Development Point of Sales Using SCRUM Framework

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Abstract: Point of Sales is a system used to make sales transactions. MPC Computers is a retail that sells computer accessories. But in its operation MPC Computer still applies a manual system, so that the services provided are not optimal. Reporting that requires a long time makes it difficult for store owners to determine inventory for the future because the information is not detailed, this results in reduced performance. In dealing with this, a Point of Sales application is made with the SCRUM agile method. This method was chosen because it is fast and light in application development and has a vision of high value products in creativity and productivity. There are three roles in the development of SCRUM, namely the Product Owner, SCRUM Master and Development Team. The Product Owner will define the business requirements needed, then from those needs transformed into a product backlog facilitated by the SCRUM Master, the Product Backlog will be transformed back into a sprint backlog that will be developed by the Development Team. During the execution the requirements can change and be flexible with the consequences of development being disturbed. The output of SCRUM is an application that will provide various modules such as purchasing, sales, inventory and reporting. The goal is to control the number of store inventory assets. So that stores can improve service, get detailed information, save time, and reduce costs.

Key words: Point of Sales, SCRUM, MPC Computer

1 Introduction
The development of information technology that has developed rapidly over time has given rise to new trends in cartographic applications (Kolesnikov and Kikin, 2016; Kameswara, 2015; Bharathi, 2014; Lisitskiy, 2014, 2013). According to their research, there are 2 most popular ways to develop cartography, namely web and cellular mapping. Both are popular and active, (Kolesnikov and Kikin, 2016; Hemalatha, 2015; Kikin, 2014; Shashidhar, 2014; Mitchel, 2005; Michael, 2003; Kraak, 2001) caused by modern features such as web technology, cellular devices and wireless communication facilities (Kolesnikov and Kikin, 2016). The role of application in the world today has increased and is now used to do production work, which was only for entertainment facilities (Kolesnikov and Kikin, 2016). One important role in how to use this application is to place the development of cartography aimed at mapping the application (Kolesnikov and Kikin, 2016). Its capabilities have led to their extraordinary level of popularity leading to the emergence of a growing mobile application market and mapping applications as the best-selling application (Kolesnikov and Kikin, 2016).

Point-of-Sale (POS) system to receive payments from customers using a credit or debit card to buy goods or services globally (Saxena et al., 2015). The most popular form of POS readers, especially in the United States (US), the nature of swiping credit cards or debit magnetic scanners (Saxena et al., 2015; Smart, 2011). Traditional POS Systems (TPOS) are identity cards used for us with credit or debit cards (Saxena et al., 2015). This system lasts a long time and most consumers are already familiar with this. At present, new POS systems are placed on the market, cellular POS systems or abbreviated as MPOS (Saxena et al., 2015; Johnson, 2012). Produced by several vendors, including Square®, Intuit GoPayment® and Paypal Here®, the MPOS system takes two forms (Saxena et al., 2015). The MPOS hardware system consists of small readers who use mobile devices (Saxena et al., 2015). Customers who make transactions must swipe their credit / debit cards through a device to pay (Saxena et al., 2015). Traders usually use car devices to receive payments and accept various other personal or business needs (Saxena et al., 2015). Payment through devices stored on the device (Saxena et al., 2015). Another type of MPOS system is software and can be used for manual card information to your cell phone or tablet (Saxena et al., 2015).
Software development life cycle (SDLC) is a method by which quality software can be developed in the given time and according to the customer expectations (Sharma, 2017; Dwivedi, 2016). SDLC is one form of traditional software development and integrated into high method (Andry, 2017; Shaw, 2002; Leau et al, 2012). SDLC produces high-quality devices that meet or exceed customer expectations, reaching in time and cost estimation. The software development life cycle is framework to define activities performed each step in the software development process (Andry, 2017). Jeff Sutherland develop the scrum software development method in 1993, and the aim is to become a development methodology that follows the Agile methodology (Permana, 2015; Pham et al., 2011). Scrum is a software development framework that is more responsive than the waterfall method for software projects and managing products or application development (Permana, 2015). The focus is on "strategy, a flexible product development where the team worked to achieve goals" (Permana, 2015; Falls, 2004).

1.1 Problem
The problem is how to develop an application that can help economic activity, especially in the sale of computer accessories, these problems must be solved in order to create a software that is suitable for use. Expected with the creation of this application, everything that becomes obstacles and problems in the process of selling computer accessories can be completed effectively and efficiently. Another problem found in the development of this software is the limited knowledge and time, so that the software created may be less in accordance with the wishes of the user.

1.2 Closing Statement
Finally, development team grateful for all aspects that have helped us in developing computer accessories sales applications. The journal that we created is expected to help anyone who wants to explore science about the development of any sales application. It is also hoped that this application can ease the sale of computer accessories and can easily print the results of sales or purchase reports.

2 Literature Review

2.1 Literature Review on Point of Sales
POS system is a system which is needed for updating from a manual process. It is the core for business analysis with access to historical sales information. POS software helps to identify not only daily and weekly POS performance, but also inventory levels based on SKU and location, order status, percentage of stock, and warehouse and stock storage (Cote, 2015; Shapiro, 2008) further shows that the POS system streamlines the process of inserting inventory into a computer after the completion of the sale, allowing accelerated inventory management for companies that are still doing manual calculations (Cote, 2015; Casison, 2013). This will affect the purchase order, which must be determined by how much the end user requests, POS data can be used to predict what the user will buy next (Cote, 2015; Simon, 2008). The POS system is a device to automatically collect and combine sales data, which can then be used to generate various sales reports (Cote, 2015; Polanz, 2011). This is important when dealing with temporal items. (Cote, 2015; Youngblood, 2013). Practices are not considered by many retailers due to lack of technical ability (Cote, 2015; Ehrenthal et al, 2014). But considering the demand for inventory management, retailers can substantially reduce cost of storage, handling and inventory (Cote, 2015; Ehrenthal et al, 2014). Not enough maturity decision can effectively technology, there is a gap between managers concept about trends and patterns. This provides management with improved capabilities for planning orders, factory placement, and adjusting strategies (Cote, 2015; Lombardi, 2011).

With combining historical data trends and purchases helps improve inventory accuracy and reduces year-end sales needs. Immediate purchasing systems drive these additional costs back into the supply chain (Cote, 2015). Switching from a manual system to a computerized system will increases purchasing efficiency proven by many exist research. Point of sale and inventory management collects information related to ordering, and historical data allows you to estimate seasonal sales more accurately and make purchasing decisions for the future (Cote, 2015).

2.2 Literature Review on SDLC Method
The following are types of SDLC model:
2.2.1 Waterfall Model
The waterfall model is a linear sequential flow in which progress is seen as flowing steadily downwards (like a waterfall) through the phases of software implementation (Egwoh and Nonyelum, 2017; Sami, 2012). This means that each phase in the development process begins in a structured manner, for example a phase can be started if the previous phase has been completed. The waterfall approach does not define the process for returning to the previous phase when the next phase is being worked on to handle changing needs (Egwoh and Nonyelum, 2017).

2.2.2 V-shaped model
It is an extension of the waterfall model. Instead of moving down in a linear way, the process steps are bent upwards after the implementation and coding phase, to form the typical V shape (Egwoh and Nonyelum, 2017; Sami, 2012). The difference between the v-shaped model and the waterfall model is the initial test planning in a v-shaped model. It makes software requirements clearly defined and known (Egwoh and Nonyelum, 2017).

2.2.3 Prototyping model
It refers to the activity of creating prototypes of software applications, for example, incomplete versions of the software program being developed (Egwoh and Nonyelum, 2017; Sami, 2012). It is used to visualize some component of the software to limit the gap of misunderstanding the customer requirements by the development team (Egwoh and Nonyelum, 2017).

2.2.4 Spiral model
It is combining elements of both design and prototyping-in-stages, in an effort to combine advantages of top-down and bottom-up concepts (Egwoh and Nonyelum, 2017; Sami, 2012). This model combines the prototyping model and the waterfall model. The spiral model is favoured for large, expensive and high-skilled projects. This model uses many of the same phases as the waterfall model, separated by planning, risk assessment, and the building of prototypes and simulations (Egwoh and Nonyelum, 2017).

2.2.5 Iterative and Incremental Model
It is developed to overcome the weaknesses of the waterfall model (Egwoh and Nonyelum, 2017; Sami, 2012). This starts with planning and ends with the spread with the cyclic interaction mined. The basic method used is to develop the system repeatedly and in some smaller ones at one time, allowing software to take advantage of what has been done. We can start with the budget module as a first iteration and then with inventory module and so forth (Egwoh and Nonyelum, 2017).

2.2.6 Extreme Programming (Agile Model)
Extreme Programming is a suitable method in developing software that requires faster adaptation that occurs (Suryantara and Andry, 2018; Suryantara, 2017). XP is also suitable for teams that have few members and are in the same location in software development. XP breaks down projects into several subprojects, such as planning, development, integration, testing and delivery (Suryantara and Andry, 2018; DeHondt and Brandyberry, 2007; Highsmith, 2003).

2.3 Literature Review on SCRUM Method Implementation
The SCRUM follows an iterative and incremental philosophy to optimize predictability and risk control. His principles guide the development activities within a process that incorporates the framework of activities including requirements, analysis, design, development and delivery, worth remembering that Scrum is not synonymous with agile management, but one of many management frameworks (Nishijima and Santos, 2013).

2.3.1 Main Roles of Scrum
There are some main roles of scrum methodology which is consist of Product Owner, Scrum Master, and Scrum Team.

2.3.2 Artifacts
The four artifacts on Scrum Methodology are Product Backlog, Sprint Backlog, Release Burndown, and Sprint Burndown.
2.3.3 Scrum Process Cycle
Each of activities takes place within the framework of a standard process and time called Sprint. The number of Sprints needed to complete each activity varies with the size and design complexity. A SCRUM project can be started even if you have only a superficial view, which will be clarified as the project evolves (Nishijima and Santos, 2013).

2.3.4 Time-Boxes
Time-Boxes are short-term events. It is a simple technique applied to software development. In Scrum, the technique applies to meetings and Sprints making them more objective. Its components are Release Planning, Sprint Planning, Sprint, Sprint Review, Sprint Retrospective (Nishijima and Santos, 2013).

2.3.5 Daily Scrum
On each day of a sprint, the team holds daily stand-up meetings time-boxed to fifteen minutes in same place and same time to follow the progress of development making use of Burndown Chart for monitoring tasks (Nishijima and Santos, 2013). Daily Scrums improve communications, identify and remove impediments to development, highlight and promote quick decision-making, and improve the Development Team’s level of project knowledge. The Scrum Master must lead the meeting and ensure that all the members of team are present, keeping the brevity of the interventions and strengthen the rules. The Daily Scrum Meeting is the continuous inspection and adaptation mechanism of Scrum (Nishijima and Santos, 2013; Schwaber and Sutherland, 2012) as seen on Figure 1. Flow Scrum.

3 Research Methodology
In this section, we focused on the software development methods we use that is Scrum. The research starts from Development Preparation, maximizing the study of researchers to understand the Scrum Method in the project. we will also consult with people who have been directly involved in Scrum to find information related to challenges during the project process. This study also provides knowledge about the Scrum framework and its implementation in software development project management. The research starts from Development Preparation, maximizing the study of researchers to understand the Scrum Method in the project. we will also consult with people who have been directly involved in Scrum to find information related to challenges during the project process. This study also provides knowledge about the Scrum framework and its implementation in software development project management (Permana, 2015).

3.1 Explanation of Scrum Roles
Based on Figure 2. SCRUM Roles, scrum Teams are cross-functional and independent and team. They choose the best way to accomplish their work. All the skills needed to complete the work are owned by cross-functional teams. The Scrum Team has proven to be effective for any complex work. Scrum Teams deliver products in an iterative and incremental ways, maximizing chances for getting feedback (Schwaber and Sutherland, 2017)
3.1.1 Product Owner
The main responsibility of the Product Owner is for increasing the product value. This is done widely across organizations, Scrum Teams, and individuals (Schwaber and Sutherland, 2017). Product Backlog management consist of:

- To expressing Product Backlog items in a very clear way;
- To ordering the items in the Product Backlog;
- To optimizing the value of the work;
- To make sure that the Product Backlog is visible to all;
- To make sure the Team understands items in the Product Backlog.

The Product Owner represents the desires in the Product Backlog. The entire members must respect the decisions of the Product Owner (Schwaber and Sutherland, 2017).

3.1.2 Development Team
Development Team is a team who delivering a releasable Increment of “Done” product. Only members of the Team can create the Increment. Development Teams are arranged well and highly endorsed by the organization. The coordination optimizes the Development Team’s overall effectiveness and efficiency (Schwaber and Sutherland, 2017).

Characteristics of Development Teams:

- No one (not even the Scrum Master) tells the Development Team how to turn Product Backlog into Increments of potentially releasable functionality;
- Development Teams are cross-functional, with all the skills as a team necessary to create a product Increment;
- Scrum recognizes no titles for Development Team members, regardless of the work being performed by the person;
- Scrum recognizes no sub-teams in the Development Team, regardless of domains that need to be addressed like testing, architecture, operations, or business analysis; and,
- Individual Development Team members may have specialized skills and areas of focus, but accountability belongs to the Development Team as a whole.

3.1.3 SCrum Master
There are three services carried out by Scrum Masters, which is consist of:

Scrum Master Service to the Product Owner
The Scrum Master serves the Product Owner in several ways, including:

- Ensuring that goals, scope, and product domain are understood by everyone on the Scrum Team as well as possible;
- Finding techniques for effective Product Backlog management;
- Helping the Scrum Team understand the need for clear and concise Product Backlog items;
- Understanding product planning in an empirical environment;
- Ensuring the Product Owner knows how to arrange the Product Backlog to maximize value;
- Understanding and practicing agility; and,
- Facilitating Scrum events as requested or needed.

Scrum Master Service to the Development Team
The Scrum Master serves the Team in several ways, which is consist of:

- To give a training for the Development Team in self-organization and cross-functionality;
• To help the Development Team to create high-value products;
• To remove barrier to the Development Team’s progress;
• To facilitate Scrum events as requested or needed; and,
• To give a training for the Development Team in organizational environments.

Scrum Master Service to the Organization
The Scrum Master serves the organization in several ways, including:
• Leading and coaching the organization in its Scrum adoption;
• Planning Scrum implementations within the organization;
• Helping employees and stakeholders understand and enact Scrum and empirical product development;
• Causing change that increases the productivity of the Scrum Team; and,
• Working with other Scrum Masters to increase the effectiveness of the application of Scrum in the organization.

3.2 Explanation of Artifacts
Artifacts of scrum describe value to offer transparency for adaptation and inspection. Artifacts who defined are designed to maximizing transparency of information so that everyone has the same concept (Schwaber and Sutherland, 2017).

3.2.1 Product Backlog
Based on Figure 3, Product Backlog below, Product Backlog is a list of needs in the product. The Product Owner is responsible for anything involved on it. The Product Backlog lists all features that establish the changes to the product in future releases. The items have the attributes of an order, etc. The items frequently include test descriptions. Product Backlog improvement consist of adding detail, estimates, etc. This is a process when the Product Owner cooperate with the Development Team. Improvement generally uses no more than 15% of the capacity of the Team. The items can be updated anytime by the policy of Product Owner (Schwaber and Sutherland, 2017).

3.2.2 Sprint Backlog
It is the items from Product Backlog chosen for Sprint and it’s a prediction about what functionality will be in the next process and the work needed to deliver that functionality into a completely done process (Schwaber and Sutherland, 2017). Sprint Backlog makes all the work that the Team identifies as important to meet the Goal. It is a plan with pretty detail that changes in progress can be understood properly. This appearance happens as the Team works through the plan and learns more about achieving the Sprint Goal (Schwaber and Sutherland, 2017). The elements of the plan are removed when elements of the plan are assumed unnecessary. Only the Team members can change its Sprint Backlog according to their will. A Sprint Backlog is a visible illustration of the work that the team plans to accomplish (Schwaber and Sutherland, 2017).
3.2.3 Increment

An Increment is a total of all the items on the product which completed during a Sprint and the value of the increments of all Sprints done in the past. The new Increment must be completed, which means the Team’s definition of done can be used. An increment is a constitution which can be checked, done work that assists empiricism. The increment must be in useable condition however of whether the Owner decides to release that increment (Schwaber and Sutherland, 2017).

3.3 Explanation of Time-Boxes

Time-Boxes on Scrum Methodology consist of:

3.3.1 Release Planning

The team discusses the plans and goals of the release, its general characteristic features and risks, improving understanding and communication.

3.3.2 Sprint Planning

It is held a planning meeting (Sprint planning) between the team (Scrum Team) and the customer (Product Owner). It elaborates a list (which can add new items throughout the project) of all the features and requirements expected of the software, known as Product Backlog. At the beginning of each Sprint, a list of items that are part of Product Backlog Sprint Backlog is known as selected according to priorities.

3.3.3 Sprint

It represents one cycle (iteration) which may last for three to four weeks. Generally, the four-week cycle is adopted in order to obtain better overall visibility.

3.3.4 Sprint Review

The team holds an informal monthly meeting lasting an average of four hours and can be adapted if Sprint is shorter. The team analyzes the changes made in increments committed to Product Backlog, reviewing features and discussing difficulties and successes during the Sprint, to decide what to do next. Sprint Review provides valuable input to subsequent Sprint Planning Meetings (Nishijima and Santos, 2013; Schwaber and Sutherland, 2012). The Product Owner verifies which Product Backlog items were completed in the Sprint, and discusses with the development team, what will be the new priorities. If there is no obstacle, a new Product Backlog is created to start a new Sprint.

3.3.5 Sprint Retrospective

All team members meet to discuss what went well and what to improve in the next sprint. The product owner does not attend this meeting. At the end of the Retrospective, the Scrum Team should have identified improvement measures to be implemented in the next Sprint (Nishijima and Santos, 2013; Schwaber and Sutherland, 2012). Each of these sprints completed and delivered, will be implemented toward to the full product.

3.3.6 Definition of “Done”

When the Product Backlog is said to be „Done“, all parties must understand the meaning of the word „Done“. Although this can vary significantly, members must have a common understanding to ensure transparency. This definition guides the Team to find out how many items can be selected. The purpose is to express additions of releasable functionality that follow to the Team’s definition of “Done” for now. When teams reach their matureness, it is high expected that their knowledge of “Done” will expand to include more strict criteria for better quality (Schwaber and Sutherland, 2017).

4 Implementation of SCRUM on the Project

In the implementation of the SCRUM methodology, the authors used 4 personnel to complete a case study developing point of sales on MPC Computers, consist of:

- Project Manager: is responsible as SCRUM Master to introduce Scrum usage in accordance with the Scrum Guidelines in order to understand Scrum theory, practices, rules and values.
• System Analyst: is responsible for conducting feasibility studies, analyzes, and designs in meeting the requested requirements of the product owner that will be executed by the programmer.
• Programmer 1: implements coding according to the results that system analyst has made and internal program testing to support the application system.
• Programmer 2: is assistant of programmer one (1).
• Tester, in charge of checking the program that the programmer has made to meet the requirements required.

The Scrum team consists of three parts:
• Product owner, the owner of the MPC computer.
• Scrum master, namely project manager and system analyst.
• Development team, namely programmers and testers.

After the team is formed, now an explanation of the process contained in the SCRUM is:

1. **Product Backlog**

Product owner (MPC Computer) delivers all ordered items needed in the operation facilitated by SCRUM Master to comply with SCRUM guidelines. Based on the Table 1. Features list software development project is a list of features that will be developed in the point of sales application.

### Table 1: Features List Software Development Project, source: (author)

<table>
<thead>
<tr>
<th>No</th>
<th>Backlog Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Purchase</td>
<td>Purchases are made if the stock has reached the minimum limit, an order will be made to several suppliers who have worked together.</td>
</tr>
<tr>
<td>2</td>
<td>Sales</td>
<td>Sales of customers to goods that have been purchased by calculating the price and quality of goods.</td>
</tr>
<tr>
<td>3</td>
<td>Purchase Return</td>
<td>Returns of damaged and non-conforming items to store purchases to suppliers.</td>
</tr>
<tr>
<td>4</td>
<td>Sales Returns</td>
<td>Returns of goods that are damaged and not in accordance with the customer’s wishes for the store.</td>
</tr>
<tr>
<td>5</td>
<td>Manage Cash Funds</td>
<td>Managing cash in and out funds that are carried out in store operations (usually a small nominal).</td>
</tr>
<tr>
<td>6</td>
<td>Debt Payments</td>
<td>Payment for purchase transactions using a “credit” payment method whose purchase status has not been paid.</td>
</tr>
</tbody>
</table>

Figure 4 shows Use Case Diagram POS, there are actors and their activities in the application.
2. Sprint Planning

The meeting between the SCRUM team in discussing Product Backlog to make any agenda that will be carried out. SCRUM Master will ensure that the team organizers can understand the objectives. The specified sprint time is 2 weeks as shown in Table 2. Working time plan. The features of the product backlog work together according to their respective roles. If there is a change, the development must be postponed until the next sprint.

<table>
<thead>
<tr>
<th>Roles</th>
<th>Day(s)</th>
<th>Hour(s) / Day(s)</th>
<th>Total Sprint (Hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Manager</td>
<td>3</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>System Analyst (Scrum Master)</td>
<td>8</td>
<td>4</td>
<td>60</td>
</tr>
<tr>
<td>Programmer 1</td>
<td>10</td>
<td>5</td>
<td>60</td>
</tr>
<tr>
<td>Programmer 2</td>
<td>10</td>
<td>5</td>
<td>60</td>
</tr>
<tr>
<td>Software Tester</td>
<td>7</td>
<td>4</td>
<td>28</td>
</tr>
</tbody>
</table>

3. Sprint and Daily Scrum

Sprint is a short development phase consisting of a sprint backlog from the results of the transformation of the backlog product in the form of small pieces. It’s flexible if there are changes from the product owner. While Daily Scrum is a Development Team event that has a 15-minute time limit during the Sprint. At this event, the Development Team makes a work plan for the next 24 hours adjusting to the sprint backlog to make predictions of the next work in the Sprint. Daily Scrum is done at the same time and place every day to reduce complexity. Based on Figure 5.

Business process point of sales, is the process that the development team must be able to solve, and each role have an estimated time for 10 days, seen in Table 3. Sprint backlog feature.
Table 3: Sprint Backlog Feature, source: (author)

<table>
<thead>
<tr>
<th>Feature Backlog</th>
<th>Task</th>
<th>AT</th>
<th>ET</th>
<th>The number of remaining hours / day Sprint</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>T1</td>
</tr>
<tr>
<td>Point of Sales</td>
<td>Business Process</td>
<td>Business Analyst</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Design</td>
<td>Interface Design</td>
<td>System Analyst</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Design</td>
<td>Database Design</td>
<td>System Analyst</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>Design</td>
<td>Coding Front End</td>
<td>Programmer 1</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Design</td>
<td>Coding Back End</td>
<td>Programmer 2</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Testing</td>
<td>Project Manager</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tester</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

Legend for Table 3: ET = Estimated Time, AT = Assigned Team, T = Time

4. Product Increment

Product Increment is a manifestation of the Product Backlog items that are completed in the Sprint and the total value of the Increment business from the previous Sprint. At the end of Sprint, the new Increment must be “Done”, which means that the Increment must be in a condition that can be used and in accordance with the Scrum Team’s definition of “Done”.

5. Sprint Review

A Sprint Review is held at the end of Sprint to inspect Increments and adapt Product Backlog when needed. At the time of the Sprint Review, the Scrum Team and stakeholders have collaborated to review what has been completed at Sprint. Based on the results of the review and changes to the Product Backlog within the Sprint, the audience collaborates to determine the next work that can be done to optimize business value. This is an Increment presentation done to get feedback and develop collaboration capabilities.

6. Sprint Retrospective

The Sprint Retrospective is an opportunity for the Scrum Team to inspect itself and make plans for improvements to be made in the next Sprint. Organized after the Sprint Review and before the next Sprint Planning. A maximum of three hours for the next Sprint. For a shorter Sprint, the duration of this event is usually shorter. The Scrum Master ensures this event is held and each participant understands its purpose.

5 Result

Based on Table 4. Benefits implementation of scrum method, the discussion and implementation of SCRUM there are several benefits.

Table 4: Benefit Implementation of SCRUM Method, source: (author)

<table>
<thead>
<tr>
<th>Case</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task Detail Estimation</td>
<td>With the implementation of Scrum method, the details of the task has been clearly set at the end of each sprint two (2) weeks.</td>
</tr>
<tr>
<td>Quality</td>
<td>Sprint makes the team motivated and stronger while developing software. So it makes the quality of the software suitable with the</td>
</tr>
</tbody>
</table>
Quality Control | The quality control can be evaluated at the end of a sprint, so the quality of the application is visible very clear in the end of a Sprint.
---|---
Risk | Errors occur all the time when the implementation process is being carried out which is shown by the Monitoring Board.
Application View | In the end of the sprint, each team showing the final sprint. So the display of development software can be seen.
Business Change | After the software is being showed, changes will be discussed in the final sprint if there is a business change.
Customer Feedback | Customer feedback will be discussed in the final sprint after the customer sees the demo from the software.
Project Monitoring | Project monitoring can be done anytime and anywhere easily by the Monitoring Board.
Live (Production) | Sprints makes it easy to develop applications directly based on the product backlog that was previously made.

6 Conclusion
Based on the analysis that has been made and the results of the discussion in the previous section, some conclusions can be drawn as follows:
- Project quality and risk appear faster;
- Saving time;
- Business Changes and Customer Feedback can be easily overcome which will be seen in the final sprint;
- Project speed that is visible in real time;
- Live applications can be done per product backlog.

In future studies, new methods will be added to improve business changes and customer feedback must be limited so that the project is not delayed.

7 References


**JEL Classification: M15**