

Agile Approaches In Construction Project Management

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Abstract- *The Agile project management approach evolved from the software industry. This process to be a vivid and continuously updated. Agile project management provides project manager with methods, tools, and approaches to aid both the project manager and project client to engage in a more efficient manner. The purpose of this study is to investigate the different stages like, can Agile be implemented in the design phase in construction industry? What adaptation is required? And how could benefit from utilizing Agile approaches from traditional way, as well as interviewing with experienced senior, project manager for the identification of possible Agile approaches to identify*

Keywords- Agile, Agile methodology, scrum, project management,

I. INTRODUCTION

Today project management is a current and highly discussed area. How project within the construction industry are managed has not changed significantly during the last decades; however, stakeholder, materials, competition and user requirements are continuously changing. This create a gap between the current managerial view on how construction project is conducted and how they could be managed to increase efficiency In the construction industry, one of the biggest challenges when creating a building is to account for the unforeseeable In order to reduce the amount of unforeseeable events, project managers typically use templates, checklists and often models with phases, sub-phases and sub-sub-phases, This so-called sequential project management approach aims to plan the project in detail and tries to carry it out without any deviation The creation of this plan often takes up significant resources before the actual construction has even started. In many cases, these processes are so long that by the time the execution phase has started, the plan needs to be revised because of modified project requirements. Constant modifications of the project requirements coupled with occurring problems in defining the original product requirement causes cost overruns and schedule delay and lowers the product quality. As a countermeasure, agile project management was created as "...the ability to both create and respond to change in order to

profit in a turbulent business environment". Instead of trying to predict unforeseeable risks, one should approach them as opportunities to profit. Therefore, the agile approach is advantageous to the traditional one, as resource consuming detailed planning from the start of the project is avoided. At the same time, decisions are delayed as long as possible. Scrum is one of many agile project management methods. It was created by Sutherland and Schwaber between 1993 and 1995 and their work strongly influenced the Agile Manifesto, which sets twelve principles and four key values for all agile project management methods. Similarly, the work by Sutherland and Schwaber was heavily influenced by Nonaka and Takeuchi . In fact, was one of the main foundations for the lean concept. Therefore, it is important to make the differentiation between lean and agile: "Lean manufacturing [was developed as] a response to competitive pressures with limited resources. Agile manufacturing, on the other hand, is a response to complexity brought about by constant change. Lean is a collection of operational techniques focused on productive use of resources. Agility is an overall strategy focused on thriving in an unpredictable environment. Flexible manufacturing system [offers] reactive adaption, while [agile system offers] proactive adaption." In this paper, gives an outlook for the implementation of Scrum in the construction

II. LITERATURE REVIEW

Jonathan adut, "Applying agile approaches in public construction and civil engineering projects" This paper deals about the common set-up of a public C&CE project usually follows three categories

1. The project client, has the task to order and prepare project. In this preparation, a resource requisite is performed in order to determine if the project should be carried out internally or if external support is needed. If external support is needed, the project client must consider incoming proposals by consultancy companies that is best suited for performing the planning and management of the project
2. Contractors, usually building companies that implements the chosen execution plan for the project

3. The public/end-user, which consists of all those affected by the intended changes of the project. Within each of the above categories there are a lot of different stakeholders involved. By this study require to simplify some changes in the methods in projects management according to the guidance of various experts.

Agnieszka Dziadosz, Mariusz Rejment “Risk analysis in construction project-chosen method” This study examines the current risk factors acquiring in various construction field and how would it be reduced effectively, it depends mainly on risk categorised by its size and damage. It explains details about

1. Risk assessment in construction,
2. multi criteria decision making method,
3. static approaches,

by its flexibility and disciplinary action, it will make great changes in risk management which is also utilised in agile manifesto. Static approaches will be more effective approaches in Agile approaches for the risk management

Owen, R. Koskela, LJ, Henrich, G and Codinhoto, R” Is agile management applicable to construction?” The main aspect of this study is to answer whether agile is applicable or not, by using lean and agile production and ‘leagile’ construction. it states ‘a response to competitive with in the limited resources in other hand, is a response to complexity brought about by constant change. lean is a collection of operation technique focused on productive use of resources, it comparing the lean and agile project management in productivity. Agile relies on incremental and iterative development with continuous learning being important to evolution of the optimal value. This study investigates every phase in construction like design phase, execution phase etc, their remedies and measures in the every single step and also the possible flexible solution and methodologies with in the project without affect the productivity or value delivery.

Mattias Yllen, johansson “Agile project management in the construction industry-an inquiry of the opportunities in construction projects” In this paper, mostly what opportunity and benefits will come from implementing Agile project management in the design phase of construction project and what possibilities are there to implement in the design phase of construction projects? It deals with the advantages of the agile project management and possible methodologies most suited for design phases in the construction industry, more over case studies about ‘Grontmij AB international technical consultant firm that has operation

in range of disciplines , such as planning design , transportation mobility, water &energy, monitoring &testing by 2012’ and it is used to gain knowledge on what benefits and possibilities that come with Agile management but also the constrain and weakness that Agile management can bring to the table in comparison to the traditional way of conducting projects.

Joao Carlos Ferreira, “AGILE approaches in project management” this paper is discussed about the numerous advantages over the Agile project management which is usually applied in software industry, this paper deals with only in the management sector but not in the construction field, however they conclude that the Agile approaches is not only used only in IT sectors also the non IT sectors ‘if any project under complexity than it can be utilized by the Agile project management’.it identify for the areas of computer engineering and Civil engineering several good practices that leads to the increase of efficiency of the project, the good practices were regular deliveries of the product to the customer, planning and discriminated definition of requirement to implement and manage the project.

Saini, M, Arif, M and Kulonda, DJ, “Critical factor for transferring and sharing tacit knowledge within lean and agile construction processes”, this paper is discussed about to investigate the critical success factors (CSFs) associated with the effectiveness of transfer and sharing of tactic knowledge in lean and agile construction process.it describes about the lean construction management, construction supply chain and organizational learning in detail. Discussion of 10 critical success factor, 1. Trust basis organization within a CSC, 2. motivation, 3. Leadership capabilities, 4. business strategies, 5. Organizational capabilities, 6. Individual capabilities, 7. identification of process improvement opportunities, 8. identification of type of knowledge to share, 9. identification of source of knowledge, 10. identification of recipient of knowledge. However, to make an initiative success within the lean and agile process, people and organization require skills and training in developing their capabilities in order to ensure the smooth transferring and sharing of tacit knowledge.

Thomas STREULE, Nino MISERINI, Olin BARTLOME, Michael KLIPPEL, Borja GARCIA DE SOTO, “Implementation of scrum in the construction industry”, this paper is discussed about the SCRUM which is a framework for product development where different processes and technique can be applied to complex project. It defines some scrum rules, the scrum team consists of the product owner, the development team, and scrum master, the team is self-organized and cross-functional, all decisions of

the project are taken within the team members and so. The following actions occur during the Sprint Review:

1. The Scrum Master has a first-hand contact with all the members of the Scrum Team and checks that all are present.
2. The Product Owner explains what Items reached the state of done and which did not.
3. The Development Team discusses what went well during the Sprint, what did not, and how the problems were resolved.
4. The Development Team presents the Increment and answers questions if needed.
5. The Product Owner discusses the Product Backlog and guesses a completion date.
6. Considering the newly updated Increment, the Scrum Team decides what is important for the next Sprint and therefore sets a preliminary Sprint goal. These are main study examined detailedly in this paper.

R.L. Owen, L. Koskela, “Agile construction project management”, This study talks about how the agile theory gives benefit to project management for the software industries by uncovering better ways of developing software by doing it and helping others do it. Through this work we have come to value: 1. Individuals and interactions over processes and tools, 2. Working software over comprehensive documentation, 3. Customer collaboration over contract negotiation, 4. Responding to change over following a plan. The Manifesto, together with its underlying ‘Principles’ (Beck and et al, 2001b) depict a substantial concentration on the early and regular delivery of value, and the use of changes as opportunities to enhance that value. Working practices focus on frequent, sustainable iterative deliveries by facilitated multi-functional, self-organizing intercommunicative teams. Scrum and other agile methodologies add to those overall

R A Bahamid and S I Doh, “A review of risk management process in construction projects of developing countries”, This paper investigates the important risk management process with accordance with some case studies, risk analysis is the most tasking procedure in the in the managing risk. By the past studies, different sources of construction risk were identified and various approaches were investigated to improve the situations. this analysis is held by, Risk retention, Risk reduction, Risk sharing, Risk control, Risk avoidance, Risk transfer. According to this techniques risk has been identified, processed and declined.

Gould, F., Joyce, N. “Construction project management” in this paper, an experimental investigation and various case studies were examined to give suitable

solution for the project management effectively. It mainly focused on the software and computer engineering problems in great manner. But it accounts with some common project management risks will applicable for non-IT- sectors also.

III. CONCLUSION

The present review paper from the literatures it is major advantage or benefit with implementing Agile approaches in construction project management in the design phase of construction projects with increased client involvement and increased time delivery. Hence, it is concluded that, the using agile approaches like lean, scrum may help design, process and success the project in good efficiency.

REFERENCES

- [1] JONATHAN ADUT, “*applying agile approaches in public construction and civil engineering projects* “*Master of Science Thesis Stockolm,Sweden 2016*
- [2] Gould, F., Joyce, N. “*Construction project management* “*Third Edition. New Jersey, USA: Pearson, Prentice Hall.*
- [3] R A Bahamid and S I Doh, “*A review of risk management process in construction projects of developing countries*”,2017 IOP Conf. Ser: Mater.Sci.Eng.271012042
- [4] R.L. Owen, L, Koskela, “*Agile construction project management*”, The Research Institute of the Built & Human Environment, The University of Salford, Greater Manchester, M5 4WT
- [5] Thomas STREULE, Nino MISERINI, Olin BARTLOME, Michael KLIPPEL, Borja GARCIA DE SOTO, “*Implementation of scrum in the construction industry*”, *Procedia Engineering* 164 (2016)269-276, science direct
- [6] Saini, M, Arif, M and Kulonda, DJ, “*Critical factor for transferring and sharing tacit knowledge within lean and agile construction processes*”, <http://dx.doi.org/10.1108/ci-06-2016-0036>
- [7] Joao Carlos Ferreira, “*AGILE approaches in project management*” *Instituto Superior Technico, Av. Rovisco Pais, 1049-001 Lisboa, Portugal*
- [8] Mattias Yllen, johansson “*Agile project management in the construction industry-an inquiry of the oppurtunities in construction projects*” *Stockolm 2012*
- [9] Owen, R. Koskela, LJ, Henrich, G and Codinhoto, R” *Is agile management applicable to construction?*”, <http://usir.salford.ac.uk/9369/>,2006
- [10] Agnieszka Dziadosz, Mariusz Rejment “*Risk analysis in construction project-chosen method*”, DOI: 10.1016/j.proeng.2015.10.034

- [11] College, B. (2015) “Relational Contracting- Creating Value Beyond the Project”, Lean construction journal,2. (1), pp.30-45.
- [12] Crawford, C.M.; Benedetto, C.A. (2000) “New Product Management: International Edition” Macgraw Hill.