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Analysis of the Use of the Scrum Method in ERP Information System development (Case Study PT XYZ)

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I. INTRODUCTION

1.1 Research Background

Nowadays, the rapid development of technology cannot be denied and abandoned. This has an impact on everyone's behavior in responding to technological changes, including business people who must also implement digitalization of information systems in all aspects of the business, both in the supply chain function, distribution to the accounting record function.

Prior to the existence of the information system, some work was done manually which took a long time so it was very possible that there were many errors that arise due to manual processes and there was no automatic validation of each business process. With the rapid development of technology today, it can be said that information systems go hand in hand as quickly as the development of information technology

In this case the author will discuss the problems that occur during the process of implementing Information Systems at PT. XYZ thus the author puts it in the final project entitled "Analysis of the Use of the Scrum Method in ERP Information System Development at PT XYZ".

1.2 Formulation of the problem

Based on the above background, the problem discussed in this study is "Analysis of the Use of the Scrum Method in ERP Information System Development at PT XYZ".

1.3 Research Objectives

Knowing how the framework of using the SCRUM method in the development of an ERP information system at PT XYZ

1.4 Research Benefits

The results of this study are expected to provide benefits for those in need, including:

1. For researchers, it is hoped that this research can bring insight as well as a place to practice some of the knowledge that has been obtained during college.
2. For the community, this research is expected to help the community, especially business actors, to understand the use of the scrum method in the development of information systems.
3. For the world of education, this research is expected to be used as a reference for future research and is expected to provide empirical evidence that can add to the taxation literature.

II. THEORETICAL BASIS

2.1 System Definition

According to Andrianof (2018), the system is an element that is incorporated and integrated with each other to form a single unit to achieve the expected goals and objectives.

2.2 Understanding Enterprise Resource Planning (ERP)

Monk and Wagner (2013:1) state that the ERP system is the core software used by organizations to integrate and coordinate information in each business area. ERP systems help organizations manage overall business processes by using the same database and reporting tools that can be used together. Indeed, ERP systems aim to help companies achieve good and smooth integration of company data and business processes.

Utami et al. (2016) suggested that ERP is a system designed to integrate all internal and external activities. Suryalena (2013) ERP is a corporate information system designed to coordinate all resources, information and activities needed for complete business processes. This system has a database and software to process the data. The software has a function to integrate all departments in managing company resources.

Islamiyah (2012) suggests ERP as follows: ERP (Enterprise Resource Planning) is a concept for planning and managing company resources including funds, people, machines, spare parts, time, materials and capacity that have a wide influence from top management to operations. in a company so that it can be used optimally to generate added value for all stakeholders (stakeholders) of the company. ERP is an integrated system that has the aim of summarizing the existing business processes so that it becomes an efficient and effective collaboration and the system is supported by information technology and can produce information that supports the company to be more competitive.

2.3 Agile Development

Agile development is a software development method that prioritizes team member interaction and collaboration with clients rather than the processes and types of tools required (Martin, 2003). Agile methods are very appropriate to be applied to software development that is required to be able to adapt to rapidly changing needs. An important priority in Agile deployments is meeting client needs by building value applications quickly and regularly. To support this, one of the principles of Agile is the process of presenting results which is carried out within a period of two to four weeks, with a preference for a faster time scale (Martin and Martin, 2006).

2.4 Scrum

Scrum was developed by Jeff Sutherland in 1993 with the aim of being a development and management method that follows Agile principles (Pham, 2011). Furthermore, the development of Scrum was carried out by Ken Schwaber and Beedle. Scrum is a complex process because there are many factors that influence the final result (Majeed, 2012). The Scrum framework consists of the Scrum Team and the required roles, events, artifacts, and associated rules (Ken Schwaber and Jeff Sutherland, 2017). Each component in this framework has a specific purpose and is critical to the successful use of Scrum. The Scrum Team aims to optimize flexibility, creativity and productivity. The facts prove that the form of a Scrum Team can make teams more effective in doing all kinds of work and all kinds of complex work (Ken Schwaber and Jeff Sutherland, 2017). Events are created to create routines and minimize other meetings that are not part of Scrum. Scrum artifacts represent work or business value to create transparency and opportunities for inspection and adaptation. The artifact described by Scrum aims to maximize the transparency of important information, so that everyone has the same understanding of the artifact (Ken Schwaber and Jeff Sutherland, 2017). Scrum artifacts represent work or business value to create transparency and opportunities for inspection and adaptation. The artifact described by Scrum aims to maximize the transparency of important information, so that everyone has the same understanding of the artifact (Ken Schwaber and Jeff Sutherland, 2017). Scrum artifacts represent work or business value to create transparency and opportunities for inspection and adaptation. The artifact described by Scrum aims to maximize the transparency of important information, so that everyone has the same understanding of the artifact (Ken Schwaber and Jeff Sutherland, 2017).

III. RESEARCH METHODOLOGY

3.1 Research Design

The research method is basically a scientific way to obtain data with a specific purpose and use. The research method is a scientific way to obtain data with a specific purpose of use (Darmadi, 2013:153). The scientific method means that research activities are based on scientific characteristics, namely rational, empirical and systematic. This study used descriptive qualitative method. (Moleong, 2008:6) explains that descriptive research is research that describes and describes the current state of the object of research as it is based on the facts. This research is an attempt to reveal problems or circumstances or events as they are so that they are only revealing facts. The results of the study are emphasized to provide an objective picture of the actual state of the object under study. This study seeks to analyze and describe the conditions of using the Scrum method in the development of an ERP information system at PT XYZ

3.2 Place and time

The place of this research is PT XYZ. As for the reason for doing research in the place in question, namely because of the suitability of the problems at hand. The time of the study began in February 2022.

3.3 Materials and Methods

In SCRUM and like other development methods, the first information that must be obtained is information about the needs, features and purpose of the feature being created. This information is obtained from the results of interviews with users directly and analysis of current documents, hereinafter referred to as User Stories.

There are 3 things that need to be prepared in the development process using SCRUM, namely Roles, Artifacts (documents) and Events.

1. SCRUM Roles: Roles are team members that must be in development using SCRUM, namely:

a. Product Owner (PO) Is the person responsible for defining the features and usability to be developed. Tasked with bridging the needs of users with the development team. IT Manager or Project Manager can be used as Product Owner.

b. Scrum Master (SM)

Is a person who is very knowledgeable in putting the values, principles and practical values of Scrum into practice. In charge of supervising, leading the team and helping the development team stay within the Scrum rules. Anyone can be used as an SM, the most important thing is that SM must be someone who understands Scrum values.

Development Team Is the person who does the development of the application directly. System analysts, programmers, testers are referred to as the development team in SCRUM.

2. Artifacts : The supporting documents in the development of Scrum are:

a. Product Backlog

This document is filled out by the Product Owner which contains the features desired by the user. In this document, they are sorted by priority which must be done first.

b. Sprint Backlog

This document contains a list of features, the name of the person who created the application, the time (in hours), the definition of completion.

3. Events in SCRUM: is a series of events that must always be carried out by all the teams involved, namely,

a. Sprint Planning

In this event, the Product Owner and the Development Team agree on the common goals of each task.
Determined completion time and which team will complete each task. This event is a very important event because from this event a work plan will be produced in one sprint in the future.

b. Daily Scrum

This event is held every day for a maximum of 15 minutes [5]. Done in the morning before the Development Team goes to work. The purpose of this event is to facilitate the obstacles faced by the Development Team during the development process. This event is only attended by the development team, and the essence of this meeting is to convey the work that has been done the previous day and what will be done the next day.

c. Sprint Review

Done at the end of each sprint. The goal is to see the status of the product being developed, especially the features that have been completed. The participants are potential users, Scrum team, Product Owner and Development Team.

d. Sprint Retrospective

Done after Sprint Review. The goal is to find out the obstacles in the application development process. Attended by Product Owner, Scrum Master, and Development Team. The point of this event is to convey what has been done in the previous sprint, obstacles and solutions that will be carried out by the team to accelerate performance and plans to be carried out in the next sprint.

Scrum is a framework for project management that has Product Backlog and Sprint Backlog artifacts. Here, the author uses web-based Enterprise Resource Planning (ERP) software development project data. Based on the results of needs analysis and interviews with users, user needs are obtained in the form of Backlog Items (user stories). From the Backlog Item that has been created, it will then be transformed into the SCRUM framework. More detail, described in figure 2

Figure 2: Scrum Framework

Source: Rubin (2012)
Figure 3: Scrum Cycle
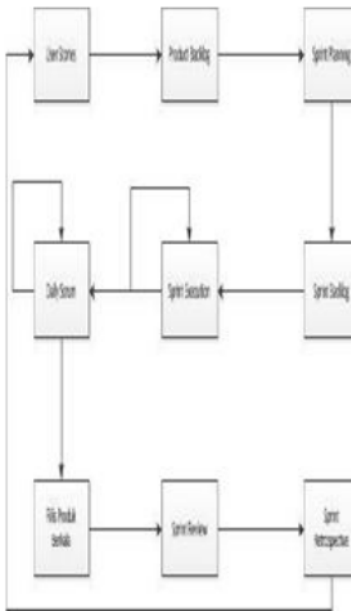
IV. RESULTS AND DISCUSSION

The cycle of Scrum in the ERP development process can be seen in Figure 3 which consists of:

1. User Stories

This document contains information about the user name, the need for the feature and the purpose for which the feature was created. This information is generated from the interview process and ongoing document analysis with users. The person who has direct contact with this user is the Product Owner. The Product Owner records user requirements in the form of a Product Backlog.

2. Product Backlog (PB)

After a user story is created, the Product Owner records it in the Product Backlog. This document   contains information on user requirements, the features to be created, the size of the work (in numbers), the priority of each feature. The list of features in this document is called Product Backlog Items (PBI). In the process of preparing the PBI, there is a process called Grooming. Grooming is an activity that refers to 3 things, namely the creation and detailing of work, PBI estimation, and PBI priorities. So, in the grooming process, the details of the developed features are determined, the estimated weight (in numbers) of each feature is determined, and the development team determines which features should be worked on first. Below is a template for the Product Backlog:

Table I Product Backlog

Kebutuhan	Fitur yang dibuat	Pi
User ingin menginput order dan surat jalan	Sales Order	Hig
User dapat membuat faktur dan pelunasan	Payment	Me

Source: Analysis result

3. Sprint Planning

Before starting application development, the Product Owner, Scrum Master, and the Development Team meet at an event called Sprint Planning. The duration of the event for this project is 8 hours. In the Sprint Planning, it discusses the work to be done, the appointment of a team that will work on a job, the duration of time (in hours) and the final goal of each job. Below are the steps taken in sprint planning:

a. The team determines their   respective capacities. This initial process is carried out by the team by determining their own workload to complete one sprint. In this paper, the author makes units of days to determine the availability of time (in days) to

complete the sprint. Below is a table of workload capacities:

Table II Product Backlog

Nama	Kesediaan	Aktifitas selain Scrum	Jam kerja	Total waktu utk proyek
Andi	5	1	7	100
Soni	5	1	7	50
Feri	3	3	7	10
Total				170

Source: Analysis Results

b. Determine the achievement of each job. In this case, it is the product owner who determines the achievement of each job in PB. An important milestone for the development team to build on to build features. If there is a job whose achievement has not been determined, it can be determined during the sprint planning event.

c. Determine the PBI to be resolved. Choose a PBI that already has an achievement, but if a PBI doesn't have an achievement then choose a PBI starting from the top and then going down. If the PBI chosen is too complex, then the PBI can be broken down into a more detailed form of PBI. In this case, all PBIs already have achievements so that the development team can choose PBIs that will be completed according to their   respective capacities and must be committed   to   achievements. Then the PB is transferred to a document called the sprint backlog, because in the sprint backlog (SB) each feature, the details of the feature, the estimate (in hours) and the name of the developer can be clearly seen. The SB document format will be discussed in the next point.

From the results of the sprint planning, it is determined that the length of the 1st sprint is 30 working days and is written in the form of a sprint backlog (SB) document. This development involves 4 people, namely 1 Product Owner, 1 Scrum Master as well as a developer and 2 development team members. In this case, the 2nd sprint has not been determined because there could be changes in needs or features in the 1st sprint development process.

4. *Sprint Backlog*(SB)

SB is one of the documents in Scrum that contains information about the features created, the details of each feature, the time (hours) of creation, the name of the developer and the achievements of each feature. SB is required by the Product Owner as a technical guide for application development projects.

SB is a development of PB which is detailed and produced after the sprint planning event.

Table III Sprint Backlog (1st Sprint)

PBI's	Estimasi	Durasi	PIC	Capaian
Membuat Database Relationship	1	1	Feri	Done
Membuat Mockup	1	1	Feri	Done
Membuat Flowchart sistem	1	1	Feri	Done
Sales Order	5	6	Andi	Done
Testing SO	1	1	Feri	Done
Shipment	5	2	Andi	Done
Testing Shipment	1	1	Feri	Done
Invoice	5	2	Soni	Done
Testing Invoice	1	1	Feri	Done
Payment	5	4	Soni	Done
Testing Payment	1	1	Feri	Done

Source: Research Results

The PB that has been created by the Product Owner is transferred to the form of a Sprint Backlog during the sprint planning event. Below is a document format from SB.

5. Sprint Execution

After the sprint backlog has been compiled that has been agreed upon in the sprint planning, then the next step is to run the development process in accordance with the sprint backlog which is called the sprint execution stage. Sprint execution is the work process of the Scrum team to towards the achievement of each work listed in the sprint backlog. Sprint execution is carried out after the sprint planning event and ends before the sprint review event begins. SB and its achievements are the basis as well as input for the development team in carrying out the sprint execution process, while the output is the product release. To make it easier to control during sprint execution, a work board is made as below:

Table IV Workboard (1st Sprint)

PBI's	To Do	In Progress	C(
Membuat Database Relationship			☑
Membuat Mockup			☑
Membuat Flowchart sistem			☑
Sales Order			☑
Testing SO			☑
Shipment		☑	
Testing Shipment	☑		
Invoice	☑		
Testing Invoice	☑		
Payment	☑		
Testing Payment	☑		

Source: Research Results

6. Daily Scrum

Is one of the events in Scrum that is carried out for a maximum of 15 minutes in 1 day. Technically, the event was held in the morning before the development team did the sprint execution and was only attended by the Scrum Master and the development team. The Daily Scrum is carried out every day and there are 3 core things that will be asked to the development team, namely what has been done before, what will be done next and what obstacles are hindering the development process.

7. Periodic product release

In the 1st sprint stage (30 working days) and 30 daily scrums, 11 features were obtained from a total of 35 features that have met the achievements and are ready to be released to the user. The development team has done 11 product releases and there are feature revisions from users to the development team which are then incorporated into the 2nd sprint. Features that have met the achievements are written as Done in their status in the sprint backlog document.

8. Sprint Review

After the 1st sprint is completed, the Product Owner, Scrum Master, Development Team and Users hold a meeting called a sprint review. Sprint review aims to discuss the work and releases that have been done during the previous sprint. The development team explained to the event participants, the work that had been done and had met the achievements. The development team demonstrates the completed features in front of the users. Users provide feedback and input to the development team on features that have been completed. If there is an addition from the

user, it is included in the work in the 2nd sprint along with features that have not been completed.

9. Sprint Retrospective

After the Sprint Review event is completed, the next event that must be carried out is the sprint retrospective. This event was attended by only the Scrum team, namely the Product Owner, Scrum Master and the Development Team for 3 hours for 1 sprint that has been passed. This event discusses 3 things, namely:

a. What has been done in the previous sprint so that it can meet the achievements
b. What are the obstacles in the 1st sprint so that it does not meet the achievements
c. What will be done in the 2nd sprint in order to meet the achievements

In this event, the development team conveyed the problem to the Scrum Master and Product Owner, then the problem was discussed with the team and a joint solution was obtained. After the sprint retrospective was held, the team conducted a sprint planning event to plan the 2nd sprint.

V. CONCLUSION

From the Scrum stages that have been carried out, ERP development using Scrum was completed in 3 sprints with a simple design and easy for users to understand. Scrum does not require a long time for ERP development, this is because the Development Team makes applications that are simple and tailored to user needs. Scrum does not require a large team to develop ERP because all teams play a multi-skill role, both as systems analysts, programmers, testers and implementors. Scrum requires every team member to have multiple skills both in the analysis and development stages, because if this condition is not met, what will happen is a project time delay that has been determined during sprint planning.

REFERENCES

Chairan, Chusnul Fatiha. 2016. Pengaruh Implementasi Sistem Enterprise Resource Planning dan Ruang Lingkupnya Terhadap Risiko Perusahaan. Skripsi diterbitkan. Makassar: Program S-1 Departemen Akuntansi Fakultas Ekonomi dan Bisnis Universitas Hasanuddin Makassar.

Darmadi, Hamid. (2013). Metode Penelitian Pendidikan dan Sosial. Bandung: Alfabeta.

Dhewanto, Falahah dan Wawan. 2007. ERP: Menyelaraskan Teknologi Informasi Dengan Strategi Bisnis. Bandung: Informatika.

Dityawarman, Fridma. Kertahadi dan Riyadi. 2016. Pengaruh Task-ERP Fit Dan Pemanfaatan ERP Terhadap Kinerja Karyawan (Studi Pada Karyawan PT PLN (Persero) Distribusi Jawa Timur Area Malang). Jurnal Administrasi Bisnis (JAB)|Vol. 35. Fakultas Ilmu Administrasi Universitas Brawijaya, Malang.Education, Inc.

Ernizar, Shinta. 2011. Analisis Penerapan Teknologi Informasi dengan Menggunakan Metode Cobit (Control Objectives For Information And Related Technology) di PLN (Persero). Skripsi diterbitkan. Medan: Program Sarjana Teknik Fakultas Teknik Industri Universitas Sumatera Utara.

Hikariati, Yoshiko. 2012. Identifikati Risiko Terhadap Penerapan Sistem Enterprise Resource Planning (ERP) Pada Tahap Pasca implementasi di PT Indofarma Tbk. Tesis diterbitkan. Jakarta: Program Magister Manajemen Fakultas Ekonomi Universitas Indonesia.

Indriantoro, Nur., dan Supomo, Bambang. 2013. Metodologi Penelitian Bisnis Untuk Akuntansi & Manajemen. Yogyakarta: BPFE.

Islamiyah, Shofawaty Nur. 2012. Analisis dan Implementasi Modul Voucher Financial Management Pada OPENERP. Jurnal Teknologi Informasi

Ken Schwaber dan Jeff Sutherland. (2017). "Panduan Scrum" Scrum Guide Indonesia. Diakses 20 November 2020. Tersedia: https://www.scrumguides.org/scrum-guide-2017.html

Kurniawati, Melati. Gunarta, I Ketut dan Baihaqi, Imam. 2015. Dampak Implementasi Enterprise Resource Planning (ERP) pada Kinerja Keuangan: Pendekatan Resources Based View. Prosiding Seminar Nasional Manajemen Teknologi XXIII. Program Studi Pascasarjana Jurusan Teknik Industri Institut Teknologi Sepuluh Nopember, Surabaya.

Majeed, H. (2012). Issues and Challenges In Scrum Implementation. International Journal of Scientific and Engineering Research, 3, 8.

Martin, R.C. (2003). Agile Software Development: Principles, Patterns, and Practice, 2nd ed. Upper Saddle River: Pearson Education.

Martin, R.C. dan Martin, M. (2006). Agile Principles, Patterns, and Practice in C#. Upper Saddle River: Pearson Education.

Moleong Lexy J. 2004, Metodologi Penelitian Kualitatif. Bandung: Remaja Rosdakarya.

Monk, E.F, Bret J. Wagner. (2013). Concepts in Enterprise Resource Planning – Fourth Edition. Course Technology. Cengage Learning.

Pham, A. e. (2011). Scrum in Action Agile Software Project Management and Development. Boston: Course Technology PTR.Rashid, M. A., Hossain, L., dan Patrick, J. D. 2002. The Evolution of ERP Systems: A Historical Perspective, (Online), (https://faculty.biu.ac.il/~shnaidh/zooloo/nihul/evolution.pdf, diakses 16 April 2017).

Rubin, K. S. (2013). Essential Scrum A Practical Guide To

Sugiyono. 2016. Metode Penelitian Kuantitatif, Kualitatif, dan R&D. Cetakan ke-24 Bandung: Alfabeta,

Suryalena. 2013. Enterprise Resource Planning (ERP) Sebagai Tulang Punggung Bisnis Masa Kini. Jurnal Aplikasi Bisnis. Fakultas Ilmu Sosial dan Ilmu Politik, Universitas Bina Widya. Riau. The Most Popular Agile Process. Upper Sadle River: Pearson

Utami, Sri Setyowati. Susilo, Heru dan Riyadi. 2016. Analisis Penerapan Enterprise Resource Planning (ERP) (Studi pada PT Domusindo Perdana). Jurnal Administrasi Bisnis (JAB) Vol. 33 Fakultas Ilmu Administrasi Universitas Brawijaya, Malang

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