AI-Driven Decision Making: A Review of Current Trends and Future Directions in Computing and Information System

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ABSTRACT

AI-driven decision-making is a process that helps to make accurate predictions and decisions, and it works by means of an artificial intelligence platform to process huge data in whole or in part without human intervention. There are many problems that cause organizations to resort to the use of AI-driven decision-making, such as processing big data, analyzing complex data, and making accurate decisions.

The aim of the research is to study the current trend or extent of AI in organizations all over the world for the purpose of decision-making, and the importance of its use in organizations. The method that will be used in the research is to interview people who work in old companies and compare the situation between the past and the present. And search for previous sites, articles, and research that discuss the current trend of using artificial intelligence for decision-making. AI-driven decision making contributes to technical and technological advancement and continuous development in all organizations around the world. The research contributes to spreading the importance of using AI in organizations for the purpose of decision making. I recommend turning to AI for the purpose of decision-making because of its positive benefits for organizations.

Introduction

What is AI?

Artificial intelligence is a branch of computer science. It focuses on building and managing technology that can learn to make and implement decisions in place of a human. This happens by processing a huge amount of data and looking for ways to model the decision. Artificial intelligence aims to make quick decisions without errors and solve problems. With the advancement of technology, the field of artificial intelligence has expanded into three areas (assisted intelligence - augmented intelligence - machine intelligence). Artificial intelligence has made a quantum leap in every sector of the technology industry. It has also become a part of our lives, and companies in all industries are investing in it (Barber, 2021).

How Does It Help with Decision-Making?

Artificial intelligence is reimagining business, boosting innovation and productivity, and helping organizations. AI improves organizational decision-making by performing error-free big data analytics, data processing and coordination. Where the data is processed and validated by using technologies that help in this, such as cloud computing. Organizations can improve the speed of decision-making processes and verify their accuracy and effectiveness by taking advantage of data powered by artificial intelligence.

With the help of AI, companies are well-equipped to face disasters by using AI decision-making algorithms, as well as detecting anomalies and predicting appropriate behavior. Artificial intelligence has many advantages, such as reducing intense human labor, reducing the effort involved in analyzing predictions, and promoting automation (Schroer, 2022).

Literature Review

Decision making is a human activity. Humans always strive to improve decision-making processes, but on the other hand, humans are limited in their ability to process data, and this causes the process to slow down, which leads to failure to improve the decision-making process (Choi et al., 2021).

Big data has led to rapid progress in technologies that process data in a fast and accurate manner, and has caused the rise of artificial intelligence recently. This is because the use of artificial intelligence for decision-making is considered as one of the most important applications of artificial intelligence. The use of artificial intelligence for decision-making has many benefits. First, it is able to help the employees of the institutions to make appropriate decisions. Second, enhance analysis and decision-making capabilities. Third, increased creativity and productivity. The decision-making process is very important in any organization, because any organization needs to take accurate decisions that contribute to the progress of the organization and solve complex problems. Therefore, organizations (institutions) began to adopt systems that support artificial intelligence, because it contributes to its rapid expansion, improves its ability to use data to make predictions, and reduces the cost of making predictions. A Gartner survey showed that "59% of organizations are still collecting information to build their AI strategy" (Panetta, 2018).
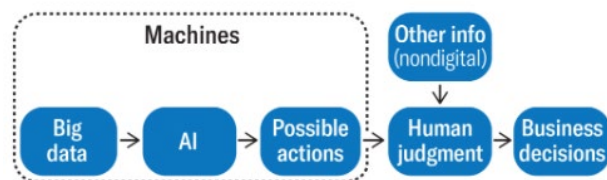
Artificial intelligence affects decision making. For example, administrative decision-making. When corporate managers make administrative decisions, they predict possible options by collecting and evaluating all information (data) and make decisions with the aim of increasing their economic returns. This requires work, effort and a long time, and the decision may not be accurate and not beneficial. Instead, they can rely on the inference process, as it is a simple decision-making process that uses a small part of the information (data) available and is done through artificial intelligence. Research on managerial decision-making has also shown that consistently optimal decision-making is difficult for two reasons (cognitive biases and limited rationality).

Information technology literature provides solutions for decision-making, such as the use of modern information technologies. The researchers also proved that information technology contributes to increasing productivity in companies, because it improves the company's ability to collect, analyze and process data for accurate decision-making. And modern information technologies, when used, help increase the accuracy of the data used in decision-making and play a role in decision-making at the individual and organizational levels. Companies that make decisions based on data increase their financial returns and increase productivity.

The researchers continued to expand the scope to include the adoption and use of artificial intelligence and not to stay on modern information technologies, because all of the progress in artificial intelligence and the development in machine learning and deep learning algorithms contribute to avoiding the occurrence of errors resulting from human judgments and decisions. The algorithms of artificial intelligence and the algorithms of modern information technologies also differ for a number of reasons. First, AI can, through self-learning, improve performance by making inferences on new data based on deep learning. Secondly, AI can get very accurate predictions and judgments, and with the increase in the number of training sessions and the amount of big data, its accuracy increases. The researchers found that AI is capable of performing higher-level cognitive tasks such as making a legal decision. From this standpoint, organizations began to use artificial intelligence algorithms. First, for tasks that need accurate

decisions and judgments, improvement and allocation of valuable resources, for analyzing employee performance, and for designing work schedules. Secondly, to reduce costs, because artificial intelligence helps in the human decision-making process, by evaluating at a broader level of options and making a more accurate assessment of the options available at the lowest cost. Third, to educate and train human professionals and improve the quality of their decisions in the event that artificial intelligence performs higher than human performance and provided that the tasks are complex or uncertain.

Artificial intelligence and human processors complement each other in organizations. This is because not all tasks can be performed by artificial intelligence the same as humans. Where there are many business decisions that do not depend only on the organization's data, but rather need vision data, company strategies, and knowledge of market conditions, and this information is only available in human minds. Artificial intelligence can be used to generate capabilities that help humans choose the best alternative in light of additional information. To take advantage of artificial intelligence and human processors in the workflow, better decisions can be taken to develop and advance the work more efficiently (Colson, 2021).

Figure 1. A decision-making model that combines artificial intelligence and human power at work. https://hbr.org/2019/07/what-ai-driven-decision-making-looks-like

Effects resulted due to the use of artificial intelligence and machine learning techniques in the period of the Corona Covid-19 pandemic. As it helped provide treatment and clinical diagnosis, and this helped reduce the time to control the epidemic. And since artificial intelligence is able to obtain characteristics, this also helped. Artificial intelligence technology was used to examine the Corona virus, by classifying patients' photos and finding the possibility of infection with the virus. I also use the data to detect the coronavirus (Almotairi et al., 2023).

Methodology

The research revolves around the issue of decision-making driven by artificial intelligence and its prevalence at the present time. At first, I could not understand it. To obtain more information that helps to understand it, I searched for sites, articles, and previous researches that discuss, explain, and analyze this topic. This helped me clarify the main idea that I adopted to write the research paper requirements and gain some important information, such as what is meant by artificial intelligence-driven decision-making, the benefits of using artificial intelligence for decision-making in organizations now, and the results of its use in organizations. I also did an interview with one of the employees who were working before using artificial intelligence and after using it in the organization to benefit more and get answers to the questions that were in my mind and also know the change that occurred after using artificial intelligence for decision-making in the organization. And what I found is that decision-making driven by artificial intelligence caused a qualitative shift in the organization and was the reason for increasing the financial rate, increasing productivity, and obtaining quick solutions to complex problems.

In the current era, big data has a major role in the development and progress of artificial intelligence. Because of its effects on computing and information systems, so I mentioned it in the research for its great role in decision-making in organizations. I also added in the research the effects of using artificial intelligence for decision-making during the Corona pandemic period.

Results and Conclusion

This paper discusses the current trend of decision-making driven by artificial intelligence (technology) in organizations. And the extent of the use of artificial intelligence for decision-making in organizations all over the world. And what I have reached is that with the advent of big data, it is necessary to use artificial intelligence because it works to help organizations improve decision-making, accuracy, and effectiveness. It also works to process and analyze data accurately and works to solve complex problems that the human mind cannot solve quickly and accurately. How many researchers have proven that decision-making using artificial intelligence is the best application of artificial intelligence, due to its ability to conduct analyzes of big data without errors resulting from human judgments and decisions. Therefore, organizations began to use it to make their decisions and to increase their productivity and improve their performance.

It is important to use artificial intelligence to make decisions in organizations because of its benefits to the organization, such as improving the performance of the organization and increasing its economic returns. And benefits accrue to the employees of the organization such as learning and training to improve the quality of their decisions. And I recommend the owners of companies and institutions to build their own strategy for artificial intelligence to reach their goals without obstacles.

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