Agile Vs. Classical Software Development Project Management: Issues And Challenges

Mehmood Ahmed[1] , Asim Shahzad[2] , Muhammad Zeeshan[2] , Ahsan Zubair[2] , Jamaluddin Mir[3] , Muhammad Zubair Tahir[2] , Aamer Khan[2] , Muhammad Sibt ul Hassan[2] , Muhammad Naeem[2]

[1] Faculty of Computer Science, University of Haripur, KPK, Pakistan.

[2] Department of Computer Science, Abbottabad University of Science & Technology, Hevellian, Pakistan.

[3] Faculty of Computer Science & Information Technology, Universiti Tun Hossein Onn Malaysia, Batu Pahat, Malaysia.

Abstract: The technological revolution is constantly progressing, resulting in change that necessitates organizations to contemplate adopting an agile mindset to move rapidly. An iterative and reactive approach that includes daily communication and flexibility is essential to stay ahead of the competition. Software project management is of the utmost importance in the software industry. It encompasses various processes and knowledge domains. The success of any software project is contingent upon meeting the triple constraint of time, cost, and scope. As an iterative software development approach, the agile methodology allows for frequent changes, fast delivery, and reduced risk. The harsh reality of contemporary business landscapes has resulted in severe challenges for conventional management practices. The required flexibility should allow for agile project management, revolutionizing how projects are organized and executed. Eleven drivers of adoption and thirteen critical success factors are related to the project dimension, team, and culture. The Covid-19 pandemic has made managing projects more complex by introducing an element of uncertainty. It is hypothesized that agile project management, being a more adaptable and variable system, could be the response to this issue

Introduction:

APM, primarily an iterative approach, puts the customer first, adapts to change, and produces a functioning product. APM is an iterative approach that puts the customer first, adapts to change, and creates a functional product. The software companies who learn from their past mistakes stay in the market, and the rest of the companies face failure. New methods and approaches are constantly being developed because technology is always advancing. The software industry continually adapts to new strategies with the advancement of techniques and technologies.

Agile methods help software development by performing tasks gradually and repeating cycles, reducing the risk. Presently the software industry witnessed remarkable improvements due to the adaption of APM [2]. Agile Project Management is a framework that is reactive to changes, works closely with the client, and requires minimal documentation. This literature review explores the facets of agile project management within the software industry.

The potential of complex and innovative software projects is always high. Successful projects always follow efficient project management activities. Even though the traditional project management best practices have been around since 1960, they are still widely used today [3][4]. When applied to potential software projects of the current era, the traditional project management tools and technologies face implementation barriers [5]. Due to the complexity and turbulence of the business environment, it is evident that conventional management is struggling [6]. Many software projects have failed in the past due to inadequate planning and a lack of project management tools and techniques.

The project's scope is one critical aspect that will determine the budget and timeline [7]. From a more conventional perspective, change is considered a risk when a software project is carried out in a controlled environment [8]. Every change must be managed cautiously as it can impact the project's budget and timeline. Defining the project's scope at the commencement is crucial in ensuring the project's success. There are five distinct levels in Agile methodology that are necessary for properly defining the scope of a project: product vision planning, story mapping planning, release planning, iteration planning, and daily planning. The APM processes and steps promote direct customer involvement, flexibility in the face of change, and delivering a working product [9].

2. Background And Related Work

The 14th Annual State of Agile Report, 2020 [10] found that Agile implementation is most successful when organizations can manage changing priorities and have visibility into ongoing projects. There are still some challenges when it comes to adoption, especially in organizational culture and resistance to change. The study's key findings were that respondents who adopted agile methods felt they could deliver software more quickly, manage to change priorities effectively, and be more productive overall. However, 84% of respondents indicated they were below a high level of competency with agile practices. This points to a need for improvement and development within APM.

Projects that aim to be innovative often fail to meet their goals using traditional project management methods [11]. The challenging environment has been resulting in a novel comprehension of project administration. As agile practices become increasingly popular, they offer firms higher flexibility. This allows businesses to be more responsive to change and adapt to new circumstances. There are many reasons why the agile development approach is so important. It has been shown to increase productivity and quality in software development projects.

Additionally, it is becoming more popular daily, so it is essential to be familiar with the approach. The Agile methodology prioritizes four values: 1) Functioning software over all-inclusive documentation, 2) Individuals and interactions over methods and tools, 3) Active customer involvement over a contract renewal, and 4) Change adaptation over following a plan [12].

The scope management process is key to defining and maintaining control over what is included in a project. This can help avoid issues later on and keep everyone on the same page. It establishes a foundation upon which performance can be measured and monitored, and it provides clear communication channels to develop responsibility and control over Projects in the Controlled Environment and Project Management Body of Knowledge (PMBOK) [13]

APM in SMP:

Integrating agile practices into the software project management process can provide numerous benefits, including improved project communication, better customer engagement, and more efficient delivery of software products. Employing agile methods in the construction of physical products has several benefits, such as better communication, more responsiveness and flexibility, enhanced transparency, and increased commitment and motivation [14]. However, while agile methods were created with software development in mind, their usefulness for developing physical products is limited. The critical challenges posed by agile development include adapting to an agile mindset, integrating agile practices into traditionally organized companies, and understanding how agile practices can be applied beyond software development. Even though agile methods have limited transferability when developing intelligent technical systems, a combination of elegant and classical approaches is necessary to take advantage of agile methods [15].

3.1 Agile and Classical Methods

The agile stage gate process, as put forward by Cooper & Sommer [16], is one example of where agile and classical methods can be combined effectively. This methodology suggests that the traditional check-points and objectives of the stage gate process remain unchanged. These are the critical components for understanding and organizing the project. However, these rather lengthy phases are short sprints that last anywhere from two to four weeks. During these sprints, a prototype that can be demonstrated needs to be created to gain timely customer feedback.

3.2 Classical to the agile transition strategy

The transformation from a traditional to an agile software project management process affects the members of the development team, the project management team, departments, and developers. Cohn and Ford [17] have suggested several ways of effectively introducing agile processes to organizations based on their experience and experimentation. These strategies can be grouped into the following categories:

Developers: Developers, overall, respond to the queries raised by all stakeholders. They must exhibit qualities like enthusiasm, skepticism as well as cautious optimism. However, some developers do not welcome the changes but tend to start the project without enough planning.

Resistance: Some developers may find they spend more time on non-coding activities and meeting attendance than on actual code production, despite Agile's focus on code over classical software project management processes. It is generally best not to intervene. In doing so, other team members can better evaluate the worth of these activities and are less likely to adopt them later.

Micromanagement: Developers who see APM as a micromanagement approach often think project management is only about meeting deadlines and avoiding delays. To prevent this issue, project managers should always express their interest in removing obstacles and avoid complaining or being judgmental about tasks that take too long.

Transitioning from the high-processing process: Developers usually prefer heavy-weight classical software project management processes because they look better on their resumes. The solution is to gradually shift from high-processing to agile methodologies to make it easier for the development team.

Distributed development: The most striking aspect of distributed projects is that they must keep the team members working together for at least one or two weeks to increase the likelihood of project success. Endless team meetings help improve productivity and the quality of delivered products.

Overzealous team: If a team rushes into Agile without taking the time to plan, it often leads to a range of issues. A team needs to carefully plan their transition and have the discipline to see it through. Agile methodology has been shown to increase productivity in the long run, but usually, there is a decrease in productivity during the transition period as team members learn new techniques.

Software testing: APM methodology does not segregate coding and testing phases separately. Code written during an iteration should be tested and debugged to ensure quality. Developers and testers need to collaborate more frequently in the agile process than in other functions.

Top management: Top management can present unique challenges to organizations that want to transition to an agile process. Upper management's primary focus is creating value for the customer, measuring progress, assessing the impact on other departments, and ensuring project completion.

Customer commitments: Project management is concerned if they can uphold customer agreements with an agile process. If the company has difficulty adhering to customer expectations regarding cost, time, and quality, exploring new methods such as an agile process may be beneficial. Even if the company has been able to deliver on customer expectations in past projects,

there is no guarantee that it will always be able to do so. The agile process promises to complete tasks in less time and with fewer resources.

Tracking progress: Many project managers find classical software project management appealing because it allows them to track progress by creating a large number of documents. However, just because these documents exist does not mean the project is going well. It would be beneficial to develop model status reports containing fictional data to illustrate to project management the efficacy of the Agile process in project tracking.

Impact on other groups: Project managers are worried that even though the agile process may be beneficial for the development team, it could harm the work of other development teams. Consequently, if those in upper management do not comprehend and agree upon the potential consequences that agile methodology could have for different groups and how to facilitate these differences, then these endeavors are pretty likely to come to naught.

Project completion: Project managers are worried that the project might take more time and miss deadlines. They tend to be displeased when informed that the project's development will continue as long as the client has work of high priority that needs to be completed.

4. Conclusion and Future Research

This study investigated the salient research work to determine how agile APM is in the face of technology innovation, which is expected to accelerate. This work focused on 17 studies to analyze and evaluate these articles' contribution to assessing the agility of APM as measured by considering the four agile values. The data demonstrate that APM is making significant progress in becoming agile. There is still some progress before APM can be regarded as genuinely agile. It is critical for APM to continuously evolve and support work success with high uncertainty because the need for this will only grow. Writers must keep treating agility by the four standards to ensure they are not declaring agility through a mixed technique.

It has been concluded that scrum positively impacts the critical areas of software project management. The Scrum framework positively impacts the project regarding time, cost, scope, quality, risk, and stakeholders. Organizations have different approaches to hiring employees, which significantly impacts how scrum affects Human Resources management. The survey indicates that scrum can help reduce risk, control cost, and develop a quality product that can be completed promptly. The failure of traditional project management approaches to deliver on the objectives of innovative projects is a common problem.

A definition of project complexity is necessary to address project management challenges. Agile practices have become increasingly popular for projects that offer firms greater flexibility to adapt to changing environments. The agile project management approach is not just limited to the software development industry but can also be applied to other sectors. It is essential for organizations considering adopting agile practices to answer the question of what they hope to

achieve. Although it is possible that the company's desired outcome is not a problem that agile methodology addresses, there are no guarantees for success with agile implementation.

The success of APM rests on critical factors such as having a well-defined product, accurate estimation of effort, and transparent standards for product acceptance. Similarly, successful communication and collaboration within groups and between vendor and customer guarantee the success of projects. At the same time, a company's APM success is typically determined by management's level of support and investment. Future studies should explore how to best tailor APM for high-risk industries such as manufacturing, mainly through further hybridization of agile and stage-gate approaches.

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