The Impact of Artificial Intelligence on Project Management (a case Study of Human Resource Management)

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Abstract

It could be easily understood that most project managers have had problems in human resource management and in supplying physical resources. These managers have mostly dealt with artificial intelligence technologies and have considered it to be useful and utilized it in their daily activities. But when it is time to make vital decisions in projects, the project managers rely on the precision of their learning and their outlooks regarding the selection of the decisions. The introduction of artificial intelligence in professional and academic world of project management and the proposal of several resolutions based on using software could foster different tasks which were previously very time consuming and costly such as communication, supervision processes, data collection, data analysis, and many other variables. Furthermore, the exploitation of artificial intelligence technology in human resource management has had many challenges and advantages. The present study has tried to recognize the advantages of using artificial intelligence in human resource management. Artificial intelligence could easily be applied in all human resource processes. Currently, it is mostly used in recruitment processes, resume assessment, chatbots, and interviews. Many mega-corporations such as Microsoft, Google, and Uniliver have been using this technology in their companies during some recent years in order to apply and develop it.

Keywords: artificial intelligence, human resource management, advantages, managers

1. Introduction:

Using artificial intelligence in human resource management may be called the most astonishing event among recruitment scholars in the year 2018. The selection of artificial intelligence in human resource management can be called "a new era in human resources" in a way that artificial intelligence alters the usual and daily tasks carried out by human beings to change the recruitment business. Artificial intelligence can help us in enhancement of human resource processes such as recruitment, services compensation, training, and developing the staff, decision making prediction, staff's exit prediction, and many others in an organization.

The enhancement of human resource management efficiency through the use of artificial intelligence has been changed into an important process in developing the future human resource management trends (Jia and et al., 2018).

Some of the capabilities of artificial intelligence for human resource management are as follows:

1) Automated performance of repeated tasks and saving time and the appropriation of time for more strategic works

2) Video analysis of the applicants and recognition of their face states, stress, topic awareness, body language, and effective communication capability through deep

learning techniques and finally the selection of the best applicants for recruitment

3) Designing a supportive smart decision making system, using neural network techniques to create a just system for the assessment of wages and salary (Jia and et al., 2018).

Therefore, regarding the importance, utilization trend, and the development of artificial intelligence inhuman resource management in many organizations and the international companies, we have tried through the present research to review the documentations and utilize digital human resource management to investigate about advantages of using artificial intelligence in different processes of human resources using data based human resources, advantages and tools in artificial intelligence in human resources. The results of the present study can help us in recognizing the outstanding advantages of utilizing this technology in Iranian organizations and companies.
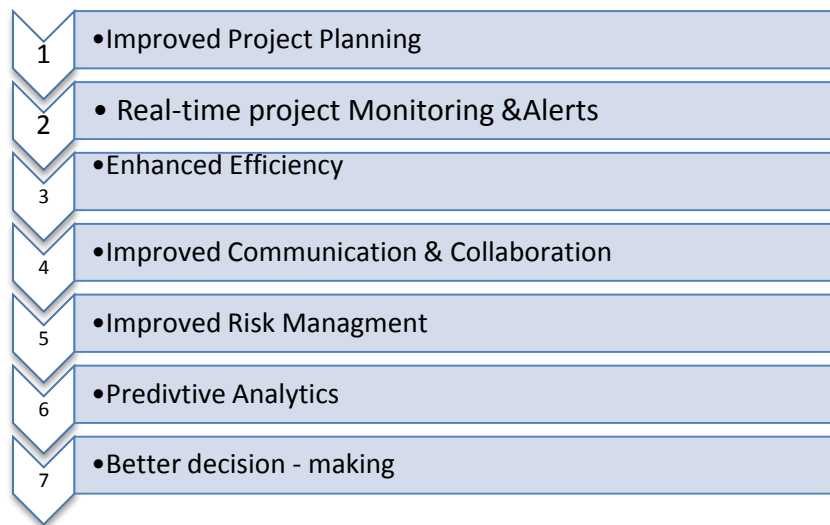
1	•Improved Project Planning
2	• Real-time project Monitoring &Alerts
3	•Enhanced Efficiency
4	•Improved Communication & Collaboration
5	•Improved Risk Managment
6	•Predivtive Analytics
7	•Better decision - making

Fig.1. Benefits of Artificial Intelligence in Project mangement

In this study we have dealt with a complete review of the application of artificial intelligence in recruitment, training, services compensation, future staff behavior prediction, talent management, and performance assessment.

2. Human resource management in team management using artificial intelligence:

To guarantee high throughput and output for each work team, the project manager should make sure that the appropriate training and merit development have been guaranteed for project team. This can be achieved through preparing online classes, couching sessions or instructions, or even in service training (Project Management Institute, 2017).

Communication is another important factor that should be included in team management because it lets the project manager to follow team development, to present in time and outstanding feedback, and also he can make sure that the team members get all required emotional and technical supports and cultivate their sacrifice (Project Management Institute, 2017). The inclusion of team members in decision making sessions and during team making activities can enhance relationships.

Fig.2. Systematization of artificial intelligence and project management

The creation of appropriate work environment to increase the satisfaction and performance of the staff and applying the required changes in the team are highly important in projects. The project managers can present the challenges and opportunities, feedback and in time support when required, and recognize and reward for good performance (Project Management Institute, 2017).

The study carried out by Thamhain (2004) showed that the appropriation of challenging professional tasks and the presentation of proper support for project teams increase their commitment and reduces communication obstacles and fight dangers and enhance the overall project team performance. Also the project manager should assess the development and quality of the works during team management because it provides an understanding of the weak points and strengths of a team or a member of a certain team.

3. Research Method:

The present study is a documentary review of the research carried out in the field regarding the advantages of using artificial intelligence in human resource printed in international journals. Based on the major goal in the present research

which deals with the identification of the advantages of artificial intelligence in human resource management, the studies carried out since 2017 and included in different databases were investigated (Wiley, Sage, Science Web, Google scholar, digital human resource (HR), Artificial Intelligence (AI) and human resource (HR)).

4. Findings:

Artificial intelligence exists everywhere. It includes smart and driverless vehicles to communication bots that talk with customers without the customers being informed that they are not talking with a human being (Gicopolos, 2019). Tom Stechora, the vice for talent recognition and individuals' analysis in IBM Company has explained artificial intelligence as: "it is a facilitator that helps us to present appropriate talent in time and achieve personality" (Gonul and Ginzig, 2018). From among the subcategories of artificial intelligence we can refer to machine learning, deep learning, natural language processing, and neural networks each of which can help us in some of human resource processes. According to the studies carried out in the field, 76 percent of organizations believe that artificial intelligence

has had a considerable effect on workforce absorption and this has resulted in artificial intelligence being considered as a necessary tool in human resource (Permanat and Choly, 2020). The use of artificial intelligence in human resource is different from what is done in reality. This technology helps human beings to understand staff instead of controlling them. This technology can lead to higher yields and greater satisfaction of the staff and reduces their job leave (Gicopolos, 2019).

4.1. Absorption of talented staff

Increasing yield and carrying out activities rapidly and with high quality are among the major advantages of artificial intelligence in human resource (Hug, 2019). Some other advantages of using artificial intelligence in human resource management include: increasing job commitment of the staff, reduction of bias in decision makings, staff exit rate prediction, the achievement of precise results in works (Yawalkar, 2019). Through the use of technologies based on artificial intelligence we can collect data required very fast and adjust ourselves with the organization's requirements and propose appropriate suggestions based on the data (Jiang and et al., 2019). Artificial intelligence presents two outputs for the organization: the decisions and the solutions based on the rich data received (Wan Crug, 2018). It should be noted that artificial intelligence would present its highest capability when ethical and humane issues are observed and supervised. Still human beings make the final decisions (Gulliford and Dickson, 2019).

In table 1, some of the advantages of artificial intelligence in human resource management have been presented:

Table 1: Advantages of artificial intelligence in human resource management (Oracle Company, 2019)

Resource finding	- Finding the best recruitment applicants using machine learning algorithms and the adjustment of conditions for the job and the applicant - Suggestion of the best jobs to applicants looking for a job - Prediction of applicant's performance based on the data
Screening and interview	- The applicants are able to change the interview time and get interviewed in an appropriate time. Also they are able to share information, writings and whatever they need. - It helps managers to avoid forgetting the interview time and have access to the applicants' data. Also it helps them adjust their questions based on the data related to the previous applicants.
Selection	- It helps managers to compare the job applicants with those who are currently working in the organization and to make the best decision. Artificial intelligence does not make the final decision. - Artificial intelligence techniques help managers to predict the probability of acceptance, rejection, and ongoing job opportunities by the job applicants.
Acquaintance and skill achievement	- Deletion of manual human resource processes such receipt of documents, presentation of information and organizational policies and the data gained from the documents investigated. - The digital assistant for a newly employed individual in the form of a 24 hour assistant - The supply and presentation of required training to an individual to increase yield

4.2.   Artificial intelligence in recruitment:

The recruitment process has encountered lots of changes throughout the history. Until 1990s, the traditional recruitment methods were used in organizations which required spending lots of time and money. In this era the organizations broadcasted in newspapers to absorb personnel or tried to absorb work forces through the friends of organizations' staff. From mid 1990s on the process of recruitment took another form which is literally called digital recruitment. The digital recruitment has gone through two stages up to now and is located in third stage as follows:

Digital recruitment 1: This stage was started in mid 1990s along with the use of internet. In this period, organizations used websites such as Monster to broadcast recruitment advertisements to absorb new staff. These ads in websites had some advantages both for the employers and the applicants. For example, the employers could broadcast their ads more rapidly and with lower costs and could receive many resumes. Also the applicants could refer to websites to select the best job positions appropriate for themselves.

Digital recruitment 2: This stage started 10 years after Digital recruitment 1**.** There were two major characteristics attributed to this period: first, different jobs could be proposed using the same environment and it led to the emergence of indeed. Through such instruments the applicants could see all job opportunities without physical presence and through searching different websites and the employers could have access to the appropriate workforce. The second characteristic of this period is the advent and use of social media. The social media called Linkdin was created in this stage and in year 2003.

Social media let individuals to communicate with each other and create new opportunities through sharing their interests, styles, job opportunities, and many other things. This period started in 2010 and ended in 2015.

Digital recruitment 3: The major characteristic of this period is the use of artificial intelligence in recruitment process which is greatly noticed from the year 2015 onwards (Black and Wan H., 2020).

Artificial intelligence can screen a great deal of resumes related to recruit applicants. This activity compared to the traditional method used by human beings could screen the applications in shorter time periods and more effectively. The use of this method could minimize the probable errors such as the deletion of talented applicants. For example, to employ 74 persons for the position of civil engineer in the ministry of labors in Malaysia, 17000 resumes were sent by the applicants and the artificial intelligence selected only 2575 applicants to be invited for the interview. Imagine how much time was needed to evaluate this amount of resumes using the traditional and manual methods (Wan and Roshidi, 2019). Paradox Start Up Company has produced a chat bot called Olivia and presents some information for the recruitmentof applicants regarding the needed jobs, skills, and the interview times (Palmo, 2019).

Based on one of the applicant recognition tools using artificial intelligence, the recruitment ads and the resumes are adjusted and a report is prepared to give the employers.

Chat bots (communication bots) can create a novel experience for the organization, specifically for new staffs. The new staff carry out the tasks required in their first working week through the use of artificial intelligence. Also they could learn about who to be connected with through it. Furthermore, they receive new data through chat bots and report their problems with the related authorities. Moreover, the approval of their off times and getting knowledge about

performance assessment indexes could be carried out through this method (EY Institution, 2018).

Also chat bots can be used to teach the staffs who are not native and don't know the language of the organization.

Chat bots are computer programs that communicate with people through Natural Language Processing (NLP) and can work all 7 days of the week and 24 hours a day. Some of the advantages of chat bots are as follows:

1) Communication with recruitment applicants and answering common questions

2) Rapid responses to the applicants and access to their data

3) The recognition and isolation of qualified applicants from among others

4) Companies can create databases comprised of data related to the applicants and communicate with them in proper times and propose jobs to them.

5) They can inform the applicants about whether they are accepted or rejected through the recruitment process

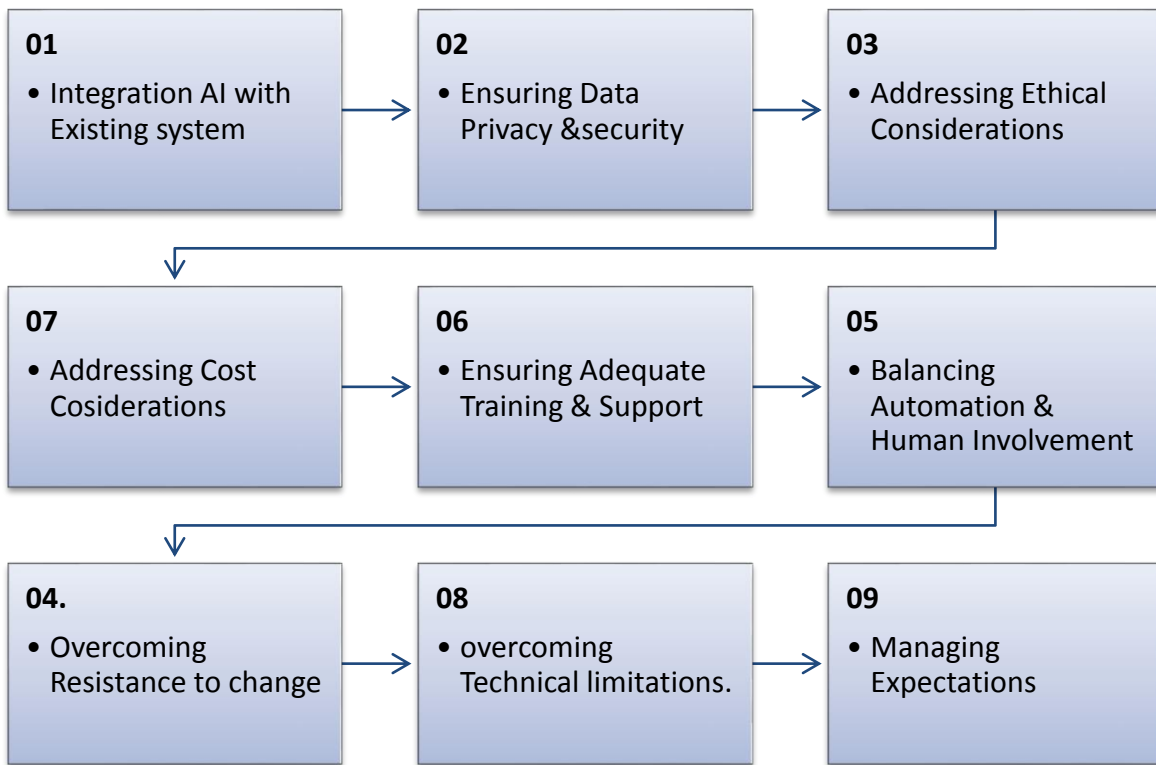6) They can adjust interview times for the applicants (Navaz and Gomez, 2019).

01
• Integration AI with Existing system

02
• Ensuring Data Privacy &security

03
• Addressing Ethical Considerations

07
• Addressing Cost Cosiderations

06
• Ensuring Adequate Training & Support

05
• Balancing Automation & Human Involvement

04.
• Overcoming Resistance to change

08
• overcoming Technical limitations.

09
• Managing Expectations

Fig.3. Challenges of AI in Project Management – authors

4.3. Using artificial intelligence in performance assessment:

Artificial intelligence can help the organization in creating a system to present feedback.

Artificial intelligence can identify measureable goals for each staff, foster the process of receiving their viewpoints permanently. Also the staff can record all their suggestions, criticisms, and worries in an online view recording system

and this can lead to be able to predict the amount of commitment to the job on the part of the staff in current and future times and their performances through analyzing the data in this system (George and Runny Thomas, 2019).

Through the use of artificial intelligence technologies, we can record and investigate about individuals' daily performance unlike the traditional performance assessment which usually was done annually (Navaz and Gomez, 2019).

On the whole, it can be claimed that the application of artificial intelligence in staff performance management could have the following advantages:

1) the data utilized in performance assessment are collected from different resources
2) staffs' performance is assessed when needed and without any delays
3) psychological biases are deleted
4) gender discrimination is reduced (Hashmi and Baig, 2020).

One of the trustable platforms in management is Synergita which is used to assess staffs' performance such as their performance assessment to create more cooperation of the staffs and to improve efficiency and yield at work place.

4.4. Artificial intelligence in talent management:

Human assets play a vital role in gaining permanent competitive merits in any organization. Thus, the absorption of talented workforces is known as the most important process in human resource management. Organizations know about this issue that a considerable amount of their competitive merits depend on the presence of talented individuals in the organization (Kolcareni and Ch., 2019).

Employing qualified and talented individuals in sensitive job positions and important posts in organizations seems a necessary task. The organizations manage the talents to select talented individuals for vital positions in the organization and try to pave the way through it to achieve organizational goals. Artificial intelligence technology helps the organization to choose the best individuals from among the applicants. It also excludes a number of individuals to focus on more talented applicants (Abdoldaim and Aldawalimi, 2020).

4.5. Artificial intelligence in human resource training:

Organizations permanently seek for staffs who accomplish their responsibilities in the highest possible level and consider up to date training programs to achieve this. Also the staff are required to enhance their knowledge and skills to do their duties better. Artificial intelligence recognizes the needs of staff and the organization using its techniques and helps the staff through designing job routes, individualization of training, and using digital facilities and helps the organization to achieve its goals and to preserve consistency in competitive routes (Permanat and Choly, 2020). Artificial intelligence algorithms can help the organization in programming training courses. This technology uses its recorded data to plan the courses based on individual differences of the staff including generation, cultural educational, environmental, and enthusiasm differences (Palmo, 2020). Artificial intelligence can plan and administer appropriate training programs for new staff (Metsa and Gualmaji, 2019).

Artificial intelligence technology can help the organization using its techniques along with training instructors and even it uses a potentiality to present appropriate training for the staff in the form of a personal instructor (Jiang and et al., 2019).

Artificial intelligence identifies a certain level of training for each of the personnel through investigating about the daily learning capabilities

of the individuals and it utilizes the feedback on the part of the individuals towards the presented training to adjust the speed and type of training and the specific person. If a person shows a negative feedback due to the high speed of the training context presented or avoids giving feedback, artificial intelligence recognizes it and tries to change the type of training. Another advantage of artificial intelligence in training refers to the access of managers to results of training the staff in an online and on spot format. Also the staff can identify their goal of attending a certain training program and get help from artificial intelligence to have access to the appropriate training program. The teachers of artificial intelligence can guide the individuals all the time (Jia and et al., 2018).

4.6.　　Artificial intelligence in prediction:

　Artificial intelligence can study the recorded data to recognize the current algorithms along with prediction of future behavior of the staffs. Thus, when a climax or collapse of the algorithm is recognized, the authorities could act appropriately to alleviate the problems (Iqbal, 2018). The previous and current data of the organization can be analyzed using modelling, machine learning, and artificial intelligence and based on it we can predict the future. Organizations' managers can predict the staffs' behavior through data analysis and this can result in staffs' performance optimization and finally there would be a better return of capital in the organization (Ghoddos Mohammad, 2019).

4.7. Artificial　intelligence　in　services consumption:

　Services consumption is known as one of the most important processes in human resource management and it has a vital role in job satisfaction and belongingness of the staffs to the organization. Artificial intelligence recognizes the patterns and predicts staffs' performance in different parts to design different models of

staffs'　service　consumption.　Artificial intelligence in service consumption can lead to justice in wages and rewards. Through the use of artificial intelligence, the human biases in payments to the staffs are alleviated and artificial intelligence acts based on current and previous outcomes of staffs' performances (Hashmi and Baig, 2020).

Conclusion

　Some advantages of artificial intelligence are quality　enhancement　and　training individualization. Since a great deal of in service training programs of the staff in organizations is carried out without considering the needs of the staffs, and this leads to unwanted effects, the use of artificial intelligence can reduce this weakness to a great extent. Artificial intelligence helps the organization to hold different training programs based on the requirements of the organization and the needs of the staff throughout the whole 24 hours a day. Also findings in this research showed　that　training　through　artificial intelligence can increase the quality and effect of training programs to a great extent. Another issue stressed as a result of doing the present study refers to decision making based on the data and　different　algorithms.　Artificial intelligencecan reduce conceptual decision making and psychological biases and result in increasing the precision in decision making by the organizations' managers. Additionally, due to the capability of artificial intelligence in prediction based on the data, the organizational managers　are　able　to　present　more comprehensive viewpoints about the future for the organization and for the staffs. Fairness in payments,　performance　assessment,　and recruitment　are　among　other　important advantages attributed to artificial intelligencein human resource management. Of course, it should be emphasized that artificial intelligence

will cause some certain challenges which we should consider along with the advantages of such a technology. The findings in this research showed that artificial intelligence has had the highest amount of usage in recruitment process in organizations up to now.

It could be predicted that artificial intelligence will be considered more seriously in future by big organizations, specifically those organizations that propose information technology services and strategies required in human resource management.
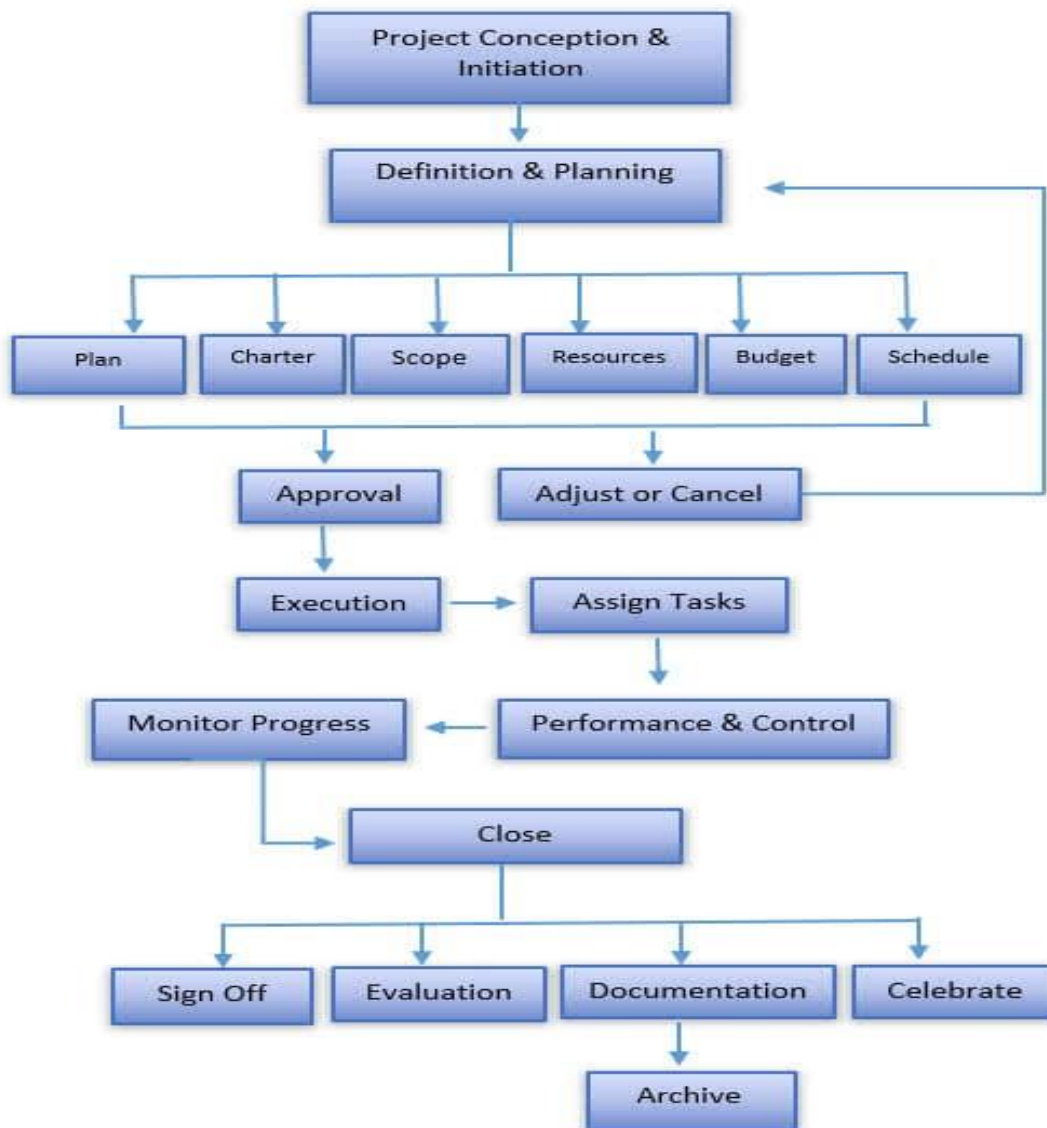

Fig.4. Project Management Process Flow Chart

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