

## **Application of Agile Methodologies for Member and Team Role Transformation in Projects**

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### **Abstract**

This paper explores how the Agile methodology impacts all the process groups of Project Management, in a way that the role of the Project Manager and role of the team transforms as compared to a non-Agile environment. Fundamentally, the role of project manager alters from a controlling and directing approach to a facilitation approach in an Agile environment. The role of the team alters more from a mindset point-of-view, from an individual accountability to more of a mutual accountability perspective. In short, the Agile methodology focuses more on the team and not on the individuals, as in a non-Agile set-up.

*Keywords: Project, Project Management, Agile Methodology, Waterfall Methodology*

### **Introduction**

A project is a 'temporary endeavour' undertaken to create a unique product or service. 'Temporary' denotes that all projects are time-bound and hence have a start and finish date; and, 'Unique' denotes that the product or service developed as result of the project is distinguishable from other products or services. Project is different from an operation. Although project and operations share some similarities like both consist of activities, both are limited by resources and both need to be planned, executed and controlled, however while operations are continuing and repetitive, projects are temporary and unique (Choudhuri). Projects also have a third characteristic besides being 'temporary' and 'unique', The third characteristic of a project is progressive elaboration. 'Project management is a group of interrelated processes, implemented in a progressively elaborative manner, in which to produce the deliverable' (USBR). "A project is a one-shot, time-limited, goal-directed, major undertaking, requiring the commitment of varied skills and resources" (BEE).

A project has the following attributes (Baume & P.Martin, 2002):

- has a clear purpose that can be achieved in a limited time;
- has a clear end when the outcome has been achieved;
- is resourced to achieve specific outcomes;
- has someone acting as sponsor who expects the outcomes to be delivered on time; and
- is a one-off activity that would not normally be repeated.

Literatures on Project strategies have viewed projects from three different tracks (Artto, Kujala, Dietrich, & Martinsuo, 2008):

1. In the first track, projects are seen more as subordinate of the parent organization and the project strategy is a derivation from the larger business strategies of the firm.
2. In the second track projects are viewed as independent organization in themselves that are loosely connected to the parent organization. In this case project have their own strategies that may not be dependent on the organizational context.
3. In the third track, projects are viewed as organization that adapt to ongoing changes as strategic entities of their own.

The first track is the most dominant one where projects are viewed as subordinate of the parent organization.

## **Project Management**

Project Management is the process of achieving project objectives (schedule, budget and performance) through a set of activities that start and end at certain points in time and produce quantifiable and qualifiable deliverables (Kay, 2013).

Project management has been practiced for thousands of years, dating back to the Egyptian epoch. Although management of projects has been going on for thousands of years, the practice has been widely recognized as a discipline in its own right for only about ten years. It was in the mid-1950s that the organizations commenced formal project management tools (Lewis, 2002). Project Management as a discipline developed from different fields of application including construction, engineering, telecommunications, and defence. The 1950s marked the beginning of the modern project management era. According to Azzopardi (2009) four periods are identifiable in terms of evolution of Project Management (Modesto & Tichapondwa, 2009):

**Prior to 1958** – The evolution of technology, such as automobiles (allowed effective resource allocation and mobility) and telecommunications (increased the speed of communication) shortened the project schedule.

**1958 – 1979: Application of Management Science** – Significant advances in technology like computer technology and space technology (moon mission) saw a increased use of Project Management.

**1980 – 1994: Production Centre Human Resources** – This period saw rapid strides in software technology and advanced space technological applications. This in turn gave project management a huge fillip.

**1995 – Present: Creating a New Environment** – Internet and more interactive technologies evolved during this phase. Most project management software packages today have internet-connectivity feature.

The success of project management lies in the ability of bringing the tasks, resources and people who are primal to the achievement of business goals and objectives, in a given time constraint and within the monetary allowance. Projects and Programs are linked directly to the strategic goals and initiatives of the organization supported (Mulcahy, June 12, 2013).

Project Management has six phases - Initiation phase, Definition phase, Design phase, Development phase, Implementation phase, and Follow-up phase. Dividing a project into phases helps in leading it better (Baars, 2006).

The objective of the Project Initiation Phase is to specify what the project should accomplish. This phase is significant from the perspective of specifying the client's needs adequately, for if there is an error in articulating the same, then poorly formulated goals and objectives will stand out as a significant source of concern. This phase requires a comprehensive discussion on the deliverables as well as on the major barriers, potential problems and roles and responsibilities of project initiation are summarized (SoM, 2004 ).

The objective of Project definition phase is to define the process of defining the project's purpose and the development of alternative means to satisfy it. The project definition process consists of three stages: determining project purposes, translating those purposes into criteria for assessing alternative designs or solutions, and generating alternative design concepts (Whelton, 2004).

The Design Phase generally begins with informal conceptualization and vetting of a project idea among colleagues within. Once the same has been done then a project concept paper is prepared to articulate the idea and also enable those doing the appraisal of the project to judge the feasibility of the idea. The design phase concludes with a project appraisal that is an internal examination of the merits of the project and whether it fits the strategic goals and objectives of the organization (Gawler, 2005).

The objective of the development phase is to chart-out the project organizational structure, detailed project planning and design, contract establishment and detailed design. This phase commences following the approval of the business case and the allocation of organizational resources (TMR-QLD, 2010).

During the Implementation phase the project is mobilized and executed. During this phase the a stock is also taken of the actual progress of the project against planned and if certain modifications are necessitated to bring the project on track the same are also executed (ITAD, 1999).

The follow-up phase does everything required to bring the project to a successful completion. Issues like duration of follow-up phase, ownerships of the bugs, resolution of the errors, training of the users, feedback etc. are of high importance (Streveler, 2009).

Each phase in this project management cycle is important and has a central theme: Initiation Phase (Idea); Definition Phase (What?); Design Phase (How?); Development Phase (How to implement?); Implementation Phase (Implementation); and, Follow-up Phase (Maintenance) (Baars, 2006).

## **Waterfall Methodology of Project Management**

Waterfall methodology is a sequential design process. Each of the eight stages (conception, initiation, analysis, design, construction, testing, implementation, and maintenance) are completed, the developers move on to the next step ( Base36, 2012). There is no room for errors as waterfall methodology does not allow developers to go back to a step that has been completed and hence requires careful planning. Since this methodology insists on extensive and meticulous record keeping, it allows new developers to join in between with ease, in the eventuality of attrition. The waterfall methodology allows client to have a complete idea about the size, cost and timeline of the project.

But this also becomes a roadblock in a way as this methodology relies too much on initial requirement specifications. Hence in case of an error in requirement specification, the project may suffer in a major way. Additionally, waterfall methodology is not conducive to the evolving needs of the client. Waterfall methodology is also rigid in a way since one it does not allow developers to go back to a step after the same has been completed, and, second the testing and debugging only happens at the end. This offers very less flexibility.

## **Agile Methodology of Project Management**

Agile Methodology follows an incremental approach, compared to the sequential approach of the waterfall methodology, and hence is seen as an answer to the disadvantages of the latter. Agile Methodology gives top priority to the client or the customer satisfaction throughout the delivery. There are 12 principles of Agile Software development (Cleland & Ireland, 2008):

1. The utmost importance is to satisfy the customer through early and continuous delivery of valuable software.
2. To welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.
3. Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter time scale.
4. Business people and developers must work together daily throughout the project.
5. Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done.
6. The most efficient and effective method of conveying information to and within a development team is face-to-face conversation.
7. Working software is the primary measure of progress.
8. Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely.
9. Continuous attention to technical excellence and good design enhances agility.
10. Simplicity—the art of minimizing the amount of work done and avoiding unnecessary work.
11. The best architectures, requirements, and designs emerge from self-organizing teams.

12. At regular intervals, the team reflects on how to become more effective, and then tunes and adjusts its behavior accordingly.

In Agile Methodology, the developers start off with a simplistic project design, and then begin to work on small modules. The work on these modules is done in weekly or monthly sprints, and at the end of each sprint, project priorities are evaluated and tests are run. These sprints allow for bugs to be discovered, and customer feedback to be incorporated into the design before the next sprint is run.

### **Agile Versus Waterfall Methodology**

Agile simply a better way of doing Project Management? The discussion to follow attempts to answer this question, with the help of research literature. Agile Methodology unlike Waterfall approach does not rely too heavily on initial planning . It expects and allows changes. At the end of each sprint, project priorities are evaluated. This allows clients to add their feedback so that they ultimately get the product they desire.

The difference between Waterfall and Agile Methodology is primarily in terms of the flexibility and client focus. Agile is much more flexible and focused entirely on satisfying the client needs. While waterfall methodology does not allow a developer to step back to a stage that has been completed, the agile methodology is much more adaptive to change and changes can be incorporated without necessarily rewriting the entire program. Flexibility in the Agile Methodology also comes from the fact that bugs are detected and removed in the entire developmental cycle rather than only at the end as in the waterfall method. Hence in the case of the latter, the entire program may have to be rewritten that may have considerable cost and time implications, in turn affecting the client satisfaction. And although both waterfall and agile methodologies allow for departmentalization, it is definitely better in Agile (Wordpress, 2008).

Waterfall is structured, one big project, a sequential process, suited for situations where change is uncommon, internal, and, a process that requires clearly defined requirements upfront; whereas, Agile is flexible, many small projects, highly collaborative, best for those who want continuous improvements, involves customers, and, a process in which requirements are expected to evolve and change (Chan, 2013).

According to the 2011 CHAOS report from the Standish Group, Agile projects are three times more successful than non-agile projects. The report goes so far as to say, “The agile process is the universal remedy for software development project failure. Software applications developed through the agile process have three times the success rate of the traditional waterfall method and a much lower percentage of time and cost overruns” (Cohn, 2012).

### **Research Objectives**

Agile process methodologies by their style are: Extreme Programming, which is socially centric; Scrum, which is engineering centric; and RUP, which is tool and management centric. Agile methodology calls for different kinds of efforts, composition of team, upfront planning, sequencing and feedback (Stevens, 2013). Research also shows that most IT executives find it difficult in understanding the Project Management process (CHAOS, 2012).

Researchers have emphasized an organizational policy for project management since it is essential in establishing the roles and responsibilities of every member of the management team according to the abilities of the employees, but especially according to the hierarchical position they hold within the organization. A project Manager's role has been equated to the role held by the Minister-Secretary of State, who holds the highest function hierarchically within the organization, but who is also politically appointed; therefore, once the person is replaced by a new person who takes on the tasks and prerogatives of the project manager, the ability of project implementation, but also the project management organizational ability are modified (Florescu, 2012).

Traditionally there has been lot of emphasis on the role of the project manager in project management and on meeting time, budget, and project performance (or scope) goals. But that seems no longer sufficient to guarantee the achievement of organizational objectives (Shenhar & Dvir, 2007). When project managers and project teams are engaged in day-to-day project execution their focus and attention, rather, is operational, and their mind-set is on "getting the job done. They typically are not focused on the business aspects. While this mind-set does contribute to project teams doing their work efficiently, left alone, it may lead to disappointing business results and even failure—when the job was not done effectively (Patanakul & Shenhar, 2012).

Ironically, however, the traditional approach is still widely ingrained, and is still accepted as the common way of running a project. Inventing contemporary project management approaches in IT projects has become very significant. 'Information technology plays a continuously increasing role in economy and successful IT projects are very important for companies. Mismanaged software (development and/or implementation) projects are very common and result in failure' (Standish Group International, 2009).

Agile is a project management technique that is more collaborative in nature (Fernandez & Fernandez, 2008) and is designed to be customized to fit the development project at hand. It answers the challenge posed to IT to deliver more in less time and with proven business value (Hernandez, 2011).

Agile is a methodology of Project Management that originated from the game of Rugby, where the entire team is focused on one goal. It has 3 Roles (product owner role, scrum master role, and, scrum team role), 3 Artifacts (product backlog, sprint backlog and, release backlog) and 3 ceremonies (sprint planning, daily scrum and, demo & retrospective). Project Management comprises of 5 process groups (initiation, planning, execution, monitoring & control and closure) and 9 Knowledge Areas (project integration management, scope management, time management, cost management, risk management, human resource management, communication management, quality management and procurement management) (ProjectManagementInstitute, 2008).

This paper explores how the Agile methodology impacts all the process groups of Project Management, in a way that the role of the Project Manager and role of the team transforms as compared to a non-Agile environment. Fundamentally, the role of project manager alters from a controlling and directing approach to a facilitation approach in an Agile environment. The role of the team alters more from a mindset point-of-view, from an individual accountability to more

of a mutual accountability perspective. In short, the Agile methodology focuses more on the team and not on the individuals, as in a non-Agile set-up.

Hence this paper aims to understand:

1. How Agile has impacted the 5 process areas?
2. Because of this impact, how have the roles altered: a) role of manager b) role of team.
3. How has agile impacted the 5 process areas
4. Because of this impact, how have the roles altered a) Role of project manager b) role of team

### **Traditional Waterfall Model**

The role of a project manager in traditional waterfall methodology is clearly defined and has well defined boundaries. In a traditional waterfall model the project manager typically focusses on the following aspects

- Keeping track of the progress in the project with the help of regular status meetings with the team, periodic status reports etc.
- Keeping track of project risks and coming up with mitigation plans for the risks which are yet to materialize and contingency plans for the risks which have already occurred.
- Making sure that there is no scope creep and unwanted scope changes in order to ensure that the team is able to make an on time delivery with the desired quality and within the agreed cost.
- Sending communications to the rest of the organization in terms of the status of the project.

Apart from the role of the project manager all other roles within the team for instance developer, technical architect, business analysts etc are all well defined with defined boundaries.

The flip side of waterfall model is basically these well defined roles and defined boundaries of these roles. This leads to an individualistic mindset within the team and each individual makes an effort to perform his/ her role and does not make an effort to extend their capabilities.

Besides the role of a project manager in this model is more of directing the team and using command and control method to manage the project team.

### **Agile Model**

In an Agile based model all roles within the team i.e. Project Manager, Developers, Technical Architect, Business Analysts etc. work jointly as one integrated team instead of working as individuals within the team.

The focus shifts from completion of individual tasks to making the delivery from the team as a whole a success.

Thus in an Agile setup the responsibility of managing the project shifts from the project manager alone to the entire team as such.

The role of an agile project manager is more of a facilitator for the team rather than a person who gives instructions to the team. A project manager in an Agile setup allows the team to be self enabled and fosters creative thinking and decision making capabilities within the team. In other words the project manager takes the copilot seat and allows the team to fly the aircraft on its own and in the process making their own decisions.

As and when the team needs the guidance, the project manager provides required direction and motivation to the team and ensures that they are moving in the right direction. Besides, the agile project manager protects the team and removes obstacles in the way of the team to ensure success. Apart from this the project manager finds ways of improving the overall productivity of the team by improvement the processes and practices followed for project development.

How has Agile impacted the 5 PM process groups and activities associated with the 5 process groups and knowledge areas?

Knowledge Areas	Process Groups				
	Initiating Process group	Planning Process group	Executing Process group	Monitoring & Controlling Process group	Closing Process group
Project Integration Management	Develop Project Charter	Develop Project Management Plan	Direct and Manage work	Monitoring & Controlling project work Perform Integrated Change Control	Close Project or Phase
Project Scope Management		Plan Scope Management Collect Requirement Define Scope Create WBS		Validate Scope Control Scope	
Project Time Management		Plan Schedule Management Define Activities Sequence Activities Estimate Activity Resources Estimate Activity Durations Develop Schedule		Control Schedule	
Project Cost Management		Plan Cost Management Estimate Costs Determine Budget		Control Costs	
Project Quality Management		Plan Quality Management	Perform Quality Assurance	Perform Quality Control	
Project Human Resource Management		Plan Human Resource Management	Acquire Project Team Develop Project Team Manage Project Team		
Project Communication Management		Plan Communications Management	Manage Communications	Control Communications	
Project Risk Management		Plan Risk Management Identify Risks Performance Qualitative Risk Analysis Perform Quantitative Risk Analysis Plan Risk Analysis		Control Risks	
Project Procurement Management		Plan Procurements Management	Conduct Procurements	Control Procurements	Close procurements
Project Stakeholder Management	Identify Stakeholders	Plan Stakeholder Management	Manage Stakeholder Engagement	Control Stakeholder Engagement	

### Planning Process Group

While in a traditional model the project manager and the project team focuses on long term deliveries in scope for the entire project, in an Agile context the project manager and the project team focusses on short term deliveries and the planning process is for a short term and iterative in nature. The delivery cycle in an Agile based project ranges from a period of one to four weeks commonly called sprints in Agile terminology. Hence in an Agile context the planning exercise is more focused and more precise in nature.

Due to this change the scope of the following activities within the planning process group is restricted to the duration of a sprint i.e. 1-4 weeks.

- Collect Requirements- Performed by PO or the PO team
- Define Scope- Performed by the Agile Team
- Create WBS- Performed by the Agile Team
- Define Activities- Performed by the Agile Team

- Sequence Activities- Performed by the Agile Team
- Estimate Activity Duration- Performed by the Agile Team
- Develop Schedule- Performed by the Agile Team
- Estimate Costs- Performed by the Agile Team
- Plan Quality- Performed by the Agile Team
- Plan Communications- Performed by the Agile Team

All the above activities are performed by the Agile team during Grooming and Sprint Planning Meeting

The process of planning is iterative which means that all the above activities will be repeated for a new sprint once an existing sprint has been completed. The advantage of this model is that at the end of each sprint the team conducts a demo and retrospective meeting where they typically demonstrate the running software or modules developed by the team and discuss the following aspects

- What we did well
- What can we do better
- Challenges/ Disturbances

Hence the team takes the learnings from a finished sprint to the new sprint and hence becomes better and better as they progress.

Besides since the planning is for a short term any unforeseen changes can be dealt within the current sprint or upcoming sprints.

### **Executing Process Group**

The direct and manage project execution is handled in a different way in the Agile context. While in the traditional waterfall model, the project manager focusses on directing the project team, assigns tasks to team members and directs the team members to perform their tasks, in an Agile context the team is responsible for day to day management of the tasks and project activities. The direct and manage project execution step in the Agile context is achieved in the form of Daily stand up meetings.

The project manager in an Agile context focuses towards removing the impediments which the team faces on a day to day basis by involving the entire Agile team and developing plans along with the team to overcome the impediments. Besides the Agile project manager strives towards making the development processes more efficient.

### **Monitor and Control process group**

The monitor and control part of project management is handled in a different way in Agile projects.

As compared to Projects following waterfall methodology, monitor and control in Agile based projects requires a continuous effort and attention. In the case of projects following waterfall methodology a lot of effort is needed upfront in terms of defining the specifications and acceptance criterias. As compared to this in an Agile setup the effort needed upfront in creation of specifications and acceptance criterias is much less. Rather these specifications and controls are developed and enforced on a day to day basis.

Besides Agile deliveries happen in the form of short sprints. Another difference between a waterfall model based project and an Agile based project is that in the former case it is the project manager who is responsible to perform the monitoring and control function whereas in an Agile context it is the project manager along with the team which performs the monitoring and control function on a daily basis in the form of Daily scrum meeting and at the end of each sprint in the form of Demo and Retrospective session. The team constantly keeps track of a burndown chart which shows them graphically how the team is progressing in terms of planned effort, the actual effort and the overall progress made by the team.

Therefor very often in Agile projects the chances of scope creep or overruns is minimal whereas in the case of waterfall model based projects the chances of scope creep and overruns is quite huge.

### **Closure Process Group**

The close project process in Agile based projects is much simpler as compared to a waterfall model based project.

In a waterfall model based project, the final release comprises of releasing the entire product in one go. Hence the final release is a huge effort and complex affair. Besides getting acceptance from the customer is complicated as well as the customer gets to see the end product only once and in between the initiation and closure phase has very little influence on the final outcome of the project.

In the case of Agile projects as mentioned earlier, the entire delivery of the project is broken down into several sprints which each sprint lasting for around 4 weeks. At the end of each sprint the team completes a working software which is a part of the overall delivery needed from the project. Besides, the team presents the working software to the customer in a demo at the end of each sprint and hence if the customer needs any changes it can be incorporated in the next sprint. Hence in the case of Agile based projects, the final release is actually the same as any other release during the lifecycle of the project. Besides since there is a close interaction with customer during the entire lifecycle of the project and the customer has a say in influencing the final outcome of the project, it leads to a smooth closure of the project, better customer acceptance and smooth sig offs. All this leads to better customer satisfaction levels.

## Conclusion

Thus it can be comprehensively concluded that Agile methodology impacts all the process groups of Project Management, in a way that the role of the Project Manager and role of the team transforms as compared to a non-Agile environment. Fundamentally, the role of project manager alters from a controlling and directing approach to a facilitation approach in an Agile environment. The role of the team alters more from a mindset point-of-view, from an individual accountability to more of a mutual accountability perspective. In short, the Agile methodology focuses more on the team and not on the individuals, as in a non-Agile set-up.

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## **Prof Ray Titus**

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**Ray Titus** is the Professor and Marketing & Strategy at the Alliance University, School of Business located at Bangalore, India. He also serves as the Area Chairperson at the Department of Marketing. Ray's entry into academia followed a decade long stint in the Industry where he served in Operations, Marketing, and Project roles. As an Industry Professional he's overseen strategic growth initiatives that included product and category expansions and the launch of an independent strategic business unit.

As an academic in the classroom Prof. Ray teaches courses on Marketing Strategy, Consumer Behaviour, and Social Media Marketing. Ray is also a visiting Professor at the SP Jain Center of Management, Dubai and Singapore, and the Asian Institute of Technology, Thailand. Prof Titus' research interests lie in the area of consumption behaviour, marketing value propositions, and new & social media landscape. As a Marketing Trainer and Consultant, Ray has closely worked with leading Indian and Multinational firms. He also actively engages with the industry through Management Development Programs.

Prof. Ray publishes his professional blog 'Buyer Behaviour' which is listed among the '*Top 100 academic Blogs every professional investor must read*' by Currency Trading and '*15 Must Read Indian Blogs about Investing & Business*' by INForum India. Ray is also a business columnist whose expert opinion features in leading business newspapers and magazines. e.mail: [raytitus@gmail.com](mailto:raytitus@gmail.com) Blog: <http://www.buyerbehaviour.org>  
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