Impact of Application of New Areas in Project Management 4.0, India

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ABSTRACT

Project Management exists way before it has come into existence officially. The making of Pyramids of Giza, Great Wall of China, and Coliseum are all some good examples of project management.
The evolution to project management has started around the year 1950, when companies started working with project management tools. Later in the 1970s and 80s some software was developed and gave rise to technological advancement. In the 2000s when the Internet arrived the new project management 2.0 was born, it has increased collaboration between the team members directly by using the project management software's.
PM 2.0 = PM 1.0 + collaboration.
The new age when there was an explosion of mobile phones that had been named the era of Project Management 3.0, the use of mobile devices had given increased efficiency in collaboration, mobility and so on.
Project management 4.0 has been defined as the fourth industrial revolution i.e., Industry 4.0, which mainly focuses on the technological tools keeping in mind the fourth industrial revolution. The main focus areas for Project Management 4.0 are the management of time, cost, quality, project team, communication, project risk, procurement and risk.

Keywords: Project management; Technological tools; Industry 4.0; Collaboration.

1.0 Introduction

The various advancements that have been made in the IT industry have been used in various fields of different industries and become a part of their development.

The emergence of Project Management 4.0 has come up with the evolution of Industry 4.0. This fourth industrial revolution is based on both, human-machine communication and machine-machine communication. The introduction of cobots, robots that will be with humans and not necessarily replacing them is the main manifestation of Industry 4.0, i.e., fourth industrial revolution.

A key project should have:

On a primary basis it should identify its stakeholders, its primary target market and final beneficiaries.

Clearly defined planning, implementation process and financial arrangements. ● A support system that monitors and evaluates the performance of the project.

A project should have an appropriate amount of finance and an economic analysis, that will indicate how much cost benefit it will be giving in future.

According to PMBoK (sixth edition) The life cycle of any Project looks like:

Initiation: It is a process that defines a new project or a new phase of an existing project by obtaining to start a new project or a new phase.

Planning: The process that is required to define the scope of the project, clarify the objectives and outline the course of action required to achieve the project's objectives.

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Execution: Those procedures used to execute the task outlined in the project management plan in order to meet the project's requirements.

Controlling & Monitoring: Those processes that are required to track, review, and regulate the project's progress and performance; identify any areas where adjustments to the plan are required; and implement the necessary changes.
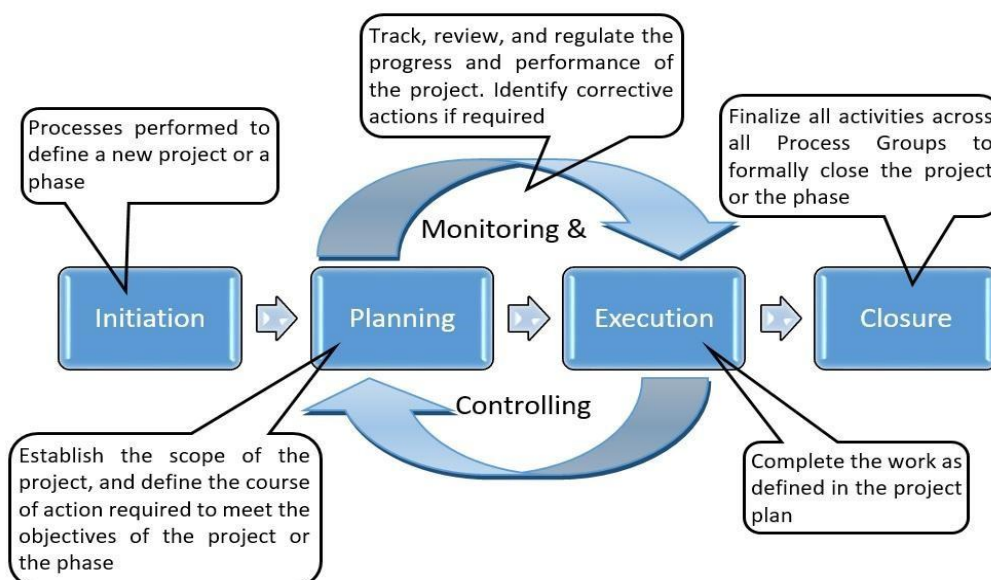
Closing: These processes are used to formally finish a project or phase by completing all activities across all Process Groups.

Figure 1: Life Cycle of Project
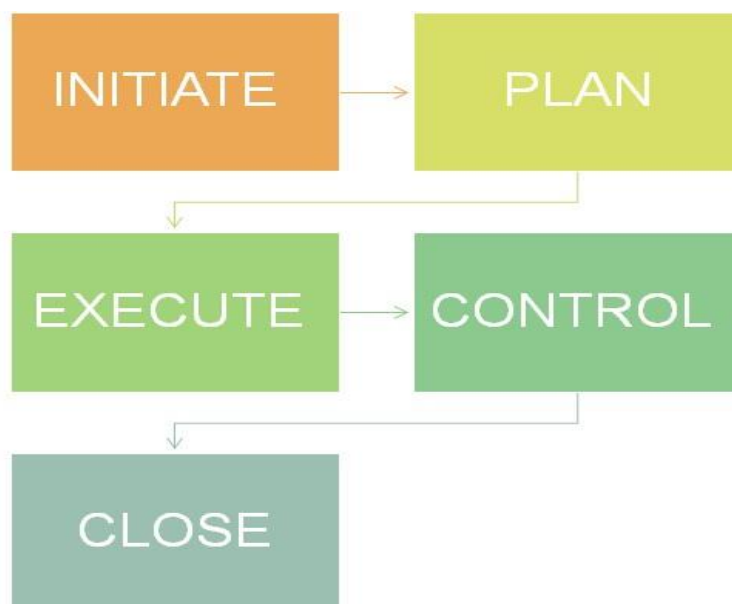
Source: PMBoK

Figure 2: Boundaries of a Project

Source: Goggle

Figure 3: Core processes of Project Management or Knowledge Areas

Source: Google

2.0 Project Management 4.0

The Project Management 4.0 concept intends to concentrate the principles of Industry 4.0 to Project Management Cycle Operations. Industry 4.0 entails bringing together all sophisticated biological, technological, and industrial automation research in order to improve our current way of life.

A new approach to how we use natural resources and, of course, a new way to improve our current way of life. In today's competitive environment, Industry 4.0 has become a requirement.

We must integrate Industry 4.0 principles such as decentralised decision-making, interoperability, technical assistance, alternative energies and new materials, nanotechnology and artificial intelligence, robotics, the Internet of Things, autonomous vehicles, and 3-D printing into project management to achieve success.

Principles to Project Management 4.0:
- Decentralised decision making.
- Analysis and Team Management using an interdisciplinary approach.
- Technical assistance.
- New materials and alternative energies.
- Mobile assistance.

2.1 Decentralised decision making

Decision making in the project management cycle plays an important role in achieving the objectives. A decentralised decision-making process makes it easier to work in teams because it gives authority to a larger group of people to make decisions. It helps involve lower-level workers, functionaries and executives in the decision-making process.

Analysis and Team Management using an interdisciplinary approach: For successful project management in traditional Project Cycle Management, we use need analysis, target analysis, and stakeholder analysis. Interdisciplinary analysis for productivity and sustainability is part of the Project Management 4.0 strategy. When doing these analyses, the team should include a technical expert, a

sociologist, an economist, a software professional, and other necessary experts. The project preparation stage benefits from a variety of perspectives and paradigms. A project management team comprising various specialists and stakeholders must be constituted. Networking or say interactive Ness will be possible in this case.

2.2 Technical assistance

Technical assistance means sharing information and expertise, transmission of working knowledge, instruction, skills, training and consulting services. Mobile applications, cloud storage, smart technologies, and project management software are all part of Project Management 4.0's technical aid for project management.
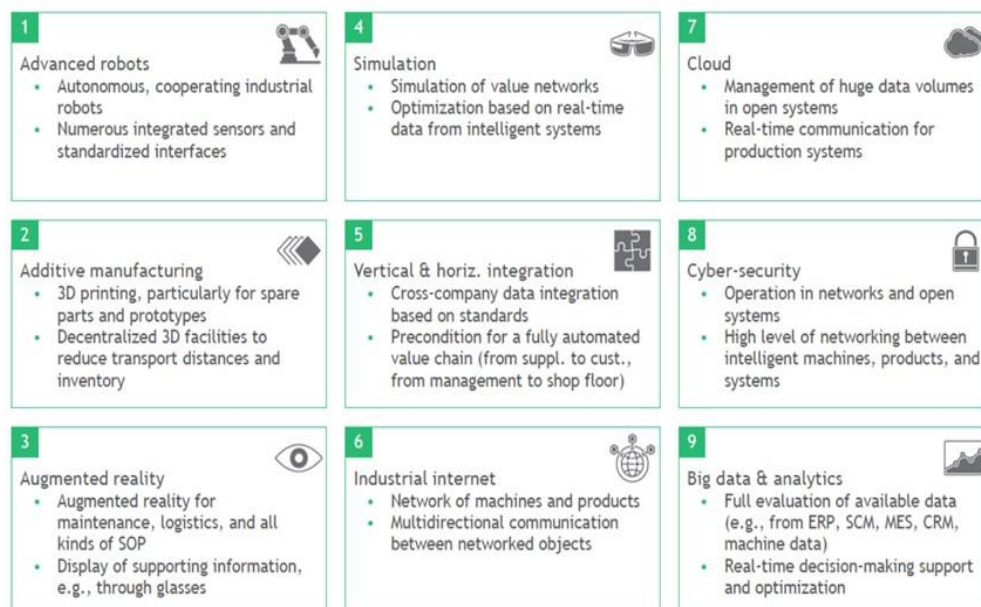
2.3 New materials and alternative energies

Energy usage, climate change effects, waste management, and consumption effects are all considered in the Project Management 4.0 methodology. In all the phases of projects, we use preferable energy technologies, climate change mitigation ideas, and waste management terminology.

2.4 Mobile assistance

Project Management 4.0 has shown us the importance of mobile technology and software's. We've found that having frequent and extensive meetings reduces productivity and motivation in workers. For our tasks and deadlines, we employ project management and team planning software. We use mobile devices to check tasks, decentralisation (role distribution), and deadlines.

Figure 4: Future Scope of Project Management

1 Advanced robots
- Autonomous, cooperating industrial robots
- Numerous integrated sensors and standardized interfaces

4 Simulation
- Simulation of value networks
- Optimization based on real-time data from intelligent systems

7 Cloud
- Management of huge data volumes in open systems
- Real-time communication for production systems

2 Additive manufacturing
- 3D printing, particularly for spare parts and prototypes
- Decentralized 3D facilities to reduce transport distances and inventory

5 Vertical & horiz. integration
- Cross-company data integration based on standards
- Precondition for a fully automated value chain (from suppl. to cust., from management to shop floor)

8 Cyber-security
- Operation in networks and open systems
- High level of networking between intelligent machines, products, and systems

3 Augmented reality
- Augmented reality for maintenance, logistics, and all kinds of SOP
- Display of supporting information, e.g., through glasses

6 Industrial internet
- Network of machines and products
- Multidirectional communication between networked objects

9 Big data & analytics
- Full evaluation of available data (e.g., from ERP, SCM, MES, CRM, machine data)
- Real-time decision-making support and optimization

Source: PMBoK

3.0 Literature Review

The area of Project Management 4.0 has not been explored that much. All the literature that we have gone through are about either Project Management in Industry 4.0 or about the Risk Factors but much details about the fourth revolution in Project Management has not been talked about.

Project management 4.0 has become a part of discussion after the advancement made in Industry and Industry 4.0 has come. In this paper we have focused on the new areas where Project Management 4.0 will be giving more emphasis and what will be its impact in the near future. All the papers published during the recent times focus more on the changes occurring during Industry 4.0 on Project Management and Project Managers. However, the working of a project is a very complex process and the changes that have come during this revolution has made it more complex as technology is working along with the human resources.

The aim of this paper is to present the framework of future scope of project management, its applications and impact in this fourth revolution.

4.0 Research Methodology

The contribution this study aims to provide on how Project Management 4.0 can or should be applied to the new future scope of Project Management. Based on this methodology of the study and the observation, the role of Project Management 4.0 in the new areas is still unexplored.

From the review of past literature, we have found that Project Management has been explored much from the point of view of Industry 4.0 and not particularly Project Management 4.0, which is also the fourth revolution in the field of project. From "CEM Solutions", we have found that the origin of Project Management is in between 1900s and 1950s Work Breakdown Structure and Gantt Chart, by Henry Gantt was also introduced. Both are playing a key role in all project management software's like Primavera Project Management and Microsoft Project.

The second era came in between 1958-1979. This was the time when CPM/PERT and Material Requirement Planning were introduced. The additional improvements were in schedule planning and controlling through network techniques.

Figure 5: CPM/PERT Network Diagram
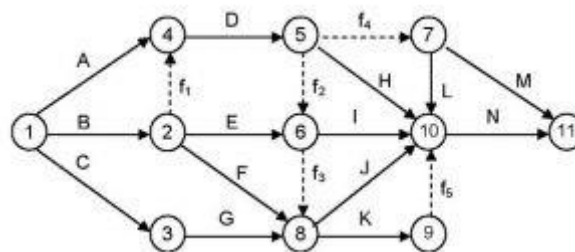
Source: CEM Solutions

In between the 1980s and mid 1990s was the time when the IT/IS sectors were rising up in the market and has given a major contribution in building up the high proficiency controlling and overseeing the projects through multitasking computers. The major thing which had happened in this era was the opinion to originate changing in project management's system, inclusion of the functions of the project such as scope, risk, procurement, communication, risk and human resource in time and cost, different ways to deal with the project and product life cycle, more focus was also given to the external environmental factors and stakeholders.

The current era, the fourth revolution in project management, relies mostly on the internet and technology. This helps industries to be more efficient, profitable and adequate in achieving their particular objectives and parallelly helps the project manager in handling different aspects of the project in a well-organized and productive way.

This fourth era of Project Management is mostly technology based, working of human resources has been limited to certain extent, more to technological experts and machine experts will be needed in future to handle the software's of Project.

This advancement of technology in Project Management will be giving industry a boom and will be providing interesting working areas to the future generation that too will be technology based.

5.0 Constraints of Project Management

Figure 6: Constraints of Project Management
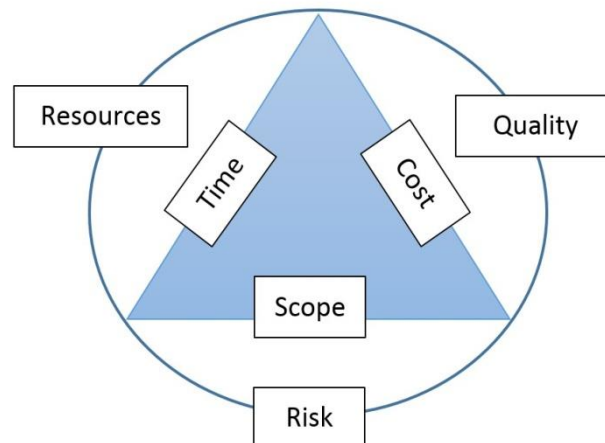
Source: Google

It includes when should the output be delivered? Time constraints include planning and defining activities as well as rearranging the activities in order and estimate resource requirements.

Cost:

It says how much money is available to achieve this outcome? Cost constraints include estimation of cost for the project, preparation of budget for the activities that have to be covered in the project. To complete the project in estimated cost preparation of budget and cost controlling is necessary.

Scope:

It guides to milestones, goals and to the objectives of the project. To keep the scope according to the project is important or else scope creep will likely happen.

Resources:

Who and what is required to do the work is narrated by the resources? Resources are always limited, how to utilise it depends on the project team working for the project. To get the maximum output from the limited resources available is the main task of the team.

Risk:

What can go wrong and what can be done about it, is what risk talks about. To be prepared for risk constraints, a backup plan has to be there so that the project will not stop and the team can grab any opportunity that comes their way.

Quality:

How does the outcome match expectations? To overcome this constraint the manager has to make sure that the project team will work as efficiently as it can so that the defects could be minimised and the desired outcome would come.

6.0 Conclusion

From the above research we have found that the future of Project Management has a wide scope. As it has many versatile fields it can work on and that are all technology based. All the four phases of project management are upward graphing. It has improved and improved, whether it is related to techniques or technologies.

As the new version of Project is going to be based on technology it should be more focused on its safety as digital threats are more likely to happen. It should work like it would be able to keep the data secured from data leaking and theft.

Successful project can only happen if the team will work on all the factors equally which are risk management, issue management, budgeting, time management, cost and resource management.

This new system of handling the projects with the help of modern technology and with the new methods is slowly replacing the traditional system of project management which is helpful in reducing the complexity of the project.

In this digital era every industry must adopt new technology so as to cope up with the present environment and be competitive in the market. This will reduce the risk and also will help in achieving the new milestones.

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