

Chapter

Digital Transformation: The Age of Innovations in Business and Society

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Abstract

This chapter considers main factors of digital transformation in business and society. The latest studies of digital ad spend in Europe and a number of marketing technology solutions all over the world within the period 2011–2020 have confirmed a rapid development of digital technologies in business and society. It was justified that due to digitalization process companies have to revise their priorities and modify their main strategic goals for simultaneous achievement of commercial efficiency and a social effect. These goals need some adjustment to specific requirements and wishes of main process participants that form five levels of approval. Proposed marketing management model in digital transformation of business and society contains basic components, which lie in the digital contour. Responses of millennials (the people born at the turn of the century) on the use of digital technologies in different spheres of life are analyzed. The pilot research allowed to distinguish three groups of millennials depending on how actively they use digital technologies in different spheres of life. Main directions of innovative marketing management development are defined. The opportunities of implementing functionality of artificial intelligence, neuromarketing, augmented and virtual reality, marketing technologies MarTech in company business-processes are studied.

Keywords: digital transformation, marketing management, a millennial, a business-process, a society, a digital technology, neuromarketing, MarTech, augmented and virtual reality, artificial intelligence

1. Introduction

Nowadays technologies and innovations actively have effect on all spheres of human life triggering digital transformation in business and society. For the last two decades, digital technologies have rapidly developed and scaled. Wide spread of the Internet, the availability of various types of devices, the development of digital platforms, launching of social media and applications caused the emergence of generation of millennials, that is, those who were born at the turn of the century and have been growing within this period. These young people do not almost represent their lives without digital technologies, actively use them in their everyday lives and are mastering new functionalities and adjusting to new realities of a society. Unlike the senior generation, the youth aged from 18 to 25 can freely orient in the digital space and have a little different rational, emotional and behavioral responses when interacting with

a society and environment. Millennials have become the main driving force of digital transformation in business and society due to their skills of mixing online and offline communication, rapid gaining digital skills, dexterity of working with databases and a desire to integrate technologies, products and systems in all spheres of life.

This young generation represents new requirements for goods, services or ideas and wishes more and more innovative products. By monitoring and analyzing customer needs and expectations, global technological corporations significantly contribute to the research and development of new products and digital solutions, which are gradually filling all spheres of life. Adjustment to society digital transformation factors and replacement of existing business models by more innovative ones have a significant impact on the development of digital skills of the senior generation and stimulate their use at work and everyday life for communication or doing certain actions.

Results of studying the status of digital marketing technologies in the world within the last 10 years witness that a number of only marketing technology solutions are growing in average at 995 items per year and at the end of 2020, there were 8000 items. However, for the development of successful business in digital transformation of society, it is not enough whether a company has only innovative technologies and products. A company has to focus on real human values and better understand its customers, employees, business partners, etc. In this connection, managerial staff has to modify traditional approaches to company management taking into account new trends and find innovative solutions to improve lives of people and society as a whole. An innovative approach to company administration in the new realities is implementation of a complex marketing management system containing a dual strategic goal—simultaneous achievement of maximum economic efficiency and a social effect.

Marketing management development depends on available digital technologies affecting people's lifestyle and transforms a whole society. Among innovative technologies used in the administration of company business processes by managerial staff, it is possible to distinguish the most experimental ones, such as artificial intelligence, neuromarketing, augmented or virtual reality and marketing technology MarTech. These four technologies grounding on the knowledge of different sciences combine variable methods and tools and actively develop integrating one to another and acquiring new functionality.

The problem to be solved in this chapter is to define factors of digital transformation impact on business and society to modify the existing approaches in management in accordance with the modern trends. To solve this comprehensive problem, the research was carried out in five stages: At the first stage, the main factors of digital transformation in business and society were defined; at the second stage, the basic hypotheses of marketing management in modern conditions were formulated; at the third stage, the up-to-date marketing management model in digital transformation of business and society was developed; at the fourth stage, the use of digital technologies by millennials in their everyday lives was studied; and at the fifth stage, the main directions of marketing management innovation development were defined.

2. Digital transformation: an age of innovations in business and society

2.1 Main factors of digital transformation in business and society

The COVID-19 pandemic has become a real challenge for business and society all over the world. The development trends of the period 2019–2021 have demonstrated

that for survival at the market and for successful realization of its activity, the company needs the following: flexibility of managerial staff’s thinking, adaptation to digital transformation of society and replacement of the existing business models by more innovative.

Since the beginning of pandemic technologies have developed rapidly and for many countries (especially for the countries of Europe and Northern America) have become the main way of connection between people (Human-to-Human, H2H), business partners (Business-to-Business, B2B), companies and consumers (Business-to-Consumer, B2C). Let us analyze the main factors of digital transformation in business and society, which are structured on **Figure 1**.

The up-to-date realities of society digitalization have determined the spiral development of companies as a result of effects of the following external factors: customer requirements and needs in communication and innovative products; business interests of global technological corporations; significant investments in scientific research and development and creation of innovative technologies and products.

Customer needs and requirements in communication and innovative products trigger the spiral of society digital transformation development. However, the locomotive of the up-to-date stage of development is global technological corporations in big batches producing personal computers, laptops, netbooks, tablets, smart-phones and other devices having features to connect to global networks and systems. Marketing tools of global technological corporations are aimed, on the one side, to popularize new innovative products and involve partners in rising functionality of equipment and devices, and, on the other side, to increase a number of potential and existing customers and provide maximum product sales volumes.

The main factors of digital transformation in business and society are as follows: competition at the market and mixing of online and offline formats, up-to-date digital skills of humans, the availability of huge databases containing data on different

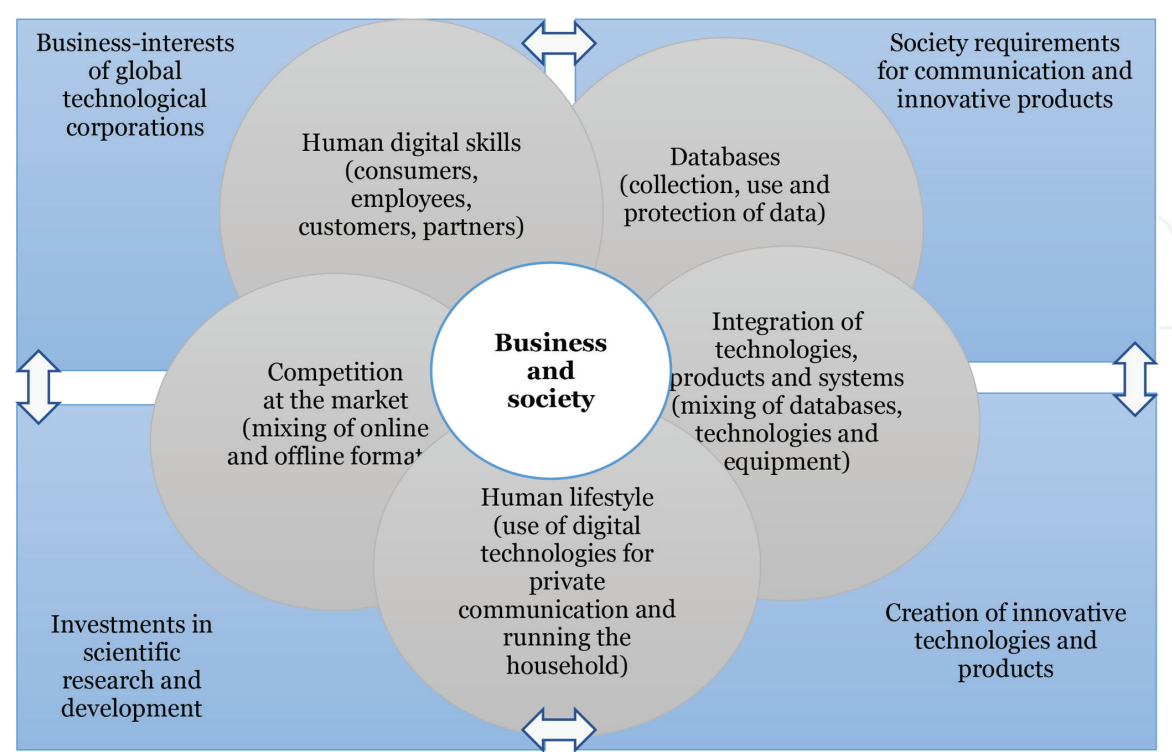


Figure 1.
Main factors of digital transformation in business and society.

aspects of society and business development, the use of digital technologies by people in various life spheres, integration processes of mixing technologies and devices, access to databases.

Competition at the market stimulates companies to active development of their online business [1]. At the same time, traditional offline business is transformed remaining the basis of digital superstructure. The companies, which have been working at the market for a long period, are afraid to lose their positions under the pressure of new ambitious players. Analyzing significant benefits from the use of digital technologies and products, these companies suppose that investment into this field is a precondition of their success and an opportunity of strengthening their own positions at the market [2–4]. It was what determined the popularity of creating new technological platforms, especially those providing automation of company's business processes, the efficient use of databases for making optimal management decisions, monitoring needs of individual consumers and a whole society.

Accumulation of vast data scopes by companies has determined the necessity of developed technologies for collecting, using and protection of information. Big Data help managerial staff to make balanced administrative decisions and develop effective innovative strategies mixing business interests, needs and wishes of a society. Besides, operational decisions of company employees often require approval at different levels that increase time for their acceptance and implementation. Integration of digital technologies, devices and systems of a company allows its employees to get the needed information quickly, increase overall performance and response to changes fast.

Digital technologies in business and society are actively developing (**Figure 2**). For example, total digital ad spend in Europe for the last 10 years (2011–2020) has been rising in average over €5 billion annually. The data have been received grounding on the analysis of 28 European countries: Austria, Belarus, Belgium, Bulgaria, Czech Republic, Croatia, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Netherlands, Norway, Poland, Russia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, UK and Ukraine [5]. At these growing rates in 2022, digital ad spend will exceed €79 billion. The results of studying development of digital marketing technologies all over the world within the analogous period witnessed that a number of marketing technological solutions have been rising in average over 995 items each year [6]. At these growing rates in 2022, a number of MarTech solutions will exceed 9900 items.

However, for structuring successful business under the conditions of digital transformation of society it is not enough if a company only has innovative technologies and products. A company has to understand its customers, employees, business partners better to know what is important for them, helping to create new products, services, tools and solutions, which will really improve the life of people and a whole society. A company has to focus on real human values and provide that its promises were matched with its competences and capabilities. Therefore, managerial staff must modify the available approaches to administration taking into account society digitalization trends.

2.2 Marketing management as an innovative approach to company administration

Marketing management is an innovative approach to company administration in conditions of changeable environment for achieving key objectives. At the same time,

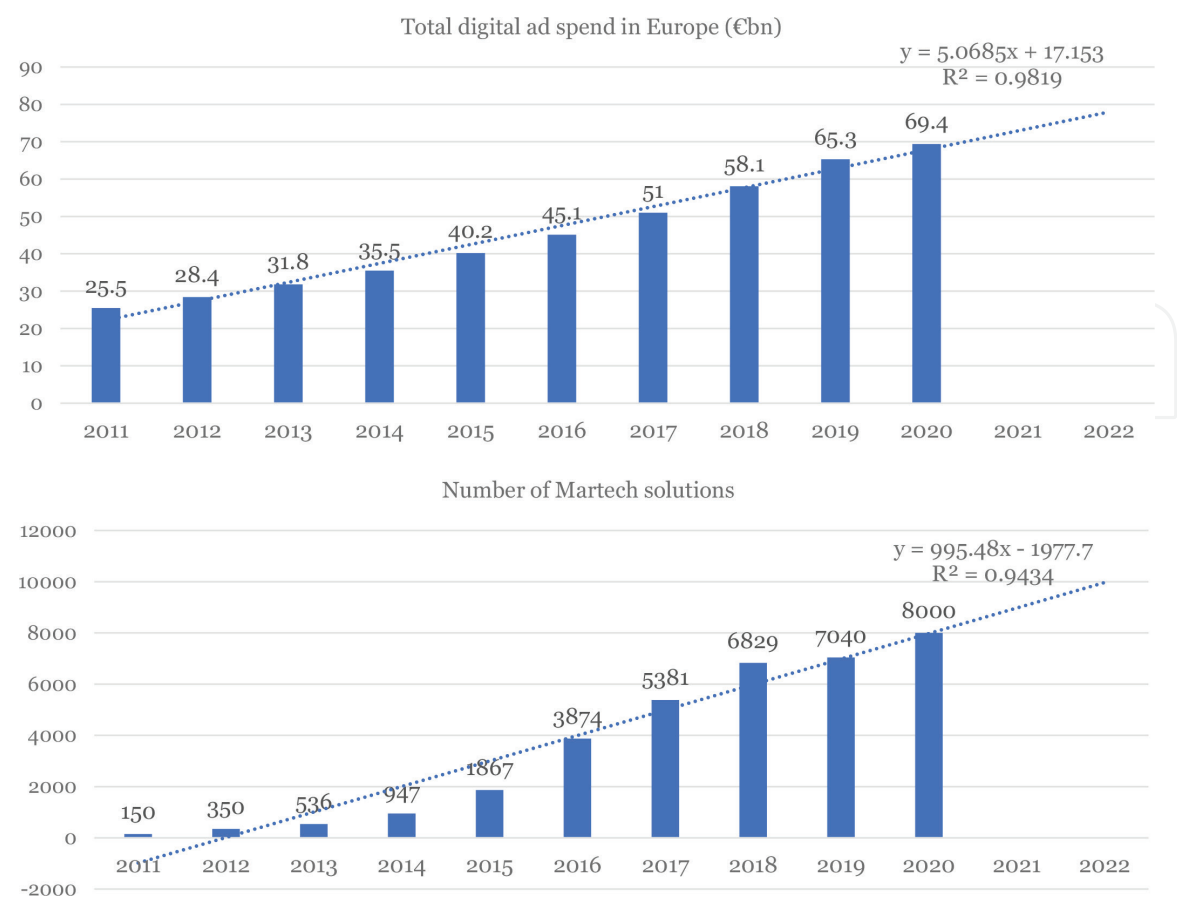


Figure 2.
Development of digital technologies in business and society [5, 6].

key objectives have to be harmonized with strategic goals and ethical codes acceptable in a society and must help to receive maximum economic and social effects.

Basic hypotheses of marketing management are as follows:

- A company functions within the environment having limited resources that stimulates its permanent struggle for survival. (According to survival theory, a company continuously adjusts and changes its fighting methods, but the essence is left unchangeable [7]).
- Marketing management contains a large number of elements bounded to each other and creating a definite integrity. (According to system theory, it characterizes patterns of creation, functioning and development [8]).
- A company functions within a society where people try to get a definite benefit from their lives. (According to Adam Smith's theory, private interests of people stimulate the level of their performance and individual development and also define the overall well-being [9]).
- Marketing management contains a complex of dynamic objectives, and to achieve strategic goals, optimal distribution of resources by each of them is required. (According to Pareto optimality theory, this is the achievement of such a condition when it is impossible to improve one business process without worsening of another one [10]).

- Marketing management best achieves established goals by arrangement of free and competitive exchange between all participants based on individual freedom principle. (According to individual choice theory, people are responsible for their own actions and are able to find the best way of interaction that can be reached if there are benefits for both parties [11]).
- Strategic decisions in marketing management are made by subjects entrusted with governing authorities after a collective discussion. (According to Arrow's impossibility theorem, it is impossible to participate in making a collective decision based on the common priorities without taking into account individual priorities [12]).

Consequently, the mathematical function of possibility to implement marketing management within a company is complex, dynamic, pluralistic and tolerant to the diversity of economic and social regulations.

Any business activity is realized to achieve a result. In marketing management, the main results are the achievement of commercial effectiveness and receiving a social effect. Implementation of the first goal allows a company to maintain balanced development, to provide an optimal level of profitability and income from its business activity, and to increase the volumes of selling goods, services or ideas at a definite level. At the same time, implementation of the second goal helps a company to achieve a certain social effect, namely to create a definite need or destroy it, to teach customers how to use products in all possible cases and in optimal volumes, to assign a definite status or fashion to products [13]. The mentioned company marketing management goals need a significant adjustment to specific requirements of main process participants that form five levels of approval (**Table 1**).

Therefore, major company marketing management goals have a certain hierarchy and structure. Economic goals more refer to company's commodity, distribution and price policies. Social goals are focused on achieving a definite effect by psychological impact of marketing events on consumer mentality and behavior, a general impression from a product. When implementing marketing management within a company, all goals approved at the mentioned five levels shall be optimally bounded to each other.

2.3 Up-to-date marketing management model in digital transformation of business and society

Digital transformation had an impact on companies' business processes. Transparent, clear and consequent communication allowed flexible interacting with a wide circle of customers and partners attracting the new and maintaining the current ones. To a certain extent, the modern marketing cannot exist without innovative technologies and products. This area is actively developing, and by now, there have been hundreds of digital tools for reducing the risks of making inefficient managerial decisions and increasing performance of employees. Technologies are becoming a much more significant component of marketing management, and there appear new digital tools to control the task fulfillment, employee motivation, arrangement and coordination of business processes. Correspondingly, managerial staff have to create such a marketing management model in digital transformation, which will become a competitive advantage of a company and enable to respond the market needs rapidly and flexibly. Nowadays, it is not enough to choose any innovative tool and test it. It is necessary to comprehensively implement a carefully chosen technology into a

Levels of approval		Major company marketing management goals	
		Commercial effectiveness	Social effect
1	Goals of company owners or managerial staff	<ul style="list-style-type: none">• Profitability• Efficiency• Increase of a market share• Financial stability• Economic activity development	<ul style="list-style-type: none">• Formation of consumer priorities• Positioning at the market• Awareness of goods, services and ideas• A product or a company status
2	Partner goals	<ul style="list-style-type: none">• Maintenance of commercial effectiveness• Achievement of joint commercial goals• Mutual support• Joint project financing	<ul style="list-style-type: none">• Creation or support of a definite need or a social effect• Maintenance of a product awareness• Conducting joint social events
3	Consumer goals	<ul style="list-style-type: none">• Product quality and design• Less expenses on buying and servicing• Optimal balance “price/quality”• Comfort of buying and using	<ul style="list-style-type: none">• Product manufacturing or safe use• Prestige or fashion• Esthetics and environment friendliness
4	Employee goals	<ul style="list-style-type: none">• Increase of the wages and salaries fund• Optimal loading• Bonuses for improved results• Carrier development	<ul style="list-style-type: none">• Work satisfaction• Social protection• Personal development• Social integration
5	Society goals	<ul style="list-style-type: none">• Increased number of jobs• Preventing receipt of super profits• Social project financing	<ul style="list-style-type: none">• Formation of definite perception• Attitude to the political climate• Social recognition

Table 1.
Major company marketing management goals by levels of approval.

company’s activity and integrate technologies, products and systems at all levels. The up-to-date marketing management model in digital transformation of business and society is schematically presented on **Figure 3**.

The first block “Mission, vision, strategy of a company” is a key component of justifying the marketing management model. The strategy has to cover all business processes of a company, to set up internal and external communication channels and help to receive maximum economic and social effects. Strategic level of marketing management characterizes the process of long-term planning (for 1 year or more) and is focused on the development of strategies or scenarios for provision of company competitiveness and performance in the future. Tactic level of marketing management defines the process of short-term planning (for the period from a month to 1 year). At this stage, a strategy is detailed in compliance with modern realities, the current marketing conditions and business processes are analyzed, the planned indicators are established to provide the certain level of income and the order of actions is regulated to achieve company’s strategic goals. Operational level of marketing management is realized by making a plenty of administrative decisions in all business areas in the real time.

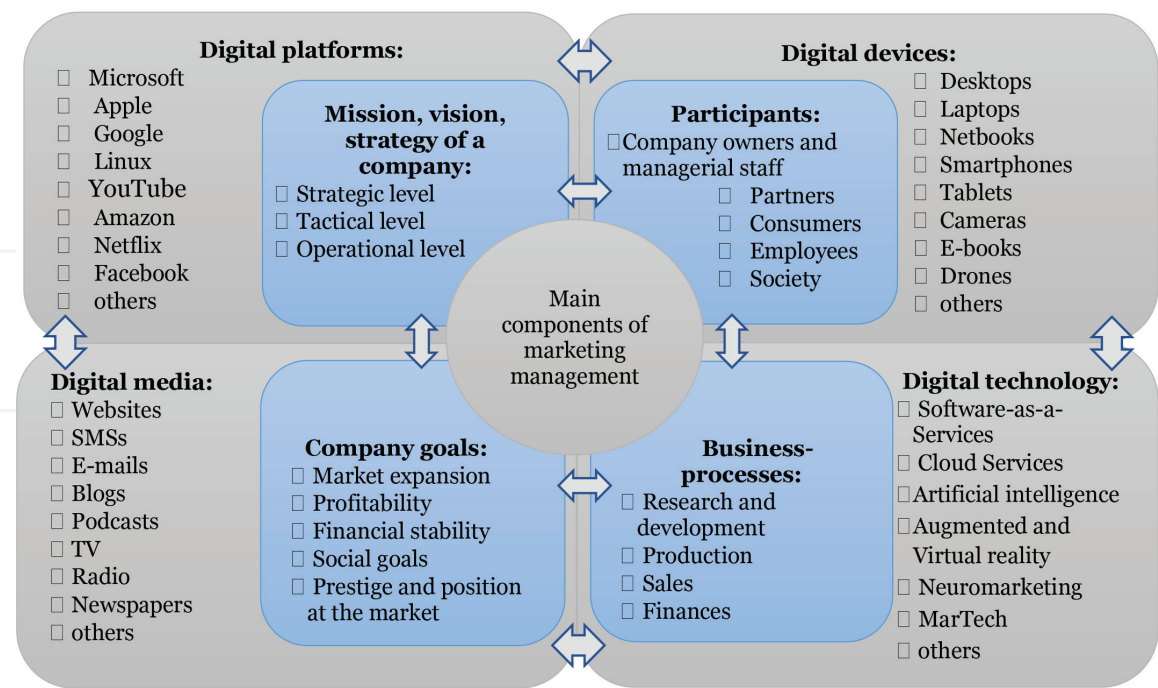


Figure 3.
The marketing management model in digital transformation of business and society.

The second block “Participants” covers the subjects of marketing management. For successful realization of a company’s strategy, it is necessary to have a team of professionals who help to implement new digital tools into activities of all employees. Having received required skills, managerial staff and employees develop an innovative management system and stimulate digital communication with partners, customers and a society. This block is closely connected with the major marketing management goals at a company by levels of approval (Table 1). The first level is characterized by a dilemma of company owners and managerial staff regarding the effectiveness. At the next levels, marketing management goals are harmonized with partner agreements, customer requirements and wishes, company employee goals, society requirements and expectations [14–16]. Therefore, major marketing management goals have a definite hierarchy and structure.

The third block “Company goals” contains the following major marketing management goals: market expansion, profitability, financial stability, social goals, prestige and position at the market. They can be conditionally divided into two components—economic and social goals. Economic goals more refer to commodity, distributive and price policies of a company. The key market expansion indicators are a market share, a turnover, a role and significance of goods or services, new market volumes. To evaluate the profitability level, managerial staff analyzes profitability, reverse profitability, return on equity and return on total capital. To the key, financial stability indicators belong the following ones: creditworthiness, liquidity, self-financing structure, capital structure. Social goals are focused on gaining a certain effect through a psychological impact of marketing events on customer mentality and behavior, a general impression from a product. When defining a social effect, managers analyze employees’ satisfaction with their work, wages, carrier development, social protection and social integration. At the same time, key indicators used to evaluate the prestige and position at the market are independence, image, political climate and social recognition. When marketing management is implemented within a company, all goals shall be optimally harmonized with each other.

The fourth block “Business-processes” contains the following main components: research and development, production, sales and finances. On the one hand, these are processes of planning, implementation, realization, correction and cancelation of fulfillment of managerial staff’s decisions by company employees. On the other hand, these are the processes of interaction between technologies and systems, which provide digital optimization, operation of different devices, equipment operation speed, usability of interfaces, etc.

The mentioned four blocks of marketing management lie in the digital contour: digital devices \Leftrightarrow digital platforms \Leftrightarrow digital media \Leftrightarrow digital technologies. Nowadays, it is really difficult to separate decisions in business made by a human from technological solutions. Most decisions made by managerial staff are grounded on the analysis of databases and preventive digital models with the use of certain platforms and devices. Realization of business processes by company employees is impossible without digital media and technologies. The company’s capability to propose a more personalized approach to each participant is a unique key to the use of innovative technologies and products. Accumulation of databases helps a company to better understand requirements and wishes of employees, partners, customers and a society in different regions. Quality analysis of available data performed by managerial staff allows to form a clearer mission, vision, strategy and goals. Effective realization of goals and tasks by employees creates more personalized suggestions of new technologies and products.

2.4 The use of digital technologies by millennials in their everyday lives

Unlike the senior consumers, millennials—the youth aged from 18 to 25 years old, who were born at the turn of the century (from 1997 up to 2003)—have different rational, emotional and behavioral responses to buying goods or services. Spread of the Internet, availability of devices, development of digital platforms, launching social media and applications were favorable for emergence of the audience with specific expectations for products according to their lifestyle. As a result of society digitalization, millennials are interested in the basic function of goods and services; however, they have specific emotional expectations for similar products.

To analyze emotional, rational and behavioral responses of the youth when buying goods or services, a pilot research was carried out among 350 respondents who gave answers to 100 questions divided into five blocks: (1) the use of digital technologies in everyday life; (2) areas of using augmented and virtual reality technologies; (3) buying goods and services online; (4) advantages and disadvantages of using devices, software and platforms and (5) responses to the use of digital technologies in everyday life. Summarized data on millennial responses to the use of digital technologies in different spheres of life are represented on **Figure 4**.

The answers of each respondent were summarized by each question and ranked in descending order. It enabled to distinguish three groups of millennials depending on a level of using digital technologies in different spheres of life: the first group (25%, 88 people)—the youth actively using digital technologies in all spheres of life; the second group (50%, 174 people)—the respondents using digital technologies for work, communication and buying certain goods and services; and the third group (25%, 88 people)—the millennials using digital technologies in certain spheres of their lives only if applicable.

The research results have demonstrated that young people (93%) understand the idea of augmented and virtual reality technologies. For the respondents who did not

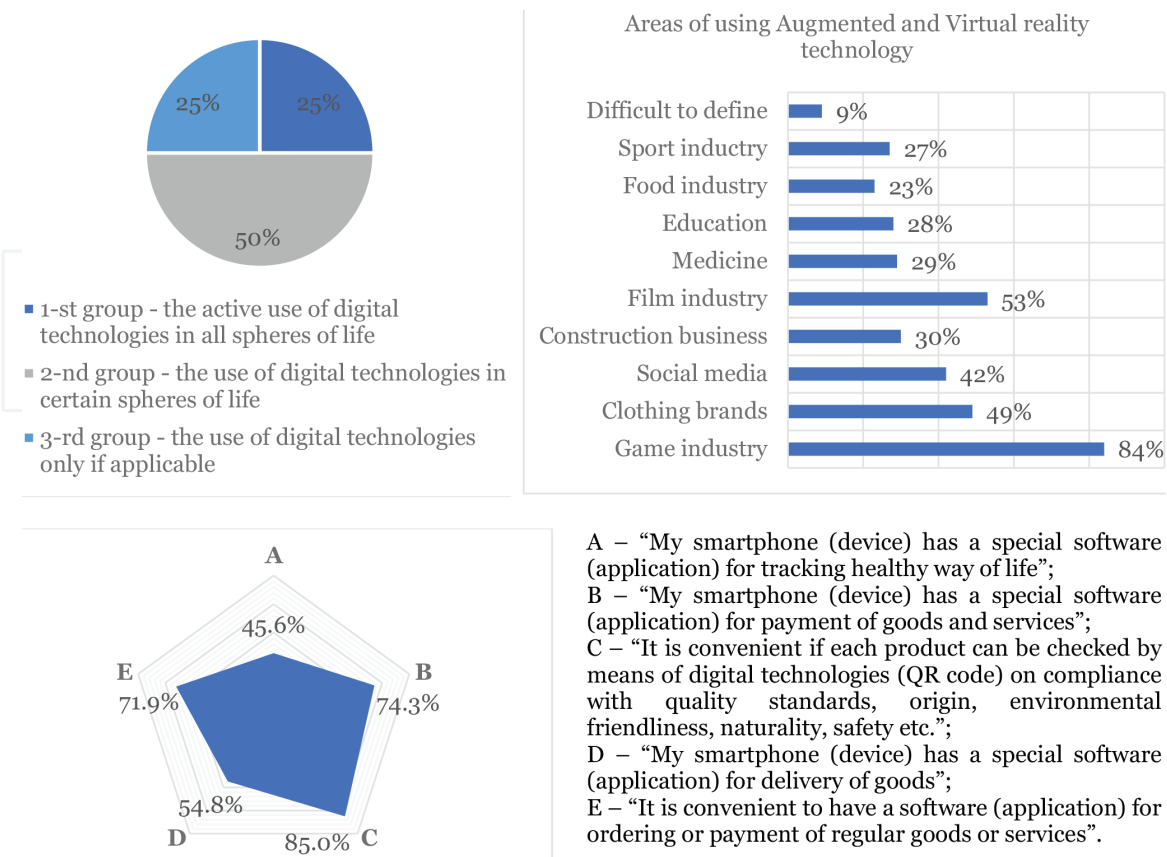


Figure 4. Millennial responses to the use of digital technologies in different spheres of life (pilot research data).

know these technologies, the researches clarified the idea and demonstrated the variants of their application on definite examples. As for possible sphere of application of AR/VR technologies, it was established that most of respondents associate augmented and virtual reality with the game industry (84%), film industry (53%), clothing brands (49%) and social media (42%). Simultaneously, millennials less perceive the above-mentioned technologies in the food industry (23%), sport industry (27.5%), education (28%), medicine (29%) and construction business (30%). Only 9% of respondents could not define the place of AR/VR technologies in their everyday lives.

During the research, the respondents also evaluated statements characterizing their perception according to the scale: 0 points—strongly disagree with the statement; 2.5 points—rather disagree; 5 points—difficult to define (neutral position); 7.5 points—rather agree with the statement; 10 points—strongly agree. It helped to find out that most millennials (85%) wish to have an opportunity to check goods and services using digital technologies (QR code) on compliance with quality standards, origin, environmental friendliness, naturality, safety, etc. Most respondents (over 70%) have a special software for the payment of goods and services in their smartphones and wish to install an application for ordering and payment of regular goods and services. A half of young people (54%) use a special software for delivery of goods and only 45% of respondents use special applications for tracking healthy way of life.

According to the results of the survey, it was found out that all respondents visited online marketplaces, and 95% of them bought goods or services online. One-third of millennials (34%) buy goods on marketplaces monthly. An additional research allowed to reveal that 95% of young people agree to buy a product if it has a confirmation of authenticity from a brand manufacturer. Therefore, a negative stereotype

about sales of fake products on marketplaces can be corrected by placement of detailed product characteristics and establishment of trustful open relationships with customers and partners.

2.5 Directions of marketing management innovation development

Marketing management innovation depends on the development of digital technologies, as they form a new lifestyle and change a view of a society creating competitive benefits for companies. Globalization and technologies have become two main factors, which define relations inside a society nowadays [17]. Correspondingly, the up-to-date marketing management strategy is grounded on multivariate choice of solutions regarding the use of definite innovative developments. That is, for realization of successful activity in digital transformation of business and society, a company permanently has to monitor the market and new tools, analyze customer needs and wishes, and maintain efficient communication with its partners.

Among the main marketing management innovation technologies can be distinguished: (1) artificial intelligence; (2) augmented and virtual reality; (3) neuromarketing and (4) MarTech. Further, we will consider them in detail.

The first innovative technology is the formation of artificial intelligence that is favorable for a company's uninterrupted interaction with customers, partners, employees and a society as a whole and helps to foresee peoples' intentions in different spheres of their lives and in different conditions. Artificial intelligence analyzes data and profiles, forms algorithms for better interaction and communication, systematizes required data providing maximum effectiveness and speed of making managerial solutions. In their activities, companies can use different variants, such as:

- voice processing technologies (e.g., virtual assistants for employees, partners and customers, which accompany the fulfillment of established tasks, handle orders, invite to joint events, recommend certain goods or services, evaluate effectiveness and loyalty);
- text processing technologies (e.g., virtual assistants, which reveal conflict situations and form algorithms of their solutions, develop marketing campaigns or different modifications of products basing on analysis of texts in social media, develop, analyze and reply to requests of customers, employees or partners);
- image recognition and processing technologies (e.g., recognition of faces to run certain business processes, definition of a health status grounding on mixing analysis of personal data with environment status data, analysis of images for a search and proposals of analogous goods, services or ideas);
- solutions making technologies (e.g., comparison of different alternatives for choosing a more efficient managerial decision, drawing up of an individual plan for personal development, career development, achievement of certain goals, motivation or rest).

The second innovative technology is augmented and virtual reality. Virtual reality is based on computer modeling of a three-dimensional image or environment where a human can interact with it if put on a special equipment (glasses, lenses or helmet with

a screen, a costume equipped with sensors). Augmented reality is a technology applying a computer reflection of imaginary additional product, idea or environment on a real image of a user, object or locality. Companies apply augmented and virtual reality technologies to design a customized product packaging (story living), and demonstrate test products under the real conditions of use (try before buy, location-based integration) [18–20]. To evaluate the effectiveness of implementing AR/VR technologies in marketing management, the following indicators are used: time of use, a number of actions, interaction with a content, a heat map, behavioral style, data of surveillance cameras, motility, quality of actions, voice timbre and modulation, tracking of eyes and body movements, understanding of further actions (preventions).

The third innovative technology is neuromarketing, which grounding on neurophysiological human behavior correlates and allows measuring human physiological and neuron signals to receive more clear representations about their motivation, wishes, decisions, etc. [21]. A neuromarketing technology combines a set of ways and methods of neuroscience and psychophysiology, namely, study of a brain, psychophysical reactions and behavioral features of a human. The mentioned researches are used in marketing management to analyze behavior of employees, partners, customers in different situations and conditions. The main neuromarketing tools can be conditionally divided into three groups [22–26]: (1) study of metabolic activities in brain (positron emission tomography and functional magnetic resonance imaging); (2) study of electrical activities in brain (transcranial magnetic stimulation, electroencephalography, magnetoencephalography, steady-state topography) and (3) study of physiological reactions (fixing of galvanic skin response, cardiovascular system, eye movement, contractions of facial muscles). Characteristics, advantages and disadvantages are given in **Table 2**.

The fourth innovative technology is MarTech combining marketing and technologies for gathering data on internal and external environment of a company. The choice of MarTech tools is an important component of development and realization of a company's successful strategy that permits to provide the optimal use of resources and harmonization of business processes. However, a tool must not substitute a strategy and implementation of digital technologies must not be just to pursuit technologies. The main MarTech tools can be conditionally divided into four groups [6]:

1. the management of data and digital assets of a company—the technologies, which store, control and maximally use digital data of a company to trace effectiveness of all business processes of marketing management and key performance indicators (KPI);
2. the management of relationships with customers—the technologies, which allow to control required structured data to maintain relationships with customers and partners;
3. the management of company's resources in separate spheres (marketing, financial, industrial, logistic, etc.)—the technologies, which are used for digital planning, administration, coordination and control of certain resources and combine data, procedures, tools and employees;
4. the management of social media and content—the technologies, which accumulate and analyze data of social media platforms to improve communication processes and increase recognizability of a company, a brand, a product, a service or an idea in a society.

Neuromarketing tools	Characteristics	Advantages and disadvantages
(1) Study of metabolic activities in brain		
Positron emission tomography	A method of medical radioisotope diagnostics grounding on application of radiopharmaceuticals being isotope-labeled and positron radiating. Using special equipment, decay of radionuclides is traced and metabolic activities in human brain are studied.	Advantages: a wide research spectrum; significant detailing of results, high-resolution anatomical images Disadvantages: high cost, a need in highly qualified specialists, psychological stress for an object of research, insignificant radiation effect
Functional magnetic resonance imaging	A method of medical diagnostics grounding on measuring hemodynamic responses caused by neuron activities in human brain. Using special equipment, correlation of cerebral blood flow and neuronal activity is traced	
(2) Study of electrical activities in brain		
Electroencephalography	A method of medical diagnostics grounding on graphical registration of biopotentials of human brain that permits to analyze physical maturity and state, general cerebral activity and its character. Using special equipment summarized, bioelectrical activity in human brain is fixed and analyzed	Advantages: a wide research spectrum; significant detailing of results, equipment mobility Disadvantages: limited resolution images, a need in highly qualified specialists, psychological stress for an object of research
Magnetoencephalography	A method of medical diagnostics grounding on measurement and visualization of magnet fields emerging as a result of electrical activity in human brain. Using special equipment helps to localize neuronal activity sources in time and space	
(3) Study of physiological reactions		
Fixing galvanic skin response	A method of diagnostics grounding on a human peculiarity to sweat while anxiety or experiencing other strong emotions. Using special equipment, the data on electrical conductivity of skin are fixed and interpreted into a conclusion about an emotional state of a human	Advantages: equipment mobility, low cost, significant detailing of results, a possibility of mixing with other tools Disadvantages: limited resolution research, a need in highly qualified specialists, psychological stress for an object of research
Fixing cardiovascular system response	A method of diagnostics grounding on monitoring of changes in heart rate, blood pressure and vascular tone. Using special equipment, the data on cardiovascular system are fixed and interpreted into a conclusion about a change of attention and emotional state of a human.	
Fixing eye movement response	A method of diagnostics grounding on video fixation of gaze direction, size of a pupil, duration of gaze delay. Using special equipment, the data on eye movement are fixed and interpreted into a conclusion about concentration of attention on the object, the order of data revision.	
Fixing contractions of facial muscles	A method of diagnostics grounding on monitoring of contractions of facial muscles. Using special equipment, the data on individual movements of facial mimic are fixed and interpreted into a conclusion about certain emotions or feelings of a human.	

Table 2.
Main neuromarketing tools [21–26].

Lately, the tools for the management of social media and content have been developing most actively. At the market, there are a large number of social platforms having a great many users, especially among millennials. Some of media platforms are universal and are spread all over the world, such as Facebook, Instagram, Twitter, TikTok, Pinterest, LinkedIn. But most of them have a certain specific and are popular among different target audiences or in definite regions and countries.

Among the most spread MarTech tools for the management of social media and content can be distinguished as follows:

- Google Analytics, which enables to verify the effectiveness of a marketing strategy at different levels of interaction with customers, partners and different audiences to accumulate and analyze databases;
- Sprinklr and Kontentino, which make it easier to work with social media and help a company to minimize staff loading in this sphere;
- Buffer, which permits to manage posts in different social networks to keep several online profiles from one information panel, to plan posts in advance and trace statistical databases;
- ManageFlitter, which administrates the management of Twitter subscribers and finds influencers, allows to cover more followers and plan posts, defines frequency of posts and analyzes statistical databases;
- Buzzsumo, which helps to monitor new tendencies, demonstrates most popular materials and trends, searches for influencers, recommends up-to-date social media platforms and materials for a target audience, defines an average number of posts by certain topics and forms detailed analysis;
- Canva, which permits to create a visual content for social networks and graphical design based on professionally developed templates and availability of various convenient tools;
- Bitly, which generates URL addresses with a limited number of signs and measures links and URL clicking indicators;
- Brandmaker, which helps to develop marketing campaigns of a company, calculate budgets, measure results;
- Contentpepper, which uses automated processes to generate company content by means of Content Management System (CMS), and send materials to a target audience to different websites and communication platforms.

When planning implementation of any digital technology, managerial staff's first steps are queries in search engines, comparison of sets of functions and prices, discussing advantages and disadvantages of a certain technology with professionals, testing a free demo version for checking the compliance with goals and specific of a company [27].

Different packages of software and platforms can be compared by their features, but a real value of software for marketing management lies in a strategy and approach

to the achievement of key goals of a company or desirable end results. Before implementing a definite digital technology in company's activity, it must be harmonized with a mission, vision and strategy. Tools, equipment and systems cannot be in conflict with each other or double certain spheres and business functions. Managerial staff has to carefully study all details, evaluate advantages and disadvantages of implementing a new technology, define opportunities and threats and only after that they must make an optimal managerial decision, which will concern company's business processes, employees, partners, customers and even a society.

3. Conclusions

Considering a rapid progress of digital technologies, needs and wishes of a society are permanently changing. It determines the importance of implementing innovative marketing management tools in company's business processes to solve a wide spectrum of tasks connected with a necessity of maintaining successful activity at the market. For complex evaluation of a company development status, now it is not enough for managerial staff to have the key economic quantitative indicators enabling to calculate expenses, revenues, incomes by separate operations, products, business units or processes. They have to be completed by qualitative indicators, which will help to define consumer priorities, staff loyalty, partner reliability, product positioning, uniqueness of goods or services, social recognition, etc. Consequently, the main goals of innovative marketing management conquering positions at the markets, which have not been developed yet, and increase of presence at already existing ones based on intellectual property, investments in research and development, innovative management methods, digital technologies in the care of employees, consumers, partners and a society as a whole.

Nowadays, the main marketing management innovations are connected with implementation of artificial intelligence, neuromarketing, augmented and virtual reality, marketing technologies MarTech in business processes of functionality. These technologies can be combined and applied in different spectrums of company's activity or various spheres of human life. Particularly, it can refer to millennials. The use of digital tools allows to analyze huge databases, detail results, develop preventive actions, predict future trends, test products, equipment or software, foresee consequences of decisions, find optimal variants of problem solutions, etc. Besides, innovative technologies help to study real requirements and wishes of people, reveal deep-seated needs and motives, balance different life spheres, test new ones, change habits, gain knowledge and skills, etc.

Therefore, marketing management and technologies are a certain symbiosis of people's decisions and digital data. That is why correct choice of digital tools in marketing management is impossible without clear understanding of a vision, mission, strategy and corporate values by managerial staff and employees. All these determine a choice of technologies and successful implementation due to consequent passing through five main stages. At the first stage, managerial staff accumulates the available actual information on different technological tools and solutions, analyzes their compliance with a mission, vision and strategies of a company, studies parameters of integration with other systems. At the second stage, an optimal technology is chosen that best meets business goals and tools start being implemented at strategic level. Implementation of new technologies at this level allows a company to evaluate an innovation focus, if it is necessary to correct, and define skills and competences

required for staff's work. At the third stage, gradual implementation of innovative technologies in business processes of a company and active cooperation with IT specialists at each operation takes place. The main goal of technological marketing management at this stage is reduction of staff's time spends on training or advanced training due to creation of intuitively understood interfaces for users and digital materials to help in solving standard task algorithms. At the fourth stage equipment, devices, platforms and tools are integrated into one system. A new system has to cover all actual business processes and contains required functionality for perspective directions. At the fifth stage, managerial staff monitors and evaluates effectiveness of business processes, analyzes advantages and disadvantages, develops improvements and recommends new solutions to increase marketing management effectiveness. Thus, implementation of digital technologies in business processes of a company significantly depends on a team's motivation and belief in success of innovations.

Establishment of factors of digital transformation impact on business and society to form innovative approaches in management in accordance with the modern realities is a complex comprehensive problem. To solve this problem, we carried out a research, which can conditionally be divided into five stages: At the first stage, the main factors of digital transformation in business and society were established; at the second stage, the basic hypotheses of innovative marketing management were formulated; at the third stage, up-to-date marketing management concept in digital transformation of business and society was developed; at the fourth stage, the use of digital technologies by millennials in their everyday lives was analyzed; at the last fifth stage, the main four directions of marketing management innovation development were defined. The conducted research enabled to reveal that fast and active implementation of innovative tools by certain companies can lead to the occurrence of covert and open conflicts between millennials and the older generation that will have a negative impact on corporate culture and psychological climate in company staff. Therefore, innovation technologies and management model in digital transformation of business and society have to be implemented gradually in compliance with strategic priorities defined by a company.


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References

- [1] Zubko T, Hanechko I, Trubei O, Afanasyev K. Determining the impact of digitalization on the economic security of trade [Internet]. 2021. Available from: <http://journals.uran.ua/eejet/article/view/248230/247009>. [Accessed: 19 January 2022]
- [2] Fisher L. US Programmatic Ad Spending Forecast 2018 [Internet]. 2019. Available from: <https://www.emarketer.com/content/us-programmatic-ad-spending-forecast-2018>. [Accessed: 19 January 2022]
- [3] Rinaldi J. Where is Video Marketing Going in 2019 and Beyond? [Internet]. 2019. Available from: <https://www.impactplus.com/blog/video-marketing-in-2019-infographic>. [Accessed: 19 January 2022]
- [4] Wyzowl. Video Marketing Statistics 2021 [Internet]. 2021. Available from: <https://www.wyzowl.com/video-marketing-statistics/>. [Accessed: 19 January 2022]
- [5] IAB Europe's AdEx Benchmark Report is the Definitive Guide to the State of the European Digital Advertising Market [Internet]. 2021. Available from: <https://iab europe.eu/all-news/iab-europe-releases-full-2020-adex-benchmark-report-to-reveal-digital-advertising-market-size/>. [Accessed: 10 January 2022]
- [6] Martech Market Size and Growth [Internet]. 2021. Available from: <https://www.martechalliance.com/stories/what-is-martech>. [Accessed: 10 January 2022]
- [7] Daft R. Organization Theory & Design. 12th ed. Cambridge, MA: Cengage Learning; 2016. p. 736
- [8] Bertalanffy L. Obshchaia teoriya sistem [General systems theory: Foundations, development, applications], Translated from English, System research. Yearbook, "Science," Moscow, Russia. 1969. p. 153
- [9] Lambin J.-J. Menedzhment, oriyentirovanny na rynek [MARKET-DRIVEN MANAGEMENT Strategic & Operational Marketing], Translated from English V.B. Kolchanov, St.-Petersburg, Russia. 2007. p. 800
- [10] Positselskaya L. Ravnovesiye i optimalnost po Pareto v shumnykh diskretnykh dueliakh s proizvolnym kolichestvom deystviy [Equilibrium and Pareto optimality in noisy discrete duels with an arbitrary number of actions] [Internet]. 2002. Available from: <http://www.mathnet.ru/links/2d712883b22bedd3dd5cab2905e5029a/fpm700.pdf>. [Accessed: 10 January 2022]
- [11] Brodskiy B. Informatsionnaya teoriya individualnogo vybora [Information theory of individual choice] [Internet]. 2007. Available from: <http://data.cemi.rssi.ru/GRAF/center/methodology/organization/download/infochoice1.pdf>. [Accessed: 10 January 2022]
- [12] Arrow Kenneth J. Kollektivnyy vybor i individualnye tsennosti [Social Choice and Individual Values], Translated from English, GU BSHE, Moscow, Russia. 2004. p. 202
- [13] Kovshova I. Orhanizatsiya marketynhovoho menedzhmentu na pidpryyemstvi [Organization of marketing management at the enterprise]. 2017. Available from: https://economyandsociety.in.ua/journals/11_ukr/41.pdf. [Accessed: 10 January 2022]

- [14] Laibson D, List J. Principles of (Behavioral) Economics [Internet]. 2015. Available from: <https://www.aeaweb.org/articles?id=10.1257/aer.p20151047>. [Accessed: 19 January 2022]
- [15] Bordalo P, Coffman K, Gennaioli N, Shleifer A. Stereotypes [Internet]. 2016. Available from: https://scholar.harvard.edu/files/shleifer/files/stereotypes.qje_october2016.pdf. [Accessed: 19 January 2022]
- [16] Kapinus L, Labins'ka N, Skrigun N. Marketing Behavior of Buyers of Goods in the Marketplace [Internet]. 2020. Available from: <https://doi.org/10.32782/2520-2200/2020-2-23>. [Accessed: 19 January 2022]
- [17] Levitt T. The Globalization of Markets, Harvard Business Review [Internet]. 1983. Available from: <https://hbr.org/1983/05/the-globalization-of-markets>. [Accessed: 10 January 2022]
- [18] Hobbs R. Gucci Partners with Snapchat for AR Try-On [Internet]. 2020. Available from: <https://www.stylus.com/gucci-partners-with-snapchat-for-ar-tryon>. [Accessed: 19 January 2022]
- [19] Bhattacharyta S. Lowe's is Using VR and AR to Get People into Stores [Internet]. 2018. Available from: <https://digiday.com/?p=296460>. [Accessed: 19 January 2022]
- [20] Sharma R. SK Telecom Launches Augmented Reality (AR) Service Based on 5G Edge Cloud. [Internet]. 2021. Available from: <https://www.thefastmode.com/services-and-innovations/17727-sk-telecom-launches-augmented-reality-ar-service-based-on-%205g-edge-cloud>
- [21] McClure S, Li J, Tomlin D. Neural correlates of behavioral preference for culturally familiar drinks. *Neuron*. 2004;**520**:379-387
- [22] Zurawicki L. Neuromarketing: Exploring the Brain of the Consumer [Internet]. 2010. Available from: https://books.google.com.ua/books?hl=uk&lr=&id=gy45SfmuxK4C&oi=fnd&pg=PR3&dq=Exploring+The+Brain+For+Measuring+Consumer+Behavior&ots=1tTsP0gJd-&sig=Jo4CVjb8qU3vw6tSyXN1SjDFS-Zo&redir_esc=y#v=onepage&q=Exploring%20The%20Brain%20For%20Measuring%20Consumer%20Behavior&f=false. [Accessed: 10 January 2022]
- [23] Ariely D, Berns G. Neuromarketing: The hope and hype of neuroimaging in business. *Nature Reviews Neuroscience*. 2010;**11**(4):284-292
- [24] Banks S, Bellerose J, Douglas D, Jones-Gotman M. Bilateral skin conductance responses to emotional faces. *Applied Psychophysiology and Biofeedback*. 2012;**37**(3):145-152
- [25] Fortunato V, Giral di J, de Oliveira J. A review of studies on neuromarketing: Practical results, techniques, contributions and limitations. *Journal of Consumer Marketing*. 2014;**6**(2):201
- [26] Zubko T, Kovshova I, Sydorenko O. Prospective Trends in Neuromarketing Tools of the Food Industry in View of Ukrainian Society Digitalization [Internet]. 2019. Available from: http://ekmair.ukma.edu.ua/bitstream/handle/123456789/17814/Zubko_Prospective_Trends_in_Neuromarketing_Tools.pdf?sequence=5. [Accessed: 19 January 2022]
- [27] Kotler P, Kartajaya H, Setiawan I. *Marketing 5.0: Technology for Humanity*. John Wiley & Sons; 2021. p. 204