

Analysis of Software Project Development Process Maturity Level Using Scrum Maturity Model: Case Study of Tribe Wholesale Digitization PT Telkom Indonesia (Persero) Tbk

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Abstract

In the face of the rapidly changing dynamics of the digital market, increasing the efficiency and effectiveness of software development has become crucial. This study examines in depth the maturity level of the software development process using the Scrum Maturity Model (SMM) in Tribe Wholesale Digitization (TWD), a strategic unit in PT Telkom Indonesia (Persero) Tbk. A quantitative approach was employed, with the questionnaire survey method serving as the primary data collection instrument. The questionnaire was designed based on the dimensions within the SMM, covering various aspects such as basic Scrum management, software requirements engineering, customer relationship management, and performance management. The respondents in this study were individuals directly involved in the software development team at TWD. The collected data were analyzed using descriptive and inferential statistical methods. The results indicate that the maturity level of the software development process in TWD varies across the SMM levels. At level 2, most teams have adopted basic Scrum practices. However, at levels 3, 4, and 5, several challenges and areas for improvement were identified, such as uneven understanding of roles among team members, traceability issues (transparency) in the development process, and rigidity within organizational structures that hinder flexibility. This study concludes that the implementation of the SMM provides a useful framework to evaluate and improve the maturity level of the development process. The findings are expected to serve as valuable input for TWD and PT Telkom Indonesia in their efforts to enhance Scrum practices and achieve a higher level of maturity.

Keywords: Agile Software Development, Scrum, Scrum Maturity Model, Process Maturity, Tribe Wholesale Digitization, PT Telkom Indonesia, Software Development, Case Study, Quantitative Analysis, Improvement Recommendations.

INTRODUCTION

The rapid development of technology in the current era is reflected by the presence of numerous digital products, indicating high interest among product developers in creating solutions that address consumer needs. As a result, software development strategies should enable these developers to validate assumptions and innovate quickly to better meet market demands. The use of agile development methods is considered highly appropriate for addressing these challenges, as these methods emphasize frequent product iterations and prioritize aspects that are performed on an iterative basis. For these reasons, agile methods are recommended not only for startups but also for large companies. PT Telkom Indonesia (Persero) Tbk (Telkom), a state-owned company operating in the information and communication technology (ICT) services sector and telecommunication networks in Indonesia, aims to become a leader in digital innovation and

globalization within Indonesia, in accordance with its mission (PT Telkom Indonesia (Persero) (Calista, 2024; Minarso et al., 2024).

As a company at the forefront of Indonesia's digital landscape, PT Telkom has a pivotal role in providing an exemplary model for Digital Transformation for organizations across the country (Danusaputro et al., 2024; Seto, 2017). According to a press release issued by Telkom in January 2022, "Leap Present as Telkom's Commitment to Accelerate Indonesia's Digital Transformation," it is clear that Telkom is committed to serving as a digital hub for Indonesia.

To support its digital transformation and strengthen its position in the telecommunications industry, Telkom has implemented a strategy known as 5 Bold Moves (Kurniasari & Putro, 2023; Pretorius, 2019; Syafitrah et al., 2024). This strategy aims to accelerate corporate growth, increase stakeholder value, and position Telkom as a digital market leader (Amping et al., 2019; Yusuf & Wibowo, 2022). Within the context of Tribe Wholesale Digitization (TWD), the implementation of this strategy exposes a critical gap between the current maturity of Scrum implementation (independent variable) and optimal software development performance outcomes (dependent variables: delivery time, product quality, sprint success rate). Understanding this relationship is essential, as the maturity level of Scrum practices directly affects project delivery and outcomes (ALSHURIDEH et al., 2024; Baxter & Turner, 2023). The five strategic steps include the establishment of an Indonesia Infrastructure Company dedicated to high-quality digital infrastructure across Indonesia, the formation of a Data Center Company to manage and expand data storage services, and the creation of a B2B Digital IT Service Company providing end-to-end digital IT solutions. Additionally, this strategy involves the integration of fixed and mobile broadband services for seamless connectivity, and the development of digital businesses such as digital content services, big data, B2B Commerce, and financial services. The 5 Bold Moves strategy provides Telkom with a framework for confronting digital era challenges and serves as a guideline for all business units, including Tribe Wholesale Digitization (TWD). This research is highly relevant in the context of Telkom's digital transformation, with a focus on two primary initiatives: B2B Digital IT Services Co, which necessitates evaluation of software development maturity through the Scrum Maturity Model to enhance delivery times and product quality, and Digital Business, which mandates an agile product development foundation. The goal of this research is to identify bottlenecks in the Scrum process, enabling a targeted improvement roadmap that aligns with Telkom's digital business direction, ensures products meet user needs, and guarantees regulatory compliance (Molaoa, 2024; Siddiqui, 2021; Widiyatmoko, 2017).

The Five Bold Moves strategy serves as a foundation for Telkom in addressing opportunities and challenges of the digital era, providing guidance for all business units, including Tribe Wholesale Digitization (TWD), in operational and product development activities. Therefore, understanding the software development process maturity level at TWD is crucial for supporting the company's strategic objectives (Chiang et al., 2024; Maharjan, 2024; Xiong et al., 2025).

Telkom remains committed to ongoing innovation, aiming not only to enhance the value of existing products but also to develop potential new offerings (Ujiati & Marsasi, 2024). To realize this vision, Telkom has established a Digital Business & Technology Division (DBT) organized around

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agile principles, as demonstrated by its tribe-based organizational structure and its use of Scrum and Kanban frameworks for project management. Since 2017, Telkom has adopted agile methodologies in software development. DBT currently comprises 22 tribes, each managing varying product types (Ujiati & Marsasi, 2024).

Tribe Wholesale Digitization (TWD) is one such tribe, focused on digitizing and streamlining business processes within the Wholesale directorate by offering products across connectivity and non-connectivity service categories. TWD encompasses a range of sales activities, from customer product searches to monitoring and unsubscribing decisions. It is divided into six squads, each handling distinct domain issues and serving both corporate clients and internal staff. To meet these needs, TWD has launched multiple digital products integrated within the MyCarrier platform. Currently, TWD's six squads oversee different business domains.

Developing products that fulfill user needs while complying with regulations requires repeated iterations and validation. Consequently, development teams must operate with speed, adhere to timelines, and follow established plans. However, current challenges include difficulties in ensuring development speed, timeliness, and plan adherence. For example, in the 2023 PI (Product Incremental) Planning agenda led by the Directorate of Wholesale, the development target for MyCarrier was set at 126 key features. By December 2023, only 88.9% of these were completed. According to JIRA monitoring reports, the achievement rate for sprint goals in each iteration is just 77%, falling short of the 100% target. Industry benchmarks show that successful Scrum teams typically achieve sprint success rates between 85-95% (Nuti, 2023). Thus, TWD's performance at Telkom is notably below industry standards, pointing to major opportunities for process maturity improvements. This success metric, agreed upon by stakeholders and the development team, underscores the anticipated outcomes; the low achievement rate has led to delays in release schedules and increased product development costs.

In light of these challenges, it is crucial for TWD to implement refinements in its software development process. To pinpoint improvement areas and assess achieved maturity, adopting and applying the maturity model concept is especially valuable. The maturity model concept provides organizations with a way to assess conditions and progress in software development (Proenca, 2016). Several studies validate the effectiveness of maturity models in software development: Yin et al. (2011) developed the Scrum Maturity Model for IT organizations, demonstrating its value in client-focused environments; Costa et al. (2017) applied SMM at SoftDesign Company, revealing substantial opportunities for process enhancement; Farid et al. (2016) illustrated how CMMI process areas can be realized through Scrum; and Iqbal et al. (2016) examined readiness for process improvement frameworks in software SMEs. Collectively, these studies reveal that, although maturity models have been tested in various organizations, their use in large-scale telecommunications companies leading major digital transformations, especially in Indonesia, remains underexplored. With the insights provided by the maturity model concept, TWD is equipped to design and execute better-targeted and structured improvement plans, optimizing every facet of software development.

This study aims to determine the maturity level of the software development process in TWD by applying the maturity model concept. The research targets development teams utilizing the Scrum framework, presenting findings on the current development process's maturity.

The purpose of this study is to analyze and identify the maturity level of software development in Tribe Wholesale Digitization, to determine the gap between targeted and current maturity levels, and to propose achievement strategies to raise maturity. The anticipated contributions of this research are multi-faceted. For organizations, it offers actionable insights to elevate software process maturity and efficiency in TWD. For academia, it enhances understanding of maturity measurement in software development and serves as a reference for future Maturity Model studies. Finally, for the author, it presents an opportunity to apply theoretical knowledge in practice and deliver relevant information to stakeholders.

Based on this background, the main issues in developing the MyCarrier application within TWD, particularly in the implementation of the Scrum framework, are critically important. Effective software development requires exploring and establishing process maturity levels using the Maturity Model, with mapping via fishbone diagrams arising from interviews and observations. Problems identified reveal that product development success has not been achieved, with three main contributing elements: Human Resources (HR), methodology, and organization. HR issues arise from insufficient understanding of project roles, with many team members focusing only on specialized skills contrary to agile principles; lack of process transparency further impedes progress. Methodologically, a strong team focus hinders assessment of individual effectiveness, and certain Scrum practices are inconsistently applied. Organizationally, strict rules at Telkom hinder agile adoption, while communication between the WINS Directorate and the Developer team must be strengthened to ensure the backlog remains a priority. This research seeks solutions for suboptimal Scrum implementation in TWD, with interview data indicating that 55.6% of respondents feel product development has fallen short of expectations. Analyzing the development process aims to address these issues and improve Scrum's effectiveness.

The goal of this study is to evaluate the maturity level of the software development process in Tribe Wholesale Digitization, establish gaps between actual and targeted maturity, and devise strategies to enhance process maturity. The research is expected to contribute significantly to organizations seeking to optimize software development. Its benefits span multiple aspects: organizationally, by facilitating improved and more efficient development processes in TWD; academically, by advancing knowledge on maturity measurement and offering a reference for future studies; and for the author, by enabling the pragmatic application of theory and providing useful insights to relevant parties.

METHOD

After determining the chosen method based on the stages carried out in chapter two, the author used a quantitative approach, as the SMM method provided clear stages and mechanisms (Daniel, 2016). This study applied a descriptive quantitative approach using surveys through questionnaires and analysis of historical software project development data at Tribe Wholesale

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Digitization (TWD), PT Telkom Indonesia. The research focused on evaluating the maturity level of the software development process using the Scrum Maturity Model (SMM).

The survey phase involved distributing questionnaires to relevant respondents. Several steps were undertaken to improve data validity, beginning with parameter tests to measure the validity and reliability of the instrument and to establish the ideal SMM level. Sampling was conducted purposively, selecting respondents based on set criteria to ensure validity and reliability.

RESULT AND DISCUSSION

Gap Analysis

Gap analysis is carried out by comparing existing scores against targets in each indicator, especially dimensions that have not been maximized such as team performance metrics, external collaboration, and integration of customer feedback into the sprint cycle.

1. SMM Ideal TWD

Based on the results of an in-depth interview with Tribe Leader TWD, an understanding was reached that the ideal level of maturity of the software development process for Tribe TWD is Level 4 (Quantitatively Managed) in the Scrum Maturity Model (SMM). This designation is based on the TWD Tribe's urgency to:

- 1) Manage processes predictively and data-driven — given the high complexity of projects and the need for rapid decision-making.
- 2) Ensure consistent quality of digital services to B2B customers — through the implementation of Continuous Integration/Continuous Deployment (CI/CD) and automated quality measurement.
- 3) Improve delivery efficiency and timeliness — by using performance metrics such as sprint velocity, defect density, lead time, and customer feedback.
- 4) Becoming a role model for digital delivery units within the Telkom Group, which is in line with the digital transformation and Five Bold Moves initiatives.

According to Tribe Leader, achieving Level 4 is relevant to address today's operational challenges while preparing organizations for larger project scales, especially in the ever-growing wholesale digital ecosystem. Tribe TWD is expected to be able to make data the main basis for process improvement and develop real-time performance monitoring capabilities.

2. The Gap Between Existing SMM and Ideal SMM

In accordance with the discussion in the previous section, measurements are carried out starting from SMM level 2 to SMM level 5 with variables that have been identified previously. The results of the analysis of maturity level measurement in the software development process in TWD can be seen in Figure 4.1

Level 5 Optimizing	Manajemen Performansi 72,96%	
Level 4 Quantitatively Managed	Standar Manajemen Projek 72,61%	Standar Manajemen Proses 76,19%
Level 3 Defined	Pengelolaan Hubungan dengan Pelanggan 78,70%	Manajemen Iterasi 73,80%
Level 2 Managed	Manajemen Dasar Scrum 90,18%	Rekayasa Persyaratan Perangkat Lunak 86,78%
Level 1 Initial		

Figure 1. SMM Measurement Analysis Results

(Source: Processed by the Author, 2025)

From Figure 1, it can be seen that there are 2 conditions that are differentiated by green and yellow. The green box illustrates that the variable is in the status of "Fulfilled All". This status is obtained in accordance with the KPA standard value that must be achieved to enter the category, which is above 85%. In contrast to the yellow box, this shows that the variable is in the status of "Most Fulfilled", where the KPA standard is between 50% and 85%.

Referring to Figure 4.2, it can be concluded that the current software development process in TWD is at level 2. This is because all the goals that are requirements are included in the "Fulfilled All" category. These results are supported by data obtained through the historical data analysis process which shows that in Scrum management, TWD has implemented how Scrum works in accordance with existing best practices.

Through interviews and validation results, it is known that the ideal maturity level for Tribe TWD is Level 4 (Quantitatively Managed). This level emphasizes the importance of measuring team performance and improving relationships with customers. However, from the results of the questionnaire, the Level 3 and Level 4 indicators have not been fully met. Some indicators have been achieved (around 50-80%), but they are not consistent across all teams.

To bridge the existing position of Tribe TWD which is currently at Level 2 (Defined) to a higher maturity target, gap analysis was carried out based on dimensions and indicators in the Scrum Maturity Model (SMM). This gap analysis aims to identify crucial areas that need improvement, as well as formulate stages of gradual improvement from Level 2 to Level 3 (Managed) until reaching Level 4 (Quantitatively Managed) as ideal conditions.

The analysis was carried out by comparing the actual conditions in each key process dimension (Key Process Area) with the conditions that should be achieved at each SMM level. The results of this analysis are the basis for the preparation of a strategic and measurable maturity improvement roadmap. The following is a gap analysis table based on the results of internal evaluations and interviews with key stakeholders in Tribe TWD:

Table 1. Gap Analysis of Existing and Ideal SMM

Dimensions/KP A	Level 2 (Defined)	Level 3 (Managed)	Level 4 (Quantitatively Managed)	Gap / Kesenjangan
Sprint Planning & Backlog Management	Routine backlogs are created and used	Backlogs are structured based on business priorities with	Backlogs are prioritized and quantitatively monitored through the metrics dashboard	There are no priority and outcome metrics yet, there is no systematic integration

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		validation from POs		with business value
Roles & Responsibilities of Scrum Teams	The roles of Scrum Master, PO, and Dev Team are implemented as per the guidelines	Responsibilities between roles run consistently and are monitored between squads	Evaluation of role contribution is carried out quantitatively based on outputs and metrics	There is no data-driven role and outcome evaluation system
Daily Scrum & Sprint Execution	Daily Scrum runs regularly and disciplined	Daily Scrum results in evaluation and tactical updates between teams	Data from each sprint (velocity, burndown chart) is used to predict subsequent performance	Lack of statistical utilization of sprint data for continuous forecasting
Sprint Review & Retrospective	Reviews and retrospectives are carried out in each sprint	Stakeholder involvement is more active, feedback is used for iterative improvement	Feedback is processed quantitatively, retrospective review results are monitored and correlated to metrics	The review-retrospective process has not been managed and evaluated based on historical data
Quality Management & Delivery	Manual validation and basic testing have been carried out	The quality assurance process is carried out in a structured manner, including the integration of testing	Automation via CI/CD, validation based on quality metrics (defect rate, test coverage)	No CI/CD, quality measurement is still manual
Performance Measurement & Monitoring	There is no formal monitoring system yet	There is regular reporting of team performance	Real-time data-driven performance dashboard, statistics based on evaluation and decision-making	There is no number-based performance metric system yet, nor does it support cross-time evaluation
Continuous Improvement	Improvements are made based on experience and discussion	Improvements have been systematically designed based on previous feedback	Improvements are made based on data trends, quantitative root cause analysis, and statistical action plans	There has been no quantitative RCA process, no documented data cycle → evaluation → improvement

(Source: Processed by the Author, 2025)

Ideal SMM Achievement Strategy

Based on previous analysis, this section outlines the current state of the software development process. After understanding the current conditions, the problem that causes the development process to be incompatible with the expected category is identified. Problem identification is carried out by parsing each objective based on the indicators that have been set. For objectives that are indicated to be problematic or not in accordance with best practice, recommendations will be prepared to increase their value. These recommendations were obtained through literature studies from the Scrum Guide, practices in SMM, and other supporting literature.

After knowing the current state of the development process, it is then sought to find out how to increase the level of maturity to a higher level. One way is to identify the shortcomings at each level by providing recommendations based on existing literature studies. To find out which part is

the problem at each level, a measurement process is carried out using the concept used previously with the object being objective for each level. The problem that is the focus to be solved is an objective that does not have the status of "Fulfilled All".

Roadmap for Improving Scrum Maturity Level Based on the results of gap analysis, a roadmap for increasing maturity from Level 2 to Level 4 (Quantitatively Managed) is prepared in four phased strategic phases:

1. Phase 1: Scrum Basics Consolidation (Level 2 – Defined)
 - a. Conduct intensive training and refreshment related to Scrum definitions and artifacts.
 - b. Standardize the use of backlogs, sprint artifacts, and roles between squads.
 - c. Develop internal guidelines related to the "Definition of Done" agreed across teams.
2. Phase 2: Strengthening Management Practices (Towards Level 3 – Managed)
 - a. Build a performance metric system based on process and outcome indicators (velocity, lead time, defect rate).
 - b. Integrate customer and stakeholder feedback in each Sprint Review session.
 - c. Establish a cross-squad retrospective ritual for cross-squad retrospective.
3. Phase 3: Quantification and Automation (Level 4 – Quantitatively Managed)
 - a. Implement a data-driven monitoring system for all sprint activities (dashboard tracking).
 - b. Perform statistical analysis of sprint performance to support decision-making.
 - c. Implement Continuous Integration/Continuous Deployment (CI/CD) with automatic validation.
4. Phase 4: Data-Based Evaluation and Quality Assurance
 - a. Conduct regular quantitative audits of Scrum processes and artifacts.
 - b. Provide metric-based maturity level reporting on a quarterly basis to Tribe management.
 - c. Develop operational standards for quantitative learning-based procedures.

Based on this strategy roadmap, Tribe TWD is not only targeted to be able to transform to Level 3, but also build a strong foundation to reach Level 4, where the entire Scrum process is managed and controlled quantitatively based on measurable performance data and predictions.

To achieve maximum results in carrying out the roadmap, detailed improvement recommendations based on the results of KPA consumption at each level were also submitted.

1. SMM Level 3

Broadly speaking, SMM level 3 consists of 2 measurement variables, namely relationship management with customers and iteration management. To find a more specific problem, measurements were made of each objective that built each variable. The measurement was carried out using KPA measurements with the results can be seen in the following figure 4.3:

Level 3 Defined	Ada definisi "Selesai" 68,07%		Product Owner Tersedia 86,90%		Sprint Review Meeting Sukses 85,11%	
	Pengelolaan Sprint Backlog 84,93%	Iterasi direncanakan 56,87%	Velocity yang Keukur 66,26%		Daily Scrum Sukses 75,30%	

Figure 2. KPA Level 3 Measurement Results

(Source: Processed by the Author, 2025)

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From Figure 4.3, it can be seen that only 2 out of 6 objectives meet the status of "Fulfilled All". To reach level 3, it is necessary to increase the scores of 4 objectives that have not met the criteria. The following will be presented recommendations that can be made to improve the current value based on the rules contained in the Scrum Guide and other supporting literature.

Table 2. Solutions to Reach Level 3

No.	Variables you want to improve	Solution			Recommendations
		Scrum (Schwaber & Sutherland, 2017)	Guide & Scrum Guide (2012)	Practice (Rubin, SCRUM (Sutherland, 2014)	
1.	There is a definition of "Done"	<ol style="list-style-type: none"> 1. Emphasizing that the definition of "finished" is a workspace 2. Making the definition of "finished" a quality standard 3. Definition of "Completion must be achieved in each iteration" 	<ol style="list-style-type: none"> 1. Be a feature size that is ready for release 	<ol style="list-style-type: none"> 1. Ensure that the definition of "Done" already meets the needs of the user 	<ol style="list-style-type: none"> 1. The Product Owner has defined the definition ("Completed") of a package with the sprint objectives, and will be discussed for each Sprint Planning activity. 2. Allocate time to establish definitions ("Completed") on each Sprint Planning activity. 3. The <i>Quality Assurance</i> (QA) team in each <i>squad</i> builds a <i>test case</i> in testing the created application that has referenced the definition ("Done")
2.	Backlog sprint management	<ol style="list-style-type: none"> 1. The development team can make changes during the sprint run 2. Sprint backlogs are structured to meet sprint goals 3. The sprint backlog is presented in detail and can be understood by the entire team 	<ol style="list-style-type: none"> 1. Backlog sprint candidates for the next sprint must be ready before the next sprint starts 	-	<ol style="list-style-type: none"> 1. The team prepares <i>the Sprint backlog</i> when the Sprint planning is carried out and validated by the Product Owner. 2. The team defined <i>the Sprint backlog</i> in detail and carried out it since Sprint Planning. 3. Product Owners assisted by researchers have started to see the sprint backlog candidates for the next sprint before the next sprint starts
3.	Planned iterations	<ol style="list-style-type: none"> 1. Every work is possible to be done 2. Sprints can be cancelled when sprints are obsolete 	<ol style="list-style-type: none"> 1. Sprints that don't go according to plan must be stopped immediately 2. The team is not distracted by outsiders 	<ol style="list-style-type: none"> 1. All activities performed in a single iteration must be locked 	<ol style="list-style-type: none"> 1. The Product Owner screens the Backlog to be done. 2. The Product Owner must immediately cancel or end the sprint if the purpose of the <i>sprint</i> is obsolete 3. Bring teams together in one place
4.	<i>Planned velocity</i>	<ol style="list-style-type: none"> 1. Every job has an estimated job 2. Utilizing <i>velocity</i> values as a benchmark for working capacity 	<ol style="list-style-type: none"> 1. <i>Velocity</i> is used to help with the planning process 2. Scrum Master conducts regular 	<ol style="list-style-type: none"> 1. Running Sprints at a consistent duration rhythm 	<ol style="list-style-type: none"> 1. Change the concept of task weighting from the current one based on the level of difficulty to the time of work. 2. Utilizing <i>velocity</i> values as a benchmark for working capacity

				analysis of sprint progress		3. <i>Velocity</i> is used to help with the planning process
						4. Scrum Master conducts regular analysis of sprint progress
5	Daily "Success"	Scrum	1. Not discussing solutions	-	1. Activities are carried out at the same time every day	4.4.1.1 The entire development team is required to attend the meeting according to the specified time
			2. Duration no more than 15 minutes			4.4.1.2 Ensure that the sprint runs according to the predetermined objectives.
						4.4.1.3 Daily scrums are conducted for no more than 15 minutes at the same time every day

(Source: Processed from primary data, 2025)

1) Recommendations to Encourage Definitions ("Completed")

Looking at the solutions presented from several sources in table 5.1, there are several things that can be done to encourage the definition of "Done".

- a. The Product Owner has defined the definition ("Completed") of a package with the sprint objectives, and will be discussed for each Sprint Planning activity.

The Product Owner is expected to not only be detailed in defining the backlog, but also in defining the definition (Done) of the backlog.

- b. Allocate time to establish definitions ("Completed") on each Sprint Planning activity.

Sprint Planning is an activity to determine what backlog will be worked on in the running of the sprint that will start. So far, the team has not regularly defined the condition ("Completed"). For this reason, it is necessary to allocate special time in each of these activities to discuss this definition ("Done").

- c. The Quality Assurance (QA) team in each squad builds a test case in testing the created application that has referenced the definition ("Done")

To know that the definition ("Completed") has been implemented, the QA team may be required to create a list of test cases that have already referred to the definition ("Completed") that has been created. By doing this, the need for a definition ("Done") will increase

2) Recommendations for Sprint Backlog Management

Some of the things that can be done for the Sprint Backlog management process are as follows:

- a. The team prepares the Sprint backlog when the Sprint planning is carried out and validated by the Product Owner.

What has often happened so far is that the sprint backlog is often not compiled through validation from the Product Owner. This resulted in several times the backlog was not in accordance with the purpose desired by the PO.

- b. The team defined the Sprint backlog in detail and carried out it since Sprint Planning.

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The sprint backlog should be clearly defined so that every member of the development team understands every activity that is being performed. In addition, this will make it easier to collaborate and share tasks between teams. For this reason, it is necessary to detail each sprint backlog.

- c. The development team can make sprint backlog changes during the sprint.

The sprint backlog is a development team worksheet so it is possible to change during the sprint as long as the change still refers to the sprint goals that have been set at the beginning. This is done with the aim of providing space for the development team to be able to maximize potential and opportunities with a mechanism that is considered the best to execute.

- d. Product Owners assisted by researchers have started to see sprint backlog candidates for the next sprint before the next sprint starts.

The criteria for a backlog sprint that can be worked on in each sprint is something that has gone through the grooming process and has been defined, the scale of priorities and needs has been defined. To get a better iteration process, it is necessary to organize the sprint backlog in advance.

3) Recommendations for Planned Iterations

Some things that can be done so that the iteration is well planned, referring to the solutions that have been described:

- 1. The Product Owner screens the Backlog to be done.

Looking at the results of the current process report, it is difficult to see whether this sprint is possible to complete or not. The product owner must consider things that are considered irrelevant to be done in the sprint to be released so that the sprint goals can be achieved.

- 2. The Product Owner must immediately cancel or end the sprint if the purpose of the sprint is obsolete

Sprint is a vehicle for Product Owners to produce products. The general goal is embedded in each sprint run. When the goal to be achieved is used or no longer relevant to the user's needs, the sprint that was running at that time must be canceled immediately.

- 3. Bring teams together in one place

When the sprint is running, the team cannot be distracted by requests or interference from other parties. The team must focus on achieving the goals of each sprint. Therefore, currently the existence of a team to be located in the same place is felt to be needed to improve performance.

4) Recommendations for Measurable Velocity

Some things that can be done so that velocity is measured properly, referring to the solutions that have been described:

- 1. Change the concept of task weighting from the current one based on the level of difficulty to the time of work. In the current process, the estimated work has been carried out. However, the estimate is only limited to the level of difficulty. This makes it difficult to predict the work

time for each sprint backlog. It is necessary to try to make an estimate in the form of time that can be discussed when the planning process is carried out.

2. Utilizing velocity values as a benchmark for work capacity. The utilization of velocity values has not been maximized at this time. This is because the estimated work is still based on the level of difficulty. Measurements with such models make it very difficult to assess the capacity of the work. However, if the previous recommendations have been made, then the use of velocity for the measurement of capacity can be carried out. The velocity value can be used to determine the number of development teams in the next iteration. In addition, it can also be used for the scope of work in one sprint in one development team.
3. Velocity is used to help the planning process. By looking at velocity, the team can estimate what work is appropriate to do in the upcoming sprint. This is usually done during sprint planning.
4. The Scrum Master conducts a regular analysis of the progress of the sprint. Scrum Masters are expected to be able to routinely analyze the progress of each sprint to be used as a reference in the next development process.

5) Recommendations for Successful Daily Scrum

Some things that can be done to produce a successful Daily Scrum

- a. All development teams are required to attend meetings according to the specified time. So far, the development team has been overall to participate in this meeting. However, the problem of implementation time which is often not on time according to the specified time is due to waiting for some people who are still unable to participate. There needs to be a commitment to be able to do this even better.
- b. Ensure that the sprint runs according to the predetermined objectives. This point is also something that must be considered by the entire team. Where in this meeting, all team members look back at whether what they are doing now is heading towards the right goal. This is considered important, because if it has been found that the current condition is not towards the specified goal, then the sprint must be stopped immediately.
- c. The daily scrum is carried out for no more than 15 minutes. The daily scrum meeting is a short agenda to be able to find out the progress of the work every day. In addition, at this meeting, the only thing that needs to be said is the problems faced. However, how to deal with it is recommended to be able to do it outside of this meeting.

2. SMM Level 4

Broadly speaking, SMM level 4 only consists of 2 measurement variables, namely project management standards and process management performance. To find a more specific problem, measurements were made of each objective that built each variable. The measurement was carried out using KPA measurements with the results can be seen in the following figure 4.4:

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Level 4
Quantitatively
Managed

Standar Manajemen Proyek 72,61%	Performansi Manajemen Proses 76,19%
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Figure 3. KPA Level 4 Measurement Results

(Source : quoted)

From Figure 3, it can be seen that the results of the maturity level measurement at level 4, the current development process does not meet the standards to be included in the "Fulfilled All" category. To be able to reach this level, there are several things that are done, namely by reviewing every variable contained in this level. As for the more complete details, it will be described as follows

Table 3. Solutions to Reach Level 4

No.	Variables you want to improve		Solution			Recommendations
			Scrum (Schwaber Sutherland, 2017)	Guide & SCRUM (Rubin, 2012)	SCRUM (Sutherland, 2014)	
1.	Project management standards	1. Create a performance appraisal matrix that can be used by the entire team in a single project	1. Implement a team-wide scrum framework in one constant managed project	1. Observing the process that has occurred so far to create a standard	1. Create a performance appraisal matrix that can be used by the entire team in a single project 2. Implement a team-wide scrum framework in a single project 3. Creation of project management standards	
2.	Process management performance	-	-	1. Conducting regular monitoring of the development process	1. Monitor the entire recommendation process	

Source : (Prepared by the Author)

CONCLUSION

Research findings indicated that the maturity level of the software development process at Tribe Wholesale Digitization (TWD) using the Scrum Maturity Model (SMM) was assessed at level two, with foundational Scrum management and requirements engineering practices fully implemented and roles, artifacts, and meetings established according to best practices. Most objectives across SMM components achieved scores above 70%, confirming that the ongoing development process was largely on the right track, though further optimization and even application of best practices across all areas remained necessary. Sequential improvement was advised, progressing to the next maturity stage as outlined by SMM recommendations and tailoring parameters to local needs and culture. The combination of historical artifact analysis and comprehensive team interviews strengthened the objectivity of the results. For future research, it is suggested to examine the long-term impact of these recommended improvements and to explore

the integration of additional agile frameworks alongside Scrum to further elevate maturity levels and project outcomes.

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