International Journal of Research in Engineering and Science (IJRES)
ISSN (Online): 2320-9364, ISSN (Print): 2320-9356
www.ijres.org Volume 9 Issue 6 ǁ 2021 ǁ PP. 09-11

Agile Project Management in Construction Industry

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Abstract
The aim of this paper is to give brief idea of Agile Project Management in Construction Industry. Today, the project leader and team find themselves in an environment that is disrupted by the rapid development of technology and customer demand to deliver value more quickly. According to Turner (2014) construction projects needs flexible leadership and management for purposes of responding to different changes that occur during their execution. As way of trying to deal with construction project management challenges over the year's managers have been using traditional methods of project management. However, due to weaknesses associated with traditional approaches of project management, agile project management technique was designed for purposes of being used in the construction industry (Turner, 2014). Agile techniques and methods can effectively manage disruptive technologies. Agile project management (APM) is based on accepting change as an inevitable part of the project management process in the construction industry, thereby providing new management opportunities. In large-scale construction, completing the construction project on time seems to be a daunting task. Time is the main factor in construction, and completion on time will bring many benefits to the client, contractors and society. Agile project management is a method that can quickly adapt to changes in delivery or designs. The time between identification of a problem and resolving the problem get reduced.
Keywords*: Construction, Construction Industry, Project Management, Agile, Agile Project Management*

Date of Submission: 25-05-2021 Date of acceptance: 07-06-2021

I. INTRODUCTION

Agile project management is an approach that focuses on the iterative development of your final deliverable. Agile project management (APM) comes from software Development of the industry; it is developed through experience progress. The use of this method is not limited to this industry. It defines the values and principles that can be adopted by other industries like construction industry. Agile project management includes different tools and the method of implementing the project based on its values and principles. Use of agile methods to develop and implement the system improves speed in which companies meet market demands. Agile management usually requires people with appropriate skills and experience so as to successfully use it while managing different types of projects (Chen, 2004). Agile project management indicates that a project is meant to be undertaken using different phases for it to achieve success. The researches have been done on the application of APM during the pre-design and design phases of construction projects. There are significant hurdles to its adoption within the actual execution phase. It seems application of APM required considerable time and effort in the construction phase. APM concept is applied by dividing whole projects into smaller manageable parts and completing each part. Some basic concepts of APM include -

- Customer collaboration & face to face meeting
- Definition of clear goals
- Breaks the project or challenge down into small bits to be completed so as of highest priority downwards
- Emphasizing learning and continuous improvement
- Responding to change
- Identifying weaknesses and issues as soon as they occur
- Implementing root cause analysis to work out the cause of problems
- Individuals and interactions

1.1 Pre-Design and Design Phases

Agile construction management may have the greatest impact and provide benefits during the design and pre-design phases of construction projects. It can increase customer participation and encourage customers to participate in the definition of project deliverables (i.e. What the finished building or construction will be).
Agile asks you to first consider a project at a strategic level, and then break it down into tasks. The practice of dividing the project into smaller pieces helps ensure frequent and consistent delivery. Smaller projects

reduce the prospect of uncertainty and improve the management of project risks. It enables you to structure any project to be more adaptive to changes.

1.2 Execution Phase

In the construction process, due to its sequence-based continuity, it should be simple enough in practice, and complexity will still spread. For example, the contractor may need to use different materials because the materials specified by the architect were not available at the time. In addition, access to websites or resources may be blocked, thereby increasing the problem.

Then, improvisation is usually used to handle construction tasks, and as a result, tracking the project schedule and managing critical path activities becomes difficult. Agile helps by breaking down the project delivery into smaller, more manageable, parts.

A major focus is time management and regularity. Agile requires frequent reviews to improve project financial management, especially in terms of productivity and profitability.

Agile methods open the door to continual improvement by encouraging workers to team up and to give their input back to construction managers. This provides insight on how to do things better and faster.

APM application in execution phase project will decrease risk & uncertainty and decrease delay by scheduling, time management, employees' motivation and client's involvement.

II. AGILE FRAMEWORK

The project management framework provides a transparent and consistent outline for the projects. With the help of Project management framework, organizations and industries create common standards. The PMBOK Guide describes a framework as the basic structure to understand project management.

There is the difference between a methodology and a framework, a methodology tells you what you want to achieve, and a framework focuses on how to achieve it.

The Agile project management uses four key values and 12 principles to organize projects. Agile frameworks are all designed to support the achievement of these four key values and 12 principles.

The popular Agile frameworks are:

1) Scrum
2) Kanban
3) Extreme programming (XP)
4) Feature-driven development (FDD)
5) Dynamic Systems Development Method (DSDM)
6) Crystal

In the 1990s based on a Harvard Business Review article titled "The New Product Development Game", the Scrum was developed. Most project managers name Scrum as the one of the most popular Agile framework.

The Scrum framework a project break down into sprints that typically only last one to four weeks. Each sprint ends with the completion of a workable version of the final project deliverable.

Scrum also has some unique terminology. In the Scrum framework, the following are key terms commonly used:

1) **Product Backlog** - A product backlog is a list of all the work that needs to be done.
2) **Sprint -** A sprint is a set time frame for completing each set of tasks from the backlog.
3) **Sprint planning –** A collaborative events in scrum, refers to determine which tasks on the backlog list you will include in each sprint.
4) **Sprint backlog -** The portion of the backlog that is assigned to the current sprint.
5) **Daily Scrum -** A brief, daily collaboration meeting in which the team reviews progress from the previous day, declares intentions for the current day, and highlights any obstacles encountered or anticipated. Also known as daily standup & generally take about 15 minutes.
6) **Retrospective -** Each sprint should end with a review meeting called a retrospective. In this team reviews their so far progress and discusses how they can improve in the next sprint.
7) **Scrum board** - Scrum board is an information radiator that is utilized to manage the product and sprint backlogs and show the flow of work and its bottlenecks. Scrum board can be a physical board, or a virtual one within a project management tool. Typically the scrum board has three columns: "To Do," "In Progress," and "Done." As you complete backlog items, you move them from one column to the next on the board. In this way, everyone can see how the work progresses & what they need to do in the current sprint.

   The above mentioned Scrum framework key terms concepts can also use in the construction industry.

Following way we can co-relate key terms to construction industry:-

1) Product owner – Area manger, OBS
2) Backlog – Scope
3) Epics – Higher level WBS
4) User story – A subset of WBS
5) Sprints / Sprints planning – Feasibility study
6) Kanban – Visual representation of tasks and status
7) Burn-down charts – Progress curves
8) Retrospective – Lessons learned

II. CONCLUSION

Agile project management is an approach that focuses on the iterative development of your final deliverable. Agile Project Management (APM) comes from software Development of the industry. Application of Agile in construction management is effective in getting the job done. Agile methods tend to welcome change so its application in design phase will be more effective as compared to its application in execution phase as changes in execution phase increases the chances of project delay. It's difficult to apply 100% Agile concept in construction industry but we can take required terms from different Agile methodologies / frameworks and apply it in hybrid manner.

The application of Agile Project Management will help to overcome common challenges in the construction industry like low transparency, poor communication, and project waste.

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