A Cross-Case Analysis Study on Scrum Culture Adoption in Three Digital Startups

Ayu Furoidah[1], Dina Dellyana[2]

[1,2] School of Business and Management, Bandung Institute of Technology.

ABSTRACT: Indonesian startups actively embrace Agile development, but implementation can be difficult due to complexity, rapid change, and ambiguity. Scrum, the most popular Agile methodology, assists organizations in dealing with issues that arise during product development. Cultivating a Scrum culture can also take time, but truly implementing it can increase productivity, product quality, and customer satisfaction. Many businesses embrace Agile without first assessing their values and principles, resulting in poor performance. This study investigates how the value of Scrum is quantified and applied to digital startups, with the goal of understanding metric results for evaluation and recommending a better implementation of Scrum culture. A cross-case analysis study was conducted on three digital startups in Indonesia, with data collected through interviews. To evaluate and enhance Scrum implementation, a Values, Goals, Questions, and Metrics (VGQM) model developed from Scrum values was presented. Businesses demonstrated the same strengths in commitment and focus for Scrum values but needed continuous improvement in different values of respect, openness, and courage for better prioritizing requests and delivering feedback. Based on the findings, recommendations were made, including extensive training, cross-functional collaboration, assessing tools and processes, and establishing clear boundaries for customer satisfaction and productive work. Improving product backlog management and employing effective Scrum tools were also mentioned. There are no metrics used by the companies in order to evaluate scrum culture implementation in their organizations. The study suggests constantly retaining those values, while continuously improving the values of openness and courage.

KEYWORDS: Scrum Assessment; Scrum Culture; Successful Agile Implementation; VGQM

INTRODUCTION

Scrum and other Agile methodologies are now widely used by Indonesian digital businesses. Integrating agility into businesses is challenging due to the complexity, rapid shifts, and uncertainty associated with Agile deployment. [1] It is counterproductive when businesses adopt Agile methodologies without fully understanding the principles and values underlying them. Examining a Scrum team's culture is crucial to ensuring the formation and improvement of Agile. [2] Scrum, a particular Agile methodology, helps individuals, groups, and organizations create value by tailoring solutions to complex issues encountered throughout product development [3]. Evaluating a Scrum team's culture is beneficial for improving teamwork, achieving project goals, and increasing product quality. [3]–[5] Furthermore, for innovation to occur, a culture of exploration and continual development is required. [3]

Startups in Indonesia fail at a high rate, with the vast majority failing to reach the Series A funding level. Startup failures are mostly caused by a lack of market need, a lack of funding, and a lack of the right talent. As they work to create valuable products, startups also deal with resources under a great deal of uncertainty and ambiguity. In adapting to VUCA situations, many startups employ Agile approaches, such as Scrum. However, many of them fail to completely comprehend and embrace the fundamental concepts and principles of Agile, resulting in unsatisfactory results instead of, boosting their productivity, team performance, product quality, and customer pleasure. The adoption of an Agile culture necessitates a shift in organizational ideals as well as the commitment of all team members. Continuously assessing the degree to which the Scrum culture has been adopted is essential for successfully dealing with VUCA situations. (See the concept in Figure 1.)
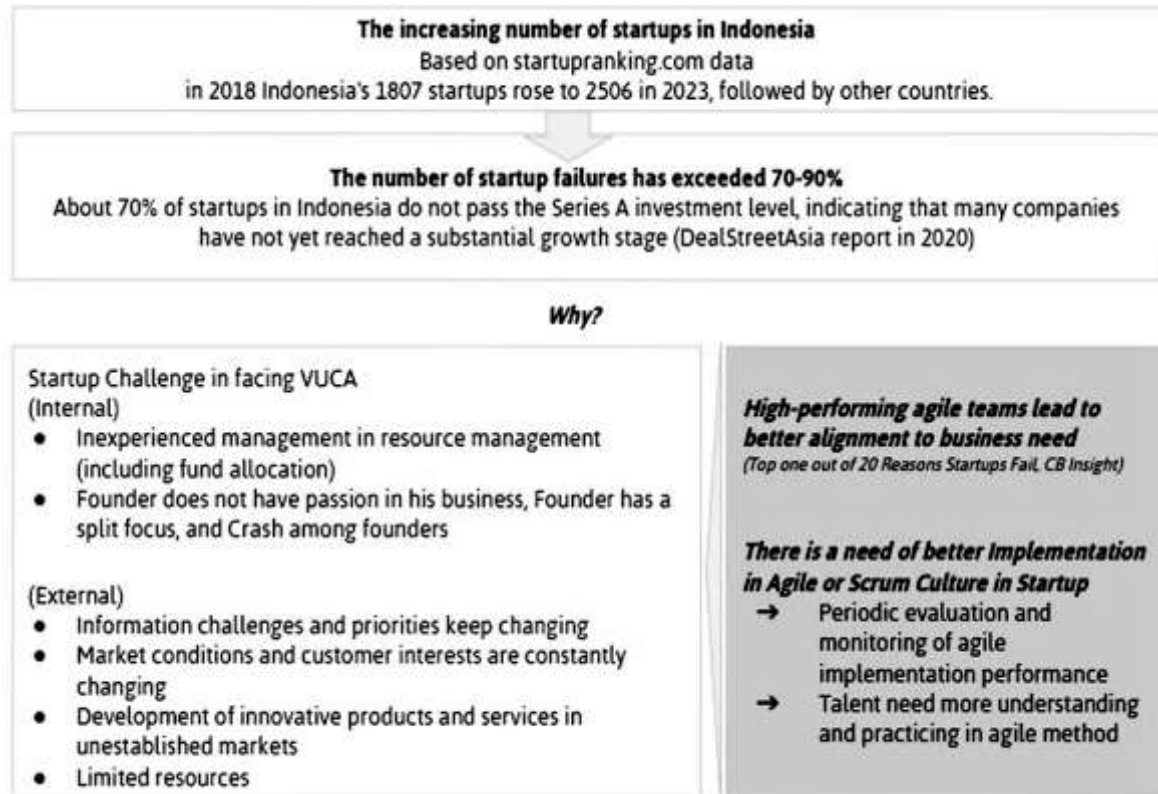
Figure 2. Business Issue Framework

This paper includes several objectives, namely: RQ1: Identifying the metrics employed by digital startups to assess the adoption of Scrum culture; RQ2: Analyzing and assessing Scrum culture implementation in three different digital startups; RQ3: Outlining a plan to deploy Scrum values in other digital businesses and offering an approach strategy to improve Scrum culture implementation in the aforementioned digital startups.

LITERATURE REVIEW

A. The Scrum Framework

Scrum is a framework used in many types of product development processes and approaches. This technique is proposed using empirical process control theory. Scrum is a unique approach to software development first used by Schwarber and Sutherland with. An emphasis on incremental product growth and timed iterations. A Scrum event can be viewed as a routine that teams perform to reduce meetings [6]. The first step is to create a product backlog containing a list of all project requirements. Development teams use continuous periods of time called "sprints" to deliver new features to customers, in which the Sprint Backlog contains specific items related to the Sprint Mission. The process by which the development team selects and forecasts work for the Sprint Backlog is called "Sprint Planning," and the Daily Scrum, the daily meeting of the Scrum Master and the Development Team, is associated with a Sprint. At the end of each Sprint, the Scrum team should conduct a Sprint review and a Sprint retrospective of the number of jobs in the Sprint Backlog that have completed increments. [7] The general concept of Scrum is shown in Figure 2.
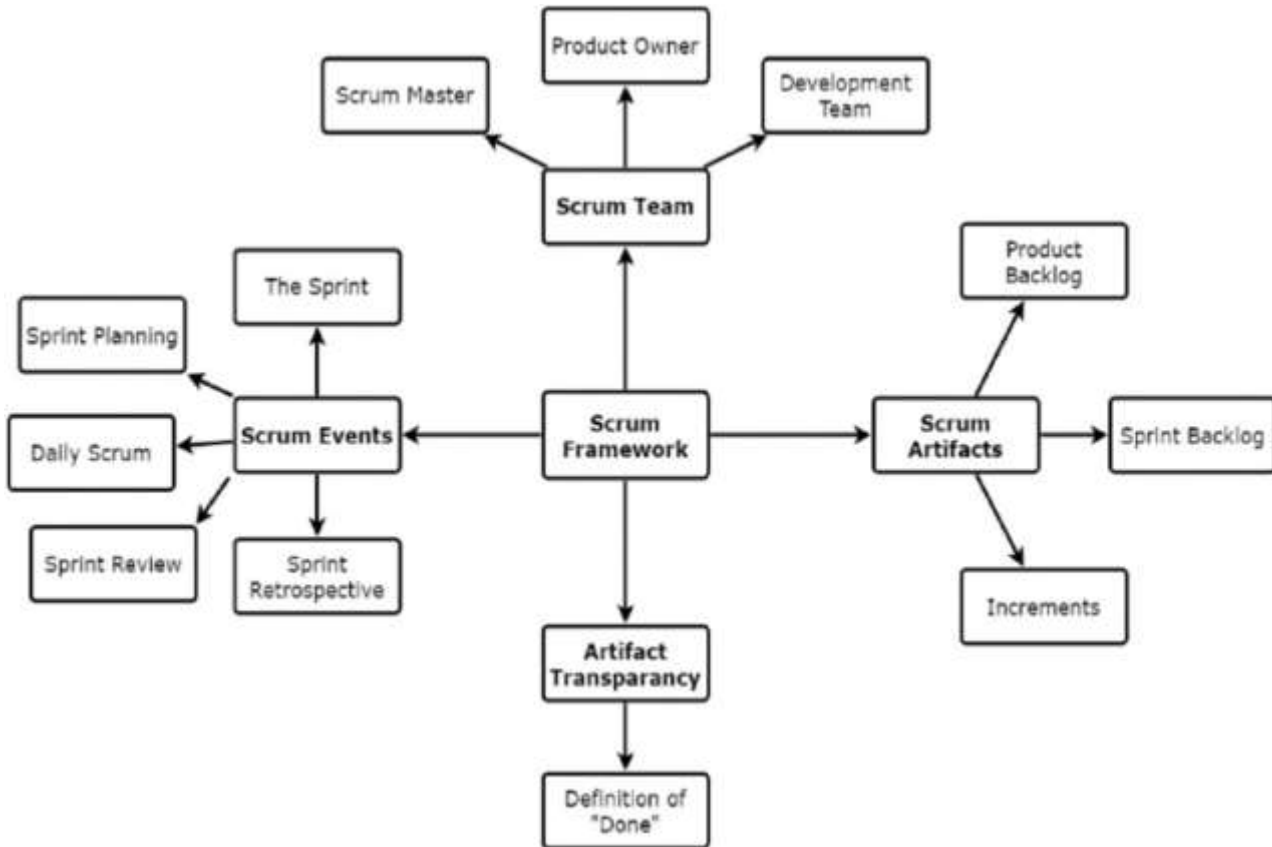
Figure 3. Scrum Framework[1]

B. Scrum Team

The product owner, development team, and Scrum Master are the three main actors in a Scrum team. However, team members collaborate across the product backlog and work across departments, so changes can be evaluated incrementally and iteratively. A Scrum Team is the most important part of the product development process, so a Scrum Team must adhere to the five Scrum Values to ensure a successful Scrum practice. Therefore, Scrum teams should focus more on aligning their corporate culture with the Scrum principles to ensure the effectiveness of the Scrum process. [2]

The entire team is encouraged to work closely together to deliver regular incremental releases and add value to customers. The product owner is responsible for organizing and maintaining the work backlog, while the Scrum Master is responsible for facilitating communication and removing impediments.

C. Scrum Values

Successful Scrum involves identifying five values that team members communicate. These values include commitment, focus, openness, respect, and courage.

1. commitment to team goals.
2. focus: work-oriented sprints to reach goals.
3. openness: be open with the group and other participants about challenges and difficulties.
4. respect: the abilities and autonomy of each individual and carry out duties.
5. courage: to always do the right thing and have the courage to solve problems.

The Scrum framework focuses on collaboration, self-organization, and continuous improvement. Scrum culture encourages agility, adaptability, and creativity in software development to ensure that teams are aligned with organizational goals and objectives. [2]

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[1] (Schwaber & Sutherland, 2020)

D. Related Work

Gadelsied et al.'s study provides an evaluation process to assess an organization's Agile culture, and to identify gaps and development opportunities. The study offers a concept known as the VGQM paradigm, which derives metrics from the Scrum Value. Based on Yahya et al., the Goal-Question-Metric (GQM) model represents a hierarchical framework starting with goals. The goal describes the purpose of the measurement, the problem being investigated, and the perspectives from which to approach the measurement. [8] GQM provides three steps for conducting qualitative studies to evaluate different approaches.

- Conceptual level (goals): The reason for investigating one or more perspectives and addressing a particular area is called a goal.
- Operational level (questions): A series of questions to highlight the purpose of the study and discuss how the other's point of view was achieved.
- Quantitative level (metric): Metrics refer to a set of metrics used to quantify each question. [8]

Before adopting Agile methodologies, it needs to enroot values in its team. The VGQM framework is used because of its ability to assess the value of Agile and identify areas for improvement. [2]

E. Ethical Issues

Due to the data sensitivity that could damage the reputations of the companies involved, the authors considered ethical factors to protect business secrets. The authors complied with the requests of the companies, be it to maintain company confidentiality or disclose the company's identity. The authors ensured that the information collected is used for scientific purposes only. Therefore, the reputations of the organizations and their employees are not at risk. As a result, the companies' initials BD, IB, and LU are used instead of the organizations' full names, and employees are recognized by their job titles.

METHODOLOGY

The data was collected through in-depth interviews with stakeholders directly and indirectly involved in the Scrum process, focusing on the implementation of Scrum values along the Scrum process as the main subject of the study (details in Table 3). An online video recorder (Zoom) and Notion were used to record the interview data. Three different digital startups contributed data, each presenting their own approach to implementing Scrum values and with each digital startup running dozens of projects. The data was then collected and analyzed using basic analysis in Excel. The research method is divided into two parts, in which Part 1 describes the conceptual process model shown in Figure 3, and Part 2 evaluates the solutions. VGQM provides metrics specifically aimed at assessing the value of Agile teams, with the goal, question, and metric paradigm (GQM) as the foundation of VGQM. [2]

A. Part 1

1. Identify Scrum Values

In addition to principles and guidelines, Scrum values also played an important role in implementation, the identification of which initiated this research. As discussed in Chapter 2, the five Scrum Values help Scrum teams achieve their goals. The authors define value in terms of the Schwarber & Sutherland Scrum Guide, based on each company's incubator management and values. See Table 1 for details.

2. Trigger Item

The collection of measurable elements is facilitated by goals already set. For example, a team's respect for its customers or its respect among team members is the factor by which the value of respect is measured. See Table 1 for details.
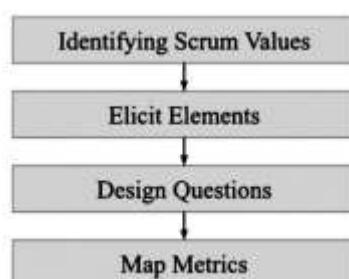

Figure 4. Value Goal Question Metric/ VGQM Framework

3. Design Issues

For these elements, the authors developed evaluation questions based on value indicators. Based on the respect score example above, an author might ask the question, "How do you measure the level of respect for customers within your organization?" The designed questions, along with the accompanying Scrum values and identified items, are listed in Table 1 below.

Table 1: Scrum Values, Elicit Elements, and Designed Questions

Number	Scrum Values	Elicit Elements	Designed Questions
1	Commitment	commitment to schedule tasks	Question 1: How are processing changes evaluated?
2	Focus	customer satisfaction	Question 2: How do you estimate the response time for customer requests?
3		focus on teamwork	Question 3: How can the degree of functionality revealed be assessed?
4	Openness	customer evaluation	Question 4: How do you measure team openness to customer feedback?
5		work in groups	Question 5: How do you assess an organization's openness to team members?
6	Respect	respect for the customer	Question 6: How do you determine the level of respect a team has for customers?
7		respect between players	Question 7: How do you measure the level of respect between Agile team members?
8	Courage	courageous in decision making	Question 8: How would you rate the team's level of ability to say no to unnecessary tasks?
9		ability to remove inactive members	Question 9: How can team courage be measured?

4. Map Metrics

The authors created a list of metrics from the previous process, with organizations using these metrics to assess how Agile team members fitted with Scrum values. Responses to these metrics provided a measure of how well a team values Agile teams and indicated the level of value of Agile teams. The calculation, description, and source of each metric are all provided in detail. Key figures are shown in Table 2.

Table 2. List of Metrics

Questions	Metric	Explanation	Source
1	Metric 1: *Lead Time = delivery task time minus development task time*	measures engagement value over an ideal time period (2-4 weeks).	[2]; [5]
2	Metric 2: *Customer satisfaction = (time request resolved minus time request created) / total customer requests*	measures focus value for performance improvement	[5]
3	Metric 3: *Uncovered functions = number of features that cannot be recovered / total number of features*	measures team focus	[10]
4	Metric 4: frequency of frequent meetings with customers	measures the team's openness level to consumers.	[9]
5	Metric 5: A team participating in planning a customer meeting	measures degree of openness within teams	[9]
6	Metric 6: *Lead Time = delivery task time minus development task time*	measures respect for customers by delivering the product at the end of the allotted period.	[5]
7	Metric 7: *Cross rate = number of cross-implementation without permission/ total tasks*	measures the level of respect among teams by estimating the number of cross-deployment incidents that occur because of overstepping without other teammates' approval.	[2]
8	Metric 8: *Courage = number of unnecessary requests rejected/ total requests*	measures courage level towards customers by resisting unnecessary requests that can interfere with the team's work process.	[2]
9	Metric 9: *courage = number active members / total members*	measures the degree of management's courage in removing inactive team members.	[2]

B Part 2

1. Case study and project setup

In the second section, the VGQM approach was tested at many digital companies. It targeted companies that use the Scrum methodology in their day-to-day operations. Table 3 provides background information on the respondents.

Table 3: Stakeholders Involved in the Interview Process

No	Description	Role	# of Respondents
1	Incubator Management	Innovation Management Officer	1
2	Incubator Startup: Company BD	Scrum Master	1
3	Incubator Startup: Company IB	Product Owner; Development Team	2
4	Incubator Startup: Company LU	CEO; Business Development Team	2

2. Data Compilation and Analysis

After collecting the information, the authors summarized the results and compared three different digital startups. Each Scrum team was notified of the results and asked to ensure they were appropriate and effective. Additionally, the authors had follow-up conversations with them to learn more about their approach to successfully adopting Scrum culture. From there, a list of potential advice was compiled for Scrum teams with low Scrum Culture Assessment scores. Table 4 summarizes the metric results.

Table 4: Metrics Result Summary

Metric	Metric	Company BD	Company IB	Company LU
1	Metric 1: *Lead Time = delivery task time minus development task time*	1-2 weeks 100%	2-3 weeks 100%	2 weeks 100%
2	Metric 2: *Customer satisfaction = (time request resolved minus time request created) / total customer requests*	2 weeks $N = 1$ $Cs = 2/1 = 2$ 200% (Inapplicable)	2 weeks $N = 3$ $Cs = 2/3 = 0.67$ 67%	2 weeks $N = 1-3$ $Cs = 2/2 = 1$ 100%
3	Metric 3: *Uncovered functions = number of features that cannot be recovered / total number of features*	0% platform development	0% platform development	25% of the programs 0% of platform development
4	Metric 4: frequency of meetings with customers	Once a month, currently in the customer validation stage 95%	Twice a month, or Once every 2 weeks 100%	4-5 times a month 100%

Metric	Metric	Company BD	Company IB	Company LU
5	Metric 5: A team participating in planning a customer meeting	100%	75% development team 100%, business team less than 50% (double role)	98%
6	Metric 6: *Lead Time = delivery task time minus development task time*	1-2 weeks 100%	2 weeks 100%	2 weeks 100%
7	Metric 7: *Cross rate = number of cross-implementation without permission/ total tasks*	0%	6%	5-6%
8	Metric 8: *Courage = number of unnecessary requests rejected/ total requests*	Result = 100% -90%* = 10%	Result = 100% -0%* = 0%	Result = 100% -30%* = 70%
9	Metric 9: *courage = number active members / total members*	12/12 = 100%	9/9 = 100%	27/27 = 100%

3. Evaluation Interview

The authors would like to thank each digital startup's Scrum team for continuing or holding a final meeting to present their findings and then contacting incubator leaders for their time in supporting this research. We thank you and ask for feedback on the research in general. Including whether the proposed results are suitable and useful solutions to help effectively introduce a Scrum culture in your organization.

A respondent from LU explained: *"The metric results, percentages, and recommendations fit and harmonize with our corporate culture, which includes openness and respect. Also, web development is linked to our products belonging to the human resources program. The results are good enough that I don't know what to say. This recommendation is true, and we need to keep improving our Scrum methodology."*

RESULT

This section describes the results of analysis performed on data obtained from three different digital companies. The purpose of the analysis was to evaluate the adoption of Scrum values by each company and make suggestions for improvement. The analysis focused on metrics generated from designed questions and examined how well companies align with standard metric values. Table 5 below contains the results of each metric analysis and a detailed description of the results.

1. Metric 1: Commitment

The main purpose of analyzing metric 1 in the context of the commitment element is to compare the lead times for each function in three different companies, denoted as BD, IB, and LU. Lead time is the duration it takes to develop a project after a client accepts a request, compared to the Scrum timebox. In terms of lead time, BD averaged 1-2 weeks for each sprint, while IB and LU averaged

2 weeks for iterations. An analysis of this study found that all three companies were successful in meeting their lead times within the expected time frame and developing their projects effectively.

Table 5: Summary of the overall result

Elicit Elements	What to measure	Overall result BD	Overall result IB	Overall result LU
commitment to schedule tasks	lead time finishing task	100%	100%	100%
customer satisfaction	time to solve the customer request	200%	67%	100%
focus on teamwork*	degree of uncovered function*	100%	100%	100%
customer evaluation	openness to customer feedback	95%	100%	100%
work in groups	openness within team members	100%	75%	98%
respect for the customer	respect level for customer	100%	100%	100%
respect between players*	respect level for team members*	100%	94%	95%
courageous in decision making	courage level with the customer	10%	0%	70%
ability to remove inactive members	courage to remove inactive members	100%	100%	100%

Reverse function (1-value)

According to a study by Gadelsied et al. (2021), an analysis of the study concluded that the data represented less than 50%. According to this research, it is widely believed that organizations participating in Agile projects should have an engagement level of 50% or higher because high engagement is important to achieving project goals. Alternately, the company could introduce more policies to increase the level of engagement among team members and reinforce the importance of engagement.

Based on interview results, BD stated that the first iteration of the Scrum process was one week. However, it turned out that most of that time was spent on sprint planning, with only four days available for development. For this reason, it was decided that BD would extend the iteration period to two weeks to give the development team additional work time to complete their work. This alignment made it possible to match sprint planning with actual development activities. The interview highlights that the company changed these processes in response to feedback during the Sprint Review and after consulting with Scrum experts. The goal was to streamline the Scrum process, increase its effectiveness, and address issues and bottlenecks that arose during the shortened iteration period.

2. Metric 2: The team focuses on the customer

Metric 2 measures customer satisfaction by looking at the time it takes to respond to customer satisfaction and the total number of customer requests. Statistics show that BD achieved a high customer satisfaction score of 200, demonstrating its ability to respond quickly to consumer requests. In contrast, IB scored 67% on customer satisfaction, indicating that there was room for improvement in addressing consumer concerns. LU received a score of 100 on customer satisfaction, demonstrating a satisfactory response to consumer needs. These results highlight the importance of responsive customer service and the need for organizations to prioritize customer satisfaction. This metric is quite complex as it is calculated using a time-responsive formula, which is detailed as follows: The use of this formula is highly dependent on how long customer requests are processed and the number of requests. Analyzing the results shows that each company had a different number of projects and requested functions. The feature development time is also determined by the average project duration. This will distort the value if the divisor is numeric. The authors found that expressions with different attributes were used in two different sources, with attempts to measure customer satisfaction through responsiveness based on the time it took the team to resolve a customer's question.

Another previous reference study found that this formula implicitly measured responsiveness in terms of the time taken to resolve external problem reports, the complexity of the reported problem, and the effectiveness of units working on the function used to measure. Long response times indicated that there were not enough sources of information to effectively process existing incident reports. This study provides information regarding how responsiveness depends on the capability of an organization in handling bug reports.

3. Metric 3: The team focuses on the work

Metric 3 assesses the number of undisclosed customer requests at the end of the product iteration. An uncovered feature is an activity or task that was not completed within the declared iteration scope. This metric shows how important it is for the team to complete all required tasks and have no unfulfilled obligations. According to the analysis provided, both BD and IB had no unreleased features at the end of their respective product iterations. This shows that they were very thorough and paid close attention to detail, and that these teams had done all the necessary work thoroughly and made sure nothing was left unfinished. Similarly, LU indicated 25% of undiscovered programs at the end of their product iteration. This is their usual score from one of four project activities in a month, but there were no undiscovered features of platform development, because if the program is not completed within two weeks, it will take longer. Web development varies in the amount of time it must be completed within the specified period.

4. Metric 4: Openness to customers

Metric 4 looks at meeting frequency to determine the level of openness and communication customers have with the team members. BD scored 95 on this indicator, demonstrating a high level of openness with customers but lower than IB and LU. Customer validation and occasional meetings to discuss additional requirements are key factors in determining the frequency of customer meetings. Depending on the backlog structure and client needs, these sessions may vary from the standard monthly frequency. Heated arguments with customers are less frequent but when necessary because it is impossible to ask the same questions as in the previous validation session if there is nothing to validate.

A BD Scrum Master explained: *"Once we see that user A needs a new feature, we usually try to validate that users X and Y also really need it. If everything matches and validates, we will continue developing new features. If our research team finds something new that we want to test, we will definitely share it with existing users and potentially test it. Our customers will actively participate in the innovation of our projects and we will do everything possible to meet their expectations."* BD is in touch with current customers from time to time, but there is room for improvement by actively involving them in project innovation and doing whatever is necessary to meet customer expectations.

5. Metric 5: Openness to team members

Metric 5 measures team members' openness by looking at their contributions during meetings, especially in planning. BD's 100% attendance in meetings, indicated that it had a high level of transparency between teams. The team consistently attended meetings in full, unless absent through acceptable reasons. This can prove that its team members had been totally involved in its projects and collaborated efficiently. Additionally, BD had built a productive workplace to let cooperation across functions exist. With actively accepted feedback in the organization, BD demonstrated how well the company worked as a team, was open to each other's criticism and comments about how the organization works, and contributed to the success of organization projects. This was also supported by their Scrum Master's statement: "*If we take a look at our team, they give us feedback in every sprint. They don't just finish their*

job descriptions but also help us see suitable ways and values to use within the process. We implement Scrum by having more discussions, and there is no leveling among us."

IB, on the other hand, received a score of 75% on the criteria, indicating a modest level of team member openness. Meeting attendance was around 75% on average. Due to the business team having a double role and being responsible for the company's overseas digital startups. Because of this, IB management should maintain information dissemination through certain tools to make sure the information will be accepted by the absent teams. Meanwhile, LU had better attendance percentage of 98, but 2% of the team was missing because the intern team was still putting its campus education objectives first. LU emphasized ideas relating to the leader's duty to ensure that the team's absent members received communications. Additionally, LU had strong teamwork and a collaborative work environment that promoted a high level of transparency in which the management level empowered the teams to update them on their work or projects and engage in casual small talk in their group.

6. Metric 6: Respect level for customers

Metric 6 measures customer respect by looking at whether the features can be delivered within the specified period. According to Gadelsied's 2023 study, the level of respect for customers depends on the ability to deliver products on time and without delay. The survey returned an average score of 41.48, indicating a low level of respect for meeting customer deadlines. This means that companies, on average, struggle to deliver their products within the expected time frame, which can lead to customer dissatisfaction. However, when looking at the specific results for BD, IB, and LU, those companies achieved the highest possible score of 100 on the Customer Respect Index. This shows that they met client deadlines and were very respectful of the customer's agreement. For BD, the average lead time for each sprint is reported to be 1-2 weeks, demonstrating the company's commitment to delivering products within a reasonable time frame. Similarly, both IB and LU reported an average lead time for iterations of two weeks, demonstrating their ability to quickly meet customer expectations.

Gadelseid's research may indicate lower average percentages of customer loyalty indicators, but specific results for BD, IB, and LU contradict this finding. These companies have effectively implemented processes and practices to ensure that client deadlines are met. This can be done by looking at some of the factors the three companies use. The first relates to planning and resource allocation, in which the ability to meet deadlines is highly dependent on effective planning and resource allocation. By taking a closer look at BD's health, it improved after previously running an iterative process with limited resources in a week then later making adjustments to how Scrum was implemented by changing the duration to two weeks.

7. Metric 7: Respect level for team members

Metric 7 measures the level of respect for team members and provides insight into how well team members respect each other's boundaries and seek approval before making administrative decisions. The cross-implementation rate is calculated by dividing the number of implemented cross-implementation incidents that occurred without the permission of other teammates by the total number of tasks. BD's cross-rate of 0% indicates a perfect level of respect, with team members continuously seeking consent so they could interact effectively without crossing borders. BD's culture is focused on promoting mutual respect and understanding to create a welcoming workplace where all team members are valued. Their Scrum Master confirms that, "*each person already has their own role and expertise, and at the time of planning, the backlogs had been assigned to each person, so each person already has their own responsibilities. Every day, there is also a daily sprint where it is reported what is being done, will be done, and obstacles, so each member will always get updates from other members and can support each other too.*"

In contrast, IB and LU, with a cross rate of 6, each had slightly lower levels of appreciation for their teammates compared to BD. These figures show that there were instances of team members coordinating or coordinating tasks without the necessary approval from their peers. While this happened fairly infrequently, it shows that there was room for improvement in maintaining respectful standards at all times. These differing results were due to these three startups having different cultures within their organizations. With a limited skilled workforce for each member, BD emphasized each member's role in completing tasks efficiently, resulting in a high level of respect among the team. IB also had a quite high level of respect within the company, with 6% of coordination between teams; indicating a high possibility of having better talent allocation compared to BD. IB supported its management tools by making a project board to get better at allocating resources, managing projects, and creating a Scrum implementation dashboard.

8. Metric 8: Courage level with the customer

Metric 8 measures courage towards customers by examining the ability to resist unnecessary requests that can disrupt the work process. This formula calculates the percentage of unnecessary requests rejected out of the total number of requests. A high

rejection rate of unnecessary requests indicates that companies value courage the more requests accepted, the more effort it takes to manage and finish the task.

As a result, BD had an acceptance rate of approximately 90% for customer inquiries, with calculated bravery level of 10%. This was primarily due to their belief in the importance level of customer requests which they always approved unnecessary requests, with a 10% agreement based on system capabilities. This shows a certain level of courage to set boundaries and prioritize tasks efficiently. The Scrum Master stated that, "*there is no unnecessary function if requested by the customer; of course, if it is requested, it must be required. What is fulfilled is usually in accordance with our capabilities in the system. If it is requested but we are not technologically capable, then we will look for other alternative solutions.*"

Meanwhile, IB had a customer request approval rate of 100 with a calculated courage level of 0%. IB always approved customer requests because they believed that they could be prioritized according to time constraints, with no rejection of unnecessary requests. This could indicate a lack of courage to fend off unnecessary requests, but could also indicate a customer-centric approach to handling all requests within the allotted timeframe. Finally, LU's approval rate for customer requests was 20 – 30%. A calculated courage level of 70% proved their ability to decline unnecessary requests and maintain a strong culture that practiced these values. This indicates a higher level of courage to set boundaries and focus on important tasks.

9. Metric 9: Courage level with team members

An analysis of metric 9, which measures the courage of team members, provides interesting insight into the performance of the companies surveyed. BD's focus on limited talent represented a deliberate strategy for building highly motivated and engaged teams. While they did not explicitly remove inactive members, their commitment to recruiting highly-skilled members encouraged all teams to take a proactive approach and ensures that members can give positive contributions and feedback. This approach created a strong sense of courage within the team, as each member was held accountable and carefully selected based on their ability to drive results.

In contrast, IB employed rotating staff, including full-time employees and interns, on a semi-annual basis, raising questions about maintaining a consistent level of courage. However, their ability to remain 100% courageous against team members suggested effective integration and leadership of non-permanent members. This demonstrated the IB's commitment to ensuring inclusion by encouraging active participation and bringing a unique perspective from every team member, regardless of employment status. By fostering a culture of collaboration and open communication, IB created an inspiring environment where team members feel valued and empowered.

Meanwhile, LU, took a proactive approach to team member health and motivation, demonstrating the company's commitment to fostering a supportive work environment. By regularly assessing team health and implementing preventative programs such as social measures and training activities, LU deeply understood the importance of building team resilience.

DISCUSSION ON FINDINGS

To evaluate the implementation of Scrum culture in three different startups, the study used metrics from Gadelseid's 2023 study which derived elements from the Scrum values using the value-goal-question-metric model. The authors did not find any current metrics used by each company to specifically assess their Scrum culture performance with the exception of the OKR/ Objective Key Result metric, which is used as a project management metric to measure organization performance by linking the activities and goals of teams to the company's strategic mission. The metrics research shows that all three digital firms have made significant progress in adopting and executing Scrum cultures.

Each organization displayed strengths in several parts of Scrum values, including commitment to Agile principles and ideals and a focus on delivering projects on time. These three companies had perfect scores in serving optimal ways to satisfy their customers through overall project performance. Optimum results were also found with regards to respect for customers and courage among teams. The results can be seen in Figure 5, which summarizes the value realized by the three digital startups.
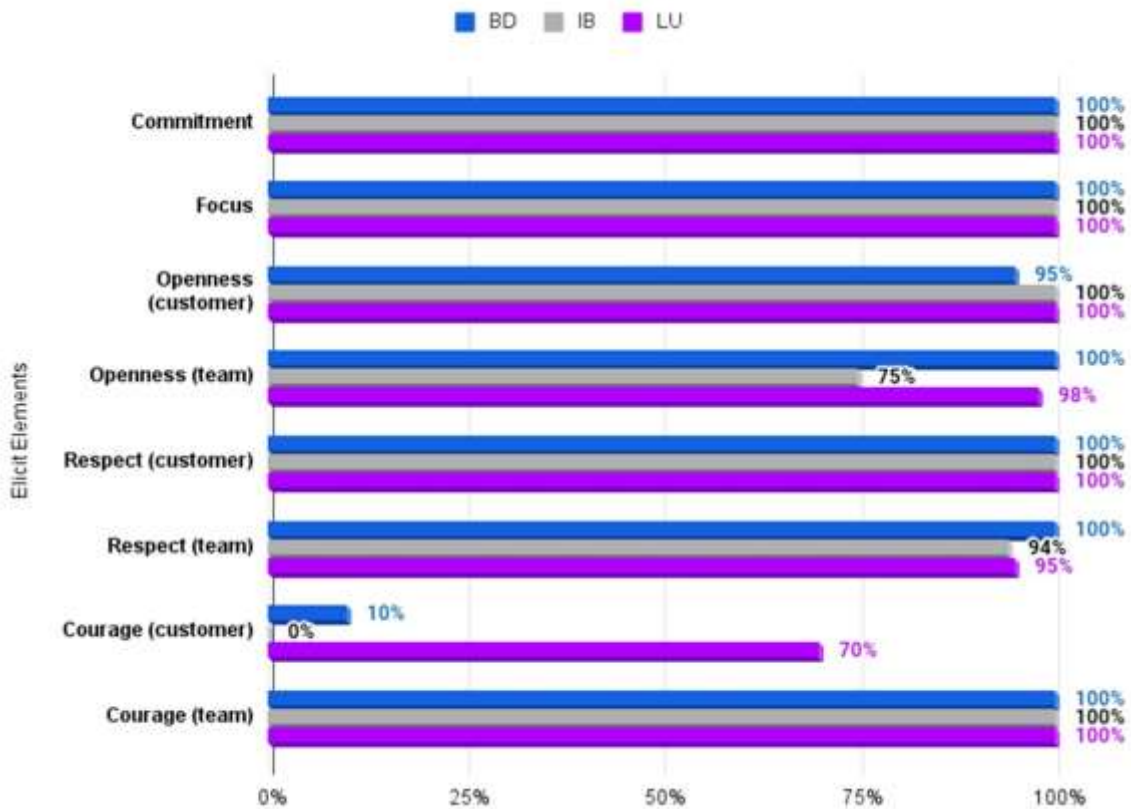
Figure 5. Summary Percentage of Scrum Value Implementation

As companies, BD, IB, and LU have the power to maintain customer satisfaction, timely project execution, accuracy of task completion, and active customer engagement. However, some areas of development have been identified for each company, including the need for more customer support, more involvement in planning customer meetings, and more involvement of the business team.

The unique value discovered in further discussion to validate and evaluate the process that took place both in an online chat and an online meeting is detailed as follows:

1. Company BD

In terms of Metric 4, i.e. Openness to Customers, BD had customer meeting frequency score of 95%, which was favorable compared to 100 percent for IB and LU, but with room for improvement due to the intensity of meetings to further discuss the development of desired product features. Based on confirmation, BD is currently at the stage of validating products for customers, so meetings are held in response to requests that features should be added, with IB and LU setting the benchmark in determining exact times for scheduled customer meetings. The frequency of meetings does not directly affect customer satisfaction, but it can create a forum for listening to customers to meet their needs and provides a space for considering feedback and brainstorming together to find better features.

In relation to team members, BD was near optimal based on how Metric 4 is calculated. This was because no team crossed boundaries and took on other people's work without that person's knowledge. This was based on the argument that each person already has a role, and each role has a limited number of people. Therefore, with limited human and time resources, crossing boundaries was unlikely to happen as everyone could concentrate on their own work. Based on a rating of 8 on the customer courage level, BD showed that it respected customer deadlines well (Metric 6) but had less courage to decline unnecessary customer requests (Metric 8).

BD received a score of 90 based on calculating its acceptance rate of unnecessary requests from customers. A high rate of unwanted requests can pose a risk to an organization, as it can interfere with the process of completing projects on time. Additionally, imposing large numbers of unprioritized requests can lead to a lack of motivation among team members. An organization can re-discuss with teams if any adjustments are needed, and the advantage of BD is that the company is focused on implementing Scrum and are already improving their systems regularly to find the best way to implement it. It also includes a willingness to optimize sprint time iterations, adjust Scrum practice to keep up with the design process, and leverage backlog improvements.

2. Company IB

For Metric 5, i.e. openness to team members, IB achieved an average of 75 percent with the indicator based on evaluation of meeting attendance. This result is related to the argument that the development team had 100 attendees, but the business team had 50 attendees due to certain members of the business team having dual roles. Systematic communication among the members needs to be built in an organization to optimize information dissemination among teams. Combining the result with the respect metrics result, IB balances member openness levels, but still respects individual member roles. Related to Metric 8, i.e. courage level towards customers based on calculating the acceptance rate of undesirable requests from them, IB earned a 100% score for unnecessary requests, with the company stating that all customer requests, including unnecessary requests, are necessary and would be accepted. Furthermore, for metric-based evaluation, IB's unique selling point is its sophisticated project board and Scrum tools that will help the organization monitor the creation of a backlog chart to comprehensively grasp the past progress of projects, consider the amount of work by each member and the progress of checkpoints.

3. Company LU

For LU's Metric 5's score, i.e. openness to team members, it was calculated based on meeting attendance, the percentage of which was related to the discussion score and indicated the team's participation in planning meetings. LU explained that all members have their own way of keeping coordination and communication within one group. The management is concerned with the culture of the organization; they foster collaboration and openness through this open group discussion for all group member without any other groups allowed, because they believe in one source of information. This can be an organizational approach to getting better at building communication systems within teams.

Regarding Metric 7, i.e. respect level for team members, LU earned a score of 5-6%, which is remarkable considering that the cross-rate percentage was still below 50%. This 5-6% value was obtained from LU's, open collaborative culture, and unlimited openness in a group that allows involvement or help in sharing tasks with other roles as well. Support for policy for was upheld by getting permission at the management level to back up any jobs. Understanding these metrics can show that each organization has its own unique style to create a culture of respect among its members. Limiting and standardizing the process can help people keep their positive attitude, among other benefits. In term of Metric, i.e. courage level towards customers which is based on calculation of the acceptance rate for unnecessary requests from customers, a 30% score from the discussion with LU indicated that it would only accommodate 20-30% of unnecessary customer requests. This significantly contributed to its agenda priorities; furthermore, the openness among its team could help decide whether unnecessary tasks need to be accommodated, referring to customers' conditions in order to treat them better.

In addition to its the interview and evaluation results, LU has to be highlighted for its good talent management; besides using "one group communication" for all members, it also fosters a good learning culture in the organization. Different setups in training projects are needed to prevent boredom in the programs. This can be in the form of motivational event with experts, sharing, and open discussion among teams related to any issues. Furthermore, LU's rotational role system for contributing as a leader in meetings could differentiate it from other companies.

In general, the results suggest that implementing Scrum values improves organizational performance and culture. The results provide useful information for digital startups looking to improve their Scrum implementations. Recommendations based on the analysis results can guide companies to improve their Scrum practices, create better collaboration, and ultimately deliver better products to their consumers.

CONCLUSIONS

In this evaluation paper, we explored how digital startups measure their implementation of Scrum values. We proposed the VGQM model as a metric derived from Scrum metrics to help evaluate and improve current implementations. All three companies

highlighted significant progress in adopting Scrum culture and demonstrated strength in several Scrum values. The study also encourages companies to conduct regular assessments against appropriate metrics and make recommendations to improve their current scores. Furthermore, to conclude the results, the paper will answer the research questions (RQ):

RQ 1: Other than the OKR/Objective Key Result metric, the authors haves not found any metrics currently used by companies to specifically assess the performance of their Scrum culture. OKR (objective key result metrics) measure the team's activities and goals against the company's strategic mission.

RQ 2: According to the Metrics Study, all three digital companies are doing very well in adopting and implementing Scrum culture. Each organization demonstrated strengths in some part of Scrum values, including a commitment to Agile principles and ideals and a focus on delivering projects on time. The three companies received perfect ratings for optimally satisfying their customers through overall project performance. Highest results have also been achieved in terms of respect for customers and courage among teams. The results can be seen from the summary graph of the value conversion percentage for the three digital startups in Figure 4.

The BD, IB, and LU companies care about maintaining customer satisfaction, on-time project delivery, accurate task completion, and proactive customer engagement. However, some areas of development have been identified for each company, including the need for more customer support, more involvement in planning customer meetings, and more involvement of the business teams. The unique values identified were further discussed during a review and evaluation process that took place in both online chat and online meetings and are detailed below.

RQ 3: An important detail in this text is the steps companies should take to improve their Scrum practices. This includes providing appropriate training, promoting cross-functional collaboration, and evaluating and improving Scrum tools and processes. Additionally, companies must balance customer satisfaction with productive work processes by setting clear boundaries, fostering open communication, and improving product backlog management. Finally, organizations can track internal performance data such as historical data transactions, feature requests, problem requests, unwanted request counts, total active and inactive member counts, employee status, meeting attendance, feedback history, etc. A database must also be considered.

Some recommendations for the three companies: BD could refine its planning and resource allocation, evaluate resource availability, improve the project board, use Scrum tools, promote innovation and risk-taking, allocate dedicated time for exploration, and establish recognition programs or incentives to honor and reward team members who demonstrate innovative thinking. Meanwhile, IB, could improve its Scrum process with backlog refinement, implementing Agile metrics, promoting innovation and risk-taking, allocating dedicated time for exploration, and establishing recognition programs or incentives to honor and reward team members who demonstrate innovative thinking. Finally, it is recommended for LU that it is better to create an Agile mindset and Scrum culture throughout the company, including Scrum training, leadership support, continuous learning and improvement, learning opportunities, innovation and exploration, performance evaluations, an improved project board, and collaboration with digital startups. Additionally, the company can participate in retrospective meetings to evaluate its Scrum adoption culture and create an internal database to track its development. Finally, the company should collaborate with digital startups to create an internal database that can provide insightful information and enable ongoing assessment.

IMPLEMENTATIONS

The most crucial information in this work is the practical implementation of enhancing Scrum culture and ideals in a digital startup company. These include evaluating the organization's Scrum strengths, weaknesses, and development opportunities; setting goals and objectives; selecting strategies to improve the culture; prioritizing strategy; deciding on a course of action; engaging stakeholders; communicating with them; monitoring and adapting the implementation strategy; and sharing the implementation plan with all stakeholders. Based on its application in the real world, the action plan is described below.

Table 6. Implementation Plan for Scrum Culture Enhancement

Activities	Q1			Q2			Q3			Q4		
	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
Scrum maturity evaluation.	■						■					
Demonstrate goals and objectives.												■
Determine strategies for enhancing Scrum culture.												■
Create an action plan.												
i. Deliver training to all members on Scrum principles and concepts.			■			■			■			■
ii. Build Scrum ceremonies and rituals: daily standup meetings, sprint planning, retrospective meetings.	■			■			■			■		
iii. Foster a culture of transparency and continual progress.	■			■			■			■		
iv. Establish community practice for Scrum Masters.			■			■			■			■
Communicate the plan to all stakeholders.		■										
Monitor and adapt the implementation of Scrum culture using metrics.	■						■					

LIMITATIONS & RECOMMENDATIONS

This study has limitations related to data collection, calculation time, and external factors that affect the results of Scrum culture evaluation. An attempt will be made to conduct a cross-study highlighting each company's unique points, strengths, and weaknesses in adopting Scrum values.

Future studies should increase sample sizes, take precautions to protect privacy and confidentiality, and standardize data collection to ensure reliable and comparable results. This allows for more detailed cross-company investigations.

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