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# **Is Agile Methodology Better than Waterfall Approach in Enhancing Effective Communication in Healthcare Process Improvement Projects?**

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## **ABSTRACT**

Smart healthcare strategies have been identified as a potential solution to address the growing challenges faced by the healthcare sector. The ability of smart healthcare strategies to improve efficiency, patient's outcomes and delivery of quality healthcare has motivated and committed governments and policy makers to invest in this innovation. However, uptake and usage of smart healthcare strategies has not been successful as anticipated, and this is due to a number of challenges faced by different stakeholders during the adoption of these strategies. The objective of this paper is to systematically check published literature to identify and compile a comprehensive list of challenges of adopting smart healthcare strategies.

The aim of this paper is to determine which of two project management methods, Agile methodology and waterfall technology, is better in enhancing effective communication in the healthcare process improvement projects.

This paper will be reviewing several organizational change management projects in the healthcare industry, analyzing the outcomes to determine which of the project management methods used is better.

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## **Introduction**

The healthcare industry has been a critical sector to human living due to its significant value to human continuous well-being. The sector has been providing life-saving services to humanity for so many years, however in recent years concern is growing about the quality of service rendered compared to monetary charges on patient and the timing of delivery. The stakeholders and experts in the industry have continued to consider ways to leverage the advantage of technology and innovation in the healthcare industry, to improve the overall process involved in the discharge of service. The introduction of cutting-edge technology has seen tremendous improvement from supply chain to patient care, medication prescription to provider visit, urgent care to diagnosis. This technology application has been the major driving force in providing quality healthcare service that meets the value of payment and reducing delivery time.

The current trend that is reshaping the worldwide financial landscape and presenting opportunities for the development of new business models is the convergence of digitization and globalization. Businesses that embrace digitalization can rapidly expand their operations into foreign markets. As stated in (Chau et al, 2018).

As a part of industry 4.0, the healthcare industry uses modern technologies like AI, IoT, user response data, digitization, machine learning, human psychology, augmented reality (AR), big data mining, etc. (Popov et al, 2022). These modern technologies aim to improve user comfort through proactive intervention in treating and detecting diseases (Metty et al, 2023). The sector is prepared to take a step forward toward industry 5.0, but there are a few challenges which includes organizational change or change culture, which this paper is going to be comparing two ways to implement it.

According to Razmak et al. (2018) change culture refers to the degree of willingness by the healthcare provider organization to support, show positive affect and openness to change decision making to incorporate the change. Change culture plays an important role in the successful adoption of smart healthcare strategies. In a study about smart healthcare strategies adoption in Netherlands hospitals, Kooij et al. (2018) revealed that the innovation-averse culture in hospitals is a major challenge in the adoption of smart healthcare strategies.

The major reason for this culture in the health sector is because of the many conflicting key stakeholders who all need their opinions to be heard and considered. This unavoidably slows down or completely stops the adoption process if one of the stakeholder groups feels unaccommodated. Additionally, adoption of smart healthcare strategies affects major healthcare provider processes which are often ambiguous and difficult to adjust (Kooij et al., 2018). This leads to changes in tasks and new responsibilities for staff. Change of established tasks or new responsibilities often rattles end users and this leads to resistance to the change and therefore promotes an innovation-averse culture within healthcare provider organizations. The method used in implementing the change becomes very critical as the change itself, this paper will be looking at the two project management methods of implementing

this change to determine which produces better result. The two methods we are considering in this paper are Agile methodology and waterfall technology. In this paper we will be reviewing two case studies under each of the methods.

Initial scoping was conducting by using the search terms (“healthcare process improvement project” OR “Agile management of healthcare process improvement project” OR “organizational change management in healthcare process improvement project” OR “healthcare process improvement project through waterfall technology”) AND (“adoption” OR “implementation”) AND (“challenges” OR “barriers”) to identify relevant electronic databases and journals to be used for the literature search. Following the initial scoping, electronic databases EBSCOhost, PubMed, Science Direct and Scopus were selected for this literature search. These databases were selected due to the reputation and variety of citations which cover the topic of this review. During the extraction of articles, an advanced search tool was used to filter and limit articles to only identify the full text, peer reviewed, English language articles published between 2013 and 2023 (10 years). This is because technology is a fast paced, rapidly evolving field thereby important to recent cases.

In analyzing the selected cases, quantitative and qualitative methods will be used to properly compare the outcomes of the two methods. Tables, equations, and diagrams will be used where necessary to further support the findings.

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## Literature Review

Project management in healthcare

*The Agile methodology approach.* (golearnsixsigma, n.d.)

Define – it is important to understand the problem at hand, identify the need to change the narrative, the old way of doing things to achieve a better result that would be beneficial to all stakeholders and the business. It is good to understand the current state and be able to chart a new course that will take the organization to the future state through a guided process. It could be the need to introduce electronic health record system that manages billing, resource scheduling, patient scheduling, physician practice management, and all records keeping. The realization that a problem exist will normally raise the questions of how to solve them, which will lead to what the new process would look like after the project. It is very important to highlight the areas that need to change for the realization of the new process. (Bizagi Modeler, 2020)

Quantify – it is also important to measure the problem, this is a way of conducting the impact analysis of the existing process. What are the losses to the business through the existing problem? The impact on resources, finances, scheduling, staff welfare, customer satisfaction, and company identity. The business may be losing through patient under-billing, inconsistent staff scheduling, delayed manual patient appointment, too much workload for a section of staffs, and approach to delivery time. These are numbers that needs to be known in the current state to fuel the discussion of realizing the future state. Understanding the losses from the existing process will convince stakeholders to see more reasons why improvement is needed to achieve better results.

Analyze – after identifying and measuring the impact of the problem, the next important phase is to identify the causes of the problems. A root cause analysis might be needed at this stage, but in so many cases what is needed is the technology aid. Taking patient appointment scheduling for an example, manual scheduling has its limitation when it comes to speed and records management, which cannot be compared to computerized scheduling backed by technology. When the problems are analyzed, proffering solutions becomes easy and promotes team inclusiveness.

Improve – this is the implementation phase where you adopt the technology that is best suited to the desired improvement, at this stage continuous verification is carried out to seek ways of improving the solution till it meets the standard to produce the desired results. The software to schedule resources should be tested again and again to meet the desired requirement while work continues with other parts of the improvement implementation project.

Control – in this phase the process is monitored to achieve desired result and assess through iterative review. The process could be refined or adjusted for further standardization, modification for compliance with industry requirements.

Communicate gains upfront – bring all stakeholders on board by letting everyone know the advantage of the process improvement from the start. Allow stakeholders input through consistent communication and make the gains known from the initial stage to fuel expectations. This makes everyone feel a part of the decision and take ownership.

Designate project champion – choose a leader for the team to charge the direction of the project, the role serves as anchor among stakeholders making sure necessary communication exist throughout the lifespan of the project.

*The waterfall technology approach*

Analyze context – process of studying the occurrence of events over a period to decide what needs to change as part of transition to sustainability (Warde et al., 2017). This helps highlight the unique features of the organization which can show why the research may produce unexpected results and why the same change strategies can produce different levels of success.

Framework – choosing a theoretical framework focuses on processes of knowing, learning, and organizing which includes studies in healthcare (Nicolini et al., 2016). Feldman and Orlikowski (2011) discuss the relation between action/structure and stability/change in the context of theorizing routines as practices. Although relevant to analysis of workplace, these approaches do not advise how social practice theory can be operationalized within organizational change processes.

Establish boundaries – for an acceptable framework there is need to set boundaries, which determines what is inside and outside of the practices. For a habit to be considered a practice it requires three types of elements: materials, competencies, and meanings. In the case of sustainable consumption studies, this may mean focusing on the material objects with the highest environmental impact.

Acknowledge connectivity – look out for connections between the practices or pattern of occurrence. They can be traced to the form of a spillover effect from home to work, or even from practice to practice within a workplace. Figueiredo et al. (2020) found that in an office a strategy focused on energy has developed skills and meanings of sustainable consumption that also prompted employees to review their waste behavior.

Data collection – this is a critical phase of the project, collecting data for empirical work from practice perspective means asking questions that shift focus away from people and technology to the practices. Who performs them? what they are? which is dominant? Another way of collecting data is for the researcher to observe the practice occur over an extended period. That means reducing the reliance on reflective interviews (Hitchings, 2012).

## Analysis

The involvement of project management in the healthcare sector is well documented and, on the increase, according to several literature reviewed. However, it seems that the involvement is more in the technology era, as there was not much literature on healthcare process improvement projects that involve project management before the coming of innovation into the sector. Most research work and case studies found were executed manually with little or no project management principles applied, and only a hand full of healthcare projects are found in the technology era applying project management methodology.

The literature found for the Agile methodology (John et al., 2022) is quite helpful with good application of lean six sigma and all necessary information needed to help the analysis required. The project produced its desired result, even though it was the second attempt after a failed attempt in the past due to a different approach. The project team was able to bring all stakeholders together working on one purpose to achieve the planned scope. The cultural change was achieved, and the business gained more around finances and customer retention and onboarding. The project also produced an unintended result of tele- health service which was beneficial to the hospital during the breakout of COVID, an initiative that would have met strict opposition before the implementation of the project. The Agile methodology do not only achieved its aim, but also set the workforce up culture-ready for more positive changes in the nearest future.

Although there are not many of such case studies out there that deploy Agile methodology in healthcare process improvement projects, even when it is found they are not around organizational change management. There are many case studies and literature about healthcare process improvement projects but do not apply project management methodology rather they used retrospective questioning or interview which do not serve the purpose for this paperwork. The literature found for this paper (Yulia and Thomas, 2022) on traditional approach to manage organizational change in healthcare process improvement project would have been better if the recommendations were implemented, so the results can be available for better analysis purpose. From the research carried out (Yulia and Thomas, 2022), the inability of traditional waterfall to have big cultural change among the healthcare workers was evident, where in one of the interviews the respondents were pointing to unavailability of infrastructure for their behavior. The approach makes it look accusive which will not make it easy for the healthcare workers to welcome the idea because it seems to push the blame to them for the offense rather than bring them in as a stakeholder to jointly look at the problem and proffer lasting solution together that will be acceptable to everyone.

From the findings and analysis of the literature so far, it is evident that Agile methodology is better at managing organizational change than the waterfall technology. According to the review (John et al., 2022) the project produced unintended shift in the organization paving the way for the introduction of Tele health without any objection from the staffs as a result of the recently concluded process improvement project.

There is a need to carry out more research in the area of healthcare process improvement projects deploying Agile methodology on organizational change management.

Further analysis of benefits of both methodologies are shown in Tab. 1 below:

Healthcare process improvement project using Lean six-sigma (John et al., 2022)	Healthcare process improvement project using traditional waterfall (Yulia and Thomas, 2022)
Process steps reduced by 50%	No reduction in process
Improved revenue	No improvement
Increase in patronage through referral	-
High Return-on-Investment	-
Elimination of waste steps	The coming of COVID nullified any gain
Positive change of mind towards future process change	No clear direction
Unintended positive consequence of cultural change	Infrastructural excuses

Table 1. Comparison of Agile and waterfall methodologies benefit

## Conclusions and recommendations

The review of the two literatures have shown that Agile methodology is more effective in managing organizational change in healthcare process improvement projects. Although there were not many case studies out there on using project management principles for organizational change management.

The Mobile Charge Capture (MCC) (John et al, 2022) case in review made it known that failure had been recorded earlier when the same project was undertaken with a different approach in the past. The success this time came as the organization changed the process to get a different result. This time it was the Lean six-sigma that was chosen, a methodology that runs on Agile principle. The principle got the stakeholders involved, project champion was selected to interface with between the staff and the project, a decision which has been credited with the success of the project.

The practice theory case (Yulia and Thomas, 2022) did not apply full project management principles in the project but the research was towards organizational change towards waste generation in an healthcare environment using questioning, discussion and records data as primary source of findings.

The success of this project has provoked a suggestion for further research on how Agile methodology can help improve the management of resource allocation in an organization. In the same thinking, looking at the success of Agile in the project under review due to stakeholder involvement and the fact that it produced unintended result, it will also be interesting to research on how Agile methodology can manage stakeholder communication to attain success against other methodology.

It is also recommended that organizations should look at other failed projects or failed attempt to initiate a project in the past critically, then try the Agile approach especially if the failed attempt was occasioned by employee revolt or attitude against culture change.

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