

Review Paper

An Attempt to Define the Concept of Entertainment 4.0 by Analogy to other Concepts, e.g., Industry 4.0, Education 4.0, etc.

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ABSTRACT

The purpose of the research work is to develop and form the concept of "Entertainment 4.0" and determine its characteristics, as a basis for its further study. The method system analysis that allows displaying the current situation within the framework of the issue under study; the method of abstraction, taken as the basis for separating the concept under study from already existing terms and characteristics in other areas, formed as a result of the fourth industrial revolution; the method of analogy, due to the insufficiency of the theoretical base; as an additional analysis mechanism, a marketing tool for identifying environmental factors – PEST-analysis was used. The results of the current scientific work are the formulation of the definition of the new concept of "Entertainment 4.0", which creates the basis for the possibility of further in-depth study of the issue under consideration. The significance of the results obtained is presented in defining the characteristics of the term "Entertainment 4.0", as well as in finding ways for the development of the industry and options for further application of the formulated term in practice and its subsequent implementation in "Industry 4.0".

HIGHLIGHTS

- The article aims to develop and define the concept of "Entertainment 4.0" and its characteristics, laying the foundation for further research, utilizing methods such as system analysis, abstraction, analogy, and PEST analysis to formulate a definition and explore the industry's development and practical application within the context of "Industry 4.0".

Keywords: Industrial revolution, gamification, development, Internet, information technology, virtual reality

The term "Industry 4.0" was first introduced by W. Walster in 2010, who proposed it at the meeting of the German Academy of Sciences and Engineering as the name of a research project on the use of cyber-physical systems and the World Wide Web (Doležalová and Becker, 2020). The concept of "Entertainment 4.0" was first found in an interview with Playtech regional manager T. Mogila (2019). Then, expert noted the ongoing development of the mobile industry and high-speed wireless networks. The expert pointed out that the spread and evolution of digital technologies opens up new opportunities

for digital entertainment to reach a new level. At the same time, the concept of "Industry 4.0" includes changes in the areas of human life, caused by a new approach to production, based on the massive introduction of information technology in the industry. Industry 4.0 is characterized by large-scale automation of business processes and the widespread dissemination and development of artificial intelligence.

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The development of the gaming environment is driven by the popularization of multi-platform (running on multiple computer hardware platforms) and network games, whose producers receive income through microtransactions by players. So, for example, Indonesian researchers H. Nurfadilah, S. Rudiman and R. Yusuf (2022) in their scientific work considered the changes in marketing caused by the fourth industrial revolution. In their scientific works, researchers focus on determining the impact of the 4P marketing complex (consisting of such elements as price (price), product (product), methods and place of product promotion (promotion and place)), on the intention of consumers to buy a product or service. G. Dash, K. Kiefer and J. Paul (2021) should also be included among the researchers' studying changes in the field of marketing. In this paper, scientists note the direct impact of digital technologies on the brand and the formation of consumer demand.

The term "Education 4.0" was studied by the researcher T. Hook (2021). The author of the work notes the impact of digital technologies and their development on social and cultural spheres, noting that the new way of life leads to the need to adapt the mechanisms and components of the learning process. In turn, the concept of "Management 4.0" is covered in the scientific works of the researcher M. Naqbi (2021). The scientist notes that technological innovations set the pace for the development of society and act as a determining factor in creating a competitive advantage for any company. The author notes the need to update the organizational structure for more efficient functioning of enterprises, subject to the introduction of new technologies in the production process. Based on the above, the purpose of this research work is a detailed study of the development of "Industry 4.0", within the framework of the quadruple industrial revolution. And also, the formation of a clear concept of "Entertainment 4.0" for its subsequent study and implementation in the "Industry 4.0". The novelty of the research work is the formation of the characteristics and terminology of "Entertainment 4.0".

MATERIALS AND METHODS

As a theoretical basis for the study, the scientific works of Polish and foreign theoretical scientists

from such countries as the United States of America (USA), Indonesia, Japan, India, Ukraine, Poland, the Czech Republic and others involved in the study of the development of spheres of human life and processes caused by the fourth industrial revolution in the areas of marketing, management, education, science, and technology. The theoretical base provided the basis for determining the directions for studying information and analysing data within the framework of the issue under consideration, as well as for confirming the need to develop and implement the term "Entertainment 4.0". As part of a scientific study, both primary and secondary information that is in the public domain was used. However, it is worth noting the lack of literature directly related to the research topic and the lack of an opportunity to conduct an interview with the researcher who first mentioned the term "Entertainment 4.0".

As a methodological basis for the study, such tools were used as: a system analysis method that allows qualitatively analysing the current situation in the industry and provides the most accurate information base within the framework of the issue under study, as well as allowing better formulating recommendations for the further development of the industry; abstraction method, to separate the concept of "Entertainment 4.0" from the general concept of "Industry 4.0" and related concepts, as well as the analogy method, applied as an effective way to conduct research with limited resources. An additional method of scientific analysis was the marketing tool PEST-analysis (allowing to determine the influence of aspects of the external environment, including political – P (Political), economic – E (Economic), social – S (Social) and technological – T (Technological) aspects of influence on the studied industry).

This research work included three stages. At the first stage, the degree of influence of the concepts under consideration on the development and functioning of society is determined. Also, the first stage made it possible to determine the purpose and problems of this research work. The second stage of the work made it possible to determine the degree of knowledge of the term "Industry 4.0". In the process of conducting the second stage of the study, data directly related to the conduct of this scientific study were obtained and systematized.

This stage included the coverage of expert opinions on the development of society in the framework of the fourth industrial revolution. The final stage was the third stage of work. During the final stage, it was possible to draw conclusions and provide a number of recommendations on the need for a detailed study of the concept of "Industry 4.0" and the introduction of an independent term "Entertainment 4.0", which have a direct impact on the development of modern society. The data obtained, within the framework of the research work, made it possible to form conclusions and recommendations that determine the vector of development of "Industry 4.0" due to the possibility of introducing and comprehensively studying the field of "Entertainment 4.0".

RESULTS

Technological progress and technical progress are the main factors in the development of civilization. For a long time, technological progress has had a direct impact on the economy, politics and culture, both helping to build effective processes and slowing them down.

Modern history distinguishes four progressive phases, called technological (industrial) revolutions. The phases of technological development cover a period of more than 250 years, thus indicating the continuous development of science and the impact of scientific discoveries on production processes and society (Młody, 2018). The period of occurrence of the 4 stages of the industrial revolution covers several centuries (Fig. 1) and acts as a vector for the development of society.

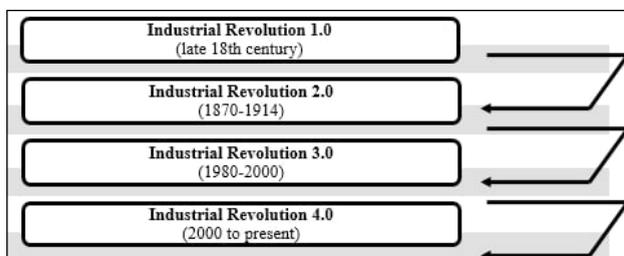


Fig. 1: Time stages of the emergence of industrial revolutions

The invention of the steam engine in the second half of the 18th century should be considered the first turning point in development. During this period, the textile and metallurgical industries underwent significant development. At the same time, coal and oil began to be used as the main sources of

energy. In the period before the first industrial revolution, people lived mainly in villages and small towns. About 80% were farmers, more than 15% were engaged in trade and were artisans, and about 1% were representatives of the nobility. It should be noted that handicrafts of that time were simple and produced on a small scale (Mohajan, 2019). The onset of the second industrial revolution was marked by the discovery of an alternative source of energy – electricity. During the years of the second industrial revolution from 1870 to 1914. A number of significant scientific discoveries were made, among them should be attributed: the internal combustion engine, the phonograph, the introduction of production and assembly lines (Wyciślak, 2017).

The period of the third industrial revolution was in the 80s of the XX century. This period is characterized by the emergence of digital technologies. It was during this period that the development of information and communication digital technologies, the opening of the worldwide Internet (1983), the large-scale introduction of computers and mobile phones. At the same time, in the field of production and social activities, the introduction of automation and robotisation of processes is gaining popularity (Prisecaru, 2016). Speaking about the existing terminology and knowledge of the topic, it should be noted that the concepts of "Economy 4.0" and "Entertainment 4.0" are either little described or do not exist in principle. Usually, the term "Economy 4.0" means economic phenomena that arose as a result of the fourth industrial revolution (Helbing, 2021).

This period was characterized by limited production and competition by reducing costs and increasing production efficiency. There was a huge demand on the market for all the products manufactured at that time. In turn, this influenced economic development and increased competition between manufacturers, which led to market segmentation. Market segmentation required the search for new mechanisms for promoting products, and by the mid-1950s, enterprises began to change their sales strategy, focusing on the needs of customers and trying to satisfy consumers as much as possible (Başyazicioğlu and Karamustafa, 2018). The term "Marketing 2.0" arose as a result of technological progress in the field of information technology.

Also, important factors in the progress of the marketing sphere of that time were the globalization of the economy and a significant increase in purchasing power. During this period, the market began to be filled with a significant number of substitute products, which increased the overall level of competition in the market. At the same time, the development of information technology has given consumers access to information, which has shifted the vector of consumption towards more conscious consumption, taking into account all the characteristics of the product and the emotional benefits from its acquisition. These changes led to a rethinking of the 4P marketing concept, it was replaced by the 4C concept – Customer, Cost, Convenience, Communication (Sefudin, 2017). Speaking about the term “Education 4.0”, it should be noted that at the initial stage, during the existence of the term “Education 1.0”, the educational process was characterized by teaching large groups of people without an individual approach to each of the students. For the era of Education 2.0, the human factor has become an important element. Thus, the educational process is based on the use of various communication channels, spreading its influence on different groups: teachers and students, parents, experts. Thanks to this approach, closer and more productive cooperation within the framework of the educational process has become possible. For that period, the 3C rule is typical – communication, assistance and cooperation (Gerstein, 2014).

Speaking about “Education 4.0”, it should be noted the close relationship of this term with “Industry 4.0”. According to the new realities, graduates of educational institutions are required to be ready to exist in a world where cyber-physical systems are common in all industries (Huk, 2021). Society is characterized as a social community united by a common culture, identity, and social ties. The first mention of society can be considered the formation of hunting communities. The processes of that time are included in the definition of “Society 1.0”. With the formation of a new way of life, the creation of larger settlements, the transition to farming, the period of functioning of the term “Society 2.0” is associated. The industrial society has formed the concept of “Society 3.0”, and the information society – the concept of “Society 4.0”. Many scientists predict that the continuous process of digitalization

and the development of the Internet will lead to the merging of cyberspace and the real world (Fukuyama, 2018). The important point is that for the concept of “Society 5.0” the pace of technology development is unimportant, moreover, “Society 5.0” tends to be separated from the technological process. An important point is the possibility of ensuring the synergy of technologies and concepts of “Society 5.0”. For “Society 5.0” the following directions will be characteristic (Nakanishi, 2019): maintaining a diversity of abilities, when each member of society can offer his own vision of the world; creating an environment where everyone can get opportunities anytime, anywhere; ensuring a safe public environment; sustainable development and promotion of a healthy lifestyle, ecological consumption and social life in harmony with nature.

The introduction of the term “Entertainment 4.0” is due to a new round of technological development. Today, radio and television are no longer the main sources of entertainment content, they have been replaced by the worldwide Internet. The development of electronic technologies has led to the emergence of such a phenomenon as “virtual reality”. Virtual reality is capable of transmitting information to a person through almost all senses, including sight, hearing, touch and more. The created virtual reality objects repeat the behaviour of similar objects in their real world. Within the framework of virtual reality, the same laws of physics apply as in the material world – the law of gravity, reflection, the properties of water, and much more. However, thanks to virtuality, new facets are opened up and, along with the “earthly” laws of physics, users have the opportunity to get new sensations that are inaccessible in real life (for example, the feeling of flying). With the development of the technological process, along with the already familiar virtual reality helmets, 3D displays, virtual reality seals and others, it became possible to directly connect technologies to the human nervous system. It is important to note that this branch has found wide application in medicine. Its use in everyday life by ordinary consumers is almost impossible due to the complexity of the technical device and the high cost of maintenance. Considering the potential for the development of the entertainment industry and the introduction of appropriate terminology, a PEST-analysis was carried out (Fig. 2).

<p>Political environmental factors</p> <ol style="list-style-type: none"> 1. Legislative changes in the entertainment industry and the development of computer technology. 2. State subsidies. 3. State policy and cooperation with other countries. 	<p>Economic environmental factors</p> <ol style="list-style-type: none"> 1. Solvency of the population and dynamics of GDP. 2. Availability of loans. 3. State policy and cooperation with other countries. 4. Investment in the industry.
<p>Sociocultural environmental factors</p> <ol style="list-style-type: none"> 1. Popularization of gaming technologies among the population and general trends in society. 2. Average age of the population. 3. Education of the population and the availability of qualified personnel. 4. Religious norms of society. 	<p>Technological environmental factors</p> <ol style="list-style-type: none"> 1. Major technological changes and innovative trends. 2. Distribution and influence of digital technologies. 3. Expenses of companies for scientific research. 4. Dynamics of demand for IT specialists.

Fig. 2: PEST-analysis of the entertainment industry

Thus, a marketing tool that allows determining the impact of aspects of the external environment on the industry under study showed the potential for the development of the entertainment sector. Thus, with sufficient state support and funding, the entertainment industry is one of the most promising industries. Moreover, with enough pace of development of the entertainment industry and sufficient intensity of technological progress in the Entertainment 4.0 era, the discoveries made will have a significant impact on all industries of Industry 4.0.

DISCUSSION

J. Rymarczyk (2020) notes the direct impact of the fourth industrial revolution on the processes of production of goods and services, as well as on potential economic, social, and political consequences. The author argues that changes in these areas are inevitable, since they are the result of the logical development of society, determined by the challenges associated with the processes of globalization. Researchers note that the production processes of the future will be expressed by a flexible system capable of self-improving the manufacturer, that the production processes of the future will be expressed by a flexible system capable of real-time self-improvement of productivity. Such a system will increase efficiency due to its autonomy. The researchers note that the emergence of such a system will reduce the material, energy, and labour costs of the enterprise and employees, and the flexibility of the system will make it easier and better to adapt to changes in the production process (Burke *et al.*

2017). Many jobs in the areas of commerce, finance, insurance, management, healthcare, law offices and call centres will be reduced due to the introduction of artificial intelligence devices into the workflow that can replace people (Schwab, 2016). At the same time, the authors note that there will be a demand for specialists in the field of information technology, programmers, machine designers, software and hardware developers, energy and resource managers, robot operators, engineers, technicians, physicists and mathematicians. However, specialists will be expected to be able to combine both technical and non-technical skills, be capable of continuous learning and retraining, and have critical thinking in order to more easily adapt to the challenges of the environment (M. Lorenz *et al.* 2020).

It is important to note that the discoveries and achievements of the fourth industrial revolution are already being actively used, especially in highly developed countries. However, not all innovations have a sufficient level of efficiency. In addition, the fourth industrial revolution brings the threat of unemployment for some professionals, while opening up new opportunities for specialists in modern professions. Many researchers believe that new employment will provide new opportunities, and vocational education in modern specialties will give new specialists the opportunity to find work easier and more easily adapt to the situation on the labour market. The fourth industrial revolution has the potential to have a positive impact on the global labour market. Also, it is important to understand that the fourth industrial revolution brings not only new technological

discoveries, but is also determined by changes in geopolitics, the legal sphere, has a direct impact on the state of the environment, and also leads to transformations in the social and cultural aspects of the behaviour of modern society. The fourth industrial revolution, "Industry 4.0", along with the terms "Marketing 4.0", "Management 4.0", "Society 4.0" and "Entertainment 4.0", is a new reality, defined not only by revolutionary innovations in industry, but also by tremendous changes in society. The present and future of mankind directly depends on how modern society manages to cope with the difficulties caused by the development of technological progress, and how society can integrate into a new reality.

CONCLUSION

According to the results obtained in the course of the research work, the insufficiency of the theoretical base of the study was determined, and also, the almost complete lack of study of the research topic was revealed in the framework of the scientific works of other authors. The absence of the concept of "Entertainment 4.0" is determined, in contrast to the generally accepted concepts of "Management 4.0", "Marketing 4.0", "Education 4.0". Following the goal of the study, thanks to the results obtained in the course of writing a scientific work, it became possible to formulate the concept of "Entertainment 4.0". So, "Entertainment 4.0" is proposed to be called a set of discoveries in the entertainment industry that can replace the traditional television and radio. These discoveries include the invention and implementation of virtual reality technology that can use a wider range of human senses and provide new facets of entertainment experiences.

Thanks to the use of a marketing tool that allows calculating the degree of influence of the external environment (PEST-analysis) on the entertainment industry, it became possible to determine the prospects for the development of the industry. It is determined that the entertainment industry has a high development potential. Thus, with sufficient state support and the necessary level of funding, the entertainment sector is able to demonstrate rapid development. Thus, within the framework of the conducted scientific research, it was possible to determine that the study of the entertainment sector is extremely relevant, and the formulation

and implementation of the term "Entertainment 4.0" can have a positive impact on the process of subsequent study of the entertainment sector and the prospects for the development of society, science and technology during the fourth industrial revolution.

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