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The Paper Reviews of Agile Methodology Software Development

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***Abstract* –There are many suggestions recently on how to improve the software development process. While many developers continue to control the development process using the traditional methodologies, this Agile Methodology comes around. This new methodology takes the development process to a higher level that creates a new challenge to any specific requirements. A sprightly movement in this new methodology created new practices such as Extreme Programming (XP), SCRUM, Lean Software Development (LSD), Crystal, Kanban and many more. The study of this paper is to identify the major changes and the implications to the industry. Firtsly, the authors will describe the meaning of Agile Methodology, followed by their characteristic, development process and the differences between Agile Methodology and traditional method. Secondly, the authors will explain the differences of the practice in Agile Methodology. Last but not least, the authors will bring the readers to the conclusion of their idea of Agile Methodology which make this methodology produce a major changes in project lifecycle.**

Keywords: **Agile Methodology, Agile Software Development, Software Development,**

I. INTRODUCTION

Some people that involve in software development have been asked "What is Agile Methodology Development?", and usually they get a different meaning of it.

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It depends on who they ask. The actual meaning of Agile Methodology is An iterative and incremental (evolutionary) approach to software development which is performed in a highly collaborative manner by self-organizing teams within an effective governance framework with "just enough" ceremony that produces high quality solutions in a cost effective and timely manner which meets the changing needs of its stakeholders [1]. Agile software development is actually a group of software development methods based on iterative and incremental development, where requirements and solutions evolve through collaboration between self-organizing, cross-functional teams [2]. The table below shows an Agile Manifesto:

More Valuable Items		Less Valuable Items
Individuals and Interactions		Processes and tools
Working software	over	Comprehensive Documentation
Customer collaboration		Contract negotiation
Responding to change		Following a plan

Table1: Agile Manifesto(source:[3])

How to organize the software development in order to deliver faster, better and cheaper. One the suggestion to improve the software development project is Agile Software Development. Not every software developer knows this method, and this article shows on how to practice this method and their effects. The main issue is how to organize the software development in order to deliver faster, better and cheaper. One the suggestion to improve the software development

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project is Agile Software Development. Not every software developer knows this method, and this article shows on how to practice this method and their effects.

The important question in Agile Software development, one of it is it helps the software developer to work with agile development and understand the challenges of effectiveness of Agile Software Development.

II. METHOD

There are several method types that have always been in Agile Methodology. The types are listed below.

1.Crystal methodologies:
A family of methods for co-located teams of different sizes and criticality: Clear, Yellow, Orange, Red, Blue. The most agile method, Crystal Clear, focuses on communication in small teams developing software that is not life-critical. Clear development has seven characteristics: frequent delivery, reflective improvement, osmotic communication, personal safety, focus, easy access to expert users, and requirements for the technical environment. [4]

2. Dynamic software development method (DSDM):
Divides projects in three phases: pre-project, project life-cycle, and post project. Nine principles underlie DSDM: user involvement, empowering the project team, frequent delivery, addressing current business needs, iterative and incremental development, allow for reversing changes, high-level scope being fixed before project starts, testing throughout the lifecycle, and efficient and effective communication [5].

3. Feature-driven development:
Combines model-driven and agile development with emphasis on initial object model, division of work in features, and iterative design for each feature. Claims to be suitable for the development of critical systems. An iteration of a feature consists of two phases: design and development [6].

4. Lean software development
An adaptation of principles from lean production and, in particular, the Toyota production system to software development. Consists of seven principles: eliminate waste, amplify learning, decide as late as possible, deliver as fast as possible, empower the team, build integrity, and see the whole [7].

5. Scrum
Focuses on project management in situations where it is difficult to plan ahead, with mechanisms for "empirical process control"; where feedback loops constitute the core element. Software is developed by a self-organizing team in increments (called "sprints"), starting with planning and ending with a review. Features to be implemented in the system are registered in a backlog. Then, the product owner decides which backlog items should be developed in the following sprint. Team members coordinate their work in a daily stand-up meeting. One team member, the scrum master, is in charge of solving problems that stop the team from working effectively [8].

6. Extreme programming (XP; XP2)
Focuses on best practice for development. Consists of twelve practices: the planning game, small releases, metaphor, simple design, testing, refactoring, pair programming, collective ownership, continuous integration, 40-hweek, on-site customers, and coding standards. The revised "XP2" consists of the following "primary practices": sit together, whole team, informative workspace, energized work, pair programming, stories, weekly cycle, quarterly cycle, slack, 10-minute build, continuous integration, test-first programming, and incremental design. There are also 11 "corollary practices" [9][10].

III. AGILE METHODOLOGY VS TRADITIONAL METHOD

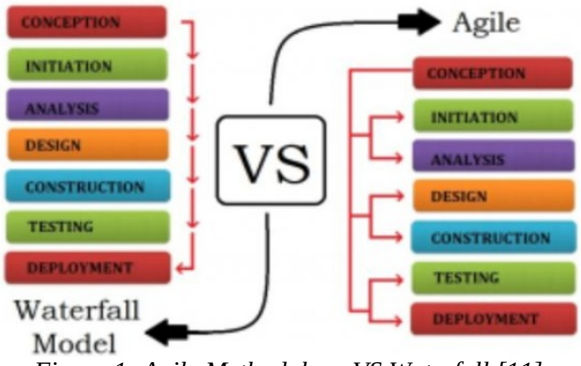

Figure 1: Agile Methodology VS Waterfall [11].

The Agile Methodology main advantage is they can return to the previous step, while the waterfall cannot change the decisions that have been done. To make any changes in waterfall, they need to start over the entire project. What makes the Agile Methodology bug free is the flexibility to check any error that fall under the part of development stages, compared to waterfall which the bug can only be tested at the end of the development process.

Another disadvantage of waterfall is the modification is not allowed after the development process completed. This makes the Agile Methodology has the flexibility to make any changes if the client request to make changes. Frequent delivery to the client makes

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the Agile Methodology emphasize rapid delivery of software development process.

Whereas Agile can be of great help under such situations and can allow simultaneous development of different modules at the same time as per time bound. If we want the project to be more segregated Agile comes as a pain relief for developers [12].

IV. DIFFERENT PRACTICE

The key of best practices in Agile Methodology has been develop through time to time. The details of the key explained below:

1. Iterative delivery: The project is being divided into several small part and it will release to client to check the functionality. This practice is to get an early feedback from client. Another things that created initially is the project plan, design and requirement, and this will meet the client requirement and adapt to project changes.

2. Increase performance: Valuable information will be exchange on frequent meeting and increase the improvement of the development process. Simple stories that being discussed makes the project requirement meet its need and will encourage teamwork. A good communication will make the team increase their knowledge and will be shared among the team members.

3. Design flexibility: This is one of the main advantages in Agile Methodology, the ability to change the requirement quickly. This will make the change in the requirement flexible and handle the changes easily.

4. Changing environment adaption: Agile Methodology has several parts of iterations. Each iteration will be characterized by analysis, design, and code and testing. Every iteration will be delivered to client to get their feedback and implement any changes of requirement.

5. Reducing the risk of development process: Every error that occurs will be fixed immediately. This helps developers to solve the upcoming problems.

6. Customer satisfaction: Agile Methodology makes the developer and client directly involve in the development process. Each progress will be delivered to client and any improvement will be done based on the client feedback. The final product will be in high quality and this makes the client ensure their satisfaction.

V. CONCLUSION

It is clear that an Agile Methodology is a rapid iteration, quickly release and evolved by the programmer, facilitated by the end-user. Basically, the traditional software development process provide a systematic process in the development, however, there are some limitation which makes the traditional development become slow in adaptation to change the business requirement. The rapid growth in the industry makes the Agile Methodology become increasingly popular. The most important part is to deliver the project requirement successfully and understand the dynamic of the project. In other words, the Agile Methodology become a future approaches for developing a systematic and well organized software development process.

VI. FUTUREWORK

To understand the advantages and benefit of Agile Methodology, a research must be done by researchers on studying the finding of Agile Methodology and Agile Software Development Process. A clear finding of the review is that we need to increase both the number and the quality of studies on agile software development. In particular, agile project management methods which are popular in industry, warrant further attention. In this context, there is a clear need to establish a common research agenda for agile software development and for future field studies to pay more attention to the fit between their research methods and the state of prior work.

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