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# A simple and effective project management

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***Abstract*—There are quite a few software project management methods principles such as Waterfall and Agile. However, it is hard to fit one single methodology for most project that are managed today due to dynamic and constantly changing world. Moreover, each of this methodology has its own pros and cons and offers challenges when need arise to change methodology from one to another during the execution of the project. Most project today can be very efficiently and successfully executed by adopting best of these methods and principle together with few simple but robust steps.**

***Keywords*—software project management, Waterfall, Agile, Mixed**

## I. Introduction

In today's rapidly changing world, continuous growth, sustainability and guaranteed return on investment have become challenges. In this era of intense competition around the world, expectations are at the acme of all time with more and more emphasis given in producing outstanding products while improving current ones as quickly as possible.

There is a constant strive for efficiency, standardization, and optimization, all while keeping cost low. This equates to sustainability, which in turn leads to growth. In order to meet their goals and stay competitive, companies need to innovate. Innovation requires investing in efficient processes and project management.

Project Management is perhaps the more critical aspect of product development. It is applicable in nearly everything; from product development to manufacturing to efficient researching, project management applies. Project management involves defining requirements, planning, designing, testing, releasing, and post-production support.

## II. Project & Project Management

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Before diving into project methodologies, it is important to understand the formal definitions of a project and project management.

A project is a planned set of interrelated tasks to be executed over a fixed period and within certain cost and other limitations [1]. A project management is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements [2].

## III. The Problem

The selection of optimal models of project management is impeded by the complexity of projects and project management methodologies, as well as the overhead costs which hinder sustainability. Is it possible to simplify project management methodologies to develop strategies that maximize returns on investments while keeping overhead down?

Before attempting to find a solution to this, let's first try to understand conventional project management methodologies that exist today. Software development will serve as a template for project management methodologies as this problem is explored.

## IV. Conventional Project Management Methodologies

There are various software project management models and methodologies designed to facilitate the formal management of the software development life cycle. Some of those are:

1. Waterfall Model [3]
2. Agile Software Development [4]

Backgrounds and high-level overviews of these models will be further explored:

### A. *Waterfall Model [3]*

Just as water falls downwards, from top to bottom, this project management methodology follows linear sequential phases of project management. These phases include requirement analysis, system design, implementation, system testing, system deployment, and finally system maintenance. These stages are sequential, meaning a stage will not start before the previous one is completed.

This model offers various obvious advantages. First and foremost, it is a structured approach from conception to the



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retirement of the project with minimal overlap of phases. This reduces ambiguity and ensures that the team tasked with this project is clear as to what they need to be doing. This model also allocates more time to the planning stages, which can ensure that less time is wasted on fixing missed requirements. This saves a lot of money. The Waterfall model also allows for clear documentation and streamlined management with minimal changes required.

Despite the advantages, the model is not without its disadvantages. The first disadvantage is met when dealing with a project with complex requirements. This type of project may require it to be broken down into smaller chunks that may not be able to follow the sequential flow of the model and does not offer overlap among various phases. Spending more time in planning results in more time before the end user or sponsor of the product can see something tangible to get an idea of returns on their investment. Additionally, documenting everything would be energy and time consuming if changes need to be made later in the project.

### B. *Agile Software Development [4]*

As the methodology based on the preplanned and well-defined scope of work may not work well for all projects. There was a need to find a more lightweight methodology of software project management to accommodate this. The other driving factor to find additional methodology was to create higher quality software in shorter time frames, running short sprints or iterations and work to produce something usable at the end of each. With such a goal in mind, 17 software developers met in Snowbird, Utah, in February 2001, later called as Agile Alliance and created the Agile Manifesto – set of lightweight and guiding principles. The Agile Manifesto forms the basis for most methods currently in use today, including Scrum Methodology, Extreme Programming (XP), Lean, Crystal Methods, and others.

Some of the popular methodologies like SCRUM and Extreme Program (XP) created based on the Agile principle also offer challenges. Such methodologies do not encourage formal design and try to proceed straight to development. This way, it tends to leave problem-solving to the knowledge and judgment of individuals working in a team rather than formalizing based on a set of theories or well-thought design and implementation process. As constant changes are welcomed, it becomes harder to estimate cost, timelines and visualize the final product. Lack of formal QA or defect tracking could introduce serious issues.

## V. Proposed Solution

In any Project Management, irrespective of whether it is a Software or non-software, few basic steps and checks could add tremendous values, such as investing in proper Planning & Analysis, selection of right Tools, Technology and resources, defining clear roles and responsibilities and establishing clear communication plan. Sometimes some these at first may appear as an overhead, however, investing time on these things could bring tremendous savings in terms of efforts, time and money. On the other hand, not investing the right amount of time and efforts in a few of these basics may lead to serious delays and/or failures.

Any software project can be typically divided into one of the three categories:

1) All or most of the scope, requirements, and specification of the product are known or can be easily identified and consolidated in the beginning phase of the project. We can say 70 ~ 80 % of the overall product or project is known at the beginning and not very likely to change.

2) Considerable, if not all requirements, scope, and specification of end project known or can be identified in the beginning phase and part of the same evolve and changes while going through the project management and execution life cycle.

3) Most of the scope, requirements, and specification are unclear in the beginning phase, needs to start with something basic and things get clearer as we go along with project management and execution life cycle.

In any category of product or project management, changing circumstance could lead to switching between any of the above categories throughout the life cycle. Therefore, we recommend breaking down overall deliverable into smaller phases or parts where possible, go with phased delivery based on the nature of the product and agreement of sponsor and stock-holder if it benefits, keep period of phases or iterations flexible based on the specifications or features that are part of phase, keep overlap between phases if that appears to be safe and optimal and help saving timelines and cost without causing re-work or extra work, explore parallel phases depending on the product and team structure after evaluating risk and eliminating chances of re-work. Moreover, following nine basic project management steps and best practices could lead to smooth and systematic project management.

A Simple and Effective Project Management Steps:

### A. *Understand Scope and Deliverable*

Imagine a situation where the chef or the cook in the kitchen don't know the food they are trying to prepare. Are they are supposed to prepare pizza, pasta or noodle? Even if they know its pizza, what if they don't know if the customer needs Neapolitan Pizza or Chicago Pizza? If the people responsible for the project do not know the deliverable or the success criteria or the end goal, it is very likely to be failed.

Although, there could be the situation that exact or full product specifications may not clear up-front, only high-level vision or concept based on which project needs to get started, still a part of deliverable needs to be identified in the beginning phase of the project to get started and progressively it could evolve into a concrete product.

Clear identification of near-term or the long-term deliverable (or both in most cases) help effort alignment,



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effectively measure progress and could become the key to the success of any project.

## B. *Identify Stack-holders & RACI Metrix:*

The timely and right level of communication suitable for the audience could bring a lot of efficiencies and could eliminate confusions in a project.

Therefore, knowing right stack holders as early as possible in the project lifecycle is very important to avoid confusions related to budget, timelines, product specifications, communication, which ultimately could lead to project failure.

Depending on the deliverable or the vision, budget, timelines, and nature of the efforts and skills required, finalize team and members with appropriate qualification and prepare a plan on onboarding them at various stage of the project and set-up a schedule.

Establishing clear roles and responsibilities of various stack-holders help individuals and team to understand expectations and so fulfill them efficiently.

**RACI:**

A good project manager should also have a clearly identified RACI metrics among all stakeholders participating in or impacted by the project. RACI can be defined as:

**Responsible**: Individual or group of individuals who perform the work. In software projects, this typically a Business Analyst, Development and Quality Assurance team.

**Accountable**: Individual or a group of individuals who are ultimately accountable for the outcome and carry final authority to make decisions. In software projects, this typically is a Project Manager.

**Consulted**: Individual or group of individuals who are consulted in various situations may be due to their subject matter expertise and so that provide feedback and contribute to the activity or task as needed.

**Informed**: Individual or a group of individuals who are required to an informed set of decisions, actions or progress, like stack holders who are impacted by this project or the outcome.

RACI can be updated as needed during the project life cycle.

## C. *Know your Budget and Timelines*

For any project, available budget and timelines play a significant role in the outcome of the project. Budget and timelines can help the identification of the right resources and tools. In a pressing situation, when the budget is low, cutting down on the scope of overall deliverables may become inevitable, or tools and resources hiring strategy gets impacted.

## D. *Perform Planning & Analysis*

Although at first, this could look like an overhead, this is very critical for the success of any project. Spending some time and efforts in formal planning and analysis of the task before jumping on to the execution, could save significant cost, time and efforts later. Create an overall long-term plan and break it down into smaller short-term plans which eventually could lead to the realization of the overall long-term plan and strategy.

Based on the nature of the product, the length of the project and expectation from stack-holders and feasibility, prepare a delivery plan considering phased delivery or single delivery at the end of the project.

## E. *Design, Implementation Approach and Documentation*

Everything is created by humans in this world are at least created twice, as things are always getting conceptualize or created in human's brain first, and then it gets materialized. If an individual or a group failed to explain things envisioned or evolved in their mind, it could be very hard for others to understand and align their efforts to achieve it. Preparing design and implementation approach up-front for the whole or part of deliverable can help stack-holders to better understand the product, align efforts to achieve the goal efficiently. Formal approvals and agreements from stake-holder could make it even more effective. Documentation could be a lightweight or exhaustive depending on the complexity and need of the project, product or implementation, cost, time and many other factors considered here. Documentation could sever as a future reference when needed and could serve as a contract or agreement.

## F. *Identify Right Tools and Technology*

What if cook who received an order to prepare pizza don't have a correct pan or oven? Once deliverable or the part of the deliverable or the product is known, cost and timelines are also known, the next steps are to identify the right tools and technology. This will not only help completion of the task efficiently and completion of the project in time and within budgeted cost, in turn, help to determine correct resources for the specific task and overall project.

## G. *Establish Communication Plan & Templates*

Precise and timely communication could help to keep all stack-holders on the same page, help identification and mitigation of risk in time and so could be a significant key to the success of the project. Depending on the type and location of stock-holders, cost, timelines, location and nature of the project, develop a communication plan with frequency and schedule of communication to keep all stack-holders informed in time. Preparing and keeping templates and communication approaches such as email softcopies or hard copies depending on the need and agreement could optimize communication efforts and save significant cost.



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### H. *Work Breakdown Structure*

Breaking down the problem or the task into the smallest possible sub-task could help planning it better. It also helps to simplify and it faster. It also helps analyze and accurately quantify overall efforts required. This again helps allocation of right resources to the right task, establish clear dependency among various task, scheduling of the task and tracking progress precisely. Work break-down structure also help to determine the duration and grouping of features to optimize overall project delivery, whether it is done in phased or single overall delivery.

### I. *United Cohesive Team and Respectful Culture*

If each team-members are united and work cohesively towards the common end goal, maintain a respectful environment and the right attitude, encouraging a culture to reach out for helping each other all along. Such united cohesive team, respectful, encouraging and motivating culture could produce magical results, successful execution and delivery of the project along with bringing happiness and job satisfaction to the team members.

## VI. Conclusion

Project management should be simple and flexible enough to be able to accommodate well-defined scope and specifications as well as open-ended and high-level concept. The simplified and effective project manager should be able to accommodate constantly changing circumstances as well. Proposed simplified and effective model of project management leverage best of Waterfall methodology and Agile Principals. Moreover adopting few simple, basic but effective steps will help alignment of team efforts, improve and streamline communication, clear understanding scope, budget and timelines, optimization of cost and time, clarity on near-term and or long-term goals, timely identification of right tools and technology, simplification of task and estimation as well as healthy and motivated team environment.

## VII. Future Work

In this paper, we have proposed a simple and effective way of project management. Future work may help to elaborate on this proposal with case-study and formal methodology for ease of implementation and adoption by the project management team.

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