

# Basic guidelines in artificial intelligence (AI) applications in ERP systems in the last 5 years

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**Abstract** - The application of artificial intelligence is extremely diverse. Artificial intelligence is used in various forms to varying degrees in modern "smart" devices such as phones, tablets and more. Artificial intelligence is developing and improving with the pace of development of the scientific and technological revolution. Artificial intelligence is a key technology in the business industry

**Keywords** - Artificial Intelligence, ERP systems, GDPR, augmented reality, block chain technology, machine learning.

## I. INTRODUCTION

The term "artificial intelligence" is used much more often in the sense of an intelligent, complex and dynamic computer system that has the ability to collect, process, store and interpret information, data and information, learn from them and use them to perform specific tasks and achieve certain goals through flexible change and transformation. It is present in many business software technologies, for example in Enterprise resource planning (ERP) systems, which integrate all the main functions of the enterprise and use various analyzes in order to predict the future. When this set of technologies is used appropriately, it allows the specific organization to thrive in product and service development, achieving remarkable results and profitability. The term stands for Artificial Intelligence (AI) and was coined in 1955 by American computer scientist and cognitive researcher John McCarthy, who first introduced it at a scientific conference at Dartmouth College in 1956[2,6]. Its development is related to the processes of automation and robotization of labor and production.

## II. BASIC APPLICATIONS

### *Enterprise Resource Planning*

Recently, the forms of application of artificial intelligence are becoming more ace. In the 1990s, a new software system known as Enterprise Resource Planning (ERP) emerged. [5, 14] This type of ERP systems are designed to "integrate all the basic functions of an enterprise, regardless of business type or charter [16]. In other words, the ERP system is seen as a tool that organizations can use to achieve a state where everyone in the organization can see what everyone else has done in business around the world at the same time [10]. According to [10] ERP "is a systematic method for dynamic balancing and optimization of a company's resources". When used properly, they allow the organization to achieve great results in growth, profitability and product and service development [10]. ERP systems are designed on a modular basis, which allows them to be adaptable and adaptable to offer best business practices [14]. The modules operate in real time and can operate as stand-alone units or combined as several modules to form an integrated system [4, 10].

The purpose of ERP systems is to intor to purpose of ERP systems is to integrate individual systems (eg warehousing, finance, accounting, logistics, manufacturing, etc.) in a complete and complete form in one enterprise [10]. Thus, when applied in an organization, the ERP system has both advantages and disadvantages. Grate and consolidate. ERP systems provide reliable access to information, good management and better control of information, increase productivity and increase efficiency in decision-making and more [7,18]. On the other hand, joining ERP systematization takes a lot of time, which can also be very valuable as a resource for an organization.

Companies should also keep in mind that ERP systems have many functions and modules which can be difficult to understand and work with [14]. In this regard, there are problems faced by ERP systems such as compatibility with hardware and software development, integration, and data development between modules [3,18]. A drastically changing business environment requires a lot of time and money to invest in ERP systems [1,18]. This is a constant challenge to expand the market that companies face in the face of increased competition, business requirements, and growing customer expectations, which puts more pressure on companies to reduce overall costs in less time [18]. This means that ERP providers are constantly improving and developing ERP systems to meet the requirements of the business - changes that allow organizations to adapt more quickly to the modified business environment [18].

### *Artificial intelligence ( AI)*

The CEO needs business tools that can analyze the large amount of data that ERP systems are able to collect to make a better decision [10]. Artificial intelligence (AI) is a decision-making tool. AI is intelligence shown by machines or software [13] who can understand the environment and then can make decisions through an artificial neural network. The goal of artificial intelligence is for software to work like a human brain, make an in-depth analysis and perceive the environment, and then make a decision based on it [15]. It is believed that technology can be used to find important facts, patterns, relationships, or other types of new knowledge that have not been discovered using standard analysis techniques [12]. Artificial intelligence is not new in the business environment. [8]. Findings speak of developments in automation and their possible effects on accounting, because there is a need for more analytical information on sales, inventory and use, and production and distribution costs. Stated [9] how much analysis changes the audit, especially in structured and repetitive information throughout the audit. According to [9] artificial intelligence can detect relevant data by extracting it from documents. In this way, managers' time is used primarily for administrative work, which machines cannot do as human judgment. Despite the benefits

of artificial intelligence, it also has a limitation. For example, [5] points out the lack of objectivity and caution of artificial intelligence, they tend to reflect the bias of the person who creates it. One of the artificial intelligence comes in the form of chat bots. Chabot's is an artificial intelligence program that interacts with natural language users [11]. Chabot's are said to be considered classic media for human-machine interaction in natural language. This is becoming increasingly important as there is a very wide range of applications such as virtual aid, e-commerce, and social networks [17].

#### *General Data Protection Regulation (GDPR)*

The entry into force of the General Data Protection Regulation (GDPR) is one of the main challenges facing companies and their management systems. Then began the main activities for the analysis of the way of data storage; the systems in which this data is contained; the possibilities for exercising strict control; development and implementation of access policies; training of data processing staff; review of relationships with suppliers and customers and others.

The impact of the GDPR is felt in banks and healthcare, which work primarily with end customers - individuals, because the processing of the results obtained from all emails sent needs to be reflected in existing systems and databases. This can only be done automatically with a modern CRM relationship management system.

The process of obtaining consent for data processing has proved to be a serious challenge for these companies and has shown the extent to which their CRM systems are able to cope with it. Business management systems are seriously affected by this regulation insofar as they process and store arrays of personal data for users, partners, suppliers and others.

As a result, ERP software developers are increasingly offering compatibility extensions with various new regulatory documents, updating their versions to comply or becoming more flexible, allowing faster changes to meet new regulations.

The GDPR has another aspect besides the right to store information, namely the right of individuals to request that their information be transferred directly from one company to another. For the time being, this aspect is largely neglected, as all efforts are focused on the management of stored information. Such requests from individuals today are rather the exception, but over time they are likely to increase, which in turn will lead to the need for new standards for such data exchange and, accordingly, to changes in companies' systems.

#### *Augmented reality*

Augmented reality is another trend that is making its way into the environments of management systems. The development of this type of technology makes it possible to supplement the physical reality with the rich information source ERP systems, and thus significantly facilitate and optimize the activities performed in the field, such as repair of machinery and equipment, tracking the path and location of materials and labor, etc.

#### *The place of augmented reality in business management systems*

Historically, ERP systems were originally designed to optimize performance in manufacturing plants, where the main resources are raw materials and parts. Only later did this type of software solutions enter more widely in other segments such as fast moving consumer goods or finance. And with the automation and digitalization of production, enterprise resource management systems are expanding their capabilities and using impressive new technologies that increase their efficiency. In recent months, there have been increasing examples of ERP integration with augmented reality devices, as well as Bluetooth beacons, which make it easier to track the location of materials and workers.

#### *The emergence of social ERP*

Social media is undoubtedly one of the most important phenomena in the technological world in recent years and there has long been talk of their integration with the corporate information environment. And lately, we are seeing more and more signs that this trend is beginning to materialize. And although we are still far from using full-fledged "social ERP systems", the first steps of major developers in this direction are already a fact.

#### *ERP looks at the blockchain*

Recently, blockchain technology is developing extremely dynamically, so in recent months attempts have been made to enter this technology in more and more business segments. Of interest to companies is the integration of blockchain in various processes and how this will affect management systems (ERP and CRM). The main advantages and capabilities of blockchain technologies are in terms of traceability of resources, products and assets, as well as even stricter control of access and use of information available in the systems.

#### *Artificial intelligence and machine learning*

The first attempts to integrate machine learning and deep learning technologies into business management systems, focusing on the encouragement and assistance of the individual who makes decisions and expanding his capabilities, instead of taking over the functions of the employee.

Artificial intelligence is an area with many applications that is much talked about among business management systems. Major manufacturers of such systems are already experimenting with the capabilities of machine learning, incorporating it into their solutions.

One of the interesting applications of artificial intelligence is image recognition, which is present in new versions of ERP solutions. Such a CRM system is connected to an image recognition system (one of the directions in artificial intelligence), which allows real-time identification of a product from the range of products offered, from which the system can automatically recognize the type of the item in question and categorize it in the appropriate group of the product catalog.

The application of artificial intelligence in business is that in ERP systems machine intelligence has a supporting role. It complements and optimizes the human factor, guiding people in making the right decisions.

The penetration of artificial intelligence and augmented reality, the "socialization" of ERP systems, are the main factors for the development and change of business software.

Business management systems are so crucial to businesses that any new technology applicable to business has a major impact on them. Examples of this influence are the rapid development of machine learning, artificial intelligence, the addition of intelligence at various levels in the corporate information infrastructure, as well as technologies such as augmented reality and the Internet of Things.

### III. FAST IMPLEMENTATIONS

Implementing an ERP system has traditionally been a difficult and lengthy process. This large-scale solution involves changing the core of business processes, so any mistake can lead to serious losses. The trend is to increase the number of implementations of standardized solutions, which significantly reduces the time required. Some development guidelines contribute to this:

Leading manufacturers of control systems have significantly improved the standard functionality of their solutions. Thus, many features that were previously developed as part of the deployment now come as basic functionality.

Large implementers with many years of experience are ready to offer ready-made solutions for many business sectors.

The opening of management systems to small and medium-sized companies. Whereas previously such software solutions were used only by large companies, today, thanks mostly to cloud technologies, the systems are becoming available for small companies, for which standard functionality is sufficient...

### IV. CONCLUSION

#### ARTIFICIAL INTELLIGENCE (AI) AND TECHNOLOGY WILL NOT REPLACE MAN, BUT WILL SUPPORT HIM

In the implementation of real applications in areas such as healthcare and education, more and more reliance is placed on machine learning and artificial intelligence. The topic of which tasks are better performed by technological solutions and which by humans is still under discussion. Computing power, type, dimension and diversity of data, information and technology infrastructure, together with research are evolving by leaps and bounds. It is not easy to determine the direction in which technology will develop in the future. Artificial intelligence must work in a way that benefits people and allows them to make the best decisions. In order to be able to analyze high quality data in real time from different sources, it is necessary to develop the infrastructure behind AI.

Therefore, ERP systems that are integrated with artificial intelligence (AI) have improved functionality and software applications can generate solutions, actions and suggestions. Large manufacturers of such systems are experimenting with

the capabilities of machine learning, incorporating it into their solutions. These advanced technologies with implemented intelligent solutions significantly increase the efficiency of the entire organization and make it competitive

It is important to understand how technologies such as artificial intelligence and machine learning and the delegation of basic business processes to machines should be used and to what extent these tools will manage and administer the relevant processes and conditions.

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