Project Risk Management on Agile Development Team: Case Study of an Outsourcing Company in Indonesia

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Agile have been widely used by companies. With using of Agile, the project will be more flexible when compared to the traditional method (Waterfall). However, the use of Agile has many challenges, including its agile nature and iterations. This makes us interested in conducting further investigations regarding risk management practices in Agile following an outsourcing company in Indonesia. The system created is in the form of a job marketplace in which there are job vacancies to support outsourced activities at the company. The purpose of this research is to identify what risks are faced related to development with Agile methods at the company. Related to this, identification will be carried out using risk management combined with Agile development methods. The results of this research indicate that there are four risks that are quite critical in the application of Agile methods, namely human factors, communication factors, changing requirements factors, and schedule factors.

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Agile telah banyak digunakan oleh perusahaan. Dengan menggunakan Agile, proyek akan lebih fleksibel jika dibandingkan dengan metode tradisional (Waterfall). Namun, penggunaan Agile memiliki banyak tantangan, termasuk sifat tangkas dan iterasinya. Hal ini membuat kami tertarik untuk melakukan investigasi lebih lanjut terkait praktik manajemen risiko di Agile mengikuti perusahaan outsourcing di Indonesia. Sistem yang dibuat berupa bursa kerja yang didalamnya terdapat lowongan kerja untuk mendukung kegiatan outsourcing di perusahaan. Tujuan dari penelitian ini adalah untuk mengidentifikasi risiko apa saja yang dihadapi terkait pengembangan dengan metode Agile di perusahaan. Terkait dengan hal tersebut, akan dilakukan identifikasi menggunakan manajemen risiko yang dipadukan dengan metode pengembangan Agile. Hasil penelitian ini menunjukkan bahwa terdapat empat risiko yang cukup kritis dalam penerapan metode Agile, yaitu faktor manusia, faktor komunikasi, faktor perubahan kebutuhan, dan faktor jadwal.

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1. Introduction

Risk management is one of the components contained in project management and managing risk accordingly which involves the success factors of a project [1]. With risk management, a project can have an overview of the problems that will be faced. However, if the application of the risk management process is not appropriate, then a project has the potential to fail. These problems usually include the scope of client satisfaction, resource management, project timing, and others [2]. An activity in a company cannot be separated from the risks that exist, whether these risks are carried out intentionally or not. In this research, the case study that we focus on is one of the outsourcing companies in Indonesia. The company has the vision to become a trusted management solution provider company. And the mission of the company is to have competence in the field of management solutions that continues to grow, provide application management solutions, and become a company that is admired, both internally and externally. That company strives to become a trusted outsourcing company. Therefore, a system was created to deal with this. The system created is in the form of a job marketplace in which there are job vacancies to support outsourced activities at the company. The development method chosen to run this project is Agile. The reason for using Agile in this project is because the Agile development method has a high value of flexibility [3]. In Agile, features that have been completed can be released earlier as needed, this is what makes Agile have a high value for flexibility [4]. Risk management in a system development process is needed. This is because there are factors that affect the success of a project [5]. The function of risk management in system development is not to eliminate risk as a whole, but with risk management, we can find out what risks we may face and can minimize them [6]. In Agile, changes are often made to the features of the system being developed [7]. This is certainly risky because when a feature in Agile is changed, changes are needed to other systems that are mutually integrated with these features. This can also happen with traditional methods [8]. This research aims to identify the factors that are the risks of the Agile method in the outsourcing company.

Related to this, identification will be carried out using risk management combined with Agile development methods. By doing this, it is hoped that there will be an overview to minimize the risks that occur in the application of Agile methods in the company. Regarding this, we have references in the form of: (RQ1) Knowing what risks and problems are the challenges in the Agile method used by the outsourcing company, and (RQ2) Exploring how these risks are communicated. This research will help the company in overcoming problems related to existing risk management.

In this section, we will present an explanation regarding the risk management process in the Agile method obtained from the literature study.
Based on research conducted by Albadarneh, *et al.* (2015), the Agile method is used because it has high flexibility and can reduce the risks that exist in the system as a whole. This is certainly very suitable for use in the development of a system whose process has iterations. According to him, Agile development methods are designed to produce high-quality software that is carried out in the shortest possible time [3]. Elbanna and Sarker (2016), revealed that currently the Agile method is widely praised by many people because it is flexible, fast, and responsive. However, recently there have been many companies abandoning Agile methods because they cannot manage the risks involved [4]. This shows how important it is to implement risk management in system development in a company, in this case especially those using Agile methods.

According to Hammad, *et al.* (2019), risk management in a project development process is often overlooked. This allows a development project in progress to have many problems in it [6]. In this study, a survey was conducted on 54 respondents, all of whom were software developers following Agile methodologies. There are more than 80% who do not apply risk management to the projects they are working on, and there are only 17% who apply risk management.
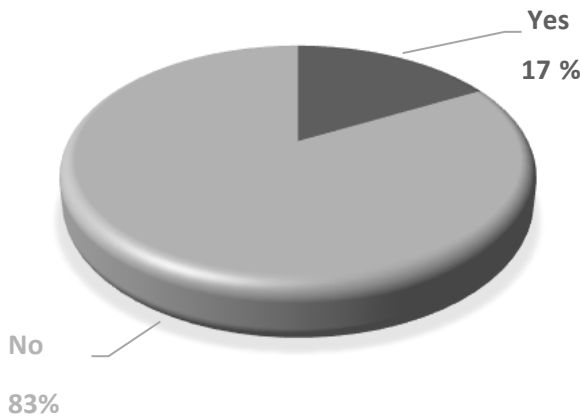
Figure 1. Risk Management Position

This is because there is no one who can handle risk management on the projects they are working on. The results of this research are divided into three factors, namely schedule risks, deployment risks, and people risks. Each of these factors in more detail has its own provisions.

2.   Research Methods

This section describes the steps and methods used in this research.

Research Design:
To be able to find out the risk management that exists in the Agile method in the outsourcing company, we need to do a research design based on a survey. The survey that we will conduct is divided into two, the first is a survey about the condition of the Agile team at the company, and the second is a survey related to the risk management process.

Table 1. Details of The Participants

Role	No. of Participants
Project Manager	1
Software Engineer	4

The scope of the survey that will be conducted is one of the divisions that use Agile methods in the outsourcing company. We limit the discussion to only discussing Agile development methods and around risk management. To answer RQ1, an interview will be conducted with a project manager and four people who act as software engineers at the outsourcing company. We will ask for information regarding how the development

process using Agile methods is carried out and what are sometimes obstacles to this. To answer RQ2, we will accommodate if there is additional information or other opinions they want to convey. Before conducting the interview, we conducted the preparation of the interview instrument first.

Validation of Interview Questions:
Questions on the interview instrument to be conducted would be better if we validated it first. This is done so that the questions we ask participants are of good quality and relevant. Validation on the interview instrument will be carried out by two experts who have experience with Agile methods for approximately 5 years. Currently, the two experts work as project managers in a company. The validation carried out by him is each of the questions contained in the interview instrument. After the questions are revised by them, then we will conduct an interview with the outsourcing company.

Distribution of Interview Questions:
Interviews conducted in this study were conducted directly to the outsourcing company. We met with members of the division who had been appointed to conduct interviews. We will ask questions based on a previously validated interview instrument. The results of the interviews conducted will be our reference in identifying related risk management related to Agile methods in the division project

3.   Results and Discussion

This section will present the results and discussion of the research conducted. Based on the results of interviews conducted with divisions that apply Agile methods, there are several factors that have the potential to be a risk. The following table is a collection of risk factors that can potentially become problems in Agile methods and their descriptions.

Table 2. Risk Factors

Factors	Description
Schedule	• The processing time given to each product backlog is sometimes unreasonable. • The processing time for each feature in application development is always delayed.

Human	• Project managers who lack experience in Agile methods. • Not all developers know the system flow on the system to be developed. • Not all developers have qualified expertise on the technology used for project development.
Communication	Poor coordination between project manager and development team.
Changing Requirements	Too many changes to the requirements requested by user.

There are four risk factors that have the potential to be a threat to the system development process using the Agile method. The data above is the result of interviews conducted with project managers and software engineers. It can be seen that the factor that has the highest number of problems is the human factor. Both from the project manager and developer side, there are problems. The most common problem in human factors is related to the knowledge of each participant. After that there are other factors: Schedule, communication, and changing requirements. The following is a further explanation of these factors and the solutions we will try to offer.

1) Schedule. This factor involves schedule in the system development process at the outsourcing company using the Agile method. There are two facts on this factor, namely the time given to each product backlog which sometimes doesn't make sense and there are often delays in the development process for each feature that is done. Our suggestion is that there is a need for more mature planning related to the preparation of the product backlog. Backlog grooming that is done before starting the sprint stage must be considered carefully first. Determine the analysis related to the effort value for each product backlog so that it is easy to find out how long it will take for these features to be completed.

2) Human. This factor generally involves the ability and experience of the team working with Agile at the company [9]. For project managers, because they don't have much experience, there is a need for deep learning related to Agile

methods. On the developer side, special training is needed in the field. This of course can improve the performance of the development team. In addition, there is a need for validation related to knowledge on the flow system that is carried out on the project. The validation can be discussed at a meeting conducted by the team

3) Communication. This factor contains related to poor communication and coordination in the team. This usually happens between the project manager and the development team. Poor communication can result in existing problems extending to affect other factors [10]. Regarding this, we recommend that a daily meeting be held with the Agile team in carrying out project development. The daily meetings are held to discuss what the team has done and what the team will do.

4) Changing Requirements. This factor is generally common, both at the parent company and the vendor. Changing requirements on a project is a very annoying thing. This is because changing requirements can affect the product backlog that has been carefully defined from the start. We cannot provide full advice on this matter [11]. We only suggest that the team can emphasize the product backlog that has been determined from the start. In addition, it is necessary to improve the performance of the team in order to be more flexible in working on project development.

4. Conclusion

The purpose of this research is to identify what risks are faced related to development with Agile methods at the company. Related to this, identification will be carried out using risk management combined with Agile development methods. To obtain the data needed in this study, an interview method was used with a project manager and four software engineers. The results of the interviews conducted were that there were four risk factors that could potentially pose a threat to project development using Agile methods. The four factors are schedule, human, communication, and changing requirements. On each of these factors, we suggest according to what the problem is.

The scope of this research only discusses risk management in Agile methods. Furthermore, this research is continued by expanding the scope of research, but still discussing about Agile methods. This research can also be used as a reference for case studies in certain companies.

5. References

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