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Expert Systems for Emulating the Decision- Making Ability of a Human Expert

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Abstract

Expert systems are a type of technology that supports an organization to identify the challenges of a project and help the organization to take effective steps to resolve the challenges. The research study is based on the utilization of expert systems on the decision-making ability of human experts. The research study has adopted a positivist research philosophy, exploratory research design, and deductive research approach to mitigate the research objectives. On the other hand, the research study has been done through the implication of a secondary quantitative data collection method. Based on the secondary quantitative research study, the study has shown the potential impact of an expert system on the decision-making ability of human experts. This research study has explained the way expert systems are creating a positive influence on the operational efficiency of an organization and the utilization of expert systems has also enhanced the decision-making ability of human exports up to 42%. Moreover, the implication of expert systems is beneficial for providing growth in business.

Keywords

Artificial Intelligence, Expert Systems, Human Experts, Project, Technology.

INTRODUCTION

Presently, the utilization of expert systems or enhanced infrastructure of the expert system has created a positive influence on the decision-making process of human experts. Moreover, the utilization of the expert system also supports the human experts to allocate the resources in the different parts of the organization. On the other hand, expert systems also enhance the knowledge of a project by highlighting the project goals and timeline. As a result, that supports the organization as well as the human experts to take effective decision making to enhance the efficiency of the project. Moreover, an effective experts system such as ***MYCIN*** can support the human experts to identify the bacteria or virus in the cloud system that helps them to take effective steps to prevent the issue. Here in this research study, a brief overview will be provided on the impact of an expert system on the decision-making ability of a human expert. *The aim of this research study is to evaluate the impact of the expert's system, on the decision-making ability of the human experts.*

The concept of an expert system and its benefits

In the context of artificial intelligence, expert systems are one of the commonly used technologies in every organization to enhance the efficiency level of the decision-making process of human experts. As per the words of Yazdi *et al.* (2019), expert systems are designed in a way that can easily identify the factors of ongoing or a future project that might create a negative influence on the project outcome. Therefore, the implication of expert systems can support the human experts to make effective decision making that will support the organization to mitigate the projected issue of a project. In today's competitive world the utilization of expert systems is one of the most essential components in the success of an eerie business organization. As per the words of Leo Kumar (2019), the usage of expert systems supports an organization by enhancing the decision-making process of the organization, which creates a positive impact on the performance as well as the project outcomes. In addition, the utilization of an expert system also supports an organization to identify the risks and challenges of a project.[5][12]

That helps the human experts to take effective decision making to mitigate the challenges and risk that has been identified by the utilization of expert systems. On the other hand, according to the words of Muhammad and Algehyne (2021), organizations with effective expert systems are performing 65% more effectively in the international market, than the organizations that are not connected with the expert system. Moreover, organizations with highly effective expert systems can enhance their productivity as well as the quality of their product by enhancing efficient levels of knowledge and resource management.[6]

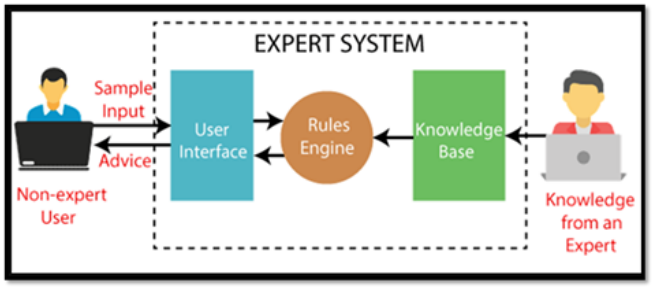

Figure 1: Benefits of Expert System [11]

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According to the words of Triantaphyllou (2019), the utilization of expert systems in organizations can enhance the activity of human experts. Since the utilization of expert systems has created a positive impact on the efficiency level of the human experts by 42%. However, the utilization of this experts system can also support the human experts to take effective decisions to maintain the productivity of the organization by allocating proper resources and analyzing the risk factors. On the other hand, by increasing the decision-making ability of the human experts, the expert's system can enhance the project outcome by 93% (Triantaphyllou, 2019). Therefore, through the findings, it can be easily stated that the inclusion of these expert systems can be a beneficial factor in an organization, in order to support the decision-making ability of human experts.[11]

Impact of an expert system on the decision-making ability of a human expert

In the competitive world, the impact of the utilization of an effective experts system is massive. As it enhances the decision-making process of the human experts that support them to take effective decisions to enhance the project outcomes, by preventing the challenges and issues that have been identified by the utilization of effective expert systems. As per the words of Garcia-de-Prado *et al.* (2017), in recent times, several effective expert systems have been introduced to the world that can take an effective part in the success of an organization. In the year 2015, the ***CADET*** has been introduced in business organizations to enhance the efficiency level of the organization. ***CADET*** is an expert system that supports human experts to identify cancer (challenges and risk) of a project. As a result, that supports the human expert, as well as the organization to take effective steps to prevent the challenges in the project in order to achieve the project goals.[2]

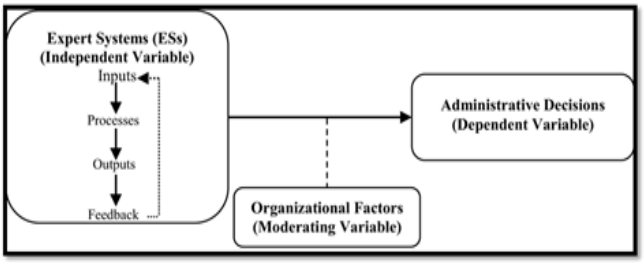

Figure 2: Impact of an expert system on the decision-making ability of a human expert [1]

On the other hand, as per the words of de Diego *et al.* (2019), the implication of this experts system can support the human experts to take effective decisions to enhance the performance of the organization by taking quick and robust decisions. However, in India, organizations such as ***TATA and Reliance*** are utilizing expert systems to enhance the efficiency level of both organizations[1].

According to the ***annual report of TATA,*** the utilization of the expert system has enhanced the efficiency of ***TATA motors*** by reducing manpower and by recommending effective decision-making. On the other hand, ***Reliance*** is utilizing the expert's system to provide a 360-degree service across the international markets, where they are operating. However, while considering the positive impact of expert systems, there are also some negative influences on the utilization of expert systems. According to the words of Rodger (2019), the utilization of these expert systems can reduce the productivity of an organization by reducing the flexibility and the ability to change the decision-making process. On the other hand, it also creates a negative impact on the innovation process of an organization by reducing the creative responses of human experts. Therefore, by analyzing the collected data about the utilization of expert systems it can be easily stated that the utilization of expert systems can create a positive impact on the decision-making ability of human experts.[8]

METHODS AND MATERIALS

In order to demonstrate the ideology of the collected data and verify the collected data, this research study has implicated the ***positivism research philosophy.*** According to the words of Ryan (2018), the implication of positivism research philosophy and helps the researcher to gain sustainable information about the research topic that helps them to identify the importance of expert systems to enhance the decision-making ability of a human expert. On the other hand, in order to accomplish the research objectives, this research study has utilized an ***exploratory research design*** instead of ***a descriptive or explanatory research design***. As per the words of Jardim *et al.* (2021), the utilization of exploratory research design supports the researcher to give just about the purpose of doing the research. Once the research objectives have been justified, the research study has utilized a deductive research approach to demonstrate the relationship between the expert system and the decision-making ability of human experts.[3][9]

Instead of focusing on logical induction to establish an innovative assumption based on current conceptions and practices, the research study has adopted a ***deductive research approach***. In addition, the utilization of the deductive research approach in this research study has supported the researcher to evaluate and recommended an effective hypothesis that helps the researcher to demonstrate the purpose of this research study. On the other hand, the research study has utilized a ***secondary quantitative method*** of data collection that helps the research study to gather sufficient data from graphs and tables from the verified website and scholarly articles. Moreover, the secondary source of data collection has been collected from journals, scholarly and peer review articles from 2017 to 2021.

RESULT AND DISCUSSION

In the current circumstances of the international market, the utilization of effective expert systems has enhanced the performance of the organizations through enhancing the decision-making ability of human persons. In this part of the research study, a critical analysis will be provided on the

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impact of expert systems on the decision-making ability of human experts. In recent times, almost every organization is investing in expert systems to enhance the performance of the organization. According to the words of Jin *et al.* (2020), an organization with an effective artificial intelligence system is 38% more effective than an organization without expert systems[4][10].

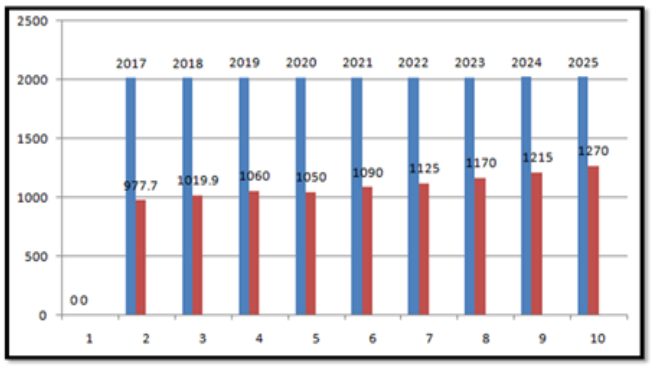

Figure 3: revenue of the business organization through the utilization of expert systems (Source: MS.Excel)

In the figure number 3, it has been demonstrated that the organizations with efficient expert systems can enhance their revenue up to 1270 billion USD by the end of 2025. As per the words of Nguyen and Bui (2019), along with the revenue the utilization of an effective expert system can also enhance the decision making process and other factors of an organization that can enhance the operational efficiency of the organization. The beneficial factor of the utilization of expert systems will be demonstrated in the figure number 4.[7]

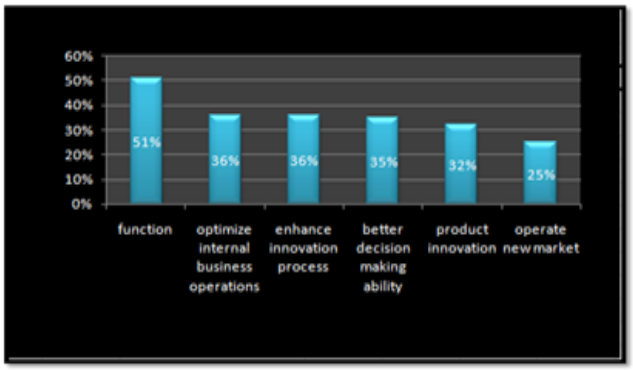

Figure 4: Impact of AI on the operational efficiency (Source: MS.Excel)

The figure number 4 has provided a sustainable viewpoint about the beneficial impact of AI technology on the operational efficiency of an organization. Through the graph it can be easily understood that the utilization of these expert systems has created a positive impact on the decision making ability of the human experts. Therefore, through the findings it can be easily stated that the implication of expert systems has created a positive influence on the decision making ability as well as the operational efficiency of an organization.

CONCLUSION

The research study has successfully demonstrated the impact of expert systems on the decision making ability of the human experts. Therefore, using an expert system is beneficial to identify the challenges and risks of a project, and helps the human experts to take effective steps in order to prevent the challenges. However, the research study has also explained the way international organizations such as TATA and Reliance are utilizing the expert systems to enhance the operational efficiency of their organization.

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