical training for proper work organization, communication, negotiation and social dialogue, but these are also issues of practical knowledge and skills (Sonea & Câmpeanu-Sonea, 2016).

In the case of subjects employed in the service industry (and particularly tourism), professional development is necessary (according to the opinions expressed) to relate and communicate with customers, but also for the efficient use of resources and the use of foreign languages (Câmpeanu-Sonea & Sonea, 2016b, p. 48-61).

Contradictions within the organizational cultures researched

The study of social issues (trust, communication, contradictions) with the help of a sociological survey operates with opinions, i.e., not with objective situations or objects, but with their reflection in the respondents' consciousness, under the influence of a complex of factors. Thus, solving the states of conflict (real or imagined by the subjects) implies, besides applying rules and principles, specific actions on a case-by-case basis.

1. Knowledge management, communication and trust

In the case of the sample of 751 subjects, we have established a high level of organizational trust, but the detailed analysis of the questionnaire responses reveals some contradictions with the theory we have adopted from the dedicated literature (Shockley-Zalabak, et al, 2010).

The increase in competence is due to the employees' concern for their own training, not to the management's concern. The management of the researched companies shows interest in the smooth running of the business and provides the appropriate database, but does not stimulate the increase of the level of training, and there is no effective knowledge management in the organizations, although

aspects of participative management are implemented (Sonea & Câmpeanu-Sonea, 2018, p. 29-37).

In individual cases of very successful companies (with Romanian capital), it has been proven that an autocratic management is more efficient than a democratic one, especially for short periods of time, as in the "young Romanian market economy". (Câmpeanu-Sonea & Sonea, 2011, p. 73-74).

The case of the restructuring of a company with foreign capital (but with subsidiaries in Romania) gave us the opportunity to analyse a series of contradictions that arose with the relocation of some services and their outsourcing from the headquarters to a subsidiary. The main issues were related to communication management, employee training and the remuneration system (Sonea & Câmpeanu-Sonea, 2018, p. 29-37).

2. Care for the internal customer - the employee, commitment and loyalty

A detailed analysis of the sociological survey of the sample of 751 respondents shows that the company management is not interested in the personal issues of the employees, nor in the quality of their life, and does not support them in solving such issues. The performance appraisal process and the individual reward system are appreciated by the employees, as are fairness and justice in the managerial decision-making process, but there are shortcomings in the processes of organizational change, adaptation to the market and promotion of the employees in the hierarchy, which can affect business stability and continuity, with undesirable effects on employees and consumers.

Although job satisfaction is valued by the respondents, employee confidence, the identification with the organization, and the interest in understanding and taking calculated risks leave much to be desired (Sonea & Câmpeanu-Sonea, 2018, p. 29-37).

A study on "trust-based culture" in a Romanian company (with multinational capital) has revealed a total lack of

interest from employees in the organization's issues (Câmpeanu-Sonea et al., 2017, p. 16-22). The suggestions to improve the situation were: stimulating the employees' interest in creativity, forward thinking and continuous improvement of the company's situation according to consumer demands (Sonea & Câmpeanu-Sonea, 2018, p. 29-37).

Contradictions in social life with effects on labour market

The 2011-2020 period was marked by numerous contradictions in social and political life. Even before the events and issues caused by the current pandemic, conflicts began to escalate, affecting the smoothness and quality of the managerial activity in Romanian companies, and the serious issues in the health system generated, as in the rest of the world, violent outbursts.

Economic and social issues are of great complexity, including labour market issues. Most of the domestic private capital is invested in SMEs, for which there is not enough support from the National Administration, while all countries of the world are making efforts to support the economy affected by the health crisis.

The personnel of the large corporations with subsidiaries in Romania faces the threat of job loss as a result of the streamlining efforts that the parent companies, also affected by the pandemic, are determined to make. The companies providing services for tourism, which should have absorbed the available labour resources, are most impacted by the pandemic and do not benefit from adequate financial support.

However, despite the difficulties of the 2015-2020 period, Romania reached 79% of the EU27 average standard of living in 2020, according to the actual individual consumption indicator (AIC/inhabitant) published by Eurostat, at the same level as Estonia, surpassing Spain, Portugal, Poland, Hungary, Lithuania and Slovenia (apud IPS, 2020), which means an important recovery in living standards and conditions compared to 2015. Also, compared to the previous years, the cost of labour force has decreased, i.e. the correct correlation with labour productivity is restored (apud NSI data, 2021), which is essential for the health of the national economy.

3. Conclusions and perspectives on labour market evolution

During the 30 years we have been referring to, we can speak of a favourable evolution on the Romanian labour market, both in terms of labour demand and labour supply. The issues of technical and structural unemployment still remain, as well as the permanent or temporary exit of the labour force from the country, which means that an important part of the main resource for the national economy and culture is unused.

But in terms of quality, the training processes in schools, the further training and specialisation in the business environment, the development of emotional intelligence and creativity, as well as knowledge management in companies

contribute to the favourable development of the labour supply. These processes are stimulated and linked to the evolution of the quality of demand by improving the communication process in companies, caring for employees and developing an organizational culture based on trust.

For the years to come, economic recovery and the return to normal social life is linked to the evolution of managerial processes in companies according to adaptive, but above all anticipatory models, which require special training and behaviour for both the members of organizations and their management.

In our opinion, a model worth following can be designed based on a study of a sample of 30 top US companies (De Smet, et al., 2021), which is based on 9 organizational imperatives, grouped as answers to 3 questions: who we are; how we operate and how we grow. The answers to the three questions given by the managers of the 30 selected companies are shown in Table 3.

So, according to Table 3, the managers of a "future-ready company" need to be very determined in pursuing their goals, to have a clear agenda concerning the values of the organization and to lead the process of developing its culture.

The company's management must closely supervise the core business through a simple and clear organizational structure (flat organization design), ensure involvement and accountability in the decision-making process, and value employee talent (skills useful to the business) more than the capital employed.

Both managers and employees must have an ecosystemic view of the development process, assimilate rapidly the new developments in science and technology, contribute actively to professional development and specialisation as well as to continuous learning and creativity.

Table 3. Top-performing companies are taking bold action across all nine imperatives

	100%		
	Bold moves	Bold plans or pilots	Neither
Who we are			
Purpose	83	13	4
Value	30	53	17
Culture	17	53	30
How we operate			
Structure	10	53	37
Decision making	17	40	43
Talent	47	43	10
How we grow			
Ecosystem	83	13	4
Tech platforms	73	23	4
Learning	20	60	20

Source: Re-written apud De Smet et al., 2021.

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Both managers and employees must have an ecosystemic view of the development process, assimilate rapidly the new developments in science and technology, contribute actively to professional development and specialisation as well as to continuous learning and creativity.

As concerns Romania’s prospects, our conclusion is that the Programme to Reduce Unemployment by 2027 (the National Employment Strategy for 2021-2027 and the Related Action Plan), if applied consistently, could be a way to balance the situation on the labour market, together with the gradual resumption of normal economic and social activity and the improvement of the labour force training process:

- initial training linked to the technical level and the structure of modern economy, as well as retraining and re-employment following technical and structural unemployment;
- adoption of economic, administrative and legislative measures to reduce the loss of human resources as a result of the permanent or seasonal departure from the country;
- creating the conditions to reach an employment rate of 75% of the population aged 20-64 in 2027.

Romania’s National Commission for Strategy and Prognosis calculated the macroeconomic impact of the absorption of funds under the NRRP (National Recovery and Resilience Plan) by simulating three hypothetical scenarios. If applied seriously and consistently, the beneficial effects for the labour market exist in all three scenarios. The unemployment rate is expected to fall from 4.8% in 2021 to 2.8% in 2026, according to government calculations. The positive impact of the reforms undertaken through the NRRP, due to the funding resources allocated to Romania by the EU, can balance the economy severely affected by the health crisis. There will also be resources for future economic and social development, with favourable effects beyond 2026.

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IS VERTICAL INTEGRATION THE KEY TO SUCCESS IN ROMANIAN FARMS?

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ABSTRACT

Purpose - According to statistics and the literature in the field, Romania has a low degree of competitiveness of agricultural processed products, phenomenon that is reflected in the export of agricultural raw materials and the import of processed food products. The paper presents the impact of vertical integration on the activities of Romanian farms by presenting a case study on a farm with cereals cultivation as main activity. In the particular case of the above-mentioned farm, we have proposed the accession and implementation of a European funded project with the purpose to introduce processing and packaging activities within farm activities and a projection of such an action was made.

Findings – The implementation of the project would show a significant impact on the financial situation of the farm, on its risk management and, at macroeconomic level, it is believed it could improve the competitiveness of agricultural processed products and reduce the export of the agricultural raw materials. According to the projection, in the third year of the project implementation the farm income will increase by 135% compared to the current situation, in a much more intensive pace than costs. Also, through integration the price and sales risk will decrease, and the production risk category, although it will expand in size, will have a diminished impact due to diversification of farm activity and the increase of its economic dimension.

Originality – The paper shows that the current situation of Romania regarding the processing of agricultural raw materials can be improved through agribusiness by implementing feasible projects for vertical integration of the farms.

Keywords: vertical integration, farm, risks.

JEL classification: Q12.

1. Introduction

Agriculture is a sector of great importance in Romania, both through its contribution to the national economy and through its vital social role. With a contribution of 4.2% to the gross domestic product, in 2020, agriculture has always played an important role for the Romanian economy. The registered contribution has decreased in the past decade, but the oscillations of agriculture still produce significant variations

in GDP. Romania remains one of the EU countries with the largest contribution of agriculture to gross domestic product.

The current situation of Romanian agriculture is characterized by an excessive land division, so the arable land of about 14 million hectares is divided into about 3.8 million farms. Therefore, in Romania, the average size of the agricultural holdings is the smallest in the European Union, around 3.5 hectares. This is the reason why we currently import 70% of the food we consume. However, if we take into account that today more than half of Romania's agricultural land is owned by agricultural holdings, we can conclude that, even if 100% of the agricultural land would have been included in holdings, we would still need to import 35% of the necessary food for domestic consumption. (Bacescu, 2013). It follows that the current unfavorable situation of agriculture in our country is not only due to land fragmentation, but also to other causes such as low yields per hectare and the lack of competitiveness of Romanian agri-food products compared to European ones.

Regarding the agricultural production obtained in our country, most of the harvest is represented by corn, followed by wheat. The production of grain corn grain decreased by 37.7%, to 10.84 million tons in 2020, compared to 17.4 million tons in 2019. The yield reached 4,313 kg / hectare in 2020, compared to 6,502 kg / hectare in 2019. Romania has participated with two thirds in the corn export of the European Union in the 2020/2021 season. In the case of wheat, the pedological drought in 2020 led to a decrease in wheat production and thus Romania dropped two positions, to 6th place from the 4th, with a production of 6.4 million tons, almost five times lower than France, a state that is on the first place, followed by Germany (22.1 million tons) and Poland (11.7 million tons), Spain (8.2 million tons) and Italy (6.7 million tons), according to the National Statistics Institute. Domestic consumption of wheat is about 3 million tons, of which about 2.2 million tons are used in bakery, about 500.000 tons for seed and almost 400.000 tons for feed and in the alcohol industry. According to information provided by the Ministry of Agriculture, Romania exported last year into the intra and extra community space a quantity of 4.336 million tons of wheat, over two thirds of the quantity obtained, collecting 844.3 million euros.

Among the reasons Romania exports large amounts of the cereal production are the ones related to the lack of storage spaces and the of processing lines.

The topic addressed in this paper is a current one since all the environments interacting with agribusiness emphasize the importance of processing raw materials in exchange for their sale in raw form. The extension of the processing process could revitalize Romania's agriculture by creating new processing units and modernizing the existing ones.

The present research started from the consultation of specialized literature and scientific articles, as well as databases on specialized websites. The databases were built in order to obtain information on the production, export and import of wheat and corn production, as well as the products obtained from the first processing of these cereals: wheat flour and corn flour.

The next step was to carry out the case study, during which an unstructured interview was conducted with the agronomist of the agricultural holding S.C. Gabiema-Col, which was founded in 2002, based in Hunedoara County, Romos commune, DN7. The farm owns 10 hectares of arable land and 347 leased hectares, and these were cultivated in 2020 as follows: 200 hectares of corn, 100 hectares of wheat, 40 hectares of rapeseed, 10 hectares of oats and 7 hectares of barley. In addition to arable land, the farm also owns some of the equipment needed for grain production, as well as storage facilities for production. For this holding we have proposed the integration of primary processing activities, through European funding, and we have analyzed the impact on the financial situation and on the risk management.

2. Material and method

Conceptually, the agri-food economy includes all activities that contribute to food security at the societal level, employing sectors such as agriculture, agricultural industry and food industry, agricultural and food distribution, restaurants, industry and services that provide intermediate components for agri-food sectors, international trade and socio-economic units and economic consumption units.

The functional manifestation of an agri-food economy implies agri-food integration. This is a mechanism that takes place micro economically and at the middle and macroeconomic level. This mechanism is manifested by engaging agriculture in the process of carrying out agri-food activity. Integrative processes are characterized by two defining vectors: qualitative growth and efficiency.

The vital character of food, the social sensitivity of this field and the relatively low allocation of resources make agri-food integration a phenomenon of first rank in terms of economic importance. Three forms of agri-food integration can be identified (Vincze, 2002):

1. Vertical integration - aims at managing a product from the raw material (agricultural) to the final food product, delimiting product chains. From a managerial point of view, the decision-making center controls the flow of a supply chain.
2. Horizontal integration - aims to organize producers mainly in cooperative systems, usually upstream or downstream of agricultural

production. It turns out that a decision-making center controls a stage of the supply chains.

3. Circular integration - involves simultaneously or successively activities from the same horizontal stage and on vertical flow.

Although agriculture is less homogeneous than industry in terms of economic and social organization and there is a great diversity of models worldwide, traditional types and forms of agricultural units are maintained and harmonize with modern ones, creating complex and coherent national systems, viable from economically point of view.

The main forms of economic organization in agriculture are: small peasant households; family farms; agri-food companies (corporations or companies); agricultural cooperatives and agricultural producers' associations. The agricultural farm is the basic primary unit of agriculture, a form of organization that ensures political stability and economic motivation for farmers. Agricultural farms are supported in most countries of the world to obtain marketable products and contribute to the economic and social stability of rural communities). Agri-food companies (enterprises) are free economic enterprises, organized for profit. Such private enterprises are less specialized in agriculture (animal husbandry, intensive production of fruits and vegetables), but especially integrate agricultural production with processing and sales (vertical integration). Along with the enterprises in the food industry, there are also agricultural holdings, with the status of enterprises that combine the activity of obtaining agricultural products with processing. This approach corresponds to existing realities in the Romanian agri-food economy.

In Romania, rural development and agricultural development are closely linked. In order to increase the productivity and competitiveness of agriculture, it is necessary to make major investments both in the input sector for agricultural production and in the processing and marketing sector, and a financing opportunity in this respect is represented by European non-reimbursable funds.

The National Program for Rural Development is the instrument through which the European Union grants non-reimbursable funds for private and public investments to ensure the development of villages in our country. Measure 121 "Modernization of agricultural holdings" falls under Axis I - "Increasing the competitiveness of the agricultural and forestry sector" and has as general objective the increase of the competitiveness of the agricultural sector through a better use of human resources and production factors and meeting national and international standards.

In order to obtain the most useful information on the topic, the study is based on a research methodology that leads to a broader understanding of the topic. Depending on the type of instigative approach, both quantitative and qualitative methods were used, the main tools and techniques that led to the paper being: the study of literature, statistical tools, the interview and the case study. The investigation involved the following steps:

- Consulting the specialized literature on the approached topic;

- Collection and processing of data on the production, export and import of cereals, as well as data on the size of agricultural holdings;
- Carrying out the unstructured interview with the agronomic engineer from the studied agricultural exploitation, on the basis of which the case study was built;
- The fourth stage was achieved by proposing the access and implementation of a European financing project through Measure 121 "Modernization of agricultural holdings", which will attract European funds for the purchase of equipment necessary for processing wheat and corn, as well as equipping the existing spaces for the processing activity;
- The fifth stage consisted in the analysis of the impact that the financing project will have on the financial situation of the farm, on the risk management, as well as on the managerial structure of the agricultural holding. Based on the results obtained from the implementation of the financing project, the last stage of the research will be carried out, namely the presentation of the discussions, recommendations and conclusions regarding the research carried out in the field of cereals processing.

- The purchase of a mill to process cereal production, so that it would no longer sold only as raw material, unprocessed, but will be offered to consumers in the form of flour, which contributes to adjusting the profile, and quality level of production to the market requirements;
- Introduction and development of new technologies and processes: acquisition of a packaging line for the flour obtained from wheat and corn production;
- Adapting the holding to Community standards: all production and processing conditions will be in accordance with European standards and rules in the field of agri-food.
- Diversification of the products offered on the market (2 new products will be introduced: wheat flour and corn flour, processed and packaged) and increasing their competitiveness, thus increasing the revenues of the Gabiema-Col farm.

The proposed operational objectives refer mainly to equipping the Gabiema-Col agricultural holding from a technical point of view by purchasing new machines and equipment (combine harvester, agricultural tractor and agricultural equipment). Regarding the amount of support provided by this project, the total amount broken down into eligible and ineligible expenditure is presented in the following table:

Table 1. Total value of the proposed project

Exchange rate: 1 EUR=4.5 RON		
	RON	EUR
Total value	465,138	103,364
Eligible value	375,498	83,444
Ineligible value	89,640	19,920

Out of the total eligible value of 83,444 euros, we have set a percentage of the public contribution of 50%, i.e., the amount of 41,722 euros. In addition to the non-reimbursable public aid, the Gabiema-Col agricultural holding will have a co-financing of 61,642 euros (of which 83,444 euros represent eligible expenses and 19,920 euros amount to ineligible expenses).

The economic impact of the introduction of processing activities on the Gabiema-Col agricultural holding

In order to highlight the impact of processing activities on the studied farm, was made a comparison of revenues, expenditures and profits related to the current situation with the same indicators related to the first three years of implementation of the project on European funds, through which we have proposed processing corn and wheat production so that raw materials (grains) are marketed as finished products: wheat flour and corn flour.

Due to the fact that the Gabiema-Col farm still has to honor contracts that have as object raw material (wheat and corn grains) and the storage capacity does not allow from the first year of implementation a storage capacity of 100% of wheat and corn production, following its progressive increase, we

3. Results

Integration is the basis of modern economic structures, agrobusiness being a form of vertical integration. Agri-food integration establishes simple and efficient functional connections between production, capitalization and consumption, creating real integrated chains on products or product groups. The finality of these actions is usually manifested in a product with a high degree of processing, a product that is offered to the consumer. Although Romanian producers have been operating in a single European market for more than seven years, even today the degree of integration on the agricultural branch of Romania is still very low and so the profitability and economic efficiency. Based on these considerations, we have proposed the integration of production and processing activities at the Gabiema-Col holding, with sources of financing from non-reimbursable European funds, further describing the content of the project for accessing funds, as well as its economic impact on farm.

Description of the proposed project in order to attract European funds

The project proposed for implementation is built on Measure 121 "Modernization of agricultural holdings", which falls under Axis I - "Increasing the competitiveness of the agricultural and forestry sector". The name of the investment is *The modernization of the agricultural holding by equipping it with agricultural equipment, the acquisition of a mill for processing cereals and a line for packing flour.*

By accessing European funds, we have proposed the following specific objectives for the Gabiema-Col agricultural holding:

have proposed the following processing plan: in the first year 50% of the wheat and corn production will be grounded, in the second year 70%, and in the third year will be reached a processing of 100% of wheat and corn production.

The following table presents the current situation and the evolution of the incomes of the agricultural holding studied in the first three years of integration of the processing activities:

Table 2. The evolution of the incomes obtained after introducing processing activities at the Gabiema-Col agricultural holding

	Revenues (RON) for the production of :					Total Revenues (Ron)
	Wheat	Corn	Canola	Oat	Barley	
Current situation	201.600	462.950	68.800	14.592	11.025	758.967
Year 1 (processed 50%)	321.800	857.000	68.800	14.592	11.025	1.273.217
Year 2 (processed 70%)	369.600	1.013.500	68.800	14.592	11.025	1.477.517
Year 3 (processed 100%)	440.300	1.249.500	68.800	14.592	11.025	1.784.217

All calculations in the previous table have been made with the following selling prices: P wheat = 0.7 Ron / kilo; P corn = 0.5 Ron / kilo; Canola P = 0.86 Ron / kilo; P oat = 0.64 Ron / kilo; Barley P = 0.7 Ron / kilo; P wheat flour = 1.7 Ron / kilo; P corn flour = 1.5 Ron / kilo. The productions obtained per hectare by the Gabiema-Col agricultural holding are: Q wheat = 3.5 t / ha; Q corn = 5 t / ha; Q canola = 2 t / ha; Q oat = 2.5 t / ha; Q barley = 2.5 t / ha. Grinding losses of 10% were taken into account. We consider the Income Index for the current situation as 100% and so due to the introduction of processing at the Gabiema-Col farm, incomes increase

by 67.7% in the first year under the conditions of processing half of the production, with 94.6% in the second year under the conditions of processing 70% of production and with 135% when processing 100%. The indices of the 3 years were calculated on a fixed basis to reflect the differences from the current situation. Regarding the costs of obtaining the above-mentioned productions, they include the expenses of raw materials and consumables taken from the technological data sheets of each crop, the cost of labor and auxiliary costs. In value, the expenses are shown in the following table:

Table 3. The evolution of expenses of production and processing activity in Gabiela-Col agricultural holding

	Expenses (Ron) for the production of:					Total expenses (Ron)
	Wheat	Corn	Canola	Oat	Barley	
Current situation	175.000	442.400	28.060	12.500	8.750	666.710
Year 1 (processed 50%)	355.870	533.804	28.060	12.500	8.750	938.984
Year 2 (processed 70%)	366.637	549.956	28.060	12.500	8.750	965.903
Year 3 (processed 100%)	386.532	579.798	28.060	12.500	8.750	1.015.640

The above table shows an increase in the costs related to the basic activity of the Gabiema-Col farm following the introduction of processing activity, costs justified by the packaging of flour, the ones with the electricity consumption and water required in the grinding and packaging processes and the expenses caused by the needed additional supplementary labor force. In order to highlight the fact that the integration of activities in agribusiness leads to a much higher economic profitability than the separation of production processes - processing - packaging - sales, a comparison between the percentage increase of expenses and the percentage increase of income after the introduction of milling activity was made.

Table 4. Comparison of the percentages increase of expenses and the ones of incomes

Index current situation revenues	Index revenues year 1	Index revenues year 2	Index revenues year 3
100%	167,7%	194,6%	235%
Index current situation expenses	Index expenses year 1	Index expenses year 2	Index expenses year 3
100%	140,8%	144,8%	152,3%

It can be seen that both revenues and expenditures have an upward trend, but the growth rate of revenues is much faster than the one of expenditures, reaching that in the year in which 100% of wheat and corn production is processed, revenues to increase by 135% (2.35 times higher) compared to the moment when nothing is processed, given that expenses increase by only 52.3%.

The gross profit expected to be obtained by Gabiema-Col farm following the processing and packaging activities for each year of implementation of the project to attract European funds is shown in Table 5.

The impact of production processing can be observed especially from the increase of the gross profit of the farm, which, in the case when only half of the wheat and corn production is transformed into flour and sold as such,

increases 3.6 times, reaching 334,233 RON from 92,257 RON.

Table 5. The evolution of gross profit at Gabiema-Col farm

	Current situation	Year 1	Year 2	Year 3
Revenues (RON)	758.967	1.273.217	1.477.517	1.784.217
Expenses (RON)	666.710	938.984	965.903	1.015.640
Gross profit (RON)	92.257	334.233	511.614	768.577

Risk management following the integration of processing activities

At present, the studied agricultural holding faces the following categories of risks: production risk, human resources risk, price risk and financial risk. After the implementation of the project for the processing of the obtained production, the farm will face the same categories of risks, but some of them will be diminished due to the vertical integration.

The biggest impact that the implementation of the project will have on risk management will be on the category of price and customer risks. From the first category, the risk of price variation will be reduced the most, because most of the production will be processed, reaching in the third year from implementation to a 100% processing of wheat and corn. According to statistical data, the price variation for cereals is quite large, and for the first line processing products (wheat flour and corn flour) the price variation is at a lower level. Also, the risk generated by ensuring customers for wheat and corn in the first two years of integration will be reduced, and in the third year it will be eliminated due to the processing of the entire production. From the category of production risk, the main risks that may affect the farm will be: environmental factors, genetics, interaction with new technologies and the production risks for wheat and corn flour. This category of risks, although it will increase through the implementation of the project, the probability of occurrence will decrease and their impact will also decrease, firstly due to the diversification of the farm activity and secondly due to the increase of its economic dimension. Regarding the risk of human resources and the financial risk, these categories will not be significantly influenced by the introduction of processing activity in the case of the Gabiema-Col farm.

4. Discussion and conclusion

The fundamental areas on which the European Union's rural development policy focuses are the agri-food economy, the environment, the economy and the rural population.

Although we recognize the importance of each of these areas, we propose as topics for discussion some solutions that can lead to the improvement of the agri-food system:

- The competitiveness of Romanian agri-food products depends on their quality; therefore, it is necessary to harmonize Romanian quality standards with the European ones;

- There is a need to integrate the agri-food economy in order to reduce the agri-food chain from farmer to consumer;
- The agricultural services sector needs to be developed, such as services for maintaining soil quality, mechanization of agriculture, consulting for farmers, risk insurance, provision of agricultural raw materials and loan provision;
- Another key aspect is the education and vocational training of the labor force employed in agriculture. People in the agri-food sector must also have adequate knowledge of management, marketing, production technologies, finance and economics, so that practicing agriculture to becomes a job and not a lifestyle;
- Capital investments in agribusiness are necessary for its start. There is a need for lending cooperatives or savings banks - lending with a flexible lending system, which provides different conditions for the development of agri-food business.

The rural economy of our country is poorly integrated into the market economy, depending largely on agriculture dominated by subsistence and semi-subsistence farms. This phenomenon occurs in the context in which Romania differs from the countries of Central and Eastern Europe by the importance of agriculture in the national economy, being reflected most concretely in the share of agriculture in GDP.

Despite the natural and human potential of agriculture, Romania is currently an importer of agri-food products, which is largely due to the low competitiveness of processed agricultural products, and an exporting country of agricultural raw materials and products with low processing grade.

The vertical integration of agricultural holdings and processing units through the application of agribusiness could lead to solving the previously mentioned problems, problems that define Romania's agriculture today. Among the advantages of the vertical integration of agricultural holdings are: ensuring the capitalization of products by agricultural producers, streamlining the costs of agricultural holdings, better management of products by avoiding losses, preserving quality and obtaining superior yields in processing activity.

In the case study carried out at the Gabiema-Col agricultural holding, we proposed a project for the vertical integration of the holding, a project co-financed by European funds through Measure 121 "Modernization of agricultural holdings". The activity of processing cereals (wheat and corn) will be integrated into the farm by purchasing a mill and a flour packaging line. Vertical integration will have a great impact on the financial situation of the holding, as well as on risk management, the risk of customers will decrease in the first two years, and in the third year it will be eliminated, the price risk category will decrease, and the category of production risk will be reduced by diversifying the activity of the agricultural holding and by the fact that it will increase its economic dimension.

5. Research limits

Among the limits of the current paper are the followings:

- In order to obtain the results, the size of the agricultural holdings was not taken into account.
- The average productions per ha are those obtained by country, and they differ from one farm to another.
- Farms must have the necessary capital to co-finance the introduction of the processing activity within them.

6. Future research

Since the integration of processing activity has such a high impact on only one farm, it would be interesting to analyze how the introduction of processing activity in all farms (or most of them) would influence the export and import of cereals.

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ATTRIBUTES AFFECTING PSYCHOLOGICAL WELL-BEING AMONG FACULTY MEMBERS IN ONLINE TEACHING ENVIRONMENT

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ABSTRACT

As the pandemic hit the world and the countries went for lockdown, the academic institutions shifted from an off-line teaching to an online teaching mode. Looking at the benefits and mass reach of virtual mode, the online teaching will become an integral part of the education system. This paper tries to study the impact of online teaching on the psychological well-being of the faculty in higher education. Two factors that have been studied in the online teaching are student engagement and assessment of students and their impact on psychological well-being of higher education faculty. Most of the research done in this area are from the student's perspective but this paper tries to study faculty perspective. The study is conducted in the Nation Capital Region of India on the faculty of the higher education.

Keywords: student engagement, online teaching, assessment of students, psychological well-being.

JEL classification: M10.

1. Introduction

Due to the pandemic in March 2020, Government of India, declared a nationwide lockdown, as a response, the academic institutions shifted to the online teaching method. Since then, depending on the number of pandemic cases, the various states and union territories keep declaring lockdown and curfews in different areas. For the safety of students and teachers, there is no option left than to teach online. The current research paper throws light on understanding the real scenario of psychological well-being among faculty members. Looking at the flexibility, convenience, mass reach and economic benefit, even after the pandemic is over, online teaching will become an integral part of the education system. This paper tries to analyze two aspects of online teaching namely student engagement and assessment of students and their impact on psychological wellbeing of the faculty. It helps in identifying the comfort level of faculty with respect to online teaching. The Government of India has implemented the New Education Policy 2020, as per this, it is mandatory for all universities in India to complete 25% syllabus through online teaching mode and 75% face-to-face interaction. Even Government of India has emphasized on the use of Information and Communications Technology (ICT) and is promoting online teaching through efficient platforms like Study Webs of Active-Learning for Young Aspiring Minds

(SWAYAM) or Massive Open Online Courses (MOOC). The change from face-to-face to online education should not be seen as a temporary shift of instructional delivery to alternative online delivery model due to the crisis of circumstances (Al Lily, Ismail, Abunasser, & Alhajhoj Alqahtani, 2020; Hodges, Moore, Lockee, Trust, & Bond, 2020).

2. Literature review

2.1. Student Engagement

It refers to the active and willful participation of the student in the learning process. Student engagement is referred as the involvement of the students in the process of learning. It is a faculty who has to ensure that students are self-motivated to participate in the learning process. Many students do not engage in class discussions as they do in the traditional face-to-face class and there is often little or no feedback when questions are asked. As a result, some online classes become long and sometimes stressful. It is the students who do the learning (Lavy & Naama Ghanayim, 2020; Orkibi & Tuaf, 2017) and if they resist or minimize their investment, attention or effort on their participation, they will only accomplish little in their learning.

The modules of offline teaching cannot be replicated to the on-line mode. The curriculum needs to be restructured to be implemented in the online mode with polls, videos etc. being integral part of teaching pedagogy. There should be a curriculum review of face-to-face materials that are practicable for online delivery, thereby preventing the teaching contents from becoming burdensome, repetitive, non-engaging, and resulting in learning being resisted (Chizhik & Chizhik, 2009; Negiri, 2013). For students to be able to focus, faculty should break down contents for easier online delivery and management (Bao, 2020). This leads to additional burden on the faculty to develop and adopt new strategies for student attention and engagement. Woolley (2015) observed that students believe that manageable online educational engagements could be helpful to get better results and that students who understand this are more likely to be involved in online learning and complete any assigned tasks than students who do not.

2.2. Student assessment

Assessment of students in online teaching refers to how faculty is using different methods like quiz, open discussions, case studies etc. in assessing the students. In

the light of this current pandemic, alternative forms of assessments should be considered and embraced because of their real benefits and positive outcomes. Traditional forms of assessment are getting criticized these days because they leave students with a crammed knowledge for marks and not the skills they need for proficiency (Ali, 2020; Czerniewicz, 2020; Ismail, Mokhtar, Nasir, Rashid, & Ariffin, 2014; Magalhaes, Ferreira, Cunha, & Rosario, 2020; Zhang, Wang, Yang, & Wang, 2020). The online teaching mode has forced the faculty to develop open book evaluation process.

Assessments can be in the form of virtual presentations, interaction models, oral presentations, creative projects using 3-Dimensional modelling and graphics, skits or plays, blogpost journaling, one-to-one conferencing, and so on (Ali, 2020; Gipps & Stobart, 2003; Lavy & Naama Ghanayim, 2020). These forms of assessments can be used to measure authenticity and performance (Gipps & Stobart, 2003) and could thus be a kind of a relief measure in this time of rapid pedagogical transformation. It is therefore suggested that schedules for teaching, tests, assignments, and so on should be made bearable with the benefits of staff (tutor) and students in focus (Rosario et al., 2015).

2.3. Online teaching

The institutions that had no prior preparation or planning measures in place prior to the outbreak of COVID-19 need to consider relief measures and all forms of reassurance for their staff and students, so as to avoid every form of excessive demands or tensions following this rapid adoption of online teaching (Ali, 2020). Online teaching refers to the competency of the faculty to use the device connected with internet from any part of the world. The earlier research has been done on the student's experience with online teaching (Brown, 2016). McIntosh (2010) has concluded that e-teaching and e-workplace does not leave a 'great feelings' nor 'great work' experience in the higher education sector and there is a need to study higher education educators' emotions and its impact on online teaching.

2.4. Psychological well-being (PWB)

Research has shown that psychological well-being is a diverse multidimensional concept (MacLeod & Moore, 2000; Ryff, 1989b; Wissing & Van Eeden, 2002), which develops through a combination of emotional regulation, personality characteristics, identity and life experience (Helson & Srivastava, 2001). Psychological well-being is defined as "a dynamic state, in which the individual is able to develop their potential, work productively and creatively, build strong and positive relationships with others and contribute to their community" (Foresight Mental Capital and Well Being Project 2010).

3. Objective of the study

1. To see the impact of student engagement on the psychological wellbeing among faculty in the online teaching mode.
2. To analyze the impact of assessment of students on the psychological wellbeing among faculty in the online teaching mode.

4. Research methodology

The data is collected from both primary and secondary sources. The primary data is collected from faculty that is teaching higher education courses in National Capital Region. It is collected with the help of questionnaire using Psychological Well Being Scale developed by Carol D. Ryff. Random Sampling is applied. The secondary data is collected from journals, books, magazines and websites. The study employs mixed-method design, with combination of quantitative and qualitative research techniques. Data obtained from the various sources is analyzed by using descriptive statistics using SPSS.

For this study, Psychological Well Being Scale developed by Carol D. Ryff (1989) is used after validating it in Indian context. The scale has following six dimensions:

1. Personal growth: feeling of developing and expanding self, engages in growth-oriented process.
2. Positive relations with others: warm, close, concern for others' welfare, capable of strong intimacy and empathy, well established relation with others.
3. Self-acceptance: feature of self-actualization, importance for mental health, optimal functioning, having positive attitude toward the self.
4. Purpose in life: directs toward purpose in life, believes in making efforts for achieving goals; focuses on aims and objective.
5. Autonomy: self-determined, feeling of independency, manages behavior from within.
6. Environmental mastery: involves in making surrounding effectively, having competence and mastery over all situations.

5. Results and Discussion

Student Engagement and its impact on the dimensions of PWB

There is a positive significant correlation between student engagement and dimensions of PWB in the online teaching, the three sub-dimensions of PWB that were highly affected by student connect were environmental mastery with a positive correlation of 0.731, positive relationship with a positive correlation of 0.675 and self-acceptance with a positive correlation of 0.611. Other dimensions showed a low level of correlation. Personal growth had a correlation of 0.162, purpose in life had a correlation of 0.161 and autonomy had a correlation of 0.132.

When the faculty has a good student engagement, it positively affects the PWB of the faculty. A further analysis showed that in the online teaching mode, student engagement was poor as they had no control over the situation and they were even not sure that students were listening to them. It is not mandatory to switch on the camera and most of the students do not switch on their cameras. Thus, lack of proper student engagement in the online teaching negatively affected the PWB of the faculty.

Assessment of Students and dimensions of PWB

There is a positive significant correlation between assessment of students and dimensions of PWB, the two sub-dimensions PWB in the online teaching mode that were highly correlated to assessment of students were Environmental Mastery with a positive correlation of 0.681, and Positive Relationship with a correlation of 0.611. Rest of the dimensions- personal growth, self-acceptance, purpose in life, autonomy did have a moderate to low level of correlation. For personal growth the correlation was 0.313, self-acceptance the correlation was 0.291, purpose in life the correlation was 0.201 and autonomy the correlation was 0.191. Further results show that faculty felt that they were not able to assess the students properly as in the online assessment process students have access to the internet and books, so it was a copy-paste assessment and thus assessment of students had a negative impact on the PWB of the faculty.

6. Conclusion

Most of the previous research done is on wellbeing of students while learning through online method. Not much work has been done on faculty wellbeing. Quality education can be imparted only when academicians are in good mental health. When a person is confronted with a change in the work environment, he tries to adjust to the new demand. These adjustments put pressure on the physical and mental state of the person. This starts affecting the wellbeing of the individual. Till recently most of the faculty in India has been teaching in physical classes through the primitive methods. In offline mode, class coordination, student engagement activities are easier and faculty is accustomed to it. Training programs should be developed for faculty to help them teach in the online mode. We need to identify new online methods to engage and assess students and train faculty in them. No country or society can develop without proper quality education. To impart quality education, the faculty has to be in good psychological wellbeing. The utility of the research is in identifying the sources that create pressure and how to reduce those pressure.

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WASTE MANAGEMENT SOLUTIONS. CASE STUDY: CLUJ-NAPOCA, ROMANIA

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ABSTRACT

The purpose of this paper was to analyze the current situation of the household waste management in the city of Cluj-Napoca and to propose a solution to the problems that aroused. As such, I proposed a scheme for the management of the main waste fractions generated by individuals and companies.

Starting with the analysis of the waste flow, of the demographic tendencies and waste generation tendencies, I analyzed a project that involves investments in the purchase of containers for collection, transport facilities, sorting facilities and composting facilities. Based on the estimated costs and incomes assumed by the implementation of the scheme, I proved the project to be efficient by using two financial indicators groups, indicators that are used in literature: 1) Dynamic criteria or based on updating; and 2) Criteria with doubles rates, or integrated.

Keywords: waste management, sanitation services, efficiency indicators, environmental protection.

JEL classification: Q53.

1. Introduction

Environmental issues are part of the serious problems of mankind and soon no field, from no country, can evade their resolution. Humankind is called to help reduce the impact caused by the nature of its activities by promoting sustainable development, considering economic development, social protection and environment protection. In the context of the sustainable development, the waste management is a global problem and requires a maximum attention.

Besides the collection efficiency, an integrated waste management involves a proper recycling system. Recycling process involves the reprocessing of the waste into a usable raw materials or goods thus enabling materials to have an extended life in order to decrease the resource consumption and avoiding disposal costs. Recycling process is dependent on two factors: the availability of recycled products supplies and the market for those goods.

It can be seen by anyone that wherever one-man lives, it produces certain changes in the environment and thus creates waste, especially domestic waste. The bigger a community is, the higher the amount of generated waste is, so the uncontrolled waste accumulated creates major problems that must be solved urgently and permanently. As a result, that waste must be managed so as not to burden

too much the community, therefore selective collection, reuse, recycling, storage and finally disposal of remaining waste must be adopted.

2. Literature review

In their research, Sasikumar and Krishna (2009) considered that the sustainable waste management requires continuous efforts of the waste producers of the city, irrespective of the waste quantities they generate. Therefore, waste management should not only be the responsibility of the local self-government, but also households, communities, private enterprises, and NGOs. Each of them has a specific responsibility to introduce an element of sustainability into the way finance and other resources are to be used, the consumption pattern they adopt, and choices of the waste management.

Reddy (2011) considered that the sector of the waste management can contribute to greenhouse gas reduction in ways that are economically viable and meet many social priorities.

According to Fagundes (2019), incineration alternatives of the waste are preferred from an eco-efficiency perspective, given the potential greenhouse gas emissions reductions and due to the possibility of energy recover, which reinforces the contribution of this technology to promote sustainability as largely found in the international literature.

In their paper, McDougall, White, Franke and Hindle (2001), have considered that all waste management systems are part of the same system – the global ecosystem. Economically, each individual unit in the waste management chain should run at a profit, or at least break even. Therefore, within the boundaries controlled by each operator, the financial incomes must at least match the outgoings.

Huseyin (2017) considered that the solid waste may be reclaimed for the economy by efficient and effective waste management planning. Increasing separate collection activities in the region will not only increase the amount of the collected package waste and the profit margins of licensed firms, but also decrease the total amount of waste sent for disposal.

The waste collection process begins with the filling of containers and ends with the loading of the collection vehicles. A collection system is defined (Bilitewski, Hardtle and Marek, 1996) as a combination of technology and human labor, specifically: collection method, container system, vehicles and personnel. The selective collection

and recycling of waste are profitable when the technical feasibility and the collection and recovery costs lead to the obtaining of products that can be traded or used as secondary raw materials. (Negrea, Cocheci and Pode, 2007). In their research, Chongwoo and Iain (1999) demonstrated that the household can make costly waste reduction efforts that affect the amount of waste to be disposed of after consumption. Reuse or composting are examples of household waste reduction effort.

3. Research methodology and starting data

The case study, as a research methodology, is appropriate because it represents "a research strategy focused on a concrete case that is interpreted in detail, presenting detailed references on the established subject, taking into account all its contextual features".

The published literature was another source of information, such as articles, academic books, laws and regulations in force.

This paper proposes and analyzes an investment project for waste management in the city of Cluj-Napoca, Cluj County.

The proposed project is based on the finding that currently, in the investigated area, the household waste management needs continuous improvement.

This project is designed to serve the city of Cluj-Napoca, with a population of ca. 410.923 inhabitants (including the stable population and people living in floating regime) and 7.200 operators. It involves actions to be provided in any integrated waste management system, which is staged as follows: (1) waste processing at the source (in the apartment, household, institution), (2) providing selective waste collection services (at collection container, where the practical responsibility of the public service begins), (3) waste transport in special vehicles, (4) waste transfer to the station for sorting and composting, (5) selling selectively collected waste directly to processors; (6) transporting the remaining waste, after the relevant fractions were used, to the environmentally ecological landfill that will be opening in the village Feleacu, through the efforts of the County Council. Based on this scenario, we will forecast expenditures and revenues for the operation of the proposed scheme, and we will determine the effectiveness of this system.

After calculations for determining the collection points that must be arranged, we obtained the following necessary items to achieve an efficient collection in Cluj-Napoca – Table 1.

According to calculations, the total number of recipients that will cover the collection activity in the city is 2268 recipients, and the total number of collection points (selective and non-selective) is 756 points.

The lifetime of the project implementation that was used in the economic and financial analysis of the project was 20 years.

According to the County Waste Management Plan (Planul Județean privind Gestionarea Deșeurilor) the trend of the waste generation is increasing, and the waste composition

is going to change, containing a large amount of packaging and decreasing the amount of the biodegradable fraction. An increase in waste generation of about 4.5% for the period 2006 -2017 and about 16.5% for the period 2006 -2037 is forecasted. Therefore, the annual variation of the indicator for waste generation is increasing, considering an increase of waste generation equal to 0.8% applied to all fractions of household waste.

Table 1. Necessary collection points and collection recipients in Cluj-Napoca

Districts	Population	Selective/ nonsel. collection points	TOTAL Collection recipients	Out of which:	
				Non-selective collection recipients (1.1 m ³)	Selective collection recipients (1.1 m ³ /0.6m ³)
Mănăștur	115,727	92/92	552	184	276/92
Mărăști	88,023	70/70	420	140	210/70
Andrei Mureșanu	5,475	10/10	60	20	30/10
Centru	21,950	24/24	144	48	72/24
Între Lacuri	12,456	14/14	84	28	42/14
Zorilor	33,145	30/30	180	60	90/30
Gheorgheni	47,124	36/36	216	72	108/36
Someșeni	17,640	19/19	114	38	57/19
Grigorescu	23,048	20/20	120	40	60/20
Plopilor	6,442	12/12	72	24	36/12
Gruia	7,400	12/12	72	24	36/12
Iris	13,595	14/14	84	28	42/14
Dâmbu Rotund	14,087	15/15	90	30	45/15
Becaș	510	1/1	6	2	3/1
Borhanci	1780	4/4	24	8	12/4
Bună Ziua	2,521	5/5	30	10	15/5
Total	410.923	378/378	2268	756	1134/378

The amount of the recyclable waste was determined by cumulating the estimated quantities of recoverable paper/cardboard, glass, metal and plastic. After the recoverable fractions are separated, the remaining waste will enter a treatment process. We have considered that in the waste amount for treatment, about 50% is the biodegradable fraction, occupying a significant share in the total amount of household waste generated by the population. The water content of this fraction is estimated to 40% and the removal of excess water will result in the dry matter of the biodegradable waste. In the calculations, we considered that 70% of dry matter will be harnessed as compost, while the remaining of 30% will be treated as final residue for storage.

In the proposed waste management system, there are three different income sources to cover the operating and

maintenance costs, and their summing represent the total forecasted incomes to be used in the efficiency analysis of the project:

1. Income from sanitation fee for household waste from physical entities;
2. Income from sanitation fee for household waste from legal entities;
3. Income from the sale of the recoverable materials (waste collected selectively, sorted biodegradable waste from the sorting station).

Table 2. The forecast of the total income

Year	Income from recoverable materials - euro -	Income from sanitation fee/physical entities - euro -	Income from sanitation fee/legal entities - euro -	TOTAL INCOME - euro -
2013	6,224,038.93	6,615,860.30	6,004,642.86	20,066,294.73
2014	6,260,162.94	6,760,913.04	6,052,680.00	20,306,069.10
2015	6,296,509.80	6,909,146.06	6,101,101.44	20,549,720.93
2016	6,333,081.00	7,060,629.08	6,149,910.25	20,797,325.26
2017	6,369,878.00	7,215,433.38	6,199,109.53	21,048,958.71
2018	6,406,902.31	7,373,631.75	6,248,702.41	21,304,699.47
2019	6,444,155.42	7,535,298.63	6,298,692.03	21,564,627.40
2020	6,481,638.85	7,700,510.05	6,349,081.57	21,828,824.02
2021	6,519,354.11	7,869,343.73	6,399,874.22	22,097,372.56
2022	6,557,302.75	8,041,879.09	6,451,073.21	22,370,358.00
2023	6,595,486.31	8,218,197.29	6,502,681.80	22,647,867.10
2024	6,633,906.34	8,398,381.27	6,554,703.25	22,929,988.46
2025	6,672,564.41	8,582,515.78	6,607,140.88	23,216,812.51
2026	6,711,462.10	8,770,687.44	6,659,998.00	23,508,431.61
2027	6,750,600.99	8,962,984.76	6,713,277.99	23,804,940.06
2028	6,786,688.88	9,159,498.20	6,766,984.21	24,100,276.13
2029	6,826,285.48	9,360,320.20	6,821,120.09	24,406,798.95
2030	6,866,127.85	9,565,545.22	6,875,689.05	24,718,505.60
2031	6,906,217.64	9,775,269.80	6,930,694.56	25,035,498.57
2032	6,946,556.47	9,989,592.59	6,986,140.12	25,357,882.53
2033	6,987,146.02	10,208,614.41	7,042,029.24	25,685,764.33

Based on the official data presented in the County Waste Management Plan (Planul Județean privind Gestionarea Deșeurilor) and the data obtained from the sanitation operators, we created a forecast of expenditures that involve the functioning of this scheme, which are summarized in Table 3.

Table 3. Forecasting the operating costs in the proposed project

Year	Disposed fee (euro/ tone)	Expenditure with disposed fee (euro)	Overheads (euro)	Expenditures for fuel and maintenance vehicles (euro)
2013	30.00	0.00	385,000.00	648,000.00
2014	31.50	6,900,953.48	400,015.00	673,272.00
2015	33.08	7,308,626.14	412,815.48	694,816.70
2016	34.73	7,740,374.25	424,374.31	714,271.57
2017	36.47	8,197,619.17	434,983.67	732,128.36
2018	38.29	8,681,866.19	445,858.26	750,431.57
2019	40.20	9,194,709.42	457,004.72	769,192.36
2020	42.21	9,737,837.05	468,429.84	788,422.17
2021	44.32	10,313,036.91	480,140.58	808,132.72
2022	46.54	10,922,202.38	492,144.10	828,336.04
2023	48.87	11,567,338.53	504,447.70	849,044.44
2024	51.31	12,250,568.80	517,058.89	870,270.55
2025	53.88	12,974,141.94	529,985.37	892,027.32
2026	56.57	13,740,439.41	543,235.00	914,328.00
2027	59.40	14,551,983.22	556,815.87	937,186.20
2028	62.37	15,379,687.14	570,736.27	960,615.85
2029	65.49	16,288,007.00	585,004.68	984,631.25
2030	68.76	17,249,955.78	599,629.80	1,009,247.03
2031	72.20	18,268,698.93	614,620.54	1,034,478.21
2032	75.81	19,347,588.74	629,986.05	1,060,340.16
2033	79.60	20,490,175.30	645,735.70	1,086,848.67

In the proposed project, I will consider a minimum storage fee of 30 euro, given that most EU countries have set a fee per ton of disposed waste of between 30 and 100 euro. The introduction of this tax and its gradual increase are economic incentives to minimize quantities of disposed waste, in favor of recycling. Although in Romania the levy for the disposed waste was postponed until 2017, we believe that this measure will encourage the citizens to recover the generated waste.

After the analysis and description of the waste management scheme, estimates were detailed for the investment component; a general estimate of the proposed management scheme was also detailed, achieving the following results:

Estimate for Object 1: Achieving the 756 collection points (selective and non-selective), including the purchase of collecting recipients of 0.1 m3 and 0.6 m3: 6,285,089 euro.

Estimate for Object 2: Procurement of transport vehicles: 5,462,100 euro.

Estimate for Object 3: Building the sorting and composting stations: 27,153,712 euro.

The total general investment resulted from the general estimate; this value is situated at 39,181,901 euro (including VAT).

Table 4. Forecasting the operating costs in the proposed project

Year	Depreciation (euro)	Equipment maintenance (euro)	Wage costs (euro)	TOTAL EXPEDITURES (euro)
2013	630,289.00	120,000.00	425,000.00	2,539,532.35
2014	630,289.00	120,000.00	435,625.00	10,534,177.66
2015	630,289.00	120,000.00	446,515.63	11,055,022.39
2016	630,289.00	120,000.00	457,678.52	11,600,035.79
2017	630,289.00	240,000.00	469,120.48	12,309,761.79
2018	315,145.00	240,000.00	480,848.49	12,551,271.94
2019	315,145.00	240,000.00	492,869.70	13,189,259.38
2020	315,145.00	240,000.00	505,191.45	13,863,279.32
2021	315,145.00	240,000.00	517,821.23	14,575,417.92
2022	315,145.00	240,000.00	530,766.76	15,327,883.42
2023	315,145.00	240,000.00	544,035.93	16,123,013.34
2024	315,145.00	240,000.00	557,636.83	16,963,282.08
2025	315,145.00	240,000.00	571,577.75	17,851,308.97
2026	315,145.00	240,000.00	585,867.19	18,789,866.79
2027	315,145.00	240,000.00	600,513.87	19,781,890.79
2028	315,145.00	240,000.00	615,526.72	20,793,967.63
2029	315,145.00	240,000.00	630,914.89	21,900,258.24
2030	315,145.00	240,000.00	646,687.76	23,069,765.17
2031	315,145.00	240,000.00	662,854.96	24,306,167.28
2032	315,145.00	240,000.00	679,426.33	25,613,359.23
2033	315,145.00	240,000.00	696,411.99	26,995,464.16

The main starting data taken into account in assessing the effectiveness of the project were determined based on the household waste stream analysis, demographic trends and trends in waste generation in the investigated area, which is the updated incomes value (UIV) having a value of **271,570,975 euro**, the updated costs value (UCV) having a value of **178,293,916 euro**, the minimum discount rate "a" (5%), as it can be seen in Table 5.

Table 5. The structure of the investment project proposed for Cluj-Napoca city

Year	Updated incomes value (euro)	Updated costs value (euro)	Investment costs (euro)	Updated investments costs (euro)
2013	-	-	19,181,901	18,268,477
2014	18,200,720.85	1,731,740.00	20,000,000	18,140,589

2015	17,541,145.96	8,555,351.39	-	-
2016	16,906,306.26	8,576,453.96	-	-
2017	16,295,248.54	8,595,083.65	-	-
2018	15,707,057.07	8,715,402.42	-	-
2019	15,140,852.16	8,695,986.97	-	-
2020	14,595,788.65	8,713,707.36	-	-
2021	14,071,054.59	8,733,248.18	-	-
2022	13,565,869.88	8,754,570.54	-	-
2023	13,079,485.01	8,777,637.23	-	-
2024	12,611,179.84	8,802,412.59	-	-
2025	12,160,262.45	8,828,862.54	-	-
2026	11,726,067.97	8,856,954.44	-	-
2027	11,307,957.55	8,886,657.06	-	-
2028	10,905,317.32	8,917,940.54	-	-
2029	10,514,870.65	8,934,842.48	-	-
2030	10,141,529.08	8,969,060.39	-	-
2031	9,781,952.03	9,004,775.88	-	-
2032	9,435,616.11	9,041,963.98	-	-
2033	9,102,018.32	9,080,600.84	-	-
2034	8,780,675.23	9,120,663.67	-	-
Total	271,570,975	178,293,916	-	36,409,066

4. Results

Starting from the structure of the investment project proposed for Cluj-Napoca city, the efficiency of this project has been demonstrated by resorting to two criteria:

(1) Dynamic criteria or based on updating wherein the following indicators have been determined: the benefit-cost ratio (BCR), the net present value (NPV), the internal rate of return (IRR).

(2) Criteria with doubles rates or integrated wherein the following efficiency indicators have been determined: the integrated internal rate of return (IIRR), the integrated net present value (INPV) and the unitary integrated net present value (UINPV).

The main efficiency indicators have sufficiently demonstrated the profitability and the appropriateness of the of the waste management scheme proposed for Cluj-Napoca as shown below:

$$BCR = \frac{UIV}{UIC}$$

$$BCR = \frac{271,570,975}{178,293,916} = 1.6 > 1$$

As the calculated value of the benefit-costs ratio 1.6 is higher than 1, it proves that the project is efficient and worthwhile to invest in.

The net present value (NPV) summarizes the investment efforts and effects for the entire lifetime of the project; it

reflects the difference between the total updated income and the total updated expenditures (including updated investment costs UIC).

$$NPV = UIV - (UCV + UIC)$$

$$NPV = 271,570,975 - (178,293,916 + 36,409,066) = 56,867,992.69 \text{ euro}$$

Finally, the accurate determination of the internal rate of return IRR will be carried out by interpolation, according to the equation below:

$$IRR = R_{min} + (R_{max} - R_{min}) \times \frac{NPV(+)}{NPV(+)+NPV(-)}$$

IRR – the internal rate of return;

Rmin - the minimum discount rate;

Rmax - the maximum discount rate;

NPV (+) the net present value, calculated for a minimum rate;

NPV (-) the negative net present value, calculated for the maximum rate.

$$IRR = 4 + (34 - 5) \times \frac{56,867,992.69}{56,867,992.69 - 81,542.87} = 33.95\%$$

In this case, the value of the internal rate of return is high, much higher than the minimal rate (5%), which proves once more, the viability of the proposed project.

The integrated internal rate of return (IIRR) involves the reinvestment of net cash flows at a reinvestment rate different from the IRR. Compared to the IRR, an advantage of this indicator would be the fact that it allows for a more accurate comparison of two competing investment project against a unique net treasury flows reinvestment ratio.

$$IIRR = \sqrt[n_{max}]{\frac{[\sum_{t=1}^n F_t (1+R)^{n-t}](1+RR)^{n_{max}-n}}{I}} - 1$$

I - capital expenditures updated on a specific discount rate

n - the project duration for which IIRR is determined

Ft - the net cash flow for the year t, that may be positive or negative

RR - net cash flows reinvestment ratio

R – the discount rate

n max - the longest lifetime of the projects to be compared.

Using Microsoft Excel, the following IIRR value was calculated for the proposed project:

$$IIRR = 13.59\%$$

The implicit hypothesis of net treasury flows reinvestment during the implementation period of the intended investment target at a higher reinvestment rate that the discount rate R will be highlighted by starting from the classical net present value (NPV) calculation formula that generates a general integrated net present value (INPV) calculation relation:

$$INPV = \frac{[\sum_{t=1}^n F_t (1+R)^{n-t}](1+RR)^{n_{max}-n}}{(1+k)^{n_{max}}} - I$$

I – capital expenditures updated on a specific discount rate

n – the project duration for which IIRR is determined

Ft – the net cash flow for the year t, that may be positive or negative

RR – net cash flow reinvestment rate

R – rate that may be a reinvestment rate if the net cash flows are positive or negative

k – financing costs, if the net cash flows are negative

nmax – the longest lifetime of the projects to be compared.

Using Microsoft Excel, the following INPV value was calculated for the proposed project:

$$INPV = 170,939,290.17 \text{ euro}$$

This value represents the income gathered by the end of the 20 years – lifetime of the proposed waste management scheme that is achieved by reinvesting the cash flows at a 10% - reinvestment rate that exceeds the 5% - capital expenditure discount rate. The income realized at the end of the 20 years – period is significant, considering the investment start-up expenditures amounting to a total of 39,181,901 euro, demonstrating the viability of the proposed project.

$$UINPV = \frac{INPV}{I}$$

$$UINPV = \frac{170,939,290.17}{39,181,901} = 4.36$$

The value of the unitary integrated net present value (UINPV) resulting from the calculations amounts to 4.36 and expresses the profitability of the project per invested currency unit, which means that every 1 euro of the initial investment will yield 4.36 Euro after 20 years of operation.

5. Conclusions

Following the financial analysis, it has been proved that the efficiency of the scheme suitable for this area cannot be conceived outside a recovery circuit for the useful materials contained in household waste (paper/cardboard, glass, metal, and plastics, including the sale of organic waste).

As part of the project, I have calculated the main financial efficiency indicators, which proved the proposed scheme to be efficient. Briefly, these are:

1. The benefit-cost ratio (BCR): a value higher than 1 for this indicator (BCR=1.6) proves that the project is appropriate, because the benefits measured by the present value of all inflows are greater than the costs measured by the present value of all output flows.
2. The net present value (NPV): the value of this indicator (NPV = 56,867,992.69 euro) shows the significantly gain achieved after 20 years of operation of the scheme, so that the capital investment is justified in this project.
3. The internal rate of return (IRR): financial internal rate of return of the project having the value 23.60%, showing a specific of the sanitation investments, which generally generate revenue.
4. The integrated internal rate of return (IIRR): the value obtained for the integrated internal rate of return justify the investment of the capital in the waste management scheme. This value was

obtained reinvesting the cash flows at a reinvestment rate of 10%, higher than the discount rate of 5%.

5. The integrated net present value (INPV): in terms of this indicator, the gain obtains at the end of 20 years is significantly if we consider the initial investment costs and this demonstrates the viability of the project. This value of this indicator was obtained reinvesting the cash flows at a reinvestment rate of 10%, higher than the discount rate of 5%.
6. The unitary integrated net present value (UINPV): the determination of this indicator demonstrates the project's profitability per monetary unit invested in the project. This index is a relative measure of the project's profitability compared to INPV which is an absolute measure.

In conclusion, investing in waste management systems will reduce the amount of waste landfill, because such systems are adequate, they involve collection and recycling that protect environment and public health.

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THE EFFECTS OF THE PANDEMIC ON HUNGARIAN PUBLIC AND PRIVATE ORGANIZATIONS: SIMILARITIES AND DIFFERENCES

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ABSTRACT

At the same time as the closure in early March 2020, global health and economic crisis hit the world. In the first and second parts of our article, we refer to the main social and economic challenges and consequences of the COVID-19 epidemic without claiming to be exhaustive. Researchers in Hungary and Slovakia are working to keep up to date with the economic and social impacts of the pandemic. Thorough and extensive surveys are needed because the image broadcasted by the media is distorted and blurred. All authors of this publication participated in the CoronaHR research examining all waves of the pandemic as well as the chances of recovery. In our paper, we analyze database of the second phase. The main purpose of our investigation is to demonstrate the similarities and differences that can be found between the activities of corporate and HR management in the private and public sectors. Every crisis is also a chance for development. We assume that we will experience positive changes after the pandemic. A relationship based on new foundations and the principle of trust will develop among corporate leaders, human resource management and employees. Innovative methods are expected to come to the fore, the procedure and way of thinking of the public sector, which can be considered traditional at the moment, will also be renewed.

Keywords: pandemic, challenges, companies and institutions, HR activities, opportunities.

JEL classification: O15, E24.

1. Introduction

We are at the beginning of the 21st century, but humanity is already going through a second crisis. The first crisis began in 2007 with the anomalies of the housing market in the USA, and by 2009, economists were surprised to find that the entire world had sunk into recession. Such a situation did not occur since the Second World War [29]. The causes and the right way out of the crisis have been investigated by many researchers, and some of the studies have not yet been completed when the following negative impact on the economy has already occurred.

On 30th January 2020, the WHO declared that the COVID-19 pandemic created the existence of a public health emergency of international concern. Despite the warnings, no government, organization or household was prepared for this epidemic [6]. By March 2020, the virus had spread to Europe to such an extent that it became necessary to change people's daily lives. The majority of the population faced drastic changes. In addition to social distance, many citizens have also experienced that they no longer have to travel to work. Some of them because they were allowed to work from home, while others because they lost their jobs. The disease caused human tragedies; furthermore, mental health problems have been encountered due to the isolated lifestyle [27].

According to Christine Lagarde, a French lawyer and politician, President of the European Central Bank (ECB), we already have reasons to be optimistic. At the World Economic Forum's inaugural Pioneers of Change virtual summit, she said "We were standing on one side of a massive river of uncertainty and hardship... thanks to the tremendous hard work of companies in the US, Germany and other corners of the world we're now seeing the other side of the river" [9].

2. Literature review

In the following section, we review the relevant findings of the literature. Since the beginning of 2020, COVID-19, also known as the coronavirus, has been affecting people's daily lives worldwide [19]. People with COVID-19 have had a wide range of symptoms such as fever, dry cough, and shortness of breath or difficulty breathing, individuals with severe cases of coronavirus may experience more serious bouts of pneumonia [10]. COVID-19 spreads mainly through close contact from person to person by respiratory drops during coughing or sneezing, including between people who are physically near each other (within about one and a half meters) [19]. The pandemic has had a devastating effect on the world economy, the economic indicators of the different countries, and the operation of various businesses. Governments have been unable to develop universally valid, effective mechanisms. Systematic chain reaction can be detected, as a result of which the productivity of a large

number of companies reduced significantly, a lot of firms, especially in the private sector went bankrupt or had to lay off employees [24].

Some researchers studying the economic effects of the virus in Hungary focus on regional differences. In their opinion, as in the case of any other crisis, disadvantaged areas may be the hardest hit by the crisis, as citizens have the least financial reserves, limited employment opportunities and lower levels of education [14].

COVID-19 has an unpredictable impact on social and economic actors worldwide for the time being, in which the issue of work organization can be identified as a major research trend in times of global crisis [23]. Namely, the measures taken to prevent the spread of the epidemic, e.g., the introduction of border locks, traffic restrictions and reductions in public transport capacity in areas such as aviation, mandatory quarantine on entry and exit, restrictions on mass gatherings and compliance with the recommendation of voluntary separation and social contact distances are serious challenges for institutions and economic organizations in the performance of their tasks [7].

Covid-19 has affected the economies of countries, different industries: it pushes the boundaries of health care; significant changes can be observed for industries where supply chain needs depend on China (e.g., automotive, pharmaceutical); education has also been forced to adapt [28]; airlines and the tourism industry is stuck; the impact of declining customer spending in the financial and insurance sectors has become noticeable [17].

Countries are implementing various strategies to curb the spread of the coronavirus, for example by limiting social interactions. The question arises as to what economic impacts these strategies have [13]. Steps and actions need to be taken individually, organizationally, nationally and globally to ensure the safety of people [19]. Organizational workflows need to adapt to government regulations and humanitarian factors [1].

Human resources as human capital is the driving force of organizational development [26]. The Covid-19 situation can also be considered as a dangerous disaster for HRM (human resource management), because the employment of people is also a serious health issue that the organization has to cope with it. From a corporate point of view, an outstanding employee becoming infected is an also serious problem. If an employee becomes confirmed to have COVID-19, the affected department or possibly the organization may be shut down. During this time, the company's productivity and market share may decrease, so the danger of the virus is significant both humanly and financially [19].

Organizations are increasingly recognizing the need to be more flexible and innovative in matters related to unexpected human resources (HR) issues, such as the outbreak of infectious diseases (e.g., COVID-19 [3]).

Other renowned researchers focus on the fact that every crisis is also an opportunity from which companies can gain experience that will allow them to recover and operate successfully again. The appropriate measures of human resource management and the organizational innovation

initiated by them play a particularly important role in this current situation. Exploring the relationship between the crisis, corporate management and HR management will bring us closer to decide which path to take in the future. Three possible directions are outlined [21].

- Return to normal pre-crisis situation.
- Development of completely new methods.
- Creating a better solution than before [21].

Some of the measures were taken only under compulsion, while others were forward-looking. One of these is working from home, as not all activities require personal presence at the company. A Swedish study found that the negative benefits of working from home are declining performance, the increasing workload, and the deterioration of well-being. Among the positive impacts we can mention that employees can sleep as much as they need, and it points in the direction of the improvement of their physical condition [11]. Similar problems may arise in Hungarian companies, the solution may be an appropriate combination of personal presence and teleworking.

Working at home requires digital competencies. This means not only technical knowledge but also a form of behavior. People who can ethically use the opportunities offered by the World Wide Web are able to do their job properly. Such colleagues are adequately able to evaluate information gathered from social media, use the World Wide Web to increase their knowledge, and are proficient in electronic administration. In the labor market, these digital competencies have become more valuable during the pandemic [18]. Proper management of IT tools is important for efficient work, but we must not forget to maintain and develop our communication skills.

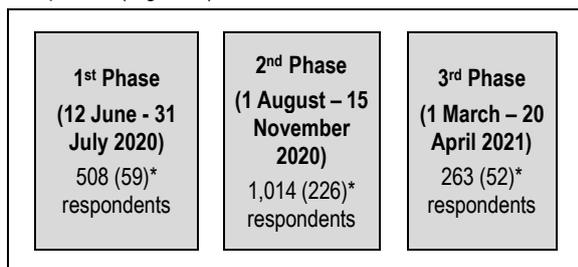
The COVID-19 pandemic has shown that supply chains are extremely vulnerable. There are several reasons for the problem, on the one hand the closure of borders, on the other hand the transformation of demand and the difficult situation of the partner companies. Innovative thinking, producing new products and finding new markets can provide a solution. Increased attention must be paid to compliance with public health standards when building new relationships [8]. Products and services developed in a state of emergency can bring significant benefits to businesses even in the post-crisis period.

The involvement of certain industries is different, the tourism and hospitality industry suffered particularly severe damage worldwide. These are mainly non-state-owned organizations. A Chinese study highlighted that small and medium-sized enterprises were in the most hopeless situation. The authors believe that restarting is not possible for all businesses without state support. Eliminating anomalies in the labor market also requires time and financial support. To replace the number of employees, market wages are needed. Entrepreneurs in difficult situations cannot provide it on their own, they need state assistance. The investigation also identified the need for a differentiated aid scheme [12]. Although our social system somewhat differs, the findings of the study can be adapted to the situation in Hungary.

A multi-phase study called CoronaHR research, led by Professor József Poór is being carried out by the cooperation of a Slovakian and fourteen Hungarian universities. The authors of this publication are all part of this large-scale project. The first three phases were related to the waves of the pandemic, examining corporate and human resource management measures. Hopefully, the fourth phase of the research will already study the path and methods of recovery from the crisis. In the first three waves of the pandemic, we discovered certain trends, demonstrate changes in management and human activity [21]. It can be assumed that the PDCA cycle also exists concerning crisis management. Specialists appointed to eliminate problems we have to make plans, implement them, and then, after checking the effectiveness, make some necessary adjustments. In addition to the general trends, we review the similarities and differences that private companies and state institutions showed during the second wave of the pandemic.

3. Aim, research methods and hypotheses

The following section describes the purpose, methods and hypotheses of our research. The paper focuses on a narrower area of data analysis. We aim to show what differences and similarities were observed in the second phase of the epidemic in the case of involvement and response in private and public sectors. In addition to our four statistically verifiable hypotheses, we also examine a hypothesis that can be verified with the help of the literature. Some elements of the systematic review were selected from the pre-pandemic period, while control elements were chosen from articles examining the effects of the pandemic. For statistical analysis, we used the database of the second phase of the CoronaHR research mentioned before [21]. The study was conducted from August to the middle of November in 2020, with the participation of 1,014 companies (Figure 1).



* number of total and public sector respondents

Figure 1. Three phases of our online CoronaHR surveys

We used the Standard SPSS program for the analysis, and our tables and figures were created using Microsoft Excel. In the course of the analyzes, we first present the distribution of the sample, followed by the summary compiled from crosstab's analysis. Finally, the hypotheses are proven or possibly rejected. Based on our research and previous experiences, we have set up the following hypotheses.

H1: Based on the experience of the last decades, before the crisis there were significant differences in the HR activities of the private and public sectors, especially about innovative

HR methods: performance appraisal, organization of training, flexible working hours [20]. During the crisis, the difference between the human resource activity of private and public companies decreased.

H2: Declining domestic and foreign demand and supply chain disruption caused fewer problems for public sector organizations.

H3: Organizations in the public sector were better prepared for the pandemic situation and better defended themselves.

H4: The private sector is more pessimistic about economic expectations and unemployment in Hungary.

H5: The public sector is working harder to retain the workforce, but the situation of employees has deteriorated.

4. Empirical research

The main features of the sample collected with the help of several contributors are described below. We had 1014 respondents and we allowed some questions to remain unanswered. Thus, the number of respondents is indicated in each case. The table reflecting the distribution of organizations by owner is the most important factor for our current study (Table 1). Using these data, we divided the entire sample into the public and private sectors.

Table 1. Proportions of the public and private institutions

	n	%
Public institutions	226	22,29
Domestic private companies	476	46,94
Foreign and mixed companies	280	27,61
Nonprofit organisations	32	3,16
Total	1014	100

Businesses vary widely in terms of the number of employees and turnover. Few organizations are operating without employees, as well as micro-enterprises, most of them are large companies. Small and medium-sized enterprises are similarly represented (Table 2). Because the proportion of the element is different from the actual distribution in Hungary, our sample cannot be considered representative. However, this sampling rate is quite adequate to provide a realistic representation of employee involvement.

Table 2. Number of employees and the annual revenue

	n	%		n	%
No employees	31	3,1	< 50 million Ft	217	22,0
1-9 employees	177	17,5	51 - 100 million Ft	102	10,4
10-49 employees	217	21,5	101 - 500 million Ft	165	16,8
50-250 employees	218	21,6	501 million - 2,5 billion Ft	175	17,8
251-500 employees	89	8,8	2,51 - 25 billion Ft	149	15,1
501-2000 employees	141	14,0	25,1 - 100 billion Ft	77	7,8
2000 employees	137	13,6	> 100 billion Ft	100	10,2
Total	1010	100,0	Total	985	100,0

Comments: 1 Euro is 351 HUF (Ft)

We received responses from all sectors of the economy, with a huge number of large and retail businesses (Figure 2). Other areas of services are also significantly represented. These are the following.

- Accounting, business, architectural, engineering, scientific research, consulting;

- Education, culture, public education, performing arts;
- Accommodation services, hospitality tourism;
- Manufacture of food products, beverages, textiles, wood and paper products.

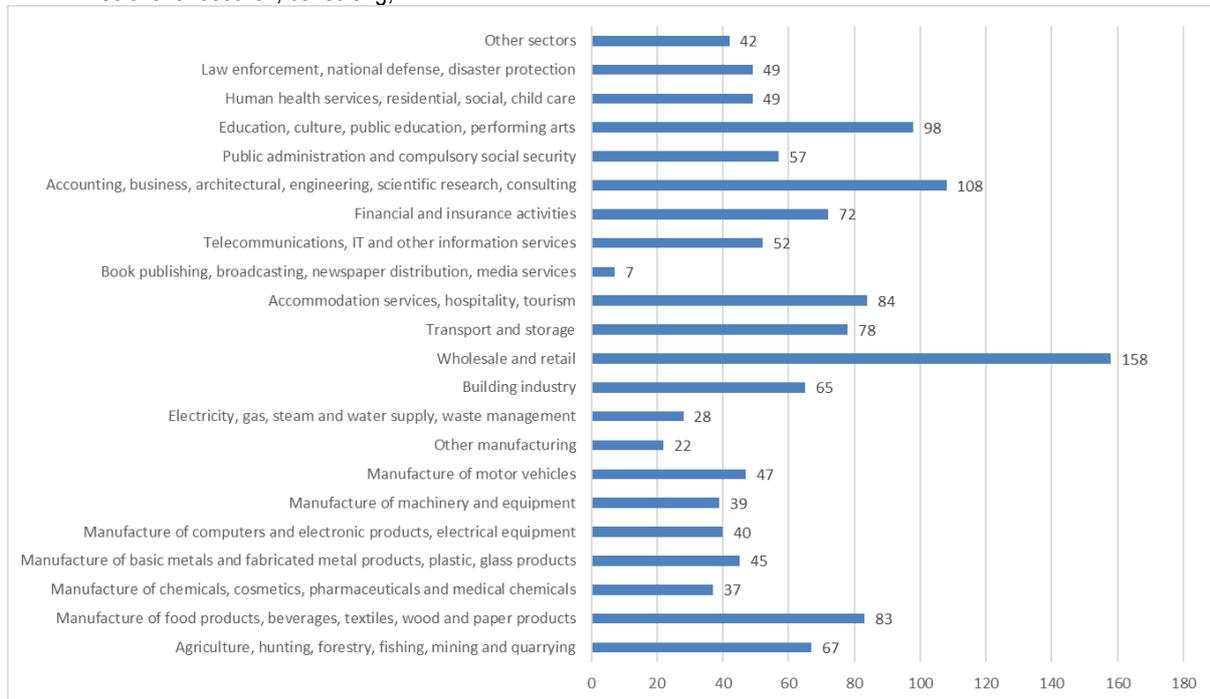


Figure 2. Number of responding organizations in the different economic sectors

Despite the appreciation of human capital, a large number of organizations still work without an HR department. In the case of 25.5%, some people perform coordination tasks, but in the case of 9.5%, more than 30 people are already involved in labor matters (Table 3). In the case of larger companies, the owner or manager of the organization is no longer able to implement either human-resource-related administrative tasks and human functions (recruitment, selection, performance evaluation, workforce retention, remuneration management, human controlling, talent management, knowledge management).

Table 3. Number of employees in the HR organization

	n	%(n=969)
Without HR department	457	47,2
1-5 employees	247	25,5
6-10 employees	84	8,7
11-30 employees	89	9,2
30 employees	92	9,5
Total	969	100,0

We checked the similarities and differences between the public and private organizations using crosstab's analysis. We found a significant difference (n = 977, p <0.001) in terms of whether the respondent was part of a company or an entire organization. There were fewer sub-organizations in the private sector. We found no significant difference

between the annual budgets of the two sectors (n = 985, p = 0.097). We found a higher number of employees in state-owned companies (n = 1010, p <0.001). There was no difference in atypical employment (n = 1009, p = 0.175).

We found that the private sector was more prepared for the crisis, the existence of the action plan was more typical (n = 1012, p <0.001). In the case of existing or later developed action plans, significantly more organizations prepared the document themselves in the private sector (n = 902, p <0.001).

Table 4. Expectations and redundancies at the respondents' organizations

Expectations and redundancies at the respondents' organizations				
	Private companies	Public companies	Number of respondents	Significance
Duration of the recession	no difference		1010	0,112
Unemployment in Hungary	more pessimistic	more optimistic	1012	0,033
Sectoral unemployment	more pessimistic	more optimistic	1012	<0,001
Revenue	more optimistic but hectic	more pessimistic	1011	<0,001
Number of employees (2020)	more redundancies	less redundancies	1014	<0,001

Concerning expectations, Table 4 is summarized several questions. There was no significant difference in the assessment of the length of the recession period between the two sectors. Regarding sectoral unemployment and unemployment in Hungary, the public sector was more optimistic and reported fewer redundancies. Private companies were more optimistic about their revenues, and the assessment presented a high standard deviation. This is due to the different situations of the industries.

The decline in domestic and foreign demand and the disruption of supply chains typically caused more trouble for the private sector. Public companies were less affected by these problems, their services were still needed, and we hypothesized that their supply chain was also largely made up of the members of the public sector so that stable public companies served each other (Table 5).

Table 5. External factors mediating the impact of the crisis

External factors mediating the impact of the crisis				
	Private companies	Public companies	Number of respondents	Significance
Declining of the domestic demand	more typical	less typical	990	> 0,001
Declining of the foreign demand	more typical	less typical	969	> 0,001
Introduction of a curfew	no difference		981	0,157
Supply chain disruption	more typical	less typical	974	<0,001
Other factors	no difference		526	0,139

Although there were fewer redundancies in state-owned enterprises, according to Table 4, in many respects employees were more severely disadvantaged than in the private sector (Table 6). Several employees were forced to take their annual leave due to lockdown and faced a higher health risk. According to management, their work-related burdens have increased. It became harder to balance work and personal life and get to their workplaces. There is no difference between the two sectors in terms of family burdens, company closures, unpaid leave and declining income.

In the next section, we summarize the information obtained statistically or collected from the literature in connection with our hypotheses. Four of our five hypotheses can be tested by relying on the database using qualitative methods. In addition, however, we have a hypothesis that we try to prove qualitatively and based on the literature. Looking back to the pre-pandemic times, we did not see any innovative solutions when observing the tasks of human resource management in the public sector. In contrast, in the private sector, atypical employment, personal development training, personalized motivation and a culture of trust have come to the fore due to the growing labor shortage. These organizational solutions of the XXI. century also appeared in state-owned companies during the pandemic. It is suggested to study the literature to see what is written on the subject.

Table 6. Burdens of the employees

Burdens of the employees				
	Private companies	Public companies	Number of respondents	Significance
The company ceases its operation.	no difference		998	0,339
Employees must take their annual leave.	less typical	more typical	991	> 0,001
Employees must take unpaid leave.	no difference		990	0,125
Employees face more health risk.	less typical	more typical	992	<0,001
The family income is decreasing.	no difference		990	0,072
Burdens at work are increasing.	less typical	more typical	990	<0,001
Family burdens are increasing.	no difference		987	0,122
It is more difficult to get to work.	less typical	more typical	991	<0,001
It is more difficult to reconcile work and private life.	less typical	more typical	991	0,005

Atypical employment in the public sector was not typical in the early 2010s. However, the demand from workers and EU directives have necessitated the development of rules. Spread is a slow process, and managers find it difficult to agree on solutions. However, it would have a positive effect on employment, and therefore on the macro-processes of the whole country, if people with travel difficulties worked from home, people with disabilities and pregnant women worked part-time, and employees with other tasks worked flexible hours. Examining the courses and training, we cannot deny that there are innovative solutions, leadership training, coaching and competency development training. However, the problem is based on the participation rate. 5.4% of the respondents' subordinates and managers were present at the leadership personal development training, while 7.3% took part in the coaching training. In the field of law enforcement, the ratio is slightly higher, but there the relationship between managers and subordinates and also between customers and service providers are more complex and diverse. There is an urgent need for professionals with the right personality who communicate according to the needs [25].

The motivational procedures used in the public sector in the past were based on performance appraisal. For such models, it is easy to make a mistake, as mathematical formulas need to be set up and individual and group performance may need to be weighted. There is always dissatisfaction with the procedure used, sometimes they are accepted less than the independent motivational and reward decisions of managers [22].

The HR function was already transformed in the first phase of the pandemic. In addition to administrative duties, they were responsible for the supervision of life and health safety measures and had to organize work from home. They had to ensure that enough people were available, however, it was important to focus on long-term planning [16]. As the listed tasks occurred at companies in both the private and public sectors, this suggests that the difference between the activities of human resource management of the two sectors has decreased.

During the pandemic, the order of risks companies has to face changed. Organizations are preparing to restart their operation, and that requires the best workforce. The risk is whether they can acquire and retain talented employees. Based on KPMG's 2020 HR Pulse research, talent risk preceded eleven other elements in the order of the importance of risks [4]. State-owned companies that monitor

risk management and can respond to changes have been forced to modify their human strategy, measuring the workforce, not in terms of quantity but in terms of knowledge.

Companies in the public sector include passenger and freight transport enterprises. During the COVID-19 pandemic, the labor market in the transport sector has been developed very interestingly. Certain tasks related to traffic safety cannot be performed in case of the absence of special education and a successful examination. Therefore, despite the release of many potential workers, their retraining and examination is a long and not always successful process. The innovative solutions, internship programs, internal retraining and in short, innovative way of thinking of the human resources department can help. Rethinking the following areas could modernize HR management in the transport industry [2].

- Opening up to women (workforce diversity);
- Opening up to young people (workforce diversity);
- Opening up to foreign guest workers (workforce diversity);
- Retraining;
- Redeployment of employees;
- Internship work;
- Teleworking, digitization [2].

Table 7. Summary on hypotheses

Number	Módszer	Proven - details	Partly proven - details	Disproven - details
1.	Systematic review	Based on the experience of the last decades, before the crisis there were significant differences in the HR activities of the private and public sectors, especially with regard to innovative HR methods: performance appraisal, organization of trainings, flexible working hours.	During the crisis, the difference between the human resource activity of private and public companies decreased. Organizations in public sector have been forced to change. Firms that failed to do so have been placed at a disadvantage.	
2.	Crosstabs analysis	Declining domestic and foreign demand and supply chain disruption caused less problems for public sector organizations.		
3.	Crosstabs analysis			Organizations in public sector were better prepared for the pandemic situation and better defended themselves. Emergency strategic plans are usually available against the threat of terrorism.
4.	Crosstabs analysis	The private sector is more pessimistic about economic expectations and unemployment in Hungary. On the other hand, the private sector is more optimistic about the revenue.		
5.	Crosstabs analysis		The public sector is working harder to retain the workforce, but the situation of employees has deteriorated. In most aspects, the situation is worse but, in some cases, there is no difference (family income, unpaid leave and family burdens).	

Redundancies affect the company's existing and required core competencies in long term [15]. In the section about crosstab's analyzes, we have already found that redundancies are less common in state-owned companies. Perhaps the modern principle of retaining existing knowledge capital has prevailed.

Employee satisfaction surveys are very important for management researchers. These show that employees of privately- owned companies are more satisfied [5]. The human management of public organizations is forced to renew itself if it seeks to maintain the amount of knowledge capital mentioned above.

According to our literature, the first part of our hypothesis is true, the human management of the public sector has used less advanced, innovative methods. The pandemic generated changes. We cannot prove in what percentage of organizations the transformation took place or to what extent. However, we can state that in the absence of renewal, the human resource activity of the public sector faces serious problems in the long run. Therefore, our first hypothesis can be considered partially justified. Table 7 summarizes our findings for all hypotheses.

5. Conclusion

We briefly summarize the most important findings of our research. Using a large but not representative database, we examined the activities of human resource management in the private and public sectors during the second wave of the pandemic. Using qualitative and quantitative methods, we found interesting findings of similarities and differences. First and foremost, the urgent task of human professionals in the public sector is to apply innovative solutions, because otherwise, the organization may lose its competitiveness and knowledge capital in the long run.

The network contacts of the public sector allowed the companies to continue to manage their operation with minimal disruptions and sources of supply even during the pandemic. Organizations have less frequently developed a strategic plan for health threats in the public sector. It is more typical to comply with the current legislation and to follow the state regulations. Private sector expectations about Hungarian and sectoral unemployment are more pessimistic, while their future revenues are, on average, more optimistic than state-owned companies.

In the second phase of the pandemic, public organizations sought to retain the workforce, but this had a negative impact on the deterioration of the working conditions of employees. Workers of state-owned companies were more likely to have to take their annual leave, their health risks and workloads increased, they found it harder to get to work, and they had difficulties with balancing work and private life.

The limitation of our study is that it only examines the second phase of the pandemic situation. As a future option, we would like to mention that the statistical analysis presents interesting results in addition to the contexts listed in the publication, so it provides an opportunity to research other perspectives as well. There is also the possibility to analyze

the introduction and application of innovative HR methods as well.

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IDENTIFYING TANGIBLE AND INTANGIBLE BENEFITS FOR IMPLEMENTING AN ORGANIZATIONAL IMPROVEMENT PROJECT: A CASE STUDY APPROACH

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ABSTRACT

The cost-benefit analysis (CBA) is an economic model suitable for measuring the present and future benefits and costs, both tangible and intangible. Although this is a well-known model, it is not so popular in the literature regarding general issues on organization and project management, as it is in other fields, such as construction and health. This paper presents an empirical study of the benefits as part of the CBA for a Romanian company that produces mural painting and that is part of a project funded by the European Union. The aim of this paper is to identify the benefits and costs of such a project and categorize them according to the literature. The results show an impressive number of intangible benefits and costs. Finally, we proposed a list with possible categories of benefits for organizational improvement projects.

Keywords: cost-benefit analysis, benefits, organizational improvement project, case study.

JEL classification: M20.

1. Introduction

Cost-benefit analysis is a very useful instrument for analyzing a current or future project. This analysis allows project's stakeholders to compare project costs with benefits, so they can decide if it is worth to invest. Even though the theory sounds great, the practice is not so easy. First of all, there are some domains of activity, such as construction and health, where cost-benefit analysis is widely used, so anyone trying to perform a cost-benefit analysis for a specific case has models to look at. But this is not the case for organizational improvement projects. Then, the person doing the cost-benefit analysis should be a trustworthy person that takes care of investors interests. It also should have specific knowledge of the field and economic knowledge. It might seem something simple to compare costs with benefits, however the process of identifying the costs and benefits, then to evaluate them and to monetize them, is a challenging process.

The present paper aims to present first of all from a theoretical point of view, the cost-benefit analysis, with a main focus on benefits. For the theoretical section, namely the literature review, we decided to divide it into two main sub-sections, as follows: a first general section on cost-benefit analysis, and the second on benefits. The project analyzed in the practical part of this paper consists of a

project aimed at organizational improvement, but it is also an investment project, being funded from European Union funds. Returning to the literature review, in that section we included theoretical aspects of cost-benefit analysis, such as definitions, critiques, components, with emphasis on benefits and categories of benefits, and models for implementing such an analysis. From a theoretical point of view, there are many sources that focus on cost-benefit analyzes, but the difficulties arise when this analysis must be performed for a field in which it has not been performed before. In the methodology we presented the chosen methodology, namely qualitative, and the chosen method is the case study. The tool for data collection is primarily the unstructured interview, but also various documents provided by company representatives. In the results section, we presented the information obtained, more precisely the benefits resulted from the project. Based on these data, we have proposed a list of benefits that should be considered when conducting a cost-benefit analysis for an organizational improvement project.

2. Literature review

2.1. CBA overview

Cost-benefit analysis is one of the most used decision support tools, being considered a rational and systemic tool (Djukic et al., 2016). The purpose of this analysis is to allow the identification, quantification and comparison of the consequences of an investment project or in general of different alternatives of resource use (Djukic et al., 2016; Mishan & Quah, 2020). These consequences are in fact costs and benefits. As examples of costs, we have the costs of purchasing and maintaining equipment, purchasing new programs, training courses for employees, etc. The benefits are the expected returns and can be either in the form of improvements or cost reductions. Both benefits and costs can be quantifiable (tangible) and non-quantifiable (intangible) (David et al., 2013).

In the literature there are two types of cost-benefit analysis: ex-ante analysis and post-ante analysis. The ex-ante cost-benefit analysis takes place in the period prior to the activity itself and is an analysis that helps to make the decision on carrying out a certain activity. For post-ante cost-benefit analysis, named also retrospective CBA (Boardman et al., 2017), this is done immediately after the implementation of the solution or after the completion of the activity and is used to evaluate the solution or activity (Turečková & Nevima,

2020). Beside these two types, there is also another type of analysis, specific for long-term projects. In medias res CBA or post-decision analysis are conducted after the project has begun, but before it is complete. This type of analysis can be conducted any time after the project has begun (Boardman et al., 2017).

There are two other types of cost-benefit analysis in the literature, categorized according to the elements included. So, there can be a financial analysis or an economic analysis. The first one includes only financial cost and revenues, as its aim is to calculate the financial efficiency of the project. The second type, the economic analysis, includes all direct and indirect benefits, for all stakeholders involved, not just for the investors (Kampová et al., 2020).

Despite the fact that this methodology is appreciated and considered useful, it has been much debated over the years, and many authors have criticized this analysis. Bardal (2020) and Jones et al. (2014) are just a few of the authors who identified after reviewing the literature several criticisms of cost-benefit analysis such as difficulties in quantifying and monetizing costs and benefits, measuring benefits and costs, subjectivity in the analytical process, difficulties in understanding and interpreting this analysis by various stakeholders, and others.

2.2. Benefits

Starting from the premise that costs and benefits are difficult to quantify and monetize, we have looked in the literature for sources that address benefit management, in order to clarify how to quantify and monetize them. Chih & Zwikael (2015) define the benefits of a project as "The target benefits are those established for a proposed project before it starts, with the expectation that they will be realized at the end of the project." During the literature review for their study, these two authors highlighted other relevant aspects related to the benefits. Here are some of them:

- Formulating and evaluating the benefits of a project are challenging tasks, as the benefits are often dynamic and can mean different things to each category of co-stakeholders;
- The benefits of a project should be established before establishing the expected results of the project, as they should be established in close connection with the strategic objectives of the organization;
- Most of the benefits set for a particular project are very vague, so it is difficult to determine whether they have been achieved or not.

The same two authors (Chih and Zwikael 2015) proposed in their study a conceptual framework containing criteria for evaluating the benefits of a project. These are:

- Strategic framing - Benefits must fit into the organization's strategy;
- Target value - You must have a baseline, a target value with a specific direction, be it positive or negative;
- Measurability - Benefits must be measurable by using either a direct measure or an indirect indicator;

- Realism - Be realistic, given the context in which the organization operates and its constraints;
- Target date - You have a set date for each benefit;
- Liability - Establish an owner / benefit manager;
- Comprehensiveness - Consider a variety of aspects, for example, encompass both financial and non-financial benefits, or encompass both operational, tactical and strategic benefits.

In their study, Lappe & Spang (2014) have analyzed the relationship between benefits and costs for project management. In terms of benefits, they divided them, from an economic point of view, into benefits with quantitative effects and benefits with qualitative effects. The first category of benefits are divided into two categories: directly quantifiable monetary measures (e.g., profit) and indirectly quantifiable monetary measures (e.g., time measures). On the other hand, the benefits from the two mentioned categories (qualitative and quantitative) can be divided and related to the organization versus project, so we have benefits related to the organization and benefits related to the project. From the category of benefits related to the organization we can give as an example the higher motivation of employees, and from the category of benefits related to the project we have as an example the increased transparency in project control. The two authors (Lappe & Spang, 2014) also made a figure that includes the components needed to calculate the rate of return on investment (ROI) for project management. In their figure, the benefits have been divided into quantitative and qualitative benefits.

Table 1. Quantitative and qualitative benefits

Quantitative benefits	Qualitative benefits
<ul style="list-style-type: none"> • Time savings; • Rationalization; • Cost savings. 	<ul style="list-style-type: none"> • Systematics; • Transparency; • Efficiency; • Competitiveness; • Employee satisfaction; • Customer satisfaction.

Source: Lappe & Spang, 2014

Shang & Seddon (2002) proposed in their paper a list of benefits categories for enterprise systems, while Indulska et al. (2009) proposed a similar list for business process modelling. Although the present study is focused on an improvement project or investment project, some of these categories are also valid. The dimensions and subdimensions of possible benefits proposed are presented below:

Table 2. Proposed benefits for enterprise system

Dimensions	Subdimensions
Operational	1.1 Cost reduction 1.2 Cycle time reduction 1.3 Productivity improvement 1.4 Quality improvement 1.5 Customer service improvement

Managerial	2.1 Better resource management 2.2 Improved decision making and planning 2.3 Performance improvement
Strategic	3.1 Support for business growth 3.2 Support for business alliance 3.3 Building business innovations 3.4 Building cost leadership 3.5 Generating product differentiation 3.6 Building external linkages
IT infrastructure	4.1 Building business flexibility for current and future changes 4.2 IT cost reduction 4.3 Increased IT infrastructure capability
Organizational	5.1 Changing work patterns 5.2 Facilitating organizational learning 5.3 Empowerment 5.4 Building common vision

Sources: Indulska et al., 2009; Shang & Seddon, 2002.

Based on the categorization proposed above, benefits for organizational improvement projects will be presented in the findings section.

3. Methodology

A case study approach seemed to be suitable for this study. The chosen organization is an organization from Romania, that has as main activity mural painting. Data collection was performed through the semi-structured interview. Myers (2013) considers that this type of interview tries to combined both structured and unstructured interviews advantages, and eliminate their disadvantages. According to the same author, a structured interview provides comparability across cases, but it limits the obtained information, as the interviewer does not explore the insights emerged during interviews. As regarding unstructured interviews, the interviewee has the freedom to talk as much as he wants and to talk about anything he thinks it is important. For the interviewer this might results in having to participate in interviews that lasts for hours and gathering much but useless data. The semi-structured interview prepared for this study had few questions, better said were kind of topics for discussion. Firstly, there were questions about the company and its activity. Then, questions about the project they are involved in, and finally, questions about costs and benefits regarding the project. The data collection was made through an interview with the company's owner, then a discussion with the company's accountant, which also gave us a lot of accounting documents. Then, after creating a draft for costs and benefits, we asked the company's owner to provide more information by answering some specific questions in writing.

The organization was established in 2017. Its main activity is mural painting, especially church mural painting. Starting with 2018, the company is part of a project financed by the European Union, which we consider a sort of organizational

improvement project for the company. Through this project, the company has some benefits, as follows: work sessions with specialists, process analysis in order to improve the processes, the techniques, the methods, the materials, but also the methods of production, sales and promotion of results, knowledge transfer improvement and purchase of equipment, inventory items, working tools, consumables necessary for carrying out the activity. The information obtained through interviews and other ways will be presented in the next section.

4. Findings

Based on the research of Indulska et al. (2009) and Shang & Seddon (2002), we tried to identify which of the benefits categories proposed by them for the enterprise system, respectively, for business process modelling can be adopted for organizational improvement project. From the dimensions in Table 2, only IT infrastructure examples weren't identified during interviews. Still, the lack of IT related benefits is not something specific for organizational improvement project, but in this case is related to the particularities of the analyzed organization. Also, there wasn't any examples for operational – customer service improvement, managerial – performance improvement, strategic – support for business alliance, strategic – building business innovations, strategic – building cost leadership and strategic – generating product differentiation.

The examples of benefits identified during the interview and discussions are presented in the table below and they are already categorized accordingly.

Based on the information in the table above, the following conclusions can be made:

- The benefits regarding operational activities are an important category, although in the analyzed case weren't any examples for customer service improvement;
- Our recommendation is to combine cycle time reduction and productivity improvements subdimensions into one;
- The customer service improvement should remain as an optional dimension, just if it's the case;
- The managerial dimension is an important one for organizational improvement projects, but the performance improvement subdimension can be analyzed only for the organizations that are using key performance constantly;
- The strategic dimension is important for more experienced and larger companies. This was not our case, and this is why there aren't many examples in this section; Subdimensions should be kept depending on the analyzed organization;
- IT infrastructure could be important for specific cases.

Finally, the organizational dimension is the most important category for organizational improvement project, as the aim of this projects is to change the way the organization works. For this dimension, examples were provided for each subdimension.

Table 3. Identified benefits for organizational improvement project

Dimensions	Subdimensions	Examples from the interview
Operational	1.1 Cost reduction	54% of gross salary for the 4 new employees is paid by the project Sample testing of materials by the chemistry team
	1.2 Cycle time reduction	Utilization of new materials after the feedback received from the sample testing Improving the pace of work due to new materials and the increased number of employees
	1.3 Productivity improvement	
	1.4 Quality improvement	Improved details and shadows of the paintings
	1.5 Customer service improvement	-
Managerial	2.1 Better resource management	Integration and training of the new employees
	2.2 Improved decision making and planning	More organization inside the company Dealing with strict deadlines
	2.3 Performance improvement	-
Strategic	3.1 Support for business growth	New employees Risk reduction with the employees Courage to experiment new things
	3.2 Support for business alliance	-
	3.3 Building business innovations	-
	3.4 Building cost leadership	-
	3.5 Generating product differentiation	-
	3.6 Building external linkages	With the university and its researchers
Organizational	5.1 Changing work patterns	Planning and deadlines
	5.2 Facilitating organizational learning	Trainings for the new employees
	5.3 Empowerment	Courage to implement new ideas
	5.4 Building common vision	The new employees are students now, but they are being prepared in order to be full-time employees

5. Conclusions

As it was previously mentioned in the abstract and introduction section, for construction projects or health related project there are plenty examples of cost-benefit analysis. Our interest for this project was an organizational improvement project and we found out that there is a lack of cost-benefit analysis for type of projects. Even more, the project analyzed was implemented by an organization that creates mural paintings. So, there was no other option for conducting cost-benefit analysis, but starting from scratch. However, during the interview and discussion, we found out that organization obtains many benefits following this project, but many of them are difficult evaluate and monetize. Finally, what we tried to do through this article, is to find a way to classify the benefits for organizational improvement projects, in order to be easier to identify and evaluate them. We discovered that the categories of benefits proposed for the enterprise system and for business process modelling are suitable for organizational

improvement projects. Although this study is based on only one case, it provides evidence that the dimensions and subdimensions of benefits proposed by (Indulska et al., 2009) and (Shang & Seddon, 2002) can be used when analyzing organizational improvement projects. Further research should test this idea on multiple case study and should go further to monetize the identified benefits.

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TAX BURDEN MANAGEMENT IN A GROUP OF COMPANIES

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ABSTRACT

It is generally accepted that the tax burden of an individual company is the part of income withdrawn in favor of the state in the form of taxes and fees. The tax burden of the company is usually in the range of 20-40%. Similar figures are given in the OECD reports on the tax burden on the economies of countries. However, the tax burden of companies operating in a group may exceed 100%. And such an excess can persist over several reporting periods.

We study the financial statements of agricultural holdings in Russia and identify the reasons for the high tax burden of individual companies included in the consolidation perimeter in accordance with IFRS. As a result of the study, we come to the conclusion that in matters of managing the tax burden in a group of companies, the central issue is ensuring a balance of cash flows.

Keywords: tax burden, taxes, group of companies, IFRS and management in holdings.

JEL classification: H22, H25, M40, Q14.

1. Introduction

In the modern world, there is a tendency towards business enlargement, aggregation of individual companies into groups. This process is international (Ng, 2014) and there can be completely different reasons for this. Group affiliation is a prominent feature of many public corporations. For example, when foreign markets are associated with high transaction costs, group affiliation is a cheaper mechanism compared to pure diversification at the firm level in managing business operations (Claessens et al., 1999). This process gives rise to the need to reform national legislation in the field of accounting and taxation, to improve approaches to conducting economic analysis in groups.

The list of IFRS and international auditing standards provides for separate standards governing reporting and auditing in groups: the existence of groups as independent business units is recognized by international standards. At the same time, the methodological foundations for conducting economic analysis in groups are not sufficiently developed. This is also true for tax analysis, in particular - for analyzing the tax burden of groups of companies.

Wide opportunities for tax optimization and tax evasion in groups of companies, in particular, the use of offshore zones (Maffini, 2012, Clausing et al., 2021) and features of transfer pricing (Nurwati et al., 2021), increase the importance of this issue: it is necessary to develop approaches to the analysis

of the tax burden in groups of companies, both for business purposes and for purposes of tax control.

Assessing the tax burden in a group of companies is a non-trivial research task. Within groups of companies, rights to assets are distributed in different ways and the ownership structure of subsidiaries is built differently. The management decisions taken within the group can have an impact on a significant increase or decrease in the tax burden of the group's companies, which, in turn, has a significant impact on the financial stability of individual companies and the group as a whole.

The purpose of this study is to identify the applicability of existing methods for assessing the tax burden to groups of companies. To do this, we will follow these steps:

1. choose and justify the calculation methodology;
2. calculate the tax burden of companies belonging to one group;
3. analyze the level of the tax burden of the group companies and the reasons that influenced it.

2. Related literature

The analytical value of the tax burden indicators is simultaneously in their application for the purposes of internal tax analyzes and external tax control.

There are several approaches to calculating the tax burden. The integral indicator is most widely used to calculate the tax burden. It is defined as the ratio of the amount of accrued or paid taxes to total income. Most researchers agree that this indicator reflects the share of the withdrawal of company revenues to the state budget (Giday et al., 2020, Sedláček, Němec, 2018), and meets the information needs of internal and external users of the analysis. At the same time, the tax burden can be defined through effective corporate tax rates (Maffini, 2012, Armstrong et al., 2012). And it can also be viewed as the aggregate amount of taxes and contributions (Casal et al., 2016).

The discussion is the question of the list of taxes and other obligatory payments that need to be included in the calculation. Some sectoral obligatory payments significantly affect the tax burden of organizations (Rota-Graziosi, G., & Sawadogo, F., 2021). Industry features, including the composition and structure of tax payments, significantly affect the level of tax burden (Shen et al., 2021).

To assess the tax burden in Russia, the most widely used is the method of Federal Tax Service of Russia, which considers the tax burden as the ratio of the amount of taxes

and fees paid to the amount of income generated on the accrual basis.

Based on the literature review, it is possible to conclude that the main problem is that the industry features of the composition and structure of tax payments affect the tax burden of organizations, generating strong fluctuations. Such fluctuations can be observed within the business groups, including participants from different sectors of the economy. In addition, it is necessary to unify approaches to the calculation of the tax burden to consider further comparisons. Other approaches to the management of the tax burden of business groups should be offered.

The following sections include a modified approach to the calculation of tax burden indicators in business groups that have high analytical value, both when making management decisions by the business groups themselves and for external tax control purposes.

3. The study of intragroup disparities in the level of tax burden

3.1. Methods

In this work, the indicators are calculated using the methodology of the Federal Tax Service of Russia, which assumes that the tax burden is the ratio of the amount of fulfilled tax obligations (determined on a cash basis) to the amount of income from core activities generated on the accrual basis. The methodology can be criticized for the fact that the figures in the numerator and denominator of the fraction are not comparable, since taxes for the 4th quarter of the current year are usually paid next year. However, the main point of this methodology is to compare the amount of tax liabilities fulfilled during the year with the scale of the company's activities (in terms of revenue).

In addition, despite the shortcomings of this methodology, currently the industry average indicators of the tax burden calculated by the Federal Tax Service of Russia are the only source of statistical data with which companies can compare their own indicators of the tax burden.

Thus, the methodology is convenient to use when comparing companies with each other and with industry average values. The application of another method is also difficult, since publicly available information is only information about the amount of taxes paid, but not the accrued tax liabilities.

To calculate the tax burden, we use data from published financial statements, as well as open data from the Federal Tax Service of Russia on the amount of taxes paid by companies. Since individual reporting in Russia is prepared in accordance with national standards, we will use the data from this reporting. However, we will determine the list of companies that need to be included in the group according to the rules for determining the perimeter using the IFRS 10 methodology.

We use the concept of control stipulated by IFRS 10, according to which the business group includes the parent company (investor) and several other companies

(investment objects) that are controlled by it. Control takes place when:

1. investor has authority in terms of investment object;
2. the investor is subjected to risks associated with variable income from participation in the investment object, or has the right to receive alternating income from participation in the investment facility;
3. the investor has the opportunity to use his power to influence the value of alternating income (change, maintain, protect revenues).

The indicators of the tax burden according to the methodology of the Federal Tax Service of Russia are calculated using the formula 1:

$$TB = \frac{T}{TI} \times 100\% \quad (1)$$

TB – tax burden;

T – taxes paid;

TI – total income.

Next, I compare the actual indicators of the tax burden with the industry average indicators given in the Transparent Business service of the Federal Tax Service of Russia, taking into account the scale of activity of each company, the main type of economic activity and the constituent entity of the Russian Federation in which economic activity is conducted. The average value of the tax burden for all companies in the group is determined by the formula 2:

$$\overline{TB} = \frac{\sum_{i=1}^n T}{\sum_{i=1}^n TI} \times 100\% \quad (2)$$

\overline{TB} – average tax burden;

$\sum_{i=1}^n T$ – total taxes paid;

$\sum_{i=1}^n TI$ – total income of the group.

When calculating the average group indicators, intra-group turnovers by revenue are not excluded, since if they were excluded, the comparison would be incorrect: in accordance with the legislation of Russia on taxes and fees, each company is considered as an independent taxpayer, even if it is included in the group.

After that, I compare the average tax burden for the group as a whole with the hypothetical average tax burden that would occur if the burden of each company in the group remained at the industry average level. To calculate the hypothetical average value of the tax burden at a level not lower than the industry average, we use the following formula 3:

$$TB_{hyp.} = \frac{\sum_{i=1}^n T_{hyp.}}{\sum_{i=1}^n TI} \times 100\% \quad (3)$$

$TB_{hyp.}$ – a hypothetical value of the tax burden, calculated on the assumption that the tax burden of each element of the business group is at the industry average level;

$\sum_{i=1}^n T_{hyp.}$ – the amount of taxes and fees paid, excluding the amount of corporate income tax on dividends and personal income tax, for all economic entities included in the

business group, which would hypothetically be paid if the tax burden of each element of the business group was at the average industry level (calculated by multiplying the amount of actually received income by the indicator of the industry average tax burden);

$\sum_{i=1}^n TI$ – the amount of income, determined according to the data of the Income statement, excluding the amount of income from participation in other organizations, for all companies of the group.

Additionally, the indicator of profitability of sales and the indicator of the tax burden on operational cash flows are considered.

The hypothesis that we put on the study is as follows: the tax burden of an individual company of a group of companies can be either unreasonably high or unreasonably underestimated, in this regard, it is necessary to analyze the tax burden of the entire group, but not separately for each component of the group.

3.2. Study of intra-group disparities in the level of tax burden and profitability of an agro-industrial group

We chose the agro-industrial group AGROKOM as the object of our research, which is the Russian holding that operates in food industry, in the retail network in Southern federal region, and also owns media assets.

The structure of the agro-industrial group under consideration in the study period (2019) includes 35 enterprises that operate in the following areas:

- animal husbandry and meat processing;
- crop production (greenhouse);
- fish farming (fishery business complex);
- production of plastic packaging;
- production of bottled artesian water;
- management of own and rented property;
- production of paving slabs and improvement elements.

In addition to the specified areas, the ultimate beneficiary is the founder or co-founder of organizations in other areas (including the tobacco business).

We have segmented the group's companies and analyzed the Livestock and Meat Processing segment. Such segmentation is necessary because the structure of taxes paid differs significantly depending on the sectors of the economy. And the calculation of the average value of the tax burden for the holding as a whole would be incorrect. To determine the composition of the group, we used the consolidation criteria in accordance with IFRS 10.

In the selected segment, the following companies operated in the period under study:

- Management and investment companies – No. 1-5;
- Manufacturing and sales enterprises (livestock, meat processing, sales) – No. 6-10.

We calculated the tax burden by formulas (1) - (3) and obtained the following results (Fig. 1). To provide a visual

presentation of data on the diagram, the company No. 5 is not represented. Its tax burden is more than 100%.

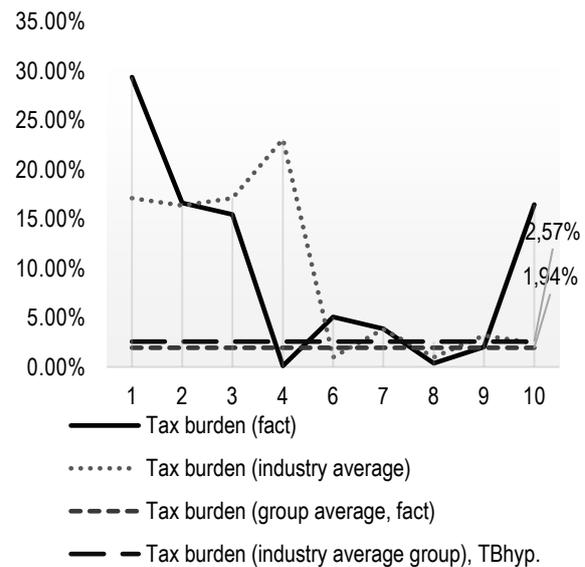


Figure 1. Fluctuations in individual tax burden ratios (2019), %

Conducted calculations demonstrate explicitly expressed disproportions of individual indicators of tax burden, as well as their essential (more than 10% module) deviation from:

- industry average values;
- group average ratio (1.94%);
- hypothetical value of the tax burden (2.57%).

We can also observe that the companies included in the group with the same types of activities and identical scale demonstrate multidirectional deviations from medium-wide values (for example, Company No. 1, No. 3 and No. 5, or Company No. 6 and No. 8). There is no overall trend in the nature of deviations.

Table 1. Individual and average tax burden indicators (2019), %

No.	Tax burden (fact)	Tax burden (industry average)	Absolute deviation*	Relative deviation*
1	29.38	17.11	12.27	71.73
2	16.62	16.36	0.26	1.60
3	15.46	17.11	-1.65	-9.65
4	0.10	23.09	-22.99	-99.55
5	7568.93	17.11	7551.82	44136.87
6	5.05	0.98	4.07	415.55
7	3.86	3.82	0.04	1.17
8	0.38	0.98	-0.60	-61.51
9	2.02	3.18	-1.16	-36.34
10	16.45	2.41	14.04	582.70

*TB (fact) from TB (industry average)

Such fluctuations (let's call them - the effect of "saw") show that inside the company group, similar to formal signs, can play different roles and have a different level of profitability. The presence of oscillations does not allow us to conclude a tendency to change the tax burden in a group of companies, assess the level of tax risks.

Calculated deviations of individual tax burden indicators are presented in Table 1.

At the same time, a decrease in the tax burden of one company with a high probability leads to an increase in the tax burden at another company. This explains the colossal level of the tax burden of the enterprise No. 5, which is due to the large tax on land (43% of the total land tax paid by all companies No.1-10).

Structural analysis of tax payments demonstrates the uneven distribution of types of tax payments by type of company (Fig. 2).

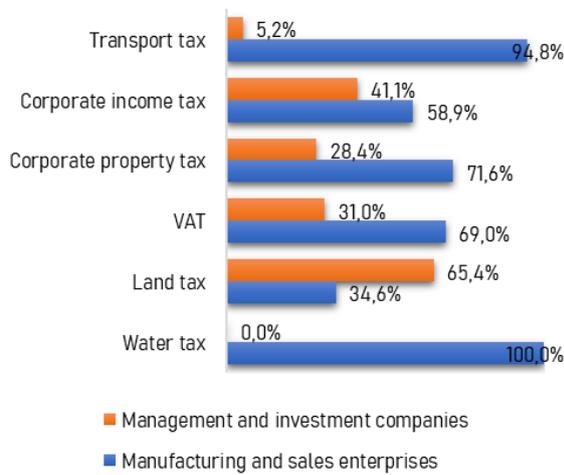


Figure 2. Distribution of fiscal payments by type of company (2019), %

As can be seen from the presented graph, the share of manufacturing and sales companies accounts for only 58.9% of the paid corporate income tax; however, these companies in 2019 generated 96.3% of revenue and 94.3% of total revenues.

It should also be noted that 65.4% of the land tax paid falls on management and investment companies, at the time, other companies use these lands, not those carrying land tax load - livestock and meat processing enterprises. To a significant extent, the share of land tax attributable to management and investment companies is influenced by the tax burden of company No. 5.

The return on sales of the companies of the group is also uneven. The profitability of sales of the companies of the group is also uneven (Fig. 3-4).

Negative profitability is observed in companies No. 3, 5, 7, 10, of which companies No. 7 and 10 are manufacturing enterprises.

Significant fluctuations in the tax burden and return on sales of individual companies of the group are largely due to internal management decisions. Out of 10 companies in the Livestock and Meat Processing Segment, 5 enterprises are

engaged in production and sales activities (livestock, meat processing, retail), and 5 companies have the main types of activities in Renting, Venture Capital investment etc. (Table 1). There is no doubt that the management and investment companies that are part of the group would not exist separately from it. The functions assigned to management and investment companies could be performed by structural divisions of an enterprise conducting production and sales activities. However, using the right to independently build the structure of the business, the owners made a number of management decisions, which resulted in the current structure of the group.

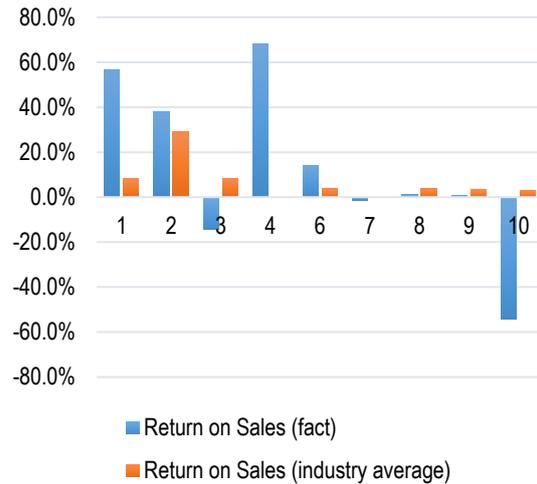


Figure 3. Return on Sales (2019), %

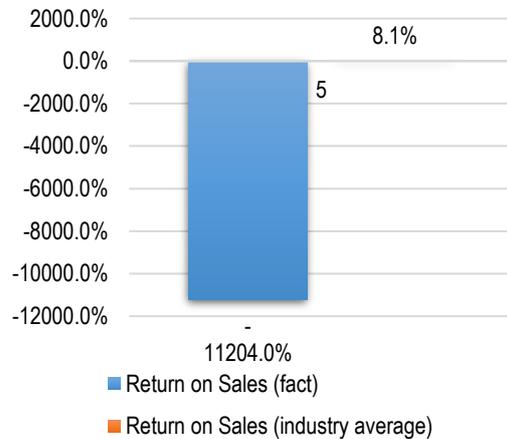


Figure 4. Return on Sales of the company No. 5 (2019), %

To determine the source of payment of taxes we refer to the structure of cash flows and estimate tax burden on operational cash flows.

So, the lack of income from operating activities to pay taxes is observed at once in several companies of the group (Fig. 5).

However, the most significant excess is observed in company No. 5.

Analysis of the financial position of company No.5 gives the following results. According to the financial statements of company No. 5, the main source of cash receipts is

obtaining loans and borrowings (100% of the volume of receipts from financial transactions). The proceeds from current activities are not sufficient either to meet the obligations to pay taxes, or to fulfill other obligations in full. Thus, the situation that is observed for company No. 5 indicates the complete financial dependence of the company on borrowed sources and the inability to withstand the high tax burden without constantly receiving new loans.

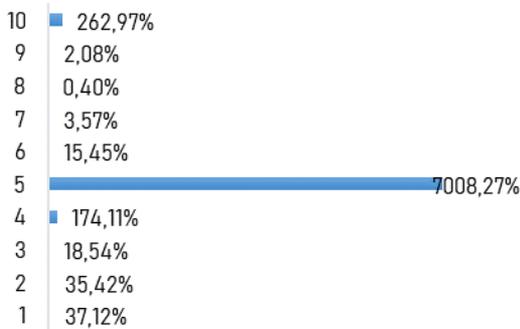


Figure 5. Tax burden on operational cash flows (2019), %

It is obvious that permanent financing of company No. 5 is possible only by the companies of the group, since in market conditions an external investor would have claimed the funds back, which has not actually happened since at least 2016. There are financial statements for the period 2016-2020, according to which, since 2016, loans have been increased without repayment (Fig. 6).

Every year, the company's short-term borrowed funds in the balance sheet increase by the amount of loans received and the amount of accrued interest payable, but neither interest nor the body of the debt is repaid.

Based on the available data, it is impossible to accurately determine the lender of enterprise No. 5. However, if the lender is not the parent company (for which tax benefits are provided), but another company of the group, then these operations for the permanent provision of loans within the group must be analyzed from the perspective of tax risks.

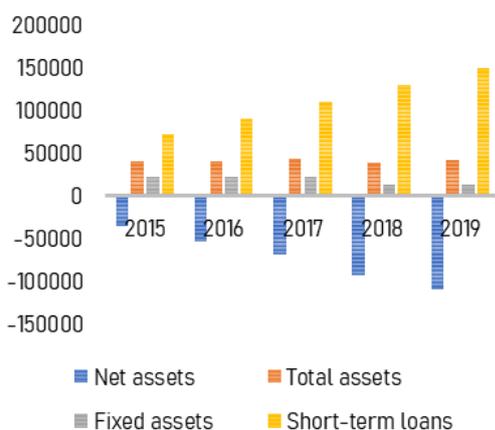


Figure 6. Indicators of the financial position of the company No. 5, thousand rubles

Additional risks are the fact that company No. 5 does not have enough assets to pay off its liabilities. Thus, this company, bearing a huge tax burden on land tax, which is due to the presence of a large number of land plots on the

balance sheet, cannot pay off its debts with the lender, even transferring these land plots to him to pay off the debt.

At the same time, since company No. 5 annually receives a loss already at the stage of profit (loss) from sales, the group as a whole receives an overrun of income tax, since the lender includes in income the interest accrued to be paid.

Individual companies, operating in market conditions and having the main goal of their activities to make a profit, are not able to withstand such a high level of tax burden for a long time. The companies of the group, on the contrary, are able to withstand the multiple excess of tax liabilities over the amount of income as long as they can receive financing from other companies in the group in the form of short-term and long-term loans, which are often not returned.

4. Conclusions

In the current research the object of the study is a segment "Livestock and meat processing" of an agro-industrial group, which includes 10 companies. The group for analysis included 5 production and sales companies and 5 management and investment companies. However, the results obtained can be considered independently of the industry, since they are due to the nature of intra-group ties, and not to industry specifics.

The calculated indicators of the tax burden of individual companies of the group deviate from the industry average level to varying degrees, there are both significant and insignificant deviations. The most significant deviation is the 442-fold excess of the tax burden relative to the industry average level. Thus, there is no general trend in the change in the tax burden indicators.

There is no general trend in the change in the return of sales too. The calculated indicators of return of sales deviate from the industry average level in modulus by 1.27% - 11212.14%.

Of particular interest is the indicator of the tax burden on the cash flow, which in some cases demonstrates the inadequacy of cash from operating activities to fulfill the obligation to pay taxes.

It can be concluded that significant fluctuations in the indicators of the tax burden and return of sales of individual companies of the group are due to the structure of the group and the management decisions taken.

The hypothesis formulated in this work is confirmed: the tax burden of an individual company of a group of companies can be either unreasonably high or unreasonably underestimated, in this regard, it is necessary to analyze the tax burden of the entire group, but not separately for each component of the group.

The tax burden of groups of companies is currently calculated using the same methods as the burden of individual economic entities. At the same time, one of the features of the group is the shifting of the tax burden within the group from one economic entity to another. So, for example, the creation of a separate company within the group, which acts as the holder of the group's main assets (land plots, real estate, intangible assets, etc.), leads to the

fact that most of the property taxes are accumulated at one enterprise, although in reality other companies of the group can also use the property. In other situations, on the contrary, the companies of the group may strive for an even distribution of the tax burden, which would be unattainable if all participants were separate independent economic entities.

The foregoing means that it is advisable to analyze the tax burden of each individual company in the group, but it is not enough to assess the total tax burden of the group, identify the sources of covering tax expenses and implement tax control measures.

The research shows following results.

1. We observe intra-group disparities in the level of tax burden and profitability of individual companies within the group.
2. It is necessary to calculate and analyze the tax burden as a whole for the group. Traditional methodological approaches to tax burden analysis are not suitable for analyzing the tax burden of companies that are part of a group.
3. Analysis of the tax burden of individual companies demonstrates the results of already adopted management decisions of the group in terms of optimizing the tax burden. Furthermore, analyzing the intra-group disparities in the level of tax burden and profitability, can yield results in identifying tax evasion.

The development of a methodology for calculating and analyzing the tax burden in business associations is based on the following principles:

- consistency in the organization of accounting processes at all level;
- priority in studying the impact of the tax burden on cash flows;
- implementation of mechanisms for drawing up consolidated financial statements in accordance with IFRS, which is now selective for groups of companies in Russia;
- ensuring a unified understanding of the list of tax liabilities (if the organization operates in several tax jurisdictions, then the same payment may be treated differently by the tax codes of different countries).

An important aspect is the nature of the links between the companies of the group, the composition of the founders and the structure of ownership of assets. If there are co-founders, one or more of whom are third parties who have nothing to do with the group, it should be borne in mind that part of the tax burden is shifted to them. In addition, it should be borne in mind that investment objects that are included in the consolidation perimeter can be acquired in the middle of the year. Accordingly, in absolute terms, the annual tax burden of an individual economic entity and the amount of its tax burden attributable to the annual tax burden of the group into which the economic entity entered in the middle of the year may differ.

It should be noted that fluctuations in individual values of the tax burden, demonstrated in this paper, to some extent smoothed at the level of the group as a whole (system effect). In particular, for the whole group, it does not matter which company is carrying a load on property taxes, since the amount of tax remains the same regardless of this. However, for a particular member of the Group, additional tax burden may significantly worsen financial indicators.

This does not mean that the analysis of the tax burden in the group of companies should be carried out exclusively through consolidated indicators. Such an approach leads to the loss of control over the tax burden of the Group's participants and entails the risks of the occurrence of cash gaps, tax risks.

The proposed approach has limitations in application. It can be applied to calculate, analyze and manage the tax burden of commercial business groups that have the main purpose of its activities to make profit, functioning in the real sector of the economy. Features of taxation, as well as differences in the structure of assets, liabilities and capital, income and expenses of business groups of other sectors of the economy, were not considered in this study. These features can be considered in subsequent research.

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THE NATURE OF INITIAL ENTREPRENEURIAL IDEAS: ARE ENTREPRENEURIAL OPPORTUNITIES RECOGNIZED OR CREATED?

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ABSTRACT

The debate concerning whether entrepreneurial opportunities are recognized or created has for many years divided the entrepreneurship research. Based on multiple cases analysis in the IT industry, in this article we prove that for IT start-ups the initial trigger for business development can be identified in multiple other areas than the traditional entrepreneurial opportunity recognition.

Entrepreneurs' personal preferences such as wanting to continue working with a former team after a previous business got bankrupted, finding a destination for some warehouse space of another business, or simply wanting to make a difference in the world are all cases where the nature of the initial entrepreneurial ideas is not much related to making money. In some cases, initial entrepreneurial ideas are neither related to solving problems or using existing solutions, as previously classified in literature.

These results mainly prove that entrepreneurship ideas emerge in relation to the efforts of entrepreneurs and are not always associated with the existence of major opportunities in the market. In such cases, initial entrepreneurial ideas are later refined and opportunities could be considered that are rather created than recognized.

Keywords: opportunity recognition, entrepreneurial opportunity, digital entrepreneurship, initial entrepreneurial ideas.

JEL classification: L26, O31.

1. Introduction

We define initial entrepreneurial ideas (IEI) as ideas entrepreneurs have just before launching their ventures. Previous entrepreneurship research has shown the heterogeneity of the causes and the complexity processes of entrepreneurial opportunity (EO) discovery and creation (George et al. 2016), but has less acknowledged the EO exploitation due to lack of agreement on the measurement of the two constructs (George et al. 2016; Kuckertz et al. 2017), due to the lack of qualitative studies in general in entrepreneurship research (Suddaby, Bruton, and Si 2015), as due the fact that capturing entrepreneurial actions is a more challenging task than observing the creation or discovery nature of EO (Jones and Barnir 2019).

IEI is part of the EO, considering the beliefs-actions-results alternative model of EO proposed by (Foss and Klein 2018), and it represents the ideas (beliefs in the model) about the present, possible future, and about entrepreneurs' abilities to bring various possible futures (Foss and Klein 2018) before starting the business.

IEI has also been documented in literature as recognized patterns by entrepreneurs, or cognitive prototypes (Baron 2006) which later influence entrepreneurs' actions and results (Baron 2006; Foss and Klein 2018). Concerning initial entrepreneurial beliefs and ideas impact on product innovation, there are few cases which associate the innovation process with initial entrepreneurial beliefs, as the analysis of business models and opportunity creation evolutionary analysis performed by (Ojala 2016), or the papers presented in the special issue concerning opportunity recognition and creation (Garnsey and Hang 2015), which recognize the complexity and environment related initial idea recognition and formation.

To explore IEI, we focus here on a particular conceptualization of EO content dimensions - problem identification and solution existence. These dimensions have been initially introduced in entrepreneurship literature by (Ardichvili, Cardozo, and Ray 2003), and later mentioned in relation to entrepreneurial opportunities as means of supply and market characteristics (Grégoire and Shepherd 2012), market and technology characteristics (Lee and Lee 2017), or just problem and solution absorptive capacity (Saemundsson and Candi 2017).

Based on identifying the IEI for 15 start-up initiatives, we have tested whether entrepreneurial opportunities are recognized entirely before launching ventures, or are later created by entrepreneurs. Since we have considered opportunities as fully recognized when both problem identification and solution existence are identified, more start-up initiatives have started without having a complete IEI defined, concerning the problem, the solution, or both, as further presented.

The next section of the paper details the theoretical background, while the third section presents the methodology we have followed. The fourth section is a summary of the findings, and the last section concludes.

2. Theoretical background: entrepreneurial opportunities, ideas, and venture development

2.1. Entrepreneurial opportunity, idea and entrepreneurial exploitation-exploration

Entrepreneurs are defined by their ability to identify and exploit opportunities (McMullen and Kier 2016). Opportunity identification is the foundation of all entrepreneurial endeavors as according to (Bagger 2019) opportunities and their identification are part of the defining start of the entrepreneurial process. There are various determinants of opportunity identification and, as (Davidsson 2015) shows, studies on the matter have grown rapidly in the last years, starting from the study of (Shane and Venkataraman 2000). For instance, (Gielnik et al. 2012) tackle the idea of creativity concerning opportunity identification and explain how divergent thinking correlates with the number and originality of generated business ideas. Wang et al. found that elements such as self-efficacy, prior knowledge, and social networks determine opportunity identification in the case of managers. Similarly, the idea can be extended to entrepreneurs. (Vandor and Franke 2016) links OI to cross cultural experiences and (Tuomisalo 2019) states that entrepreneurial opportunity results from the information-seeking behavior, while other (Hsieh, Nickerson, and Zenger 2007) root it in the process of searching problems to solve. Furthermore, opportunity identification also has a cognitive behavior component linked to the negative influence of a narcissistic personality on the learning process (Liu et al. 2019), and even to personal metrics such as a good night sleep (Gish et al. 2019). The later shows how a good night of sleep positively influences entrepreneurs' abilities to perform cognitive tasks at the very basis of entrepreneurial pursuit. More authors explore the psychological side of OI, showing that active information search compensates for a lack of entrepreneurial experience enhancing the effects of divergent thinking and general mental ability on opportunity identification (Gielnik et al. 2012). (Davidsson 2015) underlines the need for fundamental re-conceptualization of the OI structure in order to include external enablers, new ventures ideas, and opportunity confidence. Taking the matter one step further, (Scheaf et al. 2020) studies the opportunity evaluation process and concludes that opportunity attractiveness consists of gain estimation, loss estimation, perceived desirability, and perceived feasibility as distinct dimensions underpinning attractiveness. Following the opportunity identification process, entrepreneurs move on to the exploitation phase. Exploitation is combined with the exploration into the ambidexterity of the strategic approach of entrepreneurs (Vrontis et al. 2019). (Hou, Hong, and Zhu 2019) explores the relationship between the exploration and exploitation at different stages of enterprise development and in different competitive contexts, not only in the case of start-ups.

2.2. Initial entrepreneurial idea

Entrepreneurial opportunity concept, understood as "positive and favourable circumstances leading to entrepreneurial action" (George et al. 2016), is recognized as central in entrepreneurship research (Saemundsson and Candi 2017). The initial major debate on the opportunity origin - whether opportunities are recognized/discovered or created - is in our view predominantly solved since latest articles recognized the existence and the iterative and cumulative nature of the two processes of opportunity recognition and creation (Ardichvili, Cardozo, and Ray 2003; Jones and Barnir 2019; Suddaby, Bruton, and Si 2015).

There still are debates about the nature of EO and whether opportunity as a concept should exist (Foss and Klein 2018), since EO exists only after entrepreneurs become successful, while during their evolution there are only business ideas, plans or beliefs. Beliefs are defined here as rather initial ideas about the present, possible future, and about entrepreneurs' abilities to bring various possible futures (Foss and Klein 2018). While this model breaks down EO into beliefs, actions, and results, this categorization could be as well be made between IEI – initial entrepreneurial ideas (before launching the venture beliefs and ideas) and later EO content (actions and results, as well as new beliefs and ideas emerged from the entrepreneurial process). Given the entrepreneurship literature inconsistency, IEI is sometimes defined even as the EO concept itself: "we define entrepreneurial opportunities as consisting of a set of ideas and beliefs about how to create economic value and appropriate returns through innovation" (Saemundsson and Candi 2017).

IEI content has been previously described in literature considering two dimensions regarding the origin of the EO: market needs and value creation capabilities (Ardichvili, Cardozo, and Ray 2003), or, in general, technology. Based on these two dimensions, (Ardichvili, Cardozo, and Ray 2003) established that initial opportunities can be "dreams" (both market needs and technology are known), problem solving (market needs known, technology unknown), technology transfer (market needs unknown, technology known), and business formation (both categories are known). These dimensions are somehow recognized by recent literature, since problem and solution are found in different forms related to entrepreneurial opportunities: opportunity identification is made considering supply (product, service, business model or technology) and market characteristics by (Grégoire and Shepherd 2012), business opportunities are divided largely into market-based and technology-based (Lee and Lee 2017), as entrepreneurial absorptive capacity is classified as problem or solution related (Saemundsson and Candi 2017). Though (Ardichvili, Cardozo, and Ray 2003) have proposed this model for opportunity identification almost twenty years ago, the impact of the initial EO content on entrepreneurial outcomes has been rather sparsely analysed. It is recognized that EO has not been adequately conceptualized in the literature of business model creation and development (Ardichvili, Cardozo, and Ray 2003; Ojala 2016). In a study which considers founders team background (not IEI

content), it has been found that the technology knowledge of ventures' initial founding teams is associated with explorative innovation strategies (exploration of technical possibilities and technical problem-solving), while the less technical knowledge background of ventures' founding teams is usually associated with exploitive innovation strategies (reactions to customer needs, while fine tuning the technologies (Saemundsson and Candi 2017). (Ojala 2016) considers that entrepreneurs' perceptions and assumptions (IEI in our terms) is the base for the business model creation phase, the first phase of entrepreneurs' theory of business model creation and evolution. In his case study, IEI is described in terms of market and technology knowledge and is rather dominated by uncertainty since the market and technology are both unknown, and determines the creation of a simple and non-functional business model. This emerging research on EO and IEI content and its poor connection to the business literature demonstrates the importance of analysing IEI.

3. Methodology

To identify the sources of IEI, we analyzed 15 computer software firms operating in Romania, this analysis being part of a larger project concerned with analyzing their innovation patterns. All the involved software firms have been recently launched (they are between 1 and 14 years old), and have

a small size (they have between 1 and 30 employees). We have used semi-structured interviews with one of the original firms' founders or important decision makers at the beginning of 2019. The interview guide had a section concerning the background of the company and of its founders, this section being the main part of all transcribed interviews we have analyzed for identifying initial entrepreneurial ideas in terms of problem known and solution known. Based on the answers for the question concerning their initial idea, coding was made considering the two dimensions (problem and solution) established by Ardichvili et al. (2003). The results are summarized in Table 1.

4. Findings

The next table presents the results of our study. Based on detailed analysis of each interview transcript, we have identified the relevant quotes mentioned by each company representative concerning their initial entrepreneurship idea. Later, we have performed an interpretation of their initial idea, and an analysis concerning the existence within the initial entrepreneurial idea of a problem to be solved or a solution for a problem, the two elements which together form an opportunity according to (Ardichvili, Cardozo, and Ray 2003):

Table 1. Summary of the results

Case	Relevant quote for IEI	IEI short interpretation	Is the problem identified known?	Is the solution known?
Air software	We went and have searched the market, but products which were on the market did not cover what we wanted, and then I said that maybe it's a good time to develop our own solution.	No solution addresses the current needs of the market.	Yes	No
Financial solutions	Our goal is to come up with solutions. To find solutions. At least that was it for me. To find large-scale solutions that even come with an impact.	We create breakthrough solutions.	No	No
ERP ecosystem	For a year I wrote architecture, without writing any line of code, but having in mind to create a service that is agnostic about the country, taxation, absolutely anything.	We know in detail the problem and the solution – the result of our previous activity.	Yes	Yes
Innovators	We no longer wanted to be mere executors. We want to be more. We want to innovate.	We want to innovate based on our outsourcing experience.	No	No
Play innovation	There were three students from polytechnic university and two from another university for 3 months and we had to give them work We put on the board a series of ideas after which we select one and start working on it. That's how the solution was born.	We play as innovators for internship students.	No	No
Small real estate software	As a business, this thing has started as a tool I needed for the real estate market... And I made a tool for myself...	I will make a tool for myself.	No	No

Case	Relevant quote for IEI	IEI short interpretation	Is the problem identified known?	Is the solution known?
Photographs	I worked in financial audit for five years and I saw a lot of business models... This has encouraged me to make a plan for myself... starting from the need to digitize the ordering / design process, printing and editing. ... We started in 2014 due to the stimulation that the then government created the first financing program dedicated to small and medium enterprises.	We will make money as others do. We copy a product which exists in a different market and see what happens.	Yes	Yes
Medium real estate software	I also had discussions with my friend from Switzerland ... after eight years the previous solution could not cope with newer demands, the needs being much more diversified, we wanted to attack the bigger customers, but the solution we had could not cope. From here we decided to make an application ... see which one to apply in Romania...	I take one solution from the Swiss market and adapt it for the Romanian one.	Yes	Yes
Large real estate software	And one of them, my former boss, saw what was behind this platform, practically the backend from another solution, and he said... give it to my company, to adapt what I did for this rental area, to adapt for sales and many large properties, and so the new company was founded ...	We create real estate solutions based on our experience.	Yes	Yes
Simulation software	Out of a personal need, I wanted to learn about digital marketing and I was not satisfied with any solution I found at the time... I have collaborated and continue to collaborate with a company from Scandinavian region, ... in which I learned some things, I have also learned from the Dutch and some of them spilled out in the Romanian company as well.	I have a problem while learning digital marketing, but I have identified a solution which I could transpose as a new business.	Yes	Yes
Security solution	My problem was on the GDPR side and studying the market a bit, everyone was crazy about the GDPR but if you go a little deeper into the market... We specialize in this, on data collected through web technologies. And that's what we do. Protect.	We use technologies that we know to solve new market problems related to GDPR.	Yes	Yes
Online logistics	It was the threat of books ... and then I said ... well, no ... let's do something else because at the previous business I had acquired knowledge of what it means to bring goods, from England I brought, to bring goods from England, a part to be on stock, some not, some of the orders are collected later, some ... you know you had an order for 5 books ... 2 were in stock, 2 were coming in a week and one in 3 weeks ... I had to make decisions to see what to do... Do you deliver partially or not? Talk to the customer ... And I said let's use all this know-how and offer these logistics services to other online stores. So that's how we have started.	We should use the knowledge and resources from a previous business.	No	No
ERP solution	Developing that company, he found that he needed a system, or a system that would make them work more efficiently, so that's where the idea came from for him to build a system, initially to cover the needs of the company he had.	We solve a problem in our business - customer communication.	No	No
Sketches	Yes, and our previous organization didn't have funding from an event contest and the startup closed. Startups come and go ... it's okay. We stayed on the premise that we would do something at some point to work together again. Initially we kept discussing all kinds of project ideas, mobile applications and so on and we noticed so that there is a kind of difficulty in expressing our ideas visually and practically that's how it was born ... The first idea the first idea being an application in to be able to upload the design and to be able to receive feedback from potential future colleagues for the new projects and on that ...	We will do something together because we like the start-up culture and we like to work together.	No	No

Case	Relevant quote for IEI	IEI short interpretation	Is the problem identified known?	Is the solution known?
Restaurants' order	I was very frustrated with serving restaurants and I tried to make this product before with another team but nothing materialized and Lucian had a restaurant about 6 years ago and saw that it was very difficult with the serving process.	We finally create a solution for a problem that I know in detail due to our previous experiences.	Yes	Yes

Similar to the results provided by (Ojala 2016), it is obvious that IEI are under the sign of uncertainty. Out of 15 cases, 7 do not know in detail the problem of the market and neither have a solution prepared, but they are willing to launch a business due to different reasons: to solve individual problems (Small real estate software) or business problems (ERP solution), to keep working together (Sketches), to better use the existing knowledge and resources of a previous business (Online logistics), to create breakthrough solutions (Financial solutions), or just to see how it is to create products and businesses and not just to do outsourcing (Innovators and Play innovation). Most start-ups entrepreneurs have information technology background, and this experimentation with creating a business without having too much knowledge about the solution or about the market seems an affordable solution for them. On the other side, there is a single company in our group which knows only the problem of the market (Air software), while the others have invested time in better refinement of both solution and problem (for example Restaurants' order is the continuation of a previously failed business, Security solution is a new business opportunity for a company which knows well the market and has the technologies to take advantage of it, Simulation software and Large real estate software ideas' are the result of many years of individual search and tries of different products). It is thus obvious that ventures have been launched at different levels of IEI maturity. Some IEI could be rather considered as immature, while some have strong background.

5. Conclusions

We began this research with the aim observe the nature of initial entrepreneurial ideas, the ones entrepreneurs have before launching their businesses. We have found that the entrepreneurial opportunity as previously defined by (Ardichvili, Cardozo, and Ray 2003) is rather a more complex concept in comparison to initial entrepreneurial ideas. These IEIs are rather dreams and mental frameworks entrepreneurs have before launching their businesses. For sure these dreams and mental frameworks are deeply rooted into entrepreneurs' existence, experience and knowledge, as they have a certain level of maturity at different time moments. As we have observed here, if we consider a mature IEI in terms of both problem and solution existence, it is obvious that about half of the analyzed companies have been started when IEI were mature. The others have their IEI developed and reorganized during start-ups' existence. Opportunity recognition has been considered for many years the ground step in venture

creation, but in our research, entrepreneurs prove that opportunity can be created through a series of factors, experiences, motivators and personal goals when IEI are mature. Entrepreneurs do not always create venture solely to make money. In some cases, such as the ones we described, opportunity in venture creating is rooted in very personal preferences and desires such as wanting to continue working with a group of friends, finding a destination to some spare warehouse space or creating a software tool for personal use. Opportunity creation usually comes after the entrepreneurs have reached a certain level of expertise in a field, not necessary in their own business, and are capable of high resilience. The limitations of this research refer to the number of respondents, but also to the fact that we targeted a single industry. Future research directions in this field may include testing quantitatively, not only qualitatively, using a larger sample of young small and medium size enterprises in multiple fields to see if their initial entrepreneurial ideas are rooted in recognised opportunities or in created ones. Also, research may be conducted on post-pandemic shifts in initial entrepreneurial ideas.

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CSR, REGULATION, AND MARKET ABUSE: A NOTE ON THE US WESTERN POWER CRISIS

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ABSTRACT

CSR and regulation can play a lead role in preventing manipulative behaviours, insider trading, and illicit operations in financial markets. It makes no exception the Western power crisis occurred in 2000-01 in the US, characterised by few dominant energy utilities and operators, whose actions were condemned by the US Courts. To investigate these circumstances, this research note emphasises the CSR measures and regulations applied to stem the US market abuses and the power crisis. The analysis confirms that both the enforced CSR and regulation were ineffective or tardive, as indicated by the regulatory investigation, the literature, and recursive operations that happened in the following years. Nevertheless, it is found that CSR and regulative instruments can be decisive in yielding virtuous behaviours that would eventually avert upcoming abuses and crises. Such an elaboration may support greater enhancement of the use of CSR tools in the managerial implications of policy and spread awareness for the citizen-consumer.

Keywords: CSR, regulation, Western power crisis, energy markets, economic analysis of law.

JEL classification: G14; G18; M14; Q4.

1. The 2000-2001 Western power crisis

1.1. The Western power crisis explained

In 2000-2001, Enron and other operators conducted market manipulations in the electricity markets of California and further Western states of the US (CBO, 2001). Following the Federal Energy Regulatory Commission (FERC) investigations, there were published Enron Memo (Murphy et al., 2014). There, 11 strategies, emerged on targeted transmission lines, were detected (Yoder and Hall, 2000; FERC, 2003). The emergencies were classified as Stage 1, 2 and 3 by the California Independent System Operator (CAISO), according to their severity. It shall be remarked that emergencies were not called for anomalies in any case (McCullough, 2002a; 2002b).

These facts led to an energy crisis, composed of electricity and a financial crisis. The energy crisis was called due to the recurrence of rolling blackouts that occurred during that period, and the impossibility of transmitting electricity

through some specific lines – the paths were related to some specific HUBs and tailored channels (Busato and Gatto, 2019). Eventually, once the investigations led to evidence of manipulation, Enron was convicted and declared bankruptcy – the largest one in American economic history. The Enron scandal followed. This event caused social unrest and loss of confidence of investors, consumers and diverse stakeholders in the energy and financial markets (Brunet and Shafe, 2007).

All these facts brought to the fore the necessity of undertaking urgent actions. This includes the implementation of accounting, auditing, and compliance standards (Strouhal et al., 2010). Thereby, the necessity of regulation, policy, and corporate social responsibility (CSR) countermeasures found a broad agreement within the academia, policymakers, lawyers, experts, the civil society, and even many financial analysts and operators.

This paper has the objective to investigate the role of CSR and regulation enforced in the aftermath of the market abuses which contributed causing the 2000-2001 Western power crisis. A poor use of CSR and regulation eventually took place and is likely to generate a more virtuous ambient. These measures may help averting future abuses and crises in the energy sector and in the financial markets. To this scope, this exercise proposes to combine a critical analysis of key elements of the crisis – i.e., operations and prices – to reach a CSR and regulation formulation.

The work observes this organisation. Next sub-section (1.2) revises the existing CSR literature on the topic and in connected areas. The transmission lines of the Enron affairs are then described in sub-section 1.3. Next (Section 2) the market abuses evidence is analysed, highlighting Enron's operations and electricity prices. Following (Section 3), selected regulation, policy, and CSR items applied as a reaction to the crisis are discussed. Section 4 concludes by emphasising the importance of CSR, regulation and policymaking for future action.

1.2. The importance of CSR in the energy sector

The CSR orientation, in the last two decades has fuelled a great debate internationally and increased scientific production (Scarpato et al., 2020; Civero et al., 2018). Such a practice chosen by companies on a voluntary basis requires attention to the relationships with their stakeholders, carrying out specific actions towards them

(Freeman and Hasnaoui 2011; Park and Ghauri, 2015). Numerous studies highlight connections between different stakeholders and corporate CSR performance (Garcia Sanchez, 2009; Risitano et al., 2021).

Indeed, there is a growing recognition of the importance stakeholders attach to socially, environmentally and ethically responsible behaviour of companies (Martin-de Castro, 2020); linked to this, from a purely environmental perspective, many scholars attach the concept of "corporate environmental reputation" (CER). CER comprehensively integrates stakeholders' perceptions of the company's behaviour in relation to environmental sustainability issues. This term also connects to green corporate image (GCI) or corporate environmental legitimacy (CEL) (Chun, 2005; Czinkota et al., 2014).

Like all industrial sectors, the energy industry today also needs to be socially responsible by correctly assessing the social consequences of its activities and its environmental impact (Lu, et al., 2019). The sector has been increasingly demanded to raise the bar of its environmental innovation and resilience standards (Aldieri et al., 2021). According to Stjepcevic et al. (2017), sustainable energy development is the main objective of energy policy in all countries of the world, both in terms of energy security, energy environmental sustainability, and energy equity.

Many scholars argue that there are strong pressures to achieve high standards of environmental, social and

economic sustainability in this sector related to the level of transparency, market liberalisation, as well as restructuring and competition in the energy sector (Rimsaite 2019; Kolk 2016). The lack of transparency and accountability in this sector creates a high risk of corruption at both the political and corporate level, which should be mitigated by internal corporate controls related to corporate social responsibility (CSR) programmes, including codes of ethics (Spence, 2011; Mezher et al., 2010). Many researches have focused on CSR reporting practices in the energy sector (Stray, 2008; Andrew and Cortese, 2011; O'Connor and Gronewold, 2012; Mosene et al., 2013; del Mar Alonso-Almeida et al., 2014) noting the need to implement within companies an effective system of Global Reporting Initiative (GRI).

1.3. Main transmission lines

During the 2000-2001 crisis, CAISO declares more than 100 days of emergency. The main transmission lines where the market abuses took place were the following:

- Path 15: from Southern California - SoCal (SP 15) towards Northern California - NoCal (NP 15);
- Path AZ3: from Southern California - SoCal towards Arizona (Palo Verde);
- from Southern California - SoCal towards North-West Oregon (Mid-C).

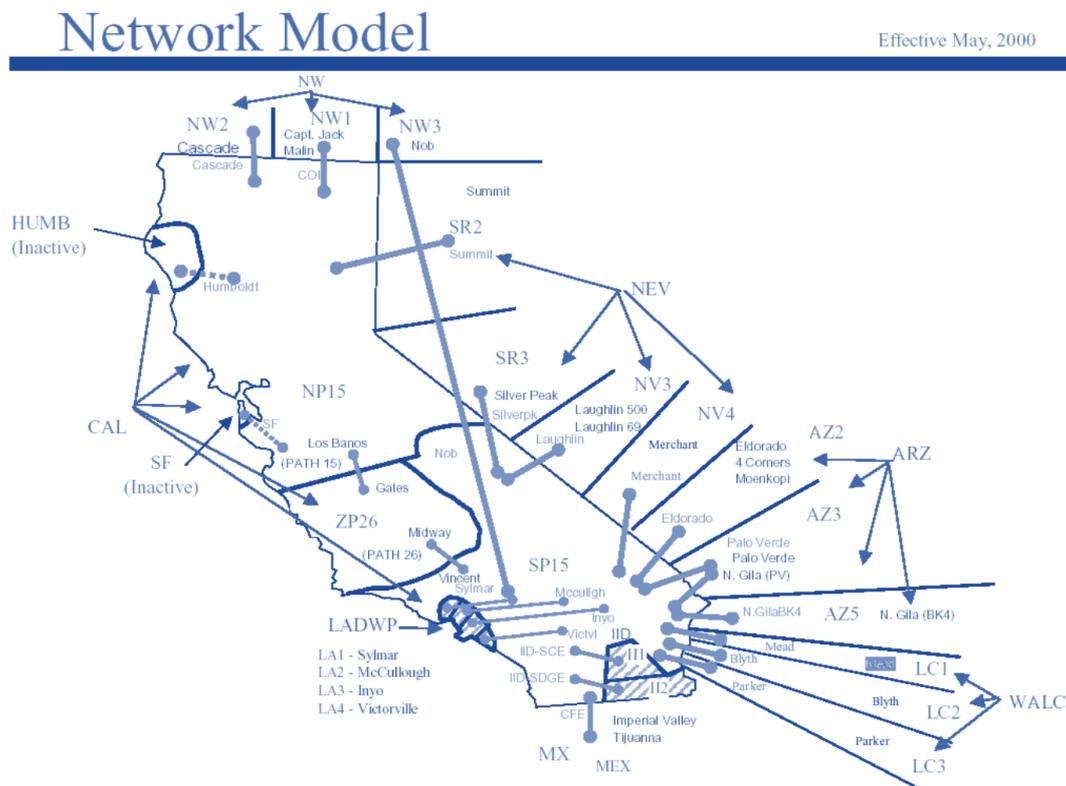


Figure 1. 2000-2001 Western markets manipulation network and salient HUBs.

Source: Re-elaboration from McCullough, 2002a.

Figure 1 sketches the network model, the main transmission lines, and the HUBs where the Western power crisis took place. In red the principal HUBs involved in the manipulations are represented.

2. Evidence

2.1. Enron's board emails and operation families

Enron manipulations emerged after the FERC's investigations. A primary role to detect the evidence was played by the emails traded amongst Enron's board (Yoder and Hall, 2000). In this email exchanges, the 11 aforementioned operations that were eventually detected were named from Enron's managers with creative names that would codify them, hiding their intention.

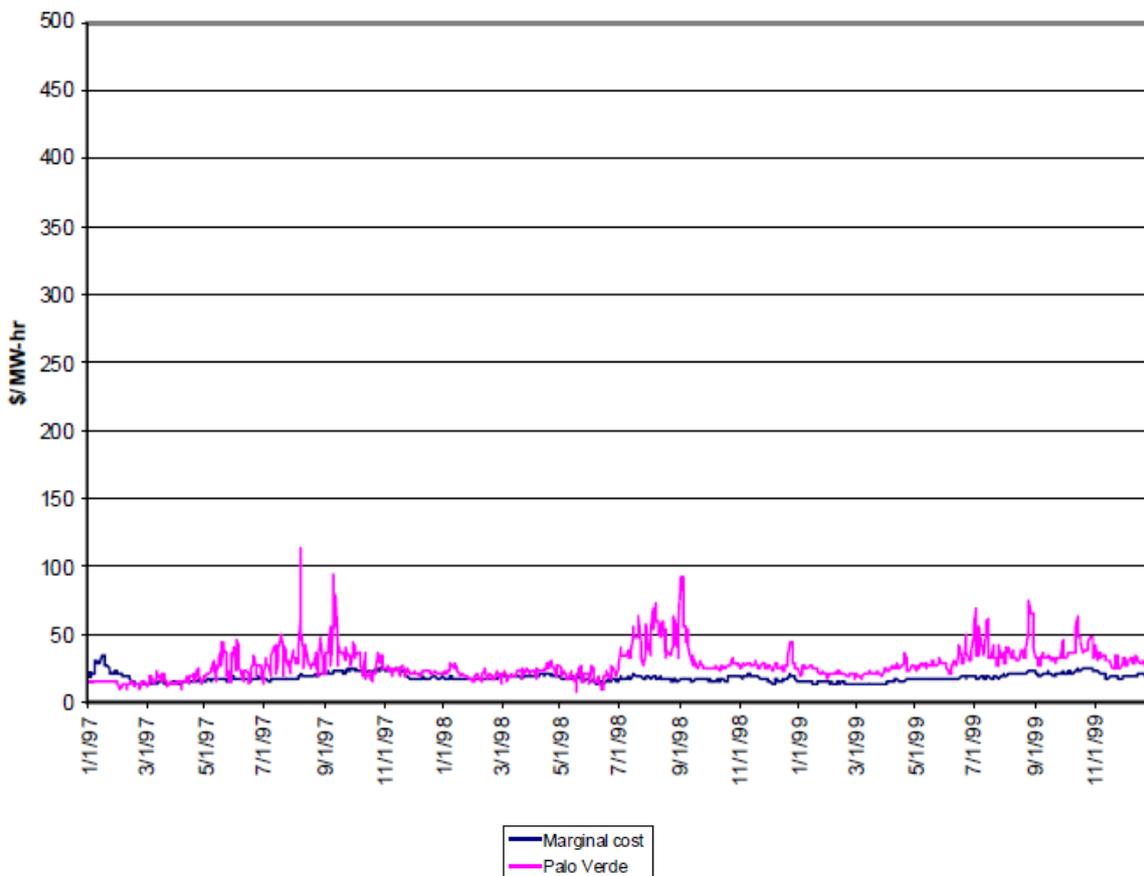
Some of the principal market manipulations conducted by Enron were associated with the following operation families:

- Death Star: Initiation and resolution of artificial congestions without releasing energy;
- Fat Boy: Artificial inflation of programming load presented to ISO;
- Ricochet: Energy purchase, export, repurchase, re-sale differential Cal regulated / other States unregulated prices.

2.2. Western markets electricity prices and market manipulations

A strand of literature investigated the existing nexus between market manipulation and price volatility (Busato and Gatto, 2019). This is because manipulations occurred in high-volatility dates, whilst after volatility periods there is no evidence of manipulations in the Western electricity markets. Basically, highly volatile dates are detected as a proxy of potential market abuse.

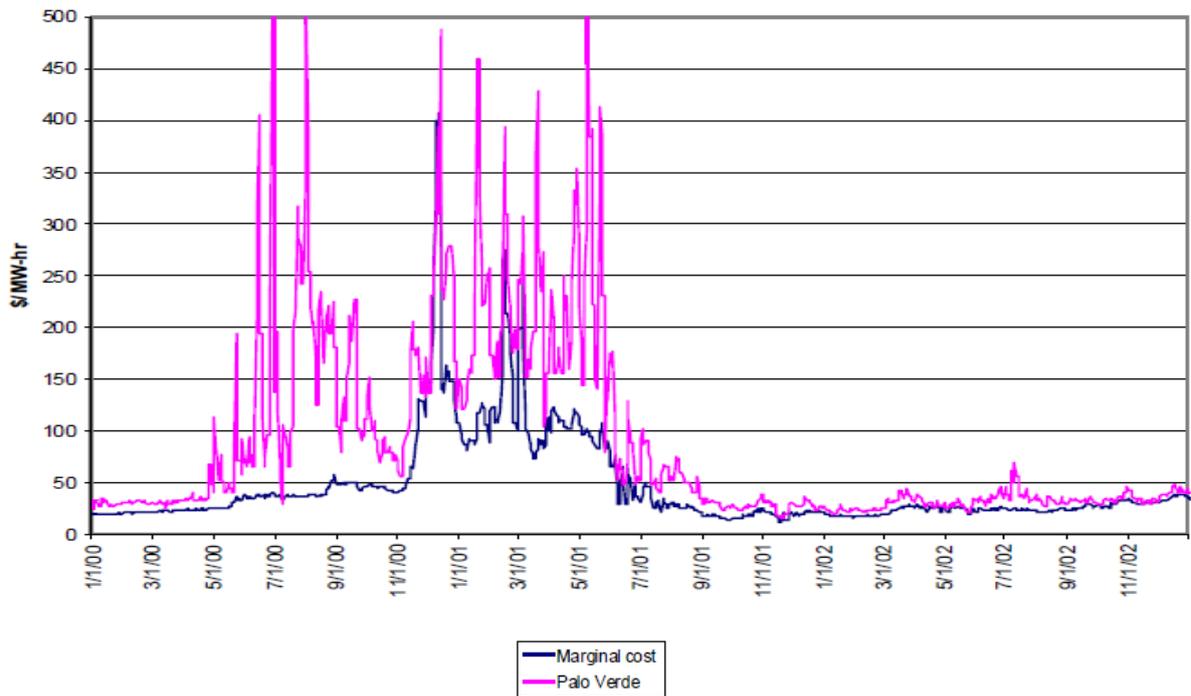
On top of that, price volatility can be observed in the long run. For this scope, marginal costs and Palo Verde HUB (Arizona) prices – whose data were previously collected by the FERC (2010) in light of its investigations – were extrapolated. Figures 2, 3, and 4 depict the trends for three periods: before the crisis (Figure 2, 1997-2000), during and after the crisis (Figure 3, 2000-2003), and after the crisis (Figure 4, 2003-2005). As it limpidly emerges, the price trends analysed with unfiltered data appear to be completely different, and the second-period prices are considerably more volatile than the prices from the other two periods (period 1 and period 3).



Electricity prices are expressed in dollars per megawatt-hour.

Figure 2. Electricity prices in the Western markets before the crisis (1/1997-1/2000)

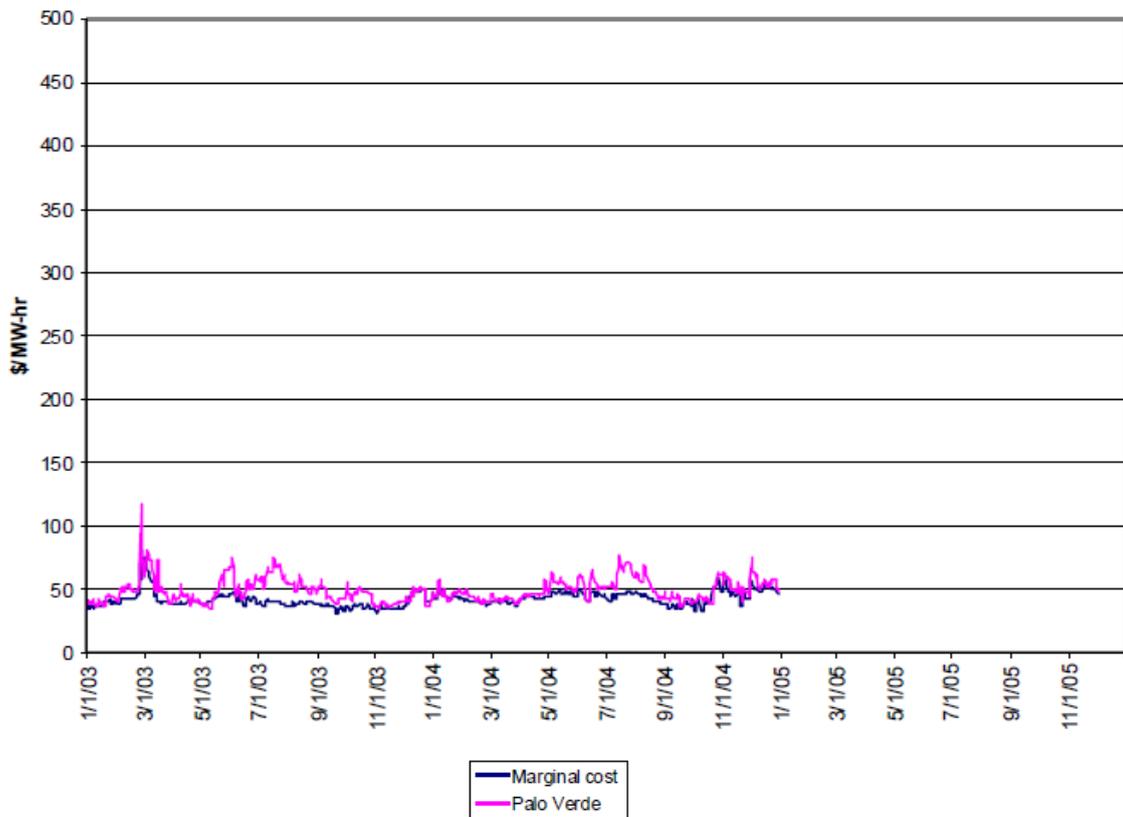
Source: FERC 2010.



Electricity prices are expressed in dollars per megawatt-hour.

Figure 3. Electricity prices in the Western markets during and after the crisis (1/2000-1/2003)

Source: FERC 2010.



Electricity prices are expressed in dollars per megawatt-hour.

Figure 4. Electricity prices in the Western markets after the crisis (1/2003-1-2005)

Source: FERC 2010.

3. Regulation, policy, and CSR

3.1. Regulation issues

A number of regulations, policy actions, CSR, and broader measures took place in the months and years following the energy crisis. The problems with the regulation in the Western markets started in January 1998, when the first restructuring policies in the California electricity market took place. Amongst the undertaken actions, one shall mention the regulation and price caps regimes: these moved the electricity prices up from 250 to 750 and again down to 250 \$/MWh in only 9 months (Borenstein, 2002; Hausman and Neufeld, 2011). The impact of those measures was that the hard caps were damaging the energy markets, whereas the successive soft caps ended up spreading the manipulations (DeCesaris et al., 2005; Wolak, 2003).

3.2. FERC's Anti-manipulation Rule and the 2005 EPAct

Amongst the different actions undertaken by the Federal Authorities and institutions in the US, one should relax on the FERC's Anti-Manipulation Rule, 18 C.F.R. § 1c.2., part of the Energy Policy Act of 2005 (EPAct, 2005). The Anti-Manipulation Rule was promulgated pursuant to the Federal Power Act ("FPA") § 222, 16 U.S.C. § 824v, enacted as part of the Energy Policy Act of 2005". The rule implementation has to be imputed, inter alia, to the necessity of better defining manipulation (Hatch et al., 2011).

It is relevant Section 222, stating that: *"It shall be unlawful for any entity [...] directly or indirectly, to use or employ, in connection with the purchase or sale of electric energy or the purchase or sale of transmission services subject to the jurisdiction of the Commission, any manipulative or deceptive device or contrivance (as those terms are used in section 78j(b) of Title 15), in contravention of such rules and regulations as the Commission may prescribe as necessary or appropriate in the public interest or for the protection of electric ratepayers"*.

Anti-Manipulation Rule, 18 C.F.R. § 1c.2. states that: *"It is unlawful the purchase or sale of electric energy or the purchase or sale of transmission services subject to the jurisdiction of the Commission:*

1. *use or employ any device, scheme, or artifice to defraud;*
2. *any untrue statement of a fact or omit;*
3. *engage in act, practice, or course of business that operates or would operate as a fraud or deceit any entity"*.

If the Rule contained in the Act should leave room for satisfactory valuations, the evidence of Barclays Bank's manipulations in the same markets and HUBs, for similar contestations, in the following years, calls for a renewed caution. In May 2015: Barclays is alleged by FERC *"for manipulative trading between 2 HUBs in electricity market in Western US" in Mid-Columbia, Palo Verde, and Southern Path-15"* (FERC v. Barclays Bank PLC, 105 F. Supp., 2015).

Indeed, Barclays *"violated FERC's Anti-Manipulation Rule, 18 C.F.R. § 1c.2. [EPAct 2005] in Nov06-Dec08 manipulating the energy markets in and around California"*.

In November 2017, Barclays will settle with the FERC for a large fine. *"In its order approving the settlement, FERC stated that Barclays will pay a civil penalty of \$70 million and disgorgement of \$35 million, totaling \$105 million in payments"*. Jurisdiction of agency's government: United States.

3.3. The Sarbanes-Oxley Act 2002

The turning point for CSR in the Western markets' issue may probably be detected in the approval of the Sarbanes-Oxley Act (SOX), a US federal law passed in 2002 (Stapp et al., 2010; Public Law 107–204, 107th Congress, 2002). This was designed as a policy response to the Enron scandal and was drafted on 7 rules. These rules include reporting, compliance, and ethical preventive, monitoring, and assessing instruments and procedures, necessary to implement and let the Act work. Although it would be hard to elicit a comprehensive evaluation and is not the goal of this research note, SOX' impact has been assessed as of primary importance for redrafting legislation, regulation, and public confidence in agents and financial operators (Green, 2004).

The SOX rules are summarised in Table 1.

Table 1. Sarbanes-Oxley Act

Sarbanes-Oxley Act (SOX)
i) crime prevention/detection
ii) compliance monitoring from an authority
iii) diligence to avoid industrial illicit activities
iv) training and communication on ethics
v) anonymous reporting
vi) incentives to compliance
vii) actions against criminal conducts

Source: re-elaboration from U.S. Government Publishing Office. (2002). Public Law 107–204, 107th Congress.

4. CSR and regulation matter

Power sector liberalisation is a controversial energy policy issue, having disputable and delicate repercussions. Sound liberalisation around the world has helped improving the electricity markets performance – see Chile, England, and Wales (Sadik-Zada, 2018). However, in other countries – such as Brazil and this study's case, California – market liberalisation, privatisation, and non-optimal regulation have caused textbook cases of the electricity crisis. In the latter case, Enron and further local operators inducted to artificial scarcity of electricity resulting in high rocketing electricity prices (FERC, 2016; Byrne and Mun, 2003). This situation ended up configuring antagonist interests between

regulators and managers posing additional policy and regulation modelling questions (Hannes, 2013).

The Western market affair led to two main conclusions:

1. Data and courts agreed on the fact that high volatility periods coincide with emergency calls and manipulation periods (FERC, 2015).
2. Empirical evidence and legal measures confirmed that the current electric markets regulation is still ineffective (see Gatto and Drago, 2021; Sadik-Zada et al., 2022; Gatto and Busato, 2020).

In light of the analyses supported within this study, some discussions can be conducted. The first fact to be pointed out is that deregulation increased the price volatility and facilitated the market power abuse for a few operators (Taylor et al., 2015). Another resulting fact is the emergence of a market power abuse retained by few operators – whose control was at least loose since these actors were almost free to conduct illicit operations. This evidence led part of the literature to consider the hypothesis of a regulator capture, that would explain some of the experienced dynamics (Busato and Gatto, 2019).

Another major aspect to be remarked is the dual nature of manipulations – long manipulations (that are deemed licit) and corners (that imply fraud and dole) (Pirrong, 2010). Though to this end, current anti-manipulation rules/acts do not make any distinction amongst the two categories. Hence, a fundamental step would be to first rediscuss manipulation regulation. This action would be likely to yield a net differentiation amongst the diverse categories of market manipulations (Evans, 2015; Misra et al., 2011).

The Western power markets and the following failing regulations, coupled with the last lacks in the systems commented, clearly underline the call for rapid measures in terms of compliance systems implementation, corporate social performance management, and increased risk management, anticipatory modelling, and data (Gatto et al., 2021; Crisan et al., 2020; Gallo, 2015; Sweeney, 2013). These actions will be possible only in a renovated industry outlook, based on business sustainability measures, stakeholder involvement, and CSR fostering assumptions (Sadik-Zada and Gatto, 2021; Gatto, 2020; Crisan et al., 2016). This will require the emergence of a consensus and a concrete dotation of a set of instruments, above all regarding financial transparency, reports, ethical standards, and in the specific case of the Western power markets, the enhancement/application of Sarbanes-Oxley Act 2002.

The paper highlighted how the growth of new sustainable environmental and economic strategies, linked to CSR tools and the concept of social innovation, can create a new virtuous business model (Rusciano et al., 2020; Olssenn et al., 2012). It emerges that voluntary business initiatives, such as CSR, are playing an increasingly important role in territorial and global energy development choices in a sustainable conception. On the other hand, the reviewed case and circumstances corroborate the need for increased ethics within financial markets to mitigate the risk of multidimensional crises (see Gatto and Sadik-Zada, 2021).

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DIGITALIZATION IN A POST PANDEMIC ERA

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ABSTRACT

The world has gotten through various events that affected the economy, yet they offered new perspectives and opportunities. The COVID—19 pandemic occurred in a period in which digitalization has a great importance and is seen by the most as a vital aspect of economic life. A crisis changes the way in which society functions and forces all the actors involved to act quickly, adapt, and try to come up with the best solutions to overcome it. The digital aspect was vital for the companies as most of the employees were required to work from home, many processes had to be automated, and the management faced the task of finding the necessary resources to fulfill the new needs of the company. The conclusions present the meaningful impact of digitalization during the global crisis of coronavirus and underline the key elements that this period brought in the rapid adoption of technologies that made the society function in the “new normal” set by this period.

Keywords: digitalization, COVID-19, resilience.

JEL classification: M12, M14, M15.

1. Introduction

As Tasnim (2020) presents, the COVID-19 pandemic affected the organizations across the globe. Supply chain management was, according to the author, a key factor in this period. The digitalization of the companies that are part of both global and local supply chains was important and continues to be in a post pandemic era. There are companies that were not digitized at all, in fact this global event made digitalization possible for almost all the sectors in the economy. It is important to see how this happened and to understand how the organizations succeed in this aspect, yet also to have a look at the current challenges and setbacks that these companies can face.

Prior to the outbreak of the pandemic, working from home was not an extended alternative. The work of the employees was made possible from home with the use of technology, the gadgets also playing the social part of life. This period presented both the companies and the stakeholders with a new perspective, the one of rapid digitalization. This element brought both benefits but also challenges and reasons for concern (Wai-Loon-Ho, Caals and Zhang, 2020).

The digital transformation in all sectors of activity is presented by Mezzour, Mannane, Benhadou, Benhadou, and Medromi (2020) as being at the top of development in

this problematic period. In their research, the authors underline the role of digitalization in the fight of reducing the spread of the pandemic and in the actions of reducing the impact the virus had both in the industrial and socio-economic sectors. These elements bring us to the idea that digitalization was crucial both for countering the spread of the COVID-19 and for helping the business field face the new reality and prepare for the future opportunities and events.

Shoakhmedova, Khashimov and Belalova (2020) affirm that this period had a great influence upon the introduction in the daily life of many digital technologies. Even if it was difficult at first to manage to work from home, to order groceries that are delivered to the doorstep and to communicate only via online platforms, the benefits for the future exceed by far the setbacks. Even after the medical system and society will be able to overcome this pandemic, we can not affirm that the world as we knew it will ever return to the way it functioned before. The digital transformation that occurred in the last months is irreversible and the digital technologies will have an important role in every decision that will be taken. Shoakhmedova, et al. (2020) conclude that almost no nation will be missed out from the transformation of the century, suggesting with this statement both that the more developed countries should help the ones in need, and that every government and enterprise may have to consider all the benefits of digitalization and act accordingly in integrating it as fast and as unitary as possible.

Tasnim (2020) presents that every company is motivated by the competition in the sector to develop new ways of integrating technological improvements to maintain the market share and satisfy the changed demands of the customers. The supply chain management had to integrate innovative digital technologies to keep up with the demand and the trend is only the beginning as the future will bring numerous tests, maybe more difficult than the one the world is facing right now. Akmaeva., Arykbaev, Epifanova and Glinchevskiy (2020) also state that under the digital transformation trends, the companies must adapt quicker, the employees should adopt the new trends and the managers that are motivated to perform will be likely to use techniques and tools that were used mostly in fast paced, innovative companies such as Tesla.

In this paper we present the analysis of the research literature related to the impact of digitalization during the pandemic and discuss both the positive step forward that this period brought for the industry by requiring a rapid

process of adaptation and the difficulties that set the premises for improvement and resilience. As the health crisis began and started to affect the world, the companies were given support and help from both local governments and global organizations. From the legislative point of view to the incentives that made the acquisition of the much-needed gadgets and equipment, every authority tried to offer all the resources to the businesses, for the economy to face the challenge and be ready to recover as soon as the health aspect starts to improve.

Based on the analyzed articles that were published until now we can affirm that the majority of researchers focused their work on the presentation of the impact that the pandemic had on digitalization. As the Covid-19 crisis is not over yet there aren't many studies about this impact, yet we anticipate that they will be published in the following months and years.

The authors that inspired us in the development of this research centered their interest upon the region or country they are located in. As the movement restrictions were still in place until now, we considered that our study should focus on the Cluj region as it is considered a development pole by many.

We will focus our attention upon the service sector as well as the IT one, as we see them as the ones with the biggest potential.

The paper is structured as follows: the first chapter will present the literature review regarding the challenges that the pandemic brought for the digitization process, and the second one will present the analysis and results of a study based on a questionnaire that targeted the impact of digitalization on the IT and service sector in Cluj area.

The conclusions present how a new era started with this important event in our lifetime, an era in which most of the employees must be prepared for the integration of the work from home days in their routine, for the use of technology for most tasks. This era will set the pace for a rapid digitalization of all processes that can be digitized, for managers that must make decisions based on information that changes hourly, for resilient companies that should be able to prepare to face any challenge and for a society that understood both the consequences of some unpopular measures, but also the opportunities and prospects that this event has brought. As for the future perspectives of research, we will compare the results from the Cluj region with other regions from Romania, Europe and beyond.

2. The challenges of the pandemic for the digitalization adoption

As the pandemic started, a lot of workers had to adapt quickly to the work-from-home environment. As the IT departments of every company were not prepared for such a tough workload, there was a challenge for them to provide the support needed for the rapid change.

Kaspersky recently presented a study that revealed that 25% of the Romanian employees had an argument with the IT department over the importance and regularity of the actualizations of their digital gadgets from the office (Onescu, 2021). The research presented by Onescu (2021) concluded that 76% of the Romanian employees do not update the operating software, digital tools and apps on a regular basis and the IT department tends to accept this behavior. This number is significantly higher than the median percentage of the study (64%).

Half of the Romanian employees affirm that they take a break when the IT team updates their apps and software and only 4% wait patiently at their desk. Just under 40% of the Romanian respondents of the Kaspersky study stated that learning new software versions is a waste of time that could be allocated to doing job related tasks. Almost the same percentage of respondents are less preoccupied by the process of updating the work-related devices compared to the personal ones, suggesting that the task of updating the computers and gadgets from work is an insignificant aspect (Onescu 2021).

According to a study performed by the online learning platform Tech Academy, over 92 percent of the Romanians living in urban areas affirm that they utilize a digital tool either for professional or personal use daily. Moreover, almost half (44.4%) of Romanians that do not have access or do not use the internet at the company they work for, clearly state that this aspect (the absence of digital knowledge) affected their career path. The study that was released in mid-June 2021 reveals that over 50% of the interviewed persons were provided by their employer with at least one digital device that helped in the daily tasks (Traicu, 2021).

The authors of the study stated that: "In a year where discussions took place online, projects were held on Zoom and the distance was kept permanently, and technology came to the aid of employers and employees to support interactions between them and their partners. The main reasons for which the Internet is used in the workplace are: the development and implementation of tasks (81%), communication with customers, colleagues and suppliers (76.2%) and research (59.5%)" (Traicu, 2021).

The most used tools during the last years, according to Traicu (2021) were the Microsoft Suite, Adobe, e-mail, ZOOM, Google Meet and social media platforms. The respondents said that the digitalization during the pandemic helped them perform their tasks faster and easier. Working from anywhere and at a chosen time, efficiency and faster procedures were also among the positive aspects.

HP released in March 2021 their Quarterly Threat Insights Report that provides analysis of the attacks against clients around the world. The volume of cyber-attacks increased by 238% during the pandemic, as the hackers targeted mostly the employees that worked from home (HP Inc., 2021).

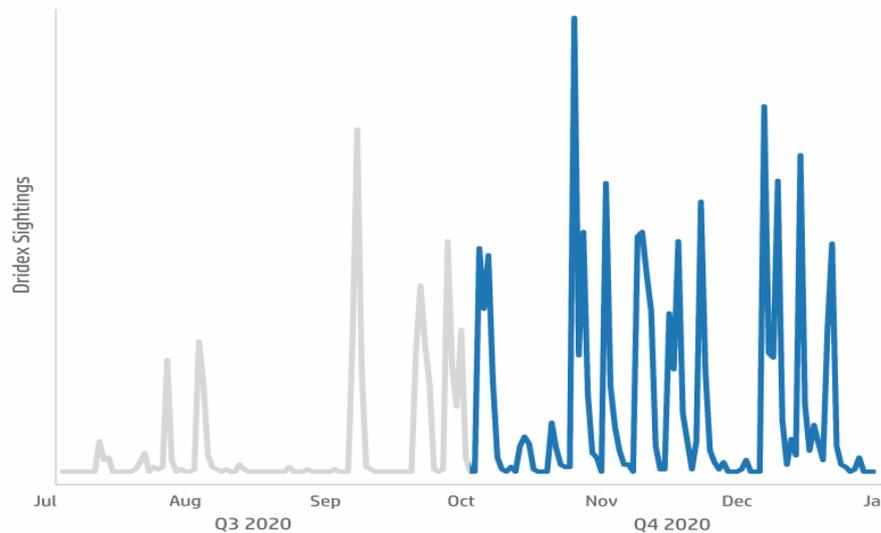


Figure 1. Dridex samples isolated by HP Sure Click in the second half of 2020 (HP Inc., 2021)

Note: This figure shows the volume of malware (executable format or .exe) isolated by HP's Sure Click software. As it is shown, the volume increased in Q4 2020 with 12% compared to Q3 2020. The main cause of the increase was a campaign that was using emails that seemed to be sent by legitimate German companies, yet they contained Trojan type malware. Copyright 2021 by HP Inc.

Mugur Pantaia, managing director of HP Inc. Romania, declared for profit.ro in an interview that: "Work will be an increasingly complex process, with more and more people working outside the office. This will provide exciting opportunities for greater mobility but will also create new vulnerabilities. The cutting-edge technologies of the future will be secure by design and smart enough not only to detect threats, but to prevent or mitigate their impact and limit the damage in the event of a cyber-attack that can target anyone, anytime." (Hackerii s-au specializat - îi vizează în special pe cei care lucrează de acasă, 2021).

According to a survey, performed by the online recruiting platform BestJobs, the new changes and challenges that were brought by the pandemic period influenced the tendency for the professional development of the employees. The most important skills for a Romanian employee are the technical ones. Seven out of ten employees that took part in the survey affirmed that aspect. On the other hand, four out of ten employees said that the soft skills are more important for them to develop in this period (Mazilu, 2021).

When talking about the technical skills, the most popular ones in the survey were as follows: "the development of the profession specific skills that the employee practices (36% of respondents), fluency in a foreign language (32.3%), qualification courses (22%), programming (19.5%), Project Management (16.4 %), Digital Marketing (15.2%), artificial intelligence (9.1%) and Product Management (8.5%). The following places are computer networking, Cloud Computing, Big Data Analysis, Business Intelligence, Digital Business Analysis and Information Security" (Mazilu, 2021).

As we can clearly see, the home office period has had a great influence upon the employees, and it motivated them into focusing on the development of digital skills along with foreign languages for a better communication with international colleagues and clients. The health crisis has

forced the employees to work closer together even if they are interacting in a digital environment, thus creating the possibility for companies to recruit remote workers from around the globe, who only need a good and stable internet connection in order to be part of the team.

When talking about the soft skills that were mentioned by the respondents as the most important to develop nowadays, the answers were, according to Mazilu (2021) the following: "most respondents (31.4%) said they wanted to develop their skills on the negotiation, complex problem solving (24.8%), as well as lifelong learning capabilities (24.4%). Almost as important are team management (22.5%), emotional intelligence (20.2%), critical thinking (17.8%), creativity (16.4%), as well as planning and organizational capacity (15%). At the same time, Romanian employees still want to improve their communication skills (13.1%), information analysis capacity (12.7%), teamwork (12.2%), discipline (11.7%), Adaptability (10.8%), customer orientation (8.4%), autonomy (8%) and proactivity (6.1%)" (Mazilu, 2021).

When interpreting the answers that are presented above, we can see that the skills that were mentioned are in a strong connection with an element that was vital also for businesses: resilience. This key factor was crucial for the economic survival of all companies that faced the health crisis both directly and indirectly. From negotiating better conditions for contracts with suppliers and clients in a new reality that was created by the virus and including clauses that could not be foreseen, to the negotiation of working hours that suited the new needs of the employees that worked from home, the art of negotiation had to be mastered both by managers and employees, in order for an acceptable compromise to be reached.

Complex problem solving was a skill that had to be adopted by most employees, as the possibility of not being able to connect to a colleague that was always available in the

office increased in the place of problems with internet connections, health issues and different time zones and working hours. Lifelong learning capabilities are now a very important aspect in every employee's professional life. From fast paced trainings and tutorials of how to use all the digital tools, to personally troubleshooting a PC when the IT team was not available due to many tickets and issues, the ability to learn throughout life was in the spotlight for every employee and entrepreneur. A manager had to find new and innovative ways to manage a team virtually, to organize meetings, tasks and brainstorming online, to help the team members develop their emotional intelligence skills and their critical thinking or creativity in an environment that was new for everyone. The communication skills were more important than ever, as the multitude of emails, documents and notes had to be compressed into a daily brief of the team at a morning virtual standup for example.

As employees started to get used to working from home, their productivity increased and they became more autonomous, relying on colleagues only when they felt they could not face a challenge by themselves and they managed to organize their daily activities better, as the home was used both for office and personal time.

3. Study: The impact of digitalization on the IT and service sector in Cluj area during the pandemic

To have a perspective upon digitalization in a post pandemic era, we developed a questionnaire that is aimed to help study the results of the responses and correlate them with the researched literature to offer a clear view of the impact of the pandemic for digitalization and to offer recommendations and prospects for the future.

The questionnaire was developed using the Google Forms tool and consists of 18 questions regarding the impact of digitalization on the service sector in the Cluj area during the pandemic. In order to receive relevant data, we developed the questionnaire both in English and Romanian.

The form targeted an audience above 18 years, that have an employer located in the Cluj area. We received answers from 61 respondents.

The first question regarded the age group of the respondent and the results were as follows:

- 41% selected an age between 18 and 25
- 21.3% of the respondents were aged between 25 and 35
- 18% selected an age between 36 and 49
- 18% of the respondents were aged between 50 and 65
- 1.7% were aged above 65

The majority of respondents were in their first years of work. This is an important aspect as the induction process and the one of gaining experience at the workplace were both affected by the pandemic and had to be performed using digital tools. The other age groups of the people that answered the questionnaire were similar in terms of

proportion, each representing close to a fifth from the total number of respondents.

The only exception consisted of the people aged above 65, that represented less than 2%. This fact is explained by the fact that in Romania the majority of employees are retired at this age, and only a few continue to work.

The second question asked the respondents in which sector they work. The responses were as follows:

- 27.9% IT
- 18% education
- 14,8% retail
- 9.8% financial-banking
- 6.6% health
- 6.6% public sector
- 3.3% HORECA (hotels, restaurants, cafes)
- 3.3% construction works
- 1,6% consultancy
- 8.2% other

As the IT sector is a vital one in the Cluj area, it was the one that the most respondents selected as the sector they work in, representing close to a third of the answers. The area the questionnaire refers to is also well known for the academic tradition. The education sector was chosen as an answer by almost 20% of the respondents. The third sector that had just under 15% from the answers was represented by the retail sector. As the Cluj area is an important economic pole in the country, it gathers an important number of companies that activate in retail.

Another important sector that was selected as the one the respondents work in, was financial-banking, gathering almost 10% of the answers. This sector is an important one in the area as the Faculty of Economics and Business Administration that is located in Cluj, is the largest faculty of Babeş-Bolyai University and of any Romanian university. Another reason is the economic development of the region and the constant need of financial-banking services.

The third question asked the respondents whether they currently live in the Cluj area, considering they work for a company that operates in Cluj. The answers are presented in the figure below:

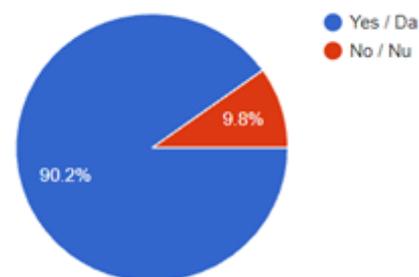


Figure 2. The answers received from the respondents to the following question: "Even if you work for a company that operates in Cluj, do you currently live in the Cluj area?"

As it can be observed from the graph above, only a small number of respondents that work for a company based in Cluj do not live in the Cluj area. In recent years, there was

an increase in the number of people that chose to move in this area as it offers multiple opportunities for a career and also a place where the quality of life is important for the local administration.

The 5th and 6th questions were aimed to gather data about the employees that worked from home. When asked whether they currently work from home, 54.1% of the respondents answered affirmatively and 45.9% stated that they currently do not work from home. The other aspect asked was regarding their colleagues, and 72.1% of the answers were that the majority of the employees from the company worked from home and 27.9% of the answers stated that the colleagues of the respondents did not work from home.

The pandemic affected all sectors of the economy. Most companies managed to adapt and transitioned to a work from home environment. This decision was not possible for all employees, as the ones that activated in the healthcare sector, the retail one and some from the public sector had to be present in hospitals, shops, and offices for the society to be able to function.

With question number 7 we wanted to gather data about the strategy approached by the companies in the Cluj area, regarding the evolution of the number of employees during the pandemic, and the results were as follows:

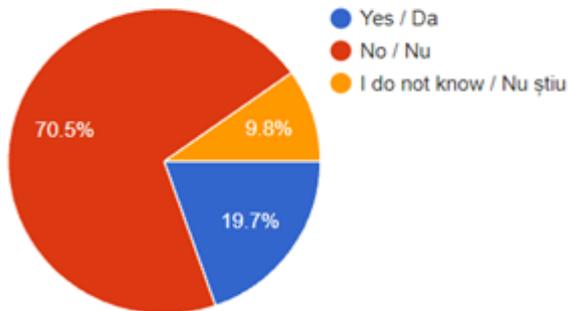


Figure 3. The answers received from the respondents to the following question: "Has your company reduced the number of employees during the pandemic?"

Based on the data gathered, we can affirm that most companies did not reduce the number of employees during the pandemic.

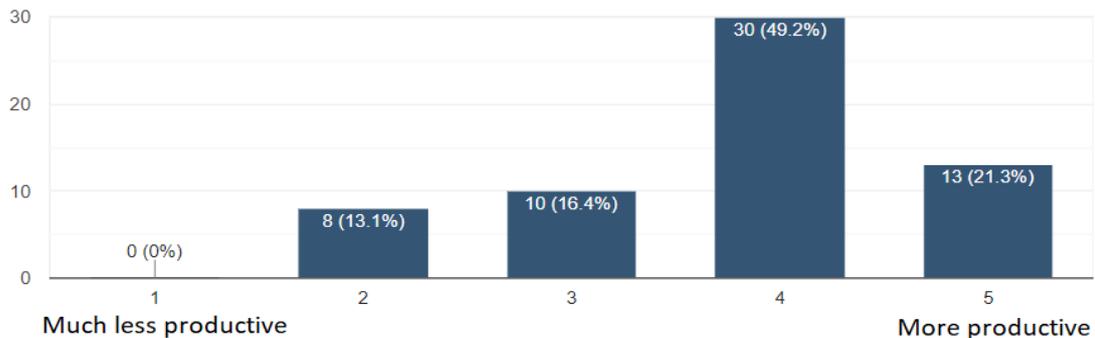


Figure 4. The answers received from the respondents to the following question: "On a scale of 1 to 5, how productive have you been during the pandemic compared to before this period?"

There were sectors in which this approach was not possible, one of the most affected ones being HORECA (hotels, restaurants, cafes). As restrictions are still imposed by the authorities, the managers of these businesses had no choice but to reduce the number of personnel. The government offered some help through measures that targeted the affected sectors, yet the entrepreneurs stated that it was not enough for them to be able to keep all the employees.

The respondents were asked with the eighth question whether they use for home office the equipment provided by their company. 47.5% of the answers stated that they used the equipment of the company, 36.1% of the answers affirmed that the company did not provide them with equipment, and 16.4% of the answers showed us that the employees used both the equipment provided by the employer and also their personal one.

This aspect was a central one throughout the work from home period. As most companies were not prepared to transition to this work environment for an extended period and with most of their employees, there was a spike in the demand of office equipment, especially computers. The supply chain was severely affected by the pandemic and some companies were not able to provide the needed equipment to the employees. Other companies only provided some equipment and the employee had to use his or her own to compensate. Unfortunately, more than a third of the respondents were not provided with any equipment from their employer and had to use their own, buy the equipment needed or work from the office if they were not able to perform their activities from home without the equipment provided.

We used a scale of 1 to 5 to determine the productivity perceived by the employee, during the pandemic period, in comparison with the period before the crisis. The responses suggest that the majority of the respondents perceived their activity as being more productive compared to the one before the Covid-19 pandemic, as shown in the graph below:

As most respondents work from home, there was a tendency in this period for employees that did the same to affirm that they perceived them to be more productive during the pandemic. Some employees were able to focus better from home, they did not have as many distractions, and this helped them to increase their productivity.

With the next question, we wanted to assess whether the employees improved their digital skills during the pandemic, using a scale of 1 to 5, 1 representing that they did not increase their digital skills at all, and 5 representing that they increased their digital skills very much.

The responses showed us that most respondents improved their digital skills during this period (44.3% of them selecting option 4 on the scale and 26.2% selecting option 5). 13.1%

of the employees selected from the scale option 3, 14.8% option 2 and only one of them selected option 1 (1.6%).

As all the employees who had to work from home used digital tools to perform their daily tasks, the answers for this question showed a clear trend of increase in terms of the improvement of digital skills perceived by the respondents during the pandemic period. These skills are an important asset as the digitalization in the economy will continue to increase and most of the employers will value the digital abilities.

Another question was asked later in the form, regarding the perception of the respondents of how much will the newly acquired digital skills help them in the future, and the answers are presented below:

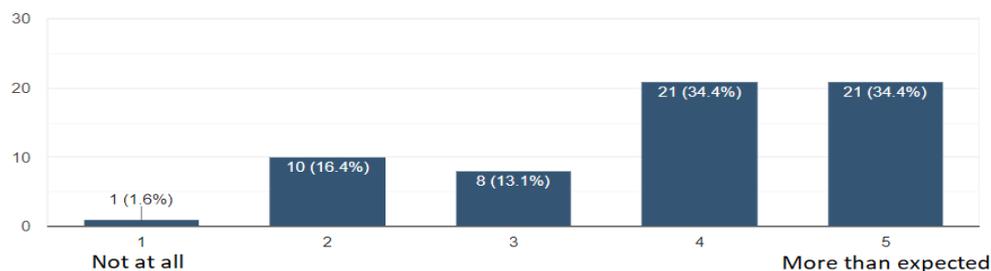


Figure 5. The answers received from the respondents to the following question: "On a scale of 1 to 5, how much do you think that the newly acquired digital skills will help you in the future?"

From the data presented above, we can clearly affirm that the employees perceive that the newly acquired digital skills will help them in the future. Most of them stated that they will help them more than expected, emphasizing the fact that was mentioned in the previous graph, that employers will value digital skills in the future in a more extensive way.

In this form, we included a question about the plan of the companies concerning the return to the office of the employees. The respondents answered in a large majority (77%) that their employer had a plan of bringing them back to the office, while 23% of the respondents affirmed that the company does not have a plan of bringing them back to the office.

Even if we are still going through a problematic period, we wanted to assess this aspect and it is important to know that a large majority of companies have a plan to bring the employees to the office. There are certain sectors that function better with the employees present at the workplace and the companies managed to develop a plan to safely achieve this target.

Other sectors, like the IT one can function with the employees working from home or remote, as there was an increase in productivity and even the recruitment could be done using digital tools. In this way, there are many teams with members working from different countries or continents that achieve and exceed their targets.

With question 12 we aimed to assess how many days a week the employees would like to work from home after the health crisis is over.

- 26.2% of the respondents would like to work from home 2 days a week

- 21.3% selected 0 days a week
- 14.8% would work from home 5 days a week
- 13.1 selected 1 day a week for home office
- 13.1% chose 3 days a week
- 11.5% selected 4 days a week as their answer

It is important to know if the employees are open to continuing working from home for a few days in a week after the pandemic is over, as companies need to organize the offices and resources. More than 60% would like to work from home only for 2 days a week or less. It is important to note that a fifth of the respondents would like to work from the office full time.

On the other hand, only just under 15% would like to work from home for 5 days a week, meaning that this work environment suits them better than the one before the pandemic. Managers will have to consider that if an employee increases productivity and is more open to work from home, this could be a good opportunity for both the company and the employee. The employees who would split the days working from the office with the ones working from home, would allow the company to reduce or reorganize the office space and offer the employees an environment that helps them focus. This aspect could reduce costs and increase productivity in the organization.

The degree of openness of the employer regarding the option of letting the employees work from home indefinitely was assessed from the perspective of the respondents. The scale of 1 to 5 was used, and the number one represents that the employer is not open at all, while 5 stands for the fact that the employer is very open for the option. The results will be presented in the graph below:

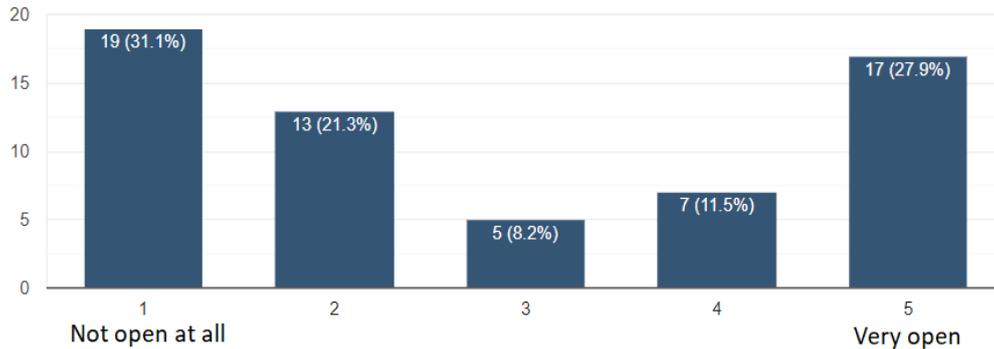


Figure 6. The answers received from the respondents to the following question: “How open is your employer to let you work from home indefinitely if you choose so?”

As with the previous question we assessed how open the employees were to continue working from home and for how many days a week, it was important to know also how open the management was to allow them to do so. It is clear that there are factors to be considered, as more than half of the employers are reluctant to the idea of letting the employees work from home indefinitely. Some companies included this work environment only for the limited time of the pandemic and this is one of the reasons for the answers above. After assessing all the factors involved, even if the employee would prefer to work from home, the manager would have to take this decision only if it is viable for both the employee and the company. If we take the education sector for example, even if some teachers would like to continue to work from home, it is important to know that in some cases this aspect would not be possible on the long terms as some students do not have access to internet or even electricity and other students would assimilate the information better in a face-to-face format.

After asking these questions, it was important to know how much the respondents wanted to return to the office. The answers were as follows:

- 41% would like to return to the office very much
- 24.6% are more open return to the office
- 9.8% are not reluctant nor open to return to the office
- 14.8% are more reluctant to return to the office
- 9.8% would not like to return to the office at all

Working from home, even if it could mean an increase in productivity or a less distracting work environment, affected the way in which the people interacted with one another. From the face-to-face meetings to the lunch that was served together with the colleagues, the pandemic introduced the online calls and enabled the employees to socialize as often as before. This is one of the factors that made over 4 out of ten respondents want to return to the office very much. When looking at the data, over 65% of the employees would like to return to the office, as they miss the work environment, the office infrastructure, and the interaction with their colleagues. These aspects will be detailed when analyzing the last question of the form.,

Question 13 targeted the perception of the period for the employees. Using a scale of 1 to 5 (1 representing very difficult and 5 not difficult at all) we received the answers as follows: 21.3% of the respondents perceive this period as very difficult, while 18% perceive it as not difficult at all. 24.6% of the employees see this period as more difficult, while 13.1% chose the answer not that difficult. 23% of the respondents affirmed that this period was not different in terms of difficulty, compared to the one before the pandemic.

When this period started, there was no data about how it would affect the employees and for how long. After more than a year and a half, more than 45% of the respondents perceive this period as more difficult than the one before the pandemic. The other respondents managed to adapt and do not see this period as more difficult than before. This element must be considered when making decisions, as these could affect some employees more than the others.

Working overtime is an important aspect to consider, especially during the home office. In the study, our intention was to assess this element, as perceived by the employees. When asked about this issue, only 11.5% of the respondents affirmed that they never worked overtime. 9.8% of them rarely worked overtime, 14.8% selected option 3 from the scale of 1 to 5. Most of the employees had to work overtime often (41%) and very often (23%).

Unfortunately, the health crisis brought another issue to the table, the fact that many employees had to work overtime. Some had to work longer hours to keep up with the demand, like in retail for example. As the health sector was, and still is, under pressure, most respondents from this sector had to work overtime also. Working overtime can be frustrating for most of the employees, making them less productive and less motivated. This issue should be a top priority for the management, as for the long term it could bring numerous issues for the company, if not addressed accordingly.

With the last question of the form, we wanted to see how much the employees miss the aspects presented in the graph below:

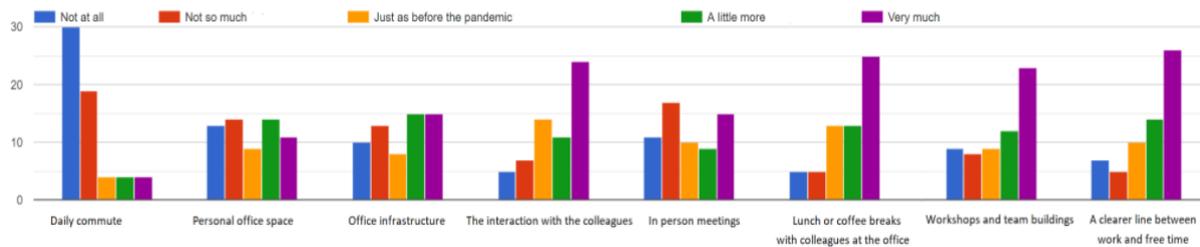


Figure 7. The answers received from the respondents to the following question: “How much do you miss the following aspects?”

This question assessed several elements that were challenged with the start of the pandemic. The respondents appreciated the aspect of not spending time during the daily commute. This aspect clearly stands out as the one which is not missed at all by the employees. By having more time to spend with the family and a less stressful start of the working day, the fact that the daily commute could be eliminated during this period was beneficial both for the company and the employees. On the other hand, some respondents missed the personal office space and the infrastructure that was not available at home. The proportion was quite similar when comparing the employees who missed the personal office space and infrastructure compared to the ones who did not, yet this aspect is also connected with the fact that some of the respondents did not receive the proper equipment from the employer and that they did not have the same conditions at home.

Even if the communication was effective through the digital tools, most employees miss the interaction with their colleagues, the meetings in person and the lunch or coffee breaks at the office. As presented in the analysis of previous questions, the social aspect is a very important one for an employee. The fact that at the office one could simply go to the desk of the colleague and ask a question instead of calling or waiting for an email was throughout the years a possibility that was both more effective and it took less time. Some people had to be alone for a long period of time, isolated from the interaction that they were used to. One could feel discouraged to take breaks and stop working when having lunch if the colleagues were not around, bringing up the issue of working overtime.

The pandemic mostly permitted only online workshops, thus making the respondents miss very much the team buildings and workshops organized in the conventional way. For a company to keep the personnel motivated and connected, the inclusion of workshops, team buildings and corporate events is vital. The members of management who oversee the corporate culture and wellbeing of the employees faced challenges because they could not organize these gatherings as they used to. Proper strategies must be integrated for the employees to be able to stay connected with their colleagues even through digital tools. Some companies included virtual town hall meetings, online coffee breaks and digital gatherings in which the attendants could talk also about personal hobbies and aspects regarding the work from home environment.

An important element that will have to be considered when considering the continuation of home office in the future is that most respondents underlined that they miss a clearer

line between work and free time. This way of working made it difficult to disconnect from the professional period of the day, as the employees did not have the means and knowledge of implementing innovative strategies to be able to separate the office time and personal time when working from home. Another aspect that prevented the respondents from separating the business hours from personal ones were the fact that a colleague or manager could ask for the input of another employee after the working period of the day, knowing that the other one has the laptop with them at home and could connect. This issue contributed also to the increase in the overtime work.

4. Conclusions

As it was presented in the paper, we can clearly affirm that there was a meaningful impact of digitalization during the global crisis of coronavirus, and we can underline the key elements that this period brought in the rapid adoption of technologies that made the society function in the “new normal” set by this period. A new era started with this important event in our lifetime, an era in which most of the employees must be prepared for the integration of the work from home days in their routine, for the use of technology for most tasks.

4.1. Challenges for employees

Based on the answers received from the respondents, we conclude that even if there were difficulties and setbacks during this period, the employees managed to adapt, facing the challenges by adopting new technologies and increasing their digital skills. As the society will begin to recover from the pandemic crisis, the employees will have to continue working into a hybrid work environment. Companies have seen an increase in productivity and a reduction in costs when work from home is used as an option for a few days a month to a few days a week. Even the most reluctant organizations started to consider this opportunity and the employees will be faced with this situation in the future. The newly acquired knowledge and skills will help the employees in the next period.

The social interaction between colleagues will continue through online tools, yet the companies started to bring the employees at the office in small numbers, especially in teams. In this way, the team members will be able to better know their colleagues, to talk with them in coffee breaks or during lunch. This aspect is very important as most individuals miss the face-to-face interaction at the headquarters.

A vital element that will challenge the employees in the next period is the fact that they will have to improve and maintain the ability of setting a clear line between professional and personal time, especially when working from home. The fact that one is having all the equipment needed to stay connected from home is not a reason to work overtime. This subject should be discussed in meetings with the teams and certain rules should be applied. The most important rule should include a reference to respecting the working hours of every colleague. Neither a colleague, nor a manager should bend this rule, as this aspect could bring setbacks in the teams' work and results.

4.2. Challenges for management

The managers of an organization will also face challenges in a post pandemic world. The first one that we bring to the discussion table is communication. The conventional way of communicating with the employees or the rest of the managerial team was disrupted by the pandemic. Every manager had to transition to video calls and virtual town halls. New approaches in communication will have to be integrated into the strategy for the future for each manager. From virtual daily standups, to face to face short meetings when at the office, the crisis shaped the way managers communicate with the team. In the next period, the good aspects should be integrated, and the negative ones shall be seen as opportunities for improvement.

The online meetings and the difficulties in organizing and scheduling activities shaped the way managers will continue to lead the teams in the future. At first, the conventional way prevailed and there was a period until everyone understood that some changes had to be adopted to transition to a new way of doing business. Nowadays, the managers are more confident and can integrate all the options into their work, bringing positive results for the team, the company, and the collaborators.

The infrastructure that needs to sustain the new way of doing management will have to continue to improve. Software tools that were used intensively and will continue to be the backbone of most projects include project and task management apps, productivity software and teams management applications. Some businesses used them prior to the health crisis, and most of them started to use them daily since the outbreak began. The period ahead will bring new opportunities for managers if they continue to use these tools and tailor the infrastructure in such a way that it suits the needs of every team.

Human resource managers went through a stressful period as restrictions affected the activity. In this difficult time, they had to adapt the policies of the organization to meet the new regulations issued by the authorities. Digitalization was into the spotlight for the human resource departments as recruitment, training and induction was performed online in most companies. From receiving an application to hosting an online interview, the HR managers had to include the possibility of signing work contracts online into the operations of the department. The digital approach will be important in the future as it can help in the recruiting process of employees that can work remotely and can be a differentiating factor for the organization.

Another challenge for managers will be the analysis of trade-offs between respecting regular working hours or contacting the employee after them if the home office work environment is used. This issue was brought up by the crisis and should be taken seriously for the period ahead. Proper guidelines are to be developed to respect the employees and their free time, the laws, and regulations and the organizational culture.

This era will set the pace for a rapid digitalization of all processes that can be digitalized, for employees that must adapt to new work environments, for managers that must make decisions based on information that changes hourly, for resilient companies that should be able to prepare to face any challenge and for a society that understood both the consequences of some unpopular measures, but also the opportunities and prospects that this event has brought.

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RISK ASSESSMENTS AT A HIGH-CAPACITY MEAT PROCESSING UNIT

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ABSTRACT

The paper addresses issues related to the identification, assessment, management and monitoring over time of the main types of risks that may occur in a high-capacity meat-processing unit. Such a risk analysis is essential, especially in the agri-food sector, as certain types of hazards would have serious consequences for production, and thus for public health objectives. The main types of risks were analyzed, focusing especially on the current pandemic evolution and the measures taken in this case, but also on the production risks related to the field of activity. Among them, the risks with impact are the development of microorganisms (bacteria, yeasts, molds), the presence of pathogenic microorganisms (Salmonella, Listeria monocytogenes) and the presence of metallic foreign bodies. The main objective was to design the requirements of an integrated quality-risk management system by addressing the horizontal quality function. The unit under study has its own risk management system, and the obtained results are recorded in databases and are subject to evaluation.

Keywords: hazard, monitoring, evaluation, integrated quality-risk management.

JEL classification: aaa.

1. Introduction

The management of the country applied within a company involves the identification and evaluation of risks, the identification and establishment of the response to the risk to determine the possibility of defense, and, implicitly, the reduction of the possible consequences by anticipating the impact that each type of risk can generate on the company. All these stages involve an efficient communication of the person involved, both directly and indirectly, in the production activity. Monitorization of and continuous analysis of this process are the key to success.

Risk is a complex concept, quite difficult to evaluate, and knows various forms of manifestation, so it must also be viewed in the light of its consequences, which requires taking responsibility for its materialization. Thus, the risk has various effects on both the economic unit and third parties. (Stihi,2010)

Risk management is a complex process by which:

- They define the strategic objectives.
- A certain budget is allocated, represented by resources and responsibilities, effective control of risks.
- The risk analysis (risk assessment, risk management and risk communication) is drawn up.
- Decisions are made about the reactions to the risk.
- Risks and risk control actions are continuously monitored.
- In the case of certain circumstances that are not under the control of the company, such as pandemic, natural disasters, war, strike, riots, political instability, terrorism, computer hacking.) a measurement plan shall be established and applied in accordance with the measures established at national and global level. (Clup,2002)

Meat and meat preparations can be a risk factor because of their spoilage. In the process, a series of bacteria develops, first those that break down the protein molecule, then those that assimilate the decomposition products. The process of spoilage may occur because of incorrect storage of these products. (Mihaiu, 2010)

Three categories of hazards may be associated with a food:

- biological (microbiological) hazard,
- chemical hazard,
- physical danger.

2. Risk management process

How the company grows and develops; its ability to remain competitive and survive depends, finally, on the competence of the entrepreneur to manage the risks that influence the business, to apply various methods of reducing unintended consequences.

Risk is a complex concept, quite difficult to evaluate, and knows various forms of manifestation, so it must also be viewed in the light of its consequences, which requires taking responsibility for its materialization. Thus, the risk has various effects on both the economic unit and third parties.

2.1. Risk assessment

Table 1. Probability and severity of the danger

Number of points	Probability of occurrence of danger /P/	Number of points	Severity of the danger /G/
3	It has not appeared so far, has not caused any illnesses	3	In case of occurrence, no disease is expected
2	Appeared 1-2 times a year	2	In case of occurrence, it can cause mild illnesses without serious consequences
1	Appeared more than twice a year	1	In case of occurrence can cause serious illness

Assessment of the severity of the danger:

- At the probability of occurrence of danger (P) on a scale from 1 to 3 the greatest danger is presented by 1.
- On a scale of 1 to 3 in the case of the severity of the danger (G) the number 1 presents the most serious consequence.
- The degree of severity of the hazard (S), $S = P * G$, which can vary between the values: 1-9 (Table 2).

Passing through the decision tree, respectively the choice of acceptable level is depending on the degree of severity of the danger.

Table 2. The degree of severity of the hazard and how to keep it under control

Severity (S)	Regulatory	How to keep it under control	Does it go through the decision tree?
1	Prevention/shut down	The process needs to be changed	not
2	Physical regulation OPERATIONAL CCP or PRP	Systematic monitoring and documentation of parameters	yes
3-4	Formal regulation CCPs or operational PRPs	Document regulations and record keeping	yes
6-9	Instruction	Through training	not

2.2. Risk identification

Within the studied society, the following categories of risks are identified:

1. Production risk
2. Price or marketing risk
3. Quality risk
4. Financial risk
5. Human resources risk
6. Legal risk
7. Offer/suppliers risk
8. Competitive risk
9. Risk of loss of assets
10. Environmental risk

Table 3. Risk classification

Microbiological / Biological	Chemical	Physical
<ul style="list-style-type: none"> • Indicators of the degree of contamination / poor hygiene <ul style="list-style-type: none"> ○ Listeria M ○ Yeasts and molds ○ Escherichia coli - staff ○ Staphylococcus aureus ○ Clostridium botulinum ○ Trichinella Spiralis • Presence of microbes – in the case of raw materials and novelants • Multiplication of microorganisms – incorrect technology • Microbes survival – incorrect technology 	<ul style="list-style-type: none"> • Pesticide residues - cultivation cereals, vegetables • Toxic chemicals – exceeding the time of heat treatments (boiling, smoking) • Heavy metals – growing cereals, vegetables, drinking water • Oil, petroleum jelly – technological equipment • Residues of cleaning and sanitizing subst. – cleaning operations • Toxins produced by microorganisms (mycotoxins) - in the case of ingredients • Insecticides, raticides – combat treatments • Antibiotics – traces of antibiotics in dairy products and meat 	<ul style="list-style-type: none"> • Metal – machinery • Paper, twine, plastic – packaging, raw materials and ingredients • Soil, sand, gravel – raw material, ingredients, storage, transport • Insects, rodents – lack of deratization or incorrect deratization • Other foreign bodies – personal hygiene

In the following, we will focus on two major categories of risks, namely, the risk of production and the risks arising from the current pandemic context with the SARS-CoV-2 virus.

Production risks are mainly represented by risks of a microbiological, chemical, or chemical nature (Table 3).

When the hazards were identified, the following were considered:

- the stages preceding and following a specified operation;
 - equipment, utilities / services and environment;
 - previous and subsequent links in the food chain.
- Wherever possible, for each of the hazards to the safety of the identified food, the acceptable level of that danger to food safety in the finished product has been determined. When setting the level, the established legal and regulatory requirements, the customer's requirements regarding the safety of the food, the intended use by the customer and other relevant data were considered.

The emergence of dangers is closely related to the monitoring of the technological flow. The most important risk is that of a microbiological nature since it will withdraw and destroy all production in case of the appearance of pathogenic germs.

The biological/microbiological hazards are represented by:

1. Unacceptable increase in the number of microorganisms during the maturation process.
2. Development/multiplication of unwanted microorganisms due to non-observance of the storage time and temperature of raw materials, ingredients, semi-cooked products, and finished products.
3. Development/multiplication/survival of unwanted microorganisms, due to non-observance of time-temperature parameters, prescribed for heat treatments.

Following the technological flow diagram of raw-dried products, the critical control points are represented by the following steps: storage of raw materials, detection of heavy metals, storage of finished unpackaged products, storage of packaged finished products, freezing of finished products and storage of finished products for transport. Samples are taken from each product group, which are analyzed organoleptically and physico-chemically, and then an analysis report is issued. Depending on the self-control program, according to the established schedule, periodic microbiological laboratory tests are made.

2.3. Technological hazard reduction possibilities

1. Observance of temperature and maturation time.
2. Observance of temperature and time in the case of storage of raw materials, semi-finished products and finished products.
3. Observance of temperature and time in case freezing raw materials.

4. Compliance with parameters in heat treatments (time – temperature).
5. Verification of products with the metal detector. Mitigation possibilities: performing in time the technical revisions for all the equipment, training the staff, strictly observing the instruction manuals, observing the sanitization programs, selecting, and evaluating the suppliers, training the staff, hiring qualified persons in the field, production on a contract basis, the existence of a register of orders and taking them directly from the customer, in writing, monitoring of the packaging methods and machinery involved.

2.4. Prevention and control measures in the current pandemic context

Installation of dispensers with alcohol-based disinfectants (min. 60%) in all common areas (access spaces, administrative areas, dining spaces), and all work points that appearing to the unit.

Introduction of additional disinfection and access control filters in the company's premises.

Daily monitoring of the temperature of the operational staff of the Production Halls / logistics warehouses / access points.

The reorganization of the employees' work schedule, so that the presence at the offices and work points of the company to be reduced to a minimum, all the activities that do not require the mandatory presence at the company's offices, are carried out from home.

All employees of the company are trained and checked to comply with and promote timely preventive measures, starting with the hygienic and sanitary ones included in the specific working procedures and instructions.

The delivery drivers, before leaving for the race, are equipped with protective gloves and protective masks. All products/boxes are handled with protective gloves during distribution.

In the production, storage and administrative premises, a distance between persons of at least 1 meter is maintained, and it is appropriate to distance the operators' workplaces accordingly in order to minimize possible contacts along the production line.

3. Conclusions

The way in which the company grows and develops, its ability to remain competitive and survive depends on the way in which the risks that influence the business are managed, implicitly, finding and applying the most effective methods of minimizing the possibility of occurrence and reducing the unwanted consequences.

The unit under study has its own risk management system, and the results obtained are recorded in the databases and are subject to periodic evaluation.

Production risks were analyzed for the raw-dried product range, following the flow diagram.

The risk assessment highlighted 6 critical control points on the technological flow of raw-dried products.

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PERCEIVED ORGANIZATIONAL SUPPORT AND WORK PERFORMANCE DURING COVID-19 PANDEMIC: THE CASE OF ROMANIA

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ABSTRACT

The SARS-CoV-2 (COVID-19) pandemic, which began in Romania at the beginning of 2020, has dramatically changed the working experiences. The aims of this research are to identify the extent to which task and contextual performance were influenced by the COVID-19 pandemic and the extent to which organizational support was favorable perceived by employees. The research only considers employees who did not interrupt their work during the pandemic or worked in a hybrid system. The study also highlights the perception of respondents regarding the changes on work brought by Covid-19 pandemic. These changes refer to: number or difficulty of work tasks, salary obtained, number of work breaks taken and working conditions in general.

Results show that during the pandemic (from March 2020 to the present time-June 2021) the task performance was not high, although the perceived organizational support was high. Similarly, the contextual performance was low, corroborated with the difficulties felt in carrying out the daily work activities. Also, organizational support has positive effects on task and contextual performance. Theoretical and practical implications of the study are discussed.

Keywords: organizational support, employee work performance, COVID-19.

JEL classification: M12, M50.

1. Introduction

The outbreak of the COVID-19 pandemic significantly changed the way employees work. Thus, some companies resorted to teleworking / work from home, while others required employees to be physically present at work (continuously or in a hybrid system). In this case, the employing organizations had to provide all the protective equipment and ensure optimal and safe working conditions.

The crisis caused by the pandemic provided a clear picture of how employers can handle some critical and unpredictable situations. Thus, employers have been forced by the pandemic context to adopt certain health protocols in order to provide employees with a safe environment in which to work.

Since the beginning of the pandemic, organizations have been required to implement certain measures against the spread of the COVID-19 virus: ensuring social distancing at

work, regular disinfection of equipment, encouraging employees to place more emphasis on hygiene at work (washing hands often, avoiding touching nose, eyes or mouth), providing sanitary equipment for employees to carry out their work (detergents, disinfectants, surgical masks, protective gloves, etc.) and encouraging employees to stay home and notify the public health system if any specific COVID-19 symptoms appear.

We believe that all these measures had an influence on the performance, engagement and well-being of employees.

In order to further limit the spread of the virus, in March 2020 Romania entered a state of emergency until May 2020. During this period, the activity of restaurants, hotels or other public places was suspended. Also, cultural, scientific, religious and entertainment activities and certain flights to/from areas severely affected by the pandemic were suspended. Thus, various industries have suffered significantly due to the pandemic - one of the most affected being the HoReCa industry.

So, the pandemic has caused huge losses to many industries and changed the lifestyle and work of many employees.

Companies that were able to allow employees to work from home adapted much more easily to the situation and were able to provide them with a safer work environment, while companies that required physical presence at work or by rotation (a few days of at home and a few days at the office) had to follow certain procedures to provide employees with safe working conditions. The security measures taken by the organizations had the greatest contribution in gaining the trust of the employees. In addition to these measures, effective communication between employees and employers has played a significant role in supporting employees during pandemics.

During this difficult period, employees place more emphasis on safety in the workplace and on support that the employer can provide, and less on rewards or opportunities for advancement or training.

Considering all these changes in the way of working, it is opportune to analyze the work performance of the employees in the conditions of a certain organizational support. We will not limit ourselves only to the theoretical framework, we will perform an analysis that will highlight the importance of these two aspects as well as the connection between them in the business environment.

2. Conceptual background

In the present study, the studied variables are perceived organizational support and work performance of the employees. Specialized literature offers numerous definitions, which represent a real support for us already having a clearly established starting point.

2.1. Perceived organizational support

According to the Organizational Support Theory, individuals tend to personify their organization by viewing it as having a personality with benevolent or malevolent intentions towards them (Eisenberger, Huntington, Hutchison, & Sowa, 1986; Rhoades & Eisenberger, 2002). Also, perceived organizational support (POS) is a basic need provided by an organization as it guarantees and strengthens supervisory tasks and requires employees to carry out the tasks efficiently and effectively (George, 1993). According to Cropanzano (1997) perceived organizational support incorporates specified principles, arrangements, choices and their usage with regard to employees.

Other researchers define perceived organizational support (POS) as employees' overall perception of how much an organization values their contribution and is concerned with their wellbeing (Eisenberger, Cummings, Armeli and Lynch, 1997). Also, perceived organizational support is influenced by various aspects such as organization's desire to pay a fair salary and to make the employee's job meaningful and interesting (Eisenberger, Huntington, Hutchison, and Sowa, 1986). The same study explained perceived organizational support as an employee's perception of the supportiveness existing in their relationship with the organization. Employees global perceptions are shaped by everyday observations and perceptions of how much their organization rewards effort and loyalty. Generally, employees will perceive organizational behavior through their managers, standards and culture (Levinson, 1965).

From our point of view, POS represents the perceptions that the employees have about the organization, managers/supervisors and working conditions, all correlated with their own interests, goals and ideals.

Based on the above definitions, it seems clear that perceived organizational support is a desirable outcome and is advantageous to all organizations.

The employees' level of POS depends on the treatment they get from their organization (Rhoades and Eisenberger, 2002). Positive organizational behavior is respected by employees, while negative treatment determines undesired employee results (Aselage and Eisenberger, 2003). Moreover, employees sharing such positive views also show a strong commitment to outperform the organization. On the contrary, employees who perceive less organizational support depict less sentimental obligation toward the organization (Sabir et al., 2021). Also, employees are attracted to organizations that meet or surpass their career expectations and personal goals (Arasanmi and Krishna, 2019). In conclusion, all activities of an organization and behaviors of managers/supervisors can possibly impact

employee perceived organizational support (Eisenberger et al, 1986).

Organizational support is sustained by effective leadership, equal employment opportunities, favorable human resource practices and desired working conditions. In this case, employees put very high emphasis on organizational culture - namely, organizational practices, values and behaviors within the organization. Therefore, the perceived organizational support involves both parties (employee-organization). The more the organization improves its organizational practices voluntarily and not forced by circumstances, the more involved the employee is in solving tasks. Employees tend to be emotionally involved in the organization - the relationship that is established between the individual and the entire organization, so it is very important that the organization gives employees the necessary resources voluntarily to grow and develop a sense of belonging and security in the workplace.

2.2. Employee work performance

Job performance is linked with the ability of the employees being aware of assigned targets, fulfilling expectations and achieving targets or accomplishing a standard set of tasks for the organization (June and Mahmood, 2011).

Sinha (2001) expressed that employees' performance relies upon the ability and receptiveness of employees themselves doing their job. In their study, Franco, L. M., Bennett, S., & Kanfer, R (2002) stated that performance depends on internal motivation, however, the existence of organizational factors to carry out a job obviously has a strong effect.

Bernardin and Russel (1993) defined job performance as the report of employee performance based on what they have done and achieved while working within a particular period. They also mentioned the six factors that can influence employee job performance: quality, quantity, timeliness, cost effectiveness, interpersonal impact and need for supervision.

Employee work performance includes two dimensions: task performance and contextual performance. Task performance (Conway, 1999) includes the explicit components of the job that include responsibilities and responsibilities that are part of job description. Task performance requires more cognitive ability and is facilitated by knowledge of tasks - the application of technical knowledge to ensure performance in the workplace and successful completion of tasks.

Motowidlo and Van Scotter (1993) consider that contextual performance refers to a prosocial behavior demonstrated by employees at work. These behaviors are desired but are not explicitly mentioned in the job description - it is perceived as a kind of volunteering for extra work, helping colleagues in solving difficult tasks, cooperating with others and sharing resources. By promoting this type of behavior, organizations want to create a positive and productive organizational climate.

In a broader approach, some researchers (Park and Park, 2019), mentioned one more dimension of job performance, namely: adaptive performance. It shows how versatile employees are in understanding and adapting to changes

taking place in the organization, based on the rapidly changing business environment. Adaptive performance can lead to positive enhanced performance capability (Shoss, Witt, & Vera, 2012) and organizational outcomes such as managing change, and organizational learning (Dorsey, Cortina and Luchman, 2010).

At a practical level, measuring employee performance and increasing it are essential. Mone & London (2010) show in their study that in order to increase employee performance, the organization should place more emphasis on the commitment of its employees. Also, research conducted by Macey & Schneider (2008) and Rich, et al. (2010) suggest that a high commitment to work can increase both the level of performance of employees and their organizational behavior, discretionary effort or psychological level.

2.3. Perceived organizational support and employee work performance

Many scholars have studied the direct correlation between employees' POS and job performance (Guan et al., 2014; Shore and Wayne, 1993; Wayne et al., 2002). Organizational support has been tested in different contexts and found to be related to performance outcomes (Park et al., 2018). According to a meta-analysis conducted by Rhoades and Eisenberger (2002), employees' POS correlates positively with job performance. Also, Niehoff et al. (2001) suggested that when employees feel empowered, they realize the meaning of work and feel they can finish their work by making their own work decisions; they see their work affect the organization, which, in turn, enhances employees' competence and advances job performance.

Research demonstrates that employees who are not interested in their work/job show a lack of care, disappointment and socially reserved quality. This is in opposition to motivated employees, who encounter a pleasurable emotional state at work, showing a high level of job performance. Employees who feel that their work is extraordinarily respected by the organization; get extra motivated and do their best (Rhoades and Eisenberger, 2002).

Additionally, Aselage and Eisenberger (2003) considered POS to be an upward-down commitment, where employees feel organizational support and strive to assist the organization to achieve its goals.

Therefore, this study proposes three hypotheses:

- H1: Perceived organizational support positively influences employee task performance.
- H2: Perceived organizational support positively influences employee contextual performance.
- H3: Organizational support has a positive impact on task performance (A) and contextual performance (B).

3. Research methodology

To test the above hypotheses, we conducted an empirical study on Romanian employees who did not interrupt their work activity during the COVID-19 pandemic or worked in a hybrid system.

The survey comprises three sections. Section one consists of 8 questions related to perceived organizational support adapted from Eisenberger, R., Huntington, R., Hutchison, S., Sowa, D. (1986) research. The 8 items measure the employee's perception of commitment, involvement, and appreciation which the employing organization provided during the pandemic compared to the previous situation. Therefore, respondents were asked to indicate their level of agreement with the 8 items related to perceived organizational support using the scale from 1 = Strongly disagree to 5 = Strongly agree.

The second section of the questionnaire included 5 questions related to contextual and task performance adapted from Koopmans, L., Bernaards, C.M., Hildebrandt, V.H., De Vet, H.C, Van der Beek, A.L. (2014).

The third section of the questionnaire considers the consequences that COVID-19 pandemic had on the work and consists of eight items, to which the respondents were able to answer on a scale from 1 to 5 (1- total disagreement; 5-total agreement) (example: The current pandemic situation has changed my daily workload; The current pandemic situation has led to lower wages; In the current pandemic context, it is becoming increasingly difficult to have time for a break).

The last part of the questionnaire included respondents' demographic data: field of activity, seniority in the position, age, level of education and the way of carrying out work during the pandemic.

4. Data analysis and findings

The questionnaire was applied online on social media networks. As a result, 408 responses were collected. Out of which, 35 were returned only partially completed, resulting in 373 usable responses.

The professional and demographic variables contained in the questionnaire show that the majority of those surveyed (68%) have more than 7 years of experience and have high-level of academic studies (62%). 40% of respondents worked without interruption during the pandemic, and 60% worked in a hybrid system.

The field of activity of the respondents is a vast one - banking, translations, education, sales, IT, justice, transport, public administration, road maintenance, engineering, police, sanitary, retail - which gives us a broader picture of the issues related to work performance, organizational support and the consequences on the work determined by COVID-19 in the last year in various fields.

Table 1 presents means, standard deviations, minimum and maximum values of the study variables.

As we observe in Table 1, the variable with the highest average refers to the organizational support felt by the respondents (mean=4.50), which suggests that the employing companies have found the methods and strategies to ensure the right working environment and support during the pandemic.

Table 1. Means, standard deviations, minimum and maximum values

	Min	Max	Mean	Std. dev.
Task performance	1.00	4.00	3.90	0.81
Contextual performance	1.00	4.00	3.75	0.75
Organizational support	1.00	5.00	4.50	0.73
Consequences of COVID-19 pandemic on work	1.00	5.00	4.32	0.89

Although the organizational support felt by the respondents is high, task and contextual performance are relatively low. Contextual performance was expected to be lower in the pandemic context, but we expect task performance to be relatively favorable at this time, more than a year after the start of the pandemic.

The average of 4.32 obtained for the variable "Consequences of COVID-19 on work" is an unfavorable one and shows that the respondents feel work tasks and responsibilities more difficult to fulfill; however, the item "The current pandemic situation has led to lower wages" has a favorable value (2.50) which shows that the respondents' salary did not decrease during the pandemic.

Correlations for the studied variables are shown in Table 2.

Table 2. Correlations among variables

	1	2	3	4
1. Task performance	1.00			
2. Contextual performance	0.768	1.00		
3. Organizational support	0.895	0.652	1.00	
4. Consequences of COVID-19 pandemic on work	0.752	0.775	0.792	1.00

*p<0.05

We observe in Table 2 positive correlation coefficients between studied variables, suggesting that the relationships are in the same direction. The highest correlation coefficient was between organizational support and task performance (0.895), while the lowest correlation coefficient was found in organizational support and contextual performance (0.652). The results support H1 and H2, which proposes a positive relationship between organizational support and task performance, respectively contextual performance.

It is also important to analyze the impact of organizational support on the two categories of performance.

Table 3. Hypothesis H1 testing -standardized parameter estimation

Variable	Task performance		Contextual performance	
	Beta	t-value	Beta	t-value
Organizational support	0.470	1.732	0.360	1.570

p<0.01

As Table 3 shows, organizational support has a greater impact on task performance (Beta=0.470) than on contextual performance (Beta=0.360). The results also support H1.

5. Conclusions

The organizational support perceived by the respondents (employees who during the pandemic did not interrupt their activity and went to work every day or worked in a hybrid system) was relatively high, which means that those employing companies managed to identify and implement effective measures to support employees during the pandemic (employees feel respected, cared for and recognized). Even if the perceived organizational support was favorable, both task and contextual performance were quite low in the analyzed period. This negative situation could lead to a decrease in satisfaction or organizational commitment. Even employee performance is unsatisfactory, organizations can improve the situation by focusing on employee needs and cares. A recommendation for the managers of the organizations within the study refers to the need to identify the factors that determined the decrease especially in task performance, so that they can implement the necessary measures. Moreover, employees want to work in organizations that provide them with positive and safe work experiences

The study also analyzed the consequences that the COVID-19 pandemic brought on the work done by employees; the most important aspects are:

- most respondents appreciated the fact that during the pandemic the number and complexity of daily tasks and responsibilities increased; at the same time, many respondents stated that they failed to complete their work tasks on time due to the need to comply with the protection measures imposed by organizations;
- another negative aspect mentioned by the respondents refers to the decrease of the number of breaks desired. This situation negatively affects their performance;
- the favorable aspect identified in our research refers to the fact that the salaries offered by employers have not been diminished during pandemic period.

In summary, the present study provides evidence that perceived organizational support is correlated with job performance. These findings can help human resources managers to find ways to use perceived organizational support to increase employee job performance.

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CORPORATE GOVERNANCE – INSIGHTS INTO BOARD CHARACTERISTICS RELEVANT FOR BANKING EFFICIENCY: EVIDENCE FROM ROMANIAN BANKS

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ABSTRACT

A prerequisite piece of corporate governance is performed by board of directors, the latter being the foundation of myriad structures and financial systems, and also forming a paramount unit in decision making process as well as the activity closely allied to it, policy making process. This field managed to gather noteworthy criticism, being contemplated as answerable for the corporate failure, in conjunction with accelerated decrease of the shareholders' wealth.

Beyond the awareness of this controversial issue that has led to theoretical debates over time, managing to provide mixed empirical results, this topic continues to capture attention and instigate a renewed interest in academic circles, this aspect being the necessary incentive that determined the author of this study to continue research in this direction.

The present study was intended to provide a better understanding of the idea that boards can have a proactive role or behavior in committing to organizational effectiveness. Through a harmonization of the existing governance literature, the paper empirically delves into the relationship between known variables of the board and the performance of the financial organization. Therefore, the study contributes with new knowledge around board of directors' influence on the Romanian financial institutions performance and provides a foundation in conducting future research in this area.

Keywords: corporate governance, financial performance, financial institution, board of directors.

JEL classification: G34, O16, G21.

1. Introduction

In recent years, the attention of regulators and academics, was directed towards the issues of corporate governance, and this is due to the importance of the economic and social health of the organization, creating the necessary environment for requesting strong corporate governance mechanisms.

Benefits such as improved operational efficiency, easier access to funding at a lower cost, and finally yet importantly an improved reputation are pillars underlying the proposed improvements to the framework and mechanisms for corporate governance (BCBS, 2006).

The exclusive appearance of directors was subject to noteworthy surveillance and served to legislation passages systematizing the manager's engagements and obligations, this been against the background of the corporate failures encountered over time. It has been brought to light that the director's capability to accomplish his duties has a repercussion on both shareholders and stakeholders.

Existing studies are relatively limited in one way or another, aiming to correlate sporadic board characteristics straightforwardly to organizational performance, neglecting other peculiarities of this topic.

The governance topic is especially crucial in the banking sector. Banking institutions should maintain their performance and establish their reputation to strengthen consumer confidence. Escalating the emphasis of this sector for a society's economic growth, these organizations apportion funds to different economic sectors, as well as enforce monetary policy.

The concept of corporate governance is not a new one, being supported, from a theoretical and practical point of view, over time. Undoubtedly, it is an indispensable factor in achieving success and sustainable economic growth.

The significance of corporate boards is always questioned, and this is more than likely on the grounds that their daily implications are abstruse in recognizing them. But this already becomes debatable, when things take a totally wrong turn, generating losses, the governing body acquiring other dimensions in recognition of its influence.

Considering this renewed concern into corporate boards, the author recognizes this propitious moment to reassess what has been accomplished or experienced, respectively what has not been learned from the studies conducted on this topic, which is representing a dynamic component in the overarching process of management and control of the organizations.

Every business organization has board, still the debates shaped around the role performed by the boards do not have a final resolution and moreover, the author considers that the answer on this topic cannot be measured or be representative from an econometric point of view. However, researchers acknowledge the discrepancies across councils, often wanting to know if these characteristics describe the real differences that reside in the way companies behave. Outside of extensive field research, lamentably, noticing those dissimilarities in behavior is perceived to be difficult and even more complex to assess them, from a practical perspective, for statistical analysis.

Accordingly, observational studies on this extent aim attention at structural characteristics across boards, on the understanding that they correspond with the variations in attitude and actions taken. As an explanation of the above, a prevalent hypothesis is developed around the idea that outside directors will act distinctly than inside directors. In analyzing the behavior of boards, for instance, the agreement to suspend the Chief executive officer when feeble economic performance is expected, specific ratios of independent to executive directors may help recognize if the behavior oscillates in a statistically considerable way. If the conduct is not straightforwardly noticeable, a closer examination of the financial activities and position of the organization can be done to understand the impact and implications of the board structure (Adams et al, 2010).

Although the existence of an impressive analysis in non-financial corporation sector can be contemplated, the same cannot be said of work addressing governance issues in the financial services sector mainly, and the banking sector explicitly, admitting that indispensable facets of corporate governance pertain, also, to the banking industry. Many studies chose to ignore these organizations, given the dissimilarities between regulations and capital structures. The author does not agree with this premise, noting that most research (Titova, 2016, Al-Saidi and Al-Shammari, 2013, Hoque et al, 2013, Himaj, 2014, Adams and Mehran, 2012) support this conclusion.

There is a comprehensive investigation regarding governance of financial organizations, unfortunately these publications being widespread in numerous journals. Still, this study remains necessary, because it is imperative to acquire a greater understanding on how financial services industry organizations are guided. It is also relevant to recognize how corporate governance of these institutions influences their performance.

The academic achievements are abundant with theoretical thoughts and opinions and illustrate a variety of contradictory hypotheses around board of directors' characteristics and their significance on the financial performance.

In the sections that follow, the author briefly discusses: (i) theoretical considerations about the bank governance, (ii) concisely reviewing prior literature highlighting the influence of the board of directors and possible correlations between its characteristics, and financial performance of the banks, and proceeding with developing hypotheses, (iii) the research design, provides results, while the final section provides the conclusions.

2. Research paradigm and theoretical orientation

Financial institutions represent a centerpiece of the economy, on the grounds of financial assets development, risks governance, and information asymmetry lessening in commercial channelings among economic agents (Merton and Bodie, 2005).

The corporate governance framework intensely deliberated accommodated various characteristics of the board

structure, shaping the premises of a paramount foundation for it. Board of directors represents the channel, for special-interest groups, to keep under observation the management, inevitably being analogous to the controversies associated to corporate governance.

Prior knowledge brought around corporate governance in financial institutions outlines subtleties of this versatile environment. Nonetheless, neither one suppositional viewpoint can entirely enfold the perplexities within an organization, and therefore it is challenging several hypotheses and judgements to support larger interpretations for corporate governance peculiarities from various angles.

Daily et al. (2003) put forward that various hypothetical methodology to corporate governance is called for ascertaining the myriad of instruments and structures that might strengthen organizational movement.

Examinations on financial institution's corporate governance (Becht, Bolton, & Roell, 2012, Macey and O'Hara, 2003) admit the subsistence of adversities, specifically opaqueness or intricacy and regulation. Additionally, these challenges hamper the strategy in adopting the common corporate governance mechanisms to the banking organization.

Information asymmetries phenomena can be encountered in every field, however the complications emergent for banking companies possibly can be heightened by the intricacy of this type of establishment (Morgan, 2002). Opaqueness or complexness exhibits the unconventional character of the financial business and the adversities external stakeholders confront whilst monitoring bank actions. Questions towards complexity are conventional in banking field, causing inconvenience for stakeholders into keeping under observation their bank.

Levine (2003) stated that complexity manifests through quality of loans being misapprehend, financial statements complicatedness, investment risk modifiable, or privileges that are slighter for insider representatives to achieve.

The complexity control imposes a board which in addition to providing managers access to objective and beneficial guidance in coordinating the financial organization, also monitors managers adequately.

The presence of a governance negative aspect can alter the conduct of these organizations. The consequential actions may conclude into a banking collapse, denoting considerable public costs and macroeconomic developments such as systemic risk and repercussion on payment risks, these macroeconomic indications, even at their minor prejudicial level, corresponding to depositor discouragement, significant restraints on credit access, and, wherefore, a moderation in the investor process (de Andres et al, 2012). Corporate governance of financial intermediates, established as an assortment of instruments that validate the effective transaction of financial resources, represents an indispensable matter consisting of guarding economic stability. Following these explanations, the board of directors, if properly shaped, can have an indispensable appearance in sustaining suitable corporate governance.

3. Literature review and hypothesis development

The structure, function and influence of boards have been debated from different angles, moving from theoretical to practical perspectives, but creating the premises of a topic still provocative and perpetual in research. It benefits from an abundance of observational studies, committed to the acknowledgment of the connection between corporate governance and financial performance, in addition to board of directors' attributes as size, independence, diversity, splitting the roles of the chairman and the CEO, and frequency of board meetings.

In this section, the author surveyed the existing research and discussed the prominent instrument, distributed into various substructures as it was already mentioned, as well as developed the hypotheses for Romanian banking sector, which subsequent will be tested.

Board size

The board size experiences a widespread recognition in academic circle, on the grounds that it is one of the most acknowledged characteristics of the internal governance mechanism, namely board of directors, which performs a controlling position into the management of the company. One of the investigations which lies at the base of this study is to what range or magnitude the size of the board stands for the financial institution performance.

Considerable councils can be constructive as a result of knowledge and expertise transferred to it by representatives from diversified backgrounds. In this context, a larger board possesses more capabilities that will help into monitoring the performance. Therefore, directors would weigh on critical actions and challenge managers to divulge the real effects and outcomes to stakeholders, which will contribute to better transparency of information (de Haan and Vlah, 2016).

On the other hand, smaller boards are presumed to experience low confidence and poor recognition for strategic changes (Golden and Zajac, 2001). But this also provides the opposite view, which claims that large councils are less efficient than smaller ones. This contradictory conclusion is generated by increased costs, information asymmetry, reduced productivity, inadequate management, and useless communication channels. Questions are raised about whether the councils have more (than ten) representatives, amid poor communication of ideas and opinions in relatively limited time, and therefore are supported councils with a small number of members, creating the premises for a better understanding between directors (Fidanoski et al., 2014).

A larger board might cause lack of interest in collecting, respectively interpreting information when its acquisition is expensive (Persico, 2004).

For the most part, it is established based on cultivating group cohesiveness and social psychological studies. Therefore, the governing body tends to become more of a symbol, and not to be component of management process. Panagiotis et al (2007) established a negative correlation between board size and financial performance, Adams and

Mehran (2012), Kutubi (2011) and de Andres and Vallelado (2008) found a positive correlation and others said that no significant association between the two (Wang et al, 2012, Zulkafli and Samad, 2007). Based on prior evidences the following hypothesis will be examined:

H1: There is a positive association between the board size and financial performance.

Board independence

Board independence concept has acquired a considerable preponderancy in corporate governance elaborations, due to the several corporate scandals which accentuated the absence of control by the board caused by the permanence of comfortable interaction between outsiders and insiders. The unapproachability of an effective balance to executive authority has consequential implications for shareholders given that they depend on the assigned board of directors to safeguard their investment.

The imperative problem refers to the meaning of independence. Legalistic terminologies have been embedded in corporate governance codes to establish that independent or outsider directors are extracted from a group of individuals, with no influence or dealings with the organization. The phenomenon of such directors possibly 'isolated' on the board has guided to additional requirements, for instance, the existence of minimum two independent directors, and situationally, it is presumed that one of the independent executive proceeds as board chairperson (Mahadeo et al, 2012)

The meaning of independence was understood in an unbiased manner and the acceptance of supposed independent members is generally tokenistic (Alves and Mendes, 2004).

From another point of view, there are other studies which have discovered positive response in connection to devaluation of fraudulent financial reporting (Dunn 2004).

Despite the absence of a general interpretation of independent directors, having constituted a board of director with a majority of outside directors represents an achievement in enhancement to the board effectiveness (Kang H. et al.,2007) and consequently in the direction of better corporate performance.

Pathan and Faff (2013) concluded that the percentage of independent directors is negatively associated to bank performance, Huang (2010) found positive and significant correlation between the number of outside directors and bank performance and Choi and Hasan (2005) found no significant relationship between the number of outsider and bank performance for the Korea.

H2: There is a positive association between the board independence and financial performance.

Frequency of board meetings

Another linked concern related to councils is illustrated by the presence of directors at board meetings. Leaders are presumed to attain knowledge and engage into decision-making in consequence of their participation at those gathering. The feature used by Aebi et al. (2012) is the

percentage of directors who engage less than 75% of council gatherings, but there was no significant correlation in their study.

This feature is associated with the internal organizational board framework (de Andres et al., 2005).

Delving into the activity of a council, interpretations were established both for and contrary to an effective connection enclosed by meeting frequency and performance (Vafeas, 1999). The purpose of these gatherings meetings is illustrated by the opportunity for board members to confront and deliberate, as well as to reciprocate beliefs and opinions regarding the supervisory actions of the managers, as well as the bank's strategy. Therefore, against the background of more recurrent actions and meetings, a more effective discipline over managers could be observed, and the advisory capacity was more consistent, these circumstances determining a positive repercussion on performance. Moreover, the emphasis of the board's consultative function is expanding considerably given the complexity of financial institution and the weight of information. However, periodic gatherings could further be the consequence of board's acknowledgment to feeble performance. For that reason, the theory regarding the impact of the council's effort on the organization performance represents an observational debate, which can deliver either proactive or reactive outcomes.

Board meeting recurrence conceivably drives imperative governance indications and this is due to the fact that it is more reasonable to accustom the frequency of the board gathering to accomplish improved governance of the organization, and not to resort on adjustment into the board or ownership framework. Still, the correlation between board meeting frequency and performance continues to be ambiguous. Board meetings represent a systematic condition which underlies the board efficiency improvement and adopted as a proxy for council activity (Van den Berghe and Levrau, 2004).

Fama and Jensen (1983) explains that committees of active and effective companies should be sedentary and manifest less animosities. Scheduled reunions in quick succession generate expenses associated for example with traveling for the purpose of conducting business-related activities. As an organization performance weakens, boards are vigorously analyzed by shareholders and tend to gather regularly. The advantage of board engagement will encompass the opportunity for directors to brainstorm, establish actions or strategies and oversee management.

Active outside board representatives can be endowed with knowledge and contribute with consistent, sector-wide acumen perceived as valuable to the bank (Grove et al., 2011). Another observation was made related to the directors who have a place in various boards, arguing that they are likely inattentive concluding that their role is affected, not being effective monitors (de Haan and Vlahu, 2016).

Other authors conform with this inference as they found that the number of board meetings promote board monitoring (de Andres et al., 2005). Chen and Nowland (2010) stated the

organizations with audit and remuneration committees are associated to higher performance.

H3: There is a positive association between the board meetings and financial performance.

CEO duality

Factors such as the opacity of financial institutions, inadequacy of market control, or the intricacy of agency costs can lessen CEO practice, emphasizing the segregation of management positions in these organizations.

Board framework is not conclusive for its establishment, although organizational inducements impact is consequential on a financial organization's probability of collapse.

Grove et al. (2011) showed that the duality of the CEO influences the performance of the financial institution, through a negative correlation, but does not manipulate the quality of loan. Still, this might invigorate bank governance not only from debt-holder's viewpoint, but also for society.

The repercussions of the dual role of the board of directors were investigate, considering the segregation of the advisory and monitoring roles to be auspicious. If this is done, an approachable management board of directors is brought to light considering CEO's readiness or refusal to suppress or share information with the supervisory board (Adams and Ferreira, 2007).

Baliga et al. (1996) indicated that a naming change or adjustment in the status might be a figurative modification undertaken by the council as an indication that they are performing their governance function, instead of substantive change which can impact efficiency, and based on this statement the authors conclude that there is no association between duality role and organizational performance.

In their study on listed companies during the Asian financial crisis, Chang and Abu Mansor (2005) looked at corporate governance influences, more precisely the duality of the CEO, and decided that the performance is for the most part correlated with organizations where both positions are controlled by distinct persons.

The main inconvenience of CEO duality pinpointed in the written works derived from the contradictory mark on board's monitoring action and elevated authoritative power to manipulate committee decisions. CEO's who also preserve the chairperson role will incline to have higher authority onto appointment of council representatives than it is necessary. Besides they may seek to designate representatives who are unlikely to challenge strategies or approaches. The consolidation of the roles might additionally limit the information spreading to other representatives (Hardwick et al., 2011).

H4: There is a negative association between the duality of the CEO and financial performance.

Board diversity

Gender represents the most deliberated diversity subject, reaching political and social dimensions, not being studied only from the council diversity perspective. Over the last few

years, distinct quota systems or anti-discrimination systems were drafted to broaden representation of female in government (Kang et al., 2007).

A mixture of developing social perspectives and durable egalitarianism legislation materializes into some response in promoting the presence of women on boards, being perceived as a pronounced scheme with reference to special-interest groups (Kang et al. 2007; Arfken et al. 2004). Subsequently, the affirmative aspects of women attendance in boards do not typically surface from empirical research—to a certain extent not in a precisely manner and in connection to financial results. Adams and Ferreira (2009) encountered positive correlation return on assets and gender. They believed that female directors are better appraiser than male representatives, based on their implications and constantly board meetings participation, mentioning that their engagement has a positive effect on organizational performance.

Francoeur et al. (2008) illustrated that organizations who consent to and propose women involvement in power elite reveal favorable and noteworthy organizational performance if the company performs in a complex environment.

Enhanced corporate governance can be obtained by sustaining women on the board of directors, and in consequence it could be interpreted as competitive advantage (Bernardi et al., 2002).

On the other hand, Carter et al. (2010) didn't find a significant correlation between female directors and cultural groups of the board and financial performance.

H5: There is a no association between the women directors and financial performance.

4. Empirical design and results

Sample selection and variable measurement

In this research, the author analyzed the documents produced and reported by the Romanian financial institutions, from 2017 to 2019 and collected evidence to see if there is any impact of board of directors' attributes on the financial institutions' performance. There are 26 commercial banks active on the NBR website, but according to the banking system changes recently, respectively bank acquisitions and mergers, and the lack of information that formed the basis of this study, the present sample corresponds to 15 banking institutions, observing 57.7% of population as sample size whose information are disclosed. 11 companies have been further excluded due to the unavailability of data either of financial nature or related to the board structure.

The data regarding the boards of directors and the profiles of the directors were collected from annual reports of the companies for all three years. The financial performance measures data have been extracted from the annual reports of the companies simultaneously.

According to Table 1, it was described the variables selected for the study and for statistical analysis. The comprehensive impact of corporate governance on bank performance

determined to examine the relationship between corporate governance variables such as board size, number of independent directors, chairman duality, frequency of board meetings, and board diversity (gender) and financial performance variables such as ROA (Return on Assets), ROE (Return on Equity) and CAR (Capital Adequacy Ratio) of financial intermediaries in the Romanian context based on past related studies (Adeabah et al., 2018, El-Kassar et al.,2018, Tulung and Ramdani 2018, Doğan and Ekşi., 2020, Owiredu and Kwakye, 2020, Rahman and Islam, 2018).

Table 1. Description of variables

Variable	Definition
Board Size (BSize)	Total number of directors in the board
Board Independence (Bind)	Total number of independent directors in the board
Board Diversity (BG)	Total number of women present on board
Frequency of Board meeting (B_Meet)	Number of board meetings per year
CEO Duality	Management of the company – unitary and dualist system
ROE	Return on equity calculated as profit after taxes divided by total assets of a bank
ROA	Return on assets calculated as profit after taxes divided by total assets of a bank
CAR	Capital adequacy ratio

According to the mentioned studies, this topic is still in the attention of academics, ensuring the quality of being an original topic, even unusual through its intensively debates. Also, the present study creates the premises for the perpetual development of this mechanism.

Table 2. Descriptive Statistics

		N	Min	Max	Mean	Std. Deviation
2017	BSize	15	3	11	6.93	2.052
	BInd	15	0	4	1.07	1.163
	BG	15	0	5	1.27	1.486
	B_Meet	15	5	85	22.53	20.625
2018	BSize	15	3	9	6.8	1.821
	BInd	15	0	5	1.27	1.335
	BG	15	0	4	1.4	1.242
	B_Meet	15	5	81	22.27	19.912
2019	BSize	15	3	9	6.67	1.839
	BInd	15	0	5	1.47	1.457
	BG	15	0	3	1.53	1.06
	B_Meet	15	4	58	23.33	16.702

Descriptive statistics of all the board related variables have been illustrated in Table 2, per every year, corresponding to 15 sampled firms. For each variable, the mean, minimum, maximum, and standard deviation values have been presented.

The maximum number of directors in the board was reported in 2017 (11), while the minimum number is kept constant for the analyzed period (3). The average number of directors in 2019 is 6.67.

The minimum number of independent directors in the board is 0, throughout the analyzed period, which means that there are banks that do not have independent directors, and the maximum is 5, remaining constant in 2018-2019.

The minimum number of female representatives on board is 0, throughout the analyzed period, and the maximum number is 5, reported in 2017, then decreasing each year.

The frequency of board meetings has an average of 23.33 in 2019, with a minimum number of meetings of 4, and a maximum of 58 meetings per year.

Table 3. Correlation analysis

		ROE	ROA	CAR
BSize	Pearson Correlation	.687**	.679**	0.166
	Sig. (2-tailed)	0.000	0.000	0.277
	N	45	45	45
BInd	Pearson Correlation	.500**	.437**	0.143
	Sig. (2-tailed)	0.000	0.003	0.349
	N	45	45	45
BG	Pearson Correlation	.321*	0.287	-.373*
	Sig. (2-tailed)	0.032	0.056	0.012
	N	45	45	45
B_Meet	Pearson Correlation	-0.224	-0.015	-0.028
	Sig. (2-tailed)	0.140	0.923	0.854
	N	45	45	45
CEO duality	Pearson Correlation	0.060	0.359	0.359
	Sig. (2-tailed)	0.697	0.105	1.106
	N	45	45	45
** Correlation is significant at the 0.01 level (2-tailed)				
* Correlation is significant at the 0.05 level (2-tailed)				

By analyzing the values of Pearson's coefficients presented in Table 3, the author reached to the following conclusions:

The board size indicates two positive influences (0.687) over ROE, and (0.679) over ROA, being significant with a high probability of 99% (Sig. <0,01). The relationship between the board size and CAR has a significant level of 0.166, which means that there is no significant relationship of the board size to CAR.

The board independence indicates two positive influences (0.500) over ROE, and (0.437) over ROA, being significant with a high probability of 99% (Sig. <0,01). The relationship

between the board independence and CAR has a significant level of 0.143, which means that there is no significant relationship of the board independence to CAR.

Board diversity has a lower positive influence (0.321) over ROE, being significant with a probability of 95% (Sig. <0,05). There is also a relationship between the presence of women in boardroom and CAR (significance level of 0.05), which means there is a significant negative relationship between board diversity and CAR. The relationship between the board diversity and ROA has a significant level of 0.287, which means that there is no significant relationship of the board diversity to CAR.

Neither frequency of board meeting nor CEO duality could be associated with the bank performance. The p values indicate that all variables failed to reach the significance level and hence there are no significant associations.

5. Findings and conclusions

Financial institutions have a challenging role of financial intermediaries. Their performance is vital for financial durability, contrarily their incapability may have a repercussion on the entire economy. For this reason, it is beneficial to follow and seek if wide-ranging corporate governance may enhance banking effectiveness.

Boards of directors possess a fundamental function in banking governance, controlling managers, and assisting them in elaboration strategies and accomplishment.

This study participates to the existing literature on corporate governance in this specific field by empirical analyzing if attributes of the board reveal the incentives and expertise of managers to fulfill these roles. To be more concrete, the author analyzed if these determinants are linked to greater bank performance.

The empirical analysis found positive and significant correlations between both board size and board independence to banks performance when evaluated using different performance measures, these findings being in agreement with the alternate premises which indicated that both characteristics are favorable and significantly associated with the bank performance.

The significance of the study indwells in the fact that it delivers detailed theoretical and practical knowledge about the impact of given variables in conditioning the performance value of banking intermediaries.

Limitations

The author proposes that future research should concentrate to the characteristics of the individuals who represent financial institutions boards to observe their capabilities to be suitable or appropriate into different categorizations of roles using relevant quantitative research approaches.

The viability of an institution is conditional upon how it copes with situations that reflects incertitude or dependency. Members who are capable to diminish these difficulties, under these circumstances, are wanted. Each member of the board has an unprecedented set of human and social

capital assets, not only education or expertise, but also those that count for most in the daily lives of people.

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A COST-BENEFIT ANALYSIS FOR A STAINED-GLASS COMPANY

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ABSTRACT

Cost-Benefit Analysis (CBA) is a financial management tool available to decision-makers with the role, on the one hand, to facilitate the substantiation of decisions on financing investment projects and on the other hand to assess the level of economic efficiency of a project. The vast majority of decision-makers in public organizations have begun to use cost-benefit analysis (CBA) to assess the effectiveness of their decisions in terms of consequences. This technique has the advantage of estimates both tangible and intangible costs and benefits. The main strength of any CBA analysis is the lack of ambiguity, which makes CBA a common language known and used throughout the world and in a variety of fields such as construction, software development construction, education, health and care, and information technology. Nevertheless, using cost-benefit analysis has to take into account the specific elements of the analyzed project in order to draw the appropriate conclusions.

This article presents a brief presentation of the CBA as a decision tool and how it is used in the case of a workshop specializing in the production and restoration of stained glass that represent elements of cultural heritage. Restoration of cultural heritage projects is a special type of investment project that does not generate any income and is subject to non-reimbursable funding through existing financing programs. These particularities make for some adaptations to the classic cost-benefit analysis methodology.

Keywords: cost benefit analysis, cultural heritage, restoration of stained.

JEL classification: D61.

1. Introduction

French economist Jules Dupuit launched the concept of cost-benefit in since then, the concept transformed into a tool and analysis has been and continues to be used in assessing the potential socio-economic impact of public investment choices and beyond (Annema et al., 2015). As early as 1960, cost-benefit analysis began to be used frequently for budgetary practices that needed to streamline spending. There is some conceptual stability in the literature on cost-benefit analysis, which is considered as a financial management tool available to decision makers, with a dual role, on the one hand to facilitate the substantiation of decisions on the financing of investment projects and on the other hand to assess the level of economic efficiency of a project.

Cost-benefit analysis is a conceptual framework applied to any systematic qualitative assessment of any public or private project, in order to establish whether or to what extent this project is socially valuable. The cost-benefit analysis differs from simple financial valuation in that it considers all the gains (benefits) and losses (costs) for social agents (Posner, 2000). CBA usually involves the use of accounting prices. Cost-benefit analysis is useful only to the extent that there is a general consensus that its value assumptions are legitimate. It is easy to make an investment decision when the benefits outweigh the costs. Conducting a cost-benefit analysis is crucial for any organization to make profitable decisions. CBA is applicable to many industries such as construction, development, education, healthcare, and information technology.

Economic impact analysis, feasibility studies, and Social Return on Investments (SROI) are other tools used by economic development organizations, communities, and policymakers across the world to determine if a project will have positive economic or social benefits. However, they each differ from a benefit-cost analysis as they do not compare an alternative analysis for not completing the project. Additionally, these tools use multiplier effects, consider market trends and in the case of the SROI only identify the direct benefits of a project or program rather than inclusive of all benefits that are realized. While these tools are certainly useful in determining if a project is worthwhile, benefit-cost analysis is a great tool to make a calculated decision based on the evidence presented and provides a clear comparison of the alternative.

In this paper, we will briefly present the CBA, the reasons why it is recommended to be used by decision makers to decide on cultural heritage objects that need restoration.

From the available documents I was able to detail the main operations that any stained-glass object goes through. In the methodology we used the case study - presenting the workshop specialized in stained glass works - cultural heritage objects, which concluded a private collaboration agreement - public institutions (several universities in Romania). The conclusions are based on the existing situation in the field of cultural heritage.

2. Literature review

2.1. Definition of cost-benefit analysis

Cultural heritage valorisation is expensive and is a great economic challenge. Conservation and restoration, are just one part of the total costs of cultural heritage preservation,

while other investments relate to regular operation and maintenance (Tišma et al., 2021).

CBA is an analytical tool to be used to appraise an investment decision in order to assess the welfare change attributable to it. All the costs and benefits of a project are taken into account, not only the financial ones. Indicators such as net present value or internal rate of profitability, but the input data are different from the financial analysis. All costs and benefits are quantified so that they can be compared. The evaluation of costs and benefits must be done starting from statistics and precedents relevant, to avoid subjectivism as much as possible.

The scientific literature frequently discusses the dilemma of choosing between cost-benefit analysis (CBA) or multi-criteria decision analysis (MCDA), which is the appropriate evaluation tool in the decision evaluation process or if they should be combined (Annema et al., 2015). The MCDA aims to support decision-makers who face numerous and conflicting choices. CBA assumes the availability of empirical data, data from the MCDA are derived or interpreted subjectively as indicators of the power of decision makers (Barfod et al., 2011). Intangible costs and benefits are important when considering capital projects based on their social value rather than their economic value, which is often the case for capital projects that support services with characteristics of public goods. It is easy to make an investment decision when the benefits outweigh the costs. Studies exploring the assessment of social benefits derived from cultural heritage remain rare and may be justified by the need to secure funding for its conservation (Navrud & Ready, 2002).

What is the CBA for?

Basically cost-benefit analysis serves two purposes: to verify that an investment or a project's benefits are more than its costs and to select an investment or a project by comparing the benefits over cost ratio (Pearce, 2016). But there are other uses of this analysis as well:

- Determining the feasibility of an opportunity;
- To provide a basis for comparing projects;
- Opportunity cost assessment;
- Performing sensitivity analysis for different real-life scenarios.

The stages of a cost-benefit analysis

Some authors (Barfod et al., 2011; Nas, 2016) consider that 4 steps need to be taken, while others consider that 6 steps are required for an informed decision. (Adler et al., 2006; Coates, IV, 2014) presents 6 steps of cost-benefit analysis: defining the framework for analysis, identifying and classifying costs and benefits, developing a timetable for expected costs and revenues, monetizing costs and benefits, reducing costs and benefits to obtain current values, and calculation of net present values. The limitations of the Cost-Benefit Analysis tool are given by certain elements such as a number of inaccuracies in quantifying costs and benefits. The existence of the element of subjectivity also comes from the fact that not all costs and benefits can be easily quantified. The risk of cost-benefit

analysis being confused with a project budget is another limitation that critics of this tool point out.

2.2. Costs

The theory provides the theoretical foundation for a general framework within which costs and benefits are identified and assessed from a societal perspective. (Nas, 2016) - There are 4 types of costs: those related to staff, those related to equipment and materials, those related to productivity and overhead. The economic benefits are those associated with: personnel, materials and equipment and product design, associated with increased sales. There are also intangible benefits within them.

Restoration costs are carried out in order to prolong life by 50-100 years. The price is also calculated depending on the complexity of the intervention. The intrinsic value of stained-glass windows is the same as that of any work of art or heritage object, and their preservation deserves the same level of attention and professionalism regardless of the period in which they were made or their material value. Stained glass windows cannot be removed from the architectural context in which they are found. For the design and implementation of a restoration-conservation program it is necessary to take into account both the characteristics of the architectural ensemble and those of installation specific to the moment of installation in embrasures. Stained glass restoration and conservation involves the collaboration of a group of specialists including (but not limited to): conservators, restorers, art historians, architects, researchers, construction engineers as well as government organizations involved in heritage protection.

The costs can be easier to detect if we follow presentation/description of the conservation-restoration process by phases, operations, sub-operations, methodologies for applying the intervention techniques, on punctual and special details depending on the case to be solved, presentation of materials, methods of use, preparation, recipe, solutions, etc.

2.3. Benefits

The benefits of cultural heritage conservation are often intangible, or only imperfectly reflected in market transactions. This raises the question of how the benefits of these activities are to be measured so that they might be incorporated into cost-benefit analyses. The most difficult aspect of the economic analysis is to estimate the benefits from the investments being made to improve the cultural heritage. These intangible benefits would be reflected in observable variables in a number of ways (for example, higher prices for property within the site, higher sales prices for goods sold at the site, increased visitation, and increased tourist spending) but only imperfectly so. The potential beneficiaries of the conservation activities can be divided into three broad groups: residents, visitors, and others. Each of these groups would receive a different mix of benefits, depending on the use they make of the patrimonial object. Benefits depend on preferences, and preferences in cultural heritage are likely to differ by cultural origin. Improvements in well-being of residents are properly counted in an economic analysis prepared under either the city's or the

country's perspective, even if such improvements do not translate into financial flow. The conservation and improvement of cultural heritage can bring substantial benefits, that these benefits are not limited to tourists. Residents of the site, and of the country in which it is located, can also benefit from such investments.

3. Methodology

The case study is popular in information system research as it provides an extensive insight into a company's activities and experience (Bensel et al., 2008). The organization that is the subject of the case study is a Romanian workshop specializing in stained glass integral parts of historical monuments, restorative. With an experience of over 30 years, it also carries out restoration activities but also makes monumental works of art for private and sacred environments around the world. Stained glass windows are made using the authentic technique of lead bonding, unchanged for 1,000 years. The glass used is handmade and comes from abroad from France and Portland (USA).

We gathered the necessary information from multiple sources - from online discussions with collaborators of the studied organization and from the materials available detailing the steps required for the stained-glass restoration process.

Starting with 2018 in Romania, the company is part of a project financed by the European Union, which we consider a sort of organizational improvement project for the company. The technical project for the restoration of stained glass is the document that proposes the general technology of the intervention, the strategy - the staging in the execution works, the interdependence with other interference interventions and is elaborated without having access to the entire glazed surface. The economic-financial estimate is general. Within the studied organization we find the main benefits presented by the literature are the economic ones, which are associated with the staff, materials and equipment. In addition, there are fewer tangible benefits that can have an economic impact. (Cristina et al., 2017; Settembre Blundo et al., 2014). The benefits that result from the automation of some of the work processes, result in their efficiency and a satisfaction among employees (Bensel). The benefits in this case have rather intangible values - the objects subject to restoration have historical / cultural value.

For conservation - restoration works with glazed surfaces between:

- Up to 10 sqm with a duration of 0.5 - 5 months,
- Between 10 - 50sqm with a duration of 5 - 24 months
- Between 50-100 sqm with a duration of 24-36 months
- Between 100-200 sqm with a duration of 36-60 months

The restoration process - in which the conservation interventions / treatments are carried out according to the heritage institute must go through 13 stages. From A to M.

Each branch into other sub-operations - for example stage A contains 14 operations, which in turn together contain about 30 sub-operations - each with specific costs. Stage B contains 9 sub-stages, which includes about 18 sub-operations. The interventions are mostly done in the workshop and a small part in situ, where the costs increase 100%. To perform the work, there is specialized personnel in the fields. For technical interventions/treatments for conservation/restoration, an increase of 15%, 30 or 50 by the case of the norm for the use of toxic substances is calculated. The tools / equipment or equipment are of the type electrical installation, mini rubber rollers, magnifying glass, sprayer, electronic scale, lamps / projectors, laboratory instruments, various containers, stereomicroscope.

The materials are such as: consolidants, protective gloves, silicone paper, Japanese paper, electricity, solvents, fine brushes, plastic syringe, various needles, melinex foil is calculated by flat rate 10% of the value of labor.

The restoration process - in which the conservation interventions / treatments are carried out according to the heritage institute must go through 13 stages. From A to M.

Each branch into other sub-operations:

- Stage A contains 14 operations, which in turn together contain about 30 sub-operations - each with specific costs.
- Stage B contains 9 sub-stages, which includes about 18 sub-activities. Stage C contains 5 sub-stages, which branch into 28 sub-activities, which take place in about 104 hours.
- Stage D contains 4 sub-stages, of which 16 are derived under activities - which take place on average over 30.4 hours.
- Stage E contains 5 sub-stages, which in turn contain 10 sub-activities, which take place in about 49, 35 hours.
- Stage F contains 6 sub-stages, which contain 18 sub-activities for about 52 hours.
- Stage G contains a sub-stage that has 3 sub-activities carried out over a total of 6 hours.
- Stage H has 5 sub-stages that take place in about 66 hours.
- Stage I contains only 2 sub-stages that take place in 16 hours.
- Stage J has the longest run - 350 hours.
- Stage K is approaching J and it will take place in about 250 hours.
- Stage L is in about 3 hours.
- The last stage, M, contains 4 sub-stages which branch into 8 sub-activities of about 33 hours.

Workforce by categories of staff - involves staff inside the workshop or outsourced staff are called upon for specific tasks, which exceed the competencies of those already involved in the workshop. The materials - used in the restoration process are used according to the needs of the stage in which they are used - are used in small quantities (gr, ml, dmp, kW / h) and their cost is calculated according to invoices or receipts from suppliers.

Table 1. Stages of restoration technical interventions treatments

Stage	Conservation/ restoration technical interventions/ treatments	Measured	Average hours	Remarks
A	Consolidation of the decohesive / adhesive paint layer	dmp m.p	26,53h	A 15% increase in the standard for the use of toxic substances is calculated. Calculate a 10% increase in the toxic medium For work performed in situ, a 100% increase in labor is added. Reductions or increases of 30% of the norm for particular situations.
B	Interventions at the level of painting and substrate (Glass)- outer side	Dmp.	22,12h	For on-site work, an increase is added to 100% labor. A 15% increase in the standard for the use of toxic substances is calculated. A 10% increase in the toxic medium is calculated. An increase of 50% is calculated for special situations usually.
C	General interventions (Glass)	Sqm.	104,5h	An increase of 50% of the norm is calculated for the situation particular. 15% toxicity is calculated (use of toxic substances) An increase of 30% of the norm is calculated for works performed outdoors. An increase of 30% is calculated for exfoliating colored surfaces.
D	Other interventions (Glass)	Dmp.	30,4 h	The total value of the labor is calculated as the sum of the workmanship of each layer to be reproduced for works of special complexity, a 100% increase in labor is added An increase of 30% of the norm is calculated for the situation particular.
E	Interventions at level of lead, zinc, Tiffany profile network	Dm Pieces. sqm	49,35h	An increase of 30% of the norm is calculated for the situation particular. An increase of 15% of the norm is calculated for the situation particular.
F	Hardware interventions (Hardware)	in m; in 5 pcs / m, in sqm	51,95h	An increase of 30% of the norm is calculated for the situation particular. A 30% increase is calculated for the use of substances toxic An increase of 50% of the norm is calculated for the situation particular (flamboyant frames, rosettes, etc.)
G	Interventions in the event of damage to framework frames, heads, frames, wooden mountings.	m	6 h	An increase of 30% of the norm is calculated for the situation particular. A 30% increase is calculated for the use of substances toxic
H	Interventions on glass panels with deteriorate sealing putty	sqm and m	66,25 h	An increase of 15% of the standard for use is calculated of toxic substances. An increase of 5% of the standard for use is calculated of toxic substances.
I	Interventions for repairing degraded masonry and panel disassembly operations with masonry repair	m	16h	An increase of 50% of the norm is calculated for the situation particular. An increase of 30% of the norm for outdoor works is calculated.
J	Packaging, storage and transport of glass panels	sqm/hours/ km	350,5 h	
K	Isothermal protection systems	sqm	252 h	An increase of 50% of the norm is calculated for the situation particular.

Stage	Conservation/ restoration technical interventions/ treatments	Measured	Average hours	Remarks
				An increase of 30% of the norm for outdoor works is calculated.
L	Interventions to ensure the waterproofing of the monument insulation during the performance of the window restoration works	sqm	2,25 h	
M	Other interventions associated with window restoration works	sqm	33 h	

Almost all methods for cultural heritage evaluation rely on a preferred public desirability scale. Their common aims are to explain the essential theoretical assumptions about consumer behaviour on the market, how to determine public desirability, and how to perform a grading. The decision-

makers need an effective tool to help them in choosing which projects to finance. Cost-benefit analysis offers the possibility of choosing an optimal project using price as the main indicator

Table 2. A breakdown of the average cost for different repairs:

Operations performed		Price estimated
Labor	The cost of labor depends on the difficulty of the work. Usually, labor costs run from	\$50 to \$100 per hour.
Minor repairs	Minor repairs range from.	\$30 to \$500 on average
Residential restoration	Residential stained glass restoration usually falls somewhere between	\$1,000 to \$5,000 per panel.
Church restoration	For church stained glass windows that need anything beyond minor repair, the cost usually runs from about.	\$10,000 to \$40,000 per window.
Additional costs	Other factors may increase the cost for repair. Costs for installation, transportation, and removal also affect the total price.	

The management and availability of cultural heritage goods and services, together with social and educational issues, relate to areas where collective or public values are particularly emphasized. Civic values are most relevant when deciding on heritage management. However, the cost-benefit analysis method reflects the consumer values that people put on the market before civic values.

4. Conclusions

All methods of quantitative evaluation of investments and sustainable use of cultural heritage are limited in their applicability, even if their theoretical assumptions are met in their entirety. But the advantages and recommendations for using cost-benefit analysis (CBA) to evaluate investments and sustainable use of cultural heritage are clearly superior.

CBA promotes transparency, takes a community-wide perspective, promotes comparability by quantifying the impacts of proposals in a standard manner, assists in the assessment of relative priorities, and encourages consistent decision making; is useful for decisions by governments.

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THE IMPORTANCE OF DMOS AND NEW CHALLENGES FOR ROMANIAN TOURISM DESTINATIONS MANAGEMENT

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ABSTRACT

The COVID-19 pandemic has triggered an unprecedented crisis in the tourism industry. There is no doubt that the year 2020 has been a crushing one for tourism and the crisis continues to affect this sector causing significant difficulties for most destinations.

This paper aims, based on the review of existing literature and direct research through surveys, to present the role of DMOs and identify the key challenges to get out of this crisis and facilitate post-COVID-19 recovery, improvement, and sustainable development of Romanian tourism destinations.

Keywords: DMOs, destination management, COVID-19 crisis, Romanian tourism, sustainable development.

JEL classification: L83, M19, Z32.

1. Introduction

At the beginning of 2020, the future looked very promising for the tourism sector, both globally and nationally. People travelled more and more, more often and over longer distances. The industry has been on the rise for many years. In 2019, according to the World Tourism and Travel Council, tourism had a total contribution of 10.3% to world GDP generating 330 million jobs. One in ten new jobs has been created in the tourism sector in the last five years. The tourism industry also grew by 3.5% compared to the global economy - 2.5% [21].

With the onset of the COVID-19 pandemics and the resulting blockade of society, an unprecedented crisis in the tourism industry has broken out and is still far from over. Estimates of international organizations (UNWTO, WTTC, OECD, Tourism Economics GTS) indicate a decrease of about 80% in international tourism in 2020 compared to 2019, reaching, according to UNWTO [20] to a decrease of 87% in January 2021 compared to January 2020. According to WTTC Travel & Tourism total GDP loss in 2020 was nearly 18 times higher than during the Global Financial Crisis in the absolute GDP loss [21]. In Romania, the situation was similar, registering a decrease of 79.9% in the number of international tourists and 46.2% of domestic tourists in 2020 compared to 2019 [22].

Some destinations are more exposed and deeply affected by this crisis and as the impact varies from place to place so

will be the recovery. The socio-economic impact at the destination level depends on several factors, including the nature of the tourist offer, the degree of dependence of tourism businesses and jobs, the restricted impact of travel on tourist flows, the extent to which restrictions coincide with peak periods. seasonal, the scale and complexity of commercial operations, the size of the domestic market, the exposure of international source markets, etc.

The lockdown period, the restrictions imposed on travel, the need to adapt to the presence of COVID-19 led to the emergence of new behavioural habits, the development of idiosyncrasies, the change in relations between society, and travellers that define the "new normal" for tourism.

All these factors explain the increased focus and need for efficient destination management to meet and adapt to new challenges. The trend and at the same time the major challenge is for destination management organizations to extend their area of expertise from traditional marketing and promotion activities to leading organizations with a broader mandate, which includes strategic planning, coordination, and management of a full range of activities in an appropriate governance structure, to improve the competitiveness and sustainability of destinations in a harmonious relationship between residents and visitors. DMOs need to find solutions and support tourism companies when the whole business idea can be changed due to circumstances and the need to adapt to unpredictable situations such as this pandemic.

Given these considerations, in this paper, we will briefly present the function and responsibilities of DMOs, and based on research we will identify the key challenges for tourism managers to ensure the survival, reinvention, and sustainable development of tourist destinations.

2. Literature review

Given that most tourism activities take place in destinations, they are the most important element of the tourism system and make up the essential unit of tourism research [8], [15], [23]. David Bierman [6] defines the destination as a country, region, or city marketed as a place to visit for tourists. And Cooper et al. [10] consider it the centre of facilities and services designed to meet the needs of tourists. In general, the destinations are an amalgam of direct and indirect tourist facilities (e.g. accommodation, catering, public and private

transport and roads, visitor information, recreational facilities, etc.) and a wide range of natural and cultural tourist attractions (e.g. e.g. landscape, monuments, atmosphere) offered to a tourist while staying in a chosen place [13]. However, for economics, a tourist destination is more than a distinctive geographical area [2], [4]. Generally, tourists perceive a destination as a whole, so this area is considered not only a "tourist place", but a "tourist product". Therefore, a tourist destination can be defined as "a collection of experiences gained by travellers" and should be perceived as a system of goods and services that suppliers are ready to deliver and tourists are willing to consume [14]. In other words, the tourist destination is the central point of the tourism activity. Therefore, a destination can be seen as a combination of all the goods, services, and experiences provided to tourists. But destinations are not infinite, neither individual nor collective. Not every place can be a destination capable of attracting tourists and the destinations themselves cannot absorb an unlimited number of tourists.

Destination management is "the coordinated management of all the elements that make up a tourist destination (attractions, facilities, access, marketing, and prices)" [19]. Responsible and sustainable destination management should involve a process that effectively and harmoniously addresses the interactions between visitors, the industry that serves them, the community that hosts them, and the environment in a broad sense (natural and cultural resources). Destination management is a comprehensive and holistic management process that includes the management of marketing, local accommodation, tours, events, activities, attractions, transportation, and more. In terms of demand and supply, the destination must try to attract the attention of both visitors and private tourism markets. The competitiveness and attractiveness of a destination come from the use of efficient and sustainable strategies and are based on a balance of interests of all stakeholders in the tourist destination. In the case of most tourist destinations, their management is handled by the Destination Management Organizations (DMOs). According to the World Tourism Organization, the destination management organization (DMO) means the main organizational entity, which can bring together different authorities and different actors and professionals, which facilitate the establishment of tourism partnerships towards a collective vision of the destination. The fundamental role of such an organization is to initiate, coordinate and manage activities such as the implementation of tourism policies, strategic planning, product development, promotion, and marketing or the activity of a tourism office and conventions. The functions of the management bodies of a destination may vary depending on the national, regional, or local competencies, depending on the current and potential needs, as well as the degree of decentralization of the public administration. [19]. So, the mission of a DMO to become a strategic leader in the development of the destination. The DMOs have political and legislative power, as well as financial means to rationally manage resources and ensure that all stakeholders can benefit in the long run. The most valuable attributes of a DMO are its credibility as a strategic

leader in destination development and marketing, as well as its ability to facilitate partnership and collaboration with the tourism industry to establish a common vision of the destination. The Destination Management Organization deals with the "factory" of the tourist destination and is responsible for achieving excellent efficiency in research, market development, ensuring some quality products, choosing a distinctive brand, and the correct distribution of beneficiaries among all stakeholders. However, OMD does not own the plant, does not hire people who work in it, and is not controlled by its processes. [18]. Among the fundamental functions of a DMO are: strategic planning; formulation (or participation in the formulation process) and implementation of the tourist policy of the destination; market information (data collection and analysis, market research, etc.); development of tourism products and businesses; digitalisation and innovation; monitoring; crisis management; training and capacity building (not only of its human resources, but also of facilitating capacity building and capacity building activities for local tourism professionals); promotion, marketing and branding; financing and encouraging investment. This includes coordination with various authorities, stakeholders and professionals to facilitate and support the industry itself and to involve all relevant public and private stakeholders - as well as residents and local communities - in designing and implementing broader strategic thinking with a view to objective: to ensure the competitiveness and sustainability of the destination in the short, medium and long term. However, from a sustainability point of view, the role of a DMO is more complex. This requires finding the right balance between competitive and challenging environmental, social and economic objectives, such as:

- preserving natural resources and minimizing the negative impact on tourism to provide the wealth of a destination for future generations [3], [12];
- increasing destination attractiveness and reputation as responsible and sustainable [11];
- maximizing the economic contributions of tourism to local / host populations [17];
- meeting the needs of visitors and shifting their interests to products focused on sustainable resource consumption [7];
- increasing the well-being of local populations and public and private stakeholders [1], [4].

As stated by Briassoulis [5]; Byrd, Cardenas, & Dregalla [9], and other authors of literature, all stakeholders must be involved in the realization of any successful plan for sustainable tourism development to address all perceived issues of destinations and to reflect the interests and opinions of the community.

3. Methodology

This study focused on obtaining in-depth information to identify the main challenges regarding ensuring the survival, recovery, and further sustainable development of Romanian tourist destinations. Thus, both secondary and office research was carried out by analysing the studies and

literature that appeared since the beginning of the pandemic regarding the evolution of the tourism industry, as well as direct research. The direct research was carried out by Elena Manuela Iștoc. The research materialized in the form of semi-open interviews (in which actors from the Romanian tourism industry participated) and in conducting surveys through the questioning technique. The surveys were conducted between 04.2020 - 03.2021. The survey involved conducting several questionnaires (one for each group of stakeholders: tourists, residents, businesses/institutions in the tourism sector, and travel agencies). The interviews were useful for collecting more nuanced data on stakeholder views, attitudes, and experiences. The interviews were attended by 43 people, representatives of the Romanian tourism industry, as follows: 21 from hospitalities industry, 11 - travel agencies, 4 - culture companies, 3 - marketing and PR, 2 - staff training companies for the tourism industry, 1 - MDG and a tourism project developer. The survey was answered by 5126 people (the questionnaire was sent online to 7000 people).

4. Results and discussions

In recent years, "destination management" has become a key factor in identifying responsible and sustainable tourism management and its prospects for a better position in the highly competitive tourism industry.

Romanian tourism will have to go through a profound transition to start building Romania as an internationally recognized tourist destination. And since competitiveness governs the general rules of the sector, it is clear that the developments that follow must be in-depth, strong, and effective to achieve higher levels of competitiveness.

The interviews revealed that Romania has an acute need to professionalize the management of tourist destinations to become competitive with other destinations in the world. And all of the participants at the interviews agreed with the urgent necessity of operating of DMOs in each Romanian county/destination. Romania faces the challenge of first and foremost establishing new experiences and products for global tourism markets and making better use of the diversity of well-differentiated tourism assets it can use to attract future customers. New approaches need to be introduced, both by the public and private sectors, to meet global challenges.

The application of efficient management of the responsible development at the level of the Romanian tourist destinations could ensure the planning of the tourism development sustainably, able to reduce the negative impact on the environment at the same time with the fair use of resources to obtain a wide range of tourism benefits for the different motivations of tourism consumers. At the same time, a material and technical urban base specific to tourism could be ensured at a quality level comparable to that of Romania's main competitors, optimal employment of the workforce in tourism but also a continuous improvement of employees' skills, essential for enhancing the quality of tourist experience.

Responsible, sustainability-oriented management can contribute to the development and promotion of Romania as a quality tourist destination, ensuring its presence on the profile market and the possibilities to increase the market share currently held; in other words, it creates the premises for a sustainable competitive advantage and even the possibility to contribute to the achievement of the SDG that, in fact, our country has assumed together with the other UN member states.

In this context, the Destination Management Organizations prove to be of major interest to the Romanian tourism industry. And, after a very long wait and following numerous criticisms of the way it is formulated, in December 2018 was published in the "Monitorul Oficial" (MO 1027 / 3.12.2018) the law on the organization and functioning of the DMOs. With the introduction of this legislation, the intention was to establish new sub-national tourism organizational structures that will facilitate the public sector, the private sector, and NGOs to cooperate in partnership to provide better tourism outcomes for local communities and consumers. In fact, the representatives of the employers' organizations in Romania have claimed on various occasions that the DMOs are of major interest to the Romanian tourism industry. A DMO structured in public-private partnership (PPP) will work best when it can establish operating procedures that are considered fair to all parties involved.

Buhalis [8] identified four key generic strategic objectives that should be addressed by the DMOs: improving the long-term prosperity of locals, maximizing visitor satisfaction, maximizing the profitability of local businesses and maximizing the multiplier effect, and optimizing tourism impact by ensuring a sustainable balance of benefits, economic and socio-cultural and environmental costs.

The development and achievement of the strategic objectives of the destination are dependent on the relations between the stakeholders. "The only way to achieve truly sustainable development of tourist destinations is through a real and strong partnership between the public sector and the private sector" - according to a hotel manager who attended the interview.

The main challenge for the Romanian DMOs is to use legislative and management tools when planning and managing destinations to ensure that the benefits of tourism are shared equitably among all stakeholders and that they use resources responsibly in creating the tourism product. Failure to respect and maintain a balance jeopardizes the relations between stakeholders and threatens the achievement of strategic objectives, competitiveness, and long-term prosperity of destinations.

Another major challenge is competitiveness. Tourist destinations are more and more numerous, many of them similar in terms of resources, and without proper management and correct market positioning, no destination can face fierce competition.

Communication. "In this period of great uncertainty, close interaction with industry and dialogue with politicians is very important" - an interviewed person. DMOs, regardless of their form, should be valid interlocutors to lead the way to the destination and to represent the destination at all levels.

To achieve this, the DMO should fully engage all key tourism stakeholders, public and private, acting and/or influencing the destination. Public consultations should be conducted with relevant stakeholders, NGOs, residents, and local communities.

Cooperation. According to an interviewed travel agent, cooperation between companies is increasingly important, especially for overcoming the crisis created by the COVID-19 pandemic. Other interviewees also emphasized the need for cooperation, the creation of common product packages, and joint marketing at the regional level.

"What will happen in the coming years will largely depend on the establishment and operation of DMOs. Dialogue, collaboration, and solution-finding will be essential." - concluded one of the interview participants.

Identification and engagement of local industries participating in the tourism value chain and creation of a favourable framework for inclusive tourism growth to maximize benefits for both local businesses and residents. At the question: "Does your company have a fair trade or fairness policy concerning its supply chain?" 91% answered "no". At the question: "How much of your goods and services (other than food and beverages) do you get from local sources?" we received the following responses: <10% - 25% of respondents; 10-25% - 8,5% of respondents; 25-50% - 16,5% of respondents and >50% - 50% of respondents. And in the question: "How much of your food and beverage products come from local or regional sources (for example, raw materials for food)?" the answers were: <10% - 35% of respondents; 10-25% - no one; 25-50% - 65% of respondents and >50% - no one of respondents. At the question "Do you encourage your customers to buy local products?" 66,5% said "yes" and 33,5% - "no".

Building a tourism culture in the destination. Permanent communication with the local community in the destination and listening to the opinions of the locals is necessary to support a long-term tourist destination. DMOs are responsible for engaging local communities to ensure that tourism development is a mutual benefit between tourism stakeholders and residents in the destination. This strategy is also vital to preserving the authenticity of local culture and lifestyle.

According to the Romanian residents' perceptions of tourism in their area:

- "My city/town/region benefits from tourism": 57% of respondents - totally agree; 33% - agree and 10% are neutral;
- "Overall, I am very pleased with the involvement and influence of residents in planning and developing tourism in my city/town": 4% of respondents are totally agreed; 19% - agree; 28% are neutral and 49% disagree.
- "How does tourism affect the specificity of the destination where you live, its culture, and its heritage?" endangers them – 0%; contributes to their maintenance – 33,3%, contributes to their improvement – 62%; no effect – 4,7%.
- "What effect does tourism have on the quality of life in the destination where you live?" endangers

it: 4,5%, contributes to its maintenance:28,5%; contributes to its improvement. 57%, no effect: 10%.

- "Would you like more or less tourism in your city/town in the future?" much less: 0%, less: -0%, same – 9,5%; more: 62%; much more: 28, %.

Building a strong brand identity; creating a brand and fulfilling the brand promise - ensuring that the experience lives up to expectations. The brand must give the destination a personality that connects it emotionally with the potential consumer and distinguishes it from other competing destinations. The value of the destination mark is strongly related to the value of the destination. "Without diversifying the tourist sources of the destination, it is almost impossible to understand what the target market is and what that market needs" -manager of marketing & PR company who participated in the interview. Therefore, brand identity is a key factor in implementing successful marketing strategies in the target market.

Following the direct research undertaken, we were able to identify other challenges for the management of Romanian tourist destinations, in close relation with those previously presented:

- Providing exceptional and safe travel experiences to meet the expectations of target market segments;
- Differentiation, diversification, and development of tourism products;
- Understanding the importance of creating a clear "competitive advantage" for Romanian tourism in the context of neighbouring competing destinations;
- Building stories behind destinations, to capitalize on the rich cultural and natural heritage;
- Development of a monitoring system designed to anticipate changes both in the tourism environment and in trends in tourism supply and demand that provide tourism actors with a decision-making tool to improve the management of their activities;
- Collaboration with entrepreneurs and the community to create new authentic visitor experiences - workshops to stimulate ideas, tips for "start-up" activities, etc.
- Innovative digital campaigns, which use social platforms to promote the exchange of experiences will become increasingly important components of tourism marketing strategies, and Romanian destinations will have to align with trends.
- Ensuring destination quality as a whole (for example, through the UNWTO.QUEST program, which supports the DMOs in strengthening their three key areas of work: strategic leadership, effective execution, and effective governance);
- Ensuring sustainable development and obtaining labels/certifications attesting sustainability and safety (such as "Safe Travel" launched by the World Tourism and Travel Council and supported by the World Tourism Organization).

But the biggest challenge, which is also a great opportunity, is to restart tourism in a sustainable way.

"I think that in Romania we still have the opportunity to explore places still untouched. Awareness of this can help us develop a system through which each company can contribute to sustainable tourism starting from the acquisition and implementation of this concept in its strategy. Promoting and preserving these places is a responsibility that all those involved must take into account."
- travel agency manager respondent to the survey.

The pandemic has drawn our attention to the things that really matter, social interaction and the natural environment. It offers a unique opportunity to redesign destinations to meet the standards of the new normal, to create sustainable destinations, better to live in, and more attractive to visit.

Tourism is a people-based industry, with human capital at its centre, bringing authenticity, values, quality, innovation, and competitiveness. In general, tourism businesses need support, the host population needs to ensure that visitors will not adversely affect their quality of life and visitors expect a quality experience. All national, regional and local government institutions need to be aware of all these challenges and create public-private partnerships to develop the most effective strategies.

5. Conclusions

Destinations are some of the most difficult entities to manage due to the complexity of stakeholder relations and the variety of those involved in the development of the tourism product.

DMOs have a key role in the development and management of tourism at the destination level with various functions. Depending on potential needs, these functions may include strategic planning, implementation of the destination tourism policy, development of tourism products, crisis management, quality improvement and assurance, workforce development, and support for the protection of the destination's cultural and natural heritage. A destination with an efficient management plan usually has a high capacity to innovate, while being more resistant to potential challenges and crises - vital aspects for destinations during the COVID-19 period.

Romanian destinations have to face challenges related to increased competition, technological transformation, connectivity, accessibility, safe and security, new business models, rapid change in demand trends, increased awareness of the need to ensure sustainable tourism, the need to preserve the well-being of residents and local communities, and to ensure a harmonious interaction with the tourist and the visitor, etc.

Although little by little, tourism has been restarted, the crisis created by SARSCov-2 continues. Reality shows us that this crisis will be longer than we expected. It is too early to say what the long-term implications are for Romanian tourism. This brings challenges for the sector, but also opportunities to encourage innovation, stimulate new managerial strategies, explore new markets, and open new destinations.

This study was limited to the brief presentation of the role of the DMOs and the identification of the main challenges for the management of Romanian tourist destinations, especially as a result of the COVID-19 pandemic, but which offers a suggestive overview. However, further research is needed on changes in potential consumer behaviour, destinations, and new trends, in the tourism industry in general, to be able to draw stronger conclusions based on which relevant solutions can be offered.

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FORMAT TRANSFORMATION BASED ON CLUSTER STORE ANALYSIS

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ABSTRACT

This study will use clustering technology for grocery retail stores. The purpose of clustering stores is to improve the financial performance of stores by managing relatively homogeneous objects - with similar area characteristics, depth of assortment, and a trading map. The work carried out a competitive analysis of the retail market in Russia, identified industry leaders and the most promising organizations. In the current study, a mathematical model was built using the Xai-Beny method to assess the effectiveness of the location of outlets. Also, a cluster analysis was carried out for retail outlets in the city of Perm, Russia. Evaluated the efficiency of the functioning of outlets depending on the volume of sales, location relative to competitors. The relative benefits of points are determined by EBITDA, SCU and percentage of losses depending on the format of the point. It is worth noting that the article also discusses equipment standards for points of various sizes and products that are sold at these points.

Keywords: marketing, cluster, brand, food retail, industry research, business economics, firm organization, and market structure.

JEL classification: M3.

1. Methods.

Clustering is based on information from independent industry and news sources, as well as based on official data from the Federal State Statistics Service.

Traditionally, in retail, the grouping of goods into categories in retail is carried out through the process of clustering. Clustering is the process of grouping a set of physical or abstract objects into classes of similar objects. A cluster is a set of similar data objects in one cluster and not similar to objects in other clusters.

There are several discussion points regarding the classification of retail chains. The largest players in the retail chain market are constantly striving to develop several trading formats at the same time. Currently, there are almost no companies operating in only one format, while the number of multifunctional networks is constantly increasing. Multi-formatity implies coexistence within one chain of stores of different types: supermarkets, supermarkets, discounters, as well as trade in different types of goods (e.g., food and non-food).

Currently, there are retail chains of regional companies (Family, Vivat, Bereg, Lakshmi), federal players (X5 Retail Group, Magnet), as well as representatives of neighboring regions: "Monetka" (Ekaterinburg) to compete with which "single shops" is becoming more difficult. The most popular consumers are the stores of the chain "Seven," "Vivat" and "Five."

Consider the outlets of the Perm region in 2016 and 2020 by the types of formats: hypermarket, supermarket, shop at home (table 1).

Based on table 1, it can be concluded that in the total number of outlets the largest share is occupied by the format of "shops at home" (58.5%).

Two federal giants also hold the lead in the number of stores in the Prikamya. According to the results of 2019 and 2020, Magnet came first: the number of stores in the region grew to 600 during the year. Last year, the network opened 73 new outlets. "Five" in the province for the year became more by 53, the total number of stores reached 450. In terms of growth of new sites over the past year, "Magnit" outperformed "Five."

The third place in the regional market in terms of the share of goods sold in recent years is occupied by the Permian "Family" - 6.3%. But at the same time the network focused on development in the regional capital. In Perm, the retailer's share reaches 9.7%. This is more than Magnet (9.1%), Coin (3%), Red and White (2.9%) and "Red and White" (2.9%). In Perm, "Family" is second only to Five in 2019.

Thus, in 2012-2020, the structure of retail formats of the Perm region gradually began to change under the influence of changes in market conditions, starting in the second half of 2014. The main trend was the reduction of the share of large-format retail against the background of the growth of the share of discounters and stores "at home" by reducing the average check primarily in large-format stores.

The share of supermarkets in 2018 decreased, due to the slowdown in the performance of Russian operators of this format and the decrease in customer traffic. Much depends on the assortment policy of networks, on the availability of profitable price offers. However, as development is hampered by weak consumer demand due to low incomes in the Perm region. The high level of mark-up in supermarkets also does not contribute to the growth of the share of this format.

Table 1. Distribution of outlets by type of stores in Perm in 2016 and 2020

Trading networks	Number of outlets		Including					
			hypermarket		supermarket		Shop at home	
	2016	2020	2016	2020	2016	2020	2016	2020
X5 Retail Group	109	302	7	1	16	7	86	294
Magnit	56	240	3	4	17	106	36	130
Lion, Bereg	120	211	-	-	120	211	-	-
Krasnoye i Belye	210	172	-	-	-	-	210	172
Monetka	21	100	-	-	21	100	-	-
Semya	33	64	1	3	9	25	24	35
Zakhoti	47	16	-	-	9	-	38	16
Azbuka vkusa	5	3	-	-	1	0	4	3
Lakshmi	7	2	-	-	-	-	7	2
Lenta	3	2	3	3	-	-	-	-
Ashan	1	1	1	1	-	-	-	-
Nash	2	0	2	-	-	-	-	-
total	697	1113	18	12	204	449	477	652

For retailers today it becomes important to reduce the cost of rent, which has influenced the formation of clusters within retail chains to optimize the management of store formats.

The K-medium method can be used in the evaluation of clustering. Its scientific interpretation is as follows: K-medium is one of the algorithms that is commonly used in the process of clustering. The letter "K" in its name indicates that the algorithm is looking for a fixed number of certain clusters. In terms of the proximity of data points to each other. The K-medium method is used in the work of Indonesian scientists under the name "Grouping retail goods through the clustering of K-medium". Scientists expect the result of this study to be a benchmark to improve the definition of minimum stock and margin of return, following a new improved grouping model. Moreover, it is expected that this model of grouping elements will be used as a reference for other retailers in general, as support for their different decision-making needs. The study is based on modelling a cluster of products using sales data to determine whether These are grouped into 3 clusters, the cluster with the highest centroid will be labeled as a fast-moving group> of elements, and the lowest centroid will be marked as a slow-moving group of elements.

The cluster process uses a cluster of k-medium. The input of this process is the original data and the delta. The original data is sales data according to the variables used for each scenario. A delta is a value that will be used to determine the acceptable gap between the center of gravity and the average. In this study, delta is set at 0.2.

The K-medium method is usually performed using a basic algorithm:

- 1) Determining the number of classes (clusters);
- 2) Determining the initial centroid of each class;
- 3) Putting all the data in a class that has the nearest centroid;
- 4) calculating the average data value for each class;
- 5) For the entire class, if the difference between average and centroid exceeds the margin of error, you should replace the middle-class centroid, then go to step 3.

Classes obtained because of the clustering process need to be checked. Clustering indicator, the result of the assessment can be in the form of the degree of compactness and the degree of separation. The small compactness and level of separation indicates a good cluster. In this study, the test is done using the xie-beny index, a function of checking the compactness and separation of fuzzy clustering. The value of the xie-beny index is calculated based on the following equation (1):

$$(1) XB = \frac{\sum_{i=1}^c \sum_{j=1}^n \mu_{ij}^2 \|v_i - x_j\|^2}{n \max_{i \neq k} \|v_i - v_k\|}$$

where:

- XB - Xai-Beni Index;
- c - Class number;
- n - Data count;
- vi - I class centroid.

In a study titled "Clustering Retail Products Based on Customer Behavior", Vladimir Holi, Ondrea Falcon and Michal Cherny propose a method of clustering retail goods on the basket.

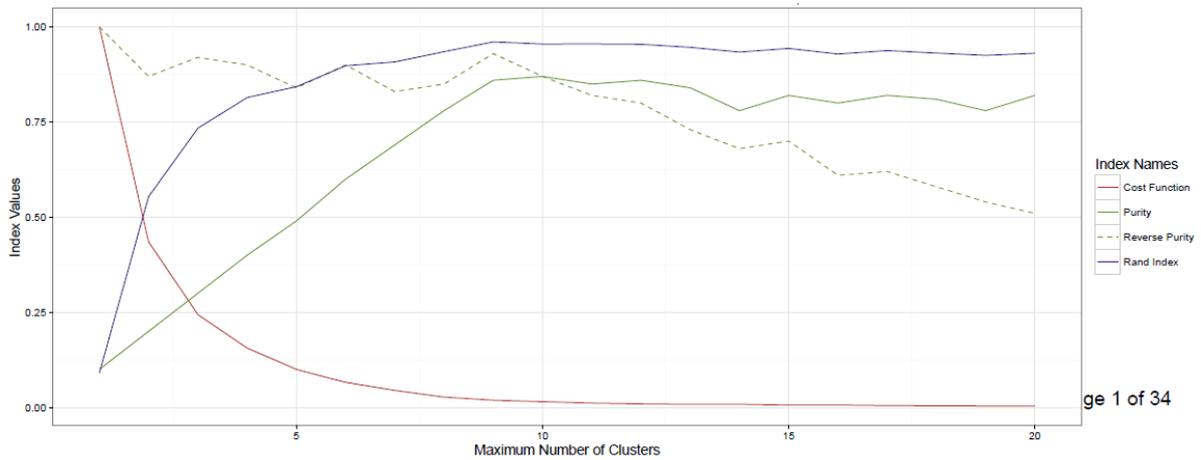


Figure 1. Clustering retail products with different number of clusters

Products are almost always classified by purpose, packaging, properties such as packaging size, brand, and price level. However, there are different approaches to product categorization. For example, "Market Structure Analysis: Hierarchical Clustering of Products Based on Substitution in Use" used Tering's hierarchical clusters, while the study "Market Segmentation for Positioning a

Family of Products Based on Fuzzy Clustering" used fuzzy clustering. The trading networks have access to a huge amount of market basket data containing sets of items that the buyer purchases in a single purchase that can be used to improve the efficiency of modeling customer behavior, such as the "Buy-based Market Segmentation Methodology".

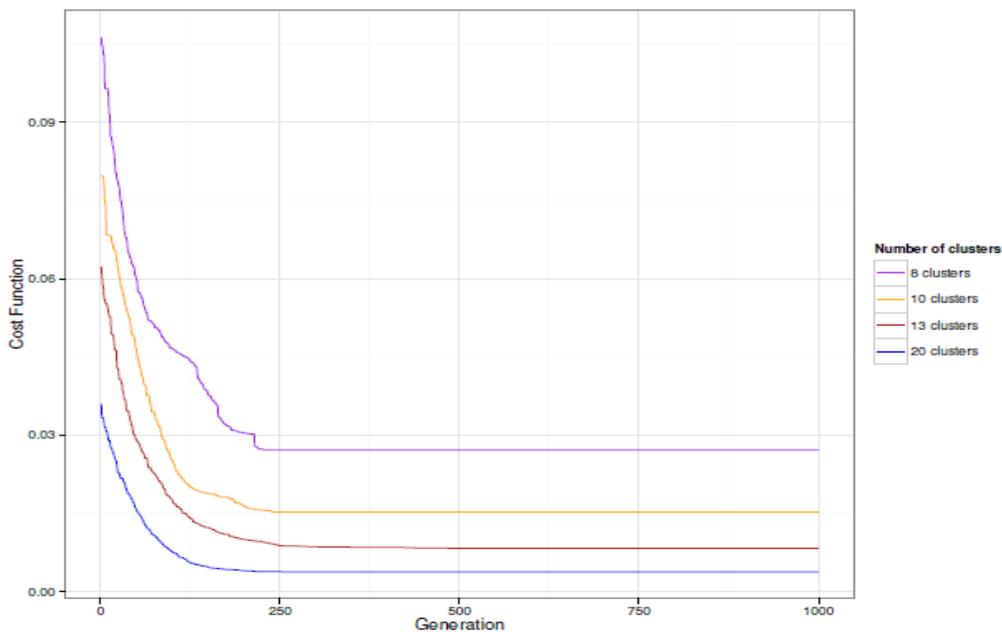


Figure 2. Cost feature for different generations for different number of clusters

Thus, the application of cluster analysis allows to form a targeted management policy of a particular cluster. In turn, different sources provide approaches to the use of clustering techniques (table 2).

Cluster analysis, the art of finding groups in data, is an uncontrolled classification of objects into groups. It identifies homogeneous groups of objects that have similar characteristics in a specific cluster but differ from those of objects that do not belong to that cluster. Recent retail trends have shown that retailers should specialize in

targeted marketing by segmenting the market rather than products and mass marketing.

It is worth noting that in similar market studies cluster analysis in the field of food-retail now is not widespread.

The tasks of clustering stores:

- Determine the criteria by which the division into formats will be carried out;
- Standardize the look of stores depending on the format;
- Optimize the assortment matrix;

- Optimize the cost of THET based on turnover and the number of functions performed;
- Set financial parameters for cluster stores.

Table 2. The practice of applying cluster analysis in market research

Article	The purpose of the study	Data
Sexton 1974	Identification of groups of families - consumers of the product. Development of brand positioning strategy	Ratings that respondents assigned to brands and products
Montgomery and Silk 1971	Customer Segmentation by Interest	Variables that characterize customer preferences
Anderson, Cox, Fulcher 1976	Identify the factors that determine the choice of the bank. Results to use for customer segmentation	Characteristics of the bank from the point of view of buyers
Bass, Pessemier, and Tigert 1969	Media Segmentation	Media variables
Calaytone and Sawyer 1978	Analysis of the stability of bank segments	Characteristics of "small" customers by several banks
Claxton, Fry, and Portis 1974	Classifying furniture and furniture buyers to identify the factors that determine their behaviour.	Customer's behavior prior to purchase
Day and Heeler 1971	Stock analysis and positioning in homogeneous groups	Factors relevant to inventory analysis
Morrison and Sherman 1972	Determine how respondents relate to male and female roles in advertising	Ratings that respondents put up different videos
Kiel and Layton 1981	Analysis of the behavior of new car buyers	Factor loads gained from the analysis of a set of variables

Cluster analysis is based on the analysis of the following indicators of stores: total turnover, turnover by product groups, margin, total traffic and traffic by check size, consumables (FOT, rent, losses). The initial division took place into 4 clusters, where 4 clusters - the largest objects by all the indicators analyzed, 1 cluster - the smallest, each store assigned a cluster depending on the value of a given indicator.

Initial analysis shows store performance in terms of turnover, margin, traffic and costs.

In the second stage, the evaluation of stores was carried out by overlaying the result parameters such as the depth of the assortment matrix and the area (deterrent). As a result of the cluster analysis, each store belongs to a specific cluster (table 3).

Table 3. Transformation of formats. Format standard

Formatte	Options	Meaning	Description
Hypermarket	Area, sq.m.	1800-4000	1. Bread and confectionery department with the presence of a bakery 2. The presence of a culinary island with pre-cooking in the trading hall3. Alcohol department 100-200 sq.m.4. Fish Island Additional services for slicing cheese and sausage products, cleaning fish, scrolling meat on minced meat6. Department of "proper nutrition"7. Cafe area in the shopping hall8. The presence of a kavist and a florist in the state9. 2 islands of CSR10. Half of the shelving - non-food zone
	Number of SCU	26 000 - 33 000	
	Average TO per month, million rubles.	40 - 180	
	EBITDA, %	9,4	
	% of losses	1,3	
Supermarket	Area, sq.m.	700-1500	1. Bread department with baking hb products2. The presence of "Ocean Food"3. Alcohol department 70-100 sq.m.4. Cooled fish on ice, the presence of a meat counter5. Additional services for slicing cheese and sausage products6. The counter with ready-to-eat food 7. "Proper Nutrition"8. Cafe area in the entrance group
	Number of SCU	15 000 - 20 000	
	Average TO per month, million rubles.	18 - 27	
	EBITDA, %	5,4	
	% of losses	1,8	
Small supermarket	Area, sq.m.	400-700	1. Bread department with baking x/b of products2. Alcohol department 50-70 sq.m.3. Cooled fish on ice, meat counter4. Additional services for slicing cheese and sausage products5. The counter with ready-to-eat food 6. Department of "proper nutrition" 7. Cafe area in the entrance group
	Number of SCU	10 000 - 15 000	
	Average TO per month, million rubles.	10 - 17	
	EBITDA, %	4,4	
	% of losses	1,9	
In homes / fresh	Area, sq.m.	200 - 400	1. Bread department with baking hb products2. Alcohol department 15-30 sq.m.3. Additional services for slicing cheese and sausage products4. Packaged ready meals5. Department of "proper nutrition" - 4 racks6. Cafe area in the entrance group
	Number of SCU	4 000 - 10 000	
	Average TO per month, million rubles.	6 - 10	
	EBITDA, %	0,9	
	% of losses	2,0	

Rules for transferring a store from format to format

The classification of the store to a particular cluster varies depending on the change in performance. The most significant argument is location, turnover, traffic and check as derived from it. Depending on the company's strategic priorities, the revision of clusters may occur without significant changes in store performance but requires a binding economic justification for such changes.

Transferring a store from one cluster to other entails changing the trading card and/or expanding/reducing the assortment matrix, as well as, if necessary, additional investment in the equipment to bring the store in line with the quality characteristics of the cluster.

2. Results

The main areas of investment can be the development of certain categories, reconstruction, and renovation.

Depending on the planned investment, the store/category must meet the standard for income from investments:

- Development - the payback of equipment is no more than a year.
- Renovation - the total turnover of the store is 3% excluding inflation.
- Reconstruction - the total turnover of the store - 10% excluding inflation.

Infrastructure changes are aimed at standardizing stores and strengthening the competitive advantages of the network by developing the range in priority categories: alcoholic beverages - "right wine", FRU, fresh - dairy products, weight cheeses and sausages, meat counter, chilled fish on ice, freshly baked bread, ready-to-eat food.

For the development of these categories, it is necessary to standardize equipment in stores of different formats (table 4).

Table 4. Standardization of equipment in stores

Product category	hypermarket	supermarket	Small supermarket	In homes / fresh
Apirits	23-49	15 racks	11 racks	9 shelving
Frov	18-25 collapses	10-12 collapses	6-8 collapses	4-6 collapse
Dairy products	11-16 slides of 1.25	7-9 slides at 1.25	5-6 slides at 1.25	3.5-4 slides at 1.25
Weight cheeses and sausages	12 stalls at 1.25	6-8 stalls at 1.25	3 counters at 1.25	2 counters at 1.25
Meat counter	Meat Island	3 counters - meat and semi-finished products	1 counter at 1.25	Only packaged products
fish	"Fish Island" - Aquarium	Table for fish on ice - slide with preservatives	Table for fish on ice - slide with preservatives	Slide with fish and preservatives
Freshly baked bread	Having a bakery	Bake-in-the-shops - 2 diggers	Bake-in-the-shops - 2 diggers	Bake-in-the-shops - 2 diggers
Ready meal	Bread and confectionery department with the presence of a bakery Having a culinary island with pre-cooking in the trading hall	Department with ready meals	1 counter 3 venets / 1 vertical slide 1.5 m	2 venets / 1 vertical slide 1.25 m

3. Conclusion

Thus, when forming clusters for formats in retail, it is necessary to consciously approach the choice of a system of clustering and the selection of criteria that allow to take into account the specific strategy of the retailer to retain the attention of the target audience in the conditions of changing consumer behavior under the influence of the pandemic.

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HEALTH GOVERNANCE LITERATURE: REVIEW AND FUTURE RESEARCH

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ABSTRACT

This paper aims to explore the literature review on corporate governance in healthcare sector. The main focus in this area of research is related to the improvement of health - outcomes generated by good governance. The objective of this research is to realize a systemic review of the literature by presenting the different studies conducted and their results. Our review starts from presenting the efforts made by different authors to define and describe the health governance function, considering that effective governance is a key component of health systems [9]. Another path followed in this research was to identify studies that link different governance mechanisms to health outcomes [9].

Our conclusions, after this literature review is that not all the studies found a positive correlation between health governance and healthcare outcomes. Another conclusion of our research is that of that the lack of governance can have an impact on the quality of health services. For a better understanding of the relationship between governance and health, further exploration is needed. Considering the obvious correlation between environment and the quality of health [27], a path for future research is to study the relationship between them, considering that researchers gave it little attention.

Keywords: governance, healthcare, literature review.

JEL classification: I1, I39.

1. Introduction

The concept of governance is not a new one, but the economic development adds new valences to this concept. Various definitions of governance are given in different studies regarding public sector governance [18]. World Health Organisation (WHO) in their 2012 study 'Governance for health in the 21st century' defined health in the 21st century as 'mainly about people and how they live and create health in the context of their everyday lives. Nowadays, in the knowledge society health is no longer an attribute of government, we assist at a growing role of expert bodies, independent agencies, business and citizens. So, the entire society is responsible for its health, considering also the Covid-19 Pandemic. The term governance is used for decades now as a core function of health systems. The World Health Organisation first mentioned governance as 'stewardship' in the World Health Report 2000 and since then we witnessed a growing literature on this matter. In the past decade health has become a critical factor for all societies, from both a macroeconomic point of view and a

political one. In any society, at the present moment, health and well-being are key factors of economic development and prosperity. Governance for health refers to the way governments address health system from a strategical point of view. WHO proposes five types of 'smart governance for health' namely: governing by collaborating, governing by engaging citizens, governing by mixing regulation and persuasion, governing through independent agencies and expert bodies and governing by adaptive policies, resilient structures and foresight.

We conducted research of social science and health literature focusing on defining the health governance function and the link between different governance mechanisms and health outcomes, despite of the literature vastness around these two concepts. In the literature there is substantial evidence that connects better health outcomes to a higher state capacity [6], but there is less attention on the specific mechanism which make possible this causal influence. By state capacity we can understand bureaucratic autonomy, control of corruption, infrastructural power, government quality, governance and others that can be found in the literature. Some authors have reached the conclusion that 'to achieve better long-run health performance may be to invest in the public health system's technical (bureaucratic) autonomy and in its system-wide planning and coordination capacities' [6].

As we notice, there are a lot of terms used in defining health governance, from governance ideals to characteristics of organization of actors in governance arrangements [4]. Different authors [4] consider that despite a growing literature around health governance, there is still a need for a better understanding of this concept. By reviewing the literature, we tried to answer several questions: which are the most relevant governance definitions? Which are the relevant governance dimensions? and Which are the appropriate tools to govern [4]? On the other hand, starting from the premise that governance mechanisms influence health outcomes, in the studied literature are identified four key governance mechanisms that can impact health outcomes: health system decentralization, health policy making through empowering stakeholders, enhanced community engagement and strengthened social capital [9]. Other authors [27] focus their attention on the main attributes that impact governance in healthcare systems: quality of health care, corporate social responsibility in health, health risk management and global health governance. The authors (27) also emphasize the link between quality of health and environment, although, according to them, this matter has received little attention.

Some authors [38] have focused their research on the increasing risks economic development has on both health and environment.

In the following part of our paper, we present the results obtained by different authors regarding the correlation between governance mechanisms and health outcomes. Our study is structured as follows: the first part was the introductory one, the next part is the literature review regarding the impact of governance on health outcomes and the third part presents our conclusions, followed by the references used. The research methodology used was the literature review.

2. Literature review

Governance in healthcare is a part of public sector governance which has been defined as “regimes of laws, rules, judicial decisions, and administrative practices that constrain, prescribe, and enable the provision of publicly supported goods and services” through formal and informal relationships with agencies in the public and private sectors [23]. This definition emphasizes that fact that public sector outcomes in general, and healthcare sector outcomes in particular are influenced by “multiple layers of governing institutions” [13]. Governance can be defined as referring to the means used in achieving “direction, control and coordination of individuals and organizations on behalf of interests they have in common” [23, 13]. The European Commission defines governance as “the rules, processes and behavior by which interests are articulated, resources are managed and power is exercised in society” [40] while WHO considers that leadership and governance “involves ensuring that strategic policy frameworks exist and are combined, with effective oversight, coalition building, regulation, attention to system-design and accountability” [41]. The World Bank defines governance as “the manner in which power is exercised in the management of a country’s economic and social resources for development” [42].

Across the literature we can find different governance definitions from both institutions such as European Commission, World Bank, World Health Organization, United Nations, and researchers [3,4,7,13,32,33]. As we can see the term “governance” is used and linked to “factors that affect the quality, effectiveness and reach of social services” [32,33]. Taking into account the “logic of governance” that results from the mentioned definition, from a public sector point of view, governance operates at many levels namely actors that establish public policies, at a second level namely the level of specific public policies and thirdly at a level of a particular organization [32,33].

Governance in the health sector was defined as the relationship among different actors that influence the behavior of specific organization in this sector, such as hospitals [17] or using the “stewardship” concept [41]. One of the most complete and accurate definition of governance in the health sector was given by [7] in 2008. They [7] define governance as “the rules that distribute roles and responsibilities among societal actors and that shape interaction among them”. The give attention in their paper to

both the way governance affect efficiency and outcomes of this particular social service, healthcare service, and the characteristics of this process such as openness, legitimacy and fairness.

The first objective that we focused on was to find in the studied literature the associations between governance and health. Most of the studies researched have indicated a positive significant link between governance and health outcomes. On a sample of 112 countries the author [22] estimated that governance has a significant negative effect on infant mortality rate.

In another study from 2009 the authors conducted a study on Uganda using different population health status such as nutrition status of infants, service utilization rates, under five mortality and immunization rates in connection with community monitoring initiative as governance construct [5]. Their findings show that community monitoring initiative have determined positive health outcomes such as an increase in weight of infants, a 33% reduction of under-five mortality and an increase with 20% of the service utilization rates. In 2010 some researchers [15] have conducted a study on 35 countries in AFRO region using the World Bank Governance Index as a measure of health governance and Hepatitis B vaccines or Haemophilus influenzae Type B as health outcomes. The World Bank Governance Index refers to government effectiveness, control of corruption, political stability, regulatory control, rule of law and voice and accountability. The results have indicated that the successful introduction of one or both the mentioned vaccines were associated with high combined governance score.

A study on 102 countries conducted in 2011 [8] has connected mortality rate associated with famine with two governance constructs: World Bank Governance Index and degree of democracy. The World Bank Governance Index used in the study was composed by the following elements: control of corruption, government effectiveness, political stability, regulatory quality, rule of law and voice and accountability. The findings of the author suggested that famine mortality is negatively correlated with government effectiveness, control of corruption and degree of democracy. Another study conducted in the same year (2011) on 45 to 180 countries tried to correlate the quality of government measured through government effectiveness, corruption perception index and rule of law as measures of governance, with healthcare outcomes such as life expectancy at birth, maternal mortality rate, child mortality rate, healthy life expectancy and self-reported health status. The results showed that all quality of government’s variables were correlated with health indicators.

Some authors have correlated in their study governance with child deprivation [16], revealing the impact of poor governance on people’s living conditions. After realizing a comparative analysis of government efficiency measured through democratization and quality of government, and child deprivation in 68 Low and Middle – income countries, researchers [16] have reached the conclusion that although democratization has no impact on child deprivation, the quality of government affects for of the seven basic human

needs namely: lack of safe water, malnutrition, lack of access to health care and lack of access to information.

In a study based on data gathered from 1984 until 2009 on Malaysia [1] authors have discovered that long- and short-term health outcomes are affected by public health expenditure and corruption. Corruption as a measure of governance associated was studied in association with health outcomes on Philippines and authors discovered that the last ones are negatively affected by corruption [2]. In 2013 was published a study based on panel data set covering 136 countries over 1960-2005[23], examining the determinants of child health. The results showed that the reduction of child mortality rates are influenced by both public spending and quality of governance. The quality of governance was measured by control of corruption and quality of bureaucracy.

There are studies [37] that address the relationship between democracy and population health. In 2008 such a study was published and revealed that democratic elections have consistent effects on health outcomes [37]. The study used a sample of 173 countries with data from 1900 to 2012.

The relationship between the quality of governance and health outcomes was studied in connection with public spending on health [24]. On a panel data from 48 countries over the period 1996-2011 authors have investigated whether the quality of governance modifies the impact public health spending has on health outcomes measured through life expectancy at birth and under-five mortality. The results showed that improved health outcomes are significantly influenced by public spending on health, while the quality of governance influences the measure of impact, namely in countries with higher quality of governance the impact of public spending on health-on-health outcome is higher.

On a study conducted on England [39] authors studied different mechanisms of governance that can be used in order to improve child survival. The authors concluded that there is a need for a framework for governance health where child health and wellbeing should be the central element and a shared social goal. According to the authors governance for health can be achieved 'through smart power; a balance of collaboration, and engagement, regulation and persuasion, producing a system that fosters adaptation, resilience and anticipation of future needs' [39].

The results of a study published in 2018 conducted on Argentina and Chile from 1960 until 2013 revealed that better infant and maternal mortality rates are due to better overall functioning of the public health system [6]. In the study the author uses infant mortality rate and maternal mortality rate as health outcomes, and state capacity measured through different elements such as bureaucratic autonomy, control of corruption, infrastructural power, government quality as measures of governance. The author considers that the 'government effectiveness' in healthcare is having a high-coverage territorially health system, well-organized and homogenous.

Other authors a moderate correlation between health outcomes and governance mechanisms [30, 34]. On a study from 2004 conducted on 59 developing countries [34] was researched the link between infant mortality rates and the

degree of democracy measured through Bollen Index. The findings revealed the lack of direct relationship between the level of political democracy and infant mortality. Another study published in 2008 [30] conducted on 91 countries revealed public spending on health has positive results in diminishing under-five mortality rates when the level of corruption falls. The study also revealed that for a better health position of a country well-functioning budget formulation, execution and monitoring are crucial, while the increase of health expenditures does not guarantee improved outcomes.

Some studies have results that show inconsistent/mixed relationship between health outcomes and governance mechanisms [21, 29, 36]. In a study published in 2009 conducted on South Africa [36] authors have studied the impact of the implementation of Ottawa Charter for Health Promotion on the use of tobacco and related deaths and on the prevalence of HIV/AIDS and related deaths. The Ottawa Charter for Health Promotion is based on five principles namely: Community participation, Healthy public policy, Supportive environment, Re-orientation of providers to preventive care and Development of personal skills. The study showed that the implementation of the five principles of Ottawa Charter were fundamental for the campaign aiming to reduce the use of tobacco, but had no impact in on the HIV/AIDS epidemic. In 2012 was published a study conducted on India [29] connecting infant mortality rates with democracy defined as an open society characterized by political competition, free election and civil activism. The obtained results were inconsistent, the infant mortality rate persisted although democracy in India had matured, and with mixed results on different states of India. In the same year, another study [21] conducted on the 15 biggest states of India tested the decentralization reform – health disparity relationship. Health disparity was measured through variation in life expectancy and infant mortality rates between urban and rural population. Results showed that decentralization have decreased health disparities between states, but it didn't have the same impact on health disparity between rural and urban population, with the conservation of a lower health status among rural population.

Decentralization is one mechanism of governance that was poorly studied in connection with health. According to a study published in 2016 the implications of decentralized governance of health systems on health related equity are varied and are influenced by the organizational context, the pre-existing socio-economic context, the form of decentralization implemented and the mechanisms involved [35]. Another study measured the impact of transition into democracy on child mortality [28], on a sample of 60 countries that underwent democratic transition for at least 10 years between 1960 and 2010. The results indicated that democratization reduced child mortality in 45 countries, while in 15 countries the effects were not significant.

In 2021 a study on a panel of 15 West African countries was published covering a period of 18 years, since 2000 until 2018 [20]. The author tested the effect of health expenditure on three health outcomes for the countries in the panel, while also investigating the effect of the quality of governance. The findings of the study revealed a positive

relationship between health expenditure and life expectancy at birth, while a negative relationship between infant mortality, under-five mortality and health expenditure. The author emphasizes the fact that the quantity of public health spending is a quality of governance.

There are also studies that haven't revealed any relationship between governance mechanisms and health outcomes [10,26]. Some authors [26] researched on health policymaking with emphasizing the importance of empowerment and alignment, by testing the association between the ratification of human rights treaties as a commitment to the right to health and population health status measured by maternal mortality rate, HIV prevalence, infant mortality rate and child mortality rate. The study [26] was conducted on 170 countries and didn't find any link between health improvements and treaty ratifications. On a study conducted on Cameroon [10] published in 2011, authors tried to determine an association between the implementation of a policy to provide free second line ARV and the proportion of HIV patients in need of second line ARV. The authors couldn't find any link between the two elements.

After a waste literature review, some authors [9] concluded that there are some mechanisms by which governance may influence health: health system decentralization which, according to different authors enables responsiveness to local needs and values [12]; health policy making which can contribute to empowering and alignment of diverse stakeholders [10,26,36]; enhanced community engagement [5] and strengthened social capital [11].

The majority of the studied mentioned have revealed that stronger governance can improve health. Some studies associate the decrease in infant mortality rate with control of corruption, rule of law and regulatory quality [22], others reveal that in the conditions of high quality of governance public health spending increase life expectancy and improve under five mortality rate [24]. Other studies correlate democratic reforms with improvements in health (Pieters, Anderson), or various public policies [14].

3. Conclusions

The 21st century societies face different kind of challenges that need new approaches of governance. As we can see, health is not always the prioritized challenge but is influenced by all the rest, although this hasn't received sufficient attention. As WHO mentioned in its paper 'Governance for health in 21st century' these challenges refer to 'systemic shocks, such as natural disasters and disease outbreaks, as well as longer-term processes such as urbanization, epidemiological and demographic transitions, food insecurity, climate change and widening economic disparities. Also, we should not forget that governments are an essential factor in assuring and providing quality life for the citizens through good health systems.

Our conclusions, after this literature review is that not all the studies found a positive correlation between health governance and healthcare outcomes. Another conclusion

of our research is that of that the lack of governance can have an impact on the quality of health services. For a better understanding of the relationship between governance and health, further exploration is needed. Considering the obvious correlation between environment and the quality of health [27], a path for future research is to study the relationship between them, considering that researchers gave it little attention. Also, another path for future research is to pay more attention for the causal influence between each mechanism that can define governance and health outcomes.

Health governance needs to take in consideration the challenges that health systems face in the 21st century such as funding for public health and health care services, considering the limited financial resources and the demographic evolution, resource utilization by efficiency criteria, assuring equitable access to health care services and the need for human resource training. All these and many others were brought in front of society by the Covid-19 Pandemic. This crisis put the spotlight on global health governance and challenging its structure. For health systems good governance means to deliver health services effective. For improving health sector performance governance need to be seen as a crucial factor.

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USING DESIGN OF EXPERIMENTS FOR CREATING A CONSERVATION TREATMENT FOR CULTURAL HERITAGE, WITHIN A UNIVERSITY-INDUSTRY COLLABORATION PROJECT

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ABSTRACT

Design of experiments (DoE) is a useful and well-known method for planning an experiment from the beginning, by setting an initial objective, until the end, by comparing the expected results with the actual results. DoE is used across various disciplines, but there aren't any studies in the cultural heritage conservation field. This is the reason why the aim of this paper is to apply DoE to an experiment that is used to create a plasma treatment to increase cultural heritage conservation. Moreover, the chosen case study is actually a university-industry collaboration project, so one of the benefits of applying DoE is that the experiment will be more well-known by both parts involved, namely the research institute and the faculty. As the analysis showed, the expected results were confirmed, although these are short-term results and it might be useful to analyze the results over time.

Keywords: design of experiments, conservation treatment, cultural heritage, collaboration project.

JEL classification: C90.

1. Introduction

Conducting research domain has evolved during the years and new methods and methodologies have emerged with the aim of helping researchers to improve their experiments and finally, their results. Experiments are very important research tools and are used in many sectors, and this is the reason why there are many ways of improving experiments, and especially their results. DoE is one example of method used by researchers to improve their experiments results. DoE is a very used methodology for planning and executing experiments. Its main advantage, compared to other methods, is the fact that it allows researchers conducting the experiment to know the impact that each factor has on the final results. Although this method is used across many research areas, we couldn't find any evidence that this method was applied for plasma treatments experiments. Plasma treatments are useful because they can stop the process of biodegradation of works of art. Hypomic fungi, traditionally called "mold", are the most important biodegradable agents in museums, museum warehouses, libraries, collections and restoration studios. Mushrooms can adapt perfectly to indoor environments and thrive in microclimatic niches caused by condensation, lack of

ventilation or water retention by hygroscopic materials. Mushrooms damage valuable pieces of art aesthetically, mechanically, chemically and by degrading organic components (Sterflinger & Pinzari, 2012). It is important to note that the textile support of paintings on canvas is the main organizing material for the development of fungi and bacteria and can support the process of microbiological spoilage in a variety of environmental conditions (Caneva et al., 2000). In a recent study, (Pyzik et al., 2021), the authors have identified different categories of bacteria and fungi that can affect materials such as: paintings on textiles and canvas, wood, paper or parchment, paintings on stone or wall, metal, photographs. Taking into account the specifics of this study, we looked for bacteria and fungi that affect canvas. In the list of fungi there is also the type of fungi that will be analyzed in the case study, namely *Aspergillus niger*. This genus includes several species: *Aspergillus candidus* *Aspergillus clavatus* *Aspergillus fumigatus* *Aspergillus niger* *Aspergillus versicolor* *Aspergillus wentii* (Vukojevi & Grbi, 2010).

In this paper, firstly the DoE method will be presented, including reasons to use it, where and by whom it is used and DoE steps. Also, a subchapter will be about collaborative projects, as the case study is referring to a collaboration project between university and industry. Then, in the methodology section, the details of the chosen case study are presented, including information about the research institute and the faculty, and also information about their collaborative project. In the findings section the DoE is applied to the mentioned case study. The conclusion section presents the interpretation of the obtained results.

2. Literature review

2.1. Defining DoE

The DoE process is an efficient procedure for planning experiments, as it allows the data to be analyzed in order to obtain valid and objective conclusions.

DoE can be useful for one of the following reasons:

- It allows one to compare the alternatives, by evaluating both cost and quality;
- One can identify the significant factors or inputs that affect the results or outcomes;

- One can obtain an optimal process output, by setting the factors, their levels and the expected results;
- It is possible to reduce variability. At some point one can obtain a satisfying “recipe”, meaning that using certain inputs and settings for them, the expected results will certainly appear;
- It is possible to maximize, minimize or even targeting an output, due to the knowledge about how the inputs affect the outputs;
- It is possible to adjust the process or product “robustness” meaning that it would be possible to find out how much can the factors and their setting be modified, but still have the same results.

DoE is used in many sectors, for example: chemical industry, polymer industry, car manufacturing industry, pharmaceutical industry, food and dairy industry, pulp and paper industry, steel and mining industry, plastics and paints industry, telecom industry, marketing (Eriksson et al., 2000).

2.2. DoE steps

The process of preparing the experiments has several steps, as it can be seen in Figure 1, that will be further presented. These are the general stages that can be applied in various fields of science. Still, some stages can be different, including other field-specific components (Seltman, 2015).

Defining the problem is the first step and consists in establishing the experiment to be performed, in general terms, and in the future stages specific details will be established.

Determining objectives is best done in a team. All proposed objectives should be noted. The group should discuss what the key objectives are and what are “nice, but not really necessary”. Prioritizing goals helps you decide which way to go in terms of factor selection, answers, and particular design. Sometimes prioritization will force you to start from scratch when you realize that the experiment you decided to run does not meet one or more critical goals.

Determining factors, levels and responses

1. *Factors (or inputs)* can be classified as controllable or uncontrollable variables. For a better understanding of these three elements, an example is provided. Imagine that someone prepares a cake. For this example, the controllable factors are the ingredients for the cake and the oven in which the cake is baked. Controllable variables will be named factors. Also, there may be other ingredients that have a significant influence on the final result (yeast, oil, water, etc.), as well as other types of factors, such as the method or tools of mixing, the sequence of mixing or the people involved. People are generally considered a noise factor, meaning an uncontrollable factor that causes variability under normal operating conditions, but we can control it during the experiment using blocking and randomization. Potential factors can be classified

using the Ishikawa Diagram, also called the Cause-Effect Diagram;

2. *Levels or settings* of each factor in the experiment. As examples for the baking of a cake we have the setting of the oven temperature and the specific quantities of sugar, flour and eggs chosen;
3. *The responses or the outcomes* of the experiment. In the case of the cake preparation example, the taste, color and consistency of the cake are measurable results, which can be influenced by factors and their levels. Experimenters often want to avoid optimizing the process for one answer over another. For this reason, the important results are measured and analyzed to determine the factors and their settings that will provide the best overall result.

Determining experimental design type

There are three main types of problems that can be resolved using DoE: screening, optimization and robustness testing. Firstly, the screening process is used with the aim of discovering the most important factors of an experiment. Secondly, optimization process is used for determining the way in which the factors should be mixed in order to obtain the best results. Finally, the robustness testing, means trying to make the experiment insensitive to small variations of the factors.

This phase consists in creating the strategy. Knowing all the details about factors and their levels, the expected results and the experiment type, the experiment is designed by specifying the number of experiments that will be carried out and the way in which they will be performed (Roy, 2001).

Conduct experiment and collect data

This stage varies depending on the research area, type of experiment, the tools needed, etc. According to (Gatti, 2014), there can be two main types of conducting experiments: classical and contemporary. The classical approach includes screening experiments, full factorial designs, fractional factorial designs, analysis of variance (ANOVA), response surface methods (RSM), Taguchi methods and sequential experimentation. The second category, the contemporary one, includes metamodeling, metamodel experimental designs, metamodel form and sequential experimentation.

Interpret results

After obtaining the results, an interpretation should be made. While analyzing the results, the following questions should be answered:

- How is the response varying when the factors and their levels are changed?
- Which are most significant effects?
- What is the model for estimating responses?
- How can be the responses optimized?

Verify predicted results

For this stage, the prediction should be compared to the obtained results. In the literature, these are called confirmation runs.

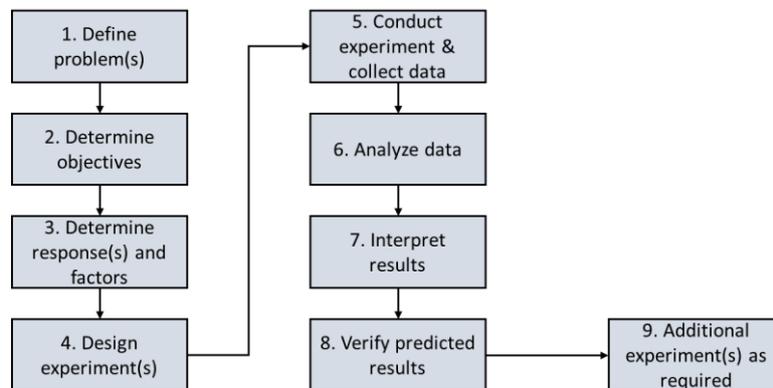


Figure 1. DoE flowchart

2.3. Collaborative projects

Regarding collaboration, there is a concept in the literature, namely process gain, that can be seen as the advantage of working together in a team (Steiner, 1972). A collaboration is successful when its results couldn't be obtained otherwise, by individually working (Kvan, 2000). Collaboration is defined in the Cambridge English Dictionary as "the situation of two or more people working together to create or achieve the same thing". But collaboration can also take place between two institutions, not necessarily two people. There is a lot of literature on the university-industry collaboration. One of the types of collaboration between these two parts is joint research and is considered a channel of knowledge transfer (Banal-Estañol et al., 2013). This kind of collaboration is beneficial for both parts involved. Regarding the university, it can obtain new funds for research and also new ideas of research, more practical ones. As for the private organization involved in the collaboration, it can benefit from the university researchers knowledge (Veugelers & Cassiman, 2005). Although this kind of relationship has many advantages for the parts involved, they might also provide challenges. According to (Bruneel et al., 2010), there are two types of barriers: those related to differences in the orientations of industry and universities and barriers related to conflicts over IP, and dealing with university administration. The first category, also named orientation-related barriers, can cause many conflicts, as each part has different interests in the project. The best way to reduce conflicts is for each part to be transparent since the beginning with their expectations and to establish a clear objective for the project, accepted both by the university and the company. DoE might be a good instrument for doing this.

3. Methodology

For this study, a case study approach was adopted as the aim of this paper is to adopt a DOE for a specific treatment against a specific type of microorganism. The analyzed case is a particular one as it is a collaboration project funded by

the European Union funds. In the project discussed there is a collaboration between a research institute from Romania and researchers from the Faculty of Biology and Geology. Firstly, the research institute will be presented and its context. The institute has more than 10 years research experience, in the following areas of expertise: robotics, computing, electro technologies, ambient assisted living, hardware design and software development. The institute gained expertise by being part of many projects funded by the European Union or by the Romanian Government. Since 2018 and until now, the institute is part of another project funded by the European Union. The aim of the present project is "Identification of deteriorogenic microorganisms on the canvas and development of measures to combat them in order to preserve the cultural heritage." As a benefit for being part of this project, the institute developed the following types of equipment and experiments:

- Advanced experimental model of nitrogen supply equipment with the following characteristics: DBD plasma with nitrogen inkjet type with 50 Hz supply, 20 kV, in order to optimize the operating parameters.
- The experiments were done with different new treatment techniques: DBD inkjet plasma with nitrogen at 17 kV, 850 Hz in pulses, inkjet nitrogen plasma with power supply at 50 Hz, 20 kV and RF plasma with helium at 27.12 MHz in inkjet system. The mentioned techniques were applied on the canvas from the surface of which the samples for metabarcoding were taken in case the removal of the microorganisms from the first application of the treatment was not possible.
- Evaluation of the effectiveness of the treatment applied to combat the biodegradative impact of microorganisms on canvas.

The work flow for the project is the following one:

1. The researchers from the Faculty of Biology and Geology inoculate canvas sample with microorganism and send them to the institute.

2. The institute perform multiple versions of the treatments and applied it to the canvas.
3. Then, the canvas is sent back to the faculty.
4. The faculty researchers evaluate the effect of the treatment over microorganism.

The aim of using DoE for the project described above is to facilitate the understanding of the project from its beginning to its end, by all parts involved, mainly because it is a collaborative project.

In the next section, the DoE methodology will be applied for the project presented.

4. Findings

Defining the problem

Experiments on series of *Aspergillus niger* colonies, inoculated on uncoated cotton canvas, in a dry environment using the high voltage source inkjet plasma system.

Determining objectives

Carrying out experiments on a number of 60 samples using plasma inkjet with N₂ and He carrier gas on sets of unpainted and primed canvas samples.

Determining factors, levels and responses

The experimental conditions used consisted of variations in voltage, frequency, flow and type of gas, the distance

between the tube and the treated surface and the treatment duration.

The expected results are the disappearance of the *Aspergillus niger* colonies of the canvas surface.

Design experiment

Preparation of canvas strips for testing / calibration of plasma treatments

For the testing / calibration of plasma treatments, 2x8 cm strips of unpainted canvas were prepared, exposed for sterilization, in UV light at 254 nm for 45 minutes on each side (Pinzari et al., 2006). The UVlink crosslinker was used to sterilize surfaces. *A. niger* spores were taken up with a sterile swab from the surface of a solid medium culture grown for 7 days. They were resuspended in 2 ml of distilled water and washed twice. After washing, they were resuspended in 1 ml of water, with Tween 20 (0.5%) (John, 2008), with a concentration of 10³ spores / ml. Spore density was defined by counting them using the Thoma counting chamber. Each strip of paper was seeded in 4 points with 25 µl of suspension (Pinzari et al., 2006), placed in a Petri dish and dried. All inoculations were performed in a laminar flow hood to ensure sterility of the procedure (Coecke et al., 2005). The plates were incubated for 7 days at 25° C.

Conduct experiment and collect data

Applying the treatment on the samples of unpainted canvas

Table 1. Details about applied treatment on the samples of unpainted canvas

Lot 1, Set 1 – uncoated canvas, treatment date: 2-3 august 2021		
Sample	Treatment conditions	Observations
Sample 1	Witness sample	Performing experiments using plasma inkjet with N ₂ on the first set of samples on unpainted canvas. Experimental conditions used: 17kV, 850 Hz, gas flow 1 l / min variable treatment period. Heat resistant glass tube Ø 4 mm outside, Ø 2 mm inside, mounted in electrical insulating support. Distance from the glass tube to the duralumin treatment surface = 10 mm (5 mm at 28.04). The distance between the tungsten wire and the opening end of the glass tube = 0 mm. Total length of tungsten wire = approx. 240mm. Copper wire coil, mounted on the outer surface of the glass tube = Cu Ø 1mm wire, with coil length = 25mm. The lower end of the Cu coil is 10 mm from the opening end of the glass tube.
Sample 2	Duration of treatment 1 second	
Sample 3	Duration of treatment 3 seconds	
Sample 4	Duration of treatment 5 seconds	
Sample 5	Duration of treatment 7 seconds	
Lot 1, Set 2 – uncoated canvas, treatment date: 2-3 august 2021		
Sample	Treatment conditions	Observations
Sample 6	Witness sample	Carrying out experiments using plasma inkjet with N ₂ on set II of samples on unpainted canvas. Experimental conditions used: 17kV, 850 Hz, gas flow 10 l / min variable treatment period. Treatment date: 2-3.08.2021. Heat resistant glass tube Ø 4mm outer, Ø 2mm inner, mounted in electrical insulating support. Distance from the glass tube to the treatment surface: 5 mm. The distance between the tungsten wire and the opening end of the glass tube = 10 mm. Total length of tungsten wire = approx. 240mm. Copper wire coil, mounted on the outer surface of the glass tube = Cu Ø 1mm wire, with coil length = 25mm. The lower end of the Cu coil is 25 mm from the opening end of the glass tube.
Sample 7	Duration of treatment 1 second	
Sample 8	Duration of treatment 1.5 seconds	
Sample 9	Duration of treatment 2 seconds	

Sample 10	Duration of treatment 2.5 seconds	
Lot 2, Set 1 – uncoated canvas, treatment date: 17-23 august 2021		
Sample	Treatment conditions	Observations
Sample 1	Witness sample	Performing experiments using plasma inkjet with He on the first set of samples on unpainted canvas. Experimental conditions used: 20 kV, 50 Hz, gas flow 1 l / min variable treatment period. Treatment date: 17-23.08.2021 Heat resistant glass tube Ø 4mm outer, Ø 2mm inner, mounted in electrical insulating support. Distance from the glass tube to the duralumin treatment surface = 5mm. The distance between the tungsten wire and the opening end of the glass tube = 0mm. Total length of tungsten wire = approx. 240mm. Copper wire coil, mounted on the outer surface of the glass tube = Cu Ø 1mm wire, with coil length = 25mm. The lower end of the Cu coil is 30mm from the opening end of the glass tube.
Sample 2	Duration of treatment 1 second	
Sample 3	Duration of treatment 3 seconds	
Sample 4	Duration of treatment 5 seconds	
Sample 5	Duration of treatment 7 seconds	
Lot 2, Set 2 – uncoated canvas, treatment date: 17-23 august 2021		
Sample	Treatment conditions	Observations
Sample 6	Witness sample	Carrying out experiments using plasma inkjet with N2 on set II of samples on unpainted canvas. Experimental conditions used: 20 kV, 50 Hz, gas flow 1 l / min variable treatment period. Treatment date: 17-23.08.2021 Heat resistant glass tube Ø 4mm outer, Ø 2mm inner, mounted in electrical insulating support. Distance from the glass tube to the duralumin treatment surface = 5mm. The distance between the tungsten wire and the opening end of the glass tube = 1mm. Total length of tungsten wire = approx. 240mm. Copper wire coil, mounted on the outer surface of the glass tube = Cu Ø 1mm wire, with coil length = 25mm. The lower end of the Cu coil is 30mm from the opening end of the glass tube.
Sample 7	Duration of treatment 1 second	
Sample 8	Duration of treatment 3 seconds	
Sample 9	Duration of treatment 5 seconds	
Sample 10	Duration of treatment 7 seconds	

Qualitative evaluation of the effectiveness of the treatments applied to the samples

Testing the efficacy of plasma treatments applied to *Aspergillus niger* spores by reseeded on treated Czapek-agar culture medium the treated, primed and ungalled cloth fragments. For the unpainted cloth the spores did not germinate for any fragment.

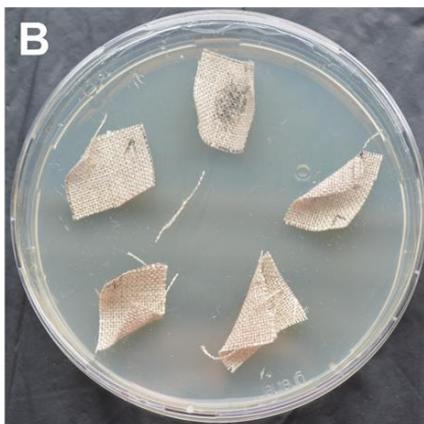


Figure 2. Fragments of unpainted cloth taken from plasma-treated strips.

Quantitative evaluation of the effectiveness of the treatments applied to the samples

Testing the efficacy of plasma treatments applied to *A. niger* spores by reseeded on Czapek-agar culture medium the washed spores from the sown spots on the unpainted cloth. For the unpainted cloth the spores did not germinate for any fragment.

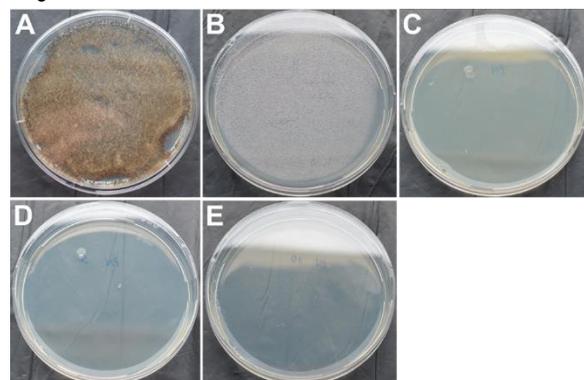


Figure 3. Spores of *Aspergillus niger* seeded on Czapek-agar medium, washed from the spots on the unpainted canvas

Interpret results

As it can be observed in the previous paragraph, the treatment applied on the samples of unpainted canvas has worked, meaning that the spores of *Aspergillus niger* did not germinate. Although this is a good result, it might be just a temporary one, as the spores can germinate in the future. Also, the effect of the treatment over the canvas should be evaluate in order to determine is the canvas was somehow affected.

5. Conclusions

In this paper, we discussed about DoE method and then applied it to a specific case. Applying this method is very useful for the chosen experiment because the experiment is part of a university-industry collaboration project implemented by two different groups of researchers and it can help them to have a clearer view on the experiment. We applied the steps of the DoE and this provides us a complete view on the experiment. The results were the expected ones, at least on short-term, as we currently don't know in future the spores won't germinate and also, we don't know the effect that the treatment has on the canvas. These two topics should be subject to further experiments.

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THE IMPORTANCE OF REQUIRED QUALIFICATIONS FOR TWIN TRADING IN THE FOOD SECTOR

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ABSTRACT

Designing a fair, healthy and environmentally friendly food system is a major concern of the European Green Pact. To meet the needs of the business environment, an upgrade of the education and training curriculum and facilities is essential to adapt to a green and sustainable agrifood model. Moreover, a sustainable growth in agri-food requires the implementation of new technologies. Therefore, education and training programs need to be adjusted and developed to enable the workforce to acquire relevant skills.

The paper analyses the current state of education and training in the field of agribusiness in Romania, with emphasis on economic programs offered by Romanian universities.

The overall goal of the current study is to establish priorities for Romanian agribusiness education curriculum through a solid partnership with the growing food and agribusiness sector and identify which skills need updating. The study explores the relationships between technological change in the pandemic context and new skills demand along the value chains and how respond universities to the skills gaps.

The study combines traditional research methods with data mining tools and case study to produce a comprehensive picture of the issue.

The main findings of the paper reveal there is a need of improving relevance and quality of education and training in the agrifood sector. Although in Romania there are many business and management schools, there is a lack of focus on the specific business and management needs of the agri-food industry. There are few agribusiness education programs in Romanian universities, most of them being in engineering and agricultural sciences.

Also, we found that an important aspect of agribusiness education is that industry leaders expect graduates to have several skills, especially the technical skills. There is a need for qualified professionals with specific skill sets, along the value chains. In this regard we developed a list of those characteristics desired by agribusiness professionals and then make it clear that students and people working in the field must develop these skills to meet the needs of agribusiness industry. We recommend strategies for developing the education and training initiative in this field in order to reduce the gap between the current offer and the real need of an expanding field.

Technology and concerns for health and the environment are set to bring major changes to jobs in agriculture and food production. The study provides a basis for reflection and action required to prepare students and workers for the jobs of the future. Also, the paper contributes to the enhancement of the attractiveness of the agri-food sector for young people, but not only.

Keywords: VET, agribusiness; education; programmes; competencies.

JEL classification: I25, I21.

1. Introduction

According to the dictionary, bioeconomy is the science that studies the economy of nature, of the biosphere; a science which studies the economy of science, as well as its effects on the biosphere.

Mihai E. SERBAN refers to bioeconomy as the science which actively integrates humanity into the environment, but also provides us with different uses of this term:

- a progressive branch of the social sciences, meant to integrate humanity and biology;
- a study of the market dynamics through the lens of evolutionary biology;
- a multitude of economic activities meant to optimize the production and usage of biological products

A famous name associated with the usage of the term is N. Georgescu-Roegen, who at the beginning of the 70s defined this term as the acknowledgement of the biological origins of economic processes, on the basis of the difficulties which humanity encounters due to the limitations of resource quantities and the unequal and inconsistent distribution of them. Georgescu-Roegen's approach culminated in the development of an 8 step "bioeconomic plan", a splendid show of progressive thinking, but also utopian; the 8 steps still remain strong arguments in the discourse of those nostalgic for a different kind of future even today." [25]

Thus, by bioeconomy we refer to an economy based on the clever application of terrestrial and maritime resources, biological and renewable, such as raw materials for food and fodder, in industrial and energy production as well. Moreover, it includes the usage of ecological processes for

durable industrial sectors. For example, biodegradable trash has considerable potential as an alternative to chemical fertilizer or for conversion into bioenergy.

Activities relating to durable economy are considered essential to fulfilling the objectives of durable development,

from food and nutritional safety to ensuring access to energy and health. What follows is an overview image of the economic, social and environmental dimensions of bioeconomy and its foreseen impact by 2030. [5]

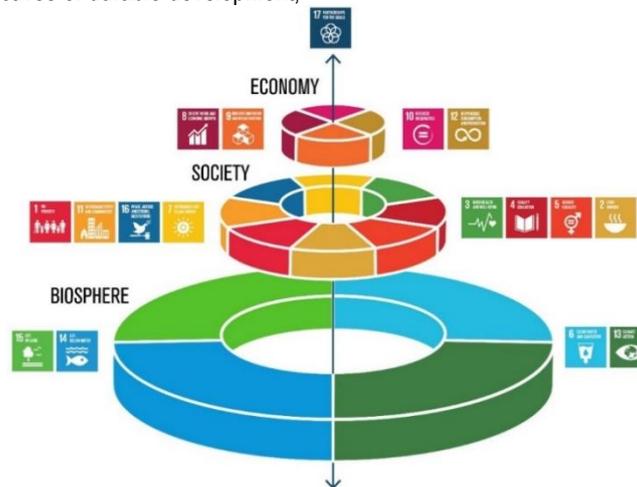


Figure 1. The Sustainable Development Goals “wedding cake”

Source: European Commission (2018)

2. The necessity of preparing specialists in the bioeconomic fields

According to the “Updated Bioeconomy Strategy” of the European Commission, all fields of bioeconomy will require qualified specialists with sets of specific competencies along the value chain. Education and training programmes need to be adjusted and developed to allow the workplace to obtain relevant skills.

To solve this challenge, the member nations, partnered with the EU, will be asked to continue developing skills specific to bioeconomy in their higher education programmes and vocational education, including entrepreneurship training.

Universities generate advanced knowledge and skills which help society to innovate in order to be able to face great challenges. The workplace of tomorrow requires skills for twin trading (ecological and digital). The ecological transition requires investments in the development of people’s skills in order to raise the number of professionals who can build and master ecological technology, including digital skills, product development, ecological business services and models, creating innovative solutions based on nature and contributing to minimizing the imprint of businesses on the environment. Beyond technical skills, the labour market requires transversal skills more and more, such as collaboration, critical thinking and creative conflict resolution. The increased influence of robots and algorithms on our labour markets continuously grows the need for unique “human” abilities, such as empathy and adapting to changes in complex mediums.

Open, democratic societies depend on active citizens who can discern information from diverse sources, identify

misinformation, make informed decisions, are resilient and act responsibly.

3. The European frame in forming specialists

With a business figure of 2.3 million Euros and representing 8.2% of the EU workforce, according to data from 2015, bioeconomy is a central element for the functioning and success of the EU economy. The food-and-beverage industry is one of the biggest sectors of production in the EU in regards to workforce engagement, business figures and added value. From the mass of bioeconomic workplaces in the EU, the agriculture sectors and food and beverage industry have a large share, representing 76%, meaning 13 million people (data from 2015).

Updated bioeconomy strategy

A sustainable Bioeconomy for Europe: strengthening the connection between economy, society and the environment.

By introducing circularity to bioeconomy, the food and agriculture sector explores the potential of transforming residue into biological products. This will bring opportunities to create workplaces for which it is required to prepare new skills and competencies. [5]

In this context and taking into consideration the contribution of the food system to the number of workplaces in bioeconomy (76% out of the whole), this study will focus on the food sector. Moreover, the food sector is sufficiently diverse and large in order to serve as an example for other sectors of bioeconomy.

According to the Food and Europe “Data and Trends” report, in 2019, “the food and beverage industry in EU hired 4.74 million people, generated a turn-over of 1.2 trillion Euros and 236 milliard Euros with added value, which made it the most

productive industry in the EU". The food sector in Europe faces great challenges, such as climate change, the drop in biodiversity and the production of safe and healthy food. Towards these challenges, it is necessary to provide answers that contribute to the implementation of agroecological systems and to a more "circular" economy accompanied by digitalization. The food sector, from production, through transformation, distribution and retail, needs to adapt to the demands of society for healthy, nutritious and accessible food. To answer these challenges, the food sector needs, besides research and innovation, education and adequate training. Though relevant to the general economy of the EU, the food sector has no higher education qualifications in the workforce. The food industry requires more and more mixed competencies, a constant upgrading of professions in order to answer the future needs of the digitalization of the industry, a reduction of ecological imprint, a more efficient use of natural resources and the circularity imposed onto value chains. For example, the agricultural sector of the EU "has, in general, a training and education level lower than other economic sectors. In 2016, more than 40% of people working in the agricultural sector have finished at most a low level of education, while this figure was 18% of the whole active population." [5]

The European Green Deal

The creation of a right, healthy and ecological food system is a major concern of the European Green Deal. European food is well-known for the fact that it is safe, nutritious and of high quality. This should also now become the global standard for durability. [9]

In this transition, there exist new opportunities for all operators on the food value chain. New technologies and scientific breakthroughs, combined with the rise of the public consciousness and the demand for durable food, will bring benefits to all involved parties.

The European Green Deal establishes how to make Europe the first continent with a neutral climate by 2050. The "Farm to Fork" strategy is the centrepiece of the Green Deal. This approaches the challenges of durable food systems and acknowledges the complicated relationship between healthy people, healthy societies and a healthy planet in a comprehensive way. The strategy is, also, essential to the Commission's agenda for the accomplishment of the Objectives of Durable Development (ODD) of the United Nations Organization. [13]

Workshop on promoting education, training and skills across the bioeconomy

According to a rapport of the European Commission "Vocational education has a rich experience and uses innovative pedagogic technologies. University training systems should learn from these schools of vocational education. There is, on the other hand, a mistrust regarding the utility of this taught information and knowledge. For example, if a university and its researchers are not well-connected to the realities of what farmers are facing, they will not trust them. They will rather trust a traditional

approach, of knowledge handed over to them by their ancestor than the strategy proposed by researchers." [15]

European Skills Agenda for Sustainable Competitiveness, Social Fairness and Resilience

The EU requires a paradigm shift regarding competencies, which would ensure the conclusion of twin trading and adapting to the socio-economic impact of the COVID-19 pandemic. [14]

Twin trades – ecological and digital – change the way in which we live, work and interact. The EU switch towards an efficient, circular, digital and neutral economy regarding the use of resources from the perspective of the climate and a large spread of artificial intelligence and robotics is expected to create new workplaces, while others will change or even disappear. These transitions show the necessity of an unexpected change of skill sets in order to capitalize on the entire potential.

The New Agenda of the competencies refers to the European Pillar of Social Rights, and, especially, its first principle which describes the right to quality and inclusive education, training and teaching for life [14]. This principle is, also, strongly tied to the European Green Deal, in the new digitalization strategy and new industrial strategies and IMMs, due to the fact that those abilities are crucial for their success [9] [12].

The European research space promotes, also, the rise and retraining of talents, especially in the academic environment. Together, these initiatives will contribute to the construction of a learning culture for life in Europe, will encourage an approach based on demand for the consolidation of cooperation with the industry and the stimulation of citizen employment.

Politics and competency offers are divided among many actors. Ministries, education and instruction providers, the industry itself, research organizations, social partners, commerce chambers and employment agencies, are just a series of organizations that contribute to the accomplishment and redimensionalization of reality.

The first step of the Agenda for competencies is that of encouraging cooperation through a European Pact for competencies. The pact for competency will reunite all interested parties, private and public, which have as an objective the rise and retraining of the European workforces in order to allow people to participate in twin trading.

Incorporating the idea of "abilities for the workplace", the second element in the evolution of the competency agenda, is a comprehensive approach towards growth and retraining, which covers the entire value chain. It starts with information regarding reliable competencies in order to offer relevant instruction for the work market. These abilities should be incorporated in national strategies and in training and education systems. Individual companies should, also, develop internal processes in order to identify the competence gaps and measures to handle training their own workforce.

The simple analysis of information and surveys regarding the employment of graduates on the work market is

insufficient for defining the new profiles of workplaces in different sectors based on the specific competency sets required. The first step in ensuring the fact that people can obtain the abilities they need for their current workplace or a future one is the updated information about the abilities required by the job market. However, often this information comes too late to act as a foundation for people's choices. Organizations that offer education and professional training need to offer relevant skills for the whole duration of the continuous learning process. Education and formal training (VET) are a main concern of the EU. Approximately half of young students in the EU are VET students, which is why, Europe needs flexible VET systems, which can help young people manage their entrance on the job market in exchange and ensure the access of adults to professional programmes adapted to green and digital deals.

VET programmes are divided into different levels of education and formal training. In exact numbers, the highest number of VET students (8.5 million students – 48% [10]) are enrolled in programmes of the higher secondary level. This compares with the 1.5 million students that are part of the non-tertiary, secondary education system, 1.2 million students in the short-term tertiary cycle, 1.2 million B.A. students and 0.7 million M.A. students. [26]

Universities generate knowledge and advanced skills which help innovate society in order to be able to face its great challenges. Thus, higher education has the role of offering students skills that they need in the future. The quick shifts in the job market and the social shifts require a change in the tertiary educational institutions in order to better their alignment to the economic medium, in order to ensure that graduates have the required education and abilities for the job market and, especially, those necessary for twin trading.

The pandemic and its consequences over life and our economy have highlighted the importance of digitalization in all economic and social fields of the EU. Almost 4 out of 10 employees have started working from home during lockdown. The current situation generated by the COVID-19 pandemic highlights the fact that the workforce in Europe needs to quickly increase its level of digital competency. This was most visible in the education sector, for students, teachers and trainers.

4. Education and training systems in the EU

The different education and training systems are inconsistent across member states of the EU. This study analyses the relevant aspects in 5 EU states with a developed agricultural system with which Romania shares many similarities.

In the case of **Italy**, the first compulsory school cycle lasts 8 years and includes primary education (5 years) and secondary education (3 years), ending in a final exam. Afterwards, pupils can choose whether to continue their studies with secondary education (5 years) in order to access higher education. Another way is enrolment to vocational training with the regions' support (3 years) to prepare for a professional qualification or ultimately enrolment in vocational instruction which alternates between

work experience and face to face training and allows young people to obtain a vault of knowledge and skills which they can get from the job market. In regions where schools, universities, companies and research teams collaborate, professional training centres were created. Work-study programmes are conceived, put into practice, monitored and evaluated under the guidance of the school or training institution in accordance with the agreements signed with the companies. [1]

In **Portugal**, level 3 corresponds to secondary education which focuses on taking into consideration higher education and level 4 secondary education is obtained through courses with a double qualification which takes into account pursuing higher education as well as the professional stage. This lasts for three years, focusing both on continuing one's studies, as well as having an active social life, ensuring a juxtaposition of these two ways: it includes the fields of scientific studies and Humanities and those predominantly orientated towards science. Along with a level 5 qualification, the regime which implements the creation, organization and running of specialized technology courses (CET) there were also postsecondary courses formed.

This technology specialization attempts to develop abilities and professional competencies, allowing introduction to work or to pursue higher-level studies. [3]

Regarding the dual system in **Germany**, the system is called such, because training takes place in two study spaces: the company and the vocational school. It usually lasts for three years. The aim of training in the dual system is to offer an education base on a large scale and vocational training and to pass down the skills and qualifications necessary to exercise a qualified professional activity. Successfully finishing the programme qualifies the individual to pursue a profession as a qualified specialist in one of the 346 training occupations currently acknowledged. At the beginning of vocational training, compulsory education needs to be entirely finished. There are no other formal admission requirements in the dual system for access to training; it's open for everybody. Nevertheless, the majority of students have a high school certificate or an admission diploma to a university. Training is ensured on the basis of a training contract professionally regulated by the private rights between a training company and a young person.

In the case of the **Netherlands**, there are four levels of secondary education: a) Practical education. In the past, practical education was known as special secondary education for children with learning difficulties. This type of education trains children to be involved in a type of work and society. It lasts for five years and some children pass from this type of education to VMBO. b) VMBO - Voorbereidend middelbaar beroepsonderwijs. Secondary vocational preparatory education prepares students for vocational secondary education (MBO) and to practice a profession. VMBO has four types of teaching means: i) BB: vocational primary education – for children with a practical leaning; ii) KB: vocational teaching framework – It is, also, heavily leaning towards the practical. Nevertheless, a student faces more challenges regarding theory; iii) GL: mixed teaching – A combination between theory and practice. Students which

pursue GL receive theoretical knowledge, but are also preparing for the job market; iv) TL: theoretical teaching – This type of education is entirely guided by theory. Thus, pupils receive only theoretical and non-practical courses. c) HAVO “Hoger algemeen voortgezet onderwijs” is the short form of “higher secondary general education”. This level lasts for 5 years and prepares students for vocational secondary education (HBO). d) VWO “voorbereidend wetenschappelijk onderwijs” which means “preparatory scientific education”. This is the highest level possible in Holland. With a VWO diploma, the students will pass into academic or university education. VWO lasts for 6 years.

Romania

Society requires more jobs in agriculture and the food industry, economic growth and better environmental protection, but also healthy and nutritional food and a territorial balance which will not leave regions behind.

The education and training sector in Romania is poorly invested in (approximately 3% of the GVA yearly, significantly below the EU average of 4.6% and the lowest percentage in the EU) and funding mechanisms to support equity are weak. In general, funding is available for the modernization of the existing infrastructure, the construction of new buildings and the purchase of equipment [6]. Other segments that need improvement refer to basic and digital skills, equity and quality in education.

The educational and training system in Romania has also a poorly developed infrastructure. Some EUR 350 million were earmarked in 2014-2020 under the European Regional Development Fund for investments in educational infrastructure in Romania. Priority is given to areas where enrolment rates in pre-school education are low and early school leaving is high. In Romania, the share of young people (18-24 years old) who leave school early is 16.4% compared to the European average of 10.6%. [8]

Almost half of the Romanian teachers believe that their profession is valued by society [24]. The attractiveness of the profession remains despite the low entry requirements for teacher education programs and traditionally low salaries (OECD, 2017). [21] that have a negative impact. Reforms have been made, though, especially in the payment area since higher bonuses were available, and the time needed to reach maximum pay was reduced due to the new salary grid introduced in 2017.

The constitution guarantees public education, including tertiary, free of charge. General objectives, aims, principles, structure and organisation of the education and training system are described in the National Law of Education (2011) [22]. It defines the following secondary education levels:

1. lower secondary education (The International Standard Classification of Education (ISCED) 2, grades 5 to 8) also called ‘gymnasium’ (gymnasium);
2. upper secondary education (ISCED 3) also called ‘secondary superior education’, comprising:

- a. three-year school-based VET programs (nationally referred to as ‘professional’ programs and may be offered as dual VET);
- b. four-year general and VET (vocational and technological) programs (grades 9 to 12) providing access to higher education;
- c. short (720 hours of practical training) VET programs;

It comprises also of post-secondary VET programs (ISCED 4) and higher education (ISCED 5-8).

Participation in higher education is generally low. In 2018, tertiary attainment for the 30-34 age group — measured as a European benchmark— declined to 24.6% from 26.3% in 2017. This is significantly below the EU average of 40.7% and below Romania’s national Europe 2020 target of 26.7% [2]. The number of graduates is low and often lack soft skills but possess good, though overly theoretical knowledge [27].

As in many EU countries, in Romania, demographic changes have an impact on vocational education and training (VET). The share of people aged 65+ has increased from 15.4% in 2008 to 18.9% in 2018 while the share of the working-age population (15 to 64) decreased from 68% to 66% accordingly. [19]

Despite strong interest from businesses, dual education is rather unattractive for students. Dropout rates among VET learners are higher compared with general education and are predominant among groups at risk: young people in rural communities and/or from low-income families, Roma and other minorities, and low performers who are required to repeat the same grade. There are also disparities between regions. For example, the early leaving rate in the North-East region is 23.6% compared with 11.3% in the West region. It is also 1.5 times higher in rural than in urban areas in lower secondary education. [23]

Moreover, retaining students in these companies is difficult and the required financial investment by companies is high. [16] Most companies are micro and small. Employers value formal qualifications that are often a prerequisite for hiring qualified staff. Services are the main economic sector in terms of contribution to gross value added to the national economy, their contribution reaching 62% in 2017. The share of the industry was 26.7% and agriculture 4.8%. [18]

The employment rate for the 20 to 64 age group increased from 64.4% in 2008 to 68.8% in 2017, approaching the 2020 national target of 70% [18] and the EU-28 average (72.2% in 2017). In 2017, the employment rate for young people aged 15 to 24 was 24.5%, lower than the EU-28 average of 34.7%, particularly for females (20.4% compared with 32.9% EU-28 average) [17]

According to Eurostat, recent VET graduates [2] perform better in the labour market than general education graduates. In 2017, the employment rate of 20 to 34-year-old recent VET graduates from upper secondary education (ISCED levels 3-4) was 67.7% compared with 60.8% of general education graduates who did not continue their studies [4]. While it is slightly lower compared with the EU-28 average (76.6%), the rate has increased by 7.2 percentage points since 2008. In 2017, almost 30% of all employees in the country were skilled non-manual workers

(managers, professionals, technicians and associate professionals, clerical support workers). Nearly one in every 10 employees worked in an elementary occupation and one in every six was a skilled agricultural, forestry and fishery worker.

Efforts to expand dual vocational education and training continue but the labour market relevance of VET remains limited. Students enrolled in VET had limited exposure to work-based learning, with only 10% of them enrolled in combined school and work-based programmes. Recent VET graduates' employability saw a slight increase in 2018 to 69.0% (67.2% in 2017) but remains below the EU average (79.5%). To increase the attractiveness of professional education, students following this path can obtain scholarships. Out of the VET students enrolled in upper secondary education in 2017/2018, 1.5% chose the dual VET pathway, which is currently only provided at European Qualification Framework (EQF) level 3 [6]. The share of VET graduates in the total share of people with education (upper secondary and post-secondary non-tertiary education) was 61.6% in 2017 [20].

Within the Cedefop, skills forecasts, skills are proxied by the highest level of qualification held by individuals in the labour force and employment. Three levels are distinguished, high, medium, and low, which correspond to the official ISCED classification. It is approximated that more than one-third of the job openings (35%) in Romania in the period 2016-2030 is expected to require a high level of qualification, 8 pp below the EU-28 average. Most of the job openings (40%) are expected to require a medium level of qualifications (6pp less than the EU-28 average), while 26% of job openings will require low qualifications, 15 pp than the EU-28 average.

5. Conclusion

Along with the switch to the Bologna system and the freedom of universities to decide in regards to the educational offer, a series of niche educational programmes were no longer considered attractive by a large part of educational institutions. This aspect paired with the lack of vision at the level of educational and economic policies has led to the number of specialists with medium and higher studies in the field of agriculture being drastically reduced.

Despite the fact that during the last years, a part of the educational institutions (vocational schools and dual learning) which were dissolved were then refunded, the number of specialists in the fields still remains low, and competence training in accordance with the demands of the job market is difficult.

Looking at the higher education system we notice a lack of institutional focus towards the specific needs of the agricultural and food industry in regards to the training of specialists in the economic field, for the management of business areas, the majority focusing on the technical qualifications: engineering and agricultural science.

Currently, there are only two universities that prepare economic specialists for these fields (Academia de Studii Economice from Bucharest and UBB). Other universities which traditionally offered training programmes in this field

have stopped offering them. A possible explanation would be the lack of interest among young people in the agricultural and food sector. The low lack of interest was also generated by a lack of performance in the agricultural and food sectors, combined with the lack of acknowledgement of said sectors' importance for the Romanian economy.

Changing the perspective of young people in regard to the two fields is presented as an essential premise for the rise in interest in instruction and training programmes. Moreover, the partnerships between educational institutions and companies can contribute to a better link between the taught competencies and the needs of the job market.

We consider that the lack of interest in the creation of specialists in the presented fields does nothing but negatively influence the performance of the analysed sectors.

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ECONOMIC METHODS USED IN CULTURAL HERITAGE RESTORATION AND MAINTENANCE

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ABSTRACT

Most of the cultural assets are labelled as public goods, and there are no markets able to express their value in terms of real prices. Reconsideration of culture and cultural heritage as factors of sustainable development has changed the way the issue of culture - cultural heritage restoration and maintenance from having it for the long term to having it for the present and having it for the long term.

In the context of a project aimed at restoring paper and canvas, a related question is the cost and economic feasibility of the intervention. As there are no similar studies that target such an intervention, this article reviews the most common economic/financial approaches to restoration/refurbishment interventions in order to identify methodologies that can be used in the project. The structure of the article is related to the most used methodologies, namely in the second part of the paper we detail cost and benefit analysis, while in the third part we present life cycle assessment and contingent valuation analysis.

Keywords: cultural heritage, cost and benefit analysis, contingent valuation analysis, life cycle assessment.

JEL classification: D15, D61.

1. Introduction

The complexity and difficulty of economic evaluation of cultural elements have their roots in the concepts of culture and cultural heritage. Culture is something unclear, difficult to define and even more difficult to quantify (Papandrea, 1999).

Using (Throsby, 1995) definition, culture can be seen, in a broader sense, as a set of traditions, customs, practices, and beliefs that characterize a group or society or, in a narrower perspective, as a group of activities. Defined as art and produced by the cultural industries. The definition of cultural assets and the notion of cultural heritage are also imprecise, turning the evaluation of cultural assets and assets into a complex task, the complexity of which increases with the non-market nature of many cultural resources. Since its 1972 convention, UNESCO has referred to monuments, groups of buildings and places of interest and are of cultural interest relevant to civilization, which may be classified as cultural heritage.

Klamer et al. (2013), classified cultural heritage as material and immaterial (performing arts, languages, traditions, etc.),

including real estate (monuments, historic centers, sites, cultural landscapes) and movable property in the first.

In the economic approach, the assumption that cultural heritage is a public good and generates propagation effects has been agreed between different authors (Frey & Steiner, 2011). Therefore, its economic value is calculated using non-market techniques. Among the material cultural heritage, museums have deserved special attention. These are often extremely important attractions for a city, region, or country, with a high capacity to attract cohorts of tourists, thus generating a multitude of propagation effects on other economic activities. Decisions as to what should be characterized as heritage, how much of it is worth keeping, and how resources should be utilized in maintaining it, have been largely the province of experts: archaeologists, art historians, architects, and others. Yet it need hardly be pointed out that such decisions have economic ramifications, and it is scarcely surprising that economists and policy analysts have begun to turn their attention to this field.

Cultural heritage usually refers to the cultural assets that have been inherited from past generations to present society. Moreover, the concept of cultural heritage has gradually been enriched by including intangibles as well as ethnographic or past industrial knowledge/know-how. The issue of culture - cultural heritage restoration and maintenance has changed from having it for the long term to having it for the present and having it for the long term. The literature uses case studies in which the two approaches are combined to design cultural heritage restoration policies. The preservation of cultural heritage is entailing excessive costs while is a source of additional income for both, the State and the people, due to tourism. There is a reconsideration of culture and heritage as drivers of sustainable development and social quality (Bertacchini & Segre, 2016). The concept of cultural heritage has gradually been enriched by including intangible aspects, as well as ethnographic or industrial knowledge/know-how of the past. Indirect methods of expressing consumer preferences and consecutive evaluation measures have been developed. Among these methods is the contingent assessment, which expresses the availability of payment for the use of cultural heritage through the economic effort associated with the object of the targeted heritage (Báez & Herrero, 2012). The sustainable restoration process is one of the biggest challenges for public and private decision-makers in the Cultural Heritage sector.

2. Methodologies

In the next paragraphs three of the most used methodologies in the field are revised: cost and benefit analysis, contingent valuation, and the life cycle assessment. Most of the cultural assets are labelled as public goods, that is, they have nonrivalry and non-exclusion characteristics, and there are no markets able to express their value in terms of real prices.

2.1. Cost-benefit analysis

The major advantage of the Cost-Benefit Analysis (CBA) comes from its methodology that brings together, in a monetary form, the costs and benefits of a project, regardless of the type of effects it produces non-monetary effects or significant macroeconomic effects.

Cost-benefit analysis is a widely used *ex ante* evaluation tool to support decision-making, especially as it measures the societal value of any project by quantifying societal effects and making costs and benefits comparable in monetary terms, although there are difficulties in measuring such effects (Koopmans & Mouter, 2020; Brent, 2009). CBA is used when considering investment decisions, both by private organizations and by public authorities (Beukers et al., 2012). For some projects, performing a classic financial analysis is not conclusive enough, especially when the material advantages it brings are less important than the non-material advantages. In such cases, the solution is achieved by a CBA which shows whether the benefits of the project justify the allocation of the necessary resources.

According to most definitions, CBA is the technique used by companies to arrive at the key decision after determining the costs and benefits of a particular action using different models, including the net present value, the cost-benefit ratio. When performing this analysis, there are two main ways to arrive at the overall results. These are the net present value (NPV) and the cost-benefit ratio (BCR). The NPV of a project refers to the difference between the present value of the benefits and the present value of the costs. If $NPV > 0$, it turns out that the project has an economic justification to go further.

On the other hand, the CBA estimates the value by calculating the ratio of the sum of the present value of the benefits associated with a project to the sum of the present value of the costs associated with a project. The higher the value, the higher the benefits associated with the considered alternative. By considering the cost-benefit ratio, the analyst must choose the project with the highest cost-benefit ratio. Presenting both forms of analysis by different methods may be most appropriate, as authorities can weigh the decision from all perspectives. The key elements of the analysis must be known before making an investment decision. Some authors consider that four steps need to be taken, while others consider that six steps are needed for an informed decision.

Adler et al. (2006) present six steps for CBA: defining the framework for analysis (1), identifying and classifying costs and benefits (2), developing a timetable for expected costs and revenues (3), monetizing costs and benefits (4),

reducing costs and benefits to obtain current values (5), and calculation of net present values (6).

The academic literature identifies a number of aspects of cost-benefit analysis that lead them to consider the method as inappropriate for evaluating certain projects, such as transportation, although it considers the principles of economic theory (Annema et al., 2015). Among the problems that usually appear in the implementation of the CBA, can be mentioned: lack of accuracy of estimates, including non-existent benefits or omitting costs, use for projects where it cannot generate relevant results. As the excessive use of CBA is not useful for all types of investment projects, especially those that have a social role and for those in which it is difficult to determine the economic costs and benefits, other techniques are recommended to be used to obtain the information needed to support the decision to finance or not a project. Techniques recommended instead of CBA are multicriteria analysis, cost-effectiveness analysis, and expert panels.

2.2. Contingent valuation

The economic evaluation of the cultural heritage is a scientific challenge because most studies estimate its economic effect as an external benefit or as a source of tourist attraction. The first application of the CVM (Contingent Valuation Method) in the field of cultural goods dates back to the 1980s.

Economists have long measured the value of goods that are routinely bought and sold in the marketplace. But ordinary markets do not exist for "public" goods. Sometimes this is because under public policy there is no charge for the good or service, or there is an arbitrarily determined charge which does not reflect the full cost of providing the service or its true market value (Mitchell & Carson, 2013; Báez & Herrero, 2012).

CVM is a method for directly estimating declared preferences for a good which are not traded on the market. It may be an invaluable tool for public authorities charged with the care of cultural heritage, as the findings may offer a coherent guideline for allocation of funding or assessing cultural projects, in sum for designing specific cultural policies linked to heritage. Individuals are asked for their willingness to pay (WTP) for the benefits perceived from a change in the supply of this good or alternatively for their willingness to accept (WTA) compensation due to possible losses in to what extent it may be used. In theoretical terms, the CVM is based on the economy of welfare since it assumes that WTP values are directly linked to the function of individual preferences. CVM has been increasingly applied to cultural resources. CVM employs survey methods to gather stated preference information, which can be used to estimate economic values of various cultural resources and projects (Noonan, 2003). The evaluation of a benefit or a cost is not related to market values. The aim of the CVM is both to create a hypothetical market in which participants may state their maximum WTP for a variation of a good through answers of the questionnaires or to correspond to the minimum monetary amount which an individual would accept as compensation in order to relinquish this public good/service WTA (Kopsidas & Batzias, 2019).

The economic valuation of cultural heritage constitutes a scientific challenge since most studies estimate its economic effect as an external benefit or as a source of tourist attraction. The first application of the CVM in the field of cultural goods dates back to the 1980s (Bedate et al., 2004). Since then, many studies in the literature (Bateman et al., 1997; Hanemann, 1991) applied and validated the CVM as a technique of the recently established scientific field of Experimental Economics. Several researchers applied CVM in many scientific fields such as historical buildings, museums, archaeological sites, tourism economics and cultural goods. CVM is basically subjective, attempting to acquire objectivity by extracting attitude and information from a stratified representative sample of interviewees, who are asked by means of a questionnaire to assign a value on a non-marketable good or an externality (Menard, 2002).

2.3. The life cycle

Decision makers need to be on the side to combine the needs of society with the obligation to protect the environment and natural resources and, on the other hand, to accompany sustainable development with future economic growth (Ristimäki et al., 2013). This goal can be achieved by applying techniques such as life cycle management (LCM), which encompasses the three dimensions of sustainability, which are environmental, economic and social (Albert, 2015).

The life cycle approach can be considered an effective method for improving innovative managerial practices towards the sustainability, preservation and restoration of Cultural Heritage by assessing the environmental impact, the financial and economic feasibility, and the implementation of an engagement strategy for the stakeholders (Settembre Blundo et al., 2014). Sustainable management of Cultural Heritage (CH) requires the

continuous assessment of the complex system of historical, environmental, social and economic variables, and CH-LCM must be the context in which we fully recognize the global interdependence of socio-economic agents.

The process of recovery and restoration is a recursive process and it consists of a set of phases, often sequential, linked by relationships that are developed over time: decision-making process, executive process, and management process (Beria et al., 2012). Decision-making is a step-by-step process of making choices by identifying a decision, gathering information, and assessing alternative resolutions for the actions of restoration, conservation, and valorization, as well as an economic and financial plan. Based on the information collected and processed in the decision-making process, the executive process deals with the selection and implementation of the restoration project through the selection of contractors and the effective execution of the work (Benoît et al., 2010). The management process includes a set of activities that begin at the end of the restoration, in order to ensure the functionality of the Cultural Heritage over time, until a new restoration will be required. For each stage of the Cultural Heritage management process described above, it is possible to estimate not only the environmental and economic impacts, but also the social ones in general, and for each stakeholder category.

The life cycle approach adopted, which is based on the CH-LCM model, allows the restoration process not to close after the work, but to monitor the state of conservation of Cultural Heritage with the ability to repeat life cycle assessments to control the fulfillment of the objectives of protection, environmental economic and social sustainability. In this way the restoration by linear process effectively becomes a cyclic one. The protocol CH-LCM is then formed from the integration of impact assessment tools, at all stages of the Cultural Heritage restoration process.

Table 1. Methods applied to cultural heritage

Contingent Valuation	Cost benefit analysis	The Life Cycle
<ul style="list-style-type: none"> • Directly estimates the stated preferences for a good that is not traded on the market. • It is a useful tool for the authorities responsible for designing specific cultural policies related to heritage. • It has been increasingly applied to cultural resources • The aim of MCV is both to create a hypothetical market in which participants can declare their maximum WTP. • It is essentially subjective, trying to gain objectivity by extracting attitudes and information from a stratified representative sample of interviewees, who are asked through a questionnaire to assign a value to a non-marketed good or an externality. 	<ul style="list-style-type: none"> • Brings together, in monetary form, the costs and benefits of a project, regardless of the type of effects it has on non-monetary effects. • It is the most used evaluation technique for assessing infrastructural investments. • It is widely adopted by all the international bodies. • Widely used ex ante evaluation tool to support decision making, especially as it measures the societal value of any project by quantifying societal effects and making costs and benefits comparable in monetary terms shows whether the benefits of the project justify the allocation of the necessary resources. • Estimates the value by calculating the ratio of the sum of the present value of the benefits associated with a project to the sum of the present value of the costs associated with a project. 	<ul style="list-style-type: none"> • Effective method of improving innovative managerial practices for the sustainability, conservation and restoration of Cultural Heritage. • It encompasses the three dimensions of sustainability, environmental, economic and social aims to implement a stakeholder engagement strategy. • It allows the restoration process not to close after the works, but to monitor the state of conservation of the Cultural Heritage with the possibility of repeating life cycle assessments to monitor the achievement of objectives. • Linear process restoration actually becomes cyclical.

Life Cycle Costing LCC - is a method for calculating the total cost of a product throughout its life cycle. The interest in the inclusion of social aspects in an environmental assessment of the life cycle of products and processes led to the development of the so-called Social Life Cycle Assessment (S-LCA). S-LCA is defined as a social impact (and potential impact) assessment technique that aims to assess the social and socio-economic aspects of products and their potential positive and negative impacts along their life cycle.

The adoption rather of an integrated approach (also using LCC and SLCA tools) shows how the involvement of stakeholders and the satisfaction of their expectations requires the integration of different historical, artistic, technical, and managerial skills in the restoration process. This need promotes synergistic cooperation between the various professionals involved in the restoration of Cultural Heritage. Moreover, this integrated approach also enriches the collection of information on the restoration process, which is no longer purely technical, but also economic and social. Finally, the adoption of the life-cycle approach also makes it possible to carry out periodic impact assessments after restoration work during the valorization phase, thus introducing a new form of monitoring before further restoration.

3. Conclusions

In literature, cost-benefit analysis is compared to multicriteria analysis. From this comparison, the CBA is presented as a decision-making tool that provides a necessary frame of reference for the cultural field. Its purpose is to provide a consistent procedure for assessing decisions regarding the right choice. It estimates the value by calculating the ratio of the sum of the present value of the benefits associated with a project to the sum of the present value of the costs associated with a project. Contingent valuation is a subjective method and the decision to restore cultural heritage objects depends on the preferences of potential customers of these public goods. Restoring the linear process actually becomes cyclical due to the Life Cycle method can help decision makers when they need to allocate financial resources to cultural heritage objects. Each method presented in this article has its advantages and disadvantages. The methods have a few points in common, which leads us to wonder if a study could not be done in which the 3 methods would be applied simultaneously.

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A COST-BENEFIT ANALYSIS OF FOUR GRAPHENE-BASED MATERIALS

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ABSTRACT

Graphene materials have attracted considerable interest over the recent years due to their extraordinary electrical, thermal, and mechanical properties arising from their unique structure.

Moreover, researchers observed the benefits of developing and using graphene-based materials in combination with other materials in the construction industry.

Therefore, this study establishes a cost-benefit analysis (CBA) framework to explore the fire performance and the high economic potential of four advanced composite materials based on: polystyrene (PS) with graphene oxide (GO), polyvinyl chloride (PVC) with graphene oxide (GO), drywall (GC) with graphene oxide (GO), wooden chipboard (PAL) with graphene oxide (GO). Considering various scenarios of production costs, results mainly showed positive outcomes, except for the case of polystyrene (PS) with graphene oxide (GO), demonstrating the efficiency and utility of developing and using these four graphene-based materials, considering all the costs including the basic material, the graphene-based solution, the maintenance and other laboratory-scale production costs.

To fully gain the economic benefits combined with improved fire performance, the future focus should lie in providing financial support for the development and commercialization of these graphene-based materials at a large scale.

Keywords: cost-benefit analysis, graphene, construction materials, case study.

JEL classification: L1, L7, M110.

1. Introduction

Graphene materials have attracted considerable interest over the last few years on account of their extraordinary electrical, thermal, and mechanical properties, arising from their unique structure (Geim & Novoselov, 2007; Patole et al., 2010). Since 2010, the remarkable scientific work of Nobel Prize winners for physics - Geim and Novoselov - the innovative experiments regarding the two-dimensional graphene material (Mikhailov, 2011), has triggered the interest in studying these "revolutionary" materials (Aoki & Dresselhaus, 2013). As a result, various researchers have studied intensively these properties, primarily the development of graphene-based materials in combination

with other materials used in the construction industry, observing the benefits of developing and using these advanced composites with improved fire performance to protect life. Therefore, this research establishes a cost-benefit analysis (CBA) framework to explore the fire performance and the high economic potential of four advanced composite materials based on: polystyrene (PS) with graphene oxide (GO), polyvinyl chloride (PVC) with graphene oxide (GO), drywall (GC) with graphene oxide (GO), wooden chipboard (PAL) with graphene oxide (GO). The remainder of the paper is organized as follows: section 2 provides a literature review of the economic analysis methods used in the launch phase of new construction materials, with a focus on the cost-benefit analysis method, and a description of the graphene materials benefits and challenges; sections 3 and 4 are the methodology and the cost-benefit analysis of the four advanced composite materials; and section 5 discusses the results and draws conclusions respectively.

2. Literature review

2.1. Economic analysis methods used in the launch of new construction materials

There is a range of economic analysis methods used for examining the economic issues associated with the development and utilization of construction materials, such as cost-benefit analysis, cost-effectiveness analysis, cost-utility analysis, life cycle assessment, and various other methodologies and indicators (net present value (NPV), internal rate of return (IRR) etc.). Since assessment of sustainable construction materials is a complex issue, multiple criteria and different methods have been applied (Šaparauskas & Turskis, 2006). Also, according to literature, one of the most appropriate and frequently used assessment tools is the cost-benefit analysis (CBA). As stated by Mishan and Quah (2020), cost-benefit analysis is the systematic and analytical process of comparing benefits and costs in evaluating the desirability of a project or program – often of a social nature, in order to decide whether the proposed project is worthwhile, the optimal scale of a proposed project and the relevant constraints. Table 1 lists some cases of CBA and other tools usage in analyzing different innovative solutions in the construction domain.

Table 1. Literature review of previous assessment tools studies on construction materials/technologies

	Product/Technology	Assessment tool	Main findings
Shen et al. (2019)	Prefabricated public housing materials	Cost-benefit analysis (CBA)	The results indicate that investment in prefabricated public housing is environmentally acceptable and efficient.
Di Maria et al. (2018)	New construction material from stainless steel slag	Life cycle assessment (LCA)	The valorization of argon oxygen decarburization (AOD)-slag to produce new construction materials is a promising route to lower the environmental impacts of cement and concrete industries.
Hong et al. (2018)	Prefabricated technology	Cost-benefit analysis (CBA)	The average incremental cost is highly linearly correlated with the prefabrication rate, which ranged from 237 yuan/m ² to 437 yuan/m ² , in eight building projects.
Liu et al. (2018)	Retrofit materials	Cost-benefit analysis (CBA)	Retrofit of existing buildings generally lack of attractiveness to investors from an economic perspective.
Whaley et al. (2017)	Thermal energy improvements	Cost-benefit analysis (CBA)	The costs associated with the upgrades is presented together with the thermal energy improvements, which bring older houses up from star ratings of 1-3 to the current minimum performance of 6, which reduces the demand for and greenhouse gas emissions of heating and cooling devices, for material and labour costs of \$15-25k.
Gabay et al. (2014)	Green buildings materials	Cost-benefit analysis (CBA)	This study matched the cost of green office buildings against the benefits to the entrepreneur and to society, over time, showing them to be economically worthwhile.
Bianchini and Hewage (2012)	Green roofs	Probabilistic social cost-benefit analysis, net present value (NPV)	The analysis demonstrated that green roofs are short-term investments in terms of net returns.
Tam (2011)	Low-cost housing technologies	Cost effectiveness analysis	About 26.11% and 22.68% of the construction cost can be saved by using low-cost housing technologies in comparison with the traditional construction methods in the case studies for walling and roofing respectively.
Blackhurst et al. (2010)	Green roofs in a typical urban mixed-use neighborhood	Life cycle assessment (LCA)	Results suggest green roofs are currently not cost effective on a private cost basis, but multifamily and commercial building green roofs are competitive when social benefits are included.
Carter and Keeler (2008)	Extensive vegetated roof systems	Cost-benefit analysis (CBA), net present value (NPV)	This type of green roof currently ranges from 10%-14% more expensive than the traditional roofing scenario.
Cheneviere and Ramdas (2006)	Long-life pavements	Cost-benefit analysis (CBA)	Large potential benefits to be obtained from the adoption of the long-life pavements (LLP) design principles on a heavily trafficked road network even before considering the potential environmental benefits.

2.2. The promise of graphene materials

The term "graphene" first appeared in 1987 (Mouras et al., 1987) to describe single sheets of graphite as one of the constituents (Shinohara & Tiwari, 2015). Graphene, a one-atom-thick monolayer of SP² bonded carbon structure, has gained increasing interest since it was reported by Geim et al. in 2004 (Bao et al., 2012; Katsnelson & Katsnel'son, 2012) and has potential applications in many technological fields, such as: high frequency analog electronics, single molecule sensors, nanocomposites, batteries, supercapacitors, liquids crystal display, hydrogen storage, etc., (Patole et al., 2010) and it has been the object of intense theoretical and experimental research (Katsnelson & Katsnel'son, 2012).

In recent years, various researchers have studied intensively the structure, morphology, dynamic mechanical properties, thermal stability and fire safety of the

composites, primarily the development of these advanced composites with improved fire performance to protect life. So, according to Patole et al. (2010), one possible way of exploiting graphene properties for real world applications would be to incorporate graphene sheets in composite materials. Therefore, researchers observed the benefits of developing and using graphene-based materials in combination with other materials, used in the construction industry, such as polystyrene (PS) with graphene oxide (GO), polyvinyl chloride (PVC) with graphene oxide (GO), drywall (GC) with graphene oxide (GO), wooden chipboard (PAL) with graphene oxide (GO). Firstly, according to Ding et al. (2015), in recent years, the polystyrene-graphene oxide (PS-GO) composites have attracted much academic and industrial attention in the field of material science due to their excellent properties including mechanical, thermal, electric, catalytic, and gas-resistance properties. Secondly, test results of Asmatulu (2017), Khaleghi et al. (2017) and

Liu et al. (2018), concluded that graphene oxide (GO) as a product of graphene significantly improved the mechanical properties and thermal stability of its corresponding PVC composites and reduced its harm to people and environment. Also, the developed graphene-wood composite (Nine et al., 2017) is proposed to be a suitable alternative to the conventional flame-retardant materials.

Although a significant amount of effort during the last decade has been committed to proposing new methods and material combinations for the preparation of graphene oxide (GO) composites, the reality is that even with the significant improvement in research activity during the last decade and high expectations for commercialized products utilizing graphene or GO derivatives, the emergence of products based on GO that have reached the marketplace has been slow, but steady of the challenges regarding practical implementation of these composites, that include: scalability, price, storage and transportation issues, as well as health and safety concerns. However, a number of these issues are being rapidly resolved through fundamental and applied research, which will only accelerate commercialization activity, and research directed towards this challenge will continue to benefit both the scientific community as well as commercialization efforts (Ha & Ellison, 2018).

3. Methodology

A cost-benefit analysis framework, specific for graphene-based materials, was conceptualized and developed to provide a holistic understanding of the cost-effectiveness of these innovative materials combined with the fire performance improvement. The total cost of graphene-based materials has been further decomposed into the following laboratory scale production costs, namely costs with the basic material, labor, energy and water, solution costs and maintenance costs. These costs have been estimated based on the results of a team which has produced these materials in our university. For example, in the case of drywall with graphene oxide, the costs for the entire estimated period of use (approx. 20 years) is calculated by considering the production cost per unit of product and consumption per unit of basic material (40.34 EUR x 200 m² x 100,000 buildings = 806.815.415,82 EUR), plus maintenance costs (0 EUR). We classified benefits into revenues related to products commercialization – the sum of basic material production cost, production cost of added technology and the profit margin (15%) (e.g. in the case of drywall with graphene oxide, 46,39 EUR x 200 m² x 100.000 buildings = 927.829.614,60 EUR), and the benefits of using the product, by reducing the fire risk (e.g. in the case of drywall with graphene oxide, the benefits of using the product are calculated as the product between the number of buildings – 100.000, average value of the building – 100.000 EUR, fire risk over 100 years - 2%, risk reduction

from product use - 5%, and years of effectiveness - 20 years). Considering the logic of performing a cost-benefit analysis, it involves the analysis of the initial costs of production/ products/technology creation, this being a first step to analyze the opportunity for these construction materials development and widespread use. Due to the fact that the product/technology was made in the laboratory, the production costs are much higher than what an industrial production would be. Thus, the costs estimated in this analysis should be taken as maximum as possible in relation to the costs that will be obtained if the technology will be transposed at industrial level. In our analysis, we have considered alternative calculation scenarios that implied reducing production costs for the new product to 1%, 5% or 10% of initial laboratory production costs. This is usually due to the fact that laboratory production is carried out at a much lower level than industrial production.

4. Cost-benefit analysis (CBA) results

We performed a case study, considering all four graphene-based materials to show the practical values of this methodology. Therefore, this study established a cost-benefit analysis (CBA) framework to explore the fire performance and the high economic potential of four advanced composite materials based on: polystyrene (PS) with graphene oxide (GO), polyvinyl chloride (PVC) with graphene oxide (GO), drywall (GC) with graphene oxide (GO), wooden chipboard (PAL) with graphene oxide (GO). For each material, we have considered three scenarios that implied reducing production costs for the new product to 1%, 5% or 10% of initial laboratory production costs, and one scenario with the initial laboratory costs. As follows, Table 2 summarizes the cost-benefit analysis results, emphasizing the added value created by these new technologies.

Although, for all these graphene-based materials, the cost-benefit analysis has generated a positive result, there are many elements that need to be considered before moving on to industrial production. In this regard, we calculated the ratio between the price of the new product (with GO) and the price of the previous product in the following table. Therefore, Table 3 summarizes the analysis of price differences between the improved and the original product.

The decision if the new product is marketable is taken, considering the following ratios between new product price and initial product price:

- Not more than 120% - the product is marketable;
- Between 120% and 150% - includes promotion costs of 20% of the production costs value;
- Between 150% and 200% promotion costs of 35% of the production costs value;
- Over 200% - currently the product is not marketable.

Table 2. Cost-benefit analysis results

	Drywall with GO	Wooden chipboard with GO	Polyvinyl chloride with GO	Polystyrene with GO
Scenario 1 (S1) – no reduction of initial laboratory production costs				
Production cost of new product (EUR)	806.815.415,82	218.782.961,46	676.835.699,80	2.782.474.645,03
Maintenance cost (EUR)	0	0	0	0
Total costs (EUR)	806.815.415,82	218.782.961,46	676.835.699,80	2.782.474.645,03
Revenues related to products commercialization (EUR)	927.829.614,60	251.602.434,08	778361054.77	3.199.845.841,78
The benefits of using the product - the fire risk reduction (EUR)	2.000.000,00	800.000,00	2.000.000,00	2.000.000,00
Total benefits (EUR)	929.829.614,60	252.402.434,08	780.361.054,77	3.201.845.841,78
Total result = Total benefits – Total costs (EUR)	123.014.198.78	33.619.472,62	103.525.354,97	419.371.196,75
Scenario 2 (S2) – reduction to 1% of initial laboratory production costs				
Production cost of new product (EUR)	35.418.661,26	100.264.097,36	94.322.109,53	157.870.182,56
Maintenance cost (EUR)	0	0	0	0
Total costs (EUR)	35.418.661,26	100.264.097,36	94.322.109,53	157.870.182,56
Revenues related to products commercialization (EUR)	40.731.440,16	115.303.711,97	108.470.425,96	181.550.709,94
The benefits of using the product - the fire risk reduction (EUR)	2.000.000,00	800.000,00	2.000.000,00	2.000.000,00
Total benefits (EUR)	42.731.440,16	116.103.711,97	110.470.425,96	183.550.709,94
Total result = Total benefits – Total costs (EUR)	7.312.778,90	15.839.614,60	16.148.316,43	25.680.527,38
Scenario 3 (S3) – reduction to 5% of initial laboratory production costs				
Production cost of new product (EUR)	66.586.206,90	105.052.738,34	114.937.119,68	263.914.807,30
Maintenance cost (EUR)	0	0	0	0
Total costs (EUR)	66.586.206,90	105.052.738,34	114.937.119,68	263.914.807,30
Revenues related to products commercialization (EUR)	76.574.137,93	120.810.649,09	132.177.687,63	303.502.028,40
The benefits of using the product - the fire risk reduction (EUR)	2.000.000,00	800.000,00	2.000.000,00	2.000.000,00
Total benefits (EUR)	78.574.137,93	121.610.649,09	134.177.687,63	305.502.028,40
Total result = Total benefits – Total costs (EUR)	11.987.931,03	16.557.910,75	19.240.567,95	41.587.221,10
Scenario 4 (S4) – reduction to 10% of initial laboratory production costs				
Production cost of new product (EUR)	105.545.638,95	111.038.539,55	147.277.890,47	396.470.588,24
Maintenance cost (EUR)	0	0	0	0
Total costs (EUR)	105.545.638,95	111.038.539,55	147.277.890,47	396.470.588,24
Revenues related to products commercialization (EUR)	121.377.484,79	127.694.320,49	169.369.574,04	455.941.176,47
The benefits of using the product - the fire risk reduction (EUR)	2.000.000,00	800.000,00	2.000.000,00	2.000.000,00
Total benefits (EUR)	123.377.484,79	128.494.320,49	171.369.574,04	457.941.176,47
Total result = Total benefits – Total costs (EUR)	17.831.845,84	17.455.780,93	24.091.683,57	61.470.588,24

Table 3. Analysis of price differences between the improved and the original product

	Drywall with GO	Wooden chipboard with GO	Polyvinyl chloride with GO	Polystyrene with GO
New product price/ per unit – S1 (EUR)	40,34	10,94	33,84	69,56
New product price/ per unit – S2 (EUR)	1,77	5,01	4,72	3,95
New product price/ per unit – S3 (EUR)	3,33	5,25	5,89	9,91
New product price/ per unit – S4 (EUR)	5,28	5,55	7,36	6,60
Original product price/ per unit – S0 (EUR)	1,38	4.95	4,42	3,28
S1/S0 (%)	2920,41%	220,84%	765,32%	2.007,18%
S2/S0 (%)	128,19%	101,21%	106,65%	120,20%
S3/S0 (%)	240,97%	106,06%	133,26%	200,94%
S4/S0 (%)	382,09%	112,08%	166,51%	301,81%
Decision regarding the new product commercialization – S1	2920,41%>200% The product is currently not marketable	220,84%>200% The product is currently not marketable	765,32%>200% The product is currently not marketable	2.007,18% > 200% The product is currently not marketable
Decision regarding the new product commercialization – S2	120%<128,19%<150% The product is marketable, but involves promotion costs of 20% of the production costs value (=7.083.732,25 EUR)	101,21%<120% The product is marketable	106,65%<120% The product is marketable	120%<120,20%<150% The product is marketable, but involves promotion costs of 20% of the production costs value (=31.574.035,51 EUR)
Decision regarding the new product commercialization – S3	240,97%>200% The product is currently not marketable	106,06%<120% The product is marketable	120%<133,26%<150% The product is marketable, but involves promotion costs of 20% of the production costs value (=22.987.423,94 EUR)	200,94% > 200% The product is currently not marketable
Decision regarding the new product commercialization – S4	382,09%>200% The product is currently not marketable	112,08%<120% The product is marketable	150%<166,51%<200% The product is marketable, but involves promotion costs of 35% of the production costs value (=51.547.261,66 EUR)	301,81% > 200%, The product is currently not marketable
Actual added value – S1	-	-	-	-
Actual added value – S2	We reduce promotion costs by 20% of the production costs value 229.066,94	15.839.614,60	16.148.316,43	-5.893.509,13
Actual added value – S3	-	16.557.910,75	-3.746.855,98	-
Actual added value – S4	-	17.455.780,93	-27.455.578,09	-

Considering the cost-benefit analysis results, it has been found that in the case of drywall with GO, the creation of the new product at laboratory costs (Scenario 1) leads to the creation of an additional value of 123.014.198.78 EUR for

the new product developed at laboratory costs. This is possible despite the consideration of extremely high costs with the laboratory production of this new technology of drywall with graphene oxide. However, the ratio between the

price resulting from the use of the new technology and the production price of the original product is 2920.41%, implying that this product is not currently marketable, and it is recommended to find alternative solutions to reduce the unit cost of production, namely through industrialization. Also, for the other three graphene-based materials, in the case of Scenario 1, the new products are not marketable at these laboratory costs.

For the second scenario, the one according to which the industrial production costs of the new product will be 1% of the value of production costs at laboratory level, all the four products can be marketable in certain conditions. For instance, in the case of polystyrene with GO, shows a value created in the amount of 25.680.527,38 EUR and the ratio between the price of the new product and the existing one being 120,20%, resulting that this product can be marketable, but involves promotion costs of 20% of the value of production costs (= 31.574.035,51 EUR), but unfortunately, the actual created is negative (-5.893.509,13 EUR). For the other three products, we obtained positive actual values.

For the third scenario, the one according to which the industrial production costs of the new product will be 5% of the value of the production costs at laboratory level, in the case of wooden chipboard with GO, leads to a value created in the amount of 16.557.910,75 EUR, and the ratio between the price of the new product and the original one is 106.06%, observing that this product is marketable.

Also, in the fourth scenario, the one according to which the industrial production costs of the new product will be 10% of the value of production costs at laboratory level, in the case of polyvinyl chloride with GO, we obtained a value of 24.091.683,57 EUR, and the ratio between the price of the new product and the original one being 166.51%, resulting that this product can be marketable, but involves promotion costs of 35% of the value of production costs (= 51.547.261,66 EUR). Thus, in this scenario, the actual value is negative -27.455.578,09 EUR. Only in the case of wooden chipboard with GO, we obtained an actual added value, in the amount of 17.455.780,93 EUR.

5. Conclusions

In summary, a cost-benefit analysis framework has been established to examine the cost performance of four innovative materials, respectively graphene-based materials, combined with the fire performance improvement. The case study was employed to assess the cost-effectiveness of developing these construction materials, considering various scenarios of production costs. Results mainly showed positive outcomes, except for the case of polystyrene (PS) with graphene oxide (GO), demonstrating the efficiency and utility of developing and using these four graphene-based materials, considering all the actual costs with the basic material, the costs of the GO solution, the maintenance of the product and other laboratory-scale production costs.

The CBA results show that the first material - drywall (GC) with graphene oxide (GO), considering all the four analyzed

scenarios, is marketable and deserves to be placed on the market only in scenario 2, namely where industrialization would result in production costs at 1% of laboratory production costs and would involve additional promotion costs. Also, in the case of wooden chipboard (PAL) with graphene oxide (GO), for the same four scenarios, it can be seen that the product is marketable and deserves to be marketed in scenario 2, 3 and 4, namely where industrialization would result in production costs at 1%/ 5%/ 10% of production costs at the laboratory level. In the case of polyvinyl chloride (PVC) with graphene oxide (GO), for the considered scenarios, it can be observed that the product may be marketable and deserves to be placed on the market considering the scenarios 2, 3 and 4, respectively where industrialization would imply production costs representing 1%, 5% and 10% of laboratory production costs. Moreover, considering the additional promotion costs, only Scenario 2 seems feasible if the production costs would be reduced to 1% of the costs at laboratory level. Finally, in the case of polystyrene (PS) with graphene oxide (GO), considering these four scenarios, it can be seen that the product is not marketable and should not be placed on the market, but there is an opportunity to reanalyze the consumption of component materials and rethink how the new product should be developed.

Although these advanced materials are facing various challenges such as the nature of demand, scalability, price, storage and transportation issues, manufacturing processes, quality concerns, competition, access to finance, health and safety concerns, socio-political considerations, legislation and industrial development policies, a number of these issues are being rapidly resolved through fundamental and applied research, which will only intensify commercialization activity, and research directed towards this challenge will continue to benefit both the scientific community, as well as commercialization efforts (Ha & Ellison, 2018; Shapira et al., 2016). Moreover, based on our cost-benefit analysis, we may state that in order to fully gain the economic benefits combined with improved fire performance, the future focus should lie in providing financial support for the development and commercialization of these graphene-based materials at a large scale.

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STUDY ON THE DEVELOPMENT OF THE KAIZEN SYSTEM AT A MEAT PROCESSING UNIT

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ABSTRACT

The paper addresses issues related to the adoption in order to elaboration and development of the kaizen-type continuous improvement strategy at a meat processing unit, a pioneering system in Romania in this field. The Kaizen Management System (SMK) is a concept of Japanese origin that focuses on continuous improvement, a process that can be implemented in any type of company, provided that it follows its steps correctly, and perseveringly applies its procedures. Is taken in consideration the application of the five kaizen bases: 7 Muda, 5S method, standardization, visual management and SDCA / PDCA calculation. The major difference between a classic management system and the Kaizen Management System is that in the classic management style the solutions come from the top down - from manager to employees, but in the kaizen philosophy, these solutions come the other way around, from the bottom up, from employees to the manager, this showing the essential role of employees within the company. The main objectives of implementing this type of strategy are to maximize productivity, quality and profit, and thus reduce costs in key business processes.

Keywords: kaizen system, continuous improvement, standardization, productivity, strategy.

JEL classification: aaa.

1. Introduction

Kaizen Management System (SMK) is a concept of Japanese origin, where "kai" translates to change and "zen" to the best. (Palmer, 2001). This concept focuses on continuous improvement, being applied by large Japanese companies such as Toyota or Sony, but it can be successfully implemented to any type of company, especially those in the food industry, provided that it follows its steps correctly and persistently applies its processes. (Chen et al, 2000).

Initially, the kaizen concept was introduced by writer Masaaki Imai with the publication of "Kaizen: The Key to Japan's Competitive Success". In the years that followed, this concept expanded worldwide, where more and more companies managed to expand and improve using it. Kaizen

Institute is a global consulting organization operating in 30 countries in Europe, America, Asia-pacific and Africa. It was created by Mr. Masaaki IMAI in Japan in 1985. (Ashmore, 2001). In Romania, KAIZEN Institute was founded in 2004 and provides companies with consultancy and training, aiming at the continuous increase of performance in quality, punctuality, staff motivation, safety and safety of work, technology and environmental protection.

The major difference between a classic management system and kaizen management system is that in the classic management style, solutions come from top to bottom - from manager to employees, but in kaizen philosophy, these solutions come the other way around, from the bottom up, from employees to the manager, which shows the essential role of employees within the company. When workers at different levels and departments are involved in decision making, problem-solving skills will be improved, and finding solutions to the identified problems will become increasingly productive over time. Kaizen's philosophy promotes teamwork and helps strengthen teams to solve problems more effectively. Thus, the success of this system results from the fact that all the employees of the company are directly involved, more precisely with the growth of the company, the employees also grow, both professionally and personally.

2. Company description

CIA ABOLIV was founded in 1992 having as main activity the slaughter of animals and the production of meat products. Today, Cia Aboliv is the largest sausage factory in Cluj County.

Cia Aboliv is one of the main suppliers of private label products for large retailer networks in Romania, Bulgaria and the Republic of Moldova.

Modern Trade, CIA ABOLIV is currently one of the main suppliers of private label products for the large retail networks in Romania (LIDL, PENNY, PROFI, KAUF LAND, METRO CASH&CARRY, MEGA IMAGE, CARREFOUR, AUCHAN).

Traditionally Trade, the company currently has partnerships with over 2000 stores in Transylvania and Banat.

The company also owns five stores, two in Turda, one in Câmpia Turzii, one in Mihai Viteazu Commune and one in Floresti.

The mission of the company is to offer consumers meat, meat products, but also other types of products that are delicious, satisfying and accessible to anyone. Through professionalism, dedication and new technology, it is desired that all the services of the society to comply with the European norms and to offer, from a healthy breakfast to a pleasant dinner, everything necessary to ensure the satisfaction, happiness and well-being of the customers.

The vision of the company is to be the favorite place of meat and meat products of consumers in Cluj County, and not only, where customers, be they companies or individual customers, come with confidence and enthusiasm, because they have chosen a beloved brand, an innovative and respected society.

The current production amounts to 100 tons of meat products per day. The products correspond to the intra-Community standards HACCP, ISO 22000_2005 and IFS FOOD. The products are found under the 4 brands known and appreciated for a long time nationally and internationally: BRIO, APETIT, SALINATE and CASA TURDANĂ.

The company has over 450 employees and a turnover of about 15 million euros.

3. Application of kaizen management system

The main objectives of the implementation of this type of strategy are to maximize productivity, quality and profit, and thus reduce costs in key business processes. Kaizen contributes to the elimination of various defects and the continuous improvement of products and production processes.

3.1. Benefits of kaizen implementation

1. Productivity growth by over 25% in the first year of implementation, through small changes made constantly for continuous improvement.
2. Decrease in the percentage of non-compliant products and, implicitly, increase in production quality and customer satisfaction.
3. Lowering production costs by eliminating MUDA (Waste).
4. Improving employee morale since the kaizen concept promotes communication between employees and managers and mutual respect.
5. Increasing social responsibility towards employees and the environment.

3.2. Key tools to be used

Gemba, a Japanese term that defines the current place where the kaizen concept processes will be implemented. In the present case, the company will focus on increasing productivity on the production flow of raw-dried products. It will aim to make all the necessary changes on the production

line to increase efficiency, looking for existing problems and optimal solutions.

The Kaizen Blitz is the organized use of team knowledge that can improve all aspects of the company. Thus, this term represents an event or a series of events, which brings together inter-functional teams aimed at improving the process or a problem identified on the technological flow of raw-dried products. A team responsible for the correct implementation of the concept of continuous improvement will be created, in order to be able to effectively manage all the changes that will be imposed.

Jishuken, a term that defines the process of continuous learning, for both managers and employees. Adapting to the needs of the market and increasing productivity are strictly dependent on always being well informed and understanding that humanity and technologies are evolving rapidly.

PDCA cycle (Figure. 1) is a tool to ensure the continuity of kaizen in following the policy of ensuring the improvement of standards. It is one of the most important concepts of the process, of an organized planning is the key to success in implementing the kaizen concept.

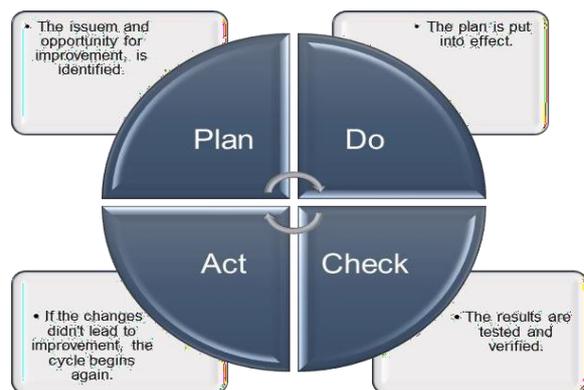


Figure 1. PDCA cycle

3.3. 7 steps to follow to introduce kaizen system in the high-capacity meat processing plant

1. Get employees involved and identify the problem
2. Analyze the problem
3. Develop a solution
4. Test and implement the solution
5. Analyze results
6. Standardize beneficial solution
7. Repeat the steps for each problem

3.4. Application of the 5S Method

The 5S method creates a solid foundation that allows businesses to use additional tools to achieve their goals. This is based on 5 steps, named: Sort (Seiri), Set in Order (Seiton), Shine (Seiso), Standardize (Seiketsu) and Sustain (Shitsuke) (Figure 2). When the work environment is tidy, people can more easily identify opportunities for improvement.

Step 1. Sort (Seiri)

This first step is about removing from the production line all objects, regardless of their nature, that are not used daily and constantly. This will foster order and discipline, creating the necessary space for carrying out the basic activity.

Step 2. Set in Order (Seiton)

After sorting, all the remaining objects will be ordered, ensuring that their settlement is made according to well-established criteria. The machines and materials that are complementary will be arranged side by side, in chronological order of their use on the technological flow. The most used will be distributed closest to employees, to shorten production times. All drawers in the cabinets will be labeled with their contents so that employees can easily find what they need in a timely manner. The floor will also be labeled, indicating where certain objects should be placed, such as trash cans, machinery, and other equipment so that these things always find their way back to where they belong. For these, a color guide established by the Kaizen team will be used, which the employees will memorize, also helping themselves with the posters in the production rooms. It is envisaged to purchase high-performance machines that will automate this step.

Step 3. Shine (Seiso)

Cleanliness is the responsibility of each employee. After the first two steps have been successfully completed, a daily schedule of cleanliness and maintenance of order will be drawn up. Each employee must follow certain hygiene rules. This will generate the maintenance of a clean and pleasant working environment, where work is a pleasure, will considerably decrease the risk of contamination of raw materials and finished products and will keep the machines in perfect working condition for a longer period, thus decreasing the degree of physical wear and tear.

Step 4. Standardize (Seiketsu)

For the proper functioning of the 5S method, reports, schedules, and daily checklists will be drawn up to monitor their effectiveness over time. Thus, it will ensure that each employee knows their personal and team responsibilities.

Step 5. Sustain (Shitsuke)

The 5S method should become a daily routine, easy to understand and perform. The first 4 steps will be repeated daily, being carefully monitored by Kaizen team members, but also by employees, who will be motivated daily by various awards, such as, employee of the day titles and performance bonuses.

3.5. Obstacles

The challenges of implementing kaizen in the organization are given by factors such as resistance to change, lack of motivation of employees and an insufficient understanding of the strategic direction of the company.

4. Conclusions

By implementing the kaizen system, the following are expected: improving the professionalism of the management team, improving the working conditions and quality of work, and stabilizing the work processes by extending the standardization.

After the first year of implementation, productivity will increase by at least 25%, the percentage of non-compliant products will have a decrease of at least 10%, and production costs will register a decrease of about 30%.

It will create a strong sense of order and discipline based on 5S principles, at all levels in the company.

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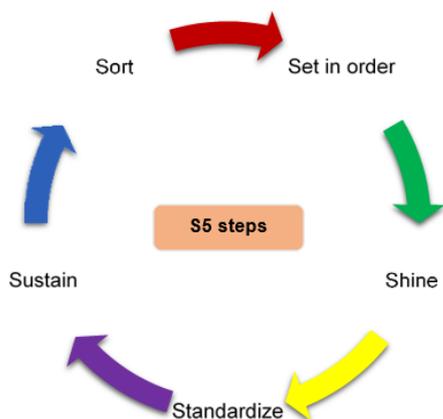


Figure 2. The 5S steps

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