INTELLIGENCE SYSTEMS IN MANAGERIAL DECISION MAKING

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Abstract: *Intelligent decision support operating systems have been innovated for virtually decades, existing decision support systems for the element of artificial intelligence, which makes them a gradual necessity for all companies that want to be sufficiently competitive and whose managers are confronted with complex decisions on a daily basis. The aim of this article is to present the practical use of intelligent decision support systems, their development through artificial intelligence, companies that are leaders in providing this solution, the advantages of their use as well as disadvantages, potential concerns and outlook for the future.*

Keywords: *intelligent operating systems, AI, systems, IDSS, decision – making, management, business, UAV*

JEL Classification: *D8, L8, M15, M21*

1. INTRODUCTION (PURPOSE OF ARTICLE)

The most common conceptualizations of artificial intelligence (AI) refer to computer systems with human-like intelligence that include the ability of these systems to "correctly interpret, learn from, and use this knowledge to achieve specific goals and tasks through flexible adaptation. In its definition, the Oxford Dictionary includes tasks such as visual perception, speech recognition, decision-making, and translation between languages, with the Merriam-Webster Dictionary emphasizing that AI mimics intelligent human behavior. Poole and Mackworth offer a slightly different explanation by shaping AI as "computational agents who act intelligently." This definition describes AI as agents capable of perceiving the environment in order to act in order to maximize the likelihood of success. From the point of view of systems, the definition also implies a rational view of AI, where the AI system, given what it knows, would act in such a way as to achieve the best possible result. The definition developed by Poole and Mackworth (2010) emphasizes two conceptual explanations. He first emphasizes the various stages of AI development (Haenlein and Kaplan, 2019). What might have been considered intelligent machine behavior five years ago is hardly considered remarkable today. There are three levels of AI: artificial narrow intelligence (applied, AI below human level, eg Siri voice recognition), artificial generalized intelligence (strong, human level intelligence, eg Siri developing the ability to perform tasks such as driving a car independently) and artificial superintelligence (conscious / aware, AI above the human level, eg Siri developing superhuman abilities to solve complex problems immediately). Most of the commercial AI technologies available today are classified as "narrow" and almost all AI technology to be integrated into the business in the next ten years will be "narrow" or "applied". This also applies to retail. The second defining characteristic highlighted in Poole's and Mackworth's (2010) definition is the idea that AI represents knowledge, expertise, and problem-solving intuition. AI requires that tailor-made knowledge be built into a "carefully constructed system" (Kaplan, 1984: 52), where the preservation of past knowledge should reflect experiences that would inform about further intellectual behavior. In AI systems, these knowledge representations could include inputs (structured and unstructured data), processes (machine learning) or self-generated AI output (robotics). As AI is constantly advancing, our understanding of the various applications must also evolve at a dizzying pace. Research on AI and its implications for business has grown to include studies on AI in recruitment and marketing. [8-20]

2. ARCHITECTURE MAIDSS (MULTI-AGENTS INTELLIGENT DECISION SUPPORT SYSTEM)

A neural network is a nonlinearity of a self-adaptive dynamic system that simulates the structure of the biological nervous system and consists of a large number of processing units. It is not a simple replacement for traditional AI, but a complement to dialectical unity. The introduction of DSS with a neural network has provided a new way of establishing DSS with traditional AI, in which the most difficult part lies in the acquisition and derivation of knowledge and in the natural language processing system. By analyzing the characteristics of the neural network and the issues that exist in DSS, the main purpose of DSS neural network research is clear. Utilizing the learning functions of the neural network, the functions of massive parallel distribution processing, continuous time-nonlinear dynamics and global collective effect, the implementation of automation of knowledge acquisition, self-study of natural language processing system, overcoming difficulties such as "combined explosion", infinite recursion , improving DSS decision support capabilities, real-time processing implementation. [5-7]

The decision support system of, for example, intelligence services takes knowledge, data and model as a major part and combines a neural network with inference and data mining. Figure 5 shows the research framework of a neural network decision support system. There are points in the research: fuzzy neural network system, neural system for data mining, neural network as an interaction system of natural language.
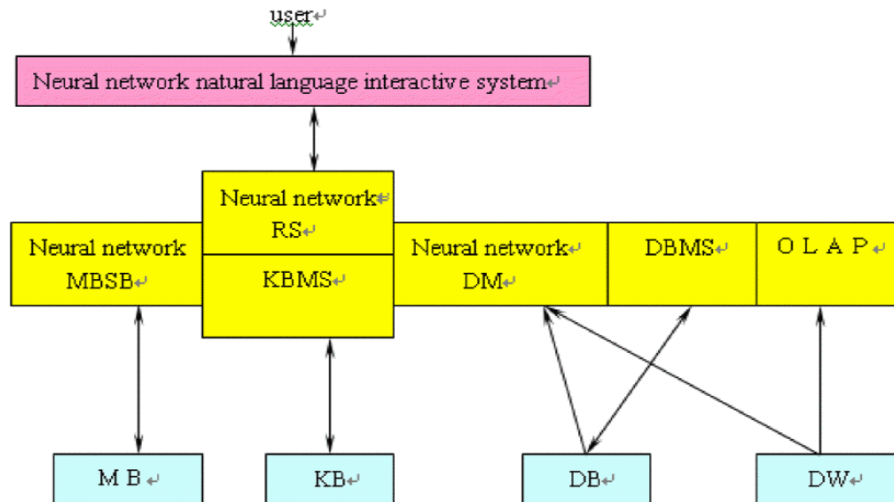
Figure 1 Schematic of the IDSS framework using neural networks
Source: [25]

There are a large number of providers using software to analyze data and assess risks using artificial intelligence.

3. PROVIDER - SOLVEIT SOFTWARE

It is an Australian company specializing in integrated enterprise supply and demand planning, simulation, optimization and predictive modeling, acquired by Schneider Electric in 2012. SolveIT software applications were integrated into the SchxiderWare Supply Chain Operation Suite to provide customers with a unique ability to optimize complex endpoints. -to-end value chains. StruxureWare Supply Chain Operation software solutions are used to model and simulate supply chains throughout the enterprise. The same decision support solution can be used for operational forecasting and planning. This allows management to create strategic scenarios on demand, add / remove assets or simulate greenfield operations. This strong support for strategic and operational decisions is at the heart of supply and demand functionality. [16-18]

4. CONCLUSION AND DISCUSSIONS

The advent of any modern technology brings not only barriers and limitations, but above all benefits. Thanks to them, the company is often willing to tolerate the restrictions and barriers, or are willing to remove them.

The first advantage is a competitive advantage. Companies are very open to modern technologies and innovations, because they know from experience that such solutions can often save them or, on the contrary, make money. Therefore, the use of an intelligent system, thanks to which the company will gain a significant competitive advantage over the competition, which did not apply such

solutions to its processes, companies welcome very positively.

Another advantage is the acquisition and processing of data in real time. Highly sophisticated intelligent systems based on artificial intelligence often know how to streamline the process of data analysis and processing through continuous learning. Thanks to this, by constantly adding new processes to the system, they do not lose their efficiency and speed and provide their decisions almost immediately. Managers are then able to use such tools effectively to make the right decision. [1-6]

Definitely one of the significant benefits is the increase in the company's profit. Even small adjustments to a well-established system can amount to millions of dollars in annual revenue. Thanks to the speed and accuracy of the data and decisions provided, intelligent decision support systems can save not only time but also money. Last but not least, the right decisions that managers subsequently apply in practice can bring companies higher profits.

The last advantage is the growing integration of these systems into the cloud. Thanks to this, the system is often available in different places and different devices. This solution is an excellent option for "field managers", who are therefore not dependent on obtaining these decisions only in the company's premises, but anywhere in the world.

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