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How Artificial Intelligence Can Help Project Managers

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Abstract- In this research work, it has been analysed that how artificial intelligence can help the project managers to manage the work. AI research is basically defined as the research that is done on different intelligence agents. It is a device that helps in perceiving the environment and helps in taking such actions that increases the chance to attain the goals. The artificial intelligence is now used within different fields. One of its finest applications is in the field of project management. Project Management AI is basically a system that can administer different projects without many resources. It does not require more input or cost. Through using the power of artificial intelligence, the tasks can be done automatically. AI also helps in making decisions associated with the projects and it helps in identifying the skills and capabilities of team members involved within a project. Project Management AI helps in fostering a safer environment It also helps in delivering untiring vigilance and objectivity. Moreover, Project Management AI is used for the development of an eco-system for managing the knowledge. Artificial intelligence provides assistance to project managers in many ways.

Keywords: *project managers, artificial intelligence, ecosystem, foster.*

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How Artificial Intelligence Can Help Project Managers

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Abstract- In this research work, it has been analysed that how artificial intelligence can help the project managers to manage the work. AI research is basically defined as the research that is done on different intelligence agents. It is a device that helps in perceiving the environment and helps in taking such actions that increases the chance to attain the goals. The artificial intelligence is now used within different fields. One of its finest applications is in the field of project management. Project Management AI is basically a system that can administer different projects without many resources. It does not require more input or cost. Through using the power of artificial intelligence, the tasks can be done automatically. AI also helps in making decisions associated with the projects and it helps in identifying the skills and capabilities of team members involved within a project. Project Management AI helps in fostering a safer environment. It also helps in delivering untiring vigilance and objectivity. Moreover, Project Management AI is used for the development of an eco-system for managing the knowledge. Artificial intelligence provides assistance to project managers in many ways. It provides number of tools such as Chatbots, Stratejos, ZiveBox, Rescoper, ClickUp, Clarizen and PolyOne. All of these tools prove to be helpful for the project managers to handle different tasks like through providing assistance to managers to make up the team and to assign the projects to particular team members. These tools also provide assistance to project managers to manage the deadlines in an effective way. The use of Artificial intelligence provides number of benefits to the project managers. The very important benefit is the support, as the pressure and burden over the project manager gets decremented by making the use of machines. Moreover, use of AI also provides more accurate results to the project managers. The tasks that are done using AI tend to be free of errors and mistakes. Along with it, the AI also provides project managers with the insights and strategies. For instance, it alerts the project managers to take some additional or alternative steps for handling the complicated projects. AI does not only assist the project managers to handle the tasks, but it also increases the productivity of project managers at individual level. AI helps the project managers to eliminate information bias. It increases the productivity of project managers by making them more creative and to have more emotional intelligence.

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I. Introduction

Computing technology tends to make the life easier for all of the individuals, it also adds up more convenience to all types of processes that else may need human effort and time. Through artificial intelligence (AI) that involves the capabilities of decision-making and machine learning generally ascribed to humans, this is particularly the next step of evolution and underway (a Collaborative et al., 2018). The use of AI has been made to change the mundane and repetitive tasks, particularly in different assembly line processes. The development of AI has been done for different objectives like for management of cyber-security concerns, diagnosis of medical conditions and in order to track the wildlife. However, the major counterpoint to the revolution of AI is the fear that one day AI can even surpass the contributions of humans within the workforce. It can even take such jobs that the individuals perform. AI will surely take over most of the time-taking tasks; this will allow the workers to get free and to do some other important tasks that cannot be managed by computers. When it comes to project management and artificial management, more of the advancements have been made and still much other advancement is on the way. Now AI is getting entered into the community of practice of project management and individuals tend to have more interest in the given topic. AI is used within different fields; the major field is the field of project management. There are number of ways in which AI helps project managers (Chou et al., 2015). The common description of AI is basically intelligence that the machines show. From the perspective of project management, the machine can actually copy the cognitive functions linked with the project manager's minds like problem solving and decision making. The AI principles are being used in search engines and speech recognition system like Siri and Google Search. Self-driven cars make the use of concepts of AI as do the simulation exercises of military and networks of content delivery. Now the computers can defeat most of the individuals in strategic games like chess. The overall objective of AI is to develop such machinery and computers that can work in the best possible way. This needs the usage of optimization strategies, computational intelligence and statistical methods. According to Bond and Gasser (2014), the programming for such strategies of AI does not only need the interpretation of technology but it also involves the interpretation of neuroscience, linguistics and psychology. The question related to the AI's usage is whether project manager's mind can be defined precisely so that its simulation can be done with the help

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of the techniques as given above. This can be accomplished in some time and there is more hope due to the use of faster computers, enhancement in technology of machine learning and use of cloud computing. In the given research, it will be analyzed that how AI helps project managers. It is important to analyze this particular topic because of the reason that now it is an age of advancement, now more of the developments have been done in the field of project management. As the project managers perform very important tasks, therefore the tasks of project managers should be done in an efficient way. Within the technological era, some techniques have been designed that can help the project managers (Ziuziaoski et al., 2014). Therefore, in this research, the attempt has been made to analyse the assistance provided to project managers by AI. In the given research, there are six sections. In the first section it has been analysed that what basically project management AI is. It has been analysed through identifying that how Artificial intelligence provides assistance in the field of project management. In Section II, a general observation has been made that how AI helps the project managers. In Section III, different tools have been analysed that can provide assistance to project managers. In Section IV, it has been identified that what are the associated benefits of using the tools for project management. In Section V, the outcomes of the assistance have been analysed like how the help of AI can increase the productivity of project managers. In Section VI, some of the risks associated with the use of AI in project management have been analysed.

II. Literature Review

Project Management AI

Project management AI is basically an integrated system that can do the administration of projects without needing the input. Through the artificial intelligence power, the tasks cannot be automated, but will infer different insights for making the recommendations to process, to make decisions related to project and to unveil the insights of team (Cappelli et al., 2018). For instance, there will be technology or there will be a particular technology in the future that will have the capability for matching the right kind of resource to the appropriate role. HR managers are making more investment in the technology for making improvement in the processes of hiring. Organisations that have used AI for the purpose of recruitment have seen increment in performance by around 20 percent (Chou et al., 2015). Improvement in revenues has been seen to get incremented by around 4 percent, and this rate of turnover has got decremented by around 35 percent (Cappelli et al., 2018). All of this automatically decreases the idle time of individuals. Now the project managers are not required to make more efforts. Through AI, now project managers can learn the cadence of output of team members and can even do the assignment of regular work dependent on the ability of individuals. It can also help in creating an ecosystem for the management of knowledge. When an employee leaves the organisation, the one takes discrete figure of non-transferable interpretation of role. According to Conforto et al. (2016), the AI for project management can be used for aggregating the workplace behavioral patterns and it also does the centralization of knowledge of worker for making improvement in the quality and consistency.

a) Create an Ecosystem for Knowledge-Management

The project management AI can also be used for aggregating different workplace behavioral patterns and it is used for centralizing the knowledge of worker to make improvement in quality and consistency (Cappelli et al., 2018). It also helps in making prevention from reinventing something, when some changes are seen. However, this function is still more theoretical, but it will become affordable and available to the businesses present at enterprise-level in the coming year.

b) Foster a Safe Environment

For projects that own different conditions of working, AI can do the detection of invisible warning signs that affect the likelihood of accident while doing projects. For instance, a construction project management Artificial Intelligence could see the performance of equipment, unsafe environment at work, can employee different facial expresseions for predicting performance, quality of air and can alert the parties for preventing some accidents (Costantino et al., 2015).

c) Deliver Untiring Objectivity and Vigilance

While project managers can cause more fatigue when identifying the deliverable for quality and accuracy, the systems of AI does not get tired and it does not make any excuses or compromises as it get burned out over the project. However, there is no such system that does the integration of all of such features. However, project managers will mainly encounter the job-altering AI advantages of project management (Charniak et al., 2014). There are not large numbers of tools of project management associated with Artificial intelligence; it is an industry that has been seen as slower to get into the umbrella of artificial intelligence and machine learning.

III. Methodology

The research methods that have been used for conducting this study have been described here. The major rationale behind choosing the particular methods of research is given in this chapter. Along with it, this chapter also gives detailed description of methods of research that have been used therefore this research can be replicated in an effective manner.

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a) Research Methods

There are two kinds of research methods. These two kinds of research methods are termed as qualitative research and quantitative research method. In quantitative method of research, numerical data is used for doing mathematical analysis. On the other hand, qualitative method of research includes expressions, words and opinions. The qualitative method of research has been used in the current research for analysing that how AI helps project managers. According to Mackey and Gass (2015), the qualitative research methods are used for doing exploratory research. The major reason behind making the use of qualitative method of research is that through using such method, the interpretation of motivations, opinions and reasons become possible. It assists in solving the problem and also assists to develop the hypotheses or ideas for quantitative study. It is seen more involved for detailed interpretation of issue of research with other significant trends in ideas and perspectives. The research has used this particular method, as it assisted in capturing expressive information like values, motivation, underlying conducts, feelings and beliefs that were not possible through using quantitative methods of research.

b) Data Collection- Secondary

The data that does not own any prior collection and is utilized for the first time is termed as the primary data. However, data that some other investigator or researcher has already collected is termed as secondary data. Secondary data collection method has been chosen for the current research. According to Silverman (2016), the most common data collection method is secondary method of data collection. It involves such data that is collected already through others. According to Silverman (2016), secondary data collection methods are used in order to do the research with lower costs. For this research primary data has not been used as it is very expensive as every team member or researcher is then required to start the research from the scratch, choosing the participants, doing search and getting materials (Ledford and Gast, 2018). Therefore, because of this, secondary data collection method has been used in order to analyse that how AI helps project managers.

c) Sources of Secondary Data

There are different resources present to access the data required for literature review. However, the current research is dependent over peer view journals and other books.

i. *Journal articles*

The collection of opinions, ideas and thoughts done by different authors in order to analyse the issues of research is termed as journal articles. Journal articles help in increasing knowledge related to the given topic. Journal articles also increase the knowledge related to different ideas of various authors (Ledford and Gast, 2018). Therefore, for this research, journal articles have been used.

ii. *Books*

Through books, deep thinking and active reading is promoted. Books give more knowledge that assist individuals in doing analysis (Silverman¸2016). Therefore, for the given research, different books have been read and referred.

iii. *Research procedure*

According to Makar et al. (2015), this research initiates with the planning of review that has been done for collecting secondary data. In the planning stage, dependent on objective, the review protocol has been developed where decision is made that how data collection should be done. Different research papers have been used too.

IV. Analysis

Tools Provided by AI to Project Managers

There are different tools that are provided by Artificial Intelligence, project managers can use these tools for getting more assistance.

a) Chatbots

The most prominent work that has been done in the field of artificial intelligence is Chatbots (Danysz et al., 2018). For instance, Redbooth and Cisco Spark made the team with Api.ai platform for creating a bot of messaging that helped in asking team members different things like 'What is urgent?, 'Show that what the team is working on?' and 'What is happening at this day?'.

b) Strategies

There is another tool that project managers can use for assistance like Strategies. Strategies gives a same function to development team of Agile software as integration of Slack. These similar types of Siri-like tools can become even more prevalent in the coming years.

c) Zivebox

There are some heavier software platforms for project management with the functionality of AI as the backend of systems. There is a digital workforce tool termed as ZiveBox, this tool owns more of the features related to project management, ZiveBox makes the use of AI for determining that in what time period the task will be completed. It also helps in analysing the productivity of every member of team and it helps in sorting through the communication databases at enterprise-level (Flick, 2015).

d) Rescoper

There is another tool named as Rescoper. The given platform assists in handling the tedious management parts so that the team stays more targeted

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over the outcomes. The given platform tells that what the AI-based software should do. The project management software changes the point of view of users so that it gets tailored for the particular settings of permissions (Kyriklidi and Dounias, 2016). It helps in scheduling the tasks dependent on duration of tasks and workload. It also gives alerts for if the system thinks that the project will run into some trouble or if it will be handled within the given budget.

e) Clickup

There is another tool ClickUp. This is basically a Project Management tool that has just come to the market. This tool is mainly one-of-type in the software industry and is mainly used in project management. In accordance with Glesne (2015), the algorithms used in ClickUp help in predicting the best member of team for some particular task and helps in assigning the tasks then. It helps in tagging users in comments dependent on the contexts that are more relevant. It also helps in visualizing updates and notifications. It also helps in predicting such deadlines that cannot be met. It also helps in making correct time estimates of specific tasks. As ClickUp has actually leaded the charge, now more of the software for project management is sure to get rise with robust functionality of AI.

f) Polydone

There is another tool Polydone, this tool is already seen as more effective. According to Ferreira et al. (2015), in the coming future, some extra machine learning and AI features will be added to this particular tool. The objective will be the automation of budget and time in an accurate manner.

g) Clarizen

AI owns the power for giving improved and new tools that can provide more advantages to the organisations in different manners and the project managers won't even have to wait in such cases. Through different products such as cloud-based management software project of Clarizen, the processes of business can be automated. The tracking and sharing of the data can be done. Moreover, the information can be accessed for making different decisions in customized workflows and even in real workplace for suiting the requirements (Glukhov et al., 2015). When it comes to the concept of project management and AI, the only thing is 'gain'.

V. Findings

Assistance to Project Managers

There are some of the AI applications that can help project managers in the coming future. The development in some of the competing constraints and usage of traditional constraints will make the analysis of tradeoff more complicated. The use of concepts of AI will make the project managers life way easier than ever before. It was used to be taken for granted that constraints and assumptions provided to the individuals at project's onset remains more intact in the entire project life-cycle (Kłosowski and Gola, 2016). Today, it is known that this is not true and the tracking of all constraints and assumptions can be done in the entire life-cycle. AI provides assistance in this particular area. Executives particularly don't know that when the ones can intervene within a project. Today, most of the organizations make use of crises dashboards. Through looking at the crisis dashboards over the computers, the Executives can just see the projects that are facing different problems and that which of the metrics is not in the acceptable range and the ones can even identify the degree to which the project is critical. The practices of AI can tell about some immediate actions that the project managers should take and at what time (Kerzner, 2018). It results into decreasing the response time to some of the conditions that are out-of-tolerance level. Management basically does not identify that how much more work can be done or should be in the queue to be done without making an overburden over labor force. The addition of projects is basically done within queue with less regard for the required technology, skill level of the required forces and availability of resources. Practices of AI could permit the development of projects' portfolio that owns the best chance for increasing the value of business that an organization can get while identifying the effective practices for resource management. However, there are still some of the software algorithms for this; the optimization practices for project scheduling are still identified as the manual activity using error and trial strategies.

According to Kerzner (2018), effective practices of AI can make the optimization of schedules even more effective through identifying all of the future and current projects going on in the organisation rather than just considering some particular projects. More often, more pressure is made over the project managers for making rapid decisions dependent on the intuition rather than through step-by-step deduction utilized by computer. Nothing is generally just false or true, as the assumptions should be made. Basically, with more availability of information, lesser number of assumptions is made. Through sufficient database related to the particular information, the tools of AI can perform problem solving and reasoning dependent on the partial or incomplete information. Through the use of AI, future can be seen and it can also give the options that can increase the decision's value. When more information is given to tools of Artificial Intelligence, then the outcome value becomes greater (Makar et al., 2015). That is why, the initial point should be the consolidation of intellectual property of project management and the tools of AI should get the information access.

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VI. Advantages of the Tools Provided to Project Managers by AI

a) Support

The use of AI is made for the automation purposes by project managers for setting alerts and for managing the flow of work and to handle some repeatable procedures. The AI future includes the provision of support to the workforce through tacking some of the complicated approaches of workflows of project for spotting wasted time and for the evaluation of performance. According to Schwarz and Sánchez (2015), it also allows the quantification of results and it helps in doing analysis in an easier way. This information assists project managers in decision making processes that results into making more improvements in the future projects.

b) Accuracy

The entry of data is identified as notoriously patchy when it comes to the concept of project management. While some of the employees give minute details related to the time and tasks, others are identified as relatively less diligent. Artificial intelligence can be used in order to give more assistance dependent on the given data and it makes the users enough able to give more preside data (Ledford and Gast, 2018). This accuracy can assist the project managers to make avoidance from some of the costly setbacks.

c) Insight and Strategy

Computer technology has been seen more dependent over the automation and crunching and other repetitive tasks, but when referring to the idea of project management and artificial intelligence, individuals are seen balking to allow the machinery for taking over some of the complicated tasks. The project managers now get alerts when the due dates come closer, and it also permit the project managers to make up a team for the particular projects or to determine the tasks that can be assigned to the employees at daily basis (Vanhoucke et al., 2016). This is mainly identified as the course set for AI. These abilities of software and machine are seen to collate the data for the purpose of anticipation. There are different programs that are present in order to test different prototypes. Through the use of AI, the developers of software can run different tests over prototypes before the actual release of the prototypes. It can even help the project managers to decrease the total number of errors and to fines the experience of user prior to any launch.

VII. Increased Productivity of Project Managers

AI helps project managers to become more productive that what the ones actually are.

a) Eliminate Information Bias

Humans tend to be more emotional, and individuals let the personal biases and feelings to affect the decision even when the ones refer to numbers. Artificial Intelligence does own opinions. The results that are acquired by making the use of AI tend to be more accurate without human error or personal biasness.

b) Use Emotional Intelligence

Project managers often bogged down because of numbers and often ignore the management at human-side. Managers are required to manage and to leave the number-crunching for Artificial Intelligence, which can be sorted with the help of large amount of data. It helps in finding patterns better and faster as compared to humans. For instance, Watson of IBM can read around 22 million of text pages within 3 seconds (Wu et al., 2014). Now the focus can be regained over the human approaches of PM, such as the identification of appropriate and right kind of staffers for particular project. It helps in identifying tasks for each and every project and helps to monitor the actual progress. The numbers affect such decisions. However, some of the subjective considerations such as interpersonal links among different members are team are identified as being more significant (Vanhoucke et al., 2016). A project can look good in terms of finance; however it tends to be disaster when it gets stacked with such individuals who cannot do working with one another in an effective way. The most important thing is the emotional intelligence. AI provides the freedom for redirecting the energy and time required for the given significant considerations.

c) Be Creative

It should be identified that how and where Artificial Intelligence can assist the business and where the one needs to get in as an innovative manager of project. Artificial Intelligence is greater at making prediction of future outcome and trends when there is more data to work with. However, such predictions do not prove to be helpful when it can be used a little. For instance, identification of monthly profitability can be more accurate (Willems and Vanhoucke, 2015). This is the point where the project managers get the opportunity. Project managers use the resources for planning the future, which may even include more creativity. Through AI, individuals get the assistance which the ones need without the expense to hire full-time employee. This human-centric solutions result into underscoring the significant role of project managers.

The personal computers' ubiquity within the organisation has made the job of every individual easier and quicker. Instead of report writing over notepad and final copy typing over typewriter; now everything is done over Word or Google Drive (Walker, 2016). The similar is true for project management and AI. AI is such tool that

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helps in the management of project and helps in doing it more effectively and efficiently.

VIII. Limitations and Future Resear

The major limitation of this research is that it has not identified some of the risks that are associated with the research topic. It can be stated that AI provides more assistance to project manager, but on the same side, it also owns some major risks for project managers. Now-a-days the machines have transformed into more agile objects and are seen enough able to get adapted in the real time without even getting programmed particularly for some work (Wenger, 2014). According to Ziuziaoski et al. (2014), the machines have now been trained to deliver faster results, to do the analysis of larger sets of data and to provide accurate answers when compared with human beings. The outcome is that the good paying jobs of project management are getting replaced with the machines. Project managers most often do report that failures are seen within the projects because of breakdown of communication, therefore there seems the need to have some systems that can communicate with one another in an effective way through the use of AI. This can then be communicated further to the users [16]. Despite of large number of benefits, there also exists fear related to the use of AI within the organisation. The associated risks of use of AI for project managers have been discussed in this research. In the future research, the risks associated with the use of AI for project managers will be discussed in detail.

IX. Conclusion

In the end, it can be concluded that now this is the era of technological advancements. More of the technological advancements have been made within every field that has changed the lives of individuals. Now-a-days, the big data and data science are very common terms. Both of these involve the use of AI, so basically AI provides the backend. Artificial intelligence is basically a device that helps to make some perception related to the environment and it assists in taking such actions that can lead to the attainment of actual goals. The artificial intelligence is now used within various fields. Its applications are not confined to only one particular field. However, within the field of project management, there is broader use of AI. The Project management AI is basically a system that helps in doing the administration of different projects. It helps to handle various projects and through using the available resources. Project management AI helps in fostering a safer environment. Along with it, the use of project management AI is done for developing an eco-system that basically helps in doing the management of knowledge. AI provides greater assistance to project managers in different ways. It helps in doing different tasks using different tools. There are different tools available for the project managers like Chatbots, Strategjos, ZiveBox, Rescoper, ClickUp, Clarizen and Polydone. Chatbots help in identifying urgent tasks and the tasks that needs to be done currently and such other things. Straegios helps in developing agile models. Zivebox helps in identifying that in what particular time period, the task will get completed. The tool Rescoper helps the project managers to handle the tedious management parts. It also gives system alerts to the project managers and identify for if the project will be done within the given deadline or not. Clickup tool helps in predicting the total number of team members appropriate for the given project. Polyden tool helps in managing the time and budget of projects. The tool Clarizen allows easier sharing and tracking of data. The project managers have got more support, accuracy, insight and strategy by making the use of AI for projects. Moreover, it has also increased the productivity of project managers at individual levels. As the AI tools have assisted the project managers to become more emotionally intelligence, creative and to eliminate information bias. However, there are also some of the risks associated with it, as because of the incremented use of AI within the field of project management, there will be a time where there will be no need of project managers and machines will replace it. In the future research, these risks will be analysed.

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