

Documentation in Agile Software Development Teams

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ABSTRACT

Agile software development has become a common practice over the last decade and is replacing more traditional methods of software development. This study was anticipated to bridge the gap between industry practice and the academic practice of managing documentation. The purpose, importance and the way documentation is managed by the development teams is outlined in this study. The study identified the tools and techniques commonly used in agile teams. The comparative study on face to face communication and documentation has highlighted the features and importance of each in agile teams of varying sizes and complexity. The frequency of updating the changes, and the consequences of not updating the changes is also discussed in the study. A qualitative approach was adopted for this research study and the interviews with agile practitioners has helped to significantly explore the requirements needed in the agile development environments of IT organizations.

Keywords: Agile software development, agile documentation, face to face communication

1. INTRODUCTION

Agile software development (ASD) processes are comprised of revolutionary methods of software development (SD). Agile methodologies are less documented and more customer oriented in comparison to traditional methodologies (Papadopoulos, 2015; Rubin & Rubin, 2011). Agile practitioners considered documentation important for their projects as they realised the little documentation in their projects was not sufficient. Although documentation was mentioned, it was not anchored in the original process. As discussed in 2001 and 2011, the agile process of SD mainly relied on verbal communication which becomes harder to recall as the time passed (Stettina and Heijstek, 2011).

The purpose of this study was to bridge the gap between the agile manifesto and previous studies conducted in this field. The importance of documentation and how they were anchored in the ASD process was explored in this study.

created in 2001 stated that working software is the primary measure of progress and is the more useful and preferred method of delivery to clients than simply providing documents to the clients during meetings (Beck, Beedle, & Bennekum, 2001). With increasing numbers of integration projects and changing team setups, maintenance of development knowledge became crucial, however, Selic (2009) argued that the trend was headed in the opposite direction.

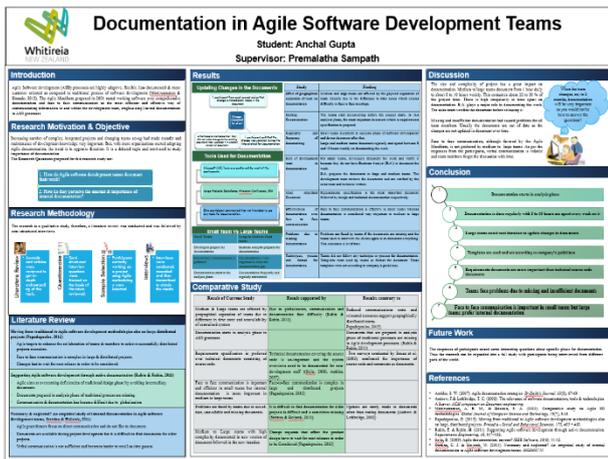
A study conducted by Souza, Anquetil & Oliveira in 2005 identified that documentation was usually out-dated, poor quality, over abundant, difficult to extract and in some cases, non-existent. A lack of up-to-date documentation was the main problem that affected software maintenance. The organisations had to interview clients and re-document the system requirements to reduce the problem of working from source code. This was a costly operation and amounted to another challenge in the provision of documentation (Brandl, 2011).

Hoda, Noble & Marshall (2010) stated that the design phase in traditional models was fragmented into different phases which resulted in a new design document for each phase which did not comply with reality as the system evolved. Problems were often faced during the updating and maintenance of the system. It added to drawbacks of traditional development process and increased the need to transfer the knowledge in an appropriate way due to changing team setups and the complexity of projects (Stettina & Heijstek, 2011).

Stettina & Heijstek (2011), suggested designers to communicate design with the least amount of documented work possible. Focusing on a document that avoided upfront details and was good enough could lead to the project's success. However, comprehensive documentation alone would not ensure project completeness unless it was collaborative in nature.

Most large organizations favoured a plan-driven approach to produce detailed and written documents but agile teams considered it a waste of effort (Ahmad and Mohammad, 2014). In contrast, Hummel, Rosenkranz & Holten (2013), asserted that agile teams found documentation worthy and very useful.

Agile concentrated more on direct communication than on internal documentation, plans, and models which were found to be of no direct use to the end customer, and face to face communication supported the constant communication with the stakeholders. However, Stettina and Heijstek (2011), stated that face-to-face communication in large and especially on



2. LITERATURE REVIEW

The literature review conducted for the study highlighted key features such as the importance of face to face communication, documentation, challenges faced by documentation, effect of missing documentation and frequent changes made to documentation. The seventh principle of the Agile manifesto

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distributed projects was not only complex but also became harder to recall as time passed.

3. METHODOLOGY

A qualitative approach was adopted for the research process. Literature reviews on similar studies were conducted to identify the gaps, and interview questions were thus formulated keeping these gaps in mind.

4. RESULT

An interview was conducted with 5 Agile practitioners and these were the following results:

Table 1: Results of the study

Category of the Questionnaire	Findings	Supported & contrasted by literature review
Regularity & Frequency of documentation	Small teams documented only in the analysis phase. No documentation was done after that. Large teams documented regularly & spent 8-10 hours weekly on documentation.	Supported by Rubin & Rubin (2011).
Problems due to missing documentation.	Problems were faced due to missing documentation. Teams had to interview clients again to re-document everything which consumed a lot of time.	Supported by Stettina & Heijstek, (2011) and Rubin & Rubin, (2011).
Updating frequent changes in documentation.	Small teams updated changes as soon as they were received. Medium to large teams documented changes in a new section in the next version of the document.	Supported by Papadopoulos (2015). Contradicted by Forward & Lethbridge, (2002).
Effectiveness of documentation over face to face communication	Face to face communication in small teams was very effective. Documentation was considered very important in medium to large teams.	Supported by Papadopoulos (2015) and Forward & Lethbridge, (2002).

5. DISCUSSION

Participants had mixed reviews about allocated time for documentation. Small teams tended to document only in the analysis phase with no documentation in any other phase and therefore did not spend much time on this analysis. Medium to large teams had to document on a daily basis by allocating a minimum of 1 hour daily and 8-10 hours weekly and whenever the client changed the requirements. It was indicated by one of the participants that the business analyst spent about 40 hours a month, and another one stated that about 20-30% of the project time was spent documenting.

Another result revealed that internal documentation as well as face to face communication were important for a development team irrespective of the team's size & project complexity. All participants faced problems due to little or no documentation available for the project they were working or had worked on. One of the participants had to re-interview their client as the entire documentation was missing. It was understood that time

constraints were the reason behind little or incomplete documentation.

6. CONCLUSION

The popularity in the use of agile methodologies has increased due to working software, changing requirements, self-organizing teams, accommodating frequent changes, changing priorities and a flexible development process that complimented the agile methodologies. The literature review supported the agile manifesto that emphasised the need for working software over comprehensive documentation, but also supported the role of documentation which did not comply with the agile manifesto. The study also found that the primary consumers of the documentation had little or no documentation to work with to maintain and enhance the product. Face to face communication was outlined as the most effective method to convey information in a development team. However, the results of interviews showed that internal documentation was considered as important as face to face communication and was essential if the project was large. The study confirmed that agile practitioners faced problems if internal documents were unavailable.

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