INTERNATIONAL SCIENTIFIC CONFERENCE "DEVELOPMENT THROUGH RESEARCH AND INNOVATION - 2021"

CONFERENCE PROCEEDINGS

Online Conference for Researchers,
PhD and Post-Doctoral Students,

August 27th, 2021

The Academy of Economic Studies of Moldova, Chisinau, Moldova

Republic of Moldova, Chișinău, 2021

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THE 2ND

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CONTENT

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DEPENDENCIES BETWEEN "PET FRIENDLY" EFFECT & DOGECOIN - DEVELOPMENT TRENDS

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Abstract: *Cryptocurrencies are one of the most discussed objects of the 21st century. There is a lot of digital money that aims to offer economic agents more functions and freedom in operating them, as well as to attract more investors in the field. One of the most innovative cryptocurrencies of our time is Dogecoin with its innovative PET FRIENDLY vision, which in recent years has been the subject of numerous research analyzes related to its development trends.*

Key words*: cryptocurrency, Dogecoin, innovation, pet friendly, COVID*

JEL CLASSIFICATION: A10, F01, F15, F19, F30, G23, M21, 016

1. INTRODUCTION

For more than a decade, cryptocurrencies have remained a hot topic in modern society, changing the worldview of economic agents. The global COVID-19 pandemic is outpacing the gradual process of digitalisation worldwide, and to date, virtual technology is part of almost every branch of public and social life. In this regard, the object of scientific development is the cryptocurrency Dogecoin, and the subject are cryptocurrencies on the PET FRIENDLY example of Dogecoin, as well as possible trends in this direction.

2. DOGECOIN CRYPTOCURRENCY ANALYSIS & PET FRIENDLY EFFECT

Dogecoin is one of the many cryptocurrencies offered in the cryptocurrency markets for trading and exchanging digital money. A historical review shows that it was created in 2013 by Billy Marcus and Jackson Palmer, and the network operates on the principle of "peer-to-peer" with open source. The PET FRIENDLY design is unique and impressive, as it depicts a dog of the Shiba Inu breed. The author's analysis of the design of the Dogecoin website stands out with its ease and "PET FRIENDLY" style, as well as its information about the dog breed used in the logo. The page is colorful, and the cryptocurrency is described as "fun and friendly". (Dogecoin.com, 2021) A previous author's study of the current "PET FRIENDLY" defines it as a set of places/sites that are suitable and where they are allowed to visit with pets, as they are friendly to them. (Yaneva, 2021)

The analysis of the cryptocurrency Dogecoin and the dependence with the "Pet Friendly" effect are the basis for the author's statement that there is a dependence between them in the form of a skillful marketing strategy aimed at digital currency design, aimed at increasing demand, supply and attracting new investors.

In the context of the 21st century, decentralization and anonymity are part of the characteristics of any digital currency, including Dogecoin, and a key prerequisite for accepting them as high-risk investments. In this regard, Dogecoin is also subject to hacker fraud, with investors incurring losses in excess of USD 12 000 in coins. A good marketing strategy is the basis for recovering losses through a SaveDogemas donation campaign for mutual aid and recovery from cryptocurrency theft. (Сикирин, 2018)

Among the main features of the digital currency with "PET FRIENDLY" design are:

- easy realization of transactions;
- low and fixed commissions of 1 Dogecoin;
- anonymous transactions;
- Easily recognizable vision based on the "PET FRIENDLY" effect.

3. REGRESSION ANALYSIS OF THE CRYPTOCURRENCY DOGECOIN

Cryptocurrencies have been part of our world for more than a decade and are still a hot topic of discussion and analysis. The case of changes in their price value, which can be formed on the basis of supply and demand, remains controversial, but the possibility of external, speculative interference in their values is not excluded. Nevertheless, their decentralization and anonymity ensures independence and lack of control by the state and/or national and supranational banking institutions, which has its positives but also risks.

Given all that has been presented so far, one of the most important topics for cryptocurrency investors is the value of digital currency. In this regard, the author traces the chronology of its value in the period from 01.2020 to 07.2021, as well as makes forecasts for its value in the next five months, ie. by the end of 2021 (Investing.com, 2021) (Figure 1.)

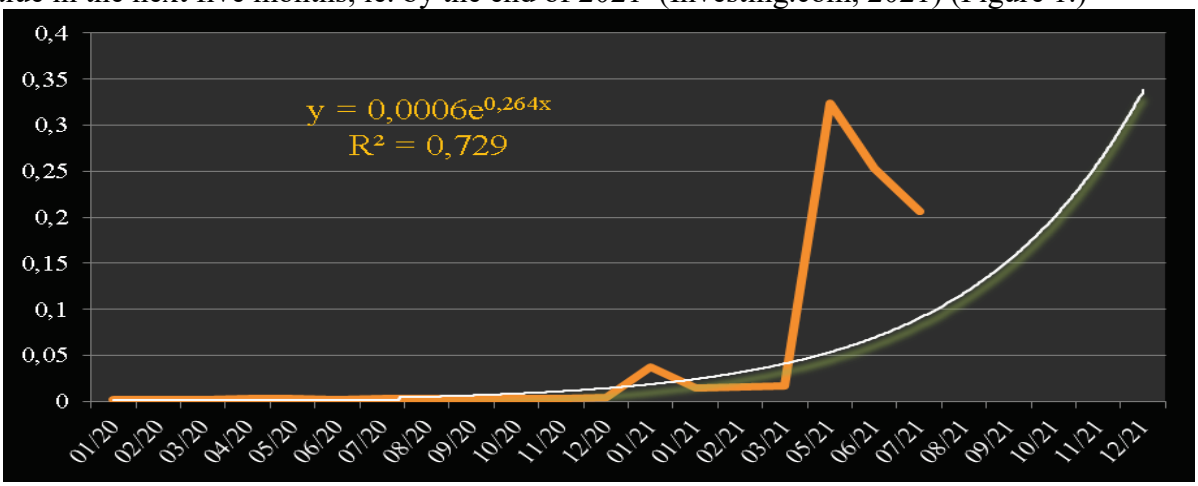

Figure 1. The price of Dogecoin in USD – Regression analysis for the period 01.2020 - 07.2021 and trends for the period until 31.12.2021
Source: investing.com and own calculations

Analysis of the cryptocurrency in the style of "PET FRIENDLY" outlines the conclusions that in early 2020, in January 1 DOGE traded for USD 0.002381, and its lowest value was in 02/2020 - USD 0.002216. After this period, as can be seen from the graphical values, its price increases at a constant rate, as the highest of the period analyzed in the scientific development is in 05/2021, when 1 DOGE is trading for USD 0.323951. In order to forecast the future price values of Dogecoin in the regression analysis, a trend line is set, related to forecasting trends for the value of Dogecoin until 12/2021, incl.

The trend line clearly shows that its price levels are expected to increase. In view of the above and in connection with Figure 1. it can be summarized that the price of the cryptocurrency Dogecoin shows sharp price amplitudes in the direction of increasing its values, and is expected to continue in the coming months. A more in-depth analysis related to the Dogecoin unit price forecast creates preconditions for determining that it is possible to increase the price by December 2021 and reach about USD 0.35.

In this case, the coefficient of determination (R^2) is 0.729, which shows that nearly 73% of the total variance of the analyzed feature is related to the analyzed time factor, and the remaining 27% are part of factors not included in the model, and the author does not rule out are the result of the PET FRIENDLY effect, the increased demand for cryptocurrency, the global COVID pandemic or other factors in public and social life that are likely to affect the value of Dogecoin.

4. DEVELOPMENT TRENDS IN DOGECOIN & POSSIBLE DEPENDENCIES WITH THE PET FRIENDLY EFFECT

For more than a decade, we have witnessed a trend towards the integration of digital and digital technologies into our daily lives. The world of cryptocurrencies is gaining momentum, offering crypto-investors many opportunities to increase financial well-being, despite the risks of financial losses as a result of cyberism. Many cryptocurrencies fail to integrate into cryptocurrencies, gradually lose their value and disappear, leaving their investors in financial losses.

Given the vision of Dogecoin, the author can define it as the "different" cryptocurrency, the cryptocurrency with PET FRIENDLY vision. At present, there is no clear relationship between the rising value of Dogecoin and the PET FRIENDLY effect, but such a hypothesis cannot be rejected, as cryptocurrencies are still new and not fully explored objects. As can be seen from the different types of digital money that stand the test of time and maintain their value over the years, the trend is aimed at attracting new investors, as well as improving cybersecurity and fraud prevention, but also through various marketing strategies.

The trend is aimed at integrating digital money into the financial system, through legislative changes and international directives to clarify the status of digital money and ways to control it. To date, cryptocurrencies are still an anonymous and decentralized alternative form of financial instrument and differ from traditional fiat money, but the trend is to increase the interest of economic entities in them and their inclusion in the international financial system.

4. CONCLUSION AND RECOMMENDATIONS

The relationship between Dogecoin and the PET FRIENDLY effect in the 21st century, driven by innovation and technological growth, is still being analyzed. Although the cryptocurrency is interesting in itself, through the graphic depiction of a dog - a pet, at the moment it is not possible to prove a relationship between its price value and the PET FRIENDLY effect, but such a statement cannot be denied. In this regard, and in view of the above, the author recommends that the subject of future research in the field be directed to analyzes related to the study of social and societal attitudes of the PET FRIENDLY effect in the choice of digital money trading, as well as ways and means of attracting new economic entities for the purpose of purchase and sale with cryptocurrencies.

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CONSUMER PREFERENCES AS A BASIS FOR POSITIONING WINE-MAKING PRODUCTS IN THE REGIONAL MARKET OF THE ATU GAGAUZIA

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Abstract: *The article focuses on the consumer preferences for specific wine brands, awareness of product labelling, as well as a system of marketing methods, strategies and tools, the use of which ensures the formation of alcoholic beverages brand by positioning the product in the regional market.*
Key words: *Positioning, consumer preferences, marketing research, market segmentation.*

JEL CLASSIFICATION: M3

1. INTRODUCTION

In the context of the development of market relations, marketing plays a special role. This is due to changes in consumer behavior, increased competition, the production of goods in significant quantities that exceed real needs and requirements. The named factors determine the need for further development of the classical concept of marketing, which cannot be achieved without improving the theory and practice of using its main tools, one of which is the positioning of goods in target markets.

Positioning allows enterprises to create demand for their products, ensure their stable position in the market, coordinate the activities of structural divisions. The achievement of these goals requires taking into account the perception and characteristics of target consumers, distinctive advantages of competing products, market situation, industry characteristics, which necessitates an integrated approach to product positioning.

This approach allows enterprises to influence consumer preferences by shaping their perception, as well as ensuring that the products offered meet the requirements of the target market.

2. RESEARCH METHODS

As a practical basis for the article were used the scientific developments of domestic and foreign scientists-economists on the theory and practice of marketing and marketing activities. The methodological base is based on the following methods: empirical research (observation, comparison); sociological methods (expert assessments, polls, questionnaires); statistical methods of data processing (grouping, rating).

3. RESEARCH RESULTS

The aim of the study was to identify preferences for wine products and to find out the reserves for increasing wine consumption. To achieve this goal were consistently solved a *number of tasks*:

- there were revealed the preferences of buyers in connection with the purchase of wine products by them;
- there has been determined the level of awareness of the population about the forms, methods and technologies of labeling of wine products.

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- There has been identified a set of factors that have the greatest impact on consumer behavior in the process of making decisions about buying wine products;
- segmentation of the wine products market taking into account social status;

During the study were formed working hypotheses:

✓ Consumers prefer domestic wine products produced in specific regions of our country to a greater extent than imported ones.

✓ The presence of a trademark is a decisive factor when deciding whether to purchase a particular type of wine product, and the brand logo on wine products is perceived by the consumer as a source of information about its high quality.

✓ For most consumers, a branded product is more valuable than a regular product.

Among the factors that are significant when deciding on the purchase of wine products are such as gender, age, social and material status of consumers.

A marketing research was carried out to confirm the hypotheses put forward. For this was used the method of polling consumers included in the number of respondents.

The respondents were divided into four age groups: the first group from 18 to 30 years old - 29,0% of the respondents; 31-45 years old - 37,0%; 46-60 years old - 25,0%; over 60 years - 9,0% of the total sample size. (Figure 1.)

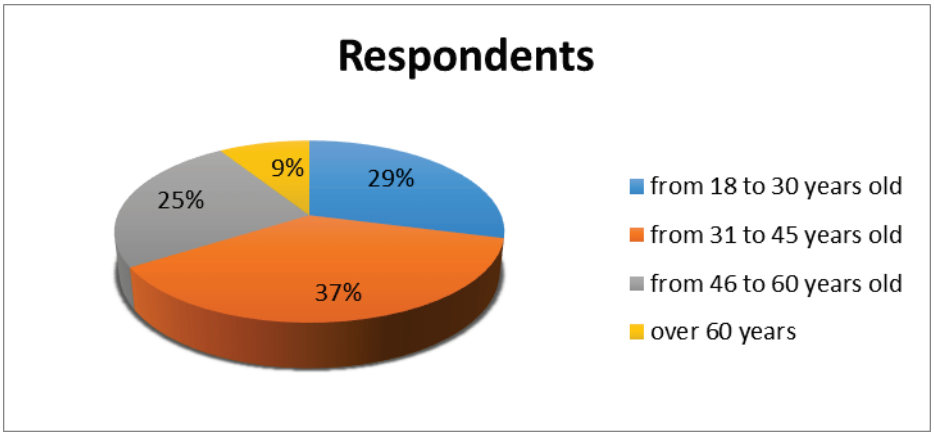

Figure 1. Structure of the distribution of respondents by age groups in the ATU (Autonomous Territorial Unit) of Gagauzia, %

Source: Developed by the author based on questionnaire data

The most numerous groups identified according to the criterion „level of financial situation" include respondents with income below average - 37,5% and average - 32,0%. 17,0% of the respondents are people with low income. 14,0% of respondents have above average and high income.

To determine the factors most influencing making a decision to purchase wine products, respondents were asked to indicate those that they take into account when buying alcohol.

In the process of marketing research, the respondents indicated the following factors that influence their decision to buy wine products: price, quality, place of manufacture, advertising, popularity of the alcoholic beverage, appearance (packaging), public opinion (reviews), the presence of special signs, brand of wine products, strength of the product, assortment, taste characteristics, container volume, prestige, habit, safety, prevalence in retail chains.

According to the survey, the most significant factors influencing the consumer's decision to buy wine products are price (38,5% of surveyed respondents), quality (29,0%), place of production (10,0%), place of production - 5,6%, fame, popularity - 9%, fame, popularity – 7,9%. (figure 2)

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Consideration of the distribution of respondents by age and sex, depending on the influence of one factor or another on the process of making a decision to purchase wine products, showed that with age, the influence of the „Price" factor increases in men (starting from the age of 31 it has a value for 44,0% respondents versus 43,2% in the sample as a whole). For women, this parameter is most significant only from the age of 60 years. The data of the survey results, taking into account the influence of factors, are presented in the table 1.

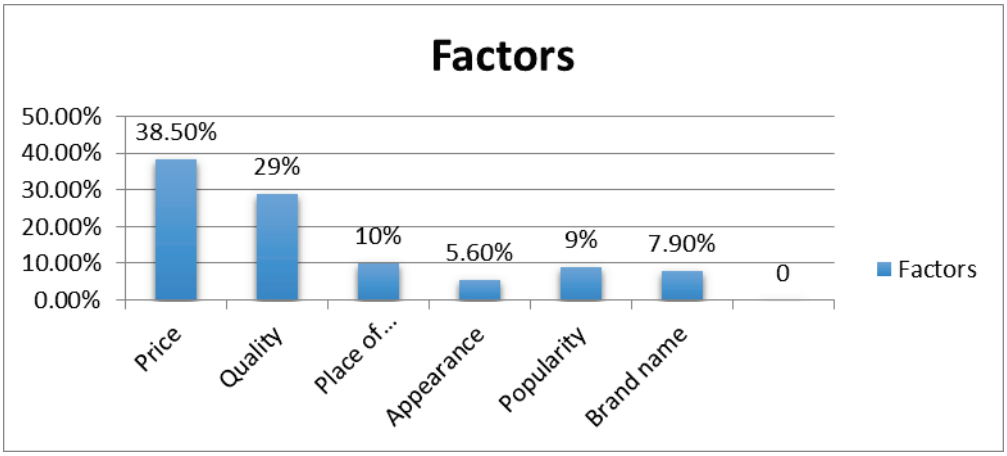

Figure 2. Factors influencing the decision to purchase wine products in the ATU (Autonomous Territorial Unit) of Gagauzia, %

Source: Developed by the author based on questionnaire data

Men aged 18 to 45 pay more attention to product quality, as well as to price (36,7% and 38,7% versus 33,3% in the sample as a whole), while for women, packaging and fame are the most significant factors.

The place of manufacture takes the third step in terms of the degree of importance of the factor when making a purchase decision. It is mainly taken into account by women under 60 years old and men over 60 years old.

The factor „Brand of wine products" is not so important for consumers, and in the buying process it is taken into account only by young people (both women and men).

Table 1 - Influence of factors on making decision to buy wine by respondents

Factors	**Gender**							**All respondents**	
	men				**women**				
	Age								
	18-30	***3 1 - 4 5***	***4 6 - 6 0***	***over 60***	***18-30***	***3 1 - 4 5***	***4 6 - 6 0***	***over 60***	
Price	41,43	44,00	50,49	54,17	41,76	39,81	41,30	51,92	43,23
Quality	36,67	38,67	33,01	30,56	32,98	31,02	30,03	32,69	33,28
Place of manufacture	7,14	6,67	9,22	11,11	9,04	13,66	11,60	3,85	9,84
Package	5,24	4,00	2,91	0,00	7,18	7,18	9,56	1,92	5,98
Fame, popularity	4,76	4,00	3,40	1,39	6,12	5,32	5,46	7,69	4,95
Wine products brand	4,76	2,67	0,97	2,78	2,93	3,01	2,05	1,92	2,73
Total	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0

Source: Developed by the author based on questionnaire data

Analyzing the data in the table, it can be concluded that there are gender differences in the degree of sensitivity to the factor „price" when deciding on the purchase of wine products. For example, low- and middle-income men with no higher education are sensitive to the price of alcohol. For men with a high level of income, regardless of education, the price does not matter. However, such results do not completely coincide with the opinion of women from this group. In

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contrast to men, in women there are no clear differences in the degree of price sensitivity in the selection of alcohol in terms of income and education.

The second most important factor influencing the decision to purchase wine products is „Quality"".

It was found that men of any income level with higher education pay attention to the quality of wine products. Women, in most cases (regardless of income and level of education), are neutral towards this factor.

The factor „Place of production" when making a purchase of wine is taken into account by women with higher education with middle and low income levels, as well as men with higher education and low income.

Another factor in the formation of demand for wine products is package.

Women (in most cases) without higher education with low and high income levels, as well as women with higher education and an average income level pay attention to the appearance of products. Among men, the appearance of products when buying is taken into account by respondents with low income and higher education.

The process of identifying the power of influence of the „Fame (popularity)" factor on the process of making a decision to buy wine showed that almost all women, regardless of their level of education and income, fall under its influence. Among men, it is taken into account by respondents with a low level of income and higher education, as well as with an average level of income without higher education.

One of the research tasks consisted in identifying the degree of presence in the motives for buying wine products of such characteristics as quality, high popularity of products, optimal price / quality ratio, breadth of assortment, product representation in chains and retail outlets, naturalness of wine (figure 3).

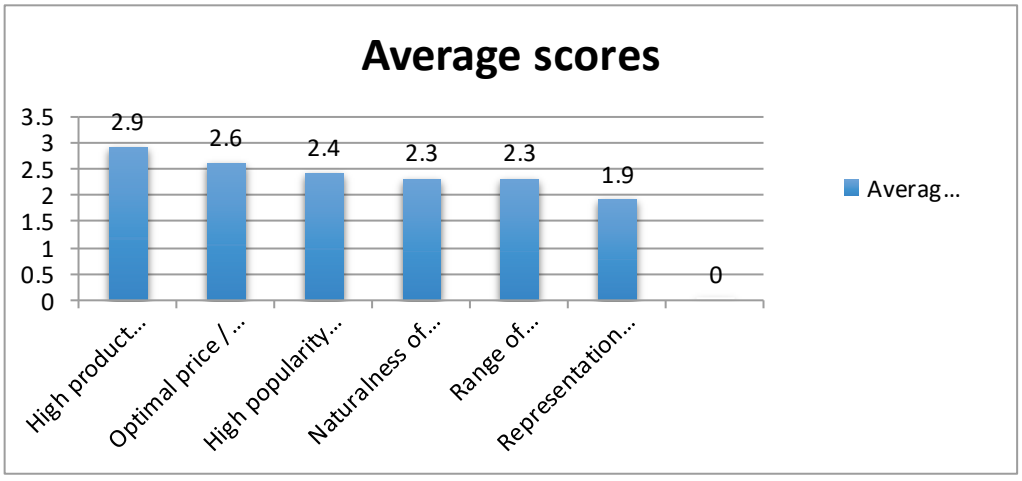

Figure 3. Structure of average scores of characteristics of wine products of domestic producers in (descending order)

Source: Developed by the author based on questionnaire data

Assessing the characteristics presented by the respondents, we can say that consumers did not assign all 5 points to these characteristics (this was the maximum, the highest rating).

Consumers rated the characteristic „High quality of products" of domestic wine producers at an average of 2,9 points out of 5, approximately 4% of respondents gave it a negative assessment. Consequently, a certain part of consumers is not satisfied with the quality of products of local producers.

„Optimal combination of price / quality" on a positive scale is estimated by almost 100% of respondents. However, this characteristic also does not come close to 5 points. Its average value is 2,6 points. This suggests that consumers are not completely satisfied with the pricing policy of domestic wine producers.

„High recognition of the local wine producers received good marks." So, 92% of respondents rate it on a positive scale, 8% - on a negative. The average score is 2,4. Accordingly, according to the respondents, the level of popularity of wine products of domestic producers, despite the high share of positive answers, even among the local population is not high enough.

„Naturalness of products" and „Range of assortment" have the same, rather high average score – 2,3. But, despite this, on a negative scale, the breadth of the assortment was assessed by only 11% of respondents versus 0,13% - the naturalness of products, consumers believe that some of the products are not natural. The last characteristic is „Representation of producers' wine products in chains and retail outlets". Average value (potential of respondents) is 1,9. From this it can be concluded that these products represent a small share in the total volume of all wine products sold in chains and other retail trade organizations.

The researches carried out made it possible to single out two approaches used in the positioning of goods: in the first case, the positions of goods are determined taking into account their perception by consumers; second - positions are set relative to competitors' products, taking into account their competitive advantages.

When using these approaches are considered the attributes of goods, but the factors of formation of consumer preferences (expectations, needs, income, age of consumers, the availability of knowledge about the product among consumers, satisfaction of consumers with the product) are not taken into account, which does not allow for the positioning of goods at the proper level. In this regard, the dissertation substantiates the use of an integrated approach to positioning (figure 4).

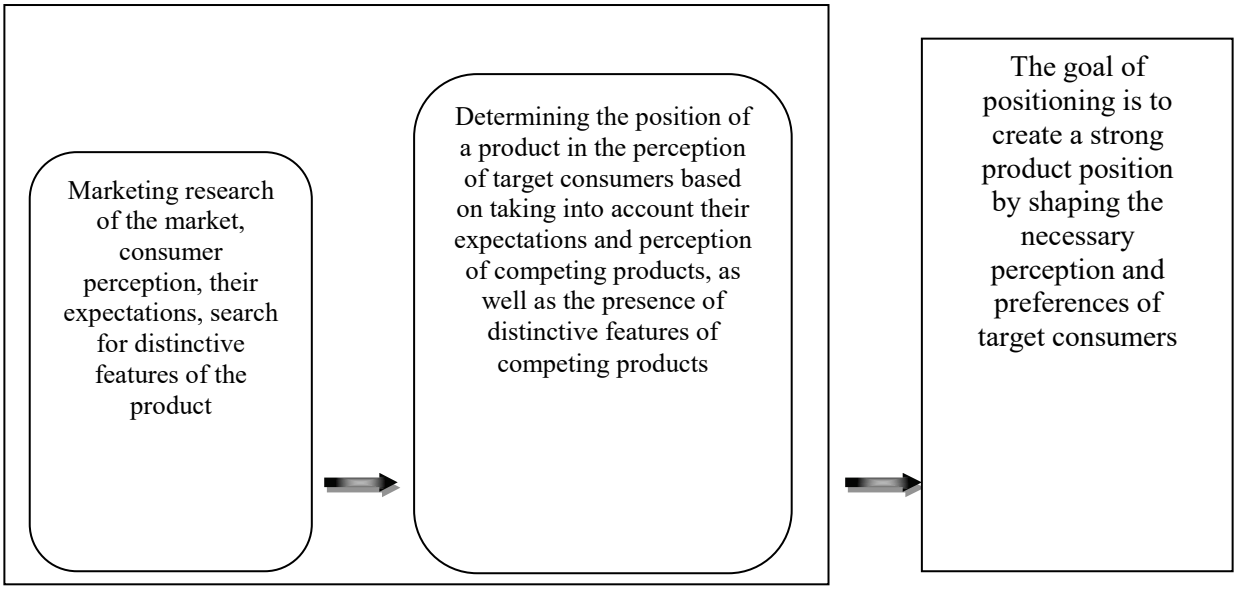

Figure 4. An integrated approach to product positioning
Source: Compiled by the author

The differences of this approach, which determine its novelty, from the existing ones are: taking into account the full list of objects of marketing research (competitors, perception and expectations of consumers, consumer behavior, goods), which makes it possible to form an

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information base for making informed decisions on the position of a product; focus both on the perception and on the distinctive features of the product in comparison with the products of competitors, which allows to ensure the achievement of the final results of positioning; clearer definition of the target of positioning; taking into account the relationship between consumer perception and product attributes.

In the scientific publication, the validity of decisions related to the positioning of goods is determined by the degree of achievement of its goal, which contributes to the creation of a strong position of the product in the perception of consumers. Obtaining this result is ensured by the presence of characteristics of the product that form its value, compliance of the product with the expectations of consumers, the presence of knowledge about the product, which was the basis for determining the criteria for assessing the validity of positioning.

4. CONCLUSION

The positioning of goods is a way to ensure the efficiency of the efficiency of enterprises by influencing consumer behavior, which determines its importance. Based on the results of the analysis conducted there were identified methodological problems, and was justified the use of an integrated approach to positioning.

The processes that ensure the creation of strong positions in the market are reflected in the methodological recommendations for positioning developed by the author. It is proposed to develop a positioning plan. It is based on making decisions such as the choice of distinctive features of the product, the choice of consumer associations with the product, determining the position of the product for the target segment in the form of a promise, bringing the product in line with the expectations of the target segments. Such information serves as the basis for the development of the marketing complex and is used by the functional divisions of the enterprise when they carry out their activities.

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SATELLITE MONITORING OF AGRICULTURAL LAND

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Abstract: *The object of the present work are the satellite images of agricultural lands, in order to obtain additional information about the development of crops. Farmers cannot afford to process "raw" satellite images, but there are companies available around the world that supply up-to-date images. In addition to images in a wide frequency range, users are offered meteorological information about the terrain, recommendations for fertilizer application and crop treatment, time series and total values of temperatures, precipitation, vegetation indices and the like. The space segment in the collection of data on agricultural crops has become increasingly relevant in recent decades and is an integral part of a comprehensive approach to precision agriculture. The study aims to trace the opportunities and differences in different sources of information.*
Key words*: satellite images, vegetation indices, precision farming, NDVI.*

JEL CLASSIFICATION: O13

1. INTRODUCTION

The rapid development of digital technologies and communications does not overtake agriculture. More and more processes, equipment, data collection and processing are based on digitalization and automation. What's more, modern communications allow most of the information we need about the state of crops and equipment to be received remotely, no matter where we are at the moment. In order to achieve real efficiency of the monitoring systems, a complex approach is needed in their construction: processing of data on the crops and their cultivation for a period of several years; expected yields of the current crop; meteorological data and forecasts; tracking crop development and soil condition through field observations and tests, through autonomous meteorological stations, through low-flying unmanned aerial vehicles, through satellite images in a wide frequency range. Obtaining and processing large amounts of information has in most cases proved impossible for manufacturers and they often turn their backs on new technologies, which reduces their competitiveness. For this reason, this study will compare different sources of data on freely accessible agricultural land. And a comparison of the information will be made when using the different sources.

2. MATERIAL AND METHOD

The object of the study are agricultural areas in the region of Dobrogea, sown with winter common wheat. Special attention is paid to a field with an area of about 0.06 km^2, near the town of Dobrich, which can be observed continuously from a distance of 300 meters, (GPS coordinates- 43.549519, 27.837412). Observations also include periodic on-site visits, sampling, satellite observations (mostly NDVI), and surveys of producers.

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The summary report for the region of Dobrogea shows a significant deviation of the main meteorological factors in the harvest 2019 - 2020. In general, they are extremely unfavorable for cereals, and when comparing them with the average long-term data, several main trends stand out:

1) extremely insufficient precipitation during the autumn-winter period and deepening drought until it reaches economic maturity;

2) high average daily and absolute maximum temperatures during the winter months;

3) return frosts during the restoration of the spring vegetation;

4) intensive amounts of precipitation in wax maturity.

The picture was multi-layered and the result of the accumulation of many types of stress, technological solutions and varietal composition. Initially, uneven germination and thinning crops are observed. At a later stage, the long and warm autumn, the fallen although insufficient rainfall favored mass fraternization of crops. However, the conditions did not allow the plants to go into complete dormancy. During all ten days of December, January and February the average daily temperatures are positive, and the absolute maximums by months reach 19.5ºC, 15.5ºC and 20ºC. Significant leaf mass was formed, but soil moisture was below the critical minimum. In March, the picture became more complicated when, after a period of warming with maximum temperatures above +20ºC, minimum temperatures up to -4.5 C were reported on several consecutive days. The degree of damage was directly related to the condition of the crop and the genetic characteristics of the variety. Particularly problematic were crops where the decision on the timing of spring feeding and the amount of imported products was incorrectly chosen. At the next stage, the deepening drought did not allow some of the brothers to develop. Some of them reached hatching, but subsequently dried up. In combination with the low atmospheric humidity, a high percentage of sterility was achieved. The rains in June were too late and rather worsened the condition of the crops, leading to mass development of saprophytes and deterioration of the physical properties of the grain.

Satellite observations have been made with specialized free-access products available on the Internet, based on images from satellite earth observation missions, (Sentinel 2, for example). Some of these products are for commercial purposes, but also offer free packages that provide a different set of data and recommendations: maps of vegetation indices; weather forecast; yield forecast; recommendations for pesticide treatment; recommendations for fertilization and its corrections; assessment of productivity areas; precipitation, etc. The data obtained in this way are oriented directly to the users and save the need to process the "raw" data received from the satellites. From the identified several dozen software products for processed satellite images are selected: One Soil, EOS Crop Monitoring, LandViewer, Agro API and Sentinel EO Browser. Images of the vegetation index NDVI for the period from January to June 2020 for the field with an area of 0.6 km^2 were downloaded and a comparison was made. A comparison of the NDVI index was made for other fields, terrains and forests and in other periods.

What are the mentioned sources of information:

The Earth Observing System (EOS) is a NASA program that includes a series of artificial satellite missions and scientific instruments in orbit around the Earth designed for long-term global observations of the earth's surface, biosphere, atmosphere and oceans. LandViewer is a simple, intuitive web interface that EOS provides as a direct marketing product to the public (Land Viewer: EOS, (2021)).

EOS Crop Monitoring is a platform for satellite monitoring of crops with a cloud service that uses space imaging to help growers monitor arable land by providing relevant up-to-date information about it (EOS Crop Monitoring, (2021)).

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The EO browser is a web platform for remote monitoring data processing. As part of the Copernicus program, it aims to contribute to a global, continuous and easily accessible source of satellite data. The EO browser combines a complete archive of the Sentinel satellites, as well as the Landsat 5, 7 and 8, Envisat Meris, Proba-V and MODIS missions (Sentinel-hub EO-Browser3, (2021)).

One Soil is a software company based in Minsk, Belarus, providing users with data on pre-ordered fields (Free apps for precision farming, (2021)).

Agro API for the natural integration of satellite imagery in agricultural applications and machine learning (Agro API, (2021)).

3. RESULTS AND ANALYSIS

Data from various satellite missions is available on the Internet, from which images can be formed in a wide frequency range. The visualization is done through, (Geographical Information Systems) GIS programs, taking into account the large amount of data, the need for a serious computer configuration, paid access to some of the data, the need for a trained specialist. On the other hand, the above-mentioned platforms offer processed data, including free and easy to use, but rather intuitive. Scanning the earth's surface via satellites is at a distance of 600 - 700 kilometres and achieving high resolution is a serious challenge. In practice, a resolution of 10x10 meters is sufficient for terrains over several tens of square metres. Certain factors, the most important of which is the cloud cover, can degrade images and mislead users. The comparison of data from different sources, as well as data from periods within a few days is an opportunity to correct possible errors. It was also found that the dynamics of meteorological conditions during the vegetation development is very high. For example, rain, after drought, sharply increases the vegetation index, and areas with a small index, can subsequently improve their level.

What do processed data products offer? Careful analysis of the reflectivity of vegetation provides information on the stage of development, phytosanitary status and even the identification of individual plant species (Monitoring Vegetation From Space, (2021)).

- Data on the meteorological situation in a specific field at the moment and short-term forecast;
- Images of the terrain with the values of different vegetation indices;
- Recommendations for fertilization and treatment, based on the crop, precursors, set yields, meteorological data, etc.;
- Data on time series of different quantities: precipitation, total temperature, dynamics and comparison of vegetation indices;
- In addition to the values of the most popular vegetation indices, users can compose images at random, based on images in the multi-spectral range and encode the color values obtained, i.e. to compile their own vegetation indices;
- It is possible to make an approximate calculation for the expected yields based on the above data.

The approach of data providers is different. Some of the packages are research-oriented, others are more production-oriented. There is a limit on the data provided during (no more than 10 images per day) or demo and trial versions, a limit on the number of fields requested for observation or observed decares and the like. Probably the goal is to limit the commercial aspect of the information received.

What do the results of the study of processed satellite images show?

First of all, the comparison of the registered vegetation indices NDVI with the condition of the terrains checked on the spot shows very good data coverage: the green artificial grass of the stadium has a vegetation index of 0.2 - 0.3; the coniferous plantations in a mixed forest

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massif have an index of 0.5 - 0.7, and the deciduous ones in the winter have an index of 0.2 - 0.3 and in May it reaches 0.7 - 0.8; the plowed area have an index of 0.2, and after the appearance of weeds - 0.4 - 0.6. (Free apps for precision farming (2021)).

Figures 1-3 show images of a field sown with wheat from different sources on the same day - 12.02.2020.

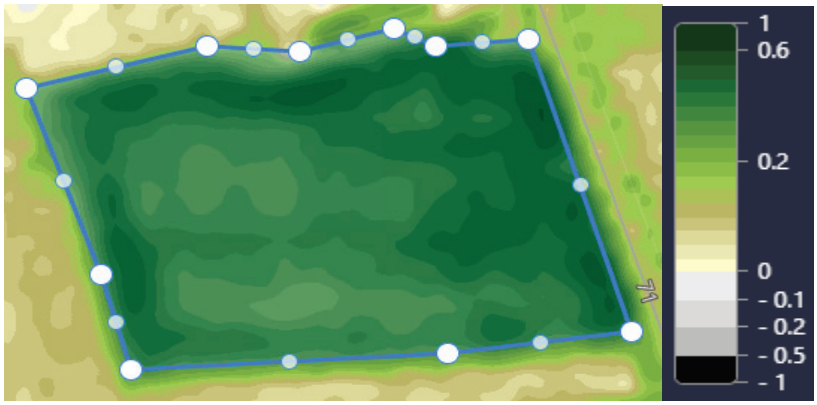

Fig. 1. LandViewer
Source: Land Viewer: EOS, (2021)

Fig. 2. One Soil
Source: Free apps for precision farming, (2021)

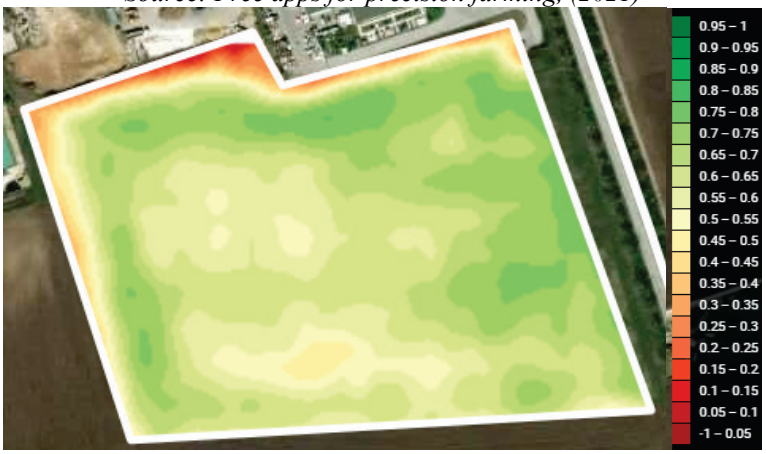

Fig. 3. EOS Crop Monitoring
Source: EOS Crop Monitoring, (2021)

The color coding of the NDVI index is different and this requires a scale comparison for each source. The resolution varies from source to source. It is usually 10 x 10 meters for free products, but One Soil offers a resolution of 5 x 5 meters. No significant differences between the

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data from the sources are observed. The reported vegetation index NDVI is in the range of ..0.5 - 0.7. All figures with the same shape and coordinates are registered with lower vegetation index. With small deviations, the mentioned sections are registered in the neighbouring time periods.

In the data from LandViewer and OneSoil from 02.01.2021 significant deviations from the absolute value of the NDVI index for another field are registered: 0.8 against 0.5. As relative values, it can be argued that the two images are identical.

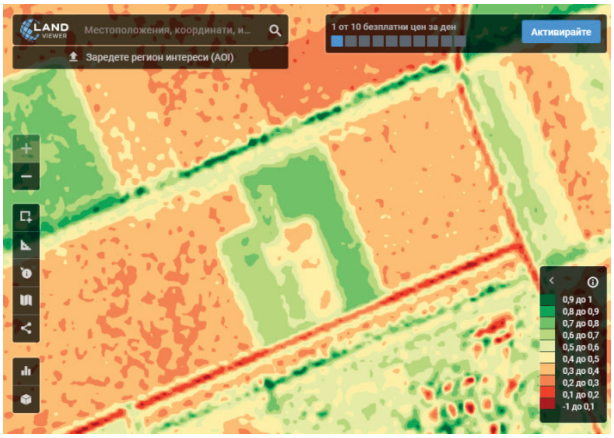

Fig. 4. LandViewer
Source: Land Viewer: EOS, (2021)

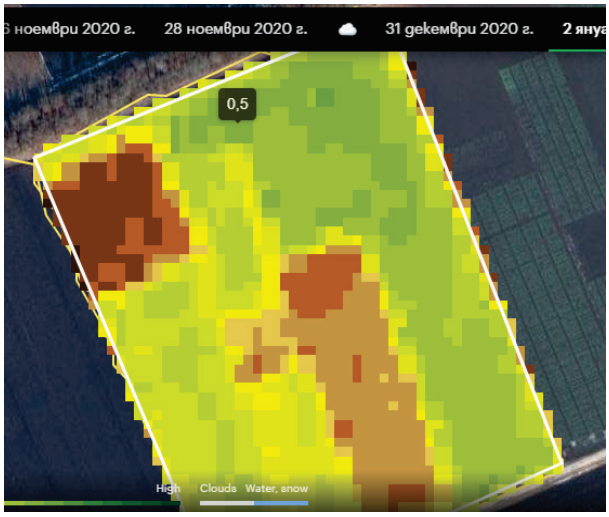

Fig. 5. OneSoil
Source: Free apps for precision farming, (2021)

In Figure 6. the maximum, minimum and average values of the NDVI index for the same field on LandViewer, in January are shown.

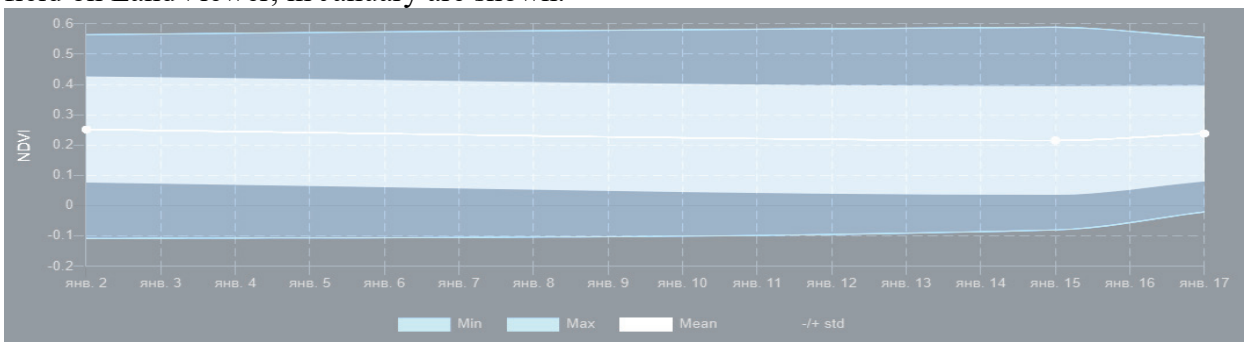

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Fig. 6. Index values NDVI

The NDVI index is an indicator of the condition of plants and does not explain the reasons for their level and variation. At the beginning of the season, it is an indicator of the way the plants have overwintered:

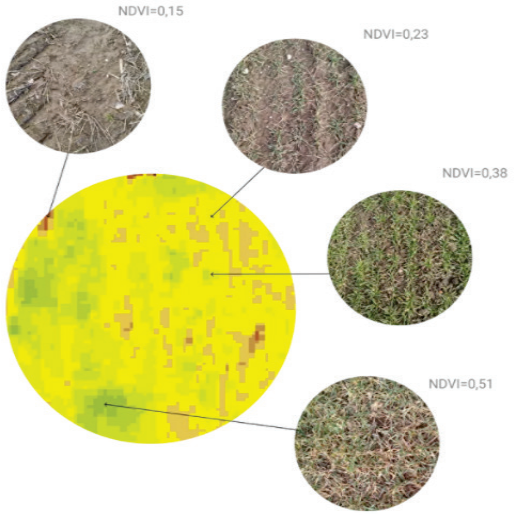

Fig. 7. Index NDVI
Source: Free apps for precision farming (2021)

• At values below 0.15 there is a possibility of a high percentage of frost;
• Values 0.15 - 0.20 are low, different degrees of damage are possible or the plants did not grow well enough when entering the winter months;
• The values 0.20 - 0.30 are relatively good and show a normal state of the crop for the development phase;
• The values 0.30 - 0.50 are inherent in strongly fraternal sowing or advanced phenological development;
• Values above 0.50 are not typical for the period before the restoration of vegetation and can be considered as anomalies, which requires examination to determine the causes.

As the photoperiod lengthens, wheat enters a spindle phase, when the stakes are set and a large amount of biomass accumulates. The period is critical and each type of stress affects the potential yield. The diet is extremely important for its realization. At this stage, the NDVI index is an indicator of how plants grow. If the values of the index are medium to high (0.5 - 0.85), most likely there are no stress factors in this part of the field. If the index is low, the probability of a technological gap in the diet, limiting factor of abiotic or biotic nature is high. The recommendation is a field inspection.

The values of the NDVI index can provide guidelines for corrections of imported fertilizer products.

If the vegetation index is high for the field area, it is recommended to reduce the fertilizer rate by 10 -- 30% depending on the soil and climatic conditions.

If the vegetation index is average, it is desirable to increase the fertilizer rate by 20 - 25% of the average.

If the vegetation index is low, it is mandatory to identify the reasons for this.

At the end of the season, the NDVI index helps to predict the onset of the appropriate harvest period. The low index is an indication that the plant is entering economic maturity. The approximate values are about 0.3 - 0.35.

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The above recommendations are too general and cannot be a basis for decision making. Serious research shows that vegetation indices change with different varieties, climatic conditions, cultivation technologies, phenological phase, etc. The compiled models for the relationship between vegetation and the NDVI index correlate well with the real situation and can be a basis for forecasting yields.

4. CONCLUSIONS

- The review of the various sources for remote spectral observation - vegetation indices can help in the work of farmers. They can plan the appropriate treatments. Accordingly, they can reduce the time for direct monitoring of crops by monitoring only areas with a reduced index.
- Spectral reading methods give the necessary parameters most easily and quickly, even for large areas, as they are easy to use. The considered sources of information give easy access even for farmers without the need for them to be IT specialists to different information about the cultivated crops. And receiving from users information on meteorological information about the terrains, recommendations for fertilizer application and crop treatment, time series and total values of temperatures, precipitation, vegetation indices and the like.
- The graphical representation of the values of the sources gives similar information to all Figures. The same in shape and coordinates are registered areas with a lower vegetation index. Significant deviations from the absolute value of the index are registered in the various web resources, this is an indication that the color coding should not be absolute.

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IMPACT OF MOBILE APPLICATIONS OVER E-COMMERCE

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Abstract: *The purpose of this paper is to examine the impact of mobile applications over e-commerce platforms as a stand-alone market place or additional channel to get in touch with potential customers and not only. This study advances research on adoption of mobile applications within the e-commerce platform and investigates the impact for the companies after initiating the process of implementation. The decisions for mobile application adoption in e-commerce are dependent on the knowledge of the owner /manager and the expertise of managing development and marketing teams. Main impact or benefits of adopting a mobile application within e-commerce are improved internal efficiency, increased information exchange, better user experience and a faster understanding of consumer feedback.*

Key words: *e-commerce, mobile application, online marketplaces, commercial website, search engine, impact, marketing tools, mobile distribution stores.*

JEL CLASSIFICATION: M15, M31, M37, L81, L96, L97

1. INTRODUCTION

In present accelerated lifestyle, the intense use of technologies and global organizations (healthcare, governmental etc.) encourage people to make purchases via different e-commerce platforms (https://blogs.worldbank.org, 2020). Customers require a convenient experience when buying products and services through e-commerce. Mostly all e-commerce systems develop their own platforms-based web and mobile technologies. The main reason is because consumers tend to use more internet traffic using a mobile device, rather than a Desktop/Laptop (Mobile Vs Desktop Internet Usage, 2021). Mobile applications (apps) offer customers convenient access to the products and services required by the clients (Pantano, E.; Servidio, R., 2012), but in the same time face limited and isolated functionality. Having the possibility to make different purchases via the mobile applications and allowing to pay for it (De Kerviler, G.; Demoulin, N.T.; Zidda, P., 2016; Martins, J.; Costa, C.; Oliveira, T.; Gonçalves, R.; Branco, F., 2021) permit people to use any e-commerce service faster and make the delivery better, allowing to know the exact address and better delivery terms (Visser, J.; Nemoto, T.; Browne, M., 2014). High-speed Internet access, the increased performance of smartphone devices, advances in personalized and interactive apps (e.g., geo-tracking (Tong, S.; Luo, X.; Xu, B., 2020)), and the fast rhythm of modern life (Kim, M.J.; Lee, C.K.; Kim, J.S.; Petrick, J.F., 2019) have created a fertile environment for the adoption of mobile applications. Indeed, the 2.7 billion smartphone users across the world spend 90% of the time they spend on their mobiles on apps (https://buildfire.com/app-statistics). The average smartphone owner uses 30 apps per month and nine apps per day. This development has changed individuals' lifestyles and turned occasional app use into a daily habit (Report: Smartphone Owners Are Using 9 Apps per Day, 2017). As with any innovation, mobile services present both opportunities and challenges to current business models. The development of mobile communication coupled with evolving mobile services have completely changed the business landscape and have transformed consumer behavior. It is important to understand the impact that these services have on users lives, business, and society.

2. CONCEPT

Mobile commerce, named also m-commerce in many sources (Kire Jakimoski, 2014), includes transactions expressed in money (value), direct or indirect, made through mobile communication technologies. Transactions can be made entirely from mobile equipment or can only be initiated or authorized with its help. In other words, mobile commerce defines the ability of the mobile consumer to obtain goods and services securely through wireless technology.

In a simple, general approach, mobile business (m-business) can be defined as an exchange of goods, services or information through mobile technologies (Kalakota, R., Robinson, M., 2001). The term refers to various value-added transactions and services, which can be done with the help of mobile devices (telephones, personal digital assistants, pagers, car on-board computers and any other portable devices capable of communicating wirelessly). More specifically, mobile business can be defined as a new form of using information and communication technologies to integrate value chains and business processes, a form that facilitates communication and coordination within the organization, as well as, overall, its management. The particular characteristics of mobile business are interactivity, almost permanent availability and personalization.

The main idea of implementing an e-commerce mobile application is to inherit the core services from the main platform and combine it with the mobile device capabilities. In the end this should represent a model or complex system where firms or individuals conduct business over the internet. This approach of using mobile device power can allow different kind of entrepreneurs to operate in different market places and promote their product value.

3. STATISTICS

In the past year we detect an increase usage of internet network usage from the mobile devices compared to the desktop/laptop. People tend to use more a mobile device to search for their needs rather than a standard PC. This trend we can observe in the following Figure 1.

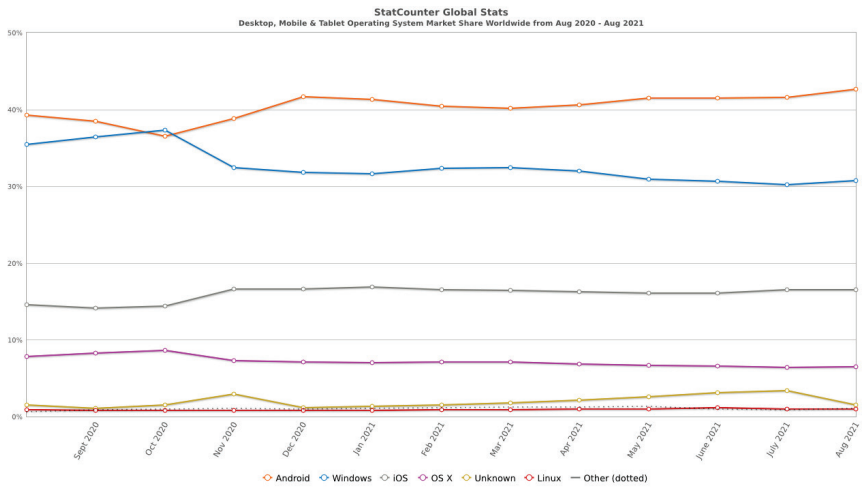


Figure 1. Desktop, Mobile & Tablet Operating System Market Share Worldwide
Source: https://gs.statcounter.com/

According to BuildFire post (https://buildfire.com/category/ecommerce), referring specifically to mobile e-commerce, it is mentioned that mobile applications forecast by the end of 2021 will hit the sales with over $221.2 billion. Basically, if we compare the mentioned sales value with the Statista Mobile App Revenues (Worldwide mobile app revenues in 2014 to 2023,

https://www.statista.com) that is also presented in Figure 2, we can observe that around 32% of total sales were done within different mobile e-commerce market places.

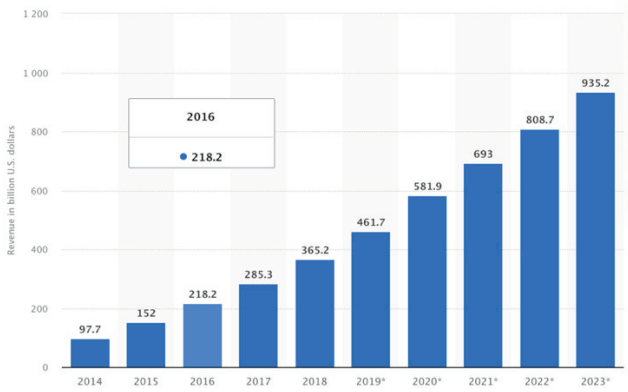
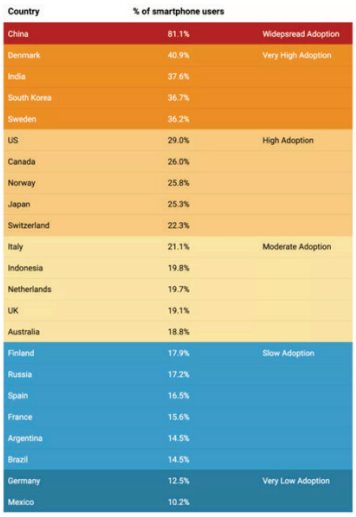


Figure 2. Worldwide mobile app revenues in 2014 to 2023
Source: https://www.statista.com

This represents a general overview over the past, current and future forecasts regarding the revenues received through a mobile app, using different conversion channels. Unfortunately, all this information and statistics rely more on the level of adoption based on the geographical location of the marketplace or zones where the mobile is available for download and use. According to the adoption rate (Key Objectives for E-Commerce Platforms, https://bluecanyonpartners.com) mentioned in Figure 3, we can observe how it differs starting from zones and reaching to separate countries, depending to their government opinion regarding it.



Country	% of smartphone users	
China	81.1%	Widepsread Adoption
Denmark	40.9%	Very High Adoption
India	37.6%	
South Korea	36.7%	
Sweden	36.2%	
US	29.0%	High Adoption
Canada	26.0%	
Norway	25.8%	
Japan	25.3%	
Switzerland	22.3%	
Italy	21.1%	Moderate Adoption
Indonesia	19.8%	
Netherlands	19.7%	
UK	19.1%	
Australia	18.8%	
Finland	17.9%	Slow Adoption
Russia	17.2%	
Spain	16.5%	
France	15.6%	
Argentina	14.5%	
Brazil	14.5%	
Germany	12.5%	Very Low Adoption
Mexico	10.2%	

Figure 3. Mobile Payment Adoption Rate
Source: https://www.merchantsavvy.co.uk/mobile-payment-stats-trends/

4. IMPACT OF MOBILE APPLICATIONS

Each developed software is meant to have a specific result in the context where it will be applied. One of the main goals of any e-commerce platforms are (Agile software development, https://en.wikipedia.org):

- Find customers/consumers for placed goods
- Merchandise placed goods on the platform
- Research/Understand market needs for new goods

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The entire flow for achieving those scopes, in a simplified form, can be represented as an agile process represented in Figure 4.

Figure 4. Mobile Payment Adoption Rate

Based on previous diagram we can remark that consumers need changes very frequent and the entire process of user engagement and user retention must be a cycled, in order to compete with other modern platforms. Basically, each step defines the following description:

- Discovery
  - Defines the process how the customers find about the service or product
- Evaluation
  - Defines how customers evaluate what to buy and what information they need to decide
- Purchase
  - Defines the payment flow or how the consumers exchange their money for the desired good
- Delivery
  - Defines the logistic part of how the consumers receive their purchase and in what terms it will reach its final destination
- Support
  - Interaction with customers in order to confirm that they have received their product and didn't meet any user experience issues during the entire process

Mobile applications or the mobile market tend to be used more rather than the web browsers. This represent a good field to fulfil the previous mentioned goals. The basic "Merchandise placed goods on the platform" we can consider a minimal way to add additional revenue to our platform. The biggest points that can be used for the mobile applications represent finding new customers/consumers and researching/understanding the market. These goals can be easy achieved and tracked with the minimal efforts and some investments.

Modern matching engines based on user preferences and analytics offer product owners to provide to their customers the most desired good and at most suitable price to pay. This instrument or technic is used mostly by any ecommerce platform and it highly recommended to be implemented. Having an excellent ecommerce platform doesn't worth anything without having any customers and sales. The killer feature or strategic point in mobile market is the

monetization part that can be used in order to engage and attract new users. Over 20-30% of the mobile applications use the monetization as source of revenue, on this point with some small investment and covering specific use cases ecommerce platforms can study the interest on specific products and attract new people.

5. COMMON E-COMMERCE FEATURES USED IN MOBILE APPS

In present there are a lot of integrated e-commerce services within the mobile apps (https://www.redbytes.in/ecommerce-mobile-app-features-list). In the following Table 1, there are mentioned the most common used features among them.

Table 1. Common e-commerce services used within mobile apps

Feature	Description
Proper customization	Every e-commerce mobile app should an outstanding user experience for the promotion of the e-commerce business. For example, in case of a shopping app the user should have a flawless navigation along with a smooth experience so that no complexities are present during the shopping.
Trouble-free registration process	Most of the users do not like the long and complicated sign-up process and some apps require a lot of information for the registration process. The whole process of registration to checkout should be simple in nature like that of Amazon. The user should be able to directly get to the main page and choose the products. Moreover, the registration should need only a mobile
Loading speed	Speed has become the meaning of life in the world that is constantly dynamic. Slow loading apps could be a horrible debacle for businesses that aim big. Make sure all app contents are optimized to fit the standards of underlying device environment and do not take more than 3 seconds to appear to users.
Feedback system	The users should be able to provide feedback on your app as this is essential for your business. It should be made in such a way that the users can report any kind of issue in the system like bugs or can provide review about your products. From this, you will get some idea about your products and the improvements that are needed in your app. The feedback of the users can help with the improvement of the app in the near future.
Indelible user experience	Products is not the only thing users are looking for, they also want to feel satisfied and delighted having a great experience inside the app. To make them addicted, try to carve unique features that offer value and rewards to users.
Push notifications	This can be considered as the most effective and easiest way to attract the users back to your store. With the help of push notifications, certain promotions can be made of the fresh arrivals or discounts are offered on the products that are stored in the cart.
Ratings and Reviews	The users should be allowed to review and rate the features of your app. The customers should be allowed to provide negative feedbacks about your services and products as this will help with the improvement of your business.
Relevant and	The content of the app should be more concise in nature because

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Authoritative App Content	users do not like contents that are too pushy in nature.
Advanced search options	Usually, Ecommerce apps have thousands of products listed across hundreds of categories. To make it fast and easier for customers to discover their favorite items, the app must offer advanced search options along with precise filters.
Wish List Button	This is considered as an essential feature. Using this feature, users can bookmark the items they wish to buy. By enabling this feature, you can notify the users about the offers that are applicable on the products in the wish bucket.
Log in via Social Media	The users should be allowed to log in via Facebook Connect or any other social media into their mobile app. Options should be given to the users for retrieving their passwords or usernames and for reminding the users about the social network platform they used for setting up the app.
Featured product	Featuring the latest trending products and discount offers via vivid sliders and banners have become a hallmark of successful ecommerce apps.
Quick checkout	This feature is a must for your e-commerce mobile app. With the help of this feature, the users can complete their order with the information that is already provided in their profile which includes the billing and the shipping address of the user.
Multi-currency payment options	The customers should be given multiple options of payment during the time of checkout with utmost security and safety. Popular modes of payment are cash on delivery, credit/debit card system, smart card, E-wallet, net banking, mobile payment, PayPal and Paytm.
Accurate Analytics	Every business must have a follow-up system that helps measure success, growth and progress periodically. Having a clear picture of business activities helps you scale and improve your customer persuasion tactics.

Source: https://www.redbytes.in/ecommerce-mobile-app-features-list/

6. MOBILE DEVELOPMENT FRAMEWORKS

Selecting a mobile development framework is an important key for creating an e-commerce application. It depends on many factors like development time, cost, maintenance and time to implement new features dominating the mobile market places. These frameworks can be classified in two major categories, native mobile development and hybrid mobile development.

Native mobile development frameworks are:

- Google Android Native Development (https://developer.android.com)
- Apple iOS Native Development (https://developer.apple.com)

Hybrid mobile development frameworks have a lot more of ramification. The main scope of this approach is to use a single code base and achieve same results for both platforms Android and iOS. The main dominant hybrid frameworks in the mobile world at the moment are:

- React Native (https://en.wikipedia.org/wiki/Mobile_app_development)
- Flutter (https://en.wikipedia.org/wiki/Mobile_app_development)
- Xamarin (https://dotnet.microsoft.com/apps/xamarin)
- Ionic (https://ionicframework.com/)

Each development platform has its advantages and disadvantages. These differences we can see in the following Table 2.

Table 2. Common e-commerce services used within mobile apps

Criteria	Native Development	Hybrid Development
Cost	High development cost	Medium-High development cost
Number of developers	Need to have at least one developer for platform in order to support each platform	It is enough to have a developer to support multiple platforms
Development Time	Fast	Medium
Native mobile features	Complete adoption	Partially adoption
Performance	High	Medium
Maintenance	High	Medium
Product Complexity Support	High	Medium
Dependency on third-parties	None	Depend
Access to hardware capabilities	Available	Depend on third-party integrations

7. CONCLUSION

With the number of advantages of mobile commerce and current trends in using mobile application in e-commerce, we can say that it will continue to grow in 2021 and beyond, attracting more customers and generating more sales. A number of companies have already started investing in a dedicated mobile application or are planning to do it. The results obtained from this study indicate that mobile applications have a great influence on ease of e-commerce platforms. This impact depends on many factors as it was described in this paper. Depending on the path the entity is using it could improve the business and help to achieve new levels. As a recommendation I would suggest to add a mobile application version to the roadmap of any e-commerce platform.

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THE IMPACT OF THE COVID-19 PANDEMIC AND THE EUROPEAN GREEN DEAL ON THE AIR TRAFFIC INDUSTRY COMPETITIVITY AND ON MOLDAVIAN CERTIFIED AIR CARRIERS

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Abstract: *The unprecedented contraction of the airflight transport sector caused by the COVID-19 pandemic, European Commission's regulations aiming for carbon neutrality by 2050, as well as the industry's slow recovery rate and high demand for capital for the implementation of costly carbon neutral air traffic solutions, are the main challenges that will shape the way the competitive forces will affect global, regional, and Moldovan air transport industry. The competitivity of airflight companies pivots on the competitivity of the entire air traffic mobility chain. To succeed Moldovan air carriers must rely on suppliers, partners and stakeholders who can solve the paradox of a lower carbon footprint while decreasing the overall cost of mobility, and all this in a very uncertain business environment. Integrated intermodal mobility solutions around Chisinau airport and ensuring a carbon efficient value chain are essential in resisting the regional competitive pressure and loss of traffic.*
Key words: *competitivity, air transport, COVID-19, strategy*

JEL CLASSIFICATION: M3

1. INTRODUCTION

On December 11, 2019, the president of the European Commission, Ursula von der Leyen, presented the "European Green Deal". This strategic planning document becomes the European main policy for the next 30 years. Acknowledging that 25% of all Europe's greenhouse emissions are generated by the transport sector, the "European Green Deal" sets the ambitious target of reducing by 90% the transport emissions by 2050 (The European Green Deal n.d.). The document stresses the importance of boosting the multimodal transportation as a means of increasing the efficiency of the transport system. According to the European Union Aviation Safety Agency's (EASA) European Aviation Environmental Report for 2019, the number of flights is expected to grow by 40% from 2017 by 2040. The technological improvements and fleet renewal were able to balance only partially the impact of the growth, without being able to alleviate EU28 greenhouse gas emissions. Therefore, by 2040 the CO2 and NOx emissions are expected to increase by at least 21% and 16% respectively (European Aviation Environmental Report 2019 n.d.). The European Commission envisages to review the airplane fuel exemptions and raise its standards concerning air pollution, noise and CO2 emissions by aeroplanes and airport operations (The European Green Deal n.d.). Airflight carriers will have to improve their fleet technology designs, their air traffic management operations prioritizing sustainable aviation fuels, while airports will be required to participate in the Airport Carbon Accreditation programs and join the 37 European airports that reached their carbon neutrality status (European Aviation Environmental Report 2019). The slowly aging European fleet raise concerns over the industry's ability to meet the carbon neutrality by 2050, leaving the industry highly dependant on the zero-emission large aircraft that must be market ready by 2035, according to the European Commission's Sustainable and Smart Mobility Strategy (Sustainable and Smart Mobility Strategy). The same planning document provides that

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airports should become multimodal mobility hubs, linking all relevant transport modes. Therefore, we should expect the concentration of the industry around airports that meet the multimodal mobility criteria.

2. THE IMPACT OF THE COVID-19 ON THE AIRLINE INDUSTRY

While lowering the carbon footprint on the short run, the Covid-19 pandemic raised increased concerns over the future of the global air traffic industry. On December the 9th, 2020, since the beginning of the year, the flight numbers were down 55% compared to the same period of 2019 (Eurocontrol Comprehensive Assessment for Thursday, 10 December 2020). The shrinking in half of the air traffic is a global phenomenon. The air traffic between Europe and south Africa saw the smallest decrease in 2020, of only 40%, compared to 2019.

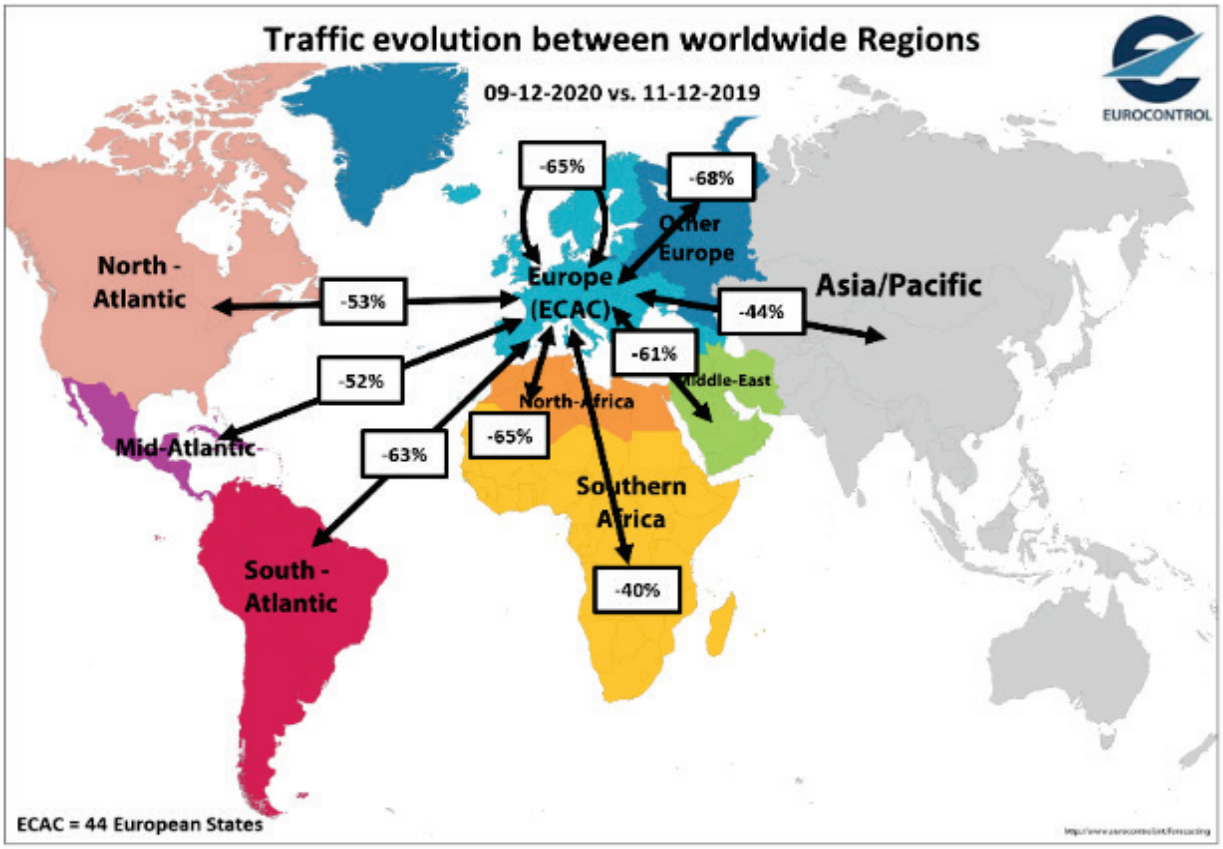

Figure 1. Traffic evolution between world regions 09.12.2020 vs 11.12.2019
Source: Eurocontrol Comprehensive Assessment for Thursday, 10 December 2020

The most impacted air traffic at the beginning of December 2020 remains Eastern Europe with a negative dynamic of 68%. On the 9th of December 2020 Moldova's air traffic was minus 68% compared to 2019. Despite the Eurocontrol scenarios the actual trend of the European air traffic is 10% bellow the projected -54%. Eurocontrol's 5 years forecast shows that with a vaccine effective in 2021, the 2019 number of flights will be attained only towards 2024 (COVID-19 impact on the European air traffic network n.d.).

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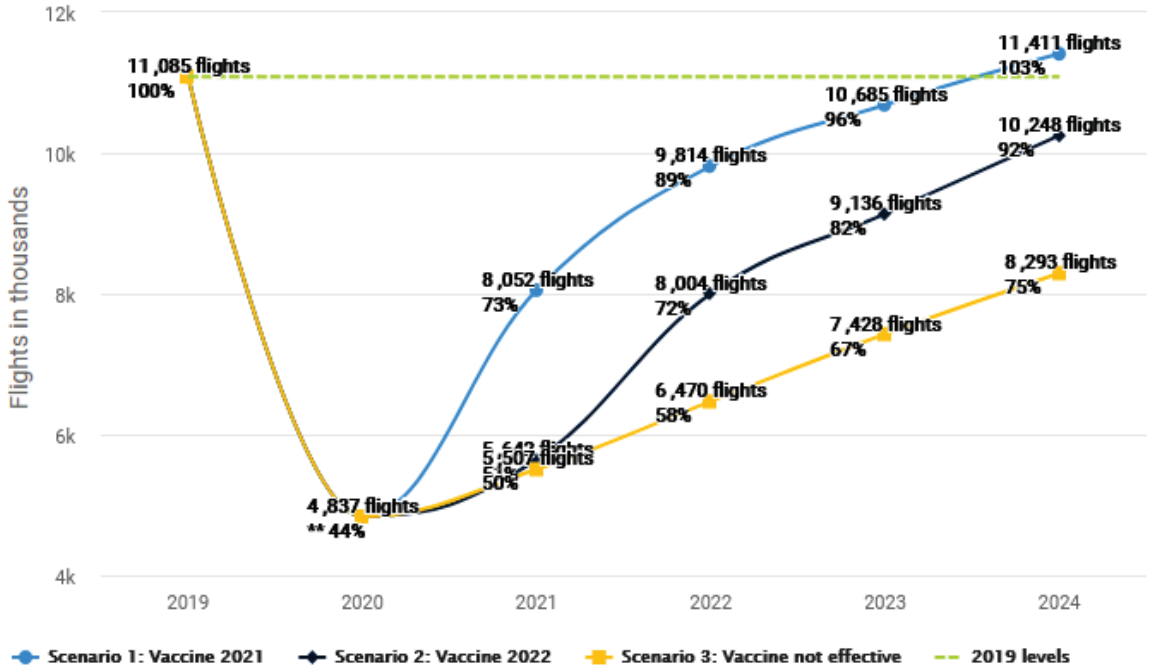

Figure 2. Eurocontrol's forecast of the ECAC member states traffic for 2020-2024, percentage change compared to the 2019 level

Source: COVID-19 impact on the European air traffic network

With continuously deteriorating revenues in the air transport business Europe is forecasted to become the worst-hit global region in 2021, with losses of 11.9 billion and EBIT margin of -9.5% (European Air Transport COVID-19 Impacts and Recovery to be Worse than other Regions n.d.). With a revenue passenger km (RPK) that is estimated to have fallen 70% in 2020 compared to 2019, the air traffic providers are expected to face serious financial problems (European Air Transport COVID-19 Impacts and Recovery to be Worse than other Regions n.d.). The negative operating margin creates an unprecedented pressure on the industry with a potential eliminatory effect for many important players on the market; therefore, leading to the concentration of the air traffic services around a few big players. It is expected that hardest hit will be companies that have lower economic leverage. We hear more often now leaders calling for a sustainable recovery of the transportation sector. Therefor, the Covid-19 pandemic is regarded as an opportunity for realizing the shift towards a greener, safer and a more integrated mobility; however, the financially drained out air transport industry lacks the necessary resources for leapfrogging to a fully electric fleet.

Not only air transportation companies, but also the air traffic infrastructure providers will face, in the upcoming years, an unforeseen regulatory, ecologic, and financial pressure. The importance of small local airports will decrease drastically. The "Green Deal" dictates the need to concentrate the air traffic in bigger and therefore more interconnected multimodal, and more efficient hubs. This approach is in line with Porter's Cluster Theory (Porter 1990) and Sheffi's logistics cluster theory (Sheffi, 2012). Therefore, encouraging the geographical concentration of companies and their suppliers serving the same industry will most likely lead to the synergetic effect perpetuated through the industry. Applying this strategy small airports might lose traffic in favour of railways or waterways companies that will interconnect with intermodal transportation hubs. This approach will lead to the decreasing role of smaller operating centres that due to their small commercial gravity and limited regional impact have less potential to become a hub and therefore reach their carbon neutrality as well as meet their financial targets.

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The drastic decrease in the atomicity of the air traffic offer will most likely follow. Maintaining a negative operating margin for yet an undetermined time is a very challenging task. Therefore, we should expect tectonic sector shifts. Air traffic companies will need time to recover from the consequences of the COVID-19 pandemic. Taking in consideration that the air traffic volume is expected to recover only by 2024, air carriers must rethink their business model and deliver on affordable, safe, and high passenger mobility while aiming for carbon neutrality by 2050. With zero emission large aircrafts available for the market by 2035, the survived companies might have to struggle for capital to make the shift to new technology.

3. THE CHALLENGES OF LOCAL COMPANIES TO BECOME COMPETITIVE

New forces shaping the air transport market augment the pressure on Moldovan airflight companies questioning their feasibility medium and long term. Signing the single European Common Aviation Area agreement, (ECAA) the Republic of Moldova embarked on a mission to liberalise the air transport industry by allowing any ECAA member state to provide domestic flights. The liberalization of the market brought low-cost companies to Moldova building up competition and menacing the local incorporated carriers. In 2019 local and foreign air carriers transported almost 3 million passengers to and from Moldova and only 52.4% were transported by national air companies (Brief analysis regarding passengers' traffic for period in 2019 n.d.). Three out of ten Moldavian certified air companies perform regular passenger transportations from the Chisinau International Airport: the limited liability companies "Air Moldova", "Fly One", and „Aerotranscargo" (Brief analysis regarding passengers' traffic for period in 2019 n.d.). From 2014 until 2019 the passenger load factor was oscillating between 74 in 2016 and 80 in 2014. In 2019 the load factor for scheduled air traffic was 76% (Brief analysis regarding passengers' traffic for period in 2019 n.d.). Therefore, after creating demand for new destinations supporting the high cost of scheduled flights with a low load factor, the ECAA members states carriers where accused of mirroring the local companies offer while applying dumping price policies (Bezniuc, 2011). With new market shaping forces: the COVID-19 pandemic, carbon neutrality and concentration of the offer around mobility hubs; Moldovan air traffic companies become highly vulnerable. The only country's airport in Chisinau does not provide an integrated mobility solution; while the obsolete railway infrastructure is not able to contribute to lowering the carbon emission per passenger km from remote locations. The Chisinau airport remains one of the most expensive ones in the region raising the attractivity of other regional airports such as the Iasi airport in Romania; therefore, representing a threat for local airflight companies.

With most competitive forces acting against Moldavian air carriers the main feasible competitive strategy remains lowering the costs. The lower price of kerosine during the pandemic (IATA Jet Fuel Price Monitor n.d.) helped the airflight carriers maintain some of the scheduled flights despite the lower loading rate. However, with the price of Jet fuel in September 2021 of more then double compared to September 2020 and the passenger actual traffic of 71% compared to 2019 the entire industry is deemed to experience a very slow recovery. Therefore, high operational costs will drag back the airflight industry capacity to stay profitable and remain financially sound for attracting capital necessary for the acquisition of new, carbon efficient aircrafts. Consequently, at least from a medium-term perspective, the maintaining of low operational costs and a competitive price for the customers could remain the main competitive strategy for Moldovan airflight companies.

4. CONCLUSION

In a post pandemic environment, the threat of new entry remains low; however, the probability of concentration of the airflight offer around the world and regional industry leaders is very probable. Due to the limited potential in generating integrated mobility and minimizing the industry's environmental impact, Moldavian airflight carriers face a real threat of substitution by other regional air traffic mobility providers, mainly from Romania. With fewer customers and a contraction of the industry by more than 60% in 2020, the buyer power will increase significantly. With almost half of Moldova's regular flights operated by international carriers with a higher access to the capital and a comparative advantage at the industry level, domestic carries might face serious challenges. These competitive forces will play a downward pressure on prices, while the Europe's Green deal will significantly increase the bill of the entire industry. Understanding the challenges of the new after-pandemic competitive environment, represents the first step in tailoring a response strategy that will help domestic air transportation industry survive on the short run, while specializing and niching on the medium to long term.

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IMPACT OF THE COVID-19 OUTBREAK ON DIGITAL PAYMENTS

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Abstract: *This study covers the impact of the COVID-19 pandemic on the electronic payments sector at global and national level, the current effect, implications and future trends. An extensive arsenal of research methods was applied to the research, such as: analysis method, synthesis method, comparison, induction, inference, etc.*

Key words: *COVID-19, impact, economic, payments, electronic, digital.*

JEL CLASSIFICATION: O14, O3

1. INTRODUCTION

The continued spread of COVID-19 has become one of the greatest threats to the global economy. Given that payments and payment services are, in themselves, an important part of the financial services package, in certain circumstances they can not only facilitate access to other financial services, but in many cases are essential for their efficient provision.

2. THE IMPACT OF THE COVID-19 PANDEMIC ON THE GLOBAL ECONOMIC AND PAYMENTS SECTOR

In the context of the COVID-19 pandemic, payment service users are affected differently, depending on their exposure to different sectors. Faced with store blocking and closing regimes, many businesses have been forced to migrate to the online environment, so the share of global retail sales generated by e-commerce is growing and is estimated to reach a third by 2024. At the same time, some segments, including travel and airlines, have experienced a severe decline due to COVID-19 (both online and offline channels). The resulting economic disruption is huge and the short-term decline in activity for businesses, both large and small, considerable.

However, there are also a few areas that are seeing an uptick in digital payments by way of increased adoption during the lockdown. These include online grocery stores, online pharmacies, OTT players (telecom and media), EdTechs, online gaming, recharges and utility/bill payments.

Consumer payment behaviour has also changed because of the corona virus epidemic, and the level of use of digital payment methods has increased during the COVID-19 epidemic. Consumers make online and mobile payments to buy food and other products, as well as to pay for daily necessities, and some of them have adopted the practice for the first time during the epidemic. In this context, the use of digital and contactless payment methods has increased against the background of the COVID-19 outbreak. According to the Report "*COVID-19 Impact on Global E-Commerce & Online Payments - 2020*" (Research And Markets, 2020) almost 50% of consumers use digital payments more than before the pandemic. The tendency is to maintain this trend through Electronic wallets and contactless cards, that are the top payment methods used as a result of this change, as consumers use less cash and make more purchases online. In an international survey cited in the aforementioned report, nearly three-quarters of Respondents reported that contactless was a "cleaner" way to pay in stores, so contactless payments received an unprecedented boost during the pandemic, with consumers also trying new payment methods

while shopping online. e-commerce and prefer the methods that have the strongest protection against losses caused by fraud. on e-commerce sites during the pandemic, consumers mainly use payment cards and e-wallets. Although there is also a strong variation in how shoppers in different countries pay online, payment security has been the main criterion applied by online shoppers when selecting their payment method.

3. THE ECONOMIC IMPLICATIONS OF THE COVID-19 PANDEMIC ON NATIONAL ELECTRONIC PAYMENTS SECTOR

The ongoing spread of COVID-19 has become one of the biggest threats to the global economy and financial markets. To contain the impact of the coronavirus outbreak, Republic of Moldova, like many countries across the globe, has taken several measures, including a nationwide lockdown; limiting movement of the entire population; shutting down public places and transport; and urging the public to stay indoors, maintain social distance, and work from home.

The digital payments sector of the Republic of Moldova is no exception. Below is the information, for each payment instrument, on the trends recorded during 2020, as well as their evolution prospects based on the "*Report on the evolution of financial market infrastructures in the Republic of Moldova – year 2020*" of National Bank of Moldova (NBM).

3.1. Credit transfer

Out of the total number of payment transactions made through credit transfer initiated by banks' customers (18.4 million transactions), 86.8 percent were initiated electronically through Automated Remote Service System (ARSS), which reflects the degree of digitization of payment services in the Republic of Moldova.

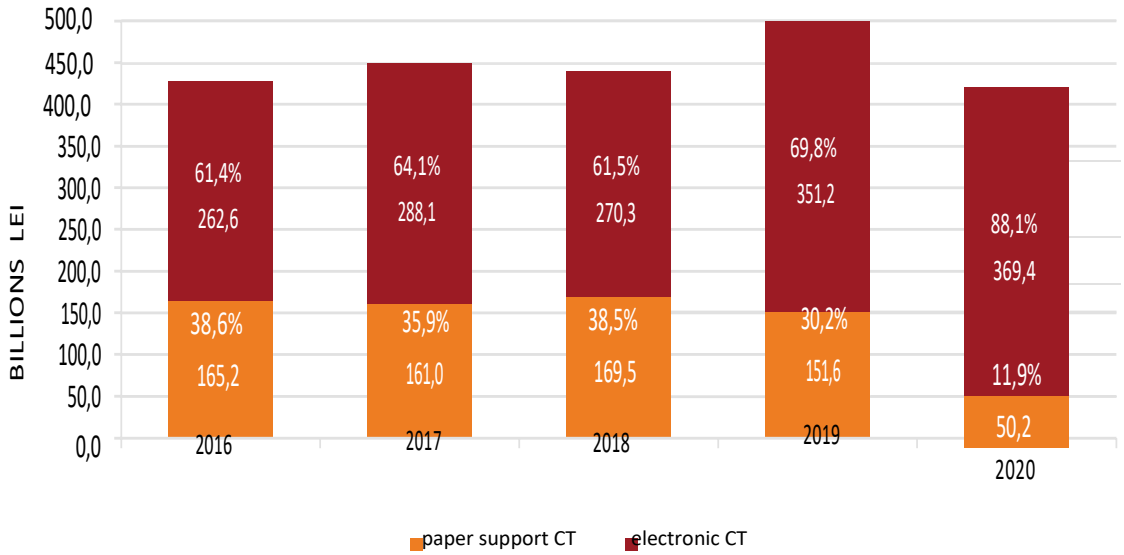

Figure 1. The evolution of Credit Transfer digitization depending on the value of operations
Source: NBM website - Report on the evolution of financial market infrastructures in the Republic of Moldova – year 2020

The value of the operations performed through the credit transfer initiated by the banks' clients amounted to 419.5 billion MDL, of which:
→ 88.0% - in electronic format;
→ 12.0 % - on paper.

3.2. Direct debit

Although the experience of some countries reveals that, direct debit can be a convenient and fast way to make periodic payments, this payment instrument is not popular among payment service users in the Republic of Moldova. During 2020, through direct debiting, 170.7 thousand transactions were made in the total amount of MDL 116.6 million. MDL, up by 30.6 percent and by 73.6 percent

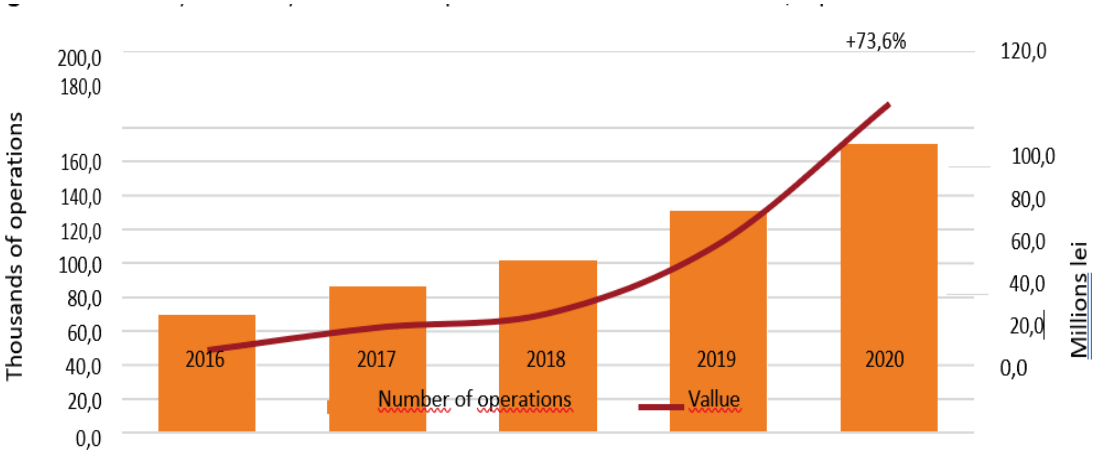

Figure 2. The evolution of transactions performed through direct debit, in the period 2016-2020

Source: NBM website - Report on the evolution of financial market infrastructures in the Republic of Moldova – year 2020

The total number of users of this tool at the end of 2020 was 14.4 thousand people, twice as much as the previous year. Most of them are individuals who use direct debit, mainly, for the payment of utilities.

3.3. Payment cards

The payment card saturation indicator in the Republic of Moldova reached the level of 0.8 at the end of 2020. Thus, according to this indicator, 4 out of 5 inhabitants of the Republic of Moldova hold a payment card. For comparison, at the end of 2019, the EU average was 1.7 cards per capita.

At the end of 2020, the number of cards in circulation issued by payment service providers in the country reached the amount of 2.18 million units

According to the technical solution, the proximity cards constituted 89.2 percent of the total number of cards issued during 2020 and 80.2 percent of the total share of cards in circulation.

Over the past four years, the number of proximity cards has increased by about 5 times, which has contributed to the gradual replacement of hybrid cards which, in turn, have previously substituted magnetic stripe cards.

Social cards are the category with the lowest share in the total of cards in circulation, but with the highest rate of active cards (80.1 percent of the total social cards in circulation). If initially, users perceived social cards as a tool for withdrawing cash from transfers of social benefits, gradually the trend of using social cards is increasingly taking shape in cashless payments. The share of cashless payments in the total number of transactions made with social cards increased in just 3 years from 44.9 percent in 2018 to 61.4 percent in 2020, thus approaching the general share of Non Cash Payments (NCP) to 73.2 percent.

Article name	Year 2020		Year 2019		Evolution in dynamics 2020 / 2019
	number of units	structure %	number of units	structure %	%
Number of cards in circulation at the end of the analyzed period - total	**2 182 076**	**100%**	**2 012 566**	**100%**	**8,4%**
a) issued under the system:					
card issued under "Visa International" trademarks	1 157 583	53,0%	1 052 648	52,3%	10,0%
card issued under "MasterCard WorldWide " trademarks	1 021 182	46,8%	954 485	47,4%	7,0%
card issued under "American Express" trademarks	3 311	0,2%	5 433	0,3%	-39,1%
b) by source:					
debit card	2 132 707	97,7%	1 968 003	97,8%	8,4%
credit card	49 369	2,3%	44 563	2,2%	10,8%
c) by "conditions of issue" feature					
personalized card, issued based on salary projects	961 321	44,1%	979 507	48,7%	-1,9%
personalized card, issued based on social projects	395 033	18,1%	396 471	19,7%	-0,4%
personalized card, issued in general conditions	765 287	35,1%	598 628	29,7%	27,8%
personalized card *	60 435	2,8%	37 960	1,9%	59,2%
prepaid card	0	0,0%	0	0,0%	0,0%
d) by the type of technical solution					
proximity card (contactless)	1 748 825	80,1%	1 392 338	69,2%	25,6%
hybrid card	428 492	19,6%	610 757	30,3%	-29,8%
magnetic stripe card	2 580	0,1%	7 025	0,3%	-63,3%
virtual card	2 179	0,1%	2 446	0,1%	-10,9%
e) by cardholder tipe					
personal card	2 164 607	99,2%	1 999 146	99,3%	8,3%
Business card	17 469	0,8%	13 420	0,7%	30,2%
f) by level of use					
active card **	**1 324 843**	**60,7%**	**1 227 675**	**61,0%**	**7,9%**
salary	649 476	67,6%	633 127	64,6%	2,6%
social	316 442	80,1%	294 561	74,3%	7,4%
general	334 517	43,7%	279 109	46,6%	19,9%
personalized	24 408	40,4%	20 878	55,0%	16,9%
Inactive card	857 233	39,3%	784 891	39,0%	9,2%

Figure 3. The evolution of transactions performed through direct debit, in the period 2016-2020
Source: NBM website - Report on the evolution of financial market infrastructures in the Republic of Moldova – year 2020

In 2020, cash withdrawal operations constituted 38.6 percent out of the total number of operations performed with social cards, but these represented 80.0 percent of the total operations performed. While the number of cash withdrawals has remained roughly constant over the past 3 years, the number of cashless payments has increased 2.2 times.

In 2020, NCP made with the cards issued in the Republic of Moldova amounted to 70.3 bn. payments of 21.8 bn MDL. These operations increased by 38.0 percent in number and 26.5 percent in value compared to the previous year. At the same time, their share constituted 73.2 percent of the total number of operations performed and 28.8 percent of the total value.

The number and value of domestic cashless payments maintain a steady upward trend throughout the analysis period. For 2020, there was an increase of 56.3 percent in number and 54.6 percent in value compared to 2019, respectively.

The increase in the value of cash withdrawals is correlated with the increase in cash in circulation.

In 2020, were made 11.0 million transactions worth 4.8 ml. MDL with payment cards issued by payment service providers from the Republic of Moldova., through e-commerce platforms both in the country and abroad, a number that has registered a slight evolution during the last year. , 75.6 percent of the total number of payments were made on e-commerce platforms offered by payment service providers abroad, which denotes the appetite of users to use e-commerce according to the size and diversity of the available acceptance network.

Indicatori			2020	2019	Evolution	Nr. per 1000 inhabitants	
						RM	EU average**
Special devices	Self-serve terminals	ATM	1 120	1 137	-1,5%	0,4	0,8
	POS terminals	located at merchants	21 234	18 057	17,6%	9,0	32,7
		including contactless	*18 383*	13 393	37,3%		
		located at banks	2 493	2 460	1,3%		
		including contactles	*438*	422	▲ 3,8%		
	e-commerce platforms*		525	408	▲ 28,7%	n/a	n/a
Total:			**25 372**	**22 062**	▲ **15,0%**		

Figure 4. Acceptance Network in the Republic of Moldova[1]

Source: NBM website - Report on the evolution of financial market infrastructures in the Republic of Moldova – year 2020.

The indicator reflecting the number of cashless payments per capita is constantly increasing. If in 2015, on average, each inhabitant of the Republic of Moldova received 3 non-cash payments per year, in 2020 this indicator reflects 26 non-cash payments.

Contactless terminals registered the most important growth rate compared to the same period of last year, as an indicator of the efforts of the commercial points to increase comfort and efficiency in payment for customers.

With the limitation of physical access to the trading points during 2020 and the increase in the need to shop in the online environment, the number of e-commerce platforms increased by 28.7 percent, reaching the figure of 525 platforms at the end of 2020.

In the last 5 years, the indicator reflecting the number of POS terminals per thousand inhabitants has improved. Thus, if in 2015, per thousand inhabitants of the Republic of Moldova there were only 4 POS terminals, in 2020 this indicator reached the value of 9 terminal POS per thousand inhabitants.

4. CONCLUSION

Therefore, we can conclude that the corona virus epidemic not only transforms the way consumers buy, but also the way they pay for their purchases. In this context, the use of digital and contactless payment methods has increased against the background of the COVID-19 outbreak. Contactless cards are the top payment methods used as a result of this change, as consumers use less cash and make more purchases online. As a result, the payments market has undergone a rapid transformation due to the need to develop new payment technologies and solutions.

[1] * software solution that allows the acceptance of payment cards in the online environment
** - for 2019

Digital payments, once a convenience, have become a necessity in these times. With a majority of the sectors that contribute to digital payments still in a state of flux, it is still too early to ascertain the long-term impact of COVID-19 on digital payments.

With economic growth expected to be severely hit, the financial outlook of the digital payments sector is no different and will follow a similar trajectory, at least in the short term. But the industry's stability and potential for innovation will play an invaluable role in rebooting the economy in the new normal.

The effects of COVID-19 during the pandemic period and the latest developments have conditioned the emergence of important challenges in terms of the development of the payments market and the increasing use of non-cash payment instruments. Thus, the stability and innovation potential of the digital payments industry will play an invaluable role in restarting the economy in the new normal

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THE ROLE OF UNIT TESTING IN TRAINING

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Abstract: *The main priority of any modern software company is to improve the quality of the software. This can be achieved by preventing software defects, i.e. Software Testing (ST) applied by well-trained programmers. This puts before each university the task of professional training of students to master theoretical and practical aspects related to various techniques, strategies and methods in the field of ST. The ultimate goal is the creation, implementation, analysis and subsequent maintenance of the software.*

Key words: *Software Development Life Cycle, Unit Testing, Design Patterns, Anti-Patterns, SQL Server, Software Testing*

JEL CLASSIFICATION: O3

1. INTRODUCTION

The topic of the Software Testing (ST) is relevant. Currently, the funds that a company spends on testing reach 40% of the company's total Internet Technology (IT) budget. A number of authors comment on the need to create, implement and automate software testing in their works (Dustin, 2009), (Nelson, 2006), (Helfen, 2007), (Dustin, 2002), (Phillip, 2010), (Dustin, 2001). However, it is related to some problems, which the authors of (Ammann, 2008) comment on. For example, as early as 1990 year, Beizer noted that: "half of the work spent on developing a work program is spent on testing activities." In 2002 year, Hailpern and Santhanam commented that: "debugging, testing, and verification activities vary between 50% ÷ 75% of the total development costs." In 2008 year, Redmond Developer News wrote that: "those developers spend about 20% of their time designing and coding, and the rest of the time is spent fixing application problems". Everything described is proof of the need to learn, creating and implementing strategies and technologies for automated software testing, to improve software performance and quality. This can only be achieved with experienced, well-known to the standards certified programmers who undergo a training course at the university to acquire the necessiry knowledge and skills in the field of ST.

2. SOFTWARE TESTING - DEFINITION. SOFTWARE DEVELOPMENT LIFE CYCLE. CLASSIFICATION

Software testing (ST) is a phase of the Software Development Life Cycle (SDLC).

Table 1. Classification of Life Cycle Models (Maneva, 2001)

<table>
<tr><td rowspan="8">Full</td><td rowspan="5">One-dimensional</td><td rowspan="4">Chronological</td><td rowspan="2">Standard</td><td>Fight</td></tr>
<tr><td>Metzger</td></tr>
<tr><td>Freeman</td></tr>
<tr><td rowspan="2">Modified</td><td>Cascading</td></tr>
<tr><td>Prototype</td></tr>
<tr><td>Branched</td><td>Fox</td></tr>
<tr><td colspan="3">Functional (Hamilton-Celdin)</td></tr>
<tr><td rowspan="3">Multidimensional</td><td colspan="3">2D (Gunther)</td></tr>
<tr><td colspan="2" rowspan="2">Three-dimensional
(Peter-Trip)</td><td>Evolutionary</td></tr>
<tr><td>Spiral</td></tr>
<tr><td>Partial</td><td colspan="4">(Appleton) for multiple use</td></tr>
</table>

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ST includes processes related to research, evaluation and establishment of the completeness and quality o computer software. ST guarantees the compliance of the software product in relation to regulatory, business, technical, functional and user requirements. (Maneva, 2001) The purpose of testing processes related to software research and verification may be in relation to: Functionalities / business requirements - checking the full version of the software; Creation of software for errors - identification of technical errors; Assess usability, performance, security, localization, compatibility and installation and review others. The software is considered complete or usable only if it has passed each test. ST starts with a requirements collection phase and reaches the implementation of the software. ST depends directly on the model used. Certain SDLC are listed in Table 1. Upon detailed examination of the life cycle models (Maneva, 2001), (Sommerville, 2011) it is noticed that the testing phase is present in each of them, directly depending on the object and objectives of testing. In Table 2 an attempt is made to summarize them by registering 8 classification groups.

Table 2. Generalized Classification Based On Literature Sources

Classification № 1 (Maneva, 2001)	**Classification № 5: Machine learning in software testing-framework dimensions (Noorian, 2011)**
1.1.According to the selected test data and expected results 1.2.According to the level of testing 1.3.Depending on whether or not the internal structure of the software is ignored 1.4.According to the purpose 1.5.Specific types of testing 1.6.According to the submitted value of the input data	5.1.Testing Category 5.2.ML Category
	Classification № 6: Software testing (Jacob, 2016)
	6.1.Unit Testing 6.1.1.Black Box Testing 6.1.2.While Box Testing 6.2.Integration Testing 6.3.System Testing
Classification № 2: According to testing methods (Kiran, 2016), (Kalin, 2010)	**Classification № 7: Static and Dynamic Testing (Functionize, 2018)**
Classification № 3: According to the level of testing (tutorialspoin, 2021)	7.1.Static 7.1.1.Review 7.1.2.Static Analysis 7.2.Dynamic 7.2.1.Functional Testing 7.2.2.Non-Functional Testing
3.1.Functionally 3.2.Non-functional	
Classification №4 (Georgi, 2020)	**Classification № 8:** Manual and automated testing (SDA, 2020)
4.1. Functional and Non-functional Tests 4.2. Black Box Testing (BBT) Techniques 4.3. White Box Testing (WBT) Techniques 4.4. Strategy for conducting BBT (Black Box Testing) 4.5. Strategy for conducting WBT	

3. MANUAL AND AUTOMATED TESTING. STANDARDIZATION AND CERTIFICATION

3.1. Manual and Automated testing

According to classification 8 of Table 2 STs are divided into Manual and Automated. Manual testing is testing without the use of an automated tool or script. The tester is the end user. The stages for manual testing are: modular, integration, system and user acceptance testing. Automated testing, also known as Test Automation, is performed by a tester who writes scripts and uses other software to test the product. Test Automation is used to restart test scenarios that have been run manually, quickly, and repeatedly. The tools used in this test are (SDA, 2020), (Dustin, 2014), (myservername, 2021): HP Quick Test Professional; Selenium; IBM rational function tester; SilkTest; TestComplete; Testing everywhere; WinRunner; LoadRunner; Visual Studio Test Professional; WATIR. The main advantage of automation over manual testing is resource saving. Early start of the testing phase reduces the time for processing and production of error-free software delivered to the end customer. By reducing manual testing efforts, by increasing testing coverage (e.g., memory leak detection under specific conditions, parallelism test, performance test, etc.), development tools will also be reduced.

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3.2. Standardization and certification

In connection with dealing with the above problems, software development companies often create and develop software testing standards themselves. In (IEEE, 2013) some known standards for software improvement are presented. For example, ATRT Display Automation (Dustin, 2014) specializes in automated software testing, including recording / recording and playback. The software allows them to automate the actions of the test engineer. To perform actions during testing, a tool is used that captures actions and information from the screen, which are based in an automated test script. During the test playback, the latest results are compared with the base results, using VNC technology - for remote connection to the tested system. The creation and implementation of software testing is done by experienced programmers. The staff is created by the university, where the precise selection of disciplines in the ST direction leads to the creation of well-trained staff for the practice. A number of other institutions offering certification on the basis of acquired experience and practice also provide an opportunity for raising the qualification of programmers. Some of the certificates that are issued as a result of proving competencies when taking an exam in the field of software testing are listed in (myservername, 2021). This ensures that experienced, certified professionals familiar with the standards and able to apply them will be preferred in the labor market.

4. FACTORS FOR SUCCESSFUL ST. AUTOMATED TEST TOOLS

4.1. Factors for a successful ST

The success of a software test depends on a number of factors, the most important of which are: Teamwork and involvement of testers in each stage of software development; Performing tests throughout the life cycle, not just by the QA team; Joint work of testers and developers, i.e. DevOps Shift-Left Practice; Implementing a flexible testing process, by automating the workflow; Availability of experienced staff; Application of functional testing; Workflow testing using different approaches, such as: dividing the tests into small fragments; application of regression testing; automation of software testing, applying various technologies, such as: Open source automation tools to be installed in the system, such as the cloud-based LambdaTest platform. It is among the leading tools for test automation for 2021. (Arsie, 2019)

4.2. Automated Test Tools

There are a variety of tools that are used to automate tests. For 2021 year, according to (myservername, 2021), among the first 10 instruments are: LambdaTest; TestComplete; QMetry Automation Studio; TestProject; Catalon Studio; testigma; Worksoft; QUALIBRATE; TWENTY ONE - Autonomous connection of testing and production; basis. For 2021 year, there are also test management tools according to (myservername, 2021) among the top 10 best tools are: Marshmallow Scale; PractiTest; GetZephyr; Collab's test; TestFLO for JIRA; XQual; Xray - Control of test edges; TestRail; Quality; Jira (RTM) Test Requirements and Management. Another classification for 2021 year according to (guru, 2021) indicates that Best Software Testing Services: Testio; QAlifed; Capgemini.

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5. UNIT TESTING CONCEPTS, ADVANTAGES, FEATURES

5.1. Unit testing concepts

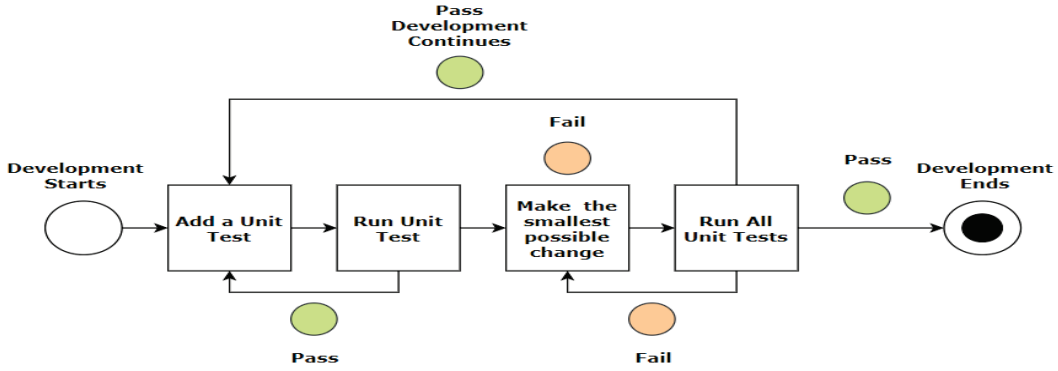

Figure 1. Unit test workflow diagram

To ensure the quality of the software, a number of traditional forms of testing are used, automated or manual forms are used to validate the behavior of the developed software. There are also various tests for loading the system, as well as tests with the participation of the user, which is a guarantee that the system works as the customer expects. The Unit test, unlike all the tests listed, focuses on a lower level. This type of testing belongs to the white box testing, which is based on the internal structure of the system. It is a functional test whose main purpose is to test the smallest "unit" of code. The Unit test is usually written in the same programming language as the source code of the application itself and is written to verify / test this code directly. In fact, the Unit test is generally code that tests another code. (manning, 2021) From the graph of Figure.1. the workflow of the Unit test can be traced.

5.2. Advantages of the Unit test (Khorikov, 2020)

- Saves money to compensate for the time spent on debugging at a later stage of system development;
- Allow restart, after a change has been made, which corresponds to the correctness of the data that meet the requirements;
- Storage of the test in the source near the code, convenient for checking and facilitating the synchronization of the main code and the test; belongs to the regression tests, which allows re-testing of part of the code, with added new functionality;
- Provides quality control when correcting errors in program code;
- Unit test can be created and run in Visual Studio development environment.

5.3. Features when creating a Unit test:

- Each Unit test adheres to the so-called model AAA (Arrange-Act-Assert). This is a model for structuring tests. According to it, the Unit test is divided into three parts - Arrangement (Setting), Action and Validation (Verification), and each of these parts is a step leading to the next. Step 1 is Stacking sets the input values of the test. Step 2 is Action, prompts the main function to be tested. Step 3 is Validation. The last third step confirms that the output of the function is what is expected. These parts are actually objects.
- In order to identify classes in the Unit test, the [TestClass] attribute must be added, through which the Unit methods are recognized.
- The Unit test method must be public, non-static, not accept parameters and not return a value. The TestMethod attribute must be added to distinguish the test from the regular method.

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- A Unit test is successful or unsuccessful according to the thrown exception, if no exception is created; the test is successful, only the ExpectedException attribute makes an exception.
- The Assert.AreEqual method in the third part of the AAA model is used to compare between two values - the one expected by the programmer and the one generated by calling the created method. If they do not match, an exception is thrown that indicates the test failed. When starting the project, the result appears in a window. It can be in three variants successful, marked with a green mark, unsuccessful, marked with a red, unconvincing, marked with a question mark.
- The management and conduct of tests is done through Test Manager and Test View. The test view allows quick selection to run a test, with the option to group by name, project, type, class name and other criteria. The test manager offers the same features as Test View, but with additional options for displaying tests. You can organize a list of tests, filter tests and more.
- If it is necessary to configure a resource (i.e. connection to a database, log file, shared object) it may be necessary to clean up the actions of the tests, which is reduced to closing a shared stream or returning a transaction. Unit Test Framework offers attributes to identify such methods, as they are grouped into three levels: Test, Class, and Assembly, these levels determine the scope and execution time of the methods. Details of these attributes are provided in Table 3.
-

Table 3. Unit Test of Framework (manning, 2021)

Attributes	Frequency and Scope
TestInitialize, TestCleanup	Executed before (Initialize) or after (Cleanup) any of the class's unit tests are run
ClassInitialize, ClassCleanup	Executed a single time before or after any of the tests in the current class are run
AssemblyInitialize, AssemblyCleanup	Executed a single time before or after any of the tests in any of the class's unit tests are run

- Methods with the specified attributes do not have to appear in the test, but more than one attribute is not allowed in this context.
- In addition to the methods listed in the Unit tests, the following are also used:
- The method Assert.AreEqual and Assert.AreNotEqual, Assert.AreSame and Assert.AreNotSame, Assert.IsTrue and Assert.IsFalse, Assert.IsNull and Assert.IsNotNull, Assert.IsInstanceOfType and Assert.OsN
  - classes CollectionAssert, StringAssert, TestContext;
  - PrivateObject to access non-public instance members;
  - PrivateType for accessing non-public static members

6. UNIT TESTING IN TRAINING

One of the main sections studied in the disciplines of Software Technologies and Technologies for Software Production at the Technical University in Varna is Software Testing. In order to apply the acquired theoretical knowledge in these disciplines in the field of ST, in practice, in the laboratory, exercises were created 5 Unit tests, oriented to one of the most common problems in software development, namely for: mathematical methods; access to a private variable; to work with databases, specifically with SQL server; Design Patterns and Anti-Patterns.

Test №1 was performed in 5 variants, each of which is described in 4 main steps:

- Step 1: Generate code (interface / class / method) to be tested;
- Step 2: Create a Unit test on the generated code from Step 1;
- Step 3: Execution and visualization of the result of the performed Unit test;
- Step 4: Analysis and conclusions from the Unit test.

Tests №2 and №4 are presented only with Unit test. Tests №3 and №5 are implemented by basic code and Unit test.

Table 4. Unit tests

Test 1: Unit test for mathematical methods. Create a Unit test using the AAA model to test a method of Adding two real numbers

Option 1

Step1:
1.Create a Calculator class.
2.Add Sum method to implement mathematical operation Addition.

```
public class Calculator
{
   public double Sum(double num1, double num2)
   {
      return num1 + num2;
   }
}
```

Step2:
1.Create a project from the Test / Unit Test Project menu
2.Add class CalculatorTests to the Unit test, following the AAA template.

```
public class CalculatorTests
{
   [Fact]
   public void Sum_numbers()
   {
      // Arrange
      double num1 = 1;
      double num2 = 2;
      var calculator = new Calculator();
      // Act
      double result = calculator.Sum(num1, num2);
      // Assert
      Assert.Equal(3, result);
   }
}
```

Option 2

Step1:
1.Create a dll file using Class Library.
2.Create a Calculator class.
3.No Sum method to implement mathematical addition operation.

Step2:
1.Create a project from the menu Test / UnitTestProject1. Create a CalculatorTests class.
2.Add the created dll file from the menu References / Add Reference.
3.Observance of AAA, when observing the Unit test.

Option 3 – the ICalculate interface is added to the specified condition in Test 1

Step1:
1.Create a Calculate interface.
2.Create a Calculator class that inherits the ICalculate interface.

```
interface ICalculate
   {
      double ADD(double a, double b);
   }
```

Step2:
1.Create a project from the menu Test / UnitTestProject1. Create a CalculatorTests class.
2.Add a void TestSet () method.
3.Adding method void TestMethodADD ()
4.Compliance with AAA, when complying with the Unit test.

```
[TestClass]
   public class CalculatorTests
   {
      ICalculate calulate;
      [TestInitialize]
      public void TestSet()
      {
         calulate = new Calculate();
      }
      [TestMethod]
      public void TestMethodADD()
      {
         double res = calulate.ADD(1, 1);
         Assert.AreEqual(2, res);
      }
   }
```

Option 4

Step1:
1.Create a dll file using Interface Library - ICalculate.
2.Create a Calculator class that inherits the ICalculate interface.

```
interface ICalculate
   {
      double ADD(double a, double b);
   }
```

Step2:
1.Create a project from the menu Test / UnitTestProject1. Create a CalculatorTests class.
2.Add the created dll file from the menu References / Add Reference.
3.Add a void TestSet () method.
4.Adding void TestMethodADD () method
5.Compliance with AAA, when complying with the Unit test.

```
[TestClass]
   public class CalculatorTests
   {
      ICalculate calulate;
      [TestInitialize]
      public void TestSet()
      {
         calulate = new Calculate();
      }
      [TestMethod]
      public void TestMethodADD()
      {
         double res = calulate.ADD(1, 1);
         Assert.AreEqual(2, res);
      }
   }
```

Option 5 - Three new methods are added to the specified condition in Test 1: Subtraction, Multiplication and Division.

Step1:
1.Create a Calculator class.
2.Add Sum method to implement mathematical operation Addition.
3.Add Subtraction method to implement mathematical operation Addition.
4.Adding a Divide method to implement a mathematical addition operation.
5.Adding Multiply method for realization of mathematical operation Addition.

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;
namespace UnitTestProject1
{   public class Calculator
    {   public double Sum(double num1, double num2)
        {  return num1 + num2;  }
        public double Subtraction (double num1, double num2)
        {  return num1 - num2;  }
        public double Divide(double num1, double num2)
        {  return num1 / num2;  }
        public double Multiply(double num1, double num2)
        {  return num1 * num2;  }
    }
}
```

Step2:

```
using System;
using Microsoft.VisualStudio.TestTools.UnitTesting;
namespace UnitTestProject1
{   [TestClass]
    public class CalculatorTests
    {  [TestMethod]
       public void Test_SumMethod()
       {
          double num1 = 1; double num2 = 2;
          var calculator = new Calculator();
          double result = calculator.Sum(num1, num2);
Assert.AreEqual(3, result);  }
       [TestMethod]
       public void Test_SubstractMethod()
       {
          double num1 = 1; double num2 = 2;
          var calculator = new Calculator();
          double result = calculator.Substract(num1, num2);
Assert.AreEqual(-1, result);  }
       [TestMethod]
       public void Test_DivideMethod()
       {
          double num1 = 1; double num2 = 2;
          var calculator = new Calculator();
          double result = calculator.Divide(num1, num2);
Assert.AreEqual(0.5, result);  }
       [TestMethod]
       public void Test_MultiplyMethod()
       {
          double num1 = 1; double num2 = 2;
          var calculator = new Calculator();
          double result = calculator.Multiply(num1, num2);
Assert.AreEqual(2, result);  }
    }
```

Step3:
1.Visualization of the result of the performed Unit test in the Test Explorer panel.

Step4:
The tested method is presented with a colored icon, test name and execution time. The color of the icon depends on the output of the test. If it is successful, it is green, otherwise it is red. If the color of the test method icon is red, the test method is corrected and executed again.

Step 3 and Step 4 are the same for all Options from 1 to 5 in Test 1

Test 2: Create a Unit test for access a private variable

Coding:

```
namespace TestLib
{
   public class TestClass
   {
      private int _idClass;
      private string _nameClass;
      public TestClass()
      { }
      public TestClass(int IdClass, string NameClass)
      {
         this._idClass = IdClass;
         this._nameClass = NameClass;
      }
   }
}
```

Unit Testing:

```
using System;
using Microsoft.VisualStudio.TestTools.UnitTesting;
using TestLib;
[TestClass]
   public class UnitTest1
   {
      [TestMethod]
      public void TestMethod()
      {
         //Arrange
         int _idClass = 1;
         string _nameClass = "Eva Planck";
         //Act
         TestClass newTestClass = new TestClass(_idClass, _nameClass);
Microsoft.VisualStudio.TestTools.UnitTesting.PrivateObject pObject =
            new Microsoft.VisualStudio.TestTools.UnitTesting.PrivateObject(newTestClass);
         // Assert
         Assert.AreEqual<int?>(_idClass, pObject.GetFieldOrProperty("_idClass") as int?);
         Assert.AreEqual<string>(_nameClass, pObject.GetFieldOrProperty("_nameClass") as string);
      }
   }
```

Test 3: To create a Unit test SCRIPT, for SQL server DataBase University with the following tables:
University (IDUniversity, Name)
Department Department (IDDepartment, Name, IDUniversity)
Specialty Specialty (IDSpeciality, Name, IDDepartment, Degree, Year, Languages, AnnualFee)
1. To enter data in University, Department and Specialty tables
2. Processing AddToDepartment @ IDSpeciality = 01, @ IDDepartment = 001
3. Filtering records in the Department table by criteria IDDepartment = 001

Unit Testing:

```
//Arrange
INSERT INTO dbo.University (IDUniversity, Name)
VALUES (5, "TU-Varna");
INSERT INTO dbo.Department (IDDepartment, Name, IDUniversity)
VALUE (51, "SIT", 5);
INSERT INTO dbo.Speciality (IDSpeciality, Name, IDDepartment, Degree, Year, TypeOfTraining, Languages, AnnualFee)
VALUES (511, "SIT", 51, bachelor, 4, regularly, AEO, 3000);

//Act
EXEC dbo.AddSpecialityToDepartment @IDSpeciality=01, @IDDepartment=001;

// Assert
SELECT * FROM Department WHERE IDDepartment=001;
```

Test 4: Create a Unit Anti Patterns test – Liar (manning, 2021)

Unit Testing:

```
[Fact]
public void ReturnEmptyForNegativeInputs()
{
   //Arrange
   var ResultExpected = 200;
   var sut = new Calculator();
   //Act
   var result = sut.Sum(100, 100);
   //Assert
   Assert.Equal(ResultExpected, result);
}
```

Test 5: Create a Unit Design Patterns test

Coding:

```
public class Zoo
{
  public void Birds ()
  {
    Helper.Instance().DoIt();
  }
}
public class Zoo
{
  private readonly IHelper _helper;
                public Zoo()
                {
                  _helper = Helper.Instance();
                }
                public Zoo(IHelper helper)
                {
                  _helper = helper;
                }
                public void Birds()
                {
                  _helper.DoIt();
                }
}
```

Unit Testing:

```
using Xunit;
using Moq;
public class ZooTests
{
   [Fact]
   public void Birds_Invokes_Helper()
   {
      var mock = new Mock<IHelper>();
      mock.Setup(x => x.DoIt());
      var zoo = new Zoo(mock.Object);
      zoo.Birds();
      mock.VerifyAll();
   }
}
```

DPs provide a solution to a specific programming problem, in a specific context, that can be used in many other different situations. (Paul, 2012)

As a result of insufficient experience or knowledge in solving a certain type of problems or using a well-established template in the wrong context, opposites of Software Design Patterns (SDPs) arise, etc. Anti-Patterns. Like any other program code, Anti-Patterns are tested. (manning, 2021) Anti-Pattern Unit tests are: Loudmouth, Greedy Catcher, Sequencer, Enumerato, Liar and others. The Liar is a single test that works and does not fail. Unfortunately, he does not test what he claims to test. What is characteristic of it is that its name is misleading because it bears the name of a certain class / method, but in reality it tests another class / method. The actual Liar gives a false sense of security. For example, if you test a method called ReturnEmptyForNegativeInputs designed to test negative values, it tests only positive values and the statement checks the result of the sum and the test is successful, although there is a discrepancy in what the test describes in its name. Ie the test is correct, although it tries to prove a completely different statement. There are two ways to correct this Unit test of the Lear Anti-Patterns: Updating the test name to a name that corresponds to the performance; Changing the performance of the test to match the name of the test. The conclusion is that the Liar is one of the most harmful TDD Anti-Patterns. It gives a false sense of security because it lies behind the test. Therefore, it is difficult to find the error in the code itself. To avoid this problem when creating / updating modular tests, you should always check that the test performance matches its name.

7. CONCLUSION

The article discussed the main problems in software development and pointed out the need for training in the field of software testing. Chapter 2 described ST as a phase of the software life cycle that is present in every software model. Two classifications were presented: of software models and of ST according to the literature. Chapters three and four described the advantages of automatic over manual testing and the possibilities for a successful ST, as well as automated testing tools. Chapter 5 discussed the concepts, benefits, and characteristics of ST. And in the last sixth experimental chapter were included 5 single tests, focused on one of the most common problems in software development, namely: mathematical methods; access to a private variable; to work with databases, in particular with SQL server; Design Patterns and Anti-Patterns. Test №1 was performed in 5 variants, each of which is described in 4 main steps: Code generation (interface / class / method) for testing; Create a Unit test of the generated code from Step 1; Execution and visualization of the result of the performed Unit test; Analysis and conclusions from the Unit test. Tests №2 and №4 are presented only with Unit test. Tests №3 and №5 are performed using a master code and a Unit test.

In conclusion, it can be said that by mastering the theory and realizing the practical tasks, students increase their competence in the field of software testing, and in particular to one of the most common types of testing, namely Unit test.

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THE ROLE OF MOBILE APPLICATION IN ADOLESCENT DEVELOPMENT. EXISTING METHODS AND GOOD PRACTICES FOR CREATING MOBILE HEALTH APPLICATIONS

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Abstract: *The use of mobile phones and tablets is becoming more and more widespread in people's daily lives. More and more applications have already been created for mental health interventions, for personal management and for motivating users to self-organize. The science of human-computer interaction emphasizes the understanding of end-user needs and is the first step in designing these types of technology-based interventions. In this article a profile of the adolescent and the accompanying problems will be made. The purpose of technology-based interventions and their use by adolescents will be described. Techniques, taxonomies and the application of behavioural design and behavioural models in the development of digital applications will be presented.*

Key words*: mobile applications, UX, adolescents, Behavioural Design, behaviour change, Behavioural change theory*

JEL CLASSIFICATION: O3

1. INTRODUCTION

Continuous consumer desires for self-development and growth enable the end user to desire more products and services in which behavioural design plays an important role. Many people are interested in how they can focus on better wealth, health and happiness.

Digital technologies allow the transition from passive users to a specific experience to a flexible space that offers activity and creativity. Behavioural systems design can provide entirely new levels of impact.

Behavioural design, science, and analysis have evolved over the past decade and are used in many academic studies, economics, politics, design applications, and in many cases are used in industry. Behavioural design intersects with several policy areas, including healthcare, technology, business and research, leading to multidisciplinary collaboration in academia and industry.

Behavioural design has sparked a heated debate over the last ten years about the ethics of certain behaviour change techniques in public policy, the technology industry, and research design [3]. The last ten years have shown the enormous power of applied behavioural science with its advantages and disadvantages, and with its dark and light sides.

Technologies such as tablets, mobile phones and other wearable devices allow tracking and processing of data in combination with the ability to care for patients at the right time and place [3]. They adapt to the changing needs of the individual over time and are more like support provided by an effective health care provider, counsellor or coach. A type of support that can otherwise occur in meaningful face-to-face interactions. Behavioural design is relatively unused in healthcare, but it is high time to use it in this area [3].

This article will briefly look at the development of healthy adolescents and the problems that arise in the process of their growth. The impact and use of technology by adolescents and their importance for adolescents and people with chronic diseases. A study was made and presented on existing techniques, methods and models of behavioural design for the development of mobile applications.

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2. THE PROCESS OF DEVELOPMENT OF ADOLESCENCE AND THE ACCOMPANYING PROBLEMS DURING THIS PERIOD

During adolescence, identity is built and plans for the future are drawn.

Teenage years are essential for cognitive control [12]. Because the prefrontal lobe is still poorly connected to other areas of the brain, adolescents find it more difficult to exercise cognitive control over situations [11]. Because of the stronger positive emotions, it is much more likely to take risky actions.

The focus requires an abstraction from emotional disorders and an emotional suppression scheme, which adolescents have not yet learned due to hormonal problems and the inability to still control their body. Under stress, the nervous system is flooded with the hormones cortisol and adrenaline, which leads to emotional exhaustion. High levels of cortisol lead to increased aggression and impulsivity. Then the focus is on worries, not work. [12] Full focus is not always available to teenagers due to hormonal imbalances [12].

"According to the WHO, 16% of children and adolescents between the ages of 10 and 19 in the world have mental disorders. Half of the mental illnesses occur around the age of 14, three quarters to the age of 25. Mental illness is the leading cause of disability in young people. Undiagnosed and untreated, mental illness has a serious impact on children's development, their educational achievements and their potential to live a full and productive life. " [10]. And according to [22] 50% of mental illnesses in adulthood begin before the age of 15 and 75% before the age of 18.

"Many children and adolescents with mental disorders face major challenges: stigma, isolation and discrimination, as well as lack of access to health services and educational institutions that violate fundamental human rights. Early recognition and proper management of the mental health of children and adolescents is needed to reach their full potential. " [10]

Without a pandemic, about 20% of adolescents experience various mental health problems [13], and the coronavirus pandemic (COVID-19) makes adolescence even more difficult [9].

In [13], an increase in consultation with clinical psychiatrists during and after online adolescent training was reported, and a recent study by UNICEF and the International Federation of Student Medical Associations (IFMSA) found that about 40% of teens experienced stress due to detachment from friends and the school environment, fear of illness and a future beyond their control.

The role of parents is crucial for the development of adolescents in any environment and setting. Regardless of whether they are emotionally mature [14] and their approach to upbringing, the development of the adolescent largely depends on them and their initiative.

Parents are responsible for setting rational time limits for the use of technology [2]. The use of technology is not a problem, but the way it is used. Awareness and balance in their use in children and adolescents is a difficult process, as the development of the brain and especially the prefrontal lobe continues until about 21-23 years of their development. And in a pandemic setting, the role of the parent is key in restricting their use.

But at the same time, if the child is not proactive and is combined with full control over him by parents or mentors, he will be deprived of the opportunity for orientation in life and imagination [6]. During this period, the more control, punishment, and judgment a parent encounters, the more likely they are to get stuck in the process of individualization.

A serious challenge to public health is the lifestyle of adolescents and students. They tend to eat unhealthy foods and have low physical activity, which leads to being overweight. Studies show that the level of physical activity of children and adolescents aged 9, 11, 12 and 15 decreases with the entry of children into adolescence [20].

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As an alternative to gaining more independence, the ability to self-analyze one's mental and physiological states, and hence the acquisition of self-confidence, the use of mobile or web applications can be offered in order to support these skills.

3. PURPOSE OF TECHNOLOGY-BASED INTERVENTIONS AND THEIR USE BY ADOLESCENTS

Mobile healthcare is a new and rapidly evolving field. Mobile healthcare encompasses a variety of technological solutions that can offer heart rate, blood glucose, blood pressure, body temperature, and brain activity functionality. It can help provide high quality health care and allow for more accurate diagnosis and treatment. Mobile healthcare is not intended to replace healthcare professionals, but is seen more as a tool to support the management and delivery of healthcare [15]. Mobile healthcare can help avoid situations where patients refrain from seeking help because they worry about not feeling uncomfortable.

According to [16], there are 100,000 mobile applications for mobile health and chronic diseases, with the 20 most popular applications being for sports, fitness and health. Chronic diseases are considered diseases such as heart and vascular diseases, type 2 diabetes, obesity, inflammation of the joints, chronic respiratory diseases [18]. They are long-term diseases and for many reasons have no definitive cure. They require regular medical care [18]. To treat chronic diseases, there are five basic skills for personal management of chronic physical conditions: identifying problems, making decisions, using resources, forming a professional relationship between patient and doctor, and taking action [8].

Mobile applications can allow the treatment of chronically ill patients outside hospitals and reduce visits to the doctor, help solve the problem of shortage of health professionals, and provide almost constant support to users. Applications can be considered as facilities [8] to encourage healthy eating, physical activity and prevention of overweight and obesity [20]. Mobile interventions based on the principles of self-control can be effective in reducing depressive symptoms among adolescents with mental health problems [19].

The purpose of such applications is to monitor symptoms (frequency of daily blood sugar readings, etc.) and promotes self-care, support self-control, provide feedback through data entry.

Mobile applications provide an interactive, social and personalized platform that helps users change their own behavior with minimal professional contact [21].

The review and studies (not claiming to be sufficiently in-depth studies) show that there is a lack of research and an in-depth approach to the needs of adolescents in mental health applications [19] [20] and few studies have focused on the existing attitudes of teenagers towards health applications [21] [22], which may have different patterns of use of technology by adults. In [22], after an in-depth study, it was found that none of the tested applications developed for mental health were specifically designed for use by children and young people. Few studies have been published on efficacy in health promotion [20].

One of the few articles describing consumer research found that those diagnosed with chronic medical problems perceived health applications as indispensable tools to help them manage their conditions.

4. TECHNIQUES, TAXONOMIES AND THE APPLICATION OF BEHAVIORAL DESIGN AND BEHAVIORAL MODELS IN THE DEVELOPMENT OF DIGITAL APPLICATIONS

4.1 Existing techniques and approaches in developing mobile applications

The challenge is to develop effective innovative tools and interventions acceptable to adolescents through mobile technologies [19]. Mobile phones are a consumer product as opposed to a business product [8]. The development of a mobile application requires an understanding of

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the needs of the end user, which is the first step in designing these types of technology-based interventions.

In [19] [21] an approach to conducting interviews is proposed as the data analysis is performed with the help of inductive thematic analysis. This is a flexible method of qualitative analysis that provides a richly detailed description of a set of data and gives an idea of the participants' views on a specific topic. The data can identify eight main themes: safety, engagement, functionality, social interaction, awareness promotion, accessibility, gender.

Several theories have been proposed in [20] that can predict and explain human behavior. This is the theory of planned behavior, which describes 3 factors: attitude, subjective norm and perceived behavioral control, which influence the intention of the individual to perform a behavior.

Another classical model is the transtheoretical model, which assesses an individual's willingness to adopt healthier behaviors and describes strategies or processes to guide the individual through the stages of change, from preconception to action and maintenance of action.

Behavior change techniques are based on 6 theories of behavior change: information-motivation-behavioral skills model, theory of reasoned action, theory of planned behavior, social cognitive theory, control theory, and operant conditioning. This taxonomy is useful when determining which of the techniques to apply in an application that is aimed at lifestyle change. Behavior change techniques trigger "rapid self-monitoring of behavior" when the application offers users to control their physical activity or daily intake [20].

The next technique is the theory of self-determination (SDT), combined with motivational interviewing. This SDT technique points to the importance of intrinsic motivation to change a person's behavior. Other techniques that can be used to create mobile applications for mobile health are the techniques of "rapid self-monitoring of behavior" and "providing feedback on effectiveness." The "specific goal setting" technique, in which they can provide conditional rewards [20].

Mental health applications, according to user tests, should be easy to use and engaging, with an attractive interface that uses color and graphics, and the ability to customize the interface, offer reminders, and be able to control how use the applications [19] [21].

Applications for healthy eating and physical activity are mainly promoted through self-assessment tools. By encouraging self-monitoring and providing feedback on performance, applications can raise awareness of food intake and physical activity levels of consumers [20].

"Gamification" or the integration of game elements is a strategy to counteract the negative perceptions around health applications. The integration of elements of the game, such as virtual badges, rankings, points and challenges, into health applications may arouse the interest of a wide audience of adolescents [21]. Gamification is a tool for positively influencing the use of systems to support change in health behavior [23]. It focuses on the person, not on the functions of the application. To master motivation and engagement, we learn mainly from games [26].

Consumer motivation can be maintained through rewards and opportunities for social comparison [20]. The inclusion of tangible rewards such as gift certificates, food baskets or exercise equipment is intended to externally motivate and engage users with lower motivation to complete targeted healthy behaviors. Other rewards may be in-store credit in the app store or virtual points that could lead to real, physical rewards to enhance the completion of positive health behaviors [21].

Having a "virtual trainer" can inspire healthier habits by providing individual exercises, diets and advice [21].

Sometimes the narrow focus on achieving a result can lead to a depressed state, so it is good to direct the user to behavior for a certain way of life [21].

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The promotion of physical activity can be achieved by presenting information such as real-time biometric feedback, calorie expenditure, counting steps [21].

Consumer surveys have shown that it is important for users to personalize applications that offer goal setting, tracking of personal data and output of messages [21].

Applications are more effective when embedded in existing structures, such as healthcare and schools [20].

4.2 Accessibility and promotion through marketing

In order to motivate users to use a healthcare application, it is very important for them to see and hear that other persons also use a healthcare application [21]. Here an important role in the use and promotion of an application plays a well-known influencer, social networks. Lack of awareness is another important factor that hinders the use of health applications [21].

Because teens prefer visualization, music, comedy, and popular culture, health app marketing can use these tools to promote a health app.

Creating a mobile virtual community for overweight people can encourage support and seek advice to overcome ignorance to achieving the goal.

4.3 Behavioral models in behavioral design used to create applications

Whether science is called behavioral design, product psychology, or behavioral science, [5] it proposes to understand the oddities of the human mind and use that knowledge to change the way people live.

Behavioral design is a bridge between behavioral sciences and product design [1]. Behavioral design is a technology to help create the right environment for people to take action or make decisions to achieve specific goals [4]. It is used to change behavior, but does not force people to change [2]. The combination of the science of influence and design thinking is a method or framework for activating or changing people's behavior [4]. This is a technique used to create behavioral product design and is deeply rooted in psychology. Behavioral design provides a framework for addressing consumer needs, rediscovering behavioral changes, and can help people in two main cases in developing a digital design product [1]:

- **Product that needs to change behavior** - the user is directed to a product that helps him change his behavior at will. Here the product gives value to the consumer by offering, for example, learning a new language, controlling diabetes, organized time and task management, getting back in shape.
- **Product that requires a change in behavior** - the user changes his behavior within the product, trying to use available functionality such as document formatting, uploading photos or documents, organizing email contacts and more.

Human behavior is the most unpredictable obstacle in the online world. When a web product is developed in the right way, it has the power to encourage desired behavior and stop unwanted behavior in users [4]. As amazing as UX (user experience) and CX (customer experience) are, they can improve a website's performance, but it won't make users act the way you want them to.

People's decisions and behavior are deeply affected by the context. In digital products, the context represents the information architecture, navigation and UI of the application [2], and it influences the choice and behavior of the user. When developing a digital product, we must take into account the way people think and the way the mind works. Attention, memory and will are limited in humans, so the mind uses shortcuts, and applied in the wrong context can cause unintentional behavior and wrong decisions. The human mind is capable of handling several tasks at once and can memorize up to ten things at once.

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Behavioral design is directly related to the system of habits and these behavioral patterns help designers to better design changes in people's behavior. When creating an application, it may turn out that it can become a habit by using it [6], and the success of an application depends on whether users have formed habits to use it. Habits are learned, and they can be acquired entirely from experience. When a person experiences a specific signal, he automatically executes an action.

How can an application program habits?

1 Model CAR (Cue-Action-Reward) [6] [2] is a framework that offers "flow" thinking in three steps:

Cues - Something that the user feels in their environment. There are three types of signs - internal, external and synthetic.

- **Internal signals:** hunger, boredom, thoughts about the taste of cinnamon, etc. They have the same power as external signals. A negative internal signal can cause outrage. These are addictive or pointless actions that can lead to toxic results for the product. It is recommended to avoid the application of negative internal signals.
- **External signals:** seeing on a television remote control, the sound of police sirens or the smell of freshly baked biscuits, cigarette smoke, etc.
- **Synthetic signals:** created intentionally by a behavioral designer to suggest a specific action. These are the specific brand color or letter (the letter "M" of McDonald's) for the purpose of recognizability, etc. The greatest strength of the synthetic signal is that it can be altered.

Action - a behavior that the user wants to perform. Actions must be quick, specific and well-described

Reward - is shown to the user as feedback that is unexpected and admirable. The award can be divided into three types:

- **Rewards of the self (desire for self-control and skills)** is related to intrinsic motivation and the desire to finish things. The desire to be better than yesterday.
- **Rewards of the Hunt (desire for conquer)** - depends on whether the application is competitive and more sought after, tracked, followed
- **Rewards of the Tribe (desire for belonging)** - mainly expressed in social networks with the reaction of users with emoticons (hearts and thumbs up), symbolizing affection

In addition to badges and points, reward can be any positive experience a user can experience - a funny GIF, some positive encouragement, a screen explosion of confetti, verbal praise, a delightful tone and vibration, or social praise from their peers. The reward is the immediate positive consequence of an action.

The brain builds habits only from positive consequences. The positive consequences must be unpredictable. People only become active when we experience positive effects. The unpredictability of positivity actually activates the mechanism for changing behavior.

The sign-action pair is the habit that the user must fulfill, and the feedback-reward is the thing with which the habit is learned through the application.

The CAR model can be applied if you need to increase user engagement.

2 According to the Fogg Behavior Model or MAT model [7] [4] [24], there are three main factors responsible for the movement of human behavior: motivation, ability, trigger. This model makes actions easier and the user more motivated.

Motivation - three different dimensions are used to provoke motivation in the user:
pleasure / pain, hope / fear and acceptance / rejection.

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Here are some design techniques to engage users:

- storytelling
- avoiding pain and seeking pleasure - "expected satisfaction from acquisition".

Ability - There are six main elements that can enhance users' abilities. These are time, physical effort, brain cycles, money, non-standard and social deviation.

Designers can increase the capabilities of users:

- By reducing the effort and time required to perform the behavior
- Reduce cognitive load - recognizes things instead of reminders
- Going through the experience or process

Trigger - can be a signal, a spark and a trigger.

A "Reminder" can be used here as a signal to quickly prompt users to start behaving.

All elements of the model are required for the user to perform a deliberate action. To perform a certain action, the user can be encouraged by increasing his motivation or ability to act. If the action is easy, then making it even easier will not change his behavior.

3 Hook Model-Framework for Behavior Change [25]

Created by psychology expert Nir Eyal to create user-engaging technology that creates habits such as a game, fitness app or online service.

This model consists of four critical phases:

Triggers - these are an internal signal - "the main reason for the formation of habits" and external signals (phone ringing), divided into four types:

- Paid - pay per click and partnership programs
- Earned: free, which keep the product in the spotlight (viral videos)
- Relationship: likes on social networks and word of mouth recommendations
- Owned: application icon, email newsletter or notification.

Action - the key behavior to be performed by a user. This can be a push notification, enter the daily calorie into your health and fitness app

Variable reward - the types of rewards are similar to the CAR model

The more satisfaction we get from performing an action, the more likely we are to repeat that activity.

Investment - crucial for building habits. The more time and effort the user invests in the product or service, the more it is valued. The investment is the time, effort and personal information that consumers contribute to the product to improve the overall experience.

When users go through the four phases of the Hook model, they will link the product or service as a source of relief.

Habit-building technologies are essential to increase people's engagement with your product or service. There are no sources in which all the behavioral models used to create a digital product are described and structured. The article does not claim to be exhaustive.

5. CONCLUSION

Mobile applications play an important role in adolescents' daily lives, and this implies their use in health promotion strategies [20].

Applications allow users to monitor themselves, set goals, provide personalized feedback, and increase their motivation. All of these tools can be part of a treatment program or to maintain educational methods, or function separately. The use of smartphone applications supports traditional approaches to health management, as they provide an interactive, social and personalized platform that helps users change their own behaviour with minimal professional contact [21].

There has been an explosion in mobile health applications in the last few years, but most applications are not of part of applications for the younger, technology-focused generation [21].

Adolescents are responsible for taking care of themselves, and health applications can enable them to put health into their own hands.

Over the next few years, rapid growth in behavioural design and guidance in the development of a code of ethics is expected to embrace the results and implications of the use of digital technologies and generate trust [3]. On the threshold of the fourth industrial revolution, there is a clear focus on creating a quality methodology through which to link ethical considerations with insufficiently established algorithms for artificial intelligence, racism in the provision of health care, policing. The next decade will provide an opportunity to create meaningful experiences connected in a global network and will support sole proprietors and small and medium-sized enterprises. In the future, behavioral science is expected to have an increasingly positive effect on people's lives.

The mission of behavioral design is to improve people's lives, contribute to collective results and maintain engagement, which should be the focus of all subdisciplines for behavioral design. The level of engagement and the factors contributing to this engagement of consumers are explored by the sciences of behavioral design and human-computer interaction. The results and situations in which each individual may find themselves are specific elements of research and design to create engaging and memorable experiences that offer a better understanding of the context of behavior, personal indicators of the individual. [3] New methods of consumer engagement can be presented through Gamification and digital technologies such as VR and AR. For technology to have a lasting positive impact on people's lives, there must be a desire to design behavioral solutions. The creation of a digital product is already looking for behavioral technology, not body technology [2]. Much work remains to be done in the future to unlock the full potential of behavioral design.

There is a clear need for applications to be created through close collaboration between scientific fields such as behavioral design, UX, product management and technology to provide value and benefit to consumers' daily lives. It is also clear that there is a lack and need for methodologically sound research to assess the safety, efficacy and effectiveness of health applications [22] for children and young people with mental health problems.

"What seems certain in general is that consumers have formed habits in which their mobile phones play an increasingly important role in their lives, whether for gaming, movie streaming or grocery shopping." [17]

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THE BIOECONOMY STRATEGIES IN EUROPE: AN OVERVIEW

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Abstract: *In general, bioeconomy can be defined as an economy where the basic building blocks for materials, chemicals and energy are derived from renewable biological resources.*
This paper provides an overview of the bioeconomy in Europe, considering it from a policy framework and concept perspective. Several strategies have been produced in Europe from different perspectives that outline visions, intentions, and recommendations for the transition to a bioeconomy. The analysis shows that a common direction for the bioeconomy, based on research and technological innovation in the various applications of biotechnology, is developing in Europe. Also, the definitions of the bioeconomy are evolving and vary depending on the actor, but display similarities. While there is great optimism about the benefits and opportunities associated with developing an advanced bioeconomy in Europe, significant risks are also expressed.
To gain a sustainable and competitive bioeconomy, the present paper wants to reach two major themes: engaging the key stakeholders and general public in an open and informed dialogue as well as a responsibility of government and industry towards innovation that drives collaborative efforts on sustainable development of the bioeconomy.

Key words: *Bioeconomy, Europe, policy strategy, visions*

JEL CLASSIFICATION: Q28, Q38, Q57

1. INTRODUCTION

The present research involved the identification and study of bibliographic sources for theoretical understanding of the issues to be analysed, clarification of basic concepts and their links, but also analysis of documents identified in the European Union (EU) on strategies and initiatives in the field of bioeconomy. Thus, the bibliography found in the Science Direct - Elsevier database, official documents and various studies of the European Commission and other international institutions, articles published in scientific journals, etc. were used for documentation.

Changes around the world have led to major challenges that require institutional support, collaboration and international coordination. Population growth, limitation of natural resources, increasing pollution are elements that have led to the emergence of several strategies and initiatives adopted at local, regional or global level, as well as the promotion of new concepts such as the bioeconomy. In a broad sense, the term bioeconomy generally refers to those parts of the economy that use renewable biological resources to obtain food, materials and energy. In the last 10 years, at the level of the European Union and not only, there has been a radical change in the economy both in the terminology used and in the approach.

In addition to the term bioeconomy, new concepts have emerged - green economy, circular economy, circular bioeconomy, partially similar, but which want to respond to the same social challenges, globally aware: food security, natural resource shortage, high dependence on fossil resources and climate change. In recent years, strategies and policies that promote the bioeconomy have been developed at the national level, but also at the level of international institutions, both as a result of new research and innovation, and as a necessity for changes in society. At the level of each country there are certain features, preliminary initiatives and development and research needs. Often, in these strategies, the main focus is on developing the

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economy and creating new jobs, by identifying new business opportunities, while the sustainability of resources remains secondary. Strategies and initiatives published and adopted by institutions and countries are difficult to compare, as they have different structures and purposes, often with different definitions and meanings for specific terms. However, a presentation of the main components contained in these strategies and initiatives is very useful, providing an overview of the evolution and reality of the bioeconomy. At the level of the European Union, the acceptance and promotion of this term came as a natural continuation of previous policies. Since 1982, the European Commission (EC) has been in charge of preparing, managing and implementing the EU Framework Programs in Biotechnology and Life Sciences. Over the years, research has been involved in the emergence of new innovations and concepts through funded programs. After much work and experience gained on the basis of various funded programs, the Life Sciences and Biotechnology - A Strategy for Europe (2002) and En Route to the Knowledge-Based Bio-Economy (2007) initiative was born.

Over the next decade, the EU has based its actions on the Europe 2020 Strategy, a strategy based on smart growth, with a strong green and inclusive orientation. This Strategy has resulted in several flagship initiatives, one of which very clearly stipulates the development of the bioeconomy at EU level by 2020. In 2012, the European Commission (EC) launched its bioeconomy initiative - "Innovating for Sustainable Growth: A Bioeconomy for Europe" and the Action Plan, accompanied by a working document in which more details are presented. Unlike developed, less developed countries, the bioeconomy is used mainly in primary sectors such as agriculture, forestry and fisheries. Even these sectors have significant potential for promoting sustainable economic growth through the transfer of knowledge and technology. All these documents started from common ideas, being mainly focused on the need to increase employment and, implicitly, social inclusion. The importance of research in achieving the proposed objectives is another aspect found in all documents, as well as the need to increase investment in research-development-innovation. Since 2002, the strategic importance of SMEs in developing biotechnology applications initially and then in the bioeconomy has also been emphasized, by encouraging and facilitating the adoption of new ideas and their transformation into marketable products and services. After in a first stage of research were approached the clarification of the basic concepts in the field of bioeconomy and the links between them, the analysis of strategies and initiatives identified at the level of the European Union and some Member States, but also at the level of other international institutions in the field of bioeconomy. , in the second stage the aim was to present models of good practices as well as proposals for actions or initiatives that can be adapted to the economic conditions in Romania. The development of the bioeconomy is currently one of the EU's priorities, along with the implementation of policies aimed at the circular economy.

2. LITERATURE REVIEW

Globally, there is a very broad terminology and multiple definitions given to the same concept by different actors, depending on the sphere of interest. Thus, terms such as biotechnology - biotechnology (BT), bioeconomy - bio-based economy (BBE) or bioeconomy (BE), knowledge-based bio-economy (KBBE) are used. Along with them appeared other terms such as bioeconomics, biocapital, bio-value or biovalue etc., bioproducts or bio-based products, bioindustry – bio-industry etc., which Birch and Tyfield (2013) generically call bioconcepts. As a result of the research that has been carried out in recent years and the results obtained from them, the use of terms such as bioeconomy or bio-based economy has evolved. Although the difference between these terms is not obvious, it does exist and they are used to represent different meanings. When used in general, the term bioeconomy encompasses economics based on the concept of bio. Most of the time differences appear in scientific articles, the concepts used

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in strategies and initiatives being interchangeable. Another term used very often in the scientific literature is the term circular economy. At the academic level, the use of these concepts has increased greatly in recent years.

Using the Science Direct database owned by Elsevier, considered by the author to be one of the leading international publishers of scientific journals, all citations were chosen for the words (a) "bioeconomy", (b) "biobased economy" and and (c) "circular economy", from all fields of study. The results are presented in Figure no. 1.

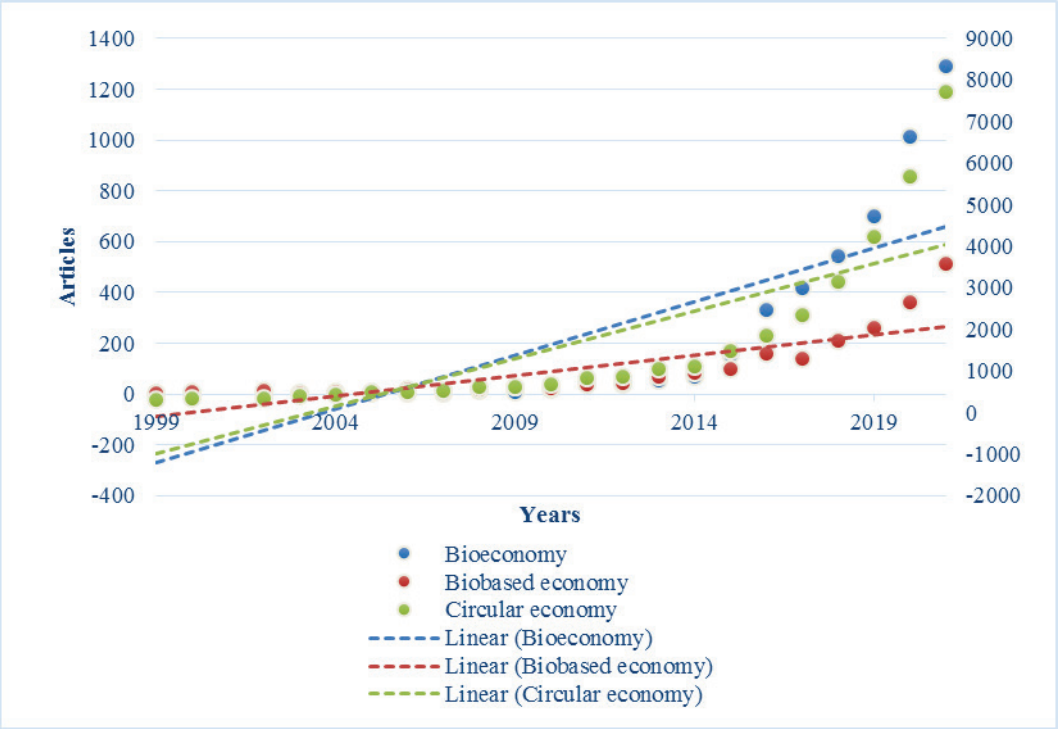

Figure 1. Number of citations in Scopus for "bioeconomy", "biobased economy" and "circular economy"

Source: Science Direct database, Elsevier, accessed on September 15, 2021

One can notice a constant trend in the period 1999-2010, slightly increasing in the period 2011-2014 and a very accelerated growth rate in the period 2015-2021. If by 2014 the citation of the terms (a) "bioeconomy", (b) "biobased economy" was balanced, after this year the bioeconomy is obviously advancing among the scientific interest and is very popular after 2015 (if in 2014 there were 67 citations for "bioeconomy", in 2015 there were 153 citations, and in 2020 they reached 1014). The term "biobased economy" is growing slightly slower, and in the last year analysed (2021) records a number of citations of 512. In other words, the term circular economy ("circular economy") is popularized among scientific interests just before the bioeconomy. It has seen a steady increase from 1999 (when there were 299 citations) to 2021 (when 7718 citations were recorded on the Science Direct platform). (Figure 1)

3. RESULTS AND DISCUSSIONS

The research process involved identifying bibliographic sources to study and understand how the subject of the bioeconomy can be measured. In recent years, the field of bioeconomy has gained increasing interest worldwide, leading to the desire to improve and develop many strategies and initiatives. The report "Synopsis of National Strategies around the World",

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prepared by the German Bioeconomy Council, identified the existence of 4 major categories of states involved in the bioeconomy, in terms of existing strategies and policies, namely: (1) states with dedicated bioeconomy strategies, (2) states with bioeconomy related strategies, (3) states with be-related strategies: dedicated be-strategy is under development, respectively (4) dedicated be strategy is under development. (Figure 2)

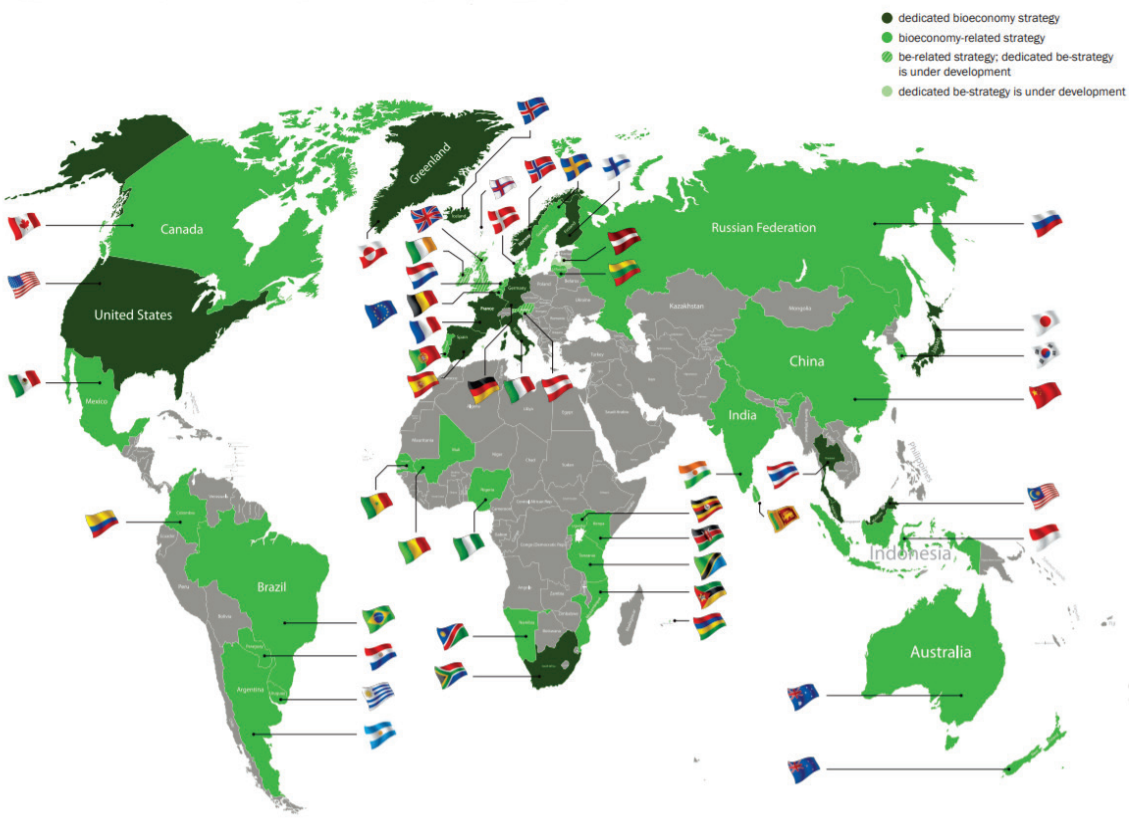

Figure 2. Bioeconomy policies around the world
Source: The German Bioeconomy Council, 2018

At the time of the report of the German Council for the Bioeconomy, there were strategies dedicated specifically to the bioeconomy (for example, in Finland, Germany, Japan, Malaysia, the United States), noting that in many other countries there was interest in this field by publishing to publish in the future) of some initial versions of the strategies or policies developed for the bioeconomy. Organizing important events such as the "Global Bioeconomy Summit" in Berlin in November 2015, 2018, as well as the virtual one in November 2020 - which brought together personalities from several fields (politics, science, business, etc.) to discuss global strategic elements on the future of the bioeconomy shows the importance of this topic. The summits drew important conclusions, emphasizing that a sustainable bioeconomy can contribute to the achievement of the "United Nations Sustainable Development Goals" (Global Bioeconomy Summit 2015) or that "we need to start making bold moves to new economic thinking and paradigms that include shifting towards metrics to better measure people and planet" (Global Bioeconomy Summit 2020).

In the European Union, several states have developed bioeconomic strategies over time, and others are in the process of writing a strategy. The following table shows the situation of the EU states in November 2019 with the bioeconomy strategy, being divided into 3 categories: there is already a bioeconomy strategy; are in the process of writing a bioeconomy strategy; they want to develop a bioeconomy strategy based on the Bioeast initiative. (Table 1)

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Table 1. Overview of the available information on bioeconomy policy developments as of November 2019

No.	Country	Dedicated BS at national level	Dedicated BS at national level under development	Other policy initiatives dedicated to the bioeconomy	Other related strategies at national level	BS
1	Austria	√				Austria's Bioeconomy Strategy
2	Belgium			√		
3	Bulgaria			√		
4	Croatia		√			
5	Cyprus				√	
6	Czech Republic		√			
7	Denmark			√		
8	Estonia			√		
9	Finland	√				The Finnish Bioeconomy Strategy
10	France	√				A Bioeconomy Strategy for France
11	Germany	√				National Bioeconomy Strategy
12	Greece				√	
13	Hungary			√		
14	Ireland	√				National Policy Statement on the Bioeconomy
15	Italy	√				BIT II – Bioeconomy in Italy
16	Latvia	√				Latvian Bioeconomy Strategy 2030
17	Lithuania		√			
18	Luxembourg				√	
19	Malta				√	
20	Netherlands	√				The position of the bioeconomy in the Netherlands
21	Poland		√			
22	Portugal		√			
23	Romania			√		
24	Slovakia		√			
25	Slovenia			√		
26	Spain	√				Spanish Bioeconomy Strategy
27	Sweden			√		

Source: Own elaboration based on „The bioeconomy in different countries":
https://knowledge4policy.ec.europa.eu/visualisation/bioeconomy-different-countries_en

Of the 27 MS, in 2019, nine already have a national bioeconomy strategy (Austria, Finland, France, Germany, Ireland, Italy, Latvia, the Netherlands and Spain). Most of the other Member States are in the process of drawing up a bioeconomy strategy (such as Croatia, the Czech Republic, Lithuania, Poland, Portugal and Slovakia), and the rest have set out to develop a national strategy through the Bioeast initiative. as is the case of Romania - which currently has other strategies associated with the field of bioeconomy.

4. CONCLUSION

The purpose of the research was to conduct a study on documents representing strategies and initiatives developed and adopted in the European Union, relevant to the field of bioeconomy. The analysis of documents on EU bioeconomic initiatives revealed a number of positive aspects, as well as a number of shortcomings that need to be addressed so that the bioeconomy can strike a balance between economic growth, social development and environmental protection, as key components of development. durable.

The role of the bioeconomy, in response to major social challenges, is increasingly better understood at the national level. Thus, at the level of 2019, nine states have already developed national strategies, which emphasize the resources they have and their ability to turn these resources into high value-added products. However, there is a need for a more coherent vision in other states to be translated into appropriate policies supported by appropriate instruments, especially as the bioeconomy can contribute to the development of less developed regions such as rural, mountain or coastal areas, reducing - thus the economic gaps at both regional and national level. States need to facilitate access to finance not only for the production of biological resources but also for their transformation into high value-added products.

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ASSESSMENT OF TANGIBLE ASSETS ACCOUNTING IN THE PUBLIC SECTOR OF THE REPUBLIC OF MOLDOVA IN ACCORDANCE WITH INTERNATIONAL STANDARDS

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Abstract: *Currently, the tangible assets accounting is one of the most actual issues for public sector entities in both in accordance with Moldovan and International Public Sector Accounting Standards (IPSAS). The research metodology is based on the analysis of national accountint treatment and IPSAS 17 PROPERTY, PLANT, AND EQUIPMENT to select convergences and divergences related to tangible assets accounting. In this way, are discussed the new accounting rules (like depreciation, impairment and revaluation model) of IPSAS 17 that should be selected and implemented upon approval of the National Public Sector Accounting Standards in Republic of Moldova. Also, in the paper are presented some proposals both for the national accounting and for the international standards.*

Key words: *tangible assets, accounting, international standards, public sector*

JEL CLASSIFICATION: M41

1. INTRODUCTION

Practically every budgetary institution activate with tangible assets. Consequently, of applying accounting treatments for it, depend the reality of information included in financial statements of the institution. Providing a true picture of the total tangible assets, it is require adoptation or alignment to international standards. Harmonizing public sector accounting at the international level is often realized today by applying the International Public Sector Accounting Standards (IPSAS) (Brusca&Martínez, 2016).

Therefore, the Republic of Moldova intends to reform the budgetary system accounting by aligning to International Public Sector Accounting Standards. Respectively, is approved the Order of the Minister of Finance No.159 of December 27, 2016 regarding the Concept and the Action Plan for the elaboration of the National Accounting Standards for the Public Sector. According to the nominated normative act, 30 national standards will be developed and implemented. It follows to be elaborated the National Accounting Standards for the Public Sector "Tangible assets", which will contain new accounting treatment, unknown in the national practice.

At present, the main normative framework governing the accounting of tangible assets in the public sector is the Order of the Minister of Finance No.216 of December 28, 2015 regarding the approval of the Chart of accounts in the budgetary system and the Methodological Norms on Accounting and Financial Reporting in the budgetary system.

To see witch level national accounting treatment for tangible assets correspond to international accounting treatment, we will analyze and highlight the convergences and divergences regarding these.

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2. MATERIALS AND METHODS

To achieve the proposed goal, are investigated two accounting referentials - the IPSAS 17 "Property, Plant and Equipment", that are the basis for reforming the Republic of Moldova public sector accounting and the Order of the Minister of Finance No.216/2015 regarding the approval of the Chart of accounts in the budgetary system and the Methodological Norms on Accounting and Financial Reporting in the budgetary system. In the investigation process were used such methods as analysis and synthesis, comparison, analogy method, systems approach, logical approach.

3. RESULTS AND DISCUSSIONS

Assets should be recognized as tangible assets if they meet the definition and recognition criteria. For the convenience of carrying out a comparative analysis, below are shown the definitions and recognition of tangible assets in accordance with Moldovan and international accounting requirements (Table 1, Table2).

Table 1. Comparative aspects regarding the definition of tangible assets

National Accounting Regulations	IPSAS 17 "Property, Plant and Equipment"
Tangible assets:	
- are assets with a useful life of more than 1 year, - held for use in the production or supply of goods or services for administrative or leasing purposes to third parties.	(a) are held for use in the production or supply of goods or services, for rental to others, or for administrative purposes; and (b) are expected to be used during more than one reporting period

Source: The author's own processing

As we see, the definition of tangible asset in national accounting regulations is similar to definition in IPSAS 17. The tangible assets are held by entity more than one year and are used in the production or supplying of goods or services, or for administrative purposes.

Table 2. Comparative aspects regarding the recognition of tangible assets

National Accounting Regulations	IPSAS 17 "Property, Plant and Equipment"
- it is probable that the budget authority / institution will obtain future economic benefits from the use of the asset; - the cost or fair value of the asset can be measured reliably.	(a) it is probable that future economic benefits or service potential associated with the item will flow to the entity; and (b) the cost or fair value of the item can be measured reliably.

Source: The author's own processing

Both the national accounting regulations and the IPSAS 17 stipulate similar recognition provisions, only that IPSAS, additional take in account the following requirements:

- the entity bears risks and rewards when using assets, and
- the entity controls the assets.

An item of tangible assets at initial recognition should be measured at its cost. According to international accounting regulations the cost is formed from some elements (Table 3).

Table 3. Comparative aspects regarding the elements of cost at initial recognition of tangible assets

National Accounting Regulations	IPSAS 17 "Property, Plant and Equipment"
Tangible assets are valued at: • the purchase costs, for those purchased; • the costs of production, for those built or produced by the institution; • fair value, for those acquired free of charge. Purchase costs include: purchase price, customs duties and import duties, transport costs, assembly and installation costs and other costs related to their preparation for use according to destination. Trade discounts, rebates and other similar items are not included in determining purchase costs. The costs of production include: cost of material consumption, labor remuneration expenses, social security contributions, health insurance premiums, etc .;	The cost tangible assets comprises: (a) Its purchase price, including import duties and non-refundable purchase taxes, after deducting trade discounts and rebates. (b) Any costs directly attributable to bringing the asset to the location and condition necessary for it to be capable of operating in the manner intended by management. (c) The initial estimate of the costs of dismantling and removing the item and restoring the site on which it is located, the obligation for which an entity incurs either when the item is acquired, or as a consequence of having used the item during a particular period for purposes other than to produce inventories during that period

Source: The author's own processing

A comparative analysis of the cost elements revealed the following convergences and divergences. In general, the costs included in the value of tangible asset in the event of its initial recognition both in national accounting regulations and in accordance with international standards are the same. So, in accordance with the order of the Ministry of Finance of the Republic of Moldova No. 216/2015, as well as in accordance with IPSAS 17 "Property, Plant and Equipment", elements of cost there are purchase prices, all direct costs associated with the purchases or production of an item of tangible assets on their own. In both cases, direct costs include consumed resources (material, labor and others), directly related to the purchases or production of a tangible asset items. However, the international standard requires the inclusion in the cost of an asset when it is recognized, costs that are not contained in the order of the Ministry of Finance of the Republic of Moldova No.216/2015. So, in accordance with IPSAS 17 "Property, Plant and Equipment", the initial cost of tangible assets includes the costs of dismantling and liquidating an item of tangible assets and restoring of the site on which it is located, in respect of which the institution undertakes an obligation either the moment of acquiring the object, or already during its operation.

As shown in the IPSAS 17, one or more items of tangible assets may be acquired in exchange for a non-monetary asset or assets. The cost of such tangible asset is measured at fair value unless:

- the exchange operation is not of a commercial nature;
- the fair value of neither the asset received nor the asset given up cannot be estimated

If an item of tangible asset is acquired as a result of an exchange transaction, and it is not possible to estimate its fair value, then such item of tangible asset is recognized at the carrying amount of the transferred asset.

Regarding to national accounting treatment, namely the order of the Ministry of Finance of the Republic of Moldova No. 216/2015, does not provide the transactions for the acquisition of tangible assets by a budgetary institution as a result of exchange for a non-monetary assets.

The main operations, as a result of which the budgetary institutions in Republic of Moldova reflect the object of the tangible assets in accounting, are as follows:

- acquisition (purchase) of tangible assets;
- receipt of tangible assets free of charge;
- procurement of tangible assets through promotional actions;
- production of tangible assets in an economic way (construction);

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- identification of fixed assets as surplus in the inventory;
- receipt of tangible assets as compensation for damage by the guilty person.

After the tangible asset has been accepted for accounting in accordance with all the recognition criteria and valuation rules, the public institution must choose the accounting model for this item, and reflect its choice in the accounting policy. Therefore, the public institution may keep the accounting records as follows:

- the cost model;
- the revaluation model.

The IPSAS 17 stipulate provision that allow budgetary institution to adopt one of two treatments for setting the value of the tangible assets. The cost model, according to international regulations, consists in accounting of tangible assets at historical value, less any accumulated depreciation and any accumulated impairment losses. The revaluation model, consist in accounting of tangible assets at fair value, less subsequent accumulated depreciation and subsequent accumulated impairment losses. Revaluations shall be made with sufficient regularity to ensure that the carrying amount does not differ materially from that which would be determined using fair value at the reporting date. The IPSAS 17 contains some stipulations related to establishing the frequency of revaluation, identification the indicators that a revalued asset's carrying amount may differ materially from that which would be determined if the asset were revalued at the reporting date, recording the results of the tangible assets revaluation.

According to the national accounting treatment, budgetary institutions use cost model for tangible assets accounting. Comparative with international treatment, it consists from historical cost, less any accumulated depreciation, without less accumulated impairment losses, whereas the rules about impairment of tangible assets are not provided in the national regulations.

Revaluated model does not applied by the budgetary institutions, whereas national framework does not determine rules related to it. However, tangible assets revaluation rules are provided, not for regular revaluation, but for revaluation in specific cases, as follows:

- sale of tangible assets;
- the transfer of the right to use tangible assets;
- transmission as a contribution in the capital of related and unrelated parties;
- other situations provided by the normative framework.

The difference between the value obtained from the revaluation and that recorded in the accounting determine increase or decrease in value of the tangible assets.

The national accounting regulations and the IPSAS 17 "Property, Plant and Equipment" stipulate different methods for treating results of the tangible assets revaluation (Table 4).

Table 4. Comparison of treatments for the results of tangible assets revaluation

The Accounting Net Value of Tangible Fixed Assets	National Accounting Regulations	IPSAS 17 "Property, Plant and Equipment"
Increase	The increase debits the asset account and the credit the income account.	The increase credits the account of 'revaluation surplus' to the extent to which it compensates a revaluation decrease of the same assets, previously acknowledged as expenditure
Decrease	The decrease debits expense account and credit one of the valued asset.	The decrease will be subtracted from any revaluation surplus to the extent of which it does not exceed that surplus even as expenditure, but only for the difference that exceeds the revaluation surplus

Source: The author's own processing

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The accounting treatment of results from the tangible assets revaluation in the national regulations is not similar to the treatment of the international standards, whereas the Chart of account not has account for "reserve of reevaluation", therefore recording the differences in expense and income accounts.

Depreciation, in accordance with IPSAS 17 "Property, plant and equipment" and the order of the Ministry of Finance of the Republic of Moldova No. 216/2015 is the systematic allocation of the depreciable cost of an asset over its useful life.

International accounting practice, in relation to the accounting of tangible assets and the formation of an indicator for the purpose of its reflection in the reporting, introduced such concepts unfamiliar to a Moldovan accountant as "depreciable amount" and "residual value".

Depreciable amount is the cost of an asset less its residual value. The depreciable amount can be equal to the initial cost only if the residual value is zero. Below is the formula for finding the depreciable amount.

$$Depreciable\ amount = Initial\ cost - Residual\ value \qquad (1)$$

The residual value of an asset is the estimated amount that an institution would currently receive from the disposal of an asset, after deducting the expected costs of disposal, as if the asset had already reached its expected age and condition at the end of its useful life. The residual value is an estimated value and therefore presents some difficulty in determining it.

As for the methods for calculating depreciation of tangible assets in accordance with the requirements of national framework, there is one way of calculating depreciation - straight-line method.

The straight-line depreciation method assumes the accrual of a constant amount of depreciation over the entire useful life of the asset, if this does not change the residual value of the asset.

According to the IPSAS 17, in addition to the straight-line method (Table 5), two more methods are provided:

- the diminishing balance method - results in a decreasing charge over the useful life,
- the units of production method - results in a charge based on the expected use or output.

Table 5. Comparative analysis of methods for calculating depreciation of tangible assets

Indicatores	National Accounting Regulations	IPSAS 17 "Property, Plant and Equipment"
Methods of calculating depreciation	straight-line depreciation method	straight-line depreciation method, the diminishing balance method, the units of production method

Source: The author's own processing

The entity selects the method that most closely reflects the expected pattern of consumption of the future economic benefits or service potential embodied in the asset and reviews them every year.

According to IPSAS 17, the tangible assets are said to be impaired when its carrying amount is greater than its recoverable amount or fair value.

Impairment if tangible assets describe a permanent reduction in their value. This concept leads to a presentation of tangible assets in financial statements at a value close to the market value.

The rules for determining and recording the process of impairment of tangible assets are described in IPSAS 21 "Impairment of Non-Cash-Generating Assets" and IPSAS 26 "Impairment of Cash-Generating Assets".

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The national accounting regulations do not provide accounting treatment of impairment of tangible assets. It is expedient to mention, that concept like impairment does not exist in national accounting definitions.

The next analyzed compartment is the derecognition of tangible assets. The derecognition means the disposal of assets in case of:

- sale of tangible assets;
- donation of tangible assets;
- identification of fixed assets as shortcoming in the inventory;
- losses from natural disasters.

According to that, the IPSAS, additional, requires to derecognize the carrying amount of the component of tangible asset that was replaced regardless of whether the replaced component had been depreciated separately. It happens when the cost of such replacement is incurred and the recognition criteria are met. National accounting framework does not provide for such derecognition, which from a theoretical point of view is easy, while in practice it is complicated and unknown.

4. CONCLUSIONS

After establishing convergences and divergences of tangible assets accounting according to national and international framework, we may conclude that differences are enough and it will not be so simple to align to new international accounting requirements. It is new, but advisable to require the recognition in the initial cost of tangible assets of the costs of their dismantling and decommissioning, as well as the restoration of the site on which they are located. Also, the IPSAS requires to recognize (if it respect recognition criteria) and depreciate separately each part of a tangible asset, when the cost of it is significant in relation to total cost of the tangible asset. Although such requirement is not provided in national framework, consider that it should be adopt for some tangible assets. Speaking about impairment of tangible assets, we conclude that the process of its determination is variable and complicated. Furthermore, at this process is compulsory to determine fair value. IPSAS 17 provides some hypotheses for determining fair value, only that it does not contain a clear guidance, which stops the application of these accounting treatments.

Based on this, we consider it appropriate to create and introduce into the IPSAS a special standard that establishes the regulations for calculating fair value. The requirements of IFRS 13 "Fair Value Measurement" can be used as a basis for the development of the national and international standards. Indeed, this type of assessment should be determined according to uniform rules by organizations of both the state (public) and privet sectors.

Pay attention to the fact that the Chart of accounts of budgetary system need to include account for recording of difference of revaluated value.

With regarding on the use of depreciation methods, basing on practice and example of Romania, we suppose that straight-line method is more optimum for budgetary system. The values calculated on diminishing balance and the units of production methods are considered tax depreciation, as they reflect the influence of taxation on accounting (Vasilcoiu R. I. 2013).

With the introduction of IPSAS 17 or the adoption of the national public sector standard for accounting for tangible assets, it is necessary to simultaneously introduce at least 10 more of the standards as follows:

- IPSAS 3: Accounting Policies, Changes in Accounting Estimates and Errors
- IPSAS 5: Borrowing Costs
- IPSAS 12: Inventories
- IPSAS 13: Leases
- IPSAS 19: Provisions, Contingent Liabilities and Contingent Assets

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- IPSAS 9: Revenue from Exchange Transactions
- IPSAS 16: Investment Property
- IPSAS 21: Impairment of Non-Cash-Generating Assets
- IPSAS 26: Impairment of Cash-Generating Assets
- IPSAS 32: Service Concession Arrangements

Summarizing what has been said, it should be noted that not all accountants may be ready to use these opportunities, since the regulations of the IPSAS, in many cases requires professional judgment, which is still problematic for many Moldovan accountants. In addition, the study of the rules specified in IPSAS 17 allows us to assert that these rules give rise to some debatable issues that require clarification. This will raise the issue of the availability of qualified public sector accounting professionals.

The world experience shows that high-quality information that is useful for users of reporting is achieved by using international standards as the basis for creating national principles of accounting and reporting of public institutions. Also, the use of IPSAS in the public sector ensures compliance with world accounting and reporting rules, improves functionality, and forms accounting tasks.

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DIGITAL PLATFORM FOR DOCUMENTS EXCHANGE IN MARITIME TRANSPORT

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Abstract: *The paper steps including the topic of digital transformation in maritime transport. Maritime transport is a vital sector worldwide and also one of the European Union's priority sectors. The digitalization in maritime transport is one of the important issues for international maritime organizations to achieve the goals of Maritime 4.0. The research methods are applied legal analyses of documents and comparative method. The article examines the reasons and the need for digital data exchange, as well as the benefits of digitalization in maritime transport. Specially attention is paid to the documents on the European level such as EU regulation 123/9 and EU directive 2010/65; and Union's collaboration between DG MOVE and DG TAXUD reasons to establishing of Single Window for customs and also defined the meaning of the WTO and IMO – Facilitation and Convention main goal of a paperless transfer of information for the development of Single Windows.*

Keywords: *Digital transformation, maritime 4.0, international maritime documents and maritime transport sector.*

JEL CLASSIFICATION: O3

1. INTRODUCTION

One of the main challenges facing the maritime industry is to adopt and put into practice the achievements of fourth industrial revolution in order to optimize maritime transport. Digitalization in maritime transport is radically changing the traditional forms of document flow. Industrial Revolution or Industry 4.0 is characterized in the development of automation and data exchange in production technologies. The maritime industry is critical to social and economic development, accounting for roughly 90% of the EU's external freight trade with more than 400 million passengers embarking and disembarking in European ports each year. In an effort to facilitate and increase the competitiveness of the European maritime sector, lessons learned from the manufacturing and vessel industry have served as a key element in future development. This includes the incorporation of new technologies, materials and optimization processes into the engineering and design practices of the greater industry. Digital data exchange is a necessity that is pushing shipping from traditional industry to maritime 4.0. Digital data exchange pushes the maritime industry beyond its traditional boundaries and provides many new opportunities to increase the productivity, efficiency and sustainability of logistics. This article discusses the goals of IMO - Facilitation and Convention and at European level towards the transition to paperless data exchange, namely the implementation of the European Maritime Single Window in European ports.

2. DIGITALIZATION IN MARITIME TRANSPORT AND MARITIME 4.0

Maritime transport is a very specific sector and the key element of world trade economy, which constantly needs to facilitate and unify the current ways of informing between related institutions and private firms. Digitalization and new developments in artificial intelligence, blockchain, the Internet of things and automation, are of increasing relevance to maritime transport. Digital opens the new windows for shipping to strengthen their straight relationships with end customers, further reduce their costs, including for fuel, vessel operation, and customer

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service. Furthermore, it pursues new revenue streams beyond traditional shipping services. On the other hand the digital transformation of maritime transport provides new business opportunities and transform supply chains and the geography of trade. Developing countries need to ensure that they will remain competitive and that their seaborne trade will benefit from improvements that can be achieved by digitalization. They will also need to invest in human, institutional and technological capacities so that their traders and service providers can seize new business opportunities.

If we categorize stages of digitalization in maritime transport, they can be divided into the following three stages:

1. Optimization – maximizing efficiency and reliability in existing processes to reduce the costs of trading.

2. Extension – moving beyond efficiency to produce opportunities for new services and businesses.

3. Transformation – reinventing logistics, trade and business models, based on data-driven revenue streams and shifts in trade flows (Newsletter no.75 by United Nations Conference on Trade and Development, UNCTAD, 2019).

This three stages are one of the main goals of IMO – Facilitation and Convention and Maritime industry 4.0, that ensure to fully transformation of the paperless and implementation on the new technologies and data helps business grow and contributes to the overall economy.

In an age of digital transformation, maritime data digitalization and standardization have become paramount to supporting changes along the entire chain of information processing (Digital transformation of data, https://www.porttechnology.org). Maritime 4.0 allows the entry of IT technologies in maritime transport like Internet of Things (IoT), Big Data Analytics (BDA), Blockchain, that ensure reduction of bureaucracy and easy access to the information. Digital innovations are transforming the global economy. The decline in search and information costs, rapid growth of new products and markets, and emergence of new players ushered in by digital technologies have the promise of boosting global trade flows (Smeets, M.).

Maritime 4.0 includes in itself all of participants of supply chain in maritime sector and also including increasingly connected ports, the emergence of autonomous ships and the growth of alternative fuels. There are still no clear principles and characteristics for M4.0. On the base of a interviews conducted practitioners and academics Maritime 4.0, refers to;

- The automated integration of real data into decision making;
- The adoption and implementation of connected technologies for design, production, and operation;
- Reduction of vessel environmental impact, related to production, operation, disposal (including emissions, underwater noise, and material utilization);
- Affordable and sustainable operation; and
- Reduction of risk, increasing safety and security (Sullivan Brendan P., et al., Shantanoo Desai, Jordi Sole, Monica Rossi, lucia Ramundo, Sergio Terzi).

These principles are defined as a result of done interviews and literature.

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The data below predict the expected digital transformation according to the regions from 2019 to 2027.

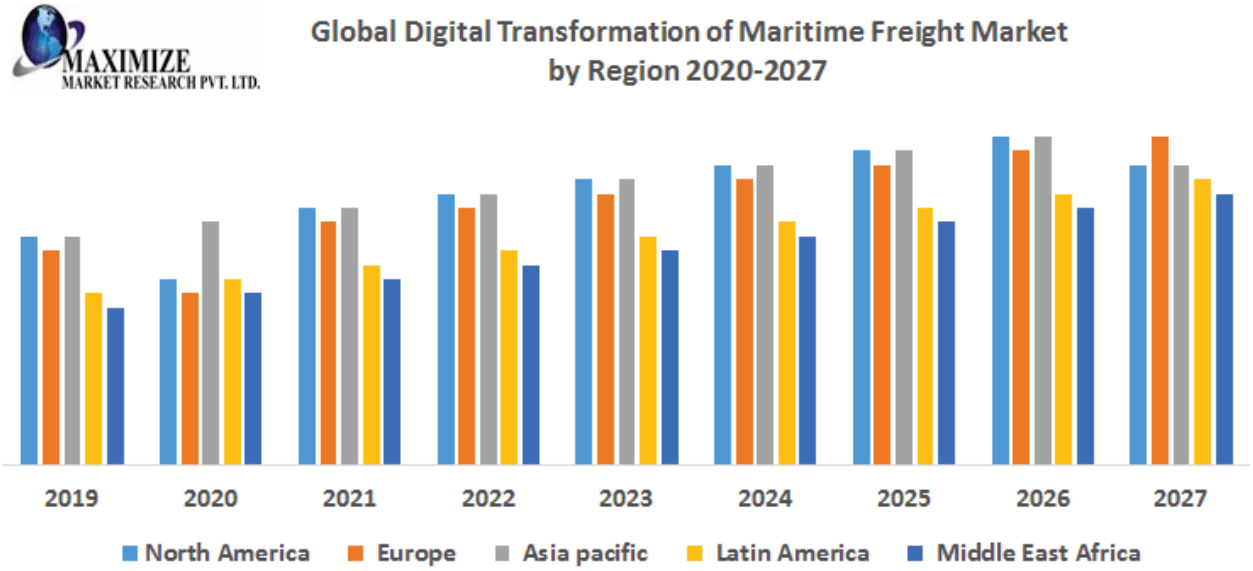

Figure 2.1. Global Digital Transformation of Maritime Freight Market: Industry Analysis and Forecast (2019-2026)

Source by: https://www.maximizemarketresearch.com/market-report/global-digital-transformation-of-maritime-freight-market/40600/

Countries with non-digitized maritime transport sectors are exposed to resilience risks, business continuity risks, more significant inefficiencies, higher transaction costs, higher trade costs, lower competitiveness, economic growth, and employment.

3. THE ROLE OF THE WTO AND IMO – FACILITATION AND CONVENTION OF PAPERLESS TRANSFORMATION IN MARITIME TRANSPORT

The role of the WTO is a great importance for the development of international trade, and maritime transport is the main mechanism for contributing to the whole cycle. The WTO is the only international body dealing with the rules of trade between nations. the declaration, adopted since 1998, calls for the transition to e-commerce between the parties. For the implementation of this practice it is necessary to establish an electronic platform through which the electronic data exchange takes place. It is the main reason to rising of the conception of a single window. The concept of a Single Window is widely known among international trade and maritime organizations.

The most commonly applied definition of the term Single Window is the following:

A single window is defined as a facility that allows parties involved in trade and transport to lodge standardized information and documents with a single point to fulfill all import, export, and transit related-related regulatory requirements (Recommendation 33, ECE/TRADE/352).

The Single Window reduces administrative burden imposed by national institutions, which complicates data transmission between parties. In the same time the Single Window begins to implement in maritime transport, namely in the form Maritime Single Window. According to the requirements of the Standard 1.3bis from 8 April 2019, under the FAL Convention all national governments have to transmission to electronic information exchange between ships and ports calls. In addition, Recommended Practice 1.3 quin encourages the use of the "single window" concept, to enable all the information required by public authorities in connection with the arrival, stay and departure of ships, persons and cargo, to be submitted via a single portal without duplication (IMO Electronic Data Exchange). Implementation of the Single

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Window in maritime transport changes the previous form of data reporting. The Figure below shows before and after using of Single Window in maritime transport.

Figure 3.1. Implementation of Single Window in maritime transport
Source: https://ec.europa.eu/taxation_customs/eu-single-window-environment-customs_en

The Single Window improves and facilitates the currently issues in maritime transport through gathering all data in one point. Using of Single Window eliminates the obligation of filling out the same documentation upon arriving at each port along the route. It aims to improve the European maritime transport sector's competitiveness and efficiency by reducing administrative burden, introducing a simplified digital information system to harmonize the existing national systems and reduce the need for paperwork (EU Regulation 123/9).

3. LEGAL INITIATIVE EU SINGLE WINDOW ENVIRONMENT

The general objective of the initiative is to create a harmonized and future-proof digital European Maritime Single Window (EMSW) environment in order to reduce the administrative burden on ships and to facilitate the use of digital information with the aim of improving the efficiency, attractiveness and environmental sustainability of the maritime transport.

The objectives are:

1. To establish harmonized rules for the provision of the information that is required for port calls;
2. To endorse and facilitate the re-use of data and information;
3. To facilitate the transmission of information between declarants, relevant authorities and the providers of port services in the port of call, and other Member States (REGULATION (EU) 2019/1239).

As the result from these aims are expected to reduce the amount of time that ships spend on reporting procedures during European port calls (1-3 hours per calls). According to the European Commission, reusing the reported data ('reporting only once'), harmonizing IT interfaces and combining customs and maritime reporting procedures could cut this time by about 50% (European Maritime Single Window: Port community advocates the continuation of Port Community Systems).

The European Maritime Single Window is a digital platform that will be a bridge between business and institutions, developed for decades at various levels, including local, national, European and international levels. With the currently Directive 2010/65 / EU did not

achieve maximum efficiency and simplicity in the Union's maritime transport due to the fact that not all national electronic platforms work equally efficiently and there are differences between the electronic exchange of information in different Member States. Researches by the European Commission shows that the use of paper reports still exists in more than 50% of ports and also the same information is sent several times to different bodies and representations to remove this burden between institutions. data provision leads to the creation of the European Maritime Single Window environment.

Existing collaboration between DG MOVE and DG TAXUD is in line with the general objective of an European Maritime Single Window integrated environment for the international trade in goods. This scenario focuses on the strategic vision behind the integrated EU Single Window environment for customs (DG TAXUD) and the EU maritime Single Window for Transport (DG MOVE). It foresees the establishment of a pan-European electronic environment for international trade operations, allowing a harmonized access for businesses to fulfil regulatory obligations and high-performing mechanisms for exchanging information between the competent authorities involved (Marsili, M., DG TAXUD Unit B1).

The increased digitalization of customs and regulatory procedures has opened up new opportunities to improve the interoperability and cooperation between customs and partner competent authorities. The EU's new maritime single window environment is focused on customs procedures, but its objective is more ambitious. The idea is to facilitate filing information required by both customs and non-customs law for logistical operators when transporting EU goods across borders (Europe simplifies customs with the European Maritime Single Window, https://www.bilogistik.com).

5. CONCLUSION

With increasing of freight traffic in maritime transport implementation of digital platforms in maritime transport allows faster and more efficient services of goods. Digitalization and Maritime 4.0 are the steps to facilitate and improve the transmission of information between national institutions and businesses. The use of digital platforms reduces human error and speed up trade flows. With the implementation of electronic platforms increase the capacity of port services by reducing the cost of ships wasting their time waiting for a port call.

The latest regulation 123/9 adopted by the European Commission, which aims at a full transition to digital data exchange between all actors in the logistics chain, namely through the implementation of Single Window. Through this digital platform is expected the data only be sent once, avoiding duplicates and unnecessary copies. In this way, technological progress is coming to European logistics to eliminate cumbersome bureaucratic hurdles that unnecessarily complicated commercial transactions.

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PRE-CONTRACTUAL INFORMATION IN CONTRACTS CONCLUDED WITH ENERGY CONSUMERS

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Abstract. *The provision of pre-contractual information in contracts concluded with consumers of energy resources derives from Directive 2011/83 / EU of the European Parliament and of the Council of 25 October 2011 on consumer rights, amending Council Directive 93/13 / EEC and Directive 1999/44 / EC of the European Parliament and of the Council and repealing Directive 85/577 / EEC of the Council and Directive 97/7 / EC of the European Parliament and of the Council, sectoral directives applicable in the energy sectors, the Civil Code of the Republic of Moldova and other acts national regulations.*
The article addresses the issue of the importance of providing pre-contractual information and regulating specific relationships regarding raising the level of consumer protection, these being the purpose of contracts concluded between trader and consumer, including contracts for the supply of energy resources.
Full harmonization of key regulatory issues should significantly increase legal certainty for both consumers and traders. Both consumers and traders should thus be able to rely on a single regulatory framework, based on clearly defined legal concepts, governing certain aspects of the relationship between traders and consumers.
Keywords: *consumers, energy resources, distance contracts, pre-contractual information, supply, quality.*

JEL CLASSIFICATION: K 32

Pre-contractual information in consumer contracts, including energy resources, as well as pre-contractual negotiation play a considerable role. As the complexity of the object of the future contract increases, the intensity of the negotiations prior to its conclusion will increase. In this regard, the Civil Code of the Republic of Moldova stipulates that the person is free to negotiate and is not liable only for the fact that no agreement has been reached. The person who is engaged in negotiations has the obligation to negotiate in good faith and not to break the negotiations contrary to good faith (Article 1025 para. (1-2) of the Civil Code).

Any clause that excludes or limits this obligation is struck by absolute nullity. Such a distinction is made even by the legislator in art. 1027 para. (1) and (2) of the Civil Code according to which "The contract is considered concluded if the parties have reached an agreement on all its essential clauses. It is essential the clauses that are established as such by law, which arise from the nature of the contract or on which, at the request of one of the parties, an agreement must be reached" (Article 1025 para. (1-2) of the Civil Code).

As we see between the pre-contractual phase which may involve a progression or regression in the sense of achieving contractual consensus, on the one hand, and the conclusion of a contract there is an indissoluble link. Regardless of the final solution of the stage of reaching the contractual consensus, it takes place under the sign of the freedom of negotiations between the parties.

In contracts concluded with consumers it is necessary to take into account the presence of standard clauses. Here, too, the Direct Civil Code stipulates that if the parties have reached an agreement, but both the offer and the acceptance refer to the standard clauses of that party, the contract is still considered concluded. Standard clauses are part of the contract in so far as the standard clauses of one party do not conflict with the standard clauses of the other party. However, the contract shall not be deemed to have been concluded if one of the parties:

- has expressly indicated in advance, and not only by way of a standard clause, the intention not to be bound by the contract if the intended circumstance arises, or

- inform the other party of this intention without undue delay (Article 1025 para. (1-2) of the Civil Code).

However, the limits of pre-contractual freedom are given by the existence of certain legal or conventional obligations, explicit or implicit. But these legal obligations in the case of contracts concluded with consumers must not be to the detriment of the principle of freedom of contract.

We referred here to the legal obligations as the conclusion of contracts with consumers of energy resources can take place only on the basis of the mandatory contractual clauses, approved either by law or by the decisions of the regulatory authority.

Although the institution of the electricity supply contract as a contract under which electricity is supplied to the consumer is recognized by law, the existence of "binding contractual clauses" must not prevail over pre-contractual information requirements and the principle of negotiating such contracts.

Althoughnder the existing legal framework all final consumers are eligible to be supplied with electricity by any chosen supplier and have the right to supply electricity on a contractual basis, in terms of accessibility, continuity and reliability, as well as their right to conclude contracts with any supplier of your choice (Art. 63 para. (1-2) of Law no. 107 of 27.05.2016), the freedom to contract is largely vitiated by these mandatory clauses imposed on the parties by the regulatory authority.

Thus, the supply of electricity to final consumers is carried out only on the basis of the electricity supply contract concluded between the supplier and the final consumer in accordance with the sectoral law and the Regulation on the supply of electricity (Art. 63 para. (1-2) of Law no. 107 of 27.05.2016). The principles underlying the contracting provided for in the above-mentioned Regulation are also provided by law and they refer to the following:

- the supplier is obliged to elaborate the standard contractual clauses of the electricity supply contract, proposed for negotiations to the final consumers;

- the standard contractual clauses are elaborated in accordance with the law and with the Regulation on electricity supply (based on the obligatory clauses);

- the binding contractual terms of the electricity supply contract concluded between the universal service provider or supplier of last resort and final consumers shall be approved by the Agency (Art. 63 para. (1-2) of Law no. 107 of 27.05.2016).

In essence, all electricity contracting conditions are strictly determined by both the Law and the Regulation on the supply of electricity, and the contracting parties do not have the right to derive in the contracting process from the provisions of the Mandatory Clauses of the electricity supply contract to the consumer. and the mandatory clauses of the contract for the supply of electricity to the non-household consumer. This normative framework is a contradictory one, it affects the principle of contractual freedom and the conclusion of electricity supply contracts, diminishing the role and importance of pre-contractual information.

The pre-contractual information requirements in contracts concluded with consumers of energy resources are established by Directive 2011/83/EU, sectoral directives applicable in the fields of energy, the Civil Code of the Republic of Moldova and other national regulations.

Full harmonization of key regulatory issues should significantly increase legal certainty for both consumers and traders. Both consumers and traders should thus be able to rely on a single regulatory framework, based on clearly defined legal concepts, governing certain aspects of the relationship between traders and consumers within the Union. The effect of such harmonization should be to remove barriers that originate in the fragmentation of rules and to complete the internal market in this area. Those barriers can only be removed by establishing

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uniform rules at Union level. In addition, consumers should enjoy a high common level of protection throughout the Union (Directive 2011/83 / EU).

Directive 2011/83/EU lays down rules on the information to be provided in the case of distance and off-premises contracts, as well as non-distance and off-premises contracts. By the same token the directive stated that contracts for district heating should be covered by the directive, similar to contracts for the supply of water, gas and electricity. Central heating means the supply of thermal energy, inter alia in the form of steam or hot water, from a central source of production, through a transmission and distribution system to several buildings, for the purpose of heating (Directive 2011/83 / EU). For these reasons the requirements relating to pre-contractual information is also applicable in the case of the conclusion of such contracts. Recital 34 of Directive 2011/83/EU states that, in providing pre-contractual information, 'the trader should take into account the specific needs of consumers who are particularly vulnerable as a result of their mental, physical or psychological disability, age or their credulity, in a way that the trader could reasonably foresee. However, the fact that such specific needs are taken into account should not lead to different levels of consumer protection".

The Consumer Rights Directive 2011/83/EU covers all the information requirements set out in Article 7 (4) of the Unfair Commercial Practices Directive 2005/29/EC, which requires an invitation to purchase to contain certain information, if not already emerges from the context. This information includes: the main characteristics of the product, in accordance with the communication medium used and the product concerned; the address and identity of the trader; price, including taxes; methods of payment, delivery, execution; the merchant's complaint handling policy (if it differs from the due diligence requirements); and, where applicable, the existence of the right of withdrawal. Therefore, when providing pre-contractual information in accordance with the Consumer Rights Directive, a trader will also comply with the information requirements of the Unfair Commercial Practices Directive. This will be without prejudice to the information requirements of the Unfair Commercial Practices Directive on the invitation to purchase before the pre-contractual stage, for example the advertising stage.

For contracts negotiated in commercial premises, Article 5 allows traders not to provide information that "already emerges from the context". The concept of "already out of context" information is also used in the Unfair Commercial Practices Directive. The Unfair Commercial Practices Directive (Directive 2005/29/EC) of 2009 mentions the geographical address and the identity of the trader as information that can sometimes be considered as "obvious or out of context", for example the address of a shop or restaurant where the consumer is already located. They also include examples of goods whose main characteristics are obvious only by looking at them (Article 7 (4)).

For off-premises contracts, Article 7 (1) further requires that pre-contractual information be "legible and written in plain, intelligible language" and for distance contracts Article 8 (1) requires that the information be provided to the consumer "in a manner appropriate to the means of distance communication used, using simple and intelligible language. To the extent that the information is presented on a durable medium, it shall be legible ".

Table1. Consistency of the consumer protection measures provided in Law no. 107/2016 with EU Directive 2009/72 (Directiva 2009/72/CE**)**

EU Directive 2009/72	**Law no. 107/2016**	**Comments**
Annex I. Consumer protection measures aim to ensure: a) the right to conclude with the electricity supplier a contract specifying: - identity and address of the supplier; - the services provided, the level of quality of the services provided, as well as the deadline for the initial connection; - the types of maintenance services offered; - the means by which up-to-date information on all applicable tariffs and maintenance charges may be obtained; - the duration of the contract, the conditions for renewal and interruption of services and the contract and whether there is a right of free termination of the contract; - any compensations and forms of reimbursement that apply if the quality levels of the services provided for in the contract are not met, including inaccurate invoicing and late payment; - the arrangements for initiating procedures for settlement of disputes in accordance with point (f);	Art. (2) The contract for the supply of electricity must obligatorily contain the following: a) the name and address of the supplier; b) the object of the contract, the quality parameters of the supplied electricity, the hourly quantities of contracted electricity; c) the means by which up-to-date information on the prices in force can be obtained; d) the cases and conditions of interruption of the electricity supply, of disconnection and reconnection to the electrical networks of the electrical installations of the final consumers; e) the duration of the electricity supply contract, the cases and the manner of extension, modification, suspension and termination of the respective contract, including to expressly provide the right of the final consumer to terminate the contract unilaterally and free of charge;	- to replace the word "name" with the word "identity"; - within the meaning of the Directive, it is considered that the services provided must correspond to the level of quality of the services provided and not to the quality parameters of the electricity provided; - up-to-date information refers to all applicable tariffs and maintenance charges and not only to up-to-date information on prices in force; - The Directive does not refer to cases of interruption of electricity supply, but only to conditions;
- information on consumer rights, including complaint handling and all information referred to in this point, clearly communicated in invoices or on the websites of electricity undertakings. The conditions must be fair and communicated in advance. In any case, this information should	f) provisions regarding the manner of notification by the supplier of the final consumer regarding the increase of the electricity supply price before its application; g) the types of maintenance services, if they are offered; h) the payment terms, the payment methods, the cases in	- The Directive refers to the modalities for initiating dispute settlement procedures and not to the modalities for initiating dispute settlement procedures;

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be provided before the conclusion or confirmation of the contract. Where the contract is concluded through intermediaries, the information referred to in this point shall also be provided before the conclusion of the contract;	which the supplier is entitled to impose the preventive payment for the electricity consumption, as well as the measures that will be taken by the supplier in case of non-compliance by the final consumer of the contractual obligations; i) any compensation and reimbursement arrangements which apply if the supplier fails to fulfill his contractual obligations, including in the event of incorrect invoicing, or if the supplier fulfills his contractual obligations late or in a defective manner; j) the modalities of initiating the procedures for solving the misunderstandings related to the non-execution or defective execution of the contractual clauses; k) the rights and obligations of the supplier and the final consumer, as well as information on the management of complaints. (3) The contractual conditions must be fair and presented to the potential final consumer before the conclusion of the electricity supply contract. If the contract for the supply of electricity is concluded by representatives, the final consumer must be notified in advance of the contractual conditions.	- the conditions must be fair and communicated in advance not only before the conclusion of the contract but also at the confirmation of the contract.
(b) the right to be duly notified of any intention to change the terms of the contract and to be informed, at the time of notification, of the right to terminate the contract. Service providers shall notify subscribers of any tariff increases, directly and in a timely manner, no later than the end of the first normal billing period following the entry into force of the increase, in a	Article 70 para. (11) The supplier is obliged to notify the final consumer about the proposal to modify the electricity supply contract at least 15 working days in advance, as well as about the fact that the latter is entitled not to accept the modification or to terminate the contract for the supply of electricity in case of	The Directive does not refer to the first normal billing period following the entry into force of the increase, in a transparent and easy to understand way.

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transparent and easy to understand manner. Member States shall guarantee customers the right to terminate any contract if they do not accept the new conditions notified by the electricity supplier.	disagreement. The supplier is obliged to notify, directly, transparently and intelligibly, the final consumers about any price increase no later than the end of the first billing period following the entry into force of the increase.	
(c) receiving transparent information on prices and tariffs, as well as on the general conditions of access to and use of electricity services;	Article 69 para (2) Each supplier is obliged to have service centers for final consumers so that the latter receive all the necessary information to allow them to make use of the rights enshrined in law and by normative acts in the field, including by regulatory acts approved by the Agency, in particular: a) information on the prices charged, as well as on the standard contractual clauses, the conditions to be met for concluding the electricity supply contract and other relevant information;	The Directive refers only to the prices and tariffs charged, as well as to the general conditions of access to electricity services, but not to the standard contractual clauses, the conditions to be met for the conclusion of the electricity supply contract.
(d) a wide range of payment methods, which do not unduly discriminate between customers. Prepay systems are fair and adequately reflect probable consumption. Any differences in terms and conditions reflect the costs to the provider of the different payment systems. The general conditions are fair and transparent. They are presented in clear and easy-to-understand language and do not include non-contractual barriers to the exercise of customer rights, such as excessive contractual documentation. Customers are protected against incorrect or misleading sales methods;	Article 69 para. (2) b) information regarding the payment methods, the possible consequences in case of non-payment of the bills for the consumed electricity, as well as regarding the situations in which the supplier is entitled to receive the preventive payment for the supplied electricity to the final consumers;	Prepayment schemes are fair and adequately reflect probable consumption but not established as possible consequences for non-payment of electricity bills, as well as for situations in which the supplier is entitled to charge the pre-payment for electricity supplied.

(e) the possibility to change supplier free of charge;	Article 69 para. (2) c) information on the procedure for changing the supplier, on the right of final consumers to change supplier unconditionally and without charging a fee, as well as on the right of the final consumer to receive, no later than two weeks after changing supplier, a final invoice of payment for electricity consumed;	The Directive does not provide for the possibility of unconditional change of supplier.
(f) the possibility of transparent, simple and inexpensive complaint handling procedures. In particular, all consumers are entitled to a high standard of service provision and complaint handling by their electricity supplier. These out-of-court dispute resolution procedures allow for the correct and prompt settlement of disputes, preferably within three months, and provide, in all justified cases, for a system of reimbursement and / or compensation. These procedures should, where possible, comply with the principles set out in Commission Recommendation 98/257/EC of 30 March 1998 on the principles applicable to bodies responsible for out-of-court settlement of disputes with consumers para. (3);	Article 69 para. (2) d) information on the ways of out-of-court settlement of possible disagreements with final consumers, on the compensations to be paid to final consumers in case of breach by the supplier of its obligations, as well as on deadlines for resolving complaints received from final consumers;	The Directive deals with the settlement of complaints but not with the means of out-of-court settlement of any disputes.
(h) that they have access to their own consumption data and that they can grant access to the measurement data, by express agreement and free of charge, to any registered supply undertaking. The party responsible for data management is obliged to provide this data to the undertaking concerned. Member States shall determine the format for the presentation of the data and the procedure for access by suppliers and consumers to that data. No additional costs can be charged to	Article 55 para. (3) System operators keep records of electricity using only metrologically verified measuring equipment, the types of which are included in the State Register of measuring instruments, published in the Official Gazette of the Republic of Moldova and placed on the official website of the National Institute of Metrology. Article 55 para. (7)	According to the Directive, Member States shall determine the format of the presentation of the data and the procedure for access by suppliers and consumers to that data. No additional costs can be charged to consumers for this service. In the Republic of Moldova all

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consumers for this service.	Producers and final consumers are obliged to grant access to system operators' representatives to measuring equipment that is within their property in order to exercise the functions established for system operators in this law and in the Regulation on the measurement of electricity for commercial purposes. Article 55 para. (8) Producers and final consumers are obliged to keep intact and not to intervene on the measuring equipment installed within the limits of their ownership. If the damage to the measuring equipment is due to the fault of the consumer, he will bear the costs of uninstallation, repair, metrological verification, installation or replacement of the damaged measuring equipment.	expenses are included in the tariff.
(i) adequate information on actual electricity consumption and actual costs, sufficiently frequent so that they have the opportunity to regulate their own electricity consumption. That information shall be communicated at appropriate intervals, taking into account the capacity of the customer's measuring equipment and the energy product concerned. The cost-effectiveness of these measures shall be taken into account. No additional costs can be charged to consumers for this service.	Article 69 para. 2 letter e) information on the ways in which the supplier is to communicate to the final consumers the data regarding the real electricity consumption and the real costs; Article 69 para. (8) The supplier is obliged to indicate in the payment invoice, in the promotional materials, the information regarding the electricity consumption of the final consumer, so that he will have the possibility to regulate his own electricity consumption, regarding the applied prices. , as well as on the cost of electricity consumed. That information shall be communicated at appropriate intervals, taking into	Appropriate information on actual electricity consumption and actual costs, sufficiently frequent, is related only to the possibility to regulate their own electricity consumption.

	account the capacity of the measuring equipment installed at the final consumers and the periodicity of reading the indications of the measuring equipment, as well as the cost-effectiveness of these measures. The provider is prohibited from receiving additional payments for this service from final consumers.	

As we see from the Table above, the consumer protection measures provided in Law no. 107/2016 do not comply with EU Directive 2009/72.

The Moldovan legislator harmonizing the national legislation on pre-contractual information with the European Directives did not take into account did not take into account the practice of other states in this field. For example, the legislation of the Romanian state has established minimum information that the supplier is obliged to provide me in the invoice, and the invoice issued by the supplier to final customers or its annex must contain, in a clear and easy to understand form, at least the following information. :

a) the identification and contact data of the supplier and of the final customer;

b) the number and date of issuing the invoice;

c) the due payment term;

d) the period for which the consumed energy was billed;

e) the manner in which the quantity of invoiced electricity was established, respectively measurement, estimation or self-reading, in the case of final customers at which the reading interval is longer than the billing one;

f) the significance of each payment obligation included in the invoice, respectively invoiced active energy, invoiced reactive energy, active / reactive energy corrections, power tax, penalties for exceeding the contracted powers, penalties for deviations from the consumption forecast, penalties for delay in payment of bills, etc.;

g) invoice quantities, specifying whether they represent measured, estimated or contracted values;

h) the units of measurement and the prices applied for each invoiced quantity;

i) regulated tariffs for transmission and system and / or distribution services, which are part of the selling price / tariff, if applicable;

j) the legal price basis, respectively the document by which the regulated prices and the taxes applied in the invoice were approved / endorsed;

k) the amounts resulting for each invoiced quantity;

l) green certificates, contribution for high efficiency cogeneration, VAT, excise and other taxes provided by the legislation in force;

m) the total payment value, specifying the total quantities of electricity invoiced on the invoicing interval;

n) information on the payment amounts for which the due date was exceeded at the time of issuing the invoice;

o) the identification code of the place of consumption;

p) the unique identification code of the measuring point;

q) methods of payment of invoices;

r) information on the rights and remedies available to final customers in case of dispute.

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In **CONCLUSION**, I believe that in order to return to normal, it is necessary to review the entire primary and secondary framework for pre-contractual information, as well as to conclude contracts for the supply of energy resources.

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SMART HOUSE SECURITY RISKS WHEN USING A SMART LOCK

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Abstract. *The number of home and office invasions is constantly increasing. Its cause would not be the lack of safety of the locking mechanisms at the entrance doors, but the fact that the locks can be broken, regardless of their complexity. It is true that some can be unlocked in minutes, traditional padlocks that have been analysed in detail by villains, a few hours or more, namely electronic ones. This study will address the main qualities of an electronic home security system. When going through different scenarios, the most suitable intelligent lock shall be chosen.*

Keywords: *Smart padlock, Bluetooth, fingerprint, remote control.*

JEL CLASSIFICATION: O 3

INTRODUCTION

The development of information and communication technologies in recent decades has affected, in the best sense of the word, the way we work, communicate, learn and generally the way we lead our lives. It should be noted that any innovation that is implemented in a device brings with it some uncertainties about how it works.

Given the latest devastating natural phenomena (mostly floods and storms), the risk that the house will run out of electricity is increasing. If for a traditional home the power outage for a longer period of time would mean a simple impossibility to use electrical and electronic devices, which in the worst case would result in altered products in the refrigerator, then for a smart home, the consequences of the lack of electricity supply for a long time may consist in the exposure of home security to an increased risk through failure of the padlocks.

Therefore, any power outage for a smart home shall have minimal consequences for its proper operation. If earlier, not for a high-tech house, it was important that after a power failure, the devices remain functional when reconnected to the power supply, which was caused by a power outage, now it is vital that the devices have a good operation and their settings to be kept.

SHORT HISTORY

Before the appearance of padlocks, people protected their property in hidden rooms or in pools of water which in turn were guarded by armed guards or hungry predators. The padlocks have been implemented even before our era (BC). This invention has been attributed to many peoples, but its origin remains unknown today. Their appearance was conditioned by the need to prohibit the use of houses, theft from them or vandalism.

The oldest known prototype is a device similar to a wooden latch, dating from the 700s BC. It was recovered from the ruins of an Egyptian temple (Figure 1). In the Iron Age, the Romans took over this technology by replacing wood with metal parts [1].

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Figure 1. Egyptian padlock
Source: https://www.historicallocks.com

The use of padlocks involves a certain level of responsibility, namely the loss of the key. In order to minimize the risk of losing the key, mechanical digital locks were invented, but even in this case the cipher may be forgotten and the padlock may remain locked.

SMART PADLOCKS

With the introduction of smart devices in the home control system, electronic locks have become the "key element". They provide extra comfort in use because they can be managed by different methods at the same time (Figure 2). Network-connected padlocks offer both security and flexibility, and their installation is becoming increasingly simple.

Figure 2. Modern smart padlock
Source: https://august.com

The basic criteria of a smart padlock:

- fire protection;
- drilling protection;
- made of robust material;
- the electronic key is used instead of the traditional one;
- automatic locking and remote control;
- voice control;
- biometric identification;
- locking mechanism - electromagnetic or electromechanical;

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Incorporating all of the above criteria into a single device would generate increased complexity in construction and adjustment. Besides the fact that the installation process will be quite unfriendly, its price will be much higher than what we currently find on the market. However, the reliability of such a padlock will be significantly reduced. It is important to mention that for a smart padlock, the remote management of the access function is a priority, and the basis of its operation is a microcomputer. An absolute priority of a smart padlock is the ability to maintain the safety of property as well as the family.

SCOPE

An absolute priority of a smart padlock is the ability to maintain the safety of property as well as the family. Its key element is a perfect match between its scope and technological endowment. The main areas where these devices apply are:

- Dwellings (houses);
- Hotels;
- Commercial offices;
- Manufacturing sites;
- Research and development organizations;
- Academic campuses

Some of the best padlocks of 2021 are Augustin Wi-Fi Smart Lock, Xiaomi Mijia, OpenPath. In principle, they could cover the full spectrum of areas of use of smart locks.

August Wi-Fi Smart Lock - makes entering and leaving the house much more comfortable, secure and smart. It is extremely easy to install, applying the device over the existing padlock cylinder. This is one of the most compact smart padlocks on the market. It is also equipped with a door sensor that informs each time if the door is closed and locked. An extremely useful advantage is the automatic locking when leaving the house and the automatic unlocking when returning. This is possible through the application installed on your phone. It is available on both iOS and Android phones. Also, through the application, messages are sent and received when certain family members have accessed the device [2].

Unlike the previous padlock, where the device is installed on an existing padlock, in the case of Xiaomi Mijia - the set contains all the necessary elements to secure the home. Its size is quite large. In addition to the technologies mentioned above, it is also equipped with a keypad, fingerprint reader - where the device has the ability to store the fingerprints of 50 users. This allows it to be installed in small businesses. In addition, NFC cards can be used. Here the danger of depletion of the power supply has been eliminated by adding an additional micro-usb port by which the device can be recharged or a safety opening can be performed [3].

OpenPath was created by a team of entrepreneurs who wanted to eliminate the situations in which they forgot the key at work, at home, or were frustrated to carry with them a lot of keys, even electronic, to access different rooms. Such situations endangered the security of the organization. In a company, smart locks have the function of both securing rooms and monitoring access to them, and managing it depending on the permission level of the key. Due to the large number of people, it is necessary to implement a variety of access keys, which would provide flexibility and convenience in the work of both employees and support staff [4].

MARKET TRENDS

Despite the difficulties of the pandemic year, the level of the market for this product has remained high. As we can see from the diagram (Figure 3), most of the marketing of this product belongs to the residential sector, which would be about one billion dollars [5]. Given the current trends, the Smart Home market will be constantly growing.

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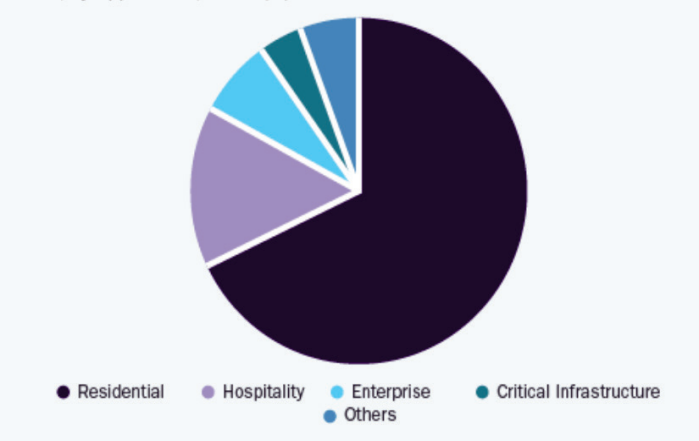

CONCLUSIONS

About 3 thousand years ago padlocks were implemented. The primary quality of this device has remained unchanged, being the security of homes or other rooms. The principle of operation has experienced dizzying development over the last century culminating in the increasing spread of smart padlocks.

Different types of devices have been adjusted to suit different usage situations. Here the scope of use, the number of users and the need for monitoring were taken into account.

The use of a smart padlock, in addition to increased security, shall bring extra comfort in the application of the latest technologies.

The market for this product is constantly growing. This trend has become even more pronounced in the last 2 years so that the turnover is about 1.4 billion dollars.

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ACCOUNTING MATTERS RELATED TO SERVICE RENDERING AND TURNKEY CONTRACTS UNDER THE TERMS OF PUBLIC-PRIVATE PARTNERSHIPS

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Abstract: *Service rendering and turnkey contracts is one of the legal forms for carrying out activities of societal interest though the public-private partnership. On 12 November 2018, the Ministry of Finance of the Republic of Moldova approved the Methodical guidelines on accounting peculiarities for implementing public-private partnerships, which were supposed to provide answers to many questions, but yet again they comprise interpretable subject-matters. One of the issues discussed to this end and tackled in this Article relates to the use of accounts and the way of mirroring the accounting records related to service rendering and turnkey contracts under the terms of public-private partnerships.*

Key words: *turnkey contract, service rendering, public-private partnership, public partner, private partner.*

JEL CLASSIFICATION: M-41

1. INTRODUCTION

The association of public and private environments shall facilitate the investment process and address the societal issues more quickly. Such association may take place via public-private partnerships under the terms of service rendering and turnkey contracts.

Taking into account different interpretations of National and International Accounting Standards, and also some Methodical guidelines uncertainties, such as how to properly account and mirror business transactions in the private partner accounting records, both the Academia and Practitioners experience difficulties related to keeping records of service rendering and turnkey contracts under the terms of public-private partnerships.

Therefore, this Article shall address some matters related to service rendering and turnkey contracts and the peculiarities thereof, show how to use the accounts *and mirror the accounting of transactions on the basis of specific examples of* service rendering and turnkey contracts under the terms of public-private partnerships, in compliance with the provisions laid down by the Methodical guidelines on accounting peculiarities for implementing public-private partnerships (hereinafter referred to as the Methodical guidelines) [2], the Law on public-private partnership No.179/2008 (hereinafter referred to as Law No.179/2008) [4], the Civil Code No.1107/2002 [1], the National Accounting Standards (NASs) [7] and the Chart of Accounts [6].

2. APPLIED METHODS

This research is build upon a theoretical and applicative approach, which enables reviewing the content of legislative and regulatory acts, and their actual application.

3. OUTCOMES AND DISCUSSIONS

Pursuant to Law No.179/2008, *the public-private partnership* is a long-term agreement concluded by a public partner and a private partner to carry out activities of public interest, based on the capacities of each partner to allocate the resources, risks and benefits in an appropriate manner [4, Article 2].

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Article 1352 of the Civil Code defines the turnkey contract as an agreement on which basis the party called the Entrepreneur/Contractor undertakes on its own risk to carry out certain works for the other party called the Customer, and the latter undertakes to receive/accept the works and pay the agreed price [1, Article 1352].

The Law on Public-private Partnership, No.179/2008, stipulates that the public-private partnership, performed through the service rendering/turnkey contract, has as subject-matter certain public services, which are rendered by a utility entity against payment, overhaul works for consideration, servicing infrastructure components and other assets under the public-private partnership terms, keeping records on resource consumption, submitting invoices to consumers [4, Article 18].

Pursuant to the Methodical Guidelines, the service rendering contract under the terms of public-private partnerships is an agreement for consideration, while the size of payment for the rendered services shall be agreed by the parties or established by regulatory acts, being settled following the service rendering, unless the parties provide otherwise [2, Paragraph 12].

If the service rendering/turnkey contract is concluded under the terms of public-private partnerships, it shall be compliant with the requirements of the relevant legal framework and its content must comprise at least one of the ways of carrying out the public-private partnership: *design-construction-operation, construction-operation-renewal, construction-operation-delivery, or construction-delivery-operation.* Otherwise the service rendering/turnkey contract would not belong to the public-private partnership scope and would be managed pursuant to other economic and legal administration criteria [4, Article 19].

According to the Methodical Guidelines, there are service rendering contracts and turnkey contracts.

The core accounting rules for service rendering transactions at the private partner are as follows [2, Paragraph 27]:

- Registration of costs related to the public service rendering contract – as an increase of costs of core activities or auxiliary activities and a decrease of inventories, increase of amortisation, liabilities, etc.;
- Settlement of contractual costs related to the rendered public services – as an increase of sales costs and decrease of costs of core activities or auxiliary activities (the actual cost of the rendered public services);
- Recognition of proceeds from rendering public services – as a concurrent increase of receivables and operating income.

For instance, an entity (private partner) renders services to a public healthcare settlement, i.e. installs dialysis equipment. In 2020 the entity rendered and delivered public services worth MDL 102 000, including VAT MDL 17 000, to a public partner. The service costs amounted to MDL 74 200.

Based on the aforementioned data, in 2020 the private partner shall recognise the income from the installation of equipment and its receipt by the public partner in the amount of MDL 85 000 and register it as concurrent increase of affiliated parties receivables and of operating income. The costs in the amount of MDL 74 200 shall be entered as increase of sales costs and decrease of costs of auxiliary activities.

On the basis of the aforementioned example, the private partner shall account the business transactions in the manner displayed in Table 1 below.

Table 1. Private Partner Accounting Records related to Service Rendering Contracts

No.	Transaction	Primary documents related to transactions	Amount, MDL	Correspondent Accounts	
				Debit	Credit
1	2	3	4	5	6
1.	Mirroring the cost of installing the dialysis equipment	Invoices, Delivery-acceptance protocols of construction works, Inventory settlement acts, Log for amortisation calculation	74 200	811	124, 211, 213, 214, 521, 821, etc.
2.	Mirroring the registration of proceeds derived from the installation of dialysis equipment	Tax invoice issued by the private partner	85 000	2345	611
3.	Mirroring the registration of VAT amount for the installation of dialysis equipment	Tax invoice issued by the private partner	17 000	2345	534
4.	Mirroring the settlement of the service cost for the installation of dialysis equipment	Accounting Note	74 200	711	811
5.	Mirroring the extinction of the receivable related to the installation of dialysis equipment	Payment Order, Account statement	85 000	242	221

124 Amortisation of fixed assets; 211 Materials; 213 Low-value and short-term items; 214 Wear and tear of low-value and short-term items; 2345 Receivables related to the public-private partnership; 242 Current accounts in national currency; 521 Current trade liabilities; 534 Accounts payable towards the budget; 611 Proceeds from sales; 711 Costs of sales; 811 Core activities; 821 Indirect production costs;

Source: developed by the Author.

Pursuant to the Methodical Guidelines, when the private partner receives assets from the public partner, which are necessary to render the contracted service, the private partner shall account those assets in an off-balance-sheet account [2, Paragraph 26].

Taking into account the complexity of turnkey contracts in comparison with the service rendering contracts, the related revenues/proceeds and expenses shall be recognised by the private partner only when the outcome of the contract can be appraised with certainty, based on the contract execution period, which could fall within a reporting period and go beyond it. If the turnkey contract is carried out through several reporting periods, the contractual revenues and expenses shall be recognised depending on the stage of completion of contract activity. Pursuant to this method, the contractual revenues and expenses shall be recognised for each stage of completion [2, Paragraph 16].

As the turnkey contracts under the terms of public-private partnerships can be performed through one of the ways listed above, we shall tackle the **construction-delivery-operation** method; hence, the private partner shall account the transactions as follows [2, Paragraph 23]:

a) Construction Phase:

- Registration of costs related to the construction of the object – as increase of costs/ of property, plant and equipment in progress and decrease of inventories, increase of amortisation, liabilities, etc.;
- Delivery of the constructed object to the public partner – as increase of current receivables and decrease of costs/ of property, plant and equipment in progress;
- Recognition of the object of the turnkey contract received from the public partner for use – as concurrent increase of fixed assets and current liabilities;
- Mutual compensation of receivables and liabilities related to the object of the turnkey contract – as concurrent decrease of liabilities and of current receivables.

b) Operation Phase:

- Calculation of amortisation of the object received from the public partner – as concurrent increase of current expenses/costs and amortisation. The utilisation period of the received object shall be established as per the NAS "Intangible and tangible fixed assets", but it shall not exceed the duration of the public-private partnership contract;
- Registration of proceeds derived from the operation of assets received from the public partner – as concurrent increase of cash or current receivables and of operating income;
- Settlement of amortisation at the time of returning the object to the public partner upon the expiry of the contract – as concurrent decrease of accrued amortisation and of object value.

For instance, pursuant to the turnkey contract under the terms of a public-private partnership, a public partner provided a land plot worth MDL 300 000 to a private partner, and the latter undertook to design and build a multifunctional Sports Centre located at the second and third floors, the space of the ground floor and the first floor being intended for car parking. The private partner invested MDL 112 500 000. Upon completing the construction of the building, it is transferred in the public partner ownership. Subsequently, the public partner shall transfer it to the private partner to be used for a 25-year term.

Upon the expiry of the contract, the public partner shall register the building (the multifunctional Sports Centre located at the second and third floors, the space of the ground floor and the first floor being used for car parking) at the market price, i.e. MDL 10 600 200, while the useful operation period is 20 years.

The private partner shall pay royalty to the public partner in the amount of 15 per cent of the proceeds collected from the sale of sports subscription tickets and payments for car parking. During the first year of operation, the proceeds derived from the sale of sports subscription tickets and payments for car parking amounted to MDL 9 210 000, while the operating costs, including amortisation, equalled to MDL 4 320 000.

In compliance with the accounting policy, the private partner recorded the costs incurred for the design and construction of the building in the account "Costs related to turnkey contracts". The proceeds derived from the sale of sports subscription tickets and payments for car parking received from the private partner shall be recorded in the account "Receipts from rendering services related to other activities".

Pursuant to the data of the aforementioned example, the private partner shall account the business transactions as shown in Table 2.

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Table 2. Private Partner Accounting Records related to Turnkey Contracts

No.	Transaction	Primary documents related to transactions	Amount, MDL	Correspondent Accounts	
				Debit	Credit
1	2	3	4	5	6
1.	Mirroring of costs related to the construction of the building (Sports Centre and car parking lot)	Invoices, Delivery-acceptance protocols of construction works, Inventory settlement acts, Log for amortisation calculation	112 500 000	840	211, 213, 124, 521, etc.
2.	Mirroring the building value (Sports Centre and car parking lot) delivered to the public partner	Tax invoice issued by the private partner	112 500 000	2345	840
3.	Mirroring the building value (Sports Centre and car parking lot) received from the public partner	Tax invoice issued by the public partner	112 500 000	123	521
4.	Mutual compensation of liabilities and receivables of the public partner	Mutual settlement acts signed by both parties	112 500 000	521	2345
5.	Calculation of annual amortisation of the building (MDL 112 500 000 : 25 years)	Log for amortisation calculation	4 500 000	811	124
6.	Mirroring the building operating costs (Sports Centre and the car parking lot)	Tax invoices, Inventory settlement acts, Accounting notes, Staff salary calculation note, etc.	10 600 200	811	211, 213, 124, 521, etc.
7.	Registration of proceeds derived from the rendered services (Sports Centre and car parking lot)	Cash receipts, control strips, reports issued by the cash and control register with fiscal memory, collection order, bank statement, tax invoices	9 210 000	241, 242, 2345	841

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8.	Registration of income share belonging to the public partner (9 210 000 lei x 15%)	Accounting Note	1 381 500	841	521
9.	Registration of income share belonging to the private partner (9 210 000 lei x 85%)	Accounting Note	7 828 500	841	611
10.	Settlement of the liability towards the public partner regarding the proceeds from other activities	Payment Order, Account statement	1 381 500	521	242
11.	Overall settlement of operating costs (4 500 000 lei + 10 600 200)	Accounting Note, Statements from the Logs of Accounts 811, 711	15 100 200	711	811
12.	Settlement of building amortisation at the end of the PPP contract upon the expiry of the established term of operation	Statements from the Logs of Accounts, Protocols of fixed asset delivery into operation	112 500 000	124	123

123 Fixed assets; 124 Amortisation of fixed assets; 211 Materials; 213 Low-value and short-term items; 214 Wear and tear of low-value and short-term items; 2345 Receivables related to the public-private partnership; 241 Cash register; 242 Current accounts in national currency; 521 Current trade liabilities; 534 Accounts receivable towards the budget; 611 Proceeds from sales; 711 Costs of sales; 811 Core activities; 840 Costs related to turnkey contracts; 841 Receipts from the rendered services.

Source: developed by the Author.

To keep records on costs related to the building, as per the Methodical Guidelines, the private partner can introduce the necessary accounts into its accounting policy. Hence, the following accounts have been suggested for use:

- 840 "*Costs related to turnkey contracts*"
- 841 "*Receipts from the rendered services*"

It is worth noting that according to the amendments operated to the Chart of Accounts, account 2345 "*Receivables related to public-private partnerships*" was introduced to account the relevant transactions, which has been used in the aforementioned examples [6].

4. CONCLUSIONS

The service rendering and turnkey contract is a form of carrying out public-private partnership relations. The legislation in force and the regulatory acts in place comprise provisions enabling the practical use of this more flexible type of contract.

In the course of the research we mentioned the matters related to the service rendering and turnkey contract, in particular, the way of using the accounts, and mirroring the accounting *of core operations on the basis of specific examples of* service rendering and turnkey contracts under the terms of public-private partnerships.

If the Accounting Methodology for transactions related to service rendering and turnkey contracts under the terms of public-private partnerships is properly implemented, then this form of association would enable reaching the targeted performance indicators for the benefit of the society, and of public and private partners.

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MECHANISMS AND PARTICULARS OF CARRYING OUT FISCAL CONTROLS IN THE TERRITORY OF EUROPEAN UNION COUNTRIES

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Abstract: *This article highlights the practice of European Union countries in administration fiscal mechanisms, in particular: improving the mechanisms for tax control (auditing) of taxpayers (Netherlands), improving the arrears management system (Ireland), creating favorable conditions for taxpayers to comply, including through tax education measures (Sweden)), development of pre-completed reports (Sweden, Denmark, Norway, Finland, France, Estonia, Lithuania, Slovenia), risk management and counterfeiting of e-commerce fraud (Denmark, Hungary, United Kingdom, Sweden), implementation of the Action Plan on eroding the tax base and manipulating profits (by virtually all EU countries), consolidating taxpayer information into a single file (Ireland and Sweden), reshaping work processes (Bulgaria, United Kingdom, Finland,Sweden).*

Key words: *administration tax, European practice, fiscal gap, fiscal mechanisms, tax compliance, work processes.*

JEL CLASSIFICATION: E62, E63, H3, H8, Q2

1. INTRODUCTION

In the tax system, an important role belongs to the tax administration and its mechanisms, starting from the fact that through these components the collection of financial resources from civil society is ensured, the techniques and attitude in the collection process having a crucial importance in this process. .

The European practice in the administration of fiscal mechanisms is based on the good practices of the countries within the European Union, with an emphasis on the countries of northern Europe, these being in the world top of the countries with the best tax systems, with a pronounced social note excellent orientation towards taxpayers.

2. FORCED COMPLIANCE

Thus, regarding improving the mechanisms for tax control (audit) of taxpayers, an example to follow is the existing system in the Netherlands.

The basic principle of external control is the principle of "horizontal monitoring". The working method of the Dutch tax authorities has changed from the application of "vertical" monitoring to the application of "horizontal" monitoring. Although vertical monitoring has not disappeared, horizontal monitoring is becoming increasingly important. Vertical monitoring is based on retroactive verification, but horizontal monitoring is a form of work based on mutual trust, understanding and transparency between the entity and the tax authorities. Horizontal monitoring consists of two elements: on the one hand, the establishment of good relations between taxpayers (in various organizational forms) and the tax authorities, which is reflected in the registration of a compliance agreement (discussed above); on the other hand,

Until recently, the relationship between the Dutch tax authorities and taxpayers was built on the dimensions of "vertical" monitoring. Therefore, the refund of taxes was subject to an audit by the tax authorities in order to verify the correctness of the completion of the tax returns.

Such a "vertical" method would lead to a situation of uncertainty for taxpayers in terms of their tax situation and this could not be resolved within a reasonable time. "Horizontal"

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monitoring is the new method that the Dutch tax authorities are promoting in order to avoid the disadvantages specific to the vertical method. Today, the "work in the past" method is being replaced by the "work in the present" method, and entrepreneurs are complying with this new method, which offers substantial advantages.

By applying 'horizontal' monitoring, the Dutch tax authorities have arrived at a method of taxpayer compliance that is highly valued. This means that entrepreneurs voluntarily comply with legal provisions, and the results given are possible through mutual trust, understanding and transparency between tax authorities and taxpayers. In other words, both sides work as a united team, and the entrepreneurial / fiscal authority psychological barrier is largely overcome.

The basic task of the "horizontal" method is to find the point of tangency between meeting taxpayers' demands without affecting the correct way to determine tax obligations. The contractor must demonstrate that it is honest from a tax point of view, which involves informing the tax inspector of the tax risks at an early stage by voluntarily providing all relevant facts and circumstances. In turn, the tax inspector provides complete information to the taxpayer about the situation created and the solution to overcome it, which allows the taxpayer to place himself in the segment of tax security.

In general, the advantages of "horizontal" monitoring include:

- "Thing in the past" is replaced by "thing in the present", and the tax authorities, being treated by a transparent attitude on the part of the entrepreneur, will provide a quick decision on the taxpayer's tax situation. Under such conditions, neither party will be in a situation of uncertainty. In addition, the taxpayer will have a fixed point of contact with the tax authorities.
- subsequent controls less rigorous. The current cooperation between the tax authority and the taxpayer means the subsequent avoidance of tax controls, which are carried out only at random in the framework of "horizontal" monitoring.
- agreement or disagreement. "Horizontal" monitoring does not imply the mandatory need to resolve disagreements between the tax authority and the taxpayer under the "Compliance Agreement". Thus, these topics leave room for discussion and, finally, the possibility to continue the discussions in question before the court on the agreement or disagreement regarding a situation. It is important to note that such a practice it is extremely fruitful in its relationship with large taxpayers.

An important moment in terms of risk management and anti-fraud is e-commerce, which is the subject of discussions on both political platforms (European Parliament, European Council, European Commission), which have led to the approval of e-commerce directives, such as Directive 2000/31 / EC of the European Parliament and of the Council of 8 June 2000 on electronic commerce or Directive 2002/20 / EC of the European Parliament and of the Council of 7 March 2002 on the authorization of electronic communications networks and services (Directive authorization) as well as on European technical tax platforms (IOTA, OECD).

Fiscal control of electronic commerce is the verification from a fiscal point of view of transactions between natural and legal persons using electronic means (internet) and / or electronic currencies as an instrument.

In this area, there are certain features of the targeting of e-commerce by EU countries. For example, in Denmark there is a special type of control (audit) - electronic control - which is responsible for monitoring the Internet to identify new trends in e-commerce, which could be a taxable basis for income tax and VAT, search and identification of entities specializing in e-commerce, based on the usual controls carried out by the tax administration. At the same time, in Hungary, the ratings offered by specialized rating sites (such as www.alexa.com), the number of goods sold by the online store (if shown) are used to identify the taxable income of online stores. , the average price of the units traded, the declarations of similar units that were subject to control. In the United Kingdom, monitoring of e-commerce has been put before the Prudential

Regulation Authority and the Financial Conduct Authority since 2013. on the basis of Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directives 2002/65 / EC, 2009/110 / EC and 2013/36 / EU, and of Regulation (EU) no. 1093/2010, and repealing Directive 2007/64 / EC, implemented from 1 November 2009. Thus, a special category of taxpayers, called payment institutions (PI's), has been created, which have become of additional prudential requirements (banks, non-bank card issuers, electronic money issuers, etc.). In Austria, the main focus is on large taxpayers, as they earn a large amount of money, but tend to pay very little in the form of taxes and fees, by allocating profit through different countries and others. The most important sources of money online are: (a) advertising on the Internet (on web pages, in applications, search engines, etc.), marketing of applications (Apps to pay or In-App-Purchase), marketing of goods via the Internet , electronic money, etc. In fact, the tax authority has a special position on bitcoin: it is not considered electronic money, but electronic tool, subject to VAT in the generally established way. To achieve the objectives of e-commerce, the Swedish tax administration has developed a well-structured system, which is considered one of the most efficient in Europe. Thus, there is a set of questions, to which very useful e-commerce investigation resources can be identified, such as: Who is the provider? (Who.is, Uwhois.com); When are the transactions made? (Archive.org); Where are the transactions made? (Netcraft.com); What is the frequency (traffic)? (Alexa.com, Similarweb.com); What's the connection? (Sitedossier.com, Webhosting.info, Opensiteexplorer.org, Bing); What interdependent people are they? (ReverseInternet.com, Sameid.net, Internetofficer.com); What is the situation in terms of trade through the domain? (Dnforum.com, Namepros.com)

Given the ongoing process of globalization and the development of the digital economy strongly focused on intangible assets and activities in a virtual environment, it has recently become increasingly difficult for current tax systems to ensure a fair taxation of profits. , keeping pace with technological development and new international business models. The current tax systems are not adapted to the new information age in which international business is currently conducted.

In the author's opinion, it is extremely important to implement measures to target e-commerce, starting from the importance that the field is gaining today and the tendency to "migrate online" of companies.

Targeting tax base erosion internationally is achieved through the Base Erosion and Profit Shifting (BEPS) Action Plan, which is a technical term that refers to the negative effects of using tax optimization strategies. by multinational companies on national tax systems.

This action plan is implemented by virtually all EU countries (those that are members of the OECD) and is taken up as good practices by other EU countries that are not members of the OECD.

The action plan indicates that, in order to maintain fiscal harmony at international level, it is necessary to take measures as soon as possible to ensure a fair taxation profits. Otherwise, it is possible to witness unilateral decisions by the countries affected by this aggressive fiscal optimization, decisions that will lead to an international fiscal chaos that will manifest itself through the reappearance of double taxation situations.

The plan is structured in three sections and:

- indicates the measures to be taken to combat the erosion of the tax base and the manipulation of profits;
- sets deadlines for implementing these measures; and
- indicates the resources required and sets out how these measures can be implemented.

The report outlines 15 measures to combat aggressive tax optimizations, as follows: (1) adapting and improving current tax systems in the context of an increasingly developed digital

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economy; (2) neutralizing the effects generated by the exploitation of the inconsistencies between the fiscal legislations of the states; (3) strengthening the rules regarding foreign companies controlled by residents; (4) limiting the erosion of the taxable base through payments of a financial nature; (5) combating harmful tax practices by considering transparency and economic substance; (6) prevention of abuses through double taxation conventions; (7) prevention of situations in which the status of permanent establishment is artificially avoided; (8) analysis of transfer pricing, taking into account the value chain created within the groups of companies

- Intangible assets; (9) analysis of transfer pricing, taking into account the value chain creating within the groups of companies - Risks and capital; (10) analysis of transfer pricing, taking into account the value chain created within the groups of companies - Other high-risk transactions; (11) the establishment of methodologies for collecting and analyzing the situations in which the erosion of the tax base and the manipulation of profits occur, as well as the establishment of measures to combat such situations; (12) forcing taxpayers to disclose aggressive tax planning structures; (13) review of transfer pricing documentation; (14) streamlining dispute resolution mechanisms; (15) development of a multilateral instrument on international tax issues.

Among the actions provided for in the BEPS plan, an important role is reserved for transfer pricing.

Transfer pricing is a set of mechanisms that are used to assign prices to goods and services that are traded between two subdivisions of the same company. A classic example involves a subdivision that produces a component that is required by another subdivision. The component is used by BD in the manufacture of a product that is sold on an open market.

Respectively, transfer prices are used to determine the revenues of both parties involved in interstate transactions. Transfer prices tend to influence the tax base of countries involved in interstate transactions. Moreover, the globalization of production has made this subject more difficult, but has also generated more situations where economists come up with complicated calculations to make the appropriate determination of a certain tax, valuations and decision topics.

It is extremely important to determine the right way to measure the impact of transfer pricing. There are several accepted methods, which provide a conceptual framework for determining the principle of "the arm's length" principle.

There is no one-size-fits-all way, and the taxpayer should select the method that best suits the "principle of full competition" on prices. In particular, the OECD Guide sets out 5 methods for determining the "principle of full competition" principle in a transaction:

a) the comparable uncontrolled price method (CUP) which is based on comparing prices set in a controlled transaction with prices set in an uncontrolled transaction in comparable circumstances for comparable goods and services;

b) cost plus method (CPM) that uses the cost set by the seller of the goods or services in a controlled transaction. The indicator takes into account the functions performed, the risks assumed, and the assets used, which are added to the cost to apply the "principle of full competition" principle in the controlled transactions;

c) the resale price method (RPM) is based on the resale price at which an asset purchased from an interdependent party (the "parent company" in relation to the "daughter company" or the subdivisions of a single company) is sold. at market price. The transfer price within the company is determined by determining the marginal resale price in an uncontrolled transaction;

d) the transactional net margin method (TNMM) which focuses on the net marginal profit related to an appropriate basis (costs, sales, assets, etc.) realized in controlled transactions;

e) the profit split method (PSM) is based on the identification and proper division of the profit made by interdependent persons in a controlled transaction.

The CUP, RPM and CPM methods are called "traditional", and the other two - "profit-based". Internationally, these methods are used, as shown in Table 1.

Tab.1 Overview of transfer pricing methods in European countries

The country	Method	The country	Method
Austria	CUP, RPM, CPM, TNMM, PSM	**Belgium**	CUP, RPM, CPM, TNMM, PSM
Czech Republic	CUP, RPM, CPM, TNMM, PSM	**Denmark**	CUP, RPM, CPM, TNMM, PSM
Finland	CUP, RPM, CPM, TNMM, PSM	**France**	CUP, RPM, CPM, TNMM, PSM
UK	CUP, RPM, CPM, TNMM, PSM	**Hungary**	CUP, RPM, CPM
Germany	CUP, RPM, CPM. TNMM, PSM is accepted by the authorities only in certain terms	**Italy**	CUP, RPM, CPM, PSM, Profitability of invested capital, Gross marginal price per sector economic
Netherlands	CUP, RPM, CPM, TNMM, PSM	**Norway**	CUP, RPM, CPM, TNMM, PSM
Poland	CUP, RPM, CPM, TNMM, PSM	**Russia**	CUP, RPM, CPM
Spain	CUP, RPM, CPM, TNMM, PSM	**Sweden**	CUP, RPM, CPM, TNMM, PSM
Switzerland	CUP, RPM, CPM, TNMM, PSM		

Source: Vragaleva, V.Taxaspectsoftransferpriceregulation: perspectiveofimplementation in the Republic of Moldova. in: Annals of "Constantin Brâncuşi" University Târgu-Jiu, 2012, vol. 1: Economics, pp. 200-204. ISSN 1844-7007

In the author's opinion, the implementation of the transfer pricing mechanism in the Republic of Moldova is premature. Moreover, starting from the specifics of the external balance of the Republic of Moldova (exports prevail over imports) it is difficult to assume that the use of the mechanism given by domestic economic agents would be interesting from an economic point of view. However, given that all countries in the region have implemented the transfer pricing system, it is important to know the latest trends in this area of taxation.

3. THE WORK PROCESS AND HUMAN RESOURCES

Countries with the best results in the field of remodeling work processes are Bulgaria, the United Kingdom and Finland, which have achieved tangible performance as a result of the actions taken. Bulgaria is one of the European countries that started the work remodeling procedure (BPR Project) in 2005, as part of the Tax Administration Reform. In order to achieve its objectives, a separate subdivision was created within the organizational structure called the Process Analysis and Modeling Directorate, whose initial purpose was to restructure the work processes to unify the functions of collecting taxes and social contributions and to create an agency. us - the National Revenue Agency, optimization of these processes. One of the most important steps in remodeling processes is their description / modeling.

The Bulgarian Tax Administration has also created the Business Process Portal, which contains a description of all processes, which allows the user to: (a) obtain information about the organization and its processes; (b) access to procedures, instructions for document forms directly from the process model; (c) performing analysis, comparison and reporting by process groups or object types from different users; (d) creating an organizational culture at the organizational level.

Such a change has allowed the Bulgarian Tax Administration to streamline and automate processes, overcome outdated processes and procedures, and achieve its goals more efficiently and effectively.

Lean Management has been introduced in the UK tax system since 2005, in order to reorganize internal processes, increase revenues, reduce workload and increase its productivity,

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they used a strategy called PaceSatter, which is a set of principles, tools and techniques used by each employee to improve the management process.

So, the strategy is based on 3 fundamental principles, which together will lead to improved performance, namely:

- top management leads the success of the entity;
- the whole team improves the processes;
- people solve problems.

In terms of process improvement, the Strategy has enabled continuous monitoring of processes to understand the impact of each stage of the process on the taxpayer, and to perform their day-to-day tasks optimally, quickly and reliably.

Thus, as a result of the efforts made, there have been a number of successes: (a) on average, average productivity has been improved by 30%; (b) a complete reorganization process has been carried out at institution level; (c) employees actively participate in performance meetings and improvement activities; (d) new performance planning and monitoring techniques have been implemented; (e) the time and costs required to achieve the objectives have been reduced (cost reduction by 50%); (f) increased productivity and quality of work by 30-50%; (g) a sustainable culture of institutional performance has developed.

In order to improve tax administration and streamline the work of the tax system, Finland's tax administration uses a process reorganization method called LEAN. The basic idea of LEAN is to get more benefits, using fewer resources. LEAN does not focus on individual / separate processes, but improves the whole process by eliminating those activities that do not bring value. First of all, LEAN is based on a philosophy of respect for people and confidence in the potential and contribution of each employee. Thus, in the process of reshaping the processes within the Finnish Tax Administration, it was taken into account that: (a) cultural change is a gradual process; (b) is learned through practice (leads to changes in values and attitudes and changes in culture and behavior); (c) small successes are necessary to excite the people involved throughout the remodeling process; (c) we need to consider 2 questions: "How do we change?" and "What are we changing?"

The initial stage of the LEAN was the description of the processes, their mapping and, then, the creation of a whole network of processes. This was followed by the identification of all processes / activities within the value stream, eliminating as much as possible the activities that do not bring value, being generating losses, and the ordering of activities that add value in a continuous flow, without many interruptions, stops and expectations. intermediate. Of course, this process is not performed only once, it is necessary to continuously improve the activity performed, in order to obtain better and better performances.

This made it possible to detect the shortcomings of certain processes, detect non-value processes and facilitate their remodeling, which led to a reduction in the time used by tax officials for certain processes, based on simplifying automation or eliminating processes, while increasing taxpayer satisfaction.

So, LEAN is a philosophy of life, which means continuous improvement, ie an organizational culture that allows everyone to be involved in analyzing and solving problems in current work, motivating and engaging everyone to observe and highlight losses, seeking perfection at every stage and enthusiasm for frequent change in the work environment.

An important aspect is human resource management. Another important aspect is the way in which, within the Swedish Tax Agency, the employee is treated, especially with regard to the work done by the human resources department in order to identify his satisfaction at work. Thus, employees, like taxpayers, are "in the spotlight" and their development needs are maximized. In addition to the internal surveys, an important element is the way of financial motivation of employees, the middle level manager being entrusted with a budget allocated by him according

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to the capabilities of each employee (in fact, each subdivision has its own budget, which is used for both payroll, as well as for other activities performed in the interest of the service). The purpose of the surveys is to find out the employees' opinion about what it is like to work at the Tax Agency and how it implements its vision, provisions and strategies. The survey is conducted on behalf of management. The structure of the surveys takes into account values, objectives and results, motivation, leadership, trust in leadership, performance and responsibility, workload and health, manager-collaborator dialogue.

Within AFS, surveys are not mandatory, but more than 90% of employees responded to the last survey, which indicates their involvement and perception of the importance of each respondent.

Presentation of results:

- Different reports, depending on the size of the group of respondents (anonymity)
- The distribution process - from top to bottom, ie the heads who manage larger sectors receive the results entirely on the managed sector. If a boss has less than 4-5 subordinates, he will be presented with the results on 5 questions with the best answers and 5 with the worst results on the subdivision he leads.

If the subdivision has 6-11 employees, more survey results will be submitted. The results are grouped in blocks of up to 4 people.

- communication from management is essential;
- web distribution;
- using indexes to present answers;
- results on questions;
- comparison with the previous survey and other organizations.

Survey results are used to prioritize goals. There is a top 5 questions with good results and a top 5 questions with bad results. As a result, the Personnel Department will make recommendations on how the AFS management could act more effectively, motivating staff, the nature of work incentives, examining the skills needed to streamline tax administration.

4. CONCLUSIONS

Therefore, it is worth mentioning that it is worth taking over the solutions presented above, inspired by the experience of European countries, it is a way to follow in the desire to improve tax administration by modernizing existing mechanisms, applying, of course, national features. For example, the application of a monitoring system
"Horizontal" in the Republic of Moldova, in addition to increasing tax revenues, could increase mutual trust between taxpayers and the tax authority, which could later be extrapolated to other categories of taxpayers and capitalized properly, while implementing the transfer pricing mechanism in the Republic of Moldova it is premature.

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PREMISES AND POSSIBILITIES OF APPLYING EDUCATIONAL MARKETING IN ORDER TO IMPROVE THE IMAGE OF THE UNIVERSITY

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Abstract: *The results of the investigations with reference to the existing situation in higher education in the Republic of Moldova, in terms of educational demand and supply, highlighted the fact that universities are exposed to an increasing competition both nationally and internationally, and the implementation of Educational marketing is in its infancy. In this context, the paper argues the necesity to apply an educational marketing aimed to increse the attractiveness and strengthening the perceived image of universities among applicants, to take into account both institutional factors (reputation of the university, location, study programs, facilities offered, tuition fees, employment opportunities, availability of scholarships, quality of teaching and scientific staff, etc.), as well as marketing / communication (quality of advertising, campus visits, career fairs, credibility and originality of information provided by institutional representatives who visits high schools, etc.), the emphasis being on the application of differentiated marketing strategies, which ensure a distinct approach for different categories of students, along with knowledge of the factors influencing the choice and possible motivations for potential students.*

Key words: educational marketing, education, higher education, university, competitiveness

JEL CLASSIFICATION: I 23

1. INTRODUCTION

We live in a constantly changing world, with a very fierce competitive environment. Unprecedented events are happening, the situation is changing at a rapid pace. One of the characteristics of the modern world is considered to be globalization. At the same time, whether large or small, strong or weak, countries are equal to the challenges posed by globalization, and competition between states means competition between their laws, administrative procedures, tax, monetary, financial, trade, environmental, judicial, and *educational*.

Education is essential for any economy, because, on the one hand, through education the relations between people and society becomes much more diverse and, on the other hand, the current society, constantly changing, globalized, based on knowledge and information, needs a well-educated workforce. In the knowledge society, educated people become the primary capital that contributes to the formation of national wealth.

Taking into account current social and economic developments, universities are becoming increasingly aware of their responsibility in training specialists in all areas of activity, therefore, attracting and retaining students must become the main purpose of university marketing activities. Higher education faces the challenge of finding ways and solutions to survive in a competitive market that is going through a revolution of knowledge and information, and university marketing has a special significance for ensuring the survival of universities in a competitive environment. The analysis of approaches, existing interpretations and references allows the definition of educational marketing as a new conception regarding the organization and functioning of the educational system, educational units and the development of educational activities, as an expression of prospecting and improving the means by which education can use its possibilities to influence the development of society and the individual (Bulat, G. 2012).

Being exposed to a growing competition both nationally and globally, higher education institutions in the Republic of Moldova are facing increasing difficulties in attracting and retaining students. This state of affairs is determined, for the most part, by factors, such as: demographic decline, massive migration of the young population, etc. At the same time, the reduction of the demand for higher education services occurred in the conditions in which the number of bidders on the national market decreased insignificantly, and the access to the services of the universities on the international market becomes easier and easier.

2. EVOLUTIONS AND TRENDS SPECIFIC TO HIGHER EDUCATION IN THE REPUBLIC OF MOLDOVA

Among the main challenges faced by higher education in the Republic of Moldova are (Belostecinic Gr., Serotila I., Duca M., 2021):

1. Low degree of autonomy of higher education institutions.
2. Low academic mobility of students, teachers and researchers.
3. The relatively small share of graduates who fall into employment according to the qualifications obtained.
4. The inefficiency of the mechanism of interaction of higher education institutions with the research-development sphere and the business environment.
5. In the opinion of potential employers, there are discrepancies between the level of qualification and the skills acquired in educational institutions and the requirements of the labor market. At the same time, the economic agents are not opened enough for collaboration with the academic environment, including in issues related to the content and quality of studies.
6. Insufficient participation of universities in International Projects and Programs.
7. Considerable decrease in the presence of the research component in universities, low involvement of teachers in the scientific research process;
8. Low status of researchers in higher education.
9. Reduced responsibility of students towards learning outcomes.
10. Insufficient funding of higher education.
11. Considerable reduction, in recent years, of the number of students studying in our universities.

The last challenge in the list above deserves a special attention, as over in the last 14 years the number of students in universities from the Republic of Moldova has been reduced, from about 128 thousand to about 59 thousand students (Figure 1), registering an increase of 37.5% of students studying part-time. And this trend will continue in the future.

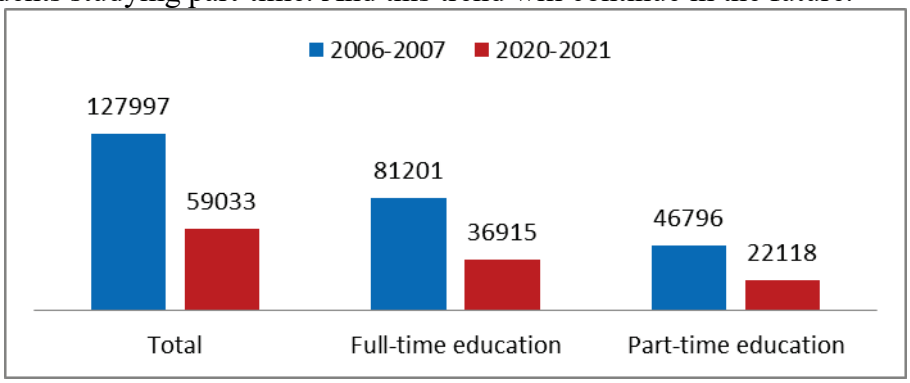

Figure 1. The number of students in higher education institutions in the Republic of Moldova in 2020-2021 compared to 2006-2007

Source: https://statistica.gov.md/

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In the academic year 2020 - 2021, the higher education system in the Republic of Moldova consisted of 26 universities, 16 public (state) and 8 private, compared to 2006-2007 when the number of higher education institutions was 31.

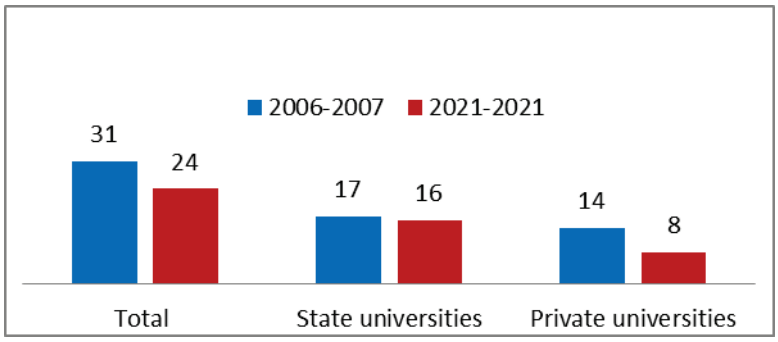

Figure 2. Number of higher education institutions in the Republic of Moldova in 2020-2021 compared to 2006-2007
Source: https://statistica.gov.md/

In the academic year 2020-2021, in the 26 universities, was studying only 59,033, the majority of them (84%), was studying in public universities, keeping approximately the same ratio (16-17%) as in 2006-2007 academic year (Figure 3 and Figure 4).

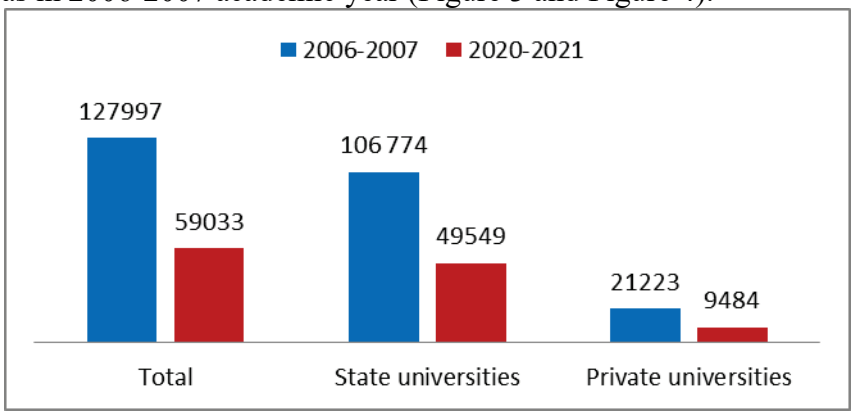

Figure 3: Number of students in higher education in the academic year 2020-2021 compared to 2006-2007, by type of institutions
Source: https://statistica.gov.md/

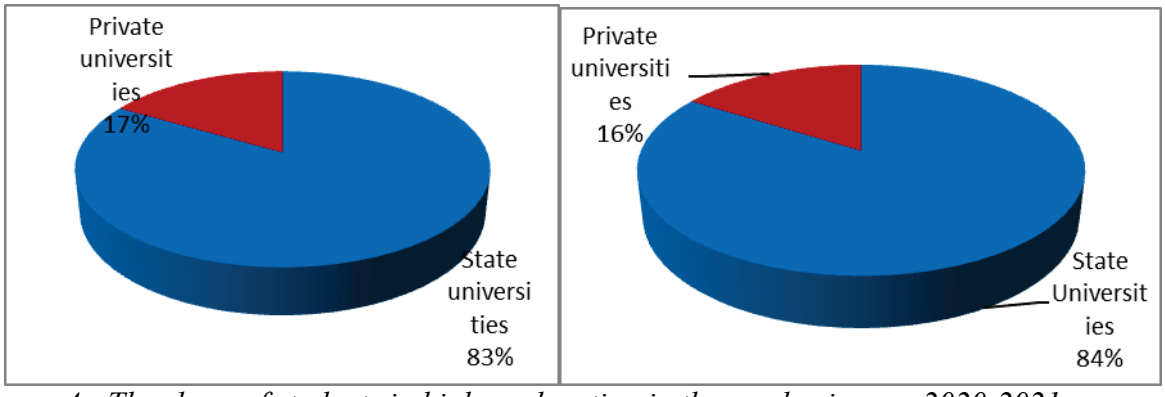

Figure 4: The share of students in higher education in the academic year 2020-2021 compared to 2006-2007, by type of institutions
Source: https://statistica.gov.md/

At the same time, there is an increase of the number of students studying in public institutions with budget funding, from 25% in 2006-2007 (Figure 5) to 44% in 2020-2021 (Figure 6), which makes it difficult to opt for specialties required on the labor market.

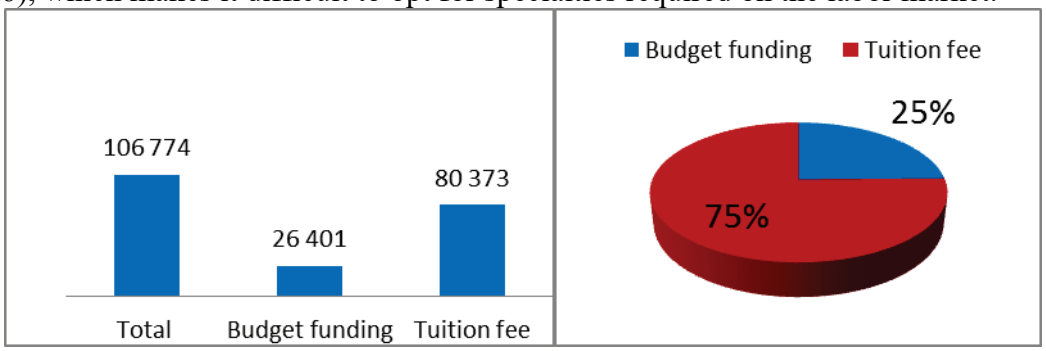

Figure 5. Number and share of students in state higher education, by the type of financing in the academic year 2006-2007
Source: https://statistica.gov.md/

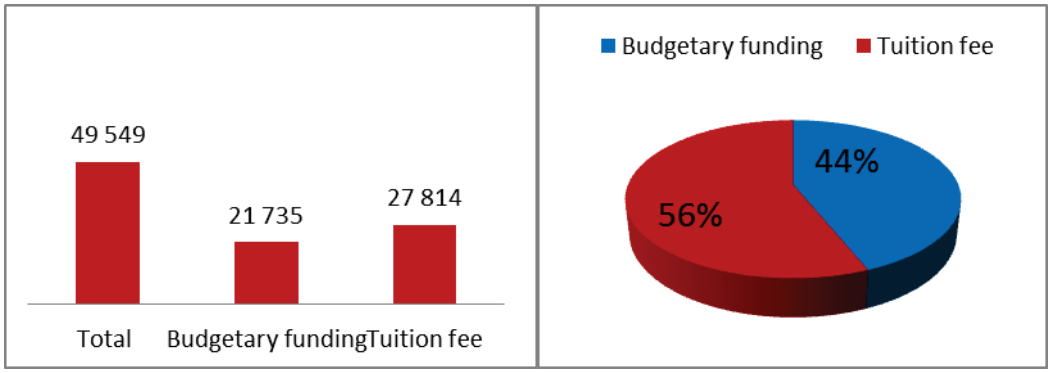

Figure 6. Number and share of students in state higher education, by the type of financing in the academic year 2020-2021
Source: https://statistica.gov.md/

There was also a significant decrease in the number of students in higher education areas. We can see a considerable reduction in the number of students at the specialties in the field of "Economic Sciences" (Figure 7), from 35,240 in 2006-2007, to 12,320 in 2020-2021, which is 35% from the total number of students in 2006-2007 and means a loss of image and attractiveness for study programs in the field of "Economic Sciences".

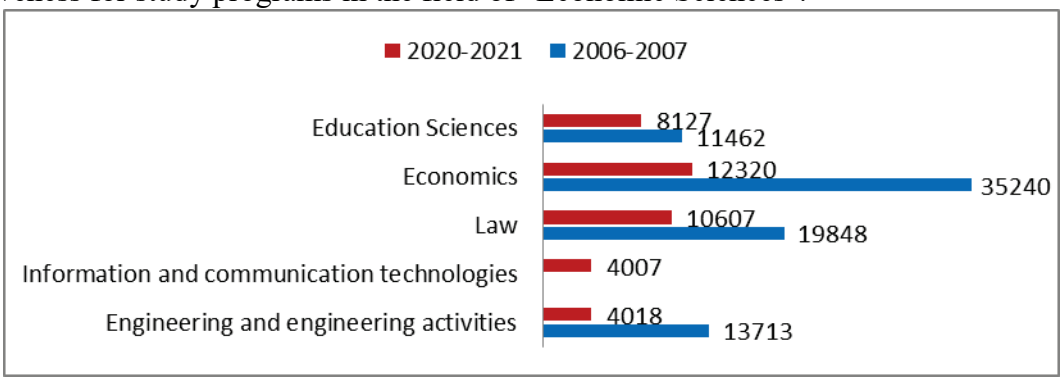

Figure 7. Number of students by general fields of study (Bachelor + Master)
Source: https://statistica.gov.md/

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3. MARKETING AS A PREMISE FOR IMPROVING THE IMAGE OF THE UNIVERSITY ON THE EDUCATIONAL MARKET

The intensification of competition on national and international market of higher education services highlights the importance of applying a new way of thinking and designing the activity of higher education institutions focused on the principles of the modern marketing concept, and the application of effective educational marketing strategies to attract and retain students, imposes the need to study the behavior of the consumer of educational services and, in particular, the way the future student makes the purchase decision and what are the determinants of choosing the university. At the same time, the emphasis on marketing must shift from supply to demand and from product-centered to consumer-centered. As a result, the student must be treated as a consumer, education as a service, and the educational institution - service provider in a competitive market (Reynolds C., 1998).

It should also be mentioned that university marketing increasingly requires a more comprehensive and coherent approach. In this order of ideas, it's important a distinct approach in the university marketing activity for different categories of applicants for studies is of interest, along with knowledge of the factors influencing the choice and possible motivations for potential students. Among the possible criteria for segmenting the market of services provided by higher education institutions can be considered the required level of education (Bachelor, Master, Doctorate), the level of training in pre-university education (high school graduates, graduates of vocational and technical education institutions such as college, bachelor's or master's degree graduates), motivation (desire to obtain higher education in a specific field, desire to obtain higher education in general, employed people who want retraining, improvement or advancement in the job) country of origin (applicants for studies citizens of the Republic of Moldova, applicants for studies abroad), other criteria that can be identified. The application of differentiated marketing strategies will allow the university management to adapt the recruitment strategies and other marketing activities in order to increase the chances of the educational institution to be selected.

It should also be mentioned that the results of recent research have highlighted a number of elements associated with university marketing, such as advertising, media with an impact on the buying behavior of potential students. In this context, the model of an educational marketing oriented towards increasing the attractiveness of the university for different categories of applicants for higher education must take into account both institutional factors (university reputation, location, study programs, facilities offered, tuition fees, employment opportunities, employment, availability of scholarships, quality of teaching and scientific staff, etc.), as well as marketing / communication factors (quality of advertising, campus visits, career fairs, credibility and originality of information provided by institutional representatives visiting high schools, etc.).

Based on the information on the website of several universities from the Republic of Moldova, it allows to find that only a small number of universities from our country has a Marketing department, in the context when are currently required radical changes and improvements in the higher education system and there is a need to develop effective marketing strategies aimed at increasing the attractiveness and strengthening the image of the university, to ensure and develop the ability to be competitive in the new conditions of the educational environment.

In order to improve the image of the university, educational institutions must develop and promote institutional practices that can be attributed to specific marketing methods and tools, and the strategic objectives of university marketing must take into account several factors, among which the most important can be considered (European Journal of Accounting, Finance&Business, 1(21), 2021):

- strengthening the image and reputation of the university among the public;

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- efficient promotion of the educational offer and of the facilities offered during the years of study;
- supporting research in higher education institutions and disseminating knowledge through specialized publications both nationally and internationally;
- fair identification of professional perspectives after graduation
- developing communication through a well-structured site, easy to access, constantly updated, offering a virtual tour of the campus
- presentation of the history, as well as of the different events in the university;
- correctly informing the public about the advantages of holding a university degree
- supporting interactive courses, attractive for students, which combine theory with practice by using numerous case studies;
- identifying the collaboration with other higher education institutions and with the business environment in order to develop partnerships.
- providing services dedicated to increasing the employability of students
- internationalization of the university and increasing the number of international students by:
  - development of specific policies for the recruitment of international students
  - identifying strategies to increase the attractiveness of the institution for international students
  - double accreditation of study programs (with teaching in romanian and / or other foreign languages),
  - internationalization of study programs with emphasis on multilingualism and multiculturalism;

4. ONLINE PROMOTION - A NEW REALITY OF EDUCATIONAL MARKETING

Traditional methods of promotion such as media, television, radio are still actual, but a special importance is given to online marketing, which refers to the set of activities and processes through which value is created, communicated and distributed to consumers and other stakeholders through the Internet. Online marketing includes marketing through websites, marketing through e-mail, marketing in social media. It becomes a mandatory element for universities and offers a number of benefits (Dobre C., Milovan A. M., 2019):

- Reducing the costs of printing and distributing materials used in marketing communication
- Creating the organizational image through communication
- Brand development (notoriety, knowledge, etc.)
- Marketing communication including public relations is faster and more interactive
- Obtaining feedback from students etc.

The trust of consumers of educational services that use the site and social networks of a higher education institution is generated by the image that the university has acquired in the online environment. The content factors of the site include dimensions such as:

- Design and design aesthetics
- Quality of information presentation
- Design elements of the web page
- The style or ambiance of the university
- Communication
- Promotional actions
- Other variables

At the same time, the creation of a quality site that achieves its objectives must be based mainly on the following aspects - usability (ease of use), quality content, ensuring visibility in search engines and design (Savciuc O., 2016).

The Covid-19 pandemic has also had a major impact on online behavior, especially for universities, as the teaching and learning process has shifted to the online environment, with the marketing strategy being largely implemented online as well. The Covid-19 pandemic has placed social media marketing in the spotlight, as it has quickly become one of the most effective ways to promote, with the aim of retaining and attracting potential students in times of crisis.

A recent study shows that in the Republic of Moldova, Facebook is the most accessed social media platform, which confirms that communicating through Facebook with potential and current students is an effective way to attract and retain them.

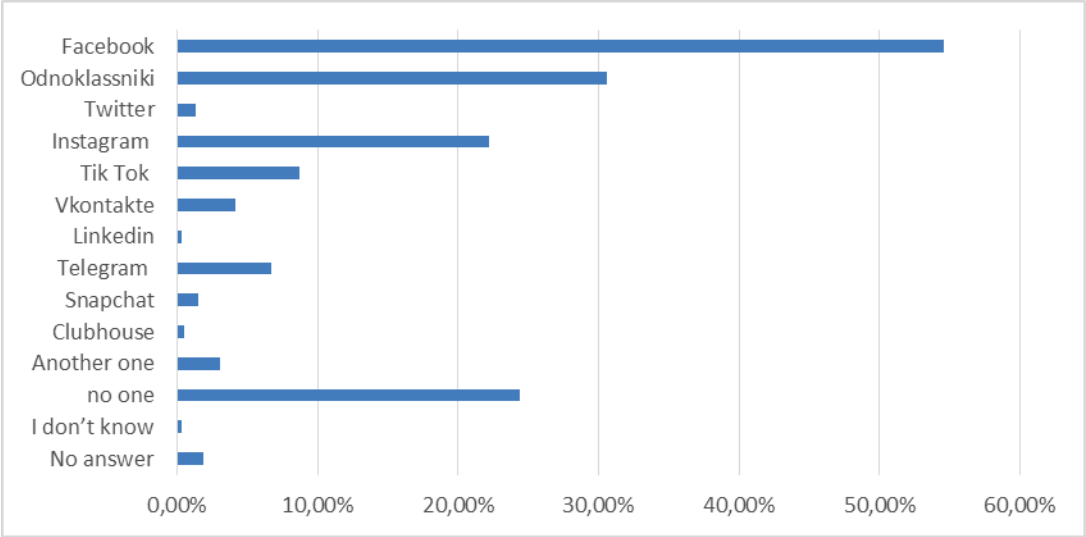

Figure 8. Social networks accessed at least once a week
Source: https://ipp.md/

This trend will continue in the future and it is important that universities have a strong online presence, which allows direct communication with potential students and development in the new normal.

5. CONCLUSION

The specific developments of higher education in the Republic of Moldova in recent years highlight the fact that universities must be aware that education has no borders and will operate in the future in a competitive and stronger environment, with a considerable increase in academic mobility and opportunities for young people to study at a European university.

This requires radical changes and improvements within universities, including the development of marketing strategies aimed to ensuring and developing the capacity to be competitive in the new conditions of the educational environment. Certainly, there are no universal recipes that can be implemented in order to develop the competitiveness of universities. Each university must aim to achieve performance in line with its strategic mission and priorities, and the implementation of effective educational marketing, including through the use of social networks and other electronic ways of communication, will greatly enhance their image and increase the attractiveness of applicants for studies.

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THE QUALITY OF AUDIT, CURRENT SITUATION AND IMPORTANCE IN THE AUDIT ACTIVITY

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Abstract: *This article covers the legal background, current situation and issues related to quality control of the audit activity of the private and public sectors. The following research methods were applied to the research, such as: comparison, inference, analysis method and synthesis method, etc.*

Key words: *supervision, audit activity. quality of audit, audit quality, international financial reporting standards.*

JEL CLASSIFICATION: G

1. INTRODUCTION

The quality of audit work is a current issue that is always discussed in both the private and public sectors. The current legislation is intended to monitor and supervise the audit activity in order to establish and improve the control process of audit services. The new normative acts will create a rich platform for the evolution of a new level of instruments related to the quality control of the audit activity.

2. REGULATION AND NORMATIVE ACTS GOVERNING THE CONTROL OF AUDIT ACTIVITY

The quality control of the audit activity is governed by the provisions of the Financial Statement Audit Law, which is in force since 01.01.2019 [1, Law no.271 of 15.12.2017]. It is noteworthy that this legislative act was drawn up on the basis of the concept of transposition into the legislation of the Republic of Moldova of Directive 2013/34 / EU of the European Parliament and of the Council of 26 June 2013 on the annual financial statements, consolidated financial statements and related reports of certain types by businesses.

The Financial State Audit Act of 15.12.2017 compared to the Law on Audit Activity of 16.03.2007 [2, Law no.61 of 16.03.2007] provides a European concept of quality control of the audit activity.

According to the current legislation, which regulates audit activity in the Republic of Moldova, the following aspects of the quality control of the audit activity are covered:

- the way of establishing the quality control policies and procedures, which are executed by the subjects of the audit activity;
- documenting the content of the quality control procedures;
- reporting compliance with quality control policies and procedures requirements.

Both legislative acts, provide the same requirements for the establishment and documentation of the policies and procedures of the audit quality control, as well as reporting requirements to the conformity supervisory authority in policies and procedures quality control. When examining the provisions of Article 24 of Law no.271 of 15.12.2017, compared to Article 10 of Law no.61 of 16.03.2007, some clarifications for the organization and exercise of the quality control of the audit activity can be observed:

- Who is the person responsible for internal audit quality control;
- What are the conditions for carrying out audit quality control;

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• Periodicity of evaluation of the effectiveness of audit quality control policies and procedures;

• Types of audit missions, which are obliged to be subject to quality control.

3. INTERNAL OR SELF-CONTROL OF THE QUALITY IN THE AUDIT ENTITY

Thus, in accordance with the new legislative provisions, the audit entity in accordance with Article 24 (3) of Law no. 271 of 15.12.2017 designates an auditor responsible for internal audit control, and the quality of the audit mission is carried out by the auditor or partner who did not take part in the audit. If the audit entity does not have the such a person, the new law suggests to appeal to another audit entity by concluding a contract, in order to respect the provisions and maintain of confidentiality and professional secret.

The new legislative provisions also set the periodicity of assessing the effectiveness of audit quality policies and procedures. Article 24 (7) of Law no. 271 of 15.12.2017 requires that the audit entity will assess the effectiveness of its audit quality policies and procedures every year. And the results of this assessment should include the proposed measures to be taken. The nominated law does not materialize under what conditions, the assessment of the effectiveness of its own quality control policies and procedures is achieved. A recommendation in this respect would be that this assessment should be performed by the professional association whose member is the audit entity.

The provisions of the new law also specify the types of audit missions which are obliged to be subject to quality control. The quality control of the audit mission is carried out in the audit entities that have performed the audit in public interest entities and large entities, established in accordance with the Accounting and Financial Reporting Act no. 287/2017, until the auditor's report or the additional report addressed to the Audit Committee, as appropriate.

4. EXTERNAL CONTROL OF THE QUALITY OF THE AUDIT ACTIVITY

The above-mentioned aspects refer to the internal or self-control of the quality in the audit entity. Additionally, in parallel with internal quality control, legislation provides the establishment and functioning of an external control of the quality of the audit activity. The authority responsible for the exercise of the external control of the quality of the audit activity is found both in Law no. 61 of 16.03.2007 and in the provisions of the new Law no. 271 of 15.12.2017.

4.1. Audit Supervisory Board

The audit supervisory Board is the authority empowered to ensure the quality assurance function based on the provisions of Chapter VIII of Law no.61 of 16.03.2007. It is noteworthy to mention that the Audit Surveillance Board being administrative authority is not considered autonomous because it was created by the Ministry of Finance and does not operate on the principles of self-government.

Currently, this authority is in the process of recasting and is to be replaced, according to Article 37 of Law no.271 of 15.12.2017 with a new public institution, namely the Public Audit Supervisory Board.

Until now, the external audit control is exercised by the audit supervisory board of the Ministry of Finance through the Control and Verification Service. But starting with 01.01.2019, the external control of the quality of the audit activity is assigned, on the basis of Article 41 of Law No. 271, to an autonomous and financial authority, which will have the opportunities to stimulate quality control inspectors.

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At the same time, the Public Supervisory Board of the Audit has the right to delegate the professional audit organizations the external control function of the quality of their members' audits, i.e. audit entities, which are audited to entities that are not of public interest. The frequency of external control of the quality of the audit activity was not specified in Law no.61 of 16.03.2007. The external quality control activity results from the Internal Activity Plan of the Board of Supervisors of the Audit Activity, which was prepared and presented annually for approval to the Minister of Finance.

In the future, according to Article 41 (3) of Law No. 271 each audit entity shall be subject to external quality control at least once every six years, and the audit entities in public interest entities - at least once in three years.

4.2. Audit Supervisory Board remuneration

Until now, the remuneration costs of the specialists in the control and verification service and members of the Council, during the examination of the normative acts related to the audit activity and their participation in its meetings, other expenses related to the work of the Council were incurred from the means provided for in the budget of the state.

Starting with 2019, the Financing of the Board of Supervisors of Audit Activity is determined by a diversified range of sources, such as:

- Annual payments of audit entities;
- Annual contributions to auditors and trainees;
- Payments for obtaining professional auditor qualification;
- Payments for recording auditors in the auditors' public register;
- Payments for registering audit entities in the audit entities.
- Subsidies from the state budget;
- Tariffs set for services provided in accordance with the legislation;
- Receipts obtained from the sale of their own publications;
- Other sources uninterrupted by legislation.

It is expected as a basic source for the financing of the audit surveillance Board's activity to be the annual payments of audit entities and annual contributions.

Under the conditions of Directive 2006/43 / EC is foreseen in advance of influences on audit quality and surveillance systems as a result of its funding by auditors and audit entities. Therefore, in order to comply with this condition, the Financial Statement Audit Law no. 271 establishes fixed payments for each auditor's report issued for the audit of financial statements. The amount of the payment is constant and does not vary from one auditor to another but is the same and therefore cannot be considered that this funding provides a possibility to influence the quality of the audit.

4.3. Public oversight of audit activity requirements

The public oversight of the audit activity, in accordance with the requirements of the European Community, is based on certain principles indicated in Article 32 of Directive 2006/43 / EC. Even if these principles are not presented and listed separately, however, the regulations set out in this legislative act concerning the organization and functioning of the public oversight system were designed taking into account the good practices in the field, namely:

- Cannot exceed a legal supervision or a legal auditor or audit firm;

- Managing the public oversight system is carried out by persons that are not practicing audit activity.

The public surveillance system must be managed by persons that are not practicing audit activity, but this does not mean that the persons concerned have not practiced the audit and that

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they were not involved in this system with relevant knowledge in the field of legal audit. This principle envisages the engagement in the public oversight system of only the audit activity of persons who are arranged as during the participation period in the activity of the system not to operate at the same time and in practice.

That is why the Executive Director of the Public Supervisory Board of Audit According to art. 38 of the Law no. 271 must not practice audit activity at least ten years in the economic or legal field. And the staff of the Council, based on the principles of Directive 2006/43 / EC should be competent in the legal audit and is also proposed that they have specific training in quality control.

At the same time, for the purpose of correspond with provisions of Article 29 of Directive 2006/43 / EC is established that auditors and audit entities must comply with the following requirements:

- The object of quality control is auditors and audit entities;
- Conclusions of the quality control are documented through a report; - avoiding conflicts of interest between those who carry out quality control and subjects of audit activity;
- Quality control is carried out at least once every six years, and the results are published.

Article 41 of Law No. 271 on the audit of financial statements, sets out certain terms for the production of quality control area. Each audit entity is subject to external quality control at least once every six years, and entities conducting audit in public interest entities - at least once every three years.

Quality Assurance, under the conditions of the new legislative provisions, is found in the external quality control of the Council for Public Supervision of Audit Activity and is also the object of its own internal quality control system within the audit entity according to the ISQC 1 "Quality Control for Companies conducting audits and revisions of financial statements as well as other insurance missions and related services". International quality control standards apply for internal quality control within the audit entity. These standards have been issued by the International Standards and Insurance Council and have been accepted in order to be applied in the territory of the Republic of Moldova.

In Directive 2006/43 / EC on the legal audit of annual accounts and consolidated accounts does not specify, after which the principles are selected, the audit files are selected in order to be subject to quality control. In my view, quality control can be carried out totally or by poll, depending on the volume of activities carried out by the audit entity, as well as the frequency of deviations previously found, comprising a representative number of auditor's reports and documents. At the same time, European rules also emphasize on transparency, so it is principally as the overall results of the quality assurance system to be made public. According to the nominated article, the general results of the quality assurance system are published annually. In this context, the Law no. 271 on the audit of the financial statements refers to the Regulation on the external audit control. The regulation at issue, at the moment, is not yet elaborated, but with the entry into force of Law no. 271, it will be approved by the Council for Public Supervision of Audit Activity.

5. CONCLUSIONS

Taking into account the conditions for the transparency provided for in Directive 2006/43 / EC, it is proposed to include the annual publication requirement of the general results of the quality assurance system and their placement on the official website. Such information would fill in the transparency of the activity and their placement on the official website for public oversight of the audit activity, including:

- Annual activity plan;
- The semi-annual external control plan;

- Annual activity report and other information reflecting the work carried out by the Council.

Depending on the volume of activities carried out by the audit entity, quality control is recommended either in total or by the survey, taking into account the frequency of deviations previously found, as well as a certain representative number of auditor's reports and documents. The quantity of reports and documents selected to be controlled must provide the possibility:

- To formulate conclusions on the adequacy of the quality control system and compliance with it;
- Establish findings on how to comply with the normative requirements in the field of audit financial statements, their revisions, insurance missions, other missions and professional services;
- Evaluate of compliance with independence requirements.

The testing of the selected audit files, under the conditions of Article 29 (1) of Directive 2006/43 / EC, must also aim at an assessment of the quantity and quality of the resources spent, the perceived audit fees and the internal quality control system within the the audit entity.

Avoiding conflicts of interest between those who carry out quality control and subjects of audit activity, under the conditions laid down by Directive 2006/43 / EC on the legal audit of annual accounts and consolidated accounts, in my view, can be achieved on the basis of an objective procedure Selecting those who will exercise quality control missions. Such missions must be carried out by appropriate vocational training and relevant experience in legal auditing and financial reporting combined with specific quality control.

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THE LOCATION OF ZĂRNEȘTI CITY IN ROMANIA IN THE SYSTEM OF SMALL AND MEDIUM URBAN LOCATIONS OF BRAȘOV COUNTY

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Abstract: *Regardless of its size as a population, or the area in which it takes place, each city has relationships of different types, relationships that ensure its existence and that can define its area of urban influence. In other words, the area of influence of a city has its own structure and is expressed through the very close relations between that city and the other urban and rural localities around it. Depending on certain elements (the level of development of the country, the geographical position of the city, the density of urban centers and the size of the city), we can determine the size of the area of influence of that city.*
This study aims to evaluate the influence of Zărnești City (Romania) on the system of localities of Brașov County, in the context of urban competitiveness. The classical methods of human geography will allow the quantitative and qualitative appreciation of the influences of the researched city, in time and space, which is part of a doctoral study.
Key words: *urban area of influence, Zărnești, small and medium towns.*

JEL CLASSIFICATION: R, P 25

1. INTRODUCTION

The city of Zărnești is located in the center of Romania and belongs to the Center Development Region. This Development Region, in turn, includes 5 counties, including Brașov County, a county in which both the city of Zărnești and the other cities described below in the current study are located.

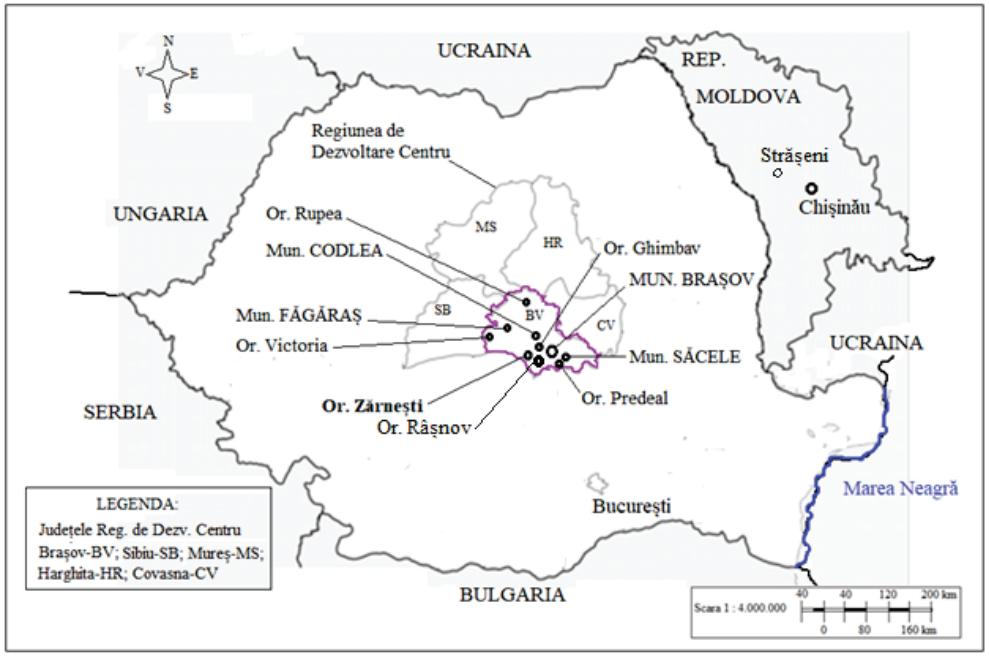

Figure 1. The cities of Brașov County
Source: Processed map. Contour Source Map of Romania - Romania Map Contour Clip Art

At the level of Brașov county, Zărnești locality is located in the southern part and belongs to the network of localities adjacent to Brașov Municipality. We specify that Zărnești is part of

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the network of localities that revolve around the Municipality of Brașov, being an integral part of the system of localities located near this municipality. (Local Development Strategy of Zărnești City, 2015-2025).

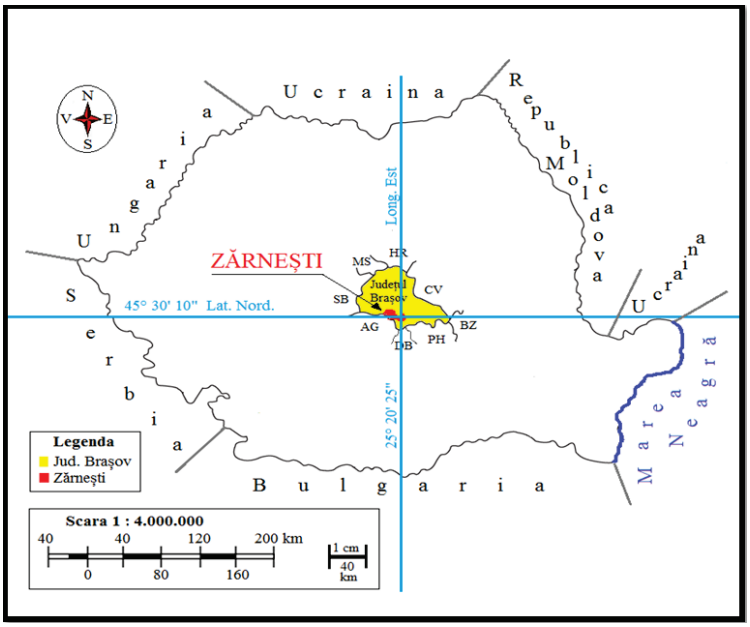

Figure 2. Zărnești on the map of Romania and Brașov county. Processed map.
Source: contour map of Romania - Romania Map Contour Clip Art

The locality received the status of a city in 1951 and currently has a population of 26,500 inhabitants, being part of the group of medium-sized cities in Romania (whose population exceeds 20,000 inhabitants). (O.N.U. - quoted by Cujbă Vadim, 2015, p.29); (Crăciun Laurențiu, 2019). The surface of the city is 204.75 km² and includes urban and extra-urban land (figure 3).

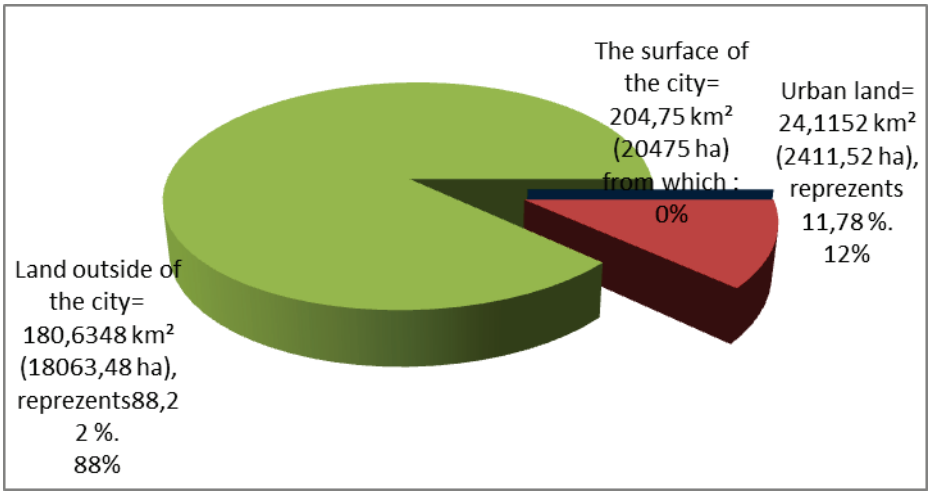

Figure 3. The total area of Zărnești city
Source: Zărnești City Hall

The out-of-town area of Zărnești is very large compared to the in-town area, according to figure 3.

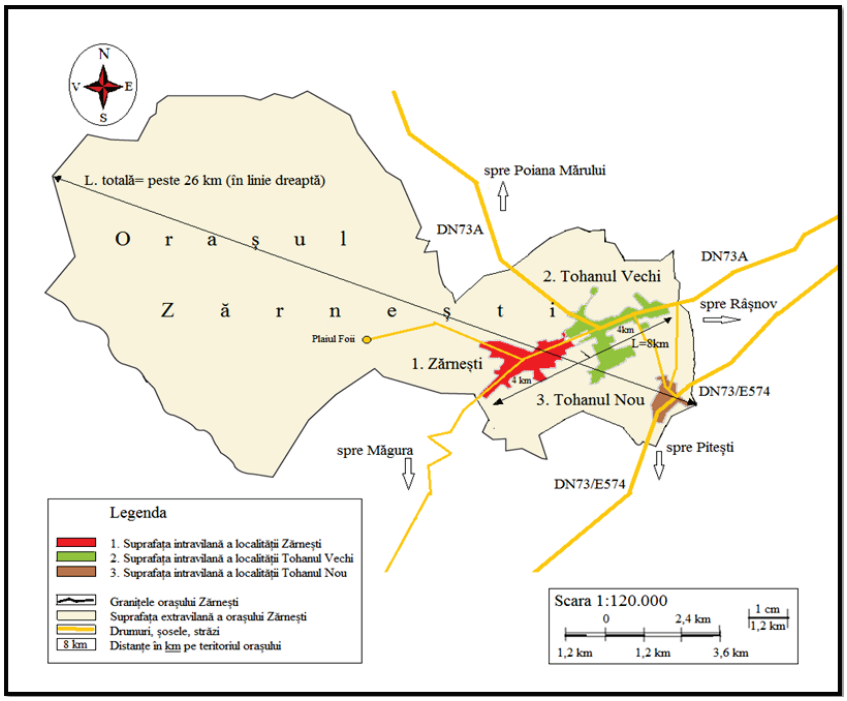

Figure 4. The urban and extra-urban area of Zărnești

Source:https://www.google.ro/maps/place/Ora%C8%99ul+Z%C4%83rne%C8%99ti/@45.5904029,25.1880802,12z/data=!4m2!3m1!1s0x40b34bbce0d28299:0x567b55985f8ad114

The city of Zărnești is drained by the rivers Bârsa and Turcu and has in its composition three localities: Zărnești Centru, Tohanul Vechi, summing up the Working District "6 Martie" which is also called "Cartierul Blocuri", as well as the village Tohanu Nou.

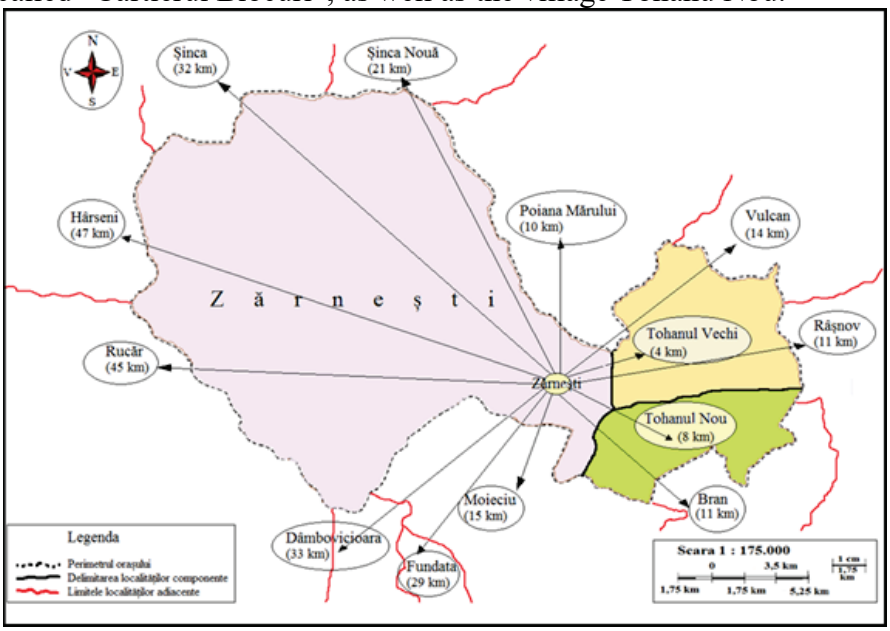

Figure 5. The component localities of Zărnești in relation to the neighboring localities

Source: map outline: https://www.google.ro/maps/place/Ora%C8%99ul+Z%C4%83rne%C8%99ti/@45.5904029,25.1880802,12z/data=!4m2!3m1!1s0x40b34bbce0d28299:0x567b55985f8ad114

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The best way for tourists from the country, or from the county, to reach Zărnești, is by car (figure 6).

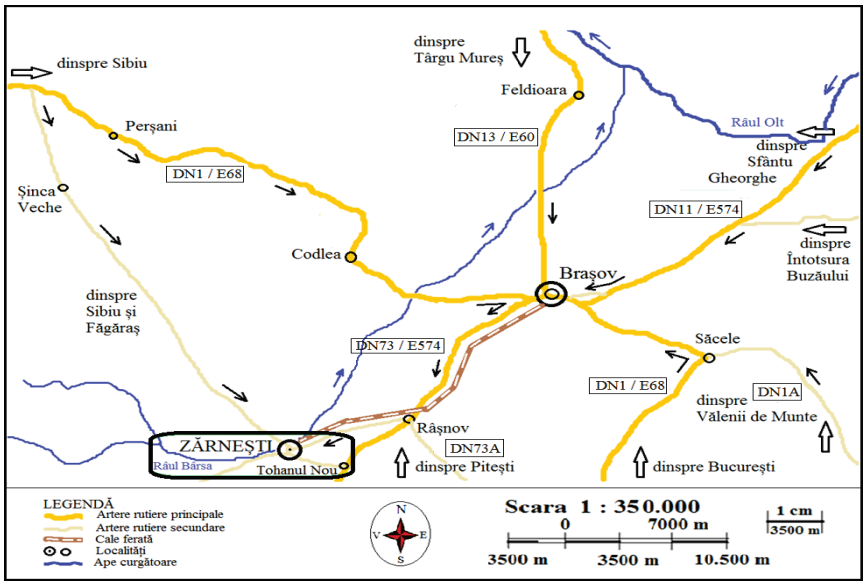

Figure 6. The main access roads to the city of Zărnești

The entire road network of Zarnesti, totals more than 145 km and includes roads of all categories: asphalt public roads, cobbled public roads, or modernized and forest roads. New neighborhoods appeared (Tohănița and Pleașa), where new related roads were built.

The previously existing roads were widened, repaired, and some of them were public lighting. "In general, forest roads are well maintained (gravel) and can be used all year round by car. The network of forest roads belonging to Zărnești has a density of 7.4 linear meters / ha and served 48% of the extent of the Zărnești Forest District". (Ocolul Silvic Zărnești).

Because the forest area overlaps over a large part of the mountain area, the access roads created for its economic use (forest roads) - are used in access, or in the spatial organization of a tourist area.

The forest routes generally follow the hydrographic network, a strongly affected network, both as a drainage regime and as a biological potential, presenting many strongly inclined slopes, which imposed a large volume of works and special measures for consolidation and stability.

The city of Zărnești, has close collaboration relations with geographically closer partner localities - Codlea, Râșnov, Ghimbav, Cristian, Vulcan, or more distant-Rupea, Predeal, Făgăraș and Victoria.

2. MATERIALS AND METHODS

The realization of this article has as an important purpose, the comparative analysis of the spheres of influence of the small and medium cities of Brașov county. When studying the cities of this county, various research methods specific to Human Geography (analytical, historical, comparative, statistical-mathematical, observation and geographical description) were used. The statistical data were used from the official sources of the INS in Romania, such as the data collected from primary sources from the Prefecture of Brașov County, this article, referring to the period 1970 and until now.

This study attempts an analysis and a brief presentation of the main characteristics of the areas of influence of each city in Brașov County, targeting all areas of activity of those cities studied.

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In carrying out the comparative study, we started from several premises:

- through the comparative analysis, it was found that the cities of Brașov County do not have the same degree of influence on each other;
- in the case of some cities, their influence is greater on the other cities around them (such as Zărnești which has a great influence on the cities of Râșnov, Ghimbav, Codlea, Predeal, as well as of several communes around it: Poiana Mărului, Cristian, Vulcan); Codlea, which in turn has a fairly large influence on the city of Ghimbav, Râșnov, but also on the communes of Hălchiu, Vulcan, Sânpetru;
- in the case of other cities, their influence on small or medium-sized towns around them is quite low (examples are given by small towns: Predeal, Rupea, Victoria, each having influence only on a few villages around them).
- the influence of Zărnești city compared to the other cities of Brașov county is different from one city to another of the county, depending on the situation;
- strategic urban development plans do not fully reflect the requirements of sustainable development;

Zărnești locality still has a great influence in the area and collaborates with a series of urban localities from Brașov County (Râșnov, Codlea, Ghimbav, Făgăraș, Rupea, Victoria, Predeal), but also with a series of rural localities, such as Cristian, Vulcan, Bran, Poiana Mărului, etc., Zărnești, constituting a polarizing center.

3. RESULTS AND DISCUSSIONS

"In our country, the territorial development of the urban phenomenon was done by increasing each city, by including new localities in the administrative territory of cities, by declaring new cities, to which for certain periods can be added the new category of communes suburban". (Cucu Vasile, 1995).

"The role of cities in the adjacent territory will be defined by their regional function, or by the application of urban functions, but also by their influences on the environment". (Ilinca Nicolae, 1999). "The city itself is the arena of social relations, which has been formed over several millennia and centuries."(Matei Constantin, Mâtcu Matei, Sainsus Valeriu, Hachi Mihai, 2008).

In most cases, the relations of cities with the adjacent space are, to a large extent, dependent on the means of transport. In the demographic relations between urban and rural, we distinguish two situations: 1) the city can exert an attraction on the inhabitants that can be temporary, or permanent and on a variable surface; (Hachi Mihai, Crăciun Laurențiu, 2020); 2) city dwellers can migrate abroad in different forms. People travel abroad often for services and refer to daily migrations for work, as well as changes of residence. An urban locality can have an influence on the peri-urban area, executing a commercial and financial attraction, in the sense that it supplies the inhabitants with goods and offers them financial aid through banks.

On the adjacent territory, the city can have an agricultural, industrial, or administrative influence. "In recent years, the relocation of labor from certain rural localities to urban centers, or from certain urban localities to urban centers, has gained maximum value, generated by the inward migration of economically active people, but also pensioners from areas urban". (Albăstroiu Elena-Simona, 2009).

Among the 14 localities located in the Brașov metropolitan area and around it, there is also the city of Zărnești. Almost 80% of the county's population is concentrated here, with a density of 202 places / km², which leads to the development of low-cost infrastructure. Today, the city of Zărnești has a population density of 130 inhabitants / km2. In 2010, the number of important companies in Zărnești, with higher turnover, was 489. In 2021, the situation is

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relatively the same, which places the locality on the 5th place between the county cities (Zărnești being positioned after Brașov, Făgăraș, Săcele and Codlea).

Zărnești locality has close collaboration relations with some partner localities, closer from a geographical point of view: Codlea, Râșnov, Ghimbav, Cristian, Vulcan, or more distant: Rupea, Predeal, Făgăraș and Victoria.

These elements are necessary for an accurate assessment of the possibilities that the city offers to the population, as well as to other urban and even rural settlements.

The city itself has a sphere of influence on the other localities around it. The emphasis is on the study, knowledge and evaluation of the economic potential of each city in Brașov County, as well as the collaboration between them.

Due to its geographical location, Brașov County largely overlaps with the Brașov Depression - the largest intracarpathian depression in Romania. From time immemorial, the relief and climatic conditions on the territory of the county have offered favorable opportunities to the living standard of the population, here, being able to cultivate many species of plants that are cultivated in Romania. (Hachi Mihai, Crăciun Laurențiu, 2019).

Considering the fact that on the territory of Brașov county there are old commercial roads, including the old road of Bran, which passes through the Zărnești area, this determined a greater economic development of the area. These roads have been traversed since ancient times by merchants and craftsmen, who were of different ethnicities and cultures. Together with the inhabitants of these lands, they laid the foundations for the later industrialization of these areas of the county. At the beginning of the 1800s, the industrialization process of the city of Brașov begins, as well as of several localities located on the current territory of Brașov County. In 1810, the foundations of the industrialization of today's Zărnești were laid. Then an alcohol factory was set up, and then a mechanical factory to process cotton. In 1860, the cotton factory was redesigned on fabric items, and later a match factory was established. In the years 1850-1880, an alcohol factory operated in Zărnești. From 1860 in Zărnești, a sawmill begins to operate. In 1889, the pulp mill was established. Starting with 1938, the Malaxa Armament Factory of the Malaxa Concern in Bucharest went into production. (Primăria Zărnești).

In the last half of the twentieth century, Zărnești - the city at the foot of Pietra Craiului has undergone significant changes in terms of its economic profile. The Zarnesti industry has grown, diversified, gaining new values. This diversification has long referred to chemicals and paper, construction of bicycles, mopeds, chainsaws, special equipment, armaments), food industry, wood industry represented by S.I.L. (Wood Industry Company), and after the 1990s - petroleum products, offered by the Romoil Company.

The location of the city of Zărnești at the contact of the depressed land with the mountain area, also influenced the structure of agriculture and determined the tourist importance of the city. zarnesti.net

Over 50% of the territory of the city (extra-urban) belongs to the mountainous area, characterized almost exclusively by forest economy, today, forests cover 54.7% of the surface of the administrative territory. (Ocolul Silvic Zărnești).

The basement of the administrative territory of the city, includes limestone, clay, gravel and quartz aggregates. They are extracted from the Bârsa River and are sorted, crushed and processed at the gravel pit at the entrance to the city. All these gravel aggregates are used as construction materials for localities in the area such as Tohan, Zărnești, Râșnov, Ghimbav, Codlea, etc. Many years ago, in Zărnești, a lime industry developed. (Lepădatu Ioan, 1998); (Vlad Ilie, 2004, 2011).

After the Revolution of 1989, the light industry and the food industry in Zarnesti were very poorly represented. Some enterprises in the city were incorporated in commercial companies (eg the Joint Stock Cooperative Company "Voința" Zărnești - former craftsman).

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Established on January 1, 1988, "Voința Zărnești" had various objects of activity: it dealt with textile production; Garments and knitwear; Mechanics - production of metal punches, constructions; services-hairdressing, hairdressing, cosmetics, tailoring, shoemaking, carpentry, windows, fur, etc ..

The raw material for garments (textile) was obtained from Codlea, Bucharest and other centers; melanin (from Ghimbav, Buzău, Mizil, Focșani, etc.). Mainly, Societatea Voința Zărnești sold its own products and had contracts with the localities: Brașov, Râșnov, Codlea, Făgăraș, Victoria, Rupea, Săcele, Predeal, Ghimbav, Timișoara, - for the delivery of protective equipment to them, and for Bucharest it produced mattresses, etc. In addition to the mentioned enterprises, the city of Zărnești also had a bakery enterprise. The bakery company existing between 1990 and 2000 produced only plain bread without other assortments, and then expanded to other assortments. (Primăria Zărnești). After 1990, the Zărnești Industrial Park was established, where several companies operate on its premises. (Primăria Zărnești).

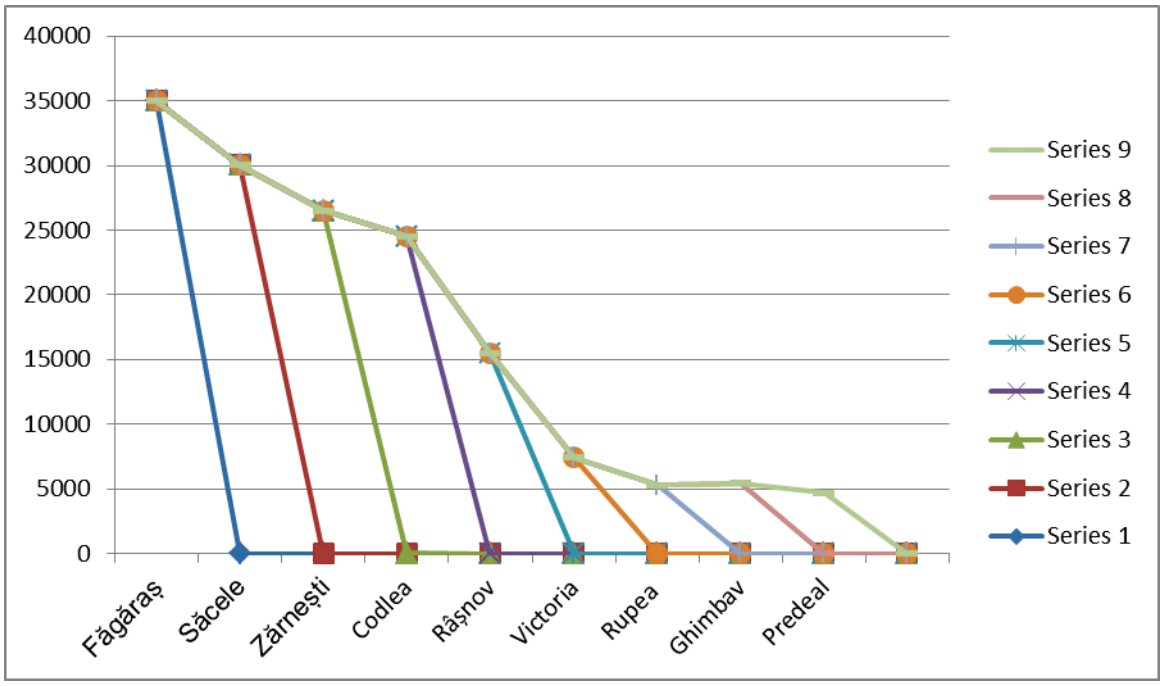

Figure 7. Population of small and medium-sized cities of Brașov County at the 2011 Census
Source: INS TEMPO online

Among the small and medium-sized towns of the county, (Cujbă Vadim, 2015); (Crăciun Laurențiu 2019). Zărnești currently occupies the third place, with a population of 26,500 inhabitants, slightly increasing (figure 7).

The first description of a road that passed through the Zărnești area refers to the "Bran Road", and dates back almost 2000 years to Roman times. At that time, "the road from the Danube to Rupea appeared on a Roman map (Danube-Zimnicea-Alexandria-Roșiorii de Vede-Pitești-Câmpulung-Bran-Rupea), a paved road called Via Gloria, also used by the Dacians". (Lepădatu Ioan, 1998); (Vlad Ilie 2004; 2011).

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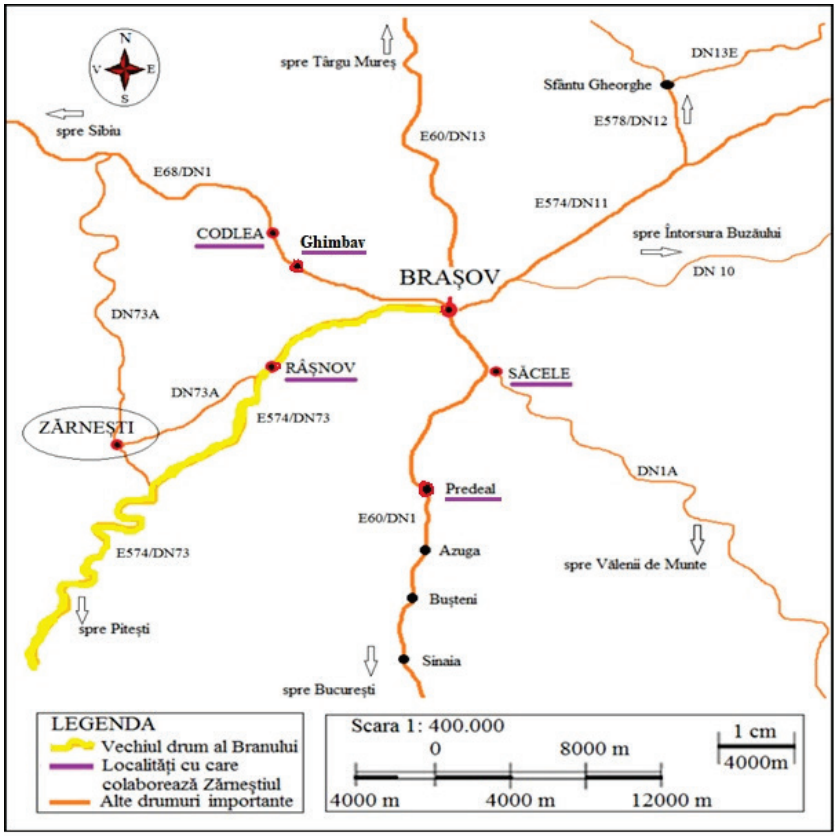

Figure 8. The old "Drum al Branului" located in the Zărneștilor area

For a long time, the traditional transport in the region was the carriage. This method is currently used on a small scale. "Today, the main traffic in Zărnești locality takes place on the national roads DN73 and DN73A, the county roads DJ112G to the relation Măgura, Peștera, Moieciu, DJ112H to the relation Tohanul Vechi-Tohanul Nou".(Primăria Zărnești).

The entire street network of the city, includes road segments of different lengths from categories III-V, "predominant being the modernized roads". (zarnești.net).

Between 1980 and 1990, the city of Zărnești had favorable conditions for carrying out economic activity. The rich resources in the mountain area (wood, limestone, etc.) have led to the amplification of some traditional activities in Zărnești: the exploitation and processing of wood, the pulp and paper industry, the construction materials industry. The city's economy was characterized by strong industrialization.

At that time, the industrial activity predominated over the other activities, namely: 40.3% of the buildable perimeter was occupied by the industrial area, and 43.3% of the total population worked in industry. More than 4,300 people from the neighboring areas commuted to Zărnești, the number of commuters exceeding 6,500 people in the 1990s. (Primăria Zărnești și Prefectura Brașov).

The development of the Zărnești industry increased the capacity to attract the labor force from that time, which moved daily to the city, Zărnești, being the second center after Brașov, within the urban group Brașov. The Zarnesti industry exerts a strong influence, especially on the active population from the adjacent localities.

All the enterprises built in the perimeter of Zărnești city contributed to the development of the city's economy by creating jobs, as well as by labor productivity.

Between 1970 and 1990, the city's economy had an upward curve, and people's living standards began to rise. (Primăria Zărnești). In this sense, people's existence, living, life have changed. Thus, "the way of life of the population was also influenced by the cultural

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environment which represents the set of values, norms, beliefs and traditions to which the population of the territory referred" taken into account. (Mihai Hachi, 2005).

Forced industrialization drew a lot of labor from the adjacent localities where the city could not cope with the situation, because "the population of the city in the 1970s was max. 20,000 loc. while the total number of employees providing employment in the area exceeded 35,000. "

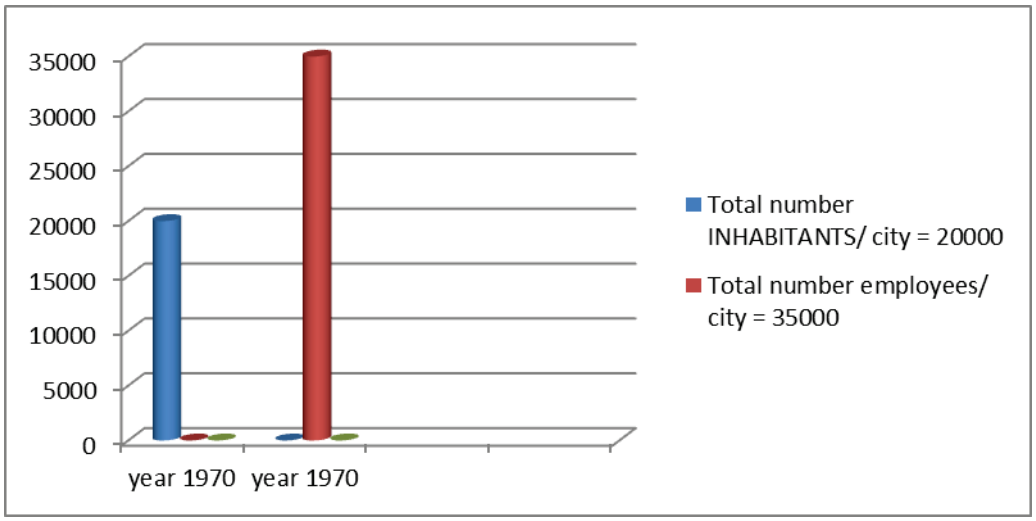

Figure 9. Comparative situation of the population and employees in the city of Zărneşti in 1970
Processed data. (Source-Zărnești City Hall and Brașov Prefecture)

The development of industry in Brașov County led to the formation of general concentrations in the territory, which according to their structure and degree of specialization, played a special role in economic life. (Prefectura Brașov).

Today, more than 30 years after the 1989 revolution, the number of commuters working in Zărnești has dropped by several hundred people. Many Zarnesti units that are still in operation are looking to reduce their activity, reduce their number of employees, or retrain.

Compared to the years 1970-1990, the area of influence of Zărnești, begins to diminish, both on the villages in the area of Bran and Poiana Mărului, as well as on the small and medium towns of the county (Rupea, Predeal, Ghimbav, Râșnov, Victoria, Codlea, Săcele, Făgăraș), Regional development is one of the priorities of the European Union, and the local authorities of Zarnesti are trying to apply these policies. (Zărnești Local Development Strategy, 2015-2025).

Zărnești locality has close commercial relations with many enterprises and sales centers both in the country and abroad. The companies from Zarnesti deliver both to the internal market and to the external market, a wide range of products such as: bicycles, weapons and military components, cellulose, timber, fodder yeast, handicrafts, carpets and much more, the income obtained from following these products delivered contributing to the growth of the city's economy. (Primăria Zărnești).

The relationship of Zărnești with the influential area: Until around the 1990s, the population of Zărnești increased permanently, due to the attraction of labor force through the industrial units in the area.

Therefore, in addition to the natural increase, the towns from the entire area of influence and implicitly from the city of Zărnești, suffered a migratory phenomenon in search of stable jobs and accommodation, or only for stable accommodation, for activities carried out in nearby towns and especially for Brașov. (Crăciun Laurențiu, 2020).

After 1990, mutations took place in Zărnești, as in most localities in Brașov County. With the fairly rapid decrease in natural growth, there is a decrease in labor migration, which now prefers stable accommodation in the locality with employment opportunities.

Zărnești town still has enough influence in the area and collaborates with a series of urban towns from Brașov County (Râșnov, Codlea, Ghimbav, Făgăraș, Rupea, Victoria, Predeal), but also with a series of rural towns, such as Cristian, Vulcan, Bran, Poiana Mărului, etc.), Zărnești, constituting a polarizing center. (Prefectura Brașov).

Through the bread and bakery factories, Zărnești provides daily food not only for its inhabitants, but also for those from the surrounding localities (Poiana Mărului, Vulcan, Branului and Moieciu area, Fundata, etc.).

Also, from the area of Zărnești city, the water necessary for the consumption of the population of this city is provided through pipes by free fall, as well as the technological processes that take place at certain small enterprises and companies from Codlea city. Until their abolition, the necessary water was provided for the former Codlea Greenhouses. (Primăria Zărnești).

For a long time, all the localities around Zărnești provided the city with all the labor force that the companies from Zărnești needed.

After 2002, there is a decrease in population (Crăciun Laurențiu 2020), and the process of deindustrialization begins. Unemployed, people began to migrate to other places in search of a better life. "Migration issues are addressed in close connection with the production forces and the urbanization process. We cannot study the migratory phenomenon, without starting from the premise that the city of Zărnești is a polarizing center". (Elena Sochircă, 2010).

The Local Authorities of Zarnesti, take into account the development of the tourist infrastructure until the end of 2025 and aim at the implementation of the projects that aim to protect the environment and to ensure the increase of the attractiveness of the area.

Due to the fact that at the level of the Center Development Region of which Zărnești is part, several political decisions were taken regarding the sustainable development of the locality in the coming years, there are great chances for the economy of Zărnești to revive and at the same time to have again a greater influence on the surrounding localities than it has at present. (Zărnești Local Development Strategy, 2015-2025).

4. CONCLUSIONS

Most cities in Brașov County have a series of common features, but also distinct in terms of geodemographic evolution, their level of economic and social development, in the current transition period that Romania is going through. Crăciun Laurențiu (2020);

- the transition to a market economy marked the population in terms of demographic evolution in the sense of a slow growth, against the background of an accentuated migration in all the cities of Brașov county;

- several demographic indicators have an involution, some even very accentuated, which will determine the demographic insecurity of the cities taken into account;

-a rapid economic development of the city of Zărnești occurred especially in the period 1960-1970. It continued until 1989-1990 and was based on industrial activities, the first places being through their productions, the bicycle factory, weapons and various technical accessories - S.C. Tohan S.A., Pulp and Paper Plant - S.C. Ecopaper S.A., the Wood Processing, Exploitation and Industrialization Enterprise I.P.E.I.L., the construction materials industry that produced lime from limestone, as well as mining prospecting.

- the industrial function generated new types of relations between the city of Zărnești and other localities in the country, which led to the increase of the degree of integration in the system of the national economy.

- the positive dynamics of the population of Zărnești between 1948-2009, "was the cumulative result of both the positive natural balance, but also of the intensification of the migratory balance as a result of the development of the industrial function". (Braghină Cristian, 2000).

- due to the industrialization of that time, as well as the influx of population, coming from many localities in employment, we note that in 1970 the population of the city was 20,000, while in the enterprises of Zarnesti worked 35,000 employees. (Primăria Zărnești).

- the development of Zărnești locality had significant consequences also on the relations established with the surrounding areas, which registered new valences, both from a qualitative and quantitative point of view.

After 1995, the influence of Zărnești locality on the neighboring localities began to decrease, due to many factors generated by the decrease of labor productivity in Zărnești enterprises, the lack of raw materials, jobs, making many inhabitants from adjacent areas no longer commute to factories. the city, and the locals, to migrate to other areas, including abroad in search of jobs.

- in Zărnești, the labor force is qualified for the industrial field, this requiring a specialization for the tertiary sector (service field), which has future prospects (natural tourist potential), but, compared to the other cities of Brașov county, a reconversion and in the field of labor in these cities, which would focus on future local industries. Crăciun Laurențiu (2020).

- The most serious problem facing the small and medium-sized cities of Brașov County is the demographic aging, the lack of qualified labor force, for the fields that are currently required.

- the lack of well-paid jobs, accentuates the seriousness of the employment problem and, correspondingly, of the economic growth, which has worsened in all the cities from Brașov county, but also from Romania.

- economic recovery is possible in almost all cases studied, through major capital investments from within, but especially from outside.

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***Prefectura Brașov

****Primăria orașului Zărnești.*

***Ocolul Silvic Zărnești).

****Romania Map Contour Clip Art.*

***zarnesti.net

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GAINING COMPETITIVE ADVANTAGE BY DEVELOPING LOGISTICS SYSTEMS

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Abstract: *The circumstances of the last decade (such as the catastrophe of September 11, 2001, the Ebola virus, the global drought or flooding, often as an answer to climate change, and the most recent, the COVID-19 global pandemic) the effects of which are still felt, have shown that both companies as well as, entire logistics systems and networks (Supply Chains (SC)) were not in any way prepared to handle this kind of events and situations, and the consequences are devastating for all involved and the global economy as a whole. Some of these effects will still be felt in the years to come. Moreover, while, up to recently, it was the individual companies that competed among themselves, today, due to the globalisation phenomena, entire supply chains compete. The internal logistics, the internal SC of a company has expanded into an external SC among companies (Vgl. Geimer (2005), S. 38.). In the course of this development, the risks, that were previously faced by individual companies and now endanger entire SCs, have changed and, thus, require new approaches. The tools used for Risk Management in an individual company are no longer sufficient in monitoring the entire SC. It is, therefore, mandatory to develop new concepts and tools which, holistically, can serve to support risk management in the SC.*

Keywords*: internal logistics, logistics systems, logistics networks, competitiveness, globalization.*

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Efficient management of logistics networks is regarded as a very important topic nowadays. This can be illustrated by an example where poor management of logistics networks has had considerable negative consequences, not only on the individual company. For example, in the case of the 2004-2005 influenza epidemic in the US, the country suddenly faced a bottleneck in the vaccine chains, as a result, there was a shortage of about 50 million doses. Efficient management of the logistics network, providing this bottleneck was not considered, could have sorted the issue in a short time (Burt (2006), p. 17).

One effect occurring in most markets, locally, regionally and internationally, is their intensification in recent years. Among other things, this would mean that, from the customer's point of view, the products should be available anytime and anywhere. The main reasons are the growing societal demands and the rapid technological progress. Today, the main concern of Supply Chain Management (SCM) is to meet customer demand as quickly and as flexibly as possible. This is based on the assumption that customer satisfaction is equally dependant on the end link in the logistics network and the performance of the entire network. The motivation of companies to merge their capabilities into a logistics network and build a common management system is, therefore, aimed at aligning their activities within logistics chains as efficiently as possible, and adapting to customer requirements. The so-called "Efficient Consumer Response" (ECR) could be the solution. The goal of the ECR is to use vertical integration (cooperation) strategies to streamline processes between companies and thus meet the customers' increased requirements. Similar to Customer Relationship Management (CRM), the ECR is part of Supply Chain Management (SCM). If, for example, the prerequisites for an ECR are met, they also serve the SCM. The most important prerequisites in the ECR, as well as in the field of IT and EDP, are based on extensive process analysis.

Companies are increasingly turning to international procurement markets. One of the consequences is that, on the one hand, their added value is reduced, and, on the other hand, the development of the business networks is achieved. Often, the complexity of the logistics chain increases due to offshoring (relocation of business processes to (typically) lower-cost foreign locations, such as Asian or East European). Market success increasingly depends on successful cooperation. As a result, companies need to focus more on their core competencies to remain competitive in saturated markets. The prerequisite is the creation of complex business networks. The efficient partnership allows for the planning, management, control and maximum optimization of the entire logistics network - from the end customer to the sub-suppliers of raw materials.

Moreover, the increasing complexity and diversity of the product due to the growing demands of individual customers and the short product life cycles can be considered as a particular reason for the efficient management of the entire network. Generally, an active transition from the seller's market to the buyer's market can be observed. In addition, the phenomena that play an important role are the rapid technological progress, the diversity of organizational structures, processes and IT solutions, as well as the increasing globalization of markets and value chains.

The change in perspective from individual ownership, "independent" companies to development and action as a network, is also evident from the fact that in the past, certain departments of a company divided work processes aiming at increasing productivity, today, the same effect must be achieved by division of labour among "independent" enterprises.

Some authors briefly define the task of SCM as the coordination of the flow of goods throughout the network. The high level of efficiency within the systems is achieved only if all physical flows circulate without any impediments within the network of "individual" enterprises. This immediately leads to the need for network interface monitoring. If the managers of the involved companies have "isolated" thinking, unnecessary resistance to overcoming interferences arises. An important term that is often used in this context is "vertical cooperation". This involves cooperation at several successive stages of the supply chain and concerns the interface issue, in particular. The process is registered within individual companies, however, it mainly concerns the different levels of the SC.

SCM should develop strategies and concepts by which disruptions in the logistics network, such as fluctuations in consumption orders, supply gaps, inaccurate sales forecasts and non-compliance with delivery deadlines, can be eliminated or avoided in the long term despite high inventory levels. The choice of SC strategies and tools is based on the strategic direction and SC objectives, and overall on its complexity, the type and intensity of cooperation with the customers and suppliers, the final product and customer requirements. By applying different strategies in the SC, two different directions can be identified, one of which is the efficient (weak) SC Strategy that is primarily aimed at high capacity use and is mainly applied when there is a stable, predictable demand and limited options. The supply chain is managed according to the PUSH principle. If, on the other hand, the demand fluctuates or the product life cycles are rather short, a responsive (agile) SC is often chosen. In this case, instead of high capacities use, the focus is on shorter delivery times and maximum flexibility in the production process. Based on this strategy, the network is managed according to the PULL principle. In addition to the materials flow, as in the case of logistics management, the SCM must also ensure a safe and fluent information flow throughout the SC. Moreover, unlike classical logistics, much more far-reaching tasks are established, because SCM, unlike logistics management, is much more strategic and the business processes are viewed from a holistic perspective and not just from the perspective of pure logistics.

At the emergence and coinage of SCM as a concept, only two flows were considered, namely the *material flow and the information flow*. However, in recent years, the importance of

the *third stream has increased,* gently moving to the foreground, namely the *financial flow*. This plays a particularly important role in SC risk management, since all the risks that arise usually negatively impact the finances of the companies involved.

Material flows have already been optimized in many SCs, leaving few opportunities for improvement. It, therefore, makes sense to discover and exploit the previously unknown hidden potential in financial flows. Only a holistic view of all SC flows and the financial flow inclusion could guarantee processes optimization and is, therefore, decisive for the overall success of the SC.

The enormous importance of these considerations is proven by the fact that several independent terms have been coined and researched in the specialised literature, thus, giving rise to an increasingly wide-ranging discussion. The first publications on this topic can be found beginning with 2002.

As for the definition, one can distinguish the terms of Supply Chain Finance or Financial Supply Chain, which, however, are sometimes used as synonyms. In very general terms, Atkinson defines the financial side of the SC as the flow of money, highlighted to support the materials flow (Atkinson (2006)).

Pfaff et al. define "Financial Supply Chain" as the ensemble of all processes that are involved in the financial flows in the SC. As a result, "Financial Supply Chain Management" handles the management of these processes from the qualification process to financing and invoicing, to customer payment. In turn, the term "Supply Chain Finance" should be regarded as an element of Financial Supply Chain Management and comprises the financing tools within the SC. Supply Chain Finance can be supported by banks or financial service providers. On the one hand, this outsourcing causes additional costs. However, on the other hand, it makes it possible to avoid labour costs in the SC, and provides the advantage of accessing expert experience and knowledge, which are not often available in current SCs, facts which usually outweigh the costs.

One of the tasks of the financial service provider is the early control of the flow of money. The main task is to generate transparency in all payment processes and optimize their management and control. Due to financial processes transparency, extensive and controlled information exchange within the SC, the risk costs can be reduced, and, therefore, significantly improve the cash flows. The focus here is on the planning, management and financial control along the value chain. One of the objectives is to reduce funding costs throughout the SC. In addition to minimising costs, a fair distribution of finance costs and profits must also be ensured.

The advantage of successful Financial Supply Chain Management lies in the discovery of the optimization potential for value chain actors. Furthermore, the objective of Supply Chain Finance is, among other things, to increase current assets or cash flow in the network to create a flexible financial domain. To reduce the working capital, the borrowing of funds and costs, as well as the outstanding debts should be reduced.

In Financial Supply Chain Management, as in higher-level SCM, the main focus is on the end customer. All services are aligned with it and the client is involved in optimizing financial processes, for example via credit checks. As in the case of SCM, IT and innovative technologies are regarded as decisive success factors for SC financing, by synchronizing the financial flows of the companies involved. For example, costs can be reduced by automated invoicing or IT-supported monitoring of financial processes.

According to Harland C. M. (2006), the other tasks of the SCM include the selection of network partners, resource and tasks allocation, network cooperation regulation and finally the evaluation of all companies and relationships in the network. If the final product is characterized by a short life cycle and demand fluctuations, the network management must follow and monitor the inherent dynamics of the SC. Generally, the SCM deals with stock reductions, all interfaces coordination and the synchronization of previously unconnected processes.

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In short, the tasks of the SCM consist in the control of the SC structure, the cooperation and communication between the participating companies and the optimization of the three flows of the SC.

The merging of several individual companies into one network has multiple advantages. On the one hand, a cost reduction can be achieved by lower storage and operating costs and optimized coordination between process participants. On the other hand, improved order processing, optimized business processes and shorter delivery times generate time savings. All parts of the unimportant, low value-added processes are reduced and the important components are automated. In addition, the early warning system can be improved and the capacity bottlenecks can be prevented by continuously updating fault information. This reduces the number of bad decisions in each of the companies involved. An improvement in customer satisfaction results from enhanced compliance with deadlines, accurate delivery times, which come as a result of optimizing long-term order processing. Moreover, integrated information and communication processes can be used to quickly respond to changing customer needs.

If the positive effects are to be measured by using key figures, which can be further divided into three categories: *cost, time and quality advantages*. It has been found that all these positive effects generally occur regardless of the SC industry.

The observations on the practical results have shown that in a successful SCM, by reducing stock up to 60% and the production times by 50%, a 30% increase in customer satisfaction can be achieved. However, this potential for improvement can only be exploited by implementing holistic thinking in all the companies involved and by integrating these individual companies into a single SC.

The successful SCM must be preceded by a fundamental change in the employees' critical thinking in all the companies involved. This comprises the holistic employee experience that goes beyond the boundaries of their own company and includes the entire SC.

Furthermore, several other requirements must be met so that the SCM functions successfully. This includes a uniform IT system with standardized interfaces. This allows for the smooth transfer of relevant information and reduces unnecessary expenses.

Since the number of SCs has increased in recent years, as well as the number of companies in a network, the network structure is more complex and manageable. For this reason, a well-established network structure and operation is imperative. The SC managers must ensure the transparency of all material flows and allocate individual areas of responsibility. Furthermore, information transfer and management must be established to avoid redundancies or errors due to poor provision of information.

All types of resources play an important role in the SC, thus, good resource management is required. This encompasses transparency and a constant overview of the available resources needed for the value chain, such as material, staff and space. This is subject to stocks (inventory) management. On the other hand, the resources in the SC must be distributed among all the parties involved. The objective of the management and distribution of SC resources is again governed by expenditure reduction. To support resource management in logistics networks, some research tools have been developed. For example, we would mention the cost of the process based on the available resources.

Another prerequisite for the comprehensive management of the SC is the choice of the right partner since this can be the decisive criterion for the success or failure of an alliance of companies. Here, the strategic company direction is of utmost importance. The strategies pursued by potential partners should match those of their own company, otherwise, a mutual blockage may occur. In this regard, the objectives and strategies must be openly discussed and presented during the first negotiations on the possible cooperation in the SC. In addition, the description of the long term actions to achieve the set goals should be determined during the

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discussions, as the opinions may differ. Finally, both their skills and those of potential partners need to be critically assessed and weighed. Overall, strategy management in a network usually consists of the following steps: Strategic Analysis, Strategy Formulation, Strategy Implementation and Strategy Control and Coordination.

CONCLUSION

Individual network partners should be able to identify the effects of their internal decisions on the whole Supply Chain. Furthermore, the network partners must be willing to temporarily give up on their advantages in favour of the SC. In the long term, however, a compromise for all involved parties is to be sought, thus, promoting a win-win relationship. The ability to work in a team and the willingness to cooperate with all involved is a prerequisite in obtaining a competitive advantage via developing logistics networks, regardless of the industry. Moreover, the company managers will solve the internal issues and will take responsibility for the entire logistics chain and/or network, thus, adjusting the measures and strategies implemented.

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THE IMPACT OF COVID-19 ON CONSUMER BEHAVIOR OF FINANCIAL-BANKING SERVICES

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Abstract: *The COVID-19 pandemic had a profound impact on the consumer of financial-banking services, changing not only his behavior but also the way they live. Banks are researching the evolution of customer requirements and needs to understand these behavioral changes and to discover how their offer will have to adapt and evolve to meet the future consumers needs in the "new normal". Many consumers have seen their personal finances negatively affected since the crisis hit. While lower disposable income and general economic uncertainty have led many to reduce their spending. The effects of the impact of the COVID-19 pandemic crisis were manifested by the decrease in GDP, the increase in the unemployment rate, the increase in the volume of deposits made in banks and the decrease in consumer spending. Because of the current environment, banks should better understand these new behaviors and meet the requirements of consumers with relevant products and convenient services.*

Key words: *consumer behavior, financial-banking services, Covid-19 pandemic, consumer needs.*

JEL CLASSIFICATION: G21, G41, M31

1. INTRODUCTION

Customers' buying behavior is changing, as is the way they sell banking products and services that require adjustments to the situation. It is important to know and focus on the main sales channels, which will have a continuous performance even after the crisis.

Consumers of financial-banking services adapt new shopping habits and opt for the use of online services, without visiting the physical subdivisions of banks, because this helps not only to solve security problems but also to obtain various advantages regarding the time, speed and cost of transactions.

As countries reopen, the question is: what are the longer-term effects on consumer behavior of financial services? Given that the challenging economic context is likely to suffer for a longer period of time, value and price considerations will most likely be on the minds of many customers, as well as the ability to obtain various financial benefits. On the other hand, certain categories of customers prefer to meet their needs in financial services through offline interactions.

People are living differently, buying differently and, in many ways, thinking differently. Consumers across the globe are looking at products and brands through a new lens (Accenture, 2020). A part of this behavior is permanent and brings in structural changes in the way we live, work and make buying decisions. (Mehta et al, 2020).

As only time will tell which changes in the buyer's behavior are more permanent, one thing is certain: we will see the impact of the crisis for a long time to come, and the rapid adaptation of banks' activity will be the key to successfully managing the effects.

The results of a new KPMG study (2020), "Adapting to consumer developments in the new reality" demonstrate that COVID-19 has a global and lasting impact on consumer needs, preferences and behaviors. Thus, four key trends were identified that affected consumers and changed consumption habits, referring to: economic impact, erosion of confidence, digital growth and the home as a new center of activity.

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For banks, it is more important than ever to perceive what motivates customers, to analyze their strategy and business model to determine how they can adapt to keep pace with the ever-changing needs of customers. Relationships between customers and banks could change permanently following the COVID-19 pandemic, which will lead them to analyze how they can gain customer trust in this new reality.

2. CONSUMER BEHAVIOR IN TIMES OF COVID-19 CRISIS

Globally, another client has emerged with new behavior and decision-making criteria, indicating the results of several surveys conducted around the world over several months. Quantifying the scale and nature of these changes specifies that this is a rapid change in the way customers see their world, which requires an equally rapid response to the way suppliers of products and services approach their markets.

Depending on the flexibility of the companies offering these services and products, as well as future restrictions, these changes in customer behavior may be permanent and may change the rules of business.

Consumers across the globe have responded to the crisis and its associated disruption to normal consumer behaviors by trying different shopping behaviors and expressing a high intent (65% or more) to incorporate these behaviors going forward. However, the change has been less pronounced in countries with a moderate degree of economic shock, such as Germany and Japan (Charm et al, 2020).

The outbreak of the COVID-19 pandemic caused substantial changes in the top of the procurement criteria, illustrating how consumption changed during this period. More than a third (36%) of consumers prioritize savings over spending and "Value for money" is the main purchasing criterion for 63% of respondents. (KPMG, 2020).

The "Future Consumer Index" study initiated by EY Global (2020) identified four consumer segments based on the dominant behaviors and opinions of 18 countries:

- saves and makes stocks (holds 35% of the total), which are pessimistic about the long-term effects, but are not so concerned about the pandemic, but concerned about the health of the family;
- drastically reduce spending (27%), the most affected by the pandemic and the most pessimistic about the future, spend less in all categories;
- keep calm and spend (26%), which are not directly affected by the pandemic and do not change their spending habits, they are just worried about others making stocks;
- hibernates and spends (11%), the most concerned about the pandemic, but best positioned to deal with the situation. They are optimistic about the future and spend more in all categories.

The shift to digital persists across countries and categories as consumers in most parts of the world keep low out-of-home engagement. Online growth for China seems more moderate, as the country had a high level of online penetration prior to the pandemic (Charm et al, 2020).

Unquestionably, the biggest change this year is the accelerated shift to digital commerce (Goldberg, 2021). In January, e-commerce represented 13% of retail sales. That number spiked to almost 20% of sales in April and levelled back to about 16% by the end of the year. That 3% increase in share represents an additional $18 billion in digital sales in a month. Web traffic monitoring company Similar Web reports that, since the pandemic began, visits to the top 20 USA e-commerce sites has been up 31% versus 2019.

People are embracing technology more than ever to support all aspects and consequences of isolation. There is also positive evidence to suggest that this crisis will build communities, rather than separate them.

The current context is rapidly changing the behavior of consumers, who seem to prefer digital channels, 66% saying that the pandemic has made them appreciate more quality technological solutions. The health crisis has contributed not only to the transition to digital technologies, but also to the creation of a model for the coming years, according to the results of the study, with 63% of respondents saying they will continue to use digital technologies more often even after the pandemic ends, stating that carrying out activities in a digital environment was even a superior alternative to in-person experiences. (Deloitte, 2021)

As customers become more comfortable with using digital to accomplish their high-value complex transactions, banks are having to accelerate their digital investment (KPMG, 2020). Larger, established banks have benefited from the "flight to safety" in these uncertain times with consumers looking for full-service banking both online and on mobile. Such banks are in a relatively strong position to develop their own technology, e.g. virtual assistants or credit decisioning. Banks must not only focus on digitization, but also on differentiation. Products and services need to be simplified to reduce cost. Personalization can be delivered through the point of interaction, making better use of customer data to help predict future situations and help inform decision-making.

The respondents of the study "Romanian consumer behavior in the context of COVID-19" initiated by EY Romania (2020) showed optimistic attitudes towards most consumption of banking products and services. Thus, only 6.6% of respondents indicated a pessimistic attitude regarding banking, 55.5% were optimistic, and 37.9% had a neutral attitude.

When asked to what extent they believe they will return to consumption habits after the end of the pandemic, 22.14% consider a major change in the banking products and services they will purchase and 52.93% believe they will return to past consumption habits.

Because of the events that are currently happening around the world, everyone wants to know what to do with their finances and investments and they feel the need to make decisions as soon as possible. (Pyle, 2021)

In the short-term savings may increase in the near-term, which can help cushion the liquidity demand for banks and retail investors may defer their renewal premia and/or opt for endowment products, which will adversely influence the flow to capital markets, but may prove positive banks having scale and strong balance sheet (Kumar, 2020). Retail financing industry, which was one of the key drivers of credit growth, will be impacted for at least two quarters, as the demand for housing assets, consumer goods and working capital financing will get hit due to general slowdown in economic activity. There is a potential risk of defaults and insolvencies unless the regulatory framework is tweaked urgently to address the unprecedented challenge that corporate sector, and retail sector is witnessing at present.

3. COVID-19 IMPACT ON THE CONSUMER OF FINANCIAL BANKING SERVICES IN THE REPUBLIC OF MOLDOVA

In response to the potentially serious threat to public health posed by COVID-19, the Moldovan authorities have implemented numerous measures to limit the spread and impact of COVID-19, which has led to a temporary reduction or suspension of trade operations. As a result, these measures severely restricted economic activity in the Republic of Moldova, had a negative impact and continue to have a negative impact on the business environment, market participants, bank customers, as well as on the economy of the Republic of Moldova, and the global economy, for an unknown period of time.

Thus, in the second quarter of 2021 (see figure 1), the situations caused by the pandemic manifested themselves as follows: every second person worked fewer hours per week (48.2%), every third person either worked from home / worked remotely, or was transferred to part-time work (37.5% and 37.6%, respectively) and one in four people (23.5%) did not work at all /

discontinued activity (in the second quarter of 2020, the highest value was recorded for people who did not work at all / interrupted activity - 60.7%, followed by people who worked fewer hours per week and people who performed work at home / distance (30.4% and 25.6%, respectively).

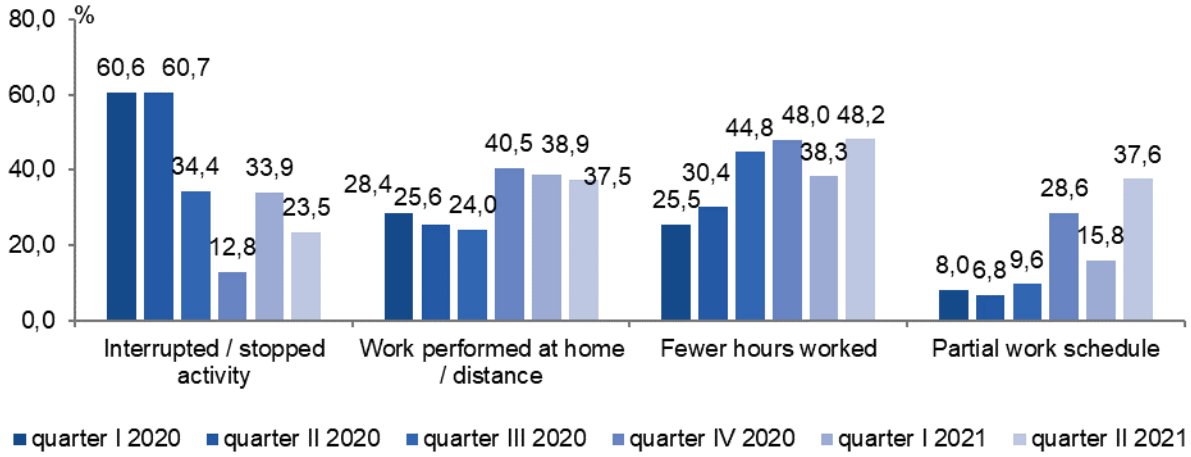

Figure 1. Persons affected by the situation at work by category, by quarters, 2020-2021, % of the total affected persons
Source: https://statistica.gov.md/

The population faced financial difficulties, expressed by the reduction or loss of income from work and remittances.

About 91.2% of households had income from salaries, pensions, social benefits (see figure 2), Just over half of households (54%) had income from work in the country, and 23.5% had income from remittances. At the same time, 12.1% mentioned the reduction or loss of income from work, 4.7% reported the reduction or loss of remittances from abroad, and only 2.6% reported the withholding of salaries, pensions, social benefits.

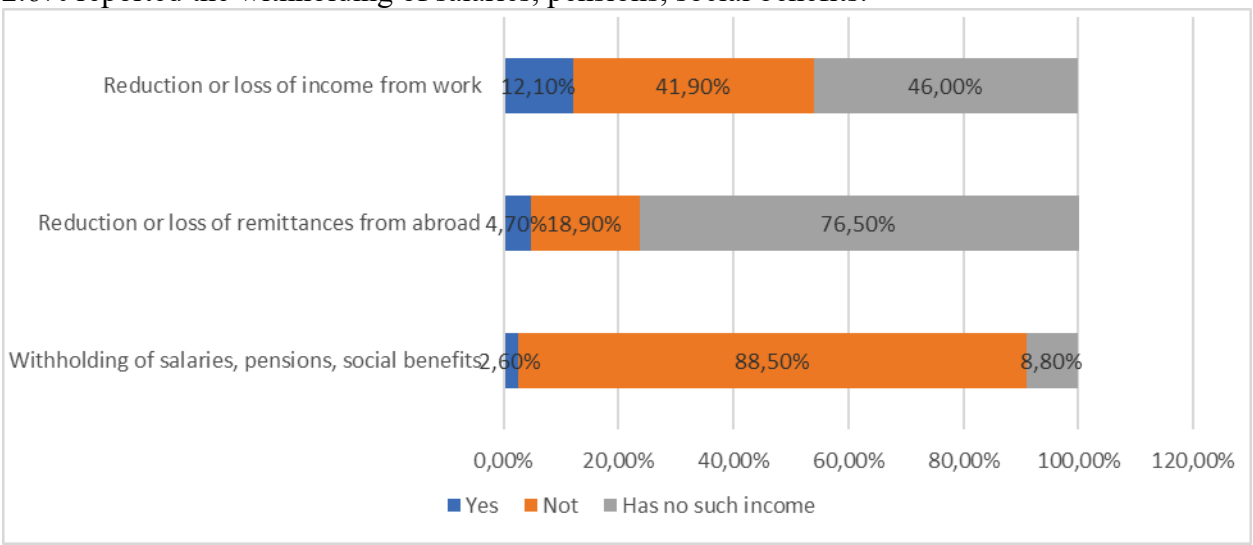

Figure 1. Persons affected by the situation at work by category, by quarters, 2020-2021, % of the total affected persons
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Knowing that customer revenues have been severely affected by the restrictive measures imposed in the context of the pandemic, banks in the Republic of Moldova have launched a comprehensive loan-rescheduling program.

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Under the given conditions, the banks offered their clients several facilities, for each category of clients (both individuals and legal entities), both for loans, advances granted to clients, as well as leasing receivables, such as: payment of installments at loans and interest payments for the first months of the pandemic were transferred for payment in subsequent months; no penalties and / or interest for late payment were charged; the loan repayment schedule was modified without charging the clients the commission for modifying the contractual clauses, etc. This ensured that the quality of the loan portfolio was maintained.

The non-performing loans rate increased in the second quarter of 2020 (8.74%), and at the end of the year it reached a more favorable level (7.38%) than until the beginning of the pandemic (see table 1).

Table 1. The quality of the credit portfolio of the banks in the Republic of Moldova

	Quarter 1, 2020	Quarter 2, 2020	Quarter 3, 2020	Quarter 4, 2020	Quarter 1, 2021	Quarter 2, 2021
Balance of credit debt, mil lei	**42.031,98**	**41.509,70**	**43.504,95**	**45.643,21**	**46.643,12**	**49.932,36**
Non-performing credits (NPC), mil lei	**3.565,14**	**3.629,30**	**3.721,79**	**3.369,65**	**3.373,62**	**3.739,71**
NPC debt/ Total own funds, %	**30,29**	**28,81**	**27,87**	**24,74**	**25,01**	**25,99**
NPC debt/ Balance of credit debt, %	**8,48**	**8,74**	**8,55**	**7,38**	**7,23**	**7,49**

Source: https://bnm.md/

Guided by the same desire to be close to their customers, banks have developed remote service systems, offering consumers more convenience and security. Thus, banks provide consumers with access to banking services and products from home, from any geographical point the customer feels comfortable and safe 24/7. Many remote services require a bank card in order to be used.

Table 2. Information regarding services with payment cards in the Republic of Moldova

	Quarter 1, 2020	Quarter 2, 2020	Quarter 3, 2020	Quarter 4, 2020	Quarter 1, 2021	Quarter 2, 2021
Cards in circulation	**2.047.832**	**2.088.822**	**2.153.139**	**2.182.076**	**2.184.418**	**2.252.973**
active cards	1.235.470	1.213.476	1.264.739	1.324.843	1.341.038	1.386.696
salary cards	978.188	975.412	954.825	961.321	935.804	943.851
social cards	402.218	408.989	418.269	395.033	404.908	420.057
Number of operations	**21.657.791**	**21.760.308**	**24.930.257**	**27.679.650**	**28.252.558**	**31.937.534**
cash withdrawals	6.398.692	5.815.075	6.645.069	6.911.528	6.381.593	7.183.109
non-cash payments	15.259.099	15.945.233	18.285.188	20.768.122	21.870.965	24.754.425
Value of operations	**17.451.082.612**	**16.889.120.218**	**19.692.825.402**	**21.614.322.561**	**20.638.828.086**	**24.056.628.225**
cash withdrawals	12.580.537.460	12.058.540.617	14.154.257.534	15.089.306.583	13.746.243.475	16.267.271.802
non-cash payments	4.870.545.152	4.830.579.601	5.538.567.868	6.525.015.978	6.892.584.611	7.789.356.423

Source: https://bnm.md/

The impact of the current crisis, as well as the active promotion of banking products through cards and the promotion of e-commerce, have led to an increase in the number of active cards and the number and volume of transactions (see table 2).

Physical channels (obtaining the product in the bank's subdivisions) will remain important, but banks should not focus on a particular channel, but on the customer, as competition becomes stronger.

4. CONCLUSION

To the extent that one can predict what will be the "new normal" in the behavior of the process of procuring financial services, there are several assumptions. In order for financial institutions to respond effectively to their customers' specific purchasing patterns after overcoming the coronavirus crisis, they should recognize the following expected trends:

- access to online financial products and services will become the main trend - after a period of intensified digital connectivity, customers have become much more receptive to banks' offers on remote banking channels, namely in such situations appreciating the convenience of using them. Thus, customers will perceive fewer barriers to seek the assistance of technology in their daily lives;
- professional assistance during the client-bank relationship to ensure its consolidation and customer loyalty;
- the need for high transparency and information on the supply of products and services of banks and the conditions for their purchase by different categories of customers, in particular, information on the cost;
- personalization will be essential to meet consumer needs as a result of deeper understanding of consumer groups, through the segmentation generated by Artificial Intelligence and psychological cues.

The next normal in behavior of financial banking services consumer may likely be explored on dimensions mentioned below:

- rethinking about considering psychological approach in understanding consumer behavior, taking into account factors such as economies of consumption, saving and mental health;
- mobilization of financial and personnel resources at speed and scale as central focal point of bank's activity to respond to their consumers behavior changes;
- rewiring COVID generation: opportunity to realign the present young generation to new principles of life and business to build a new segment of consumers;
- creating new products or services that fully satisfy the client's contemporary needs and requirements.

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THE HEAD OF STATE "NEUTRAL" POWER: CONCEPTUAL BASIS

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Abstract: *the author presents one of the non-traditional aspects of the theory of separation of powers in the historical and legal framework of the development of the concept of neutrality of the head of state, and at the present stage. The article reveals the controversial issues of the correlation of the powers of the head of state with the powers of other state authorities, reveals his position in the state mechanism.*

Key words: *the theory of separation of powers; the concept of the neutral power of the head of state; system of public authorities; a system of checks and balances; form of government, arbitration authority.*

JEL CLASSIFICATION: Z18

1. INTRODUCTION

Considering the theory of separation of powers, its content, questions about the existence and number of branches of power in the state, the problem of the legal status of the head of state - the monarch or the president - and his interaction with the government and parliament are inevitably raised. This allows us to solve the problem of determining the place of the head of state in the state mechanism, taking into account the peculiarities of the political and constitutional development of each country. In general terms, the head of state is recognized as the highest representative of the state within the country and in the international arena, a symbol of the stability and integrity of the state and its political and legal institutions. However, it is not always possible to agree with such a statement of the question, because the head of state often has real powers in the field of management, executive and administrative activities. One of the aspects of the problem of the status of the head of state is the concept of his "neutrality", which will be described in this article.

2. THE CONCEPT OF NEUTRAL POWER ACCORDING TO B. CONSTAN

The concept of "neutral power" was introduced into science by B. Constan, who thereby revised the original structure of the division of powers. In contrast to the classical interpretation of the theory of separation of powers, Constan singled out royal power as an independent branch, personifying at that historical moment the power of the head of state. He described its place and role in the state mechanism as follows: "The royal power is located among all these four powers, but it is higher than them, it possesses both supreme and mediating power, being at the same time interested not in upsetting the balance, but, on the contrary, in maintaining it "(Констан, 2000, с. 39). Constan B. (Констан, 2000, с. 40) does not enter into a direct dispute with Locke and Montesquieu, but significantly corrects their construction of the monarch as the head of the executive branch. B. Constan (Констан, 2000, с. 41) considered the British system to be the real personification of neutral power: "If the action of the executive power is dangerous, control removes the ministers. If the action of the chamber of peers is destructive, the king gives it a new development, the creation of new peers. If a threat comes from the electoral house, the king either uses his veto or dissolves the elective house. Finally, even if the action of the judiciary becomes unbearable, because it applies too severe punishments to certain actions, the king mitigates her actions by using the right of pardon. " This confirms that Constan's theory is characterized by a sober attitude to the principle of separation of powers, since already modern

practice has shown that a mechanistic adherence to it does not guarantee against imbalance in the system of public power. Moreover, such an imbalance can be caused by the disproportionate dominance of not only the executive, but also the legislature. Constan (Констан, 2000, с. 44) therefore writes that "the vices of almost all constitutions can be attributed to the fact that they did not create a neutral power, but placed the entire aggregate of power that it should have in one of the existing authorities." He rightly believed that society needs an institution that will not be designed to govern in the narrow sense of this concept, but to ensure a balance between the branches of government - this will be the institution of neutral government.

3. CRITICISM OF B. CONSTAN'S CONCEPT

It is interesting to note that Russian researchers perceived the meaning of neutral power in a slightly different way. So, B.N. Chicherin (Чичерин, 2006, с. 41) wrote: "Standing over the parties that are not involved in their struggle, he abstains from them, moderates them, gives advice and directions." N.I. Lazarevsky (Лазаревский, 1908-1910, с.287), analyzing Constan's ideas, used the word "pacify": "Royal power is irresponsible, neutral. Her high position creates peace of mind for her bearer, placing him outside the struggle of parties. She hovers over everything. B. Constant calls her "pacifying" power as such she humbles the ministers, dissolves the chamber, pardons the unjustly condemned. "

B. Constan's concept contains another fundamentally important idea: the institution of neutral power must have the strength necessary to fulfill its mission (Констан, 200, с.39): "Executive power, legislative power and judicial power are three forms of power, each of which in its own area should contribute to general development; but when these confused powers intersect, collide, interfere with each other, it takes strength to put everything back in place. "

O.E. Kutafin (Кутафин, 2013, с.7), who believed that the head of state could be such "nominally or realistically", at the same time made an absolutely correct reservation: the state is called upon to find a way out of the most difficult situation, being a kind of reserve of state power".

According to M.A. Krasnov (Краснов, 2017, с.60-69), B. Constant, putting forward the concept of "neutral power", "did not imply their reserve role. He quite rightly proceeded from the mission of the monarch, which was not to actively include him in politics, but to constantly protect the constitutional system and thereby protect statehood from collapse in difficult situations for the country, and at the limit - to prevent such situations ... The exercise of power within the framework of such a mission is not at all a reserve. "

4. THE PRACTICE OF APPLYING THE CONCEPT OF NEUTRALITY OF THE HEAD OF STATE

Already from the end of the XIX century in the literature, opinions began to be expressed that the property of political neutrality can be attributed to presidents in parliamentary and mixed models. G. Jellinek (Еллинек, 2004, с.412), in particular, wrote that the Third Republic in France "implemented a system of parliamentary government on the basis of the teachings of B. Constan, Thiers and Prevost-Paradol, and the head of state occupies the position of a neutral element, standing above other states by factors, but without real participation in the management of state affairs".

K. Schmitt (Шмитт, 2010, с.44), saying also that the king becomes "invisible, resolving all contradictions and frictions of various state actions and functions, the regulating and modeling moment, invisible moderateur" republican president of the state ". The Norwegian King Haakon VII remarked in the 1940s: "I am king even for the communists."

In this regard, we can agree with M. A. Krasnov (Краснов, 2017) that it is permissible to apply the concept of "neutrality" to a constitutional monarch: indefinite and irresponsible allows

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him (regardless of the method of replacing the throne) not to participate in politics. Presidents, however, are "generated" by politics, and therefore, naturally, they are also under the influence of the party.

It cannot be denied that if the president's influence on the political course is weakened (for example, in Poland, Slovenia, Bulgaria, Moldova, etc.), then the president may well look like a politically neutral institution. However, here, on the one hand, he remains a hostage of the party that nominated him, which, in turn, was rightly emphasized by V.V. Komarova and Sh.B. Magomedov (Комарова, Магомедов,1999, с.123-124), on the other hand - "such a president is institutionally too weak to exercise neutral power, which, as noted, cannot remain powerless."

Meanwhile, presidents, even in a presidential republic, usually seek to convince society of their external commitment and political neutrality. It is significant that the American Founding Fathers usually thought of presidential elections without the participation of political parties, perceived as a political evil. And although, since the election of the second president of the United States, the main candidates have been nominated by parties, as Agaev (Агаев,1994, с.15) says: "every president-elect wanted to appear before the public as a national figure." Wilson (Wilson, 1908, p. 68-69) deduced the presidential "suprapartisan" state from the fact that the people prefer to choose a person, rather than a prize. Therefore, according to him, the popularly trusted president leads the nation, and "his party can hardly oppose him."

The idea of "neutrality" of the president in the mixed model is even more controversial, since this model formally denies that the president belongs to the executive branch and thus presents him as "the president over everything." However, the lack of clear criteria and the institutional structure of neutral power leads to the fact that such presidents take a certain political position.

In the context of the semi-presidential model in France, the concept of "presidential arbitration" appeared, which became a kind of replacement for the concept of "neutral power". It should be borne in mind here that B. Constan wrote about the neutrality of power as a separate branch and at the same time had very clear tasks to "pacify" the political sphere. De Gaulle's construction, however, does not prejudge the president's belonging to a separate branch of government, but at the same time represents him as the de facto head of the executive branch, but responsible for it precisely because he acts as an "arbiter" for all branches of government.

5. CONCLUSION

Based on the analysis of different positions on the issues under study, it can be concluded that the "presidential arbitration" due to uncertainty opens up wide opportunities for the president for uncertainty and even some abuse of competence. French researchers themselves speak about the vagueness, the extraordinary breadth of this concept in real state life. For example, according to S. Formery (Formery, 2012, p. 20), it "carries" ever greater ambiguity ", i.e. assumes two roles of the "arbiter president": "neutral" and "active". J. Wedel (cit. ex.: Formery, 2012) criticized: "It was expected, in fact, that the president is not considered a member of the political struggle. But in practice, it was quickly discovered that General de Gaulle accepted arbitration as "active arbitration", which meant, in fact, that the rights granted to the president must be used in order to work in his own country and guide its development. " Formery himself is quite approving of the idea of "arbitration", although he understands: "if the president has a parliamentary majority, he is the real head and cannot be limited to the role of a" neutral arbiter. "

Other French authors also speak of the actual use of "arbitration" as an invasion of the operational administration of the country. Thus, B. Mathieu (Матье, 2014, с.116) wrote, characterizing the French practice of exercising presidential power: "The function of an arbiter includes a number of powers specifically provided for by the Constitution ... Ordinary time

directs the activities of the government, sets specific tasks for it, leaving it to the cabinet to implement day-to-day politics. "

Studying and analyzing the legal and practical aspects of consolidating and implementing the theory of "arbitration", we come to the conclusion that it has become a doctrinal justification for the actual expansion of presidential powers, which, in fact, does not correspond to the concept of "neutrality" of the head of state, the very arbitration function, which presupposes finding the highest official at an equal distance from all other bodies and branches of government in the state.

We believe that it is quite possible to find arguments and adhere to the position that the presidential power is an independent branch of government. But the signs of such independence today are extremely difficult to discern, since, as a rule, the president, under the conditions of most models of power, is too closely connected with the executive branch, which may significantly violate the principle of separation of powers.

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TAX POST – AN ALTERNATIVE METHOD TO VERIFY THE TAXPAYER'S VOLUNTARY COMPLIANCE WITH THE LEGAL FRAMEWORK

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Abstract: *Every taxpayer must be aware of their rights, obligations and consequences that will result from non-compliance with applicable tax legislation. It is important for the taxpayer to understand his tax burdens, to be aware of the importance of correctly declaring and paying in full the taxes and duties due to the National Public Budget so that the state, in turn, can provide quality services to citizens.*
In the tax system, an important role belongs to the tax administration and its mechanisms, starting from the fact that these components ensure the collection of financial resources from civil society, the techniques and attitude in the collection process having a major importance in this process.
Key words: Voluntary compliance, tax post, tax audit, forced tax compliance, electronic tax post

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Every taxpayer must be aware of their rights, obligations, and the consequences that will result from non-compliance with the tax legislation in force. It is important for taxpayers to understand their tax duties, to be aware of the importance of correctly declaring and paying in full the taxes and duties due to the National Public Budget so that the State, in turn, can provide citizens with quality services.

The government system, the tax system and its constituent parts have an important role to play in the proper functioning of the general government processes. On the one hand, it ensures the collection of necessary funds not only to cover the current needs of the functioning of the government bureaucratic apparatus, but also for general economic development by financing capital investments and developing quality services for the population and the business environment. On the other hand, the 'severity' and non-transparency of tax legislation and administration lead to a growing lack of confidence on the part of taxpayers and civil society as a whole in the ability of governments to manage the money entrusted to them effectively, creating invisible barriers between governments and the main stakeholders - citizens and the business community.

In the tax system, an important role is played by the tax administration and its mechanisms, starting from the fact that through these components is ensured the collection of financial resources from civil society, the techniques and attitude in the collection process having a major importance in this process.

The topicality of the issue stems from the importance of functional tax administration with internationally comparable performance for both citizens and the business environment, in order to respect their rights and economic interests, given that such a system would ensure the collection of resources necessary for sustainable development, which will increase the confidence of the population and the business environment in the policies and actions of tax administration bodies.

An analysis of the situation in the research area shows that the field of tax research has been less attractive to domestic practitioners, with more emphasis on general tax policy regulations and less on tax administration issues, and that tax administration regulations have been largely fragmented without a general assessment, which is also confirmed by the lack of a normative act, the Code, which would cover the entire tax procedure. The lack of a systemic approach to this issue is becoming more visible in multiple court proceedings.

The tax administration provides an additional method of verifying economic agents in terms of compliance with tax legislation and the correct reporting of income and data reflected in the mandatory reports. This procedure is called - Post Tax.

The right to set up tax posts as provided for in Article 133 para. (2) point 13) shall be the responsibility of the State Tax Service. At the same time, the procedure for the establishment and operation of the tax post is regulated by Article 146 of the Tax Code and the Regulation on the operation of tax posts.

The purpose of establishing the tax post is well determined and constitutes:

1) prevention and detection of tax violations;
2) prevention and detection of tax evasion;
3) preventing and stopping the fraudulent activity;
4) identifying, documenting, and proving fictitious transactions;
5) ensuring that tax liabilities are calculated, declared, and paid in full;
6) estimating tax liabilities by Article 225^1 of the Tax Code;
7) performing other tax administration tasks.

Respectively, the operation of the tax post focuses on the strict monitoring of the taxpayer's compliance with the obligations established by the legislation in force.

According to the tax legal framework, tax posts can be of three types: stationary tax post, mobile tax post and electronic tax post.

The State Tax Service decides on the establishment of tax posts, determines the type and location, and, in the case of electronic tax posts, and the electronic communication technology.

The tax posts are established based on the analyses performed and presented to the management of the STS by the responsible Directorate within the central apparatus of the STS.

The tax post is established by the STS based on the impact of the risks that persist in the taxpayer's activity, prioritizing the risks that persist for a specific taxpayer and/or a sample analyzed, based on the available resources.

For the assessment of the risk criteria, the period of activity of the taxpayer is examined for 3 years, or at least one quarter prior to the current period, except for cases of identification of obvious risks of practicing entrepreneurial pseudo-activity.

Risks in the taxpayer's activity are divided into three categories, namely:

- documentation of fictitious transactions,
- concealment of actual sales proceeds
- other violations.

The increased risks of documenting fictitious transactions are:

1) the taxpayer documents deliveries/purchases with enterprises with signs of pseudo activity;

2) the taxpayer does not have subdivisions and employees, if any, qualified employees, for the proper conduct of the business;

3) the taxpayer records deliveries of goods/services at significant values (at least 500 thousand lei monthly) without having material/human assets to ensure the conduct of the entrepreneurial activity, such as lack of subdivisions, registering only the legal address, does not have employees, all transactions are intermediation transactions, with the application of an insignificant commercial surcharge, or even without its application. In particular, when

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examining the documents relating to the taxpayer's activity, the incoming and outgoing goods should be analyzed, with identification of the period and place of storage/storage of the goods, if the date of purchase does not coincide with the date of delivery and appropriate explanations should be requested from responsible persons of the taxpayer.

4) persons in positions of responsibility of the taxpayer have previously held positions in businesses in which possible indications of pseudo-entrepreneurial activity have been identified;

5) the taxpayer frequently registers changes in the composition of founders and/or managers or the following data are identified about them - old age or too young to conduct a business, is enlisted in the ranks of the army, is serving his sentence in places of detention, is undergoing treatment for a long period, the capacity to exercise is limited, it is not possible to identify them according to the data provided by the Public Authority responsible for the state registration of taxpayers and others;

6) documentation of purchases from taxpayers who, upon verification, have not confirmed delivery of goods. The significance of this indicator will be assessed based on the value of documented purchases in the total purchases registered by the economic agent;

7) the taxpayer is in arrears with the National Public Budget (hereinafter NBS) and the application of other enforcement measures did not result in its collection;

8) the taxpayer documents transactions for the performance of which the legislation in force establishes the obligation to have a license, authorization, trade notification, in their absence;

9) the taxpayer documents significant transactions (at least 500 thousand lei per month) with the issue of a large number of tax invoices with a value of less than 100 thousand lei, thus avoiding their registration in the General Electronic Register of Tax Invoices (hereinafter referred to as GERTI);

10) other suspected violations of the law.

The increased risks of concealment of actual recorded sales revenue are as follows:

1) the taxpayer records a low share of taxes and duties paid in the volume of sales made, compared to taxpayers engaged in similar activity, and/or compared to the average indicators established for the national industry (the information is to be examined in the light of the indicators recorded in the last 3 years);

2) the taxpayer registers a significant share of supplies made with cash payment - the share of documented supplies to individuals, holders of entrepreneurial patents, and/or unregistered economic agents as payers of value-added tax (hereinafter VAT), constitutes at least 30% of the total supplies made during the period considered.

3) the taxpayer has been subject to operational checks during the last 2 years, and in 80% of them violations of the rules for the use of cash and control machines and/or failure to present at the first request the documents of origin of the goods were found;

4) during the fiscal control by the method of factual verification, a shortage or surplus of goods was established, in an amount exceeding 10% of the value of the deliveries/supplies recorded according to the accounting data at the time of the inventory;

5) the taxpayer has employees, but according to the submitted accounts, the amount of the calculated salary is significantly lower than the amount of the guaranteed minimum wage in the economy, or the average salary for the type of activity practiced, and/or the number of employees according to the data in the accounts compared to the turnover allows to assume the use of undeclared work by the taxpayer;

6) the taxpayer declares losses from entrepreneurial activity during 2 tax periods preceding the period under examination;

7) other increased risks of concealment of revenues from actual sales made.

The activity of the examined taxpayer can be classified as with increased risk indices if it meets the criteria of at least two risks listed above. At the same time, when applying the taxpayer

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management measures, the STS will not be limited to identifying the mentioned risks, which, based on the specifics of the activity of the taxpayers directly examined on the spot, can be diversified.

Taking into account the specificity and diversity of the activities carried out by some taxpayers, the STS may decide on the simultaneous establishment of several types of tax posts for a taxpayer.

At the same time as the order designating the tax official, responsible for monitoring the tax post, the SFS issues a decision to initiate control using the factual verification method.

When the tax post is established, the tax official shall inform the taxpayer (his representative or person in charge) and/or the subdivision (his representative or person in charge) at which the tax post is established, located in a place other than the taxpayer's place of business, about the establishment of the tax post, by handing over the STS order on the establishment of the tax post, the order on the appointment of the tax official responsible for monitoring the tax post and the copy of the decision on the initiation of the tax audit, all against signature. If necessary, the summons on the need to present the documents required for the establishment of the tax office shall be drawn up and signed, and delivered. If the subdivision at which the tax office has been established is located in a place other than the taxpayer's registered office, the persons in charge of the entity or its representatives shall be informed verbally by telephone or other available technical means of information/communication of the establishment of the tax office, with the delivery, on the day of the establishment of the tax office, of the above-mentioned documents.

After notifying the taxpayer of the establishment of the tax post, the tax official shall ensure:

1) checking the stock of blankets of strict record, with the removal, where appropriate, of those not used at the time of the establishment of the tax post and their release at the request of the taxpayer. In the electronic tax post, the blankets will be returned as soon as the inventory actions have been completed. In the case of use by the taxpayer of the serial and number diapason, an inventory of the available diapason will be carried out and the taxpayer will be informed of the obligation to notify before it is used, with the participation of the tax official directly involved in the transaction;

2) request from the taxpayer to carry out a total or, as the case may be, selective inventory of the stock of goods, raw materials, materials, other assets, to be carried out in accordance with the provisions of the Regulation on inventory, approved by the Order of the Ministry of Finance No 60 from 29.05.2012. In the case of selective inventory, the reason for carrying out the selective inventory must be indicated in the control document. If discrepancies are established during the selective inventory, a full inventory will be initiated;

3) verification of the possession of trade notifications, authorizations, licenses required for the type of activity practiced;

4) verification of the updated list of debtors and creditors of the taxpayer;

5) verification of contractual obligations (employment contracts, work contracts, assignment of receivables, etc.) which are in force or are to be applied during the period of activity of the tax office;

6) suspension, if ordered by the Order establishing the tax office, of the electronic tax services "e-invoice" and SI Online Order of standard forms during the operation of the tax office;

7) verification of other aspects directly related to the activity of the monitored taxpayer.

Specific aspects of the operation of tax posts arising from their type:

Stationary tax post:

According to Article 146 (2) of the Tax Code, the stationary tax post is located in a stable and specially arranged place, where it performs its duties.

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When setting up the tax post, the tax official shall examine the commercial unit, production, service establishment, other premises liable to sealing, including examination of the layout of the rooms/territories concerned, so as to identify all access routes through which assets could be withdrawn or introduced, whereupon the tax official responsible for monitoring shall draw up a note to the head of the subdivision responsible for monitoring the tax post, setting out proposals for the identified access routes to be sealed, which shall be countersigned by the taxpayer's responsible person and approved by the head of the subdivision to which the tax official belongs. This note shall be attached to the Tax Post File. The operation of the tax post shall be carried out in such a way as to ensure that all access routes are monitored. In order to prevent goods/products and other material assets from being introduced and/or withdrawn from the premises outside working hours, the premises shall be sealed using available means of sealing, so that opening the access route causes damage to the seal.

In the event of the need to unseal the access route, the seal shall be removed only by the tax official, with the participation of the representative of the taxpayer with whom the tax post is established. In the event of damage to the seal being discovered in the absence of the tax official, the tax official shall establish this fact by means of a tax inspection. The document shall describe the violation, the data relating to the affixing of the seal and attach pictures of the damaged seal(s). At the same time, an inventory of the stock of goods, materials, raw materials stored in the subdivision is requested. The results of the inventory shall be compared with the inventory data taken at the time of the establishment of the tax post and the data recorded on a daily basis according to the reports on the operation of the tax post.

The tax officials in charge of the tax post ensure the monitoring of all the inflows/outflows of assets, goods, material values, and/or services, with the mandatory recording of this information in the reports. When verifying the delivery or purchase, the tax official shall check the correctness of the completion of the primary documents and the correspondence of the information recorded therein with the factual situation. Similarly, in the case of transactions concerning the transfer of assets within the disintegrated entity from a territorial point of view or outside the entity without transfer of ownership, the correctness of the reflection of these transactions in the primary documents shall be verified.

In the case of the establishment of stationary tax posts, taxpayers who provide services shall ensure the presence of tax officials both in the room where the service is provided directly and in the premises where the money is collected, orders are submitted by individuals, and/or legal entities. The tax official shall monitor the cash collection using devices and systems for recording cash transactions.

Mobile tax post:

According to the provisions of Article 146 (2) of the Tax Code, the mobile tax post, provided with technical means, including transport, shall move, where appropriate, within the controlled territory.

The mobile tax post may monitor a taxpayer who has subdivisions located in different localities and/or whose activity is carried out in different localities without the need for registered subdivisions (e.g. purchase of agricultural products), or it may monitor the activity of several taxpayers whose activity is carried out within a controlled territory. The mobile tax post moves within the radius of the taxpayer's subdivisions and/or the radius of the controlled territory.

In the case of the establishment of mobile tax posts, the tax officials, based on the workload, organize the deployment of the tax post in such a way that it is possible to monitor all transactions carried out by the taxpayer, new contracts concluded, provision/processing of services, delivery/processing of goods, materials, production, including agricultural, tangible and intangible assets, trading with other assets not specified above.

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Within the mobile tax post, the taxpayer's activity is checked periodically at different times of the working day at different registered subdivisions. During the operation of the tax post, the taxpayer informs the monitoring tax official by e-mail, if necessary, and by other available means, who confirms receipt of the message describing the object of the transaction, about the intention to make deliveries and/or purchases of goods/material services, production, including agricultural, tangible and intangible fixed assets, trading with other assets not specified above. The tax official, after being informed of the intention to carry out a transaction, is to verify the object of the transaction, and the blank required for documentation is issued only for real transactions.

Within the mobile tax posts, the commercial spaces, destined for the storage of the taxpayer's goods, are sealed.

Electronic tax post

According to Article 146 para. (2) of the Tax Code, electronic tax post is a technical and informational solution for the electronic transmission and storage of information that can be used directly or indirectly to determine tax liability. According to Art. 146 para. (3) of the Tax Code, the electronic tax post is the technical and informational solution for transmitting information in electronic form, using communication networks, from the taxpayer to the STS information system. The means available for this purpose are used to operate the electronic tax post as a technical and IT solution.

The tax official responsible for monitoring the electronic tax post checks the information submitted by the taxpayer with the information in the STS information System. If discrepancies are established, the tax official responsible for monitoring checks the accounting records with the data submitted and the transactions performed. The results are recorded in the tax audit report.

The operation of the tax post shall take place in accordance with the working arrangements of the taxpayer and/or the subdivision at which the tax post has been established, and all its activity, both as a whole and in specific situations, shall take place without causing inconvenience to the taxpayer and without disruption to business.

All transactions with all types of assets within the tax post are to be monitored by the tax official, starting with the initiation process, and the fact of confirmation of the verification is the appropriate entries in the slip for the release of the strict record blanks and the confirmation of informing the responsible tax official about the initiation of the transaction process.

During the period of operation of the tax post, the tax official records, at the time of the transactions, all the inflows and outflows of assets. At the same time, the report shall show separately, for each day, the deliveries recorded by the cash register and control equipment for which a strict record and the advances received has not been issued.

In case of detection during the operation of the tax post of cases of violation of tax legislation, in accordance with the provisions of art. 216 para. (5) of the Tax Code, the tax official shall draw up the tax control act. For this purpose, the STS shall issue a decision on the initiation of control for carrying out tax control. Depending on the type of violation, the method of carrying out the tax control may be factual, operational, partial or thematic.

In the case of mobile tax posts, the taxpayer is obliged to inform the tax official responsible for monitoring the tax post about the intention to carry out transactions within at least one working day before their documentation, if the taxable value of the object of the transaction exceeds 100 thousand lei. The notification of transactions, the value of which does not exceed the indicated amount, is generally carried out without observing the deadline of at least one day. The method and deadlines for informing about the transaction to be carried out may be brought to the taxpayer's attention by the responsible tax official by another means than the prescribed one, in written form against signature, but confirming receipt of the information.

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The operation of the tax post will ensure the monitoring of the taxpayer's activity during the entire period of operation of the tax post, namely:

1) economic transactions of sale/purchase/production of goods, materials, production, including agricultural, tangible and intangible assets, provision/receipt of services, inclusion/exclusion of assets in/out of the taxpayer's share capital, transactions with other assets and other types not specified above;

2) the transfer of assets within the disintegrated entity from a territorial point of view or outside the entity without the transfer of ownership;

3) verification of the hours actually worked by employees and cross-checking of this information with the hours on which the salary is calculated (timesheets, employment contracts) and verification of the information on the salary actually paid, if necessary with explanations from the employees and the taxpayer's administration. The tax official will draw up and keep the working time register of all the staff of the enterprise, in stationary tax posts it will be countersigned at the end of the working day by the official and the person in charge of the taxpayer, and in mobile and electronic tax posts at least once a week;

4) request/check other information that will ensure efficient monitoring of tax posts, including those available in the Information Systems, whenever needed, such as bank turnover, cadastral information, other available assets, etc.

The tax official is obliged to check the data submitted by the taxpayer in the tax post with the data of the accounting records and tax statements submitted, whenever the need arises, but not less often than once a month.

In the case of the creation of tax posts in publicly owned places, the decision shall be notified to the executive body of the local public administration. In the case of setting up tax offices on the territory of a taxpayer, the taxpayer is obliged to provide the tax official with the access and conditions necessary for the performance of his duties, as well as the technical conditions for the installation of electronic communication equipment (in the case of setting up electronic tax posts).

The operation of tax posts in public places is carried out in accordance with the general principles of operation of tax posts.

The specificity of the operation of tax posts set up in public places is that their main purpose is to simultaneously monitor the activity of several taxpayers. Depending on the specifics of the operation of the tax post set up in public places, the preparation of the report on the operation of the tax post is not mandatory.

The tax official in charge of monitoring the tax post shall carry out an analysis of the functioning of the tax post, in which the information on the taxpayer's activity during the period of functioning of the tax post (in days) shall be reflected, compared to the same period before the establishment of the tax post and for the similar period of the previous year. At the same time, the evolution of the risks that were the basis for the establishment of the tax post shall be indicated, as well as the indication whether other risks than those that were the basis for the establishment of the tax post were established during the monitoring period. After the description of the risks in the analysis, the proposals for extending the tax post are indicated. The Directorate responsible for the establishment of the tax post may request additional data on the activity of some tax posts in order to determine more accurately the indicators that would lead to the extension or non-extension of the activity of the tax post. The management of the STS, as a result of the examination of the analyses and risk criteria in the activity of taxpayers for whom tax posts are established, decides on the appropriateness of extending, not extending or modifying the tax posts.

Within the framework of the operation of the tax post, as appropriate, the STS is entitled to extend the period of operation of the tax post for the accumulation and contraposition of all the indicators necessary to establish the existence or non-existence of the tax violation.

The tax official in charge of monitoring the activity of the tax post shall inform the taxpayer (his representative or person in charge) of the changes made by presenting the STS order of change and, if necessary, the order appointing the tax official in charge of monitoring the tax post, both against signature, within 2 working days of their issue.

At the end of the period of operation of the tax post, no later than 15 calendar days from the date of completion of the operation of the tax post, the tax official in charge shall draw up a Statement of the results achieved at the tax office.

The Statement of the results achieved at the tax post shall be approved by the management of the directorate within the STS responsible for monitoring the tax post, whose tax official drew it up. The data that are included in the Statement of Findings are checked against the data in the taxpayer's accounting records and the data recorded by the tax official during the monitoring of the tax post.

If, during the operation of the tax post, the tax official, pursuant to the provisions of Article 145 of the Tax Code, has collected documents from the taxpayer, including the strict record blanks, they shall be returned to the owner from whom they were collected within a maximum of 3 working days from the date of completion of the operation of the tax post. At the same time, if access to any electronic tax services has been restricted, it shall be removed within a maximum of 3 working days. The rooms shall be unsealed no later than the day after the end of the tax office's activity.

The monitoring examines several aspects of the taxpayer's activity, including deliveries/procurement, the share of taxes paid to the BPN, the evolution of the average salary per employee and the number of employees, and so on. If necessary, in the post-monitoring period, these actions are also carried out by initiating tax visits or even tax audits at the taxpayer's premises. At the end of the actions, the tax officials carry out a tax visit to the taxpayer, in order to document the indicators recorded in the post-monitoring period, with the preparation of the Tax Visit Report. As a result, the tax official responsible for the functioning of the tax post shall draw up an Analysis of the functioning of the tax post in relation to the post-monitoring period, in which the data before the establishment of the tax post, the data recorded during the tax post and their dynamics in the period after the end of the tax post are compared, resulting in proposals for further monitoring of the taxpayer's activity, including by re-establishing a tax post.

Post-monitoring analysis, includes the comparison of the data recorded by the taxpayer in the three full months prior to the time of establishment of the tax post, which relates to the last three full months of operation of the tax post and the last three full months after the end of the tax post. If the tax post has lasted for a period shorter than three full months, the post-monitoring analysis shall be performed proportionally for all periods for the last full months only. If the duration of the tax period did not cover a full tax period (one full month), the STS may initiate the post-monitoring procedure. Depending on the analysis presented, the STS management may decide on the repeated establishment of a tax post on the taxpayer.

Appreciation of the estimated income as a result of the operation of the fiscal posts

In accordance with the provisions of Article 2251 of the Tax Code, for the estimation of tax liabilities, the following cumulative conditions must be met:

1) tax posts have been established at least twice during the tax period;

2) the periods of operation of the tax posts are at least 30 calendar days and the difference between the periods of operation is at least 60 calendar days;

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3) the average daily deliveries of goods and services up to and between the periods of operation of the fiscal posts are less than 70% of the average daily deliveries recorded during the periods of operation of the fiscal posts.

The results obtained during the operation of the tax posts are subject to examination in order to establish the basis for estimating the income from sales (provision of services).

Assessment, for each individual month, of the weight of the average daily value of deliveries recorded from the beginning of the calendar year until the establishment of the first tax post and between the periods of operation of the tax posts, in relation to the average daily value of deliveries recorded during the periods of operation of the tax posts.

The estimate of income from sales (provision of services) is calculated by multiplying the difference between the average daily value recorded by the taxpayer during the period of operation of the tax posts and the average daily value recorded by the taxpayer in the months selected for the estimate of income from sales (provision of services) by the number of calendar days in these months.

After the completion of the second tax post, the results obtained within the tax posts and the data recorded by the taxpayer in the period from the beginning of the calendar year to the first tax item and those recorded in the period between the tax items are subject to a detailed examination in order to assess the basis for estimating sales revenue (provision of services).

CONCLUSION

If the results of the examination of this information reveal contradictory data, the STS initiates a tax audit using the thematic verification method in order to estimate tax liabilities through indirect methods and sources.

Following the examination of the mechanism of establishment and operation of tax posts, despite the fact that the legislator provides that this procedure does not fall within the procedure of tax control, I consider, however, that the tax post does not fall within the taxpayer's compliance action, but is a broader part of direct control actions with the application of multiple prohibitions of proper operation. However, in order to ensure efficient tax administration and detect bad-faith taxpayers, the tax post can be a new method of checking taxpayers.

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ELECTRONIC INFORMATION RESOURCES

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PERSONALIZED MEDICINE ARE THE MYTH FOR THE REPUBLIC OF MOLDOVA?

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Abstract: *Personalized medicine has emerged as a concept to help address these challenges with strategies for prevention, diagnosis, and treatment tailor-made for individuals or groups of individuals. The aim is to make sure that patients receive the specific interventions that work best for them and that time and money is not wasted on trial and error.*

Key words: P*ersonalised Medicine, Covid-19 pandemic, challenges*

JEL CLASSIFICATION: I 1

1. INTRODUCTION

Personalized medicine is a promising new concept for dealing with challenges of health and health systems.

Furthermore, many medicines do not effectively treat some patients or are even harmful, as illustrated by the finding that over 6% of acute hospital admissions are caused by serious adverse reactions to medicines.

2. THE TERM USED IN EUROPE IS PERSONALIZED MEDICINE:

"Personalized medicine refers to a medical model using characterization of individuals' phenotypes and genotypes (e.g. molecular profiling, medical imaging, lifestyle data) for tailoring the right therapeutic strategy for the right person at the right time, and/or to determine the predisposition to disease and/or to deliver timely and targeted prevention."

Other terms that are used by the global community are "precision medicine," "stratified medicine," "individualized medicine," "genomic medicine," "pharmacogenomics," and "P4 medicine" (for personalized, predictive, preventive, and participatory). (Mimmesgern Nimmesgern., E., et al. (2017).

In ancient times, ~1550 BC, the first evidence about medicine adapted to individual's health appeared in the *Odyssey* written by Homer.

The adaptation of that ancient **"*Egyptian medicine"*** to an individual's health status was further elucidated in the Classical period from Herodotus when the practice of medicine was divided into categories and every doctor was a specialist for one disease, one body part.

Although **"*Hippocratic medicine*"** shares similarities with the Egyptian, the former does not undermine the latter. In contrast, Hippocrates used the knowledge of Egyptian medicine and advanced it by removing the magico-religious part and making it more rational (Jouanna, J. (2012)).

This approach began to change in the 1870s, when discoveries made by researchers in Europe allowed the advent of a **"*scientific medicine*,"** a precursor to the evidence-based medicine.

In the early 1950s, scientists started to realize progressively the need for "***evidence-based medicine***." The prediction of drug response to ensure the safety of the patient as well as a better outcome gave birth to the field of today's **"*personalized medicine*."**

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Initiatives in personalized medicine have been launched in many parts of the world. Perhaps best known is the precision medicine initiative launched by US President Obama in his State of the Union address in January 2015.

In Europe, efforts are under way to implement personalized medicine, as recognized in the conclusions of the Council of the European Union at its meeting on 7 December 2015.

General Secretariat of the Council to Delegations; Document number 15054/15: Personalised medicine for patients – Council conclusions (Personalised medicine for patients (7 December 2015), Brussels, SAN 428, Council of the European Union).

At the EU level, reflections on personalized medicine started in 2010 with a series of workshops on different research areas that can contribute to this new model of practicing medicine. The results of the workshops fed into the conference "Perspectives in Personalized Medicine" organized in 2011 by the European Commission.

A report on "Use of '-omics' technologies in the development of personalized medicine" was published in 2013 as a first European policy document in the field.

European Commission 25.10.2013 SWD (2013) 436 final: Commission staff working document: Use of '-omics' technologies in the development of personalized medicine.

The German Academy of Sciences Leopoldina has published a report on individualized medicine and the German Ministry for Education and Research issued an Action Plan for Individualized Medicine.

The French National Alliance for Life Sciences and Health, AVIESAN, has recently issued its Genomic Medicine 2025 plan, as commissioned by French Prime Minister Valls.

Aviesan alliance nationale pour les siences de la vie et de la santé: Genomic medicine France 2025, www.aviesan.fr, website in French. The 'genomic medicine France 2025' plan can be downloaded in English from this website.

3. WHY PERSONALISED MEDICINE?

In this regard, human genome mapping was a breakthrough providing a better understanding of people's genetic make-up. Although individuals are 99.1% identical, the remaining 0.9% of interindividual genetic variability is responsible for the observed variability within the humans.

Today, the four humors of Hippocrates, blood, phlegm, yellow bile, and black bile, which determined the treatment of each individual have been replaced with the four building blocks (A, T, G, C) enabling improved medical predictions (Hippocrates (ca. 460 B.C.Bca. 370 B.C.).

4. IMPLEMENTATION OF PERSONALISED MEDICINE IN PRACTICE

In order to put this coordination into practice, the EU funded the "PerMed" project, in which representatives from EU Member States and countries associated to the EU research framework program, together with various other stakeholders, have developed a European strategy framework for personalized medicine. This resulted in a publication in June 2015 entitled "Shaping Europe's vision for personalized medicine.

The PerMed agenda defines five challenges to advance personalized medicine (Aguirre M et al (2015)):

- Challenge 1 – Developing Awareness and Empowerment
- Challenge 2 – Integrating Big Data and ICT Solutions
- Challenge 3 – Translating Basic to Clinical Research and Beyond
- Challenge 4 – Bringing Innovation to the Market
- Challenge 5 – Shaping Sustainable Healthcare

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IC PerMED

The member organizations of IC PerMed will work to:

- Establish Europe as a global leader in personalized medicine research;
- Support the personalized medicine science base through a coordinated approach to research;
- Provide evidence to demonstrate the benefit of personalized medicine to citizens and healthcare systems;
- Pave the way for personalized medicine approaches for citizens.

5. PERSONALISED MEDICINE IN REPUBLIC OF MOLDOVA

- 2018- Member of IC PerMed
- 2019- First NGO in Personalized Medicine
- 2019 –Member of ICGEB (U.N. Structure)
- 2020-First International Personalized Medicine Conference
- 2021 – Preparing the Law for Biobanks

6. CHALLENGIES (COVID-19)

Combining the human genome, environmental factors, disease assessments, and medication in order to achieve a better therapeutic outcome is the exact vision that personalized medicine is aiming to achieve.

A mob of problems is still around the patient's needs, which is a challenge for personalized medicine nowadays (Visvikis-Siest S., Gorenjak V., Stathopoulou M. G. (2018)).

The limitations of personalized medicine have come to the foreground nowadays due to the pandemic of coronavirus disease 2019 (COVID-19) that emerged in December 2019 in China and managed to spread rapidly in multiple countries at the beginning of February 2020.

Despite all the worldwide-recognized advances and discoveries that have been achieved, modern medicine still cannot provide a treatment with current therapeutic approaches. It is widely recognized that the genetic background of each (Gao J., Tian Z., Yang X. (2020)).

So far, several regulatory authorized diagnostic tests have been used to detect the existence of the COVID-19 virus. One of the most utilized is the RT-PCR test (real-time reverse transcription-polymerase chain reaction).

The RT-PCR test lacks the necessary accuracy and sensitivity due to the substantial percentage of "false-negative" result.

Literature suggests adopting chest CT (computed tomography) as an additional diagnostic tool in parallel with the RT-PCR test. Chest CT is a non-invasive diagnostic test with great efficiency that can minimize the false-negative cases from RT-PCR assay.

7. CONCLUSION

Today, premises are created for the development of Personalised Medicine in Republic of Moldova, but it is necessary to follow the evolution of Personalised Medicine in the countries where it is implemented.

At the same time, its implementation requires that market prices be competitive with other services.

Ethical and deontological aspects are also important, especially in interventions on the human genome.

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