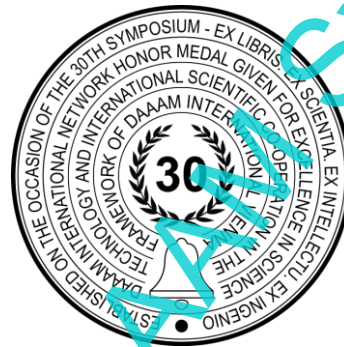# ARTIFICIAL INTELLIGENCE AS AN ESSENTIAL FACTOR OF SUPPORT TO CORPORATE COMMUNICATION IN BUSINESS DECISION PROCESS

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Abstract

In more and more situations, information technologies are successfully replacing physical work, but also some mental human activities where artificial intelligence is increasingly relevant. In this paper, the goal of the research is determined, which is the use of artificial intelligence in defining corporate strategic decisions. The reason for this is because the decisions determine the long-term direction and intensity of the corporation as a complex economic system. In this sense, the hypothesis was put forward that artificial intelligence is a great support for the process of creating strategic decisions. That is why the features, experiences and possibilities of IT technologies, especially artificial intelligence, were investigated. Based on these findings, a communication model was set up where all participants in the process of creating artificial intelligence can use its capabilities. The discussion and concluding consideration confirm the goal and hypothesis, but also the need for research into innovations in IT technologies, especially artificial intelligence, with the goal of its even more effective use.

Keywords: artificial intelligence, process, corporation, strategy

1. Introduction

The development of technique and technology had its own particularly prominent epochs, so it all started with the first industrial revolution, dating from the turn of the 18th to the 19th century. It is the time when the peasant population turns into a civil and industrial one. James Watt and his steam engine played a major role in the first industrial revolution. The second started in 1870 and lasted roughly until 1914 and was marked by the rapid development of industry, especially steel and oil. In addition, there was a strong development of electrical engineering and mechanical engineering. The third industrial revolution began in the 1980s of the last century. It was marked by personal computers, the Internet and the explosive development of information and communication technology.

The present time is precisely the era of the fourth industrial revolution, and its main determinants are the following [10]:
• Robotics,
• Autonomous vehicles
• Internet of things,

• 3D printing
• Nanotechnologies,
• Quantum computers,
• Artificial Intelligence.

In the desire to replace human physical work, the development of machines that perform a series of mechanical actions, i.e. robots, is expected to be the basis for the largest number of industries by 2025 [4]. The Internet of Things is a new technology that networks and connects devices. With that step, networked devices and sensors enter our lives, becoming part of the Internet of Things. Today, every serious car company already owns or is developing new models and has in its program the creation and development of an autonomous model, i.e. a car without a driver. Printing, printing in three dimensions is a new method of quickly creating the necessary prototypes of various objects and devices, by which objects in space are created directly from the 3D CAD program. Three-dimensional printing is particularly valuable in many fields, such as: design, informatics, electronics/electrical engineering [10]. Nanotechnology, design, preparation, characterization and application of materials, devices and systems that are functional organized in the range of sizes 1 to 100 nm and characterized by phenomena and properties that occur only at these dimensions. Nanomaterials exhibit different properties compared to macro materials, which enables them to be used in various new applications. One or more properties can be different, individual particles can have multiple functionality, and sometimes the properties can be precisely regulated by size.[15]. Quantum computing in its simplest sense refers to technology that makes newly made computers easier adoption of transformational techniques to provide better results. This particular computation uses certain principles of quantum physics to revolutionize the entire process in which computing devices are operated today. Quantum computers can solve complex problems much faster than classical computers and have potential applications in cryptography and optimization.[16]. Artificial intelligence (UI, according to the English acronym AI, from Artificial Intelligence), is a part of computer science (informatics) that deals with the development of the ability of computers to perform tasks that require some form of intelligence, i.e. being able to navigate new situations, learn new concepts, draw conclusions, understand natural language, recognize scenes, etc. [10] The goal of this work is precisely research into the possibility of applying artificial intelligence in concrete economic practice. Corporate communication was chosen as the object of research, the goal of which is to make strategic decisions. Accordingly, the essential elements of strategic decisions will be considered. It is hypothesized that artificial intelligence can more quickly and reliably determine the essential elements or components of a business strategy. In this sense, the possibilities of artificial intelligence will be explored and a model of corporate communication and creation of strategic decisions will be established with the support of artificial intelligence. As part of the discussion and conclusion, the researched material as well as the communication model will be considered, from which the help of artificial intelligence in making strategic decisions in large corporations will be determined, thus confirming the hypothesis and the credibility of the research goal.

This is an intriguing topic that in itself opens up new spaces and goals for research into the use of artificial intelligence in various areas of the economy and all other social activities.

2. Corporate communication and strategic decisions

Artificial intelligence is already in use today in various economic activities. In this case, the possibility of its application as part of the information system of a large company or corporation is discussed. By its very definition, a corporation is a capital company that obtains funds for establishment and operations by issuing shares. It is a more developed form of a capitalist enterprise, and it is one of the forms of a commercial company. Corporations have eliminated almost all the risks that other legal forms of companies have because they managed to eliminate and find almost all the weaknesses that could endanger them or put them at risk, and in the case of bankruptcy of the corporation, the owner of the shares loses only what he invested in the shares. [12]. In addition, corporations have particularly developed in the USA and Great Britain, where the term refers to various types of organizations that have legal personality. In the US, a corporation is denoted by the suffix Inc. (abbreviated from incorporated), and in Great Britain with the addition of Ltd. (abbreviation of limited: (with limited guarantee). [15]. In complex companies or corporations there is a complex system of communication that includes several organizational forms and levels. The goal of this and any other communication can be itself, another person, or other entity such as a group, organization, or society. Similar to many related sciences, there are dozens, even hundreds, of different definitions of communication, and there is still no single one that is accepted by the majority of scholars working in this scientific field .[2].

Corporate communication is also a kind of orchestration of all instruments in the field of organizational identity (communication, symbols and behaviour of organization members) in such an attractive and realistic way that it creates or reflects a positive reputation among groups with which the organization is in a relationship of mutual dependence. The result is a great competitive advantage for the organization."[11].
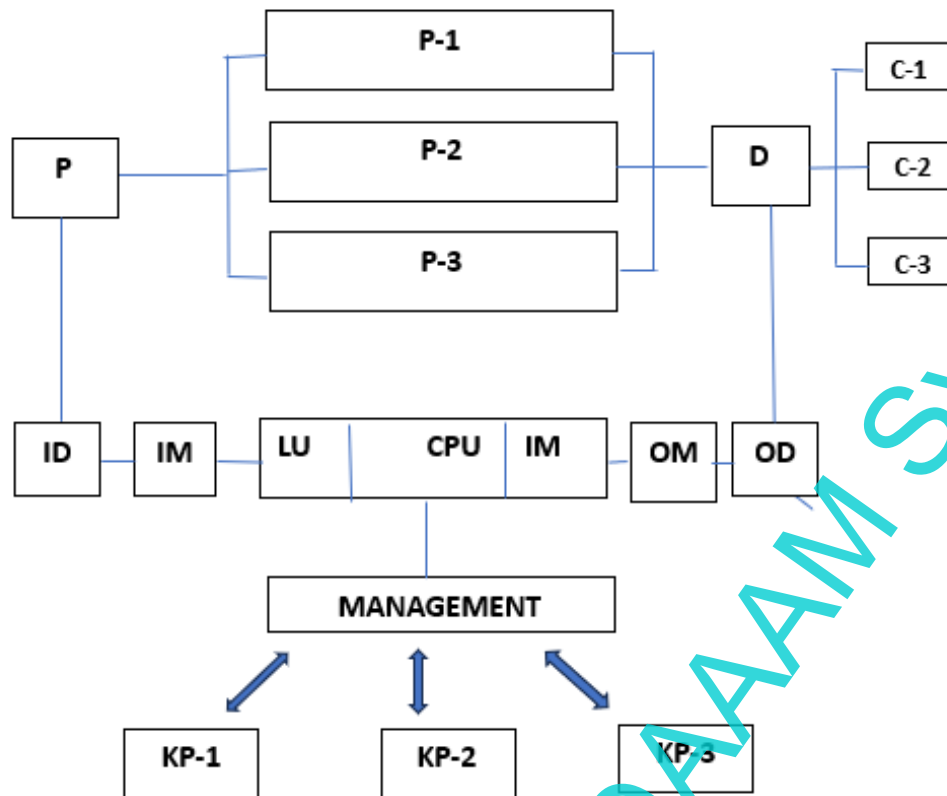
Fig. 1. The communication process of managing a corporation of three types of production

Legend: P-Sales, P1-P3-Production Phases, D-Distribution, C1-C3-Customers, ID-Input Device, IM-Input Module, LU-Logic Unit, CPU-Central Processing Unit, IM-Internal Memory, OM -output module, OD-output device, KP1-KP3-cooperative dislocated drives

In a practical sense, Figure 1 shows an example of a corporation that has three types of production at its headquarters. The picture shows the corporate management and communication process from the procurement of inputs to the distribution of products to customers. Complete control of the production process, system maintenance and cost process is enabled by one of the well-known systems that can be used to manage a complex production or service process, the programmable logic controller known as PLC (Programmable logic controller). According to the cited source, a programmable logic controller is defined as "A digital electronic device that uses programmable memory to store commands that require the execution of specific functions, such as logic functions, counting, timing, calculation, in order to control various types of devices and processes through digital and analogue input-output modules".[6]. Programmable logic controllers are industrial computers whose hardware and software elements are adapted to work in industrial conditions, and which can be easily programmed and incorporated into existing industrial but and business or organizational systems.

The presented technical approach can be connected using information technology to the management system, especially with costs, where each operation can be observed separately. In this way, cost savings can be investigated and accepted. That is why it is necessary to analyse and establish certain laws regarding the movement of yields, that is, income and costs in certain stages of production.

In this case, the subject of consideration will be focused on communication in order to make decisions with special emphasis on strategic decisions. The decisions themselves should be the result of a choice between several alternatives, and strategic decisions are oriented to the long-term business of the company and are characterized by three features [1]:

1. they are rare, usually without precedent
2. they are important, they require considerable resources and human efforts
3. they are directive, they create a basis for other decisions and actions in the company.

The fundamental responsibility of managers at the strategic level is in setting goals, defining the strategy for their achievement, continuous monitoring and analysis of the company's environment, and making strategic decisions, that is, decisions that affect the company as a whole [1]. In addition, effective managers at the strategic level of management are people who see the company as a whole, who can balance current business needs in relation to future ones and make up-to-date decisions based on that [3].

In order to emphasize the importance of strategic decision-making, the following explanations differentiate strategic from other types [9]:

1. Strategic decisions are extensive, risky and have significant long-term effects, require large amounts of resources and have long-term consequences for the company as a whole.

2. They represent a bridge between the designed and realized strategy

3. They eliminate boundaries between functions because, for example, strategic decisions on capital investment require the integration of finance and strategy.

The aforementioned facts that arise from corporate communication in order to make strategic decisions are the basis for the use of artificial intelligence in that process. Making specific strategic decisions is preceded by a thought-organizational process.

The process of making strategic decisions in a complex corporation begins with a vision (in some cases also a mission), continues with the definition of strategic goals and the determination of the plan as the final document of strategic decision-making. This is followed by the process of strategic management in order to realize the business strategy. Strategic management implies the realization of goals or plans and constant and periodic control. At the end of the strategic period, it is necessary to perform a comparative analysis in order to determine the success of the set strategy. [6]

3. Characteristics of artificial intelligence

Artificial intelligence (AI) is the most important general-purpose technology of our times. [17] During the development of society, first physical jobs but also certain routine mental actions were increasingly performed by machines. In this sense, artificial intelligence is increasingly at the origin of occupations today. The term artificial intelligence refers to those activities (algorithms, programs, etc.) that try to imitate the natural intelligence of humans. The combination of robots and artificial intelligence leads to the development of autonomous systems, which is a trend today. Autonomous systems are developed in a targeted way so that they can surpass humans in some properties (physical strength, memory capacity, calculation speed, parallel development of several controlled actions, etc.). The following three types of artificial intelligence are known [7]:

- Technical,
- Biotechnical,
- Biological.

The basic elements of technical artificial intelligence are: artificial neural networks, fuzzy logic systems, genetic or evolutionary algorithms, and expert systems. The term artificial neural network means a complex system, composed of elements (artificial neurons), which interact in a certain way, with each other and with the environment of the system (artificial neural network weights), so that they build a functional whole [7]. The advantages of neural computers, based on artificial neural networks compared to classical (serial) computers, are manifested in massive parallelism in information processing, then in adaptability and in the ability to learn [7]. Another technical approach is a system of indirect logic that works in linguistic form: if-then. For example: if the room is cold, then open the radiator valve. In this way, it is possible to linguistically describe the dynamics of a system whose mathematical model we do not know. For this reason, among other things, this method is widely accepted in the field of control systems. This approach has a limitation because the number of behaviour rules (if-then rules) grows exponentially with the increase in the number of input and output variables of the system, and with the number of adopted input and output fuzzy sets[14].

Genetic or evolutionary algorithms, as elements of artificial intelligence, use the principles of Darwin's theory of selection the better, the stronger win i.e. different evolutionary paradigms. That is why genetic algorithms are suitable for searching (selecting) the best (optimal) solutions. [7]. Expert systems represent a set of computer programs, which are generated in such a way as to imitate a human expert in a field of interest. Newer expert systems contain the already mentioned elements of artificial intelligence, and they themselves belong to this set [4]. It is important to keep in mind that expert systems are not only programmed according to the decision-making mechanism and do not always behave according to expectations, that is, they can be programmed to learn while drawing conclusions[13]. Biotechnical artificial intelligence is being developed as a combination of technical and biological components of artificial intelligence. These are various experiments on connecting the human brain with electronic chips, electro-mechanical sensors and authors, etc. The value of this type of intelligence is reflected in the rehabilitation of people with various impairments (for example, vision) and disabilities (for example, hands, legs, etc.). On the other hand, biotechnical artificial intelligence can be accepted as a transitional phase to the development of biological artificial intelligence. This artificial intelligence relies on genetic engineering [7].

From the previous definitions, i.e. the particularities of artificial intelligence, it is evident that there are already various possibilities for its useful use today. In any case, it should be borne in mind that artificial intelligence, which is a special software, cannot create certain new solutions on its own for the time being, but must have an extremely complex database or memory of different conclusions according to the problem. In this sense, Figure 3 shows an example of the use of artificial intelligence in a practical activity. The image shows a management process where all information and communications take place through one contact center known as CRM (Customer Relation Management) [8]

Fig. 2. An example of the use of artificial intelligence [5]

In this case, it is a communication process with clients in the technical maintenance of machines and equipment where the outsourcing maintenance provider is in constant contact with several clients and, if necessary, transmits information about a maintenance problem (facility or equipment). If he doesn't have a solution, he consults a database or artificial intelligence. For complex problems where a quick decision is needed, artificial intelligence can offer a quick solution. The condition for this is a large amount of problems and corresponding solutions stored, which must contain artificial intelligence software. This example can be used in various technical and other organizational management processes and also in making corporate strategic decisions.

4. A model of corporate communication and creation of strategic decisions with the support of artificial intelligence

Given that strategic decisions are of a long-term nature and very important for the direction and intensity of the corporation's development, it is necessary to approach their definition using human resources and information technologies. In addition, during the definition, the resources of the corporation in the headquarters itself, the management and the resources of its dislocated plants should be consulted. This is possible with the help of information technologies, and especially with the use of software that contains elements of artificial intelligence. Figure 4 shows a model of an example of management and communication of a corporation of three types of production, where each type has dislocated cooperative facilities that produce its inputs. In the technical and IT sense, this is possible by combining PLC with CRM as shown in the figure 3.
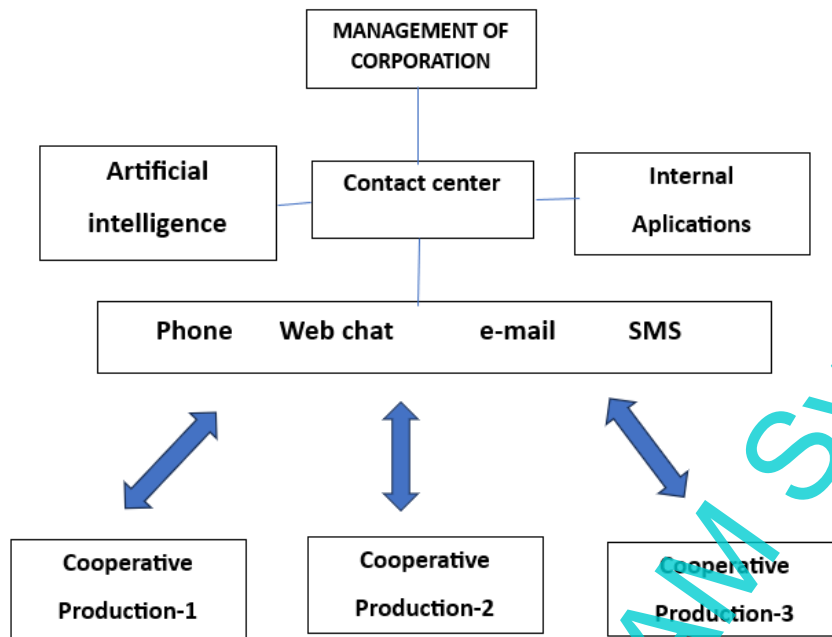
Fig. 3. Communication process of the corporation with the support of artificial intelligence

Figure shows an example of the communication process in this case in order to define strategic decisions at the corporate level. The appropriate human resources of the main administration, as well as personnel from cooperative plants, participate in the process. In this sense, the corporation's computer is connected to the CRM through the contact center. This is made possible by software that contains, in addition to drivers, special software for internal applications that allow connection to dislocated drives. A special role is played by artificial intelligence software, which contains a number of solutions that participants in the creation of strategic decisions can use to create proposals, test solutions and make the final decision. As an effective connection with the dislocated facilities, using the contact center, IT solutions were installed for fast communication through already known IT solutions such as; telephone, Web chat, e-mail and SMS. By using the aforementioned IT technologies and appropriate software, especially artificial intelligence, the management of the corporation with the help of the plant management can create more variants and choose the optimal strategic decision proposal. A special advantage of this kind of communication is the speed of proposing and testing certain decisions, and this is made possible by artificial intelligence.

5. Discussion

The previous considerations show, first of all, the complexity and great responsibility of all participants when making strategic decisions, especially when it comes to large complex companies or corporations. In modern times, information technologies can provide great help, both as support for the production and the complete business process. This enables quick, safe and precise access to relevant information when creating and making strategic decisions. A consideration of the special features of artificial intelligence shows that there are already great possibilities for its use even in making business decisions. There are already certain hardware and software solutions that are used to organize discussions where the participants are dislocated. In this example, it is about the communication of personnel at the headquarters of the corporation with the participation of participants from certain dislocated plants. This enables them to have CRM through the contact center. In support of the participants is artificial intelligence with the help of internal application software that enables the participation of dislocated participants. Considering today's possibilities of artificial intelligence in the application of making corporate strategic decisions, it is possible to increase the efficiency of the process from the previous considerations. This fact alone indicates that the hypothesis of this work as well as the goal of the research have been achieved. In addition, the modernity of the topic creates conditions for continued research. In addition, the development of information technology, especially artificial intelligence, will open up new opportunities for its use in various areas of the economy and other social activities.

6. Conclusion

Based on the research and consideration of the previous content, several conclusions are visible. First of all, it is an absolute justification for researching this very topic. In addition, the target was hit as well as the hypothesis set. Considering the topicality of a topic such as artificial intelligence, research into the possibility of its application in the economy is certainly one of the priorities. In this case, it is an application in making strategic decisions in a complex economic system such as a corporation. Actuality stems from the fact that strategic decisions determine the multi-year

direction and intensity of the corporation's development. That is why, when considering and making strategic decisions, all the most important personnel and resources must be included in the decision-making process. This particularly applies to information technology, and in this case it is artificial intelligence. The paper first specified the purpose of using artificial intelligence, which is the process of making strategic decisions. By researching the experience, peculiarities and possibilities of artificial intelligence, it was determined that for now it is a great support for the participants who create and make strategic decisions. After that, a functioning model was set up where IT technologies create a fast and secure connection between decision-making participants. In particular, artificial intelligence can provide support in the creation and testing of individual proposals, as well as in the optimization of several possible combinations for individual decisions. The effectiveness of this process depends to a large extent on the database and solutions and on the perfection of the artificial intelligence software. In any case, the consideration of corporate decisions as an object and the uniqueness, possibilities of artificial intelligence and by defining the process and model of its functioning, showed the goal of the work and confirmed the hypothesis. With regard to the development of artificial intelligence, there is an opportunity to continue research. This applies to many activities in the economy and all other activities.

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