Emergence of Agile Methodologies: "Perceptions from Software Practitioners in Sri Lanka"

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Abstract- Agile software development methods have caught the attention of software practitioners and researchers worldwide. Several issues have arisen from the experience of software methodologies, including the nature of research questions that such studies address the advantages and challenges associated with being a member of the community under study, and how to maintain the rigour in data collection. A systematic review of empirical studies of agile software development up to and including 2005 was conducted. The search strategy identified 1996 studies, of which 36 were identified as empirical studies. The studies were grouped into four themes: introduction and adoption, human and social factors, perceptions on agile methods, and comparative studies. The review investigates what is currently known about the benefits and limitations of, and the strength of evidence for, agile methods. The main implication for research is needed perception from software practitioner. For the industrial readership, the review provides a map of the findings, according to topic, that is compared for relevance to their own settings and situations. This paper focused on the various methods which software practitioners adopt Agile to enhance their business operations, which aims to organize, analyze and make sense out of the dispersed field of agile software development methods. The comparative analysis is performed using the method's life-cycle coverage, project management support, type of practical guidance, fitness-for-use and empirical evidence as the analytical lenses. The results show that agile software development methods, without rationalization, cover certain, different phases of the software development life-cycle and most of them do not offer adequate support for project management, uncovering of the better ways of developing software by doing it and helping others do it, while there is value in the items on the right and value the items on the left more.

Index Terms- Software practitioners, Perceptions on agile methods,strength of evidence,method's life-cycle coverage,Project management support

I. INTRODUCTION

The current software development environment is dynamic. The requirements of the client may change time to time while the product is in the process. The software companies and practitioners try to catch the clients as much as possible. Current competition among software development firms is high. Therefore, the companies treat the client as "god" and try to accept the changes in requirements from client without any issue to them. The Agile methodologies enable the company to react to changes effectively and release the small versions and get feedback from the client for future versions.

Recently, many of the suggestions for improvement have come from experienced practitioners, who have labelled their methods as agile software development. This movement has had a huge impact on how software is developed in Sri Lanka. However, though there are many agile methods known about how these methods are carried out in practice and what are the effects. According to current trend IT industry is one of the fast growing firms. Nowadays software practitioners in Sri Lanka are moving from traditional methodologies to agile.

This Systematic review seeks to evaluate, synthesize and resent the [1] empirical finding on agile software development to date and provide an overview of topics analyzed. This overview discusses the certain research questions. Such as, what are the outlook about the agile methodologies among software practitioners in Sri Lanka? What are the welfares and issues are occurred by practicing agile methodologies in Sri Lanka? How the agile methodologies is involved with software practitioner in Sri Lanka? How the practitioners in Sri Lanka, have the impression of the differentiation through other methodologies?What are the strength of the findings and suggestions for research and practice in Sri Lanka?

This review will also help the scientific community that works with agile development to build a common understanding of the challenges that must be faced when investigating the effectiveness of agile methods. The results of such investigation will be relevant to the software industry.

This document is contained the background study of the existing research and the current research of the agile methodologies. Also it included the result and the discussion about the awareness of this Methodologies which is insight from Software Practitioners in Sri Lanka. It mentioned the conclusion what are we gathered from the discussion.

II. LITERATURE REVIEW

Agile methods are an established process for developing software nowadays. There is, however, less evidence of their usage among software practitioners in Malaysia. While the methods have become mainstream in other regions, that is not the case in this country. This paper empirically investigates the perceptions of Agile methods usage from [1] seven organizations involving 14 software practitioners in Malaysia. Our participants are using Scrumand have a maximum of five years experience. We categorized our findings in terms of awareness, introduction, and challenges they are facing,

together with the suggested and practiced solution from them. The challenges with developing software systems led to a switch from traditional software methodologies like Waterfall towards the Agile software methodologies. These Agile software methodologies have become more and more popular in recent times, and Scrum in particular has been adopted by many companies. The current literature suggests that these Agile methodologies are indeed more effective in project management, particularly in dealing with the complexity of modern software systems and the rapidly changing business environment. Given however a lack of available evidence of such research on the factors leading to the adoption of Scrum, its usage and its impact within Sri Lanka, this thesis investigates [2] the efficacy of Scrum in project management in the Sri Lankan context. Agile methodologies were initially proposed as being effective in specialized scenarios, for example, with small co-located teams, but studies have shown that these methodologies are also effective in many other settings. The existing literature further proposes that many factors can affect the effectiveness of these methodologies. This thesis therefore sets out to compare some of the critical success factors identified in the existing literature against various characteristics found in the Sri Lankan environment.

The purpose of this study was to investigate whether the software development companies can achieve expected software quality through agile development. In order to reach this goal, the first objective of the research was to identify the [3] software quality factors through various quality models and quality management philosophies. To identify the software development process models. Toanalyze the software quality difference between development methodologies in terms of selected quality factors. And finally to identify the development technique by which high quality software products could develop. The research was conducted in the Sri Lankan context focusing on software development companies registered with the Sri Lanka Exports Association. After the preliminary investigation on obtaining relevant information, four companies namely; Virtusa, Team Work, DMS and E- College were selected for the research. The second pilot survey reflected that it was impossible to collect data from clients. Thus, the research was aimed only at developer oriented quality factors.

There has been a noticeable focus shift from agile methods such as eXtreme Programming (XP) and Scrum to lean software development in the last several years, which is indicated as "from agile to lean". However, the reality may not be as simple or linear as the term implies. To provide a better understanding of the combined use of agile and lean approaches in software development, a set of experience reports were analyzed. These reports were published in the past conferences dedicated to agile software development and report experiences of using both agile and lean. The results of the analysis show that agile and lean can be [4] combined in different manners for different purposes in software development. Lean is often applied as guiding principles for agile development. When combined at practice level, flow based lean processes tend to substitute time-boxed agile processes.

The software Requirement Engineering (RE) is one of the most important and fundamental activities in the software life cycle. With the introduction of different software process paradigms, the Requirement Engineering appeared in different facets, yet remaining its significance without a doubt.

This study was conducted to analyze the impact of poor Requirement Engineering in outsourced software projects from the developers' [5] context (sample size n = 57). It was identified that the present outsourcing scenario has created to have frequent requirement changes, shrunk design and stretched development phases, and frequent deliverables, which have to be accommodated by the software developer with extra effort and commitment beyond the project norms. The results reveal important issues and open policy level discussions while questioning our insights on the outsourcing benefits as a whole.

Product-Line Engineering and our study aimed to describe what agility is for software product lines and find out more on how this approach could be realized. [6]Agile Software Product-Line Engineering could reap benefits from the best of the two software engineering approaches combining long term strategic efforts with short term agility.

The companies under study seem to combine Software Product-Line Engineering and Agile Software Development with success, reducing initial investment and exploiting reuse, and we found several practices that are interesting for further study. Based on these practices we present our view of a top- down approach to Agile Software Product-Line Engineering starting with several characteristics and a proposal for a definition of the field. Further, a framework for implementing the approach based on our research is presented, before we describe our thoughts on how the practice areas of Software ProductLine Engineering can be combined with Agile Software Development practices.

Agile software development represents a major departure from traditional, plan-based approaches to software engineering. A systematic review of empirical studies of agile software development up to and including 2005 was conducted. The search strategy identified. 1996 studies, of which 36 were identified as empirical studies. [7]The studies were grouped into four themes: introduction and adoption, human and social factors, perceptions on agile methods, and comparative studies. The review investigates what is currently known about the benefits and limitations of, and the strength of evidence for, agile methods. Implications for research and practice are presented. The main implication for research is a need for more and better empirical studies of agile software development within a common research agenda. For the industrial readership, the review provides a map of findings, according to topic, that can be compared for relevance to their own settings and situations.

A survey was conducted among Agile professionals, [8] gathering survey data from 109 Agile projects from 25 countries across the world.

Multiple regression techniques were used, both at the full regression model and at the optimized regression model via the stepwise screening procedure. The results revealed that only 10 out of 48 hypotheses were supported, identifying three critical success factors for Agile software development projects: (a) Delivery Strategy, (b) Agile Software Engineering Techniques, and (c) Team Capability.

Limitations of the study are discussed together with interpretations for practitioners. To ensure success of their projects, managers are urged to focus on choosing a high- caliber team, practicing Agile engineering techniques and following Agile-style delivery strategy.

Participants agree that documentation tools should seek to better extract knowledge from core resources. These resources include the system's source code, test code and changes to both. Resulting technologies could then help reduce the effort required for documentation maintenance, something that is shown to rarely occur. Our data reports compelling evidence that software professionals value technologies that improve automation of the documentation process, as well as facilitating its maintenece. [9]

III. METHOLOGY

The team has gathered information form quantitative research method which is used to aim to gather an in-depth understanding of software practitioner in Sri Lanka. The research methodology was based on a comprehensive survey conducted through software practitioner in Software development industry in Sri Lanka. Since the main objectives of the study and the research problem are generic to any Information technology industry company and country as a whole the survey and its findings could easily be generalized with minor alterations. For this study, 32 software developers from 8 Small to Medium software developing enterprises were used.

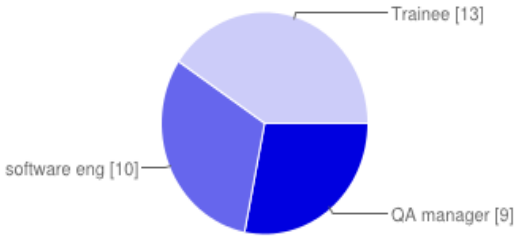

Figure 1: Current position of software practitioner

Type	No of Practitioners	Percentage
QA Manager	9	28%
Software Engineer	10	31%
Trainee	13	41%

Table 1: Current position of software practitioners

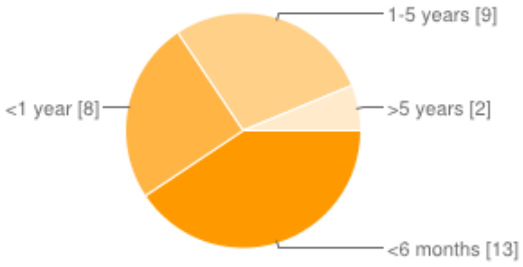

Figure 2: Working Experience

Duration	No of Employee	Percentage
< 6 Months	13	41%
< 1 Year	8	25%
1-5 Years	9	28%
> 5 Years	2	6%

Table 2: Working Experience

IV. RESULT AND DISCUSSION

In this study the team has come up with a decision that agile methodology is used by 94% of software practitioners in Sri Lanka. There are only 11% of practitioners gained full of satisfactions. 12% of practitioners are extremely interested in agile methodology. By comparing with other practices the agile methodology got 84% in performance.

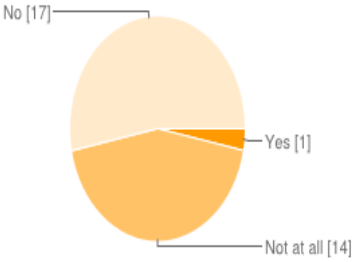

Figure 3 : Issues Occurred While Practicing Agile

Issues	No Of Practitioners	Percentage
Yes	1	3%
No	17	53%
Not at all	14	44%

Table 3: Issues Occurred While Practicing Agile

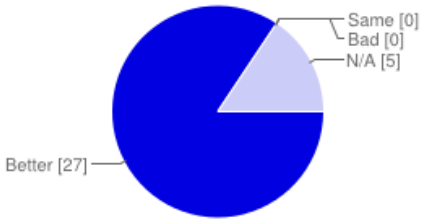

Figure 4: Agile is compared with other methodologies

Performance	No of Practitioners	Percentage
Better	27	84%
Same	0	0%
Bad	0	0%
N/A	5	16%

Table 4: Agile is compared with other methodologies

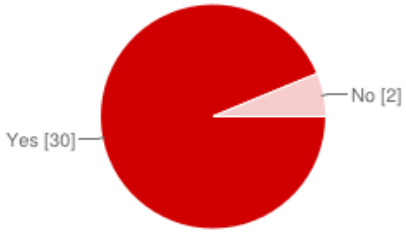

Figure 5: No of practitioners are using Agile

Usage	No of Practitioners	Percentage
Yes	30	94%
No	2	6%

Table 5: No of practitioners are using Agile

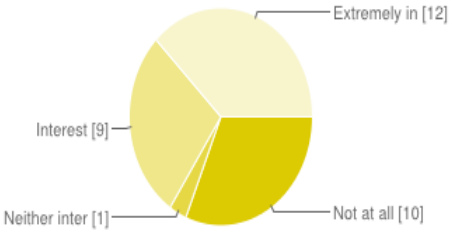

Figure 6: Interest in Agile Methodology

Interest	No of Practitioners	Percentage
Not at all	10	31%
Neither interest	1	3%
Interest	9	28%
Extremely Interest	12	38%

Table 6: Interest in Agile Methodology

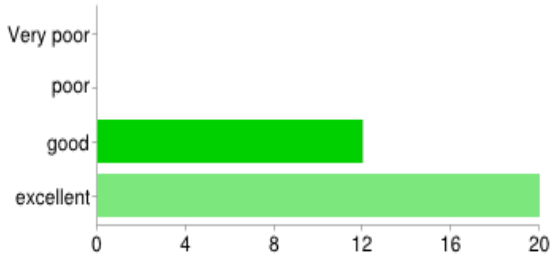

Figure 7: Practitioners Satisfaction (Quality)

Quality	No of Practitioners	Percentage
Very Poor	0	0%
Poor	0	0%
Good	12	38%
Excellent	20	63%

Table 7: Practitioners Satisfaction(Quality)

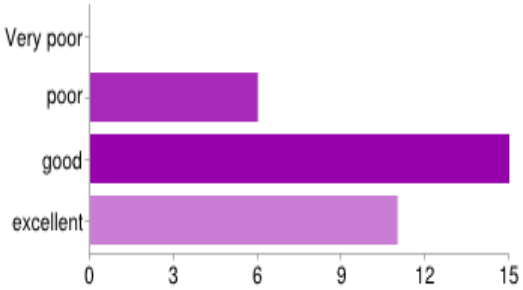

Figure 8: Experience of using Agile

Experience	No of Practitioners	Percentage
Very Poor	0	0%
Poor	6	19%
Good	15	47%
Excellent	11	34%

Table 8: Experience of using Agile

V. CONCLUSION

The outcome of this research, there are some possible future studies relevant to this research, which can be considered as further extensions. The main goal of this study is focused on appearance of Agile Methodologies, insight from Software Practitioners in Sri Lanka. The objective of this study was to investigate how agile and lean approaches have been combined in software development. To explore this phenomenon, a data analysis of 32 experience reports containing real-world experiences of combining agile and lean in software development was conducted. The patterns of combining agile

and lean in these experience reports were identified and categorized in a more systemic way. The findings of the study would enrich our understanding of how agile can be combined in software development. The combination types identified in the study can serve as a thematic map for the researchers who intend to conduct more in-depth study of the phenomenon of agile. The practical implication of the study is that it reveals different ways to agile. There is no one-type-fits-all solution. Each organization should reflect on its own situation and needs before embarking on the journey of combining agile. Then the potential combinations summarized in this study could provide them with some promising directions to explore. However, how to effectively tailor the combination types to suit the specific situation and needs of the organization is a challenge yet to be addressed satisfyingly and worth further studying.

One main limitation of the study is lack of practitioners in the software industry have been selected for the research.Even though there are number of software firms in Sri Lanka and some of the companies has to be selected and there are many field of practitioners in the industry. But our target is few of them. There are different type of software methodologies available, although the different kinds of project has to be focused on several methodologies it may depend on the life time, complexity, cost and knowledge of the practitioners in their project the team has not been considered them. There are some sub practices in agile such as Xtreme Programming and scrum; the team did not deeply consider those methodologies. Agile methodology has some critical success factors as same as a correct delivery strategy, a proper practice of Agile software engineering techniques and a high-caliber team.

Another interesting study is to bring the analysis presented in the paper one step deeper and analyze specific agile practices that are possibly disjoint, to reveal how and why these practices are related and enacted indifferent organizational contexts to the future researchers. This review holds a precise conclusion of this master thesis summarizing the important points and findings of our work.

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