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## TRENDS IN THE DEVELOPMENT OF RISK MANAGEMENT

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### ABSTRACT

Awareness of the need for effective risk management is gaining ground, both among business organizations and in scientific publications in the field. The prospects for development in risk management must be tailored to the growing and transformative needs of Industry 4.0. The paper focuses on different directions, priorities of the Federation of European Riskmanagement Associations (Ferma). The main subject of research is placed on risk management through artificial intelligence. Both the risks of its introduction and the benefits of it have been identified.

**Key words:** Artificial Intelligence, Risk Management, Risk Integration

### INTRODUCTION

The inevitable new face of risk is largely related to the ever-increasing dimensions of risk integration. One of the biggest sources of risk for business organizations today comes from the context of its strategic plan. The greater the degree of integration between the organization's goals and risk management, the more likely it is to successfully reach its positive end.

The challenges of integrating risk management are addressed in all areas of management in business organizations (1): operational activities, economic and strategic. This means that Enterprise Risk Management (ERM) will be a necessity for future project management processes.

Enterprise Risk Management (ERM) (2) is a nascent process that can serve many purposes:

- risk management tool,
- strategic planning;
- identifying emerging opportunities and potential competitive advantages.

ERM integration varies depending on the type of project. It can be said that risk integration

requires specific customization that meets the unique goals of the organization (2). Integrating risk management and strategic planning also requires the corporate team to reflect on their goals before deciding on the best way to integrate the two processes.

By creating a close link between the organization's strategic planning and risk management processes, risk mitigation and competitive advantage can be ensured.

The integrated risk management approach has been the subject of much research. According to Julia Lin and staff (3), risk integration can be based mainly on different software systems. On this basis modern information systems for process management in business organizations (ERP, CRM, HR, etc.) have been developed. Following developments in management, the integration of all processes and systems is a natural step that must be achieved (4).

The implementation of an integrated risk management approach implies reaching a scope on all aspects of the organization's activities, more complete and purposeful achievement of project goals, harmonization of all processes. The integrated management approach achieves the optimization of time, resources, and resources in organizations. Risk integration across processes is often defined as "the sum of interconnected processes that share a unique pool of human, information, material,

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infrastructural and financial resources to achieve a set of goals related to the satisfaction of a number of stakeholders (5).

The integrated measurement and management of all risks, no matter in which part of the organization are located, allows for a comprehensive risk management framework. The global objective of an integrated risk management system is to establish management policies and procedures to ensure risk awareness and accountability throughout the project life cycle.

When it comes to risk integration, things naturally focus on the introduction and use of artificial intelligence throughout the risk management process (6).

#### **ARTIFICIAL INTELLIGENCE OR AI**

Big data, the cloud, AI and IoT are the main technologies in the radar of many major projects, especially when they seek to understand and fully manage their individual impacts (7). For this reason, technology is taking a great deal of power in risk management.

The risk assessment algorithm is usually based on complex calculations. There are various models such as: VaR (Value at Risk), Morten Black-Sholes model and more. These models come in various simulation and modeling algorithms, such as Monte Carlo simulation, GARCH, EWMA.

Risk management teams use rule-based expert systems to monitor operations and generate alerts. They give risk signals based on rules, historical thresholds, and setting each one over time takes a long time in which it is necessary to maintain a balance between risk exposure and team effectiveness, and this has its consequences (8). Therefore, there is a need to use artificial intelligence in risk management. Big data and artificial intelligence represent a significant advantage in the development of project risk management. AI is most commonly viewed as intelligence demonstrated by machines, with intelligence being defined with reference to what we view intelligence as in humans (9).

Artificial intelligence enables the exploration and creation of computer systems that exhibit a certain form of intelligence and attempt to apply knowledge similar to that of natural intelligence (10).

Using artificial intelligence can achieve a high degree of synchronization of the risk management process, higher efficiency, make data analysis easier to understand, eliminate much of the subjective mistakes.

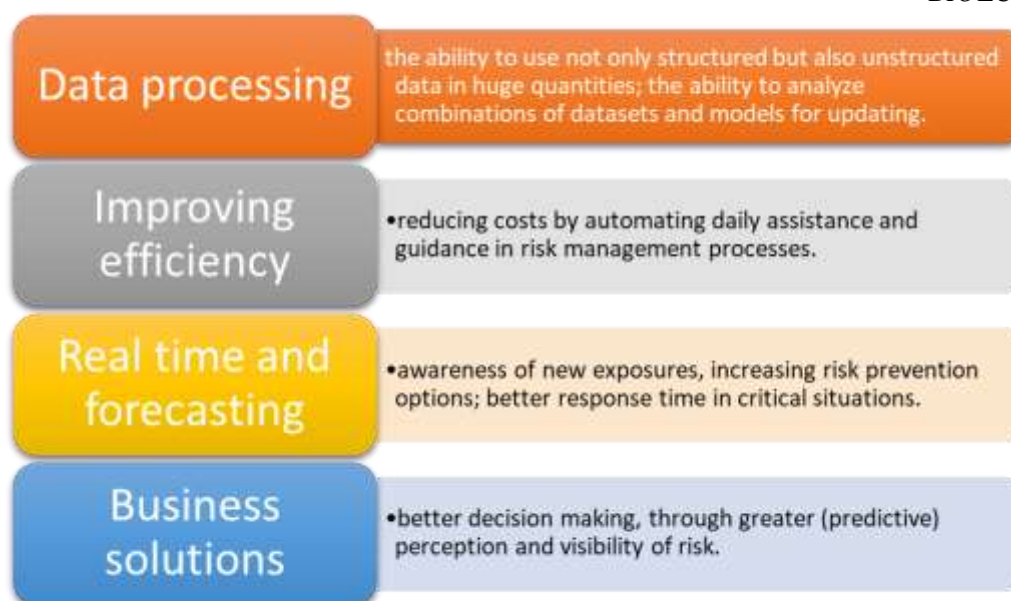
Artificial Intelligence (AI) systems are software (and often hardware) systems designed by people who, in the physical or digital dimension, perceive an environment. Their work is done by collecting data, interpreting it, reflecting on knowledge or processing the information derived from that data, and deciding on the best actions that can be taken to achieve a specific goal. AI systems can be based on specific rules or on a numerical model. It is characteristic of them that they can adapt their behavior by analyzing the environment and previous actions in such situations.

The development of this technology, combined with the ever-increasing volume of data, has a key role to play in the advent of the AI era. Risk management is no exception to general trends. As with any new technology, there are emerging risks and challenges associated with AI. Issues related to ethics, equity, bias, reliability of decisions made or proposed by AI are at the forefront of this. Another problematic issue that arises is the transparency of algorithms and the increase in cyber risks (11).

Along with the risks of introducing artificial intelligence into risk management, it has many benefits. One of the main advantages is that the insights that now only become visible when losses occur in the future will be obvious due to the ability to analyze large volumes of historical data.

The main benefits of risk management can be summarized in the following described in **Figure 1**.

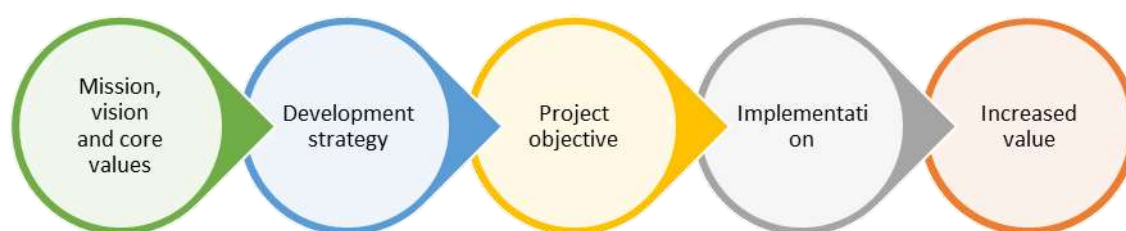
The main advantages of artificial intelligence entry into risk management, which are the use of large amounts of data; better work efficiency; improving identification and management time; real-time work; more efficient business decisions are a prerequisite for creating a number of competitive advantages.



**Figure 1.** Main benefits of using artificial intelligence in risk management

All of these allow us to overcome a number of current risk management constraints. Decisions previously made blindly or through benchmarking will be based on data and made systematically. This is the reason business organizations start their path to AI if they want to be at the forefront of risk management. In this way, they will build the foundation for technology that will soon pave the way for us to deal with risks (11).

To manage risks through AI in a more secure and sustainable way, organizations need to analyze the risk profile of the project through the components of the risk management framework. **Figure 2** shows an exemplary risk management framework that can be used to better identify and monitor new risks created by AI.

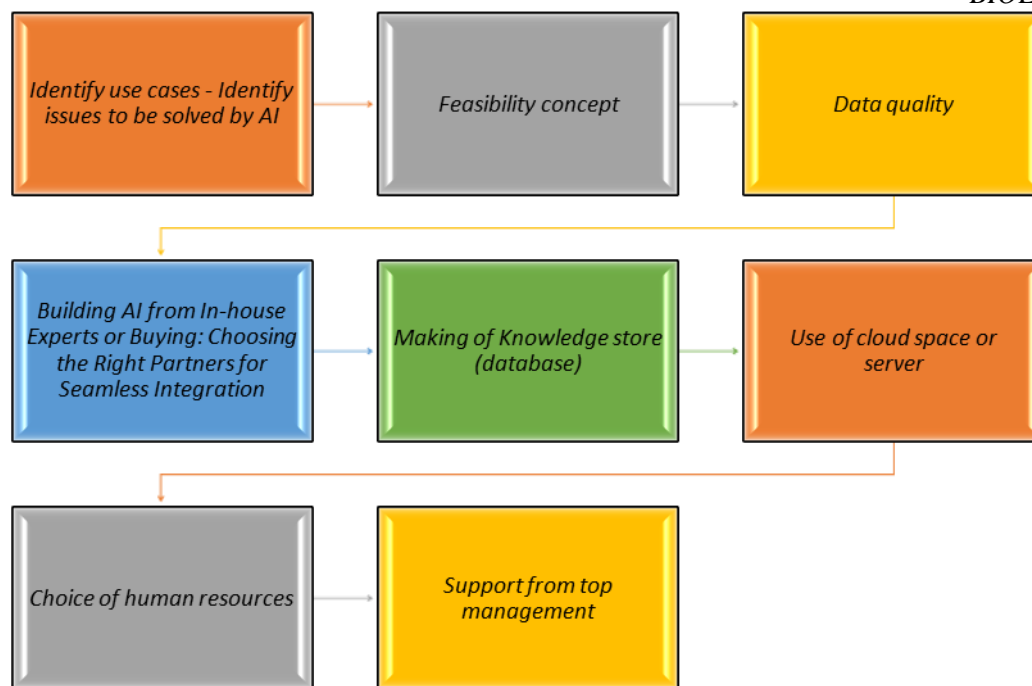


**Figure 2.** AI risk management framework

### INTRODUCING ARTIFICIAL INTELLIGENCE

To help project teams implement AI methods, here is an example roadmap. It may vary depending on the specifics of the project, its requirements, the data available, the risk management policy adopted, etc. It should be

borne in mind that the roadmap should be seen as a dynamic process that should be reviewed and adjusted according to the project environment.



**Figure 3.** Roadmap for introducing AI in risk management

Source: Cotelle, Ph., Dias, T., Florian, J., Gunes, O., ets. 2019, Artificial Intelligence Applied to Risk Management, FERMA Perspectives 03, p21

1) Identifying Use Cases - Identifying Problems to Solve Using AI - This first step requires learning about the basics of AI, including its capabilities. It is appropriate here to explore different ideas and consider how AI capabilities can be integrated into existing processes and services. You should start this process before applying AI.

2) Feasibility concept - it is good to set high goals in the pursuit of AI transformation, but it must start with proof of concept viability. This is where a test or pilot project is needed that can demonstrate the feasibility and viability of your idea. Tying the idea directly with business value will also show potential and feasibility. This will also give an indication of the return on investment.

3) Data quality - Having a high-end algorithm powered by a reliable database can improve the quality of the information available. The main difference between a normal server and an AI knowledge server is in structure and content. For AI, highly structured, requestable data is required.

The main data issues to consider are:

- What data will be used?
- Is accurate data available?
- Does the available data overlap with external data?
- If data providers are used, do they need to maintain their own data?

4) Building or Buying - Choosing the right partners for seamless integration. AI may be necessary for every project implementing organization, but not every organization can have the resources and apply it independently. Alternatively, these organizations may be able to deploy AI from specific business areas. It is important here to evaluate the project's capabilities in terms of technology and business processes before the actual application of artificial intelligence. Tackling any internal vulnerability means identifying what needs to be done, what processes need to be developed internally before the artificial intelligence application is launched. Choosing the right partner is a crucial decision. Important for him are: the availability of qualified human resources, the availability of experience, understanding of the project-specific business challenges.

5) Creating Databases - For artificial intelligence, the amount of data is not critical, determining the quality of the data. AIs are based on "data science" and statistical algorithms. These algorithms become reliable when the quality data set is applied in a specific sequence. Due to the fact that corporate data is often interpreted differently by different groups of people, obtaining high quality data can only be talked about when the

data is integrated and can create accurate and rich databases.

6) Use of cloud space or server - when choosing where and how to store the databases, it should be borne in mind that the initial database will grow at an exponential rate and from there the available memory will fill up very quickly. This causes many organizations to use cloud storage. On the other hand, many projects handle sensitive information and high security requirements, which provokes the choice to focus on using their own servers.

7) Human Resources Training - Human resources are often cautious in view of the threat that technology would replace their availability needs. Introducing AI as a way to improve their daily tasks is important. It's still common to underestimate the demands that AI is making on business. This is not just about the technical resources you need, and implementing systems. AI strategies sometimes fall apart because the organization has not trained its human resources to move to a new way of working. Business processes will change, response rates will increase, responsibilities will shift, ie. people will have to be prepared.

8) Top Management Support - The involvement and support of senior management is a key factor in the success of AI implementation. This allows the introduction of artificial intelligence to be approached with the necessary seriousness, to allocate resources efficiently, and to track results (11).

## CONCLUSION

The dynamics in today's reality confront us with the progress of AI. Risk management should add value based on a combination of risk management skills, organization and project knowledge, and digital understanding. Current risk management skills (a thorough understanding of a wide range of risk management techniques, people management skills and communication skills) remain relevant. The risk manager needs digital knowledge that is constantly updated. His needs are also linked to having a multidisciplinary team that understands the effects of risk.

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