

TALLINN UNIVERSITY OF TECHNOLOGY

School of Business and Governance

Department of Business Administration

Ali Bayatpour

THE EFFECT OF SCRUM ON EMPLOYEE SATISFACTION:

A STUDY AMONG STARTUPS

Master's thesis

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Supervisor: Susanne Durst, PhD

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I hereby declare that I have compiled the thesis independently and all works, important standpoints and data by other authors have been properly referenced and the same paper has not been previously presented for grading.

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Ali Bayatpour

(signature, date)

Student code: 194311TVTM

Student e-mail address: aliglbayatpour@gmail.com

Supervisor: Susanne Durst, PhD:

The paper conforms to requirements in force

.....

(signature, date)

Chairman of the Defence Committee:

Permitted to the defence

.....

(name, signature, date)

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ABSTRACT

Agile methodology is a method for developing and managing products through iterations. This methodology is made specifically for software project management and is widely used to build high-quality software products. According to Ajith Jerom, Rajamohana (2020), Scrum is the most popular agile methodology globally. There is much research about how Scrum affects products and business itself when it comes to bigger companies. However, when it comes to how Scrum affects employee satisfaction, specifically in the case of software startups, there is a significant knowledge gap, and there is almost no information about this matter. This paper tries to find how Scrum affects employee satisfaction when it is implemented in startup companies' employees by using quantitative and qualitative research methods. Forty-one surveys and thirteen interviews were conducted from startup employees, managers, agile experts, Scrum masters to see how Scrum affects different aspects of employees' work and life when they use Scrum as their project management methodology. This paper reveals how to implement Scrum properly in order to have more happy, motivated, knowledgeable and collaborative employees. In addition, it reveals that Scrum can have an adverse effect on employees if it is implemented incorrectly. Generally, this paper reveals crucial information about what is the effect of an exemplary implementation of Scrum over employees when it comes to startup companies.

Keywords: Agile methodology, Scrum, Employee satisfaction, Sprint, Demo meeting, Retrospective meetings, Daily standups, Daily meetings, Information adequacy, Colleagues and Teamwork, Recognition, Employee Empowerment, Tasks and working conditions, Fairness, Personal development

INTRODUCTION

The research problem comes from the situation that Startups usually do not have proper structures and routines(Zaech & Baldegger, 2017). One of the consequences of lacking the structures and routines is employee dissatisfaction (Ugboro & Obeng, 2000b) which causes the company to lose employees. In addition, one of the consequences of employee dissatisfaction is customer dissatisfaction (Jeon & Choi, 2012) which leads to losing money for the company. Jeon & Choi (2012) also mentioned that Employee satisfaction leads to customer satisfaction even though Customer satisfaction does not affect employee satisfaction. When it comes to the software industry startups, in which startups are producing a software product, having a structure and routine becomes more vital because some characteristics of this industry are numerous uncertainties, unpredictabilities, and swift changes(Tomy & Pardede, 2017). Although other industries likewise suffer from similar issues, Bannerman (2008) mentioned that software projects in startups are different and do not follow a similar structure. Every software project is unique, which introduces many new risks, which means that other project management methodologies are neither sufficient for software projects nor lead to the project's success. As an example, according to Baumeister et al. (2017), there is a growing demand for a systematic approach(i.e., Agile project management methodologies like Scrum) to deal with startups' high uncertain and fast-changing environment, leading to more satisfied employees and finally more customer satisfaction and it saves startups limited resources. Due to fast changes, uncertainties, and lack of a systematic approach working for Software startups can be noticeably stressful and unpleasant for employees. Oftentimes, since there is no systematic approach in software startups, employees in startups might face different misunderstandings and communication and teamwork issues. For example, there might be situations where the goals and requirements of projects might be obscure to the employees, and this lack of information can cause stress and poor working conditions. These factors, including information adequacy, teamwork, and communication, are essential factors of employee satisfaction(Hanaysha & Tahir 2016, Matzler et al., 2004, Tomažević et al., 2014). Consequently, lacking a systematic approach, the complex nature and uniqueness of each project, fast-changing requirements of the product and the industry, uncertainty in software startups, and fast-changing Software industry lead to employee

dissatisfaction. Furthermore, as mentioned before, employee dissatisfaction leads to both customer dissatisfaction and startups losing their employees. Since startups have quite limited resources, the costs of losing employees and customers will be huge. Despite the existing problem in Software Startups, there is no practical research to show how using Agile methodologies like Scrum affects employee satisfaction in Software startup companies. This research hypothesis is that using a proven agile methodology like the Scrum framework can improve employee satisfaction in Software companies, and eventually, this can save startups from losing both customers and employees.

Numerous IT companies are using the Scrum framework for managing their product development, and it's probably the most famous Agile framework in the world (Ajith Jerom, Rajamohana, 2020). The process of developing software is complex, and every company probably needs a management tool to facilitate developing a software product. Nowadays, there are numerous startups trying to build software products. And they are using different agile methodologies, including Scrum, to develop their products. This research aims to find if Scrum can improve employee satisfaction in software startup companies or not. In addition, which employee satisfaction factors are going to be affected positively or negatively when a startup uses Scrum as its project management methodology. Furthermore, this research shows what employee's work and life factors are crucial to be considered when a startup intends to use the Scrum framework as its management methodology. Over the years, Agile methods, especially the Scrum framework, offered many techniques and practices to improve communication, flexibility and building autonomous teams. Based on a report on Agile published in May 2020, among over 40,000 executives and managers, 95% of the respondents said that their organization uses Agile methods (digital.ai, 2020). Among all the Agile approaches, the Scrum framework attracted enormous attention, and it's essential to gain an in-depth understanding of the effect of implementing Scrum over startups. There are a few real-world proofs about implementing Scrum in startups (e.g., Rehman et al., 2018, LIU, 2018; Kaim et al., 2019). It's crucial to focus on startups because they do not have enough time and resources, and because of this matter, they are in a dangerous and fragile position. To survive that very early stage, implementing an Agile framework like Scrum can help to increase the chance of survival. Besides, almost no empirical study of the impact of Scrum over employee satisfaction on startups has been conducted. The purpose of this research is to find the effect of Scrum on employee satisfaction in startup companies.

Structure of thesis

Regarding the structure of the paper, the literature review of this paper is about the popularity and the importance of Agile methodologies, especially the Scrum framework. Also, it is about the previous studies concerning the effects of Scrum on employee satisfaction. Furthermore, it addresses why there is a need for a robust management methodology and whether using the Scrum framework can be beneficial for startup companies or not.

The methodology is about measuring employee satisfaction, and it explains how the researcher measured and revealed how using Scrum affected different employee satisfaction areas. Those areas are information adequacy, colleagues and teamwork, recognition, employee empowerment, tasks, and working conditions, personal development, fairness, and the overall impact of Scrum on employees. For this purpose, the researcher first conducted a survey and used the Likert Scale methodology to get feedback on the effect of Scrum on employee satisfaction. Next, quantitative data resulting from the questionnaires were analyzed with IBM SPSS Modeler. 12 Interviews were conducted to improve the accuracy of the research. The researcher used Thematic Analysis to analyze the interviews data.

The next part of this paper is the result section, in which the final results and interpretations are presented. In the discussion chapter, the author summarized the key findings of the research. The patterns, correlations and data interpretation provided for making the results more understandable. Besides, this chapter compared the results from the previous findings with the research results. The chapter discussed whether the results are aligned or are contrary to each other. And finally, the conclusion chapter started with addressing the main question and the aim of the research. In this section, the author provided a clear and concise explanation to make conclusions regarding the research hypothesis, summarized the whole study, and finally made recommendations for future research.

1. LITERATURE REVIEW

In this section, the author followed a systematic review and analyzed existing research related to the research hypothesis, which is that using Scrum improves employee satisfaction in software startup companies. This way of reviewing the literature helps to show what is already known and lays the groundwork for further research (Saunders et al., 2015).

1.1. Scrum and Benefits

Scrum is an Agile framework for managing product development, primarily for developing software, and it's being used in numerous tech companies (Matharu et al., 2015). According to Ajith Jerom, Rajamohana (2020), it is probably the most widely known Agile framework globally. Matharu et al. (2015) shows that Scrum performs better than other Agile frameworks. There is a significant movement towards using Agile methodologies, particularly in the IT industry where there are fast changes in the process of product development (Strategy Under Uncertainty," 2014). Scrum is based on empiricism control theory ("Scrum Challenges: An Agile Process Reengineering in Software Engineering," 2020, p. 1239). In other words, a company acquires knowledge based on experimenting and experience. And that's the reason that Scrum is based on transparency, inspection, and adaptation(Lei et al., 2017, p. 63) since in the Software industry, everything changes very fast (Williams & Cockburn, 2003, pp. 39-43).

Different case studies show how the Scrum framework had positive effects on companies. A case study named LRN conducted showed that after implementing Scrum, qualitative delivery of the company improved up to 150%, and it was the result of learning and adapting, which are the consequences of using Scrum(LRN Transitions to Scrum to Deliver More Value with Its "Scrum Loaded" Initiative, 2019). Another case study showed that the TRUMPF company achieved higher stakeholder involvement in the product vision and improved customer deliverable value (How TRUMPF Used Scrum to Drive Its Agile Transformation, 2019).

Although numerous articles claim that Scrum brings tremendous value as a software project management methodology (e.g., Rehman et al., 2018, pp. 1–3; LIU, 2018, p. 4; Kaim et al., 2019, p. 203), there are few real-world proofs (Kautz et al., 2014b, p. 161). When it comes to empirical studies based on firms' complexity, the information about the usefulness of Scrum becomes even more limited. Kautz et al. (2014, p. 161) tried to reveal how Scrum can affect productivity and employee satisfaction. The paper used the number of interruptions and uninterrupted development hours as two indicators to measure quality. In the study, employee satisfaction is measured by getting feedback from project managers, analysts, and developers, the prominent people involved in product development. There are various opinions and experiments about how to measure employee satisfaction. Based on Mann & Maurer (2005, p. 1), "decreasing overtime work is one of the leading indicators of employee satisfaction." The result showed that implementing Scrum reduced the overworking time while customer satisfaction increased. Besides, developers found the Scrum process very beneficial, and most of them were eager to use Scrum for future projects showing that Scrum increases employee satisfaction. The result also showed that Scrum increases the team's productivity by reducing the number of interruptions. It means the team experienced fewer distractions and could work continuously for long hours. Using Scrum also improved the quality of the product. There were fewer bugs, and the number of both minor and significant errors was reduced. A study conducted at Adobe company showed that Scrum provides a better working environment for the employees (Green, 2011, p. 1), leading to higher employee satisfaction.

1.2. Scrum in startups and mature companies

Based on Scrum advocates' advice, it is better to have small teams, usually less than ten people (Rising & Janoff, 2000, p. 27). However, it is not mentioned that there is a big difference between a company with many small teams and a company with only a few small teams. Start-ups do not have enough resources. On the other hand, a bigger company with many teams not only has more resources, but its time and goals are different. However, some studies do not recommend using Scrum when it comes to small-scale tech companies. Yau & Murphy (2013) tried to answer the question: is it worth it for small start-ups to strictly apply and follow an Agile methodology? Or is it costly and time-wasting? Based on the report, larger-size companies work very differently than start-ups, and In the case of start-ups, Agile methodologies like Scrum are trying to solve problems that might not even exist. For many years Agile methods have proven

their usefulness for many large-scale companies (Krill, 2010). However, based on this report, there is a lack of information about the usefulness of Scrum when it comes to start-ups. There are uncertainties regarding if Scrum can help small-scale start-ups or not. The paper notes that team meetings and some tasks are unnecessary and might waste the start-up's valuable resources. However, no empirical research is provided to support this statement strongly. A few studies consider a firm's complexity when it comes to evaluating the Scrum framework. As an illustration, González-Cruz et al. (2020, p. 1114) claims that the start-up can implement a certain number of Agile development approaches based on a start-up's state. Start-ups are in one of the following four stages (D.H. Tsai & Lan; 2006, Martan, 2020): First, the Seed Stage, in which both the business model and product development are uncertain and changing. Second, the Early Stage, in which the very first business model and product or service are ready. The third stage is Growth that is the point at which the start-up is established. Moreover, the last stage is Expansion, which is when the start-up is expanding itself and its customer segment. In the Early Stage, the Lean start-up is better than the Agile methodology (Gonzalez-Cruz et al., 2020, p. 1114), but there is no sign of solid proof that supports this claim.

According to Dikert et al. (2016), Agile methods aim to help small-size teams (Dikert et al., 2016, p. 99). Furthermore, according to Dyba & Dingsoyr (2009, p. 8), as the size of a company increases, it becomes more challenging to implement Agile. Scrum tries to improve internal communication by its different events, including Daily Scrum, Sprint Review, Sprint retrospective (Scrum Guide | Scrum Guides, 2020). Besides, based on González-Cruz et al. (2020, p. 1120), the use of direct communication is a necessary condition for Agile internal communication when it comes to small startups, and the paper studied 350 startups samples and used questionnaires for data gathering. One of the conclusions was that Agile methods are more useful when a company is at a later stage. This result aligns with Yau & Murphy (2013), which states that a rigorous Agile methodology tries to solve problems that do not exist when it comes to small startups.

On the other hand, Haase & Eberl (2019, p. 596) claims that large companies have a solid routine; however, it is challenging for startups to implement and maintain one. By having a routine, startups will be able to predict, prevent and overcome challenging problems, become more resilient, and have a greater chance of survival. Startups need to become adept at handling uncertain situations. Moreover, it is related to what this paper tries to figure out: having an

established routine increases the predictability of events, reduces staff stress and leads to more employee satisfaction.

1.3. Employee Satisfaction

Hanaysha & Tahir (2016) conducted a survey with a sample of 242 to measure Job satisfaction. The researcher used employee empowerment, Teamwork, and employee training as the relevant factors to measure job satisfaction in the higher education sector in northern Malaysia. The result of the study showed that employee empowerment had the most significant effect on job satisfaction. In addition, Teamwork and employee training came as the most important factors after employee empowerment, respectively. Furthermore, this study used Cronbach's reliability method to test each questionnaire category. Similarly, the current research used the same approach to check if the survey's statements are reliable. Tomažević et al. (2014) targeted three aspects: Salary and Security, Relationship and Leadership, and Tasks and Working Conditions of employee satisfaction. The research concluded that organizational support (e.g., Supervisor support and trust), which belongs to the Relationship and Leadership dimension, had the most significant impact on employee satisfaction. Similarly, the current study measured if supervisors and managers valued and supported the employees' opinions; Tasks and Working Conditions were also regarded as one of the employee satisfaction factors.

Tessem and Maurer(2007) showed that using Scrum can increase the employee's motivation and job satisfaction when it comes to large teams. This study targeted five job satisfaction factors from Hackman(1980), including variety, autonomy, feedback, significance, and the ability to finish the given task completely. The qualitative study used semi-structured interviews with seventy people, including developers and business representatives, to measure the impact of the Scrum framework on the five mentioned factors on large teams. In addition, the same study noted that using Scrum in small teams leads to sharing knowledge among team members, which improves the personal development of each member.

Bhatti (2012) stated that after a company changed its management methodology from a traditional Waterfall to Scrum, the result showed improvement in employee engagement and job satisfaction. The same study also revealed that 82% of employees reported higher productivity after using the Scrum framework, which is an outstanding outcome because the current research

is also trying to evaluate the effect of Scrum on employees' self-improvement. In addition, using Scrum increases employee engagement which leads to job satisfaction growth. Consequently, more employee engagement gave more control over their day-to-day work. The current research also concluded that the more control employees have over their daily tasks, the less stressful their working environment will be. The current study used stress levels as an indicator of working conditions, and based on Bhatti(2012), using the Scrum framework improved the working condition by lowering stress levels. Furthermore, Bhatti(2012) mentioned that employees could see the result of their work after finishing each development cycle when they used Scrum methodology. The previous result is very important due to the fact that during the interviews, some participants, who were professional managers, mentioned that when employees see the impact of their efforts in action after each development iteration, it gives them more motivation at work. The same research showed that the goal of each project is included in the base plan when using Scrum. This information is aligned with the current study purpose, which is to reveal if Scrum can provide more information for employees by clarifying the goal of each project to the team members.

Kautz et al. (2014) measured the effect of Scrum on different factors, including productivity, employee satisfaction, and quality at a company. When it came to employee satisfaction, the authors targeted Overtime, Project progress, Communication, Feedback, Social life, and Work pleasure. It is important to note that the current study included all the same factors in measuring employee satisfaction except Project progress. The results revealed that Scrum did not have a major effect on reducing overtime. However, it mostly enhanced the work pleasure based on the respondent's opinion. Following Work pleasure, Project progress, Social life, Communication, and Feedback had the most significant improvements, respectively.

2. RESEARCH DESIGN

The researcher followed the Research Onion from Saunders et al. (2015, chapter 4-5) to design the research. Here are the main steps researcher followed to design the research:

1. Philosophies
2. Approaches to theory development
3. Strategies
4. Techniques and procedures

Before going through steps, it is essential to clarify the goal of the research design, and it is primarily an Evaluative study(Saunders et al., 2015, p. 176) since the researcher tried to figure out how well Scrum affects employee satisfaction when it's implemented in startups.

The first step of designing the research was the research philosophy which was how the researcher developed his knowledge about the Scrum framework. However, the researcher tried to find answers only about the effect of Scrum on employee satisfaction. Learning all aspects of Scrum and a deep understanding of the whole framework was necessary. Designing the research philosophy was the first and the most crucial step for choosing better methodologies and understanding the context of the investigation.

The next part of the research design is the approach to theory development. This research includes data gathering and analyzing it to explore the effect of Scrum on employees and generate new theories about how Scrum affects employee satisfaction in startups. That is why the approach to theory development is both abductive and inductive to some extent.

The methodological choice was one of the most crucial parts of the research, and the author followed a partially integrated mixed method (Teddlie and Tashakkori 2021). The author used concurrent triangulation design regarding employee satisfaction, using both quantitative and qualitative approaches to provide more profound knowledge(Saunders et al., 2015, p. 170). One of the methods used to measure employee satisfaction was the Likert Scale method which is quantitative. The second method to measure employee satisfaction was conducting interviews to gain a deeper understanding and richer information about the effect of Scrum on the employees.

It is important to note that all the participants read and signed the consent form before they participated in the study. The researcher tried to follow other ethical principles, including:

- Being open and honest
- Having respect for all the participants
- Confidentiality and privacy of those who took part

3. METHODOLOGY.

This paper tries to test the following hypothesis in this section:

Scrum improves employee satisfaction in software startup companies.

To test the validity of the hypothesis, both qualitative and quantitative research methods were used. The researcher used a sequential explanatory research design (Saunders et al., 2015, p. 171) which means the author conducted a quantitative followed by a qualitative approach to generate a deeper understanding of using Scrum on team members. First, a questionnaire method was used to get feedback on different employee satisfaction categories from experts who had experiences of working with the Scrum project management method. Consequently, their feedback could reveal beneficial information about the effect of Scrum on employees. Then, an interview was conducted to get a more profound knowledge and support the result of the previous method.

3.1. Questionnaire

Online questionnaire surveys were conducted to reveal the effect of Scrum on employees. The reason for conducting a questionnaire was that it allowed the researcher to gather data from a larger sample. This part of the research included gathering primary data because there was no secondary dataset about the effect of Scrum on employee satisfaction with the focus on startups. The researcher chose the self-completed web questionnaires method to gather the data (Saunders et al., 2015, p. 440). The type of the data variable was Attitudes and Opinions, in which the respondents needed to ruminate about each context before responding (Dillman et al., 2014). The survey was based on the five-statement-Likert-Scale method. It consisted of 25 statements about participants' opinions about the effects of Scrum on employees' different aspects of life and work. Both positive and negative statements were provided in the questionnaire to ensure that the respondents read each of the statements thoroughly before answering them. In addition, an explanation of the research's purpose and the topic was provided on the first page of the questionnaire to make the aim of the research more clear to the respondents. The researcher also did a Pilot Test before surveying to ensure that respondents would not have difficulties answering the statements. Also, to ensure that all statements were valid, transparent, and reliable (Saunders et al., 2015, p. 473). The research population included all developers and managers who were directly working on developing a product under Scrum's umbrella. The

sample size was 41. Regarding the response rate, two measures were considered from Saunders et al. (2015, p. 282), total and active response rate.

All the questions were required to be answered. Consequently, no questions were left unanswered in the questionnaires. In addition, all those who participated were a part of the Scrum team, which is why all the respondents were eligible to participate. Since the sample size was small, the effect of each sample on the results of the questionnaire was substantial.

Based on Hanaysha & Tahir (2016), Matzler et al., (2004, p. 1185), Tomažević et al., (2014), a variety of statements designed to measure different satisfaction areas including, Information adequacy, Colleagues and teamwork, Recognition, Employee empowerment, fairness(Diekmann et al., 2004, p. 243), Tasks and working condition, Personal development, and overall impact of Scrum on employees. Every category included two to five questions to provide feedback about that specific category. Here are all the categories and a brief explanation of each of them.

- Information adequacy: It includes statements about whether Scrum gives employees more information about different projects, company goals and objectives, roles, and responsibilities.
- Colleagues and teamwork: It includes statements about whether Scrum increased collaboration between Scrum team members and created a more friendly work environment, and employees got more constructive feedback from their colleagues.
- Recognition: If Scrum helped hard workers recognized, different opinions were valued and heard, and their superiors praised employees.
- Employee empowerment: If Scrum gives more freedom to employees to make decisions, or they become more involved in decision-making and whether it helps them share their constructive criticisms with other team members.
- Fairness: If Scrum helped distribute tasks evenly among team members and had positive or negative effects on people being treated equally at the company.
- Tasks and Working Condition: If the Scrum framework helped employees to create a higher-quality product. In addition, how Scrum affected employees' stress level and their work and life balance.
- Personal development: If Scrum had effects on employees' self-improvement and their productivity.
- Overall: the overall effect of Scrum over culture and transparency, if it is a suitable framework for startups, and if there are better project management choices for startups.

As can be seen, various factors were taken into account to select the best statements to achieve the best possible result regarding the effect of using the Scrum framework on employee satisfaction. A specific name was chosen for each of the statements to specify which category they were targeting. This way of naming the variables made the interpretation and visualization of the data more straightforward.

Each statement targeted one specific field at a time to avoid confusion for respondents. Although more response items provide higher accuracy, this survey used five-response items to offer a more user-friendly survey. All the response items were agreement-based. In addition, to gather a broader range of responses, items designed as bipolar included Strongly disagree, Disagree, Neither agree nor disagree, Agree, Strongly agree.

After finishing and gathering all the questionnaires, all the results were added to the SPSS variable view. The numbers 1 to 5 were added as values to each question to represent the labels "Strongly disagree" to "Strongly agree," respectively. In addition, some of the questions were designed with a negative frame to avoid respondents' bias when filling the questionnaire. In the previous case, the numbers 1 to 5 were assigned to "Strongly agree" to "Strongly disagree," respectively.

It is important to note that the Likert scale data type gathered in this survey was ordinal since the exact difference between items was not defined. In addition, to ensure the survey reliability, all the survey category statements were tested with Cronbach's reliability test with the acceptance of Cronbach's alpha value of greater than 0.7. In order to measure Cronbach's alpha, reliability analysis with model Alpha was chosen. Next descriptives for "item", "Scale" and "scale if item deleted" and "Correlations" from "Inter-Item", for each of the eight categories' statements, were chosen to calculate Cronbach's alpha for each category.

In order to test the hypothesis, a Chi-square test was conducted via Microsoft Excel to measure the independence level for each individual Likert Scale item. For this purpose, The responses for each question were divided into two "Agree" and "Disagree" categories, and the "Neither agree nor disagree" responses were omitted. The significance level of 5 percent was chosen to see if results happened by chance.

Next, Frequencies from Descriptive Statistics were chosen to summarize the data. The mode or the most common response for each statement was found to analyze the ordinal data and get an overall view of the data sample. To better visualize the frequency of each response item, a bar chart for each statement was created. IBM SPSS modeler was used for data analysis and generating the charts for data visualization. The frequency table for each statement was drawn to get a better understanding of the results.

This research paper used the Likert Scale because it helps transform questionnaire results into quantitative data and gives the researcher the power to record abstract data as recordable observation. Likert scale type of survey is also user-friendly. It helps the participants give their opinion more accurately by providing them the optimum number of options to give their idea about each statement. Finally, the Likert scale offers more accurate results because it provides more options than only yes or no to answer each question. It is also possible that the Likert scale results in response bias. However, since the respondents were all experts, the questionnaire's bias should have been minimized. Moreover, all the survey statements and also the details about the frequency charts can be found in the appendix section at the end of this paper.

3.2. Interview

Because there was a need for more and deeper information about how Scrum affected employee satisfaction, the interview approach was inductive to build a more detailed theory. The author picked the Purposive sampling(Saunders et al., 2015, p. 301) approach when it came to interviews, and he chose the most expert members in the Scrum field from different startups. The main reason for choosing Purposive sampling was that finding professionals in Scrum who work for startups is an arduous task. It is worth mentioning that the interviews conducted were semi-structured at the beginning and unstructured at the end of each interview. First, the author prepared some of the most important questions before the interviews. Depending on how each conversation went, the author asked different questions or asked the prepared questions in a different order about how Scrum played its role in employee satisfaction. However, in some cases, some parts of the interviews went unstructured. The interviewee took the lead of the conversation and talked freely about what aspects Scrum had a positive impact on and vice

versa. The unstructured part of the interviews was mainly conducted since there was a need for more in-depth and broader information about the research hypothesis.

Furthermore, during the unstructured part of the interviews, experts who took part in the interviews shared some crucial information that was utterly new to the researcher. Those responses reveal new insights about using Scrum. Another reason for conducting both semi-structured and unstructured interviews was that it is common to use both interview structures in exploratory and evaluative studies(Saunders et al., 2015, p. 393). Also, there were many possible questions to ask from participants, and there was no simple answer for the questions since the questions and the topic itself were complex(Saunders et al., 2015, p. 394). To ensure that participants give their genuine and reliable answers, they were all assured that all the interviews would be anonymous and their name and company's actual name would not be published. All the interviews were pre-arranged, and they were in both forms of internet and face-to-face. The remote interview method was used since some of the interviewees lived in other countries, and some preferred remote interviews. In addition, internet-based interviews were cheaper and more convenient for both the interviewee and the participants. On the other hand, there was a need to build trust and make a rapport environment before the interviews in some cases. Consequently, in the mentioned cases, the researcher conducted face-to-face interviews to gather richer data.

Interviews were conducted with both managers and lead developers. Before the interviews, the author sent each participant some interview themes, so the participants make themselves ready for the interviews and to provide more accurate and useful information. Since participants might have needed to check some reports and statistics of their organization, giving them the themes in advance could give them enough time to prepare the useful information in advance. The interviews started with more general questions to prepare participants' minds and increase their focus for more in-depth questions in the subsequent parts. The order of questions was provided in a way that there was a logical structure between the flow of questions. In addition, long and confusing questions or asking two questions at once were avoided so as not to confuse the participants. In addition, the researcher tried to ask more about the participants' real-life experiences rather than talking about concepts. More sensitive questions were asked at the end of each interview since there was a need to build more trust with the participants at the starting point of the interviews. Different types of questions were asked from the participants, like open and exploring and closed questions. Furthermore, interviews were audio-recorded after getting permission from each interviewee.

Each interview took about 35 minutes on average. The researcher tried to avoid too long interviews since the topic was complex by its nature, and having long interviews could result in unreliable and inaccurate information. The central question was how Scrum affected your satisfaction at your work and at your personal life? In addition, the interviewer encouraged the participants to go further and give broader explanations about the different effects of Scrum over employee satisfaction. After conducting the interviews, taking notes from the answers and discussions and recording each of the interviews with the permission of the interviewee. All the interviews were transcribed and Thematic analysis was conducted in order to analyze the data. The author also took an inductive approach since the questions were specific, and the results gave a robust idea of the themes which could be found in the data. The author followed six steps of Thematic analysis developed by (Braun & Clarke, 2006, p. 90).

Familiarization: The author accurately examined the data to find the prevalent themes. In other words, to realize patterns that repeatedly happened in each Interview question.

Coding: The author highlighted key phrases, sentences, and words that describe the gist of each participant's answer.

Generating themes: After finding the common part of the answers for each question, the author started creating patterns and finally created themes. It is important to note that only relevant themes that could increase employee satisfaction knowledge were chosen after creating themes.

Reviewing themes: After creating the themes and ensuring their usefulness, all the themes were evaluated to make sure that they were correct.

Defining and naming the themes: After making sure that the themes were finalized and ready, themes were formulated, and the researcher decided how each theme could lead to getting valuable information.

Writing up: Finally, the analysis of the data was prepared, and the results addressed each theme and explained how many times each theme appeared during the interview conversation.

4. RESULT

4.1. Questionnaire

The following table shows the Cronbach's alpha reliability test based on each category statement and number of items in each category:

Table 1. Cronbach's alpha reliability test

Category	Cronbach's alpha	Number of Items
Information Adequacy	0.908	4
Colleagues and Teamwork	0.757	3
Employee empowerment	0.850	3
Tasks and Working Condition	0.461	3
Recognition	0.888	3
Fairness	0.715	2
Personal Development	0.62	2
Overall Satisfaction	0.89	5

The table above clearly shows that most of the questionnaire categories passed the Cronbach's alpha reliability test. Considering the Cronbach's alpha coefficient, those categories with a coefficient greater than 0.7 are considered as reliable. For example, the Information Adequacy score was 0.908, which shows a very high-reliable score and after that Overall satisfaction(0.89), Recognition(0.888), Employee Empowerment(0.850), Colleagues and Teamwork(0.757), Fairness(0.715) got the highest reliability score from highest to lowest score and passed the test. However, the reliability test showed two categories, including Personal Development(0.62) and Tasks and Working Condition(0.461), are not reliable enough to make any conclusions.

A non-parametric Chi-square test with a significance level of 5 percent was used for each Likert-scale item to evaluate the statistical significance of the hypothesis. The results are available in the table below:

Table 2. Chi-square test with a significance level of 5%

QUESTION NUMBER	CHISQ.TEST
1	1
2	0.601508
3	0.002022
4	0.161513
5	0.039592
6	0.4795
7	0.023141
8	0.086348
9	0.00607
10	0.715001
11	0.008151
12	0.35316
13	0.177932
14	0.4795
15	0.548506
16	0.00729
17	0.086348
18	0.018603
19	0.00604
20	0.723674
21	0.023342
22	0.013328
23	0.0771
24	0.479
25	0.088082

Table 2 shows that ten questions meet the criteria of less than 0.05 in order to test the hypothesis and the rest of the items had higher variation than the expected response.

The results for Descriptive analysis are as the following:

Regarding information adequacy, the results for the first two questions in the category were not strong enough based on the Chi-Square test to test the hypothesis and make conclusions. However the Chi Square numbers for question 3 and 4 were less than five percent. The frequency result showed that 56.1% of the participants believed that Scrum makes the responsibility of everyone more clear and only 26.36% disagreed. Similarly 60.9% of the participants believed that Scrum provides more information for team members to make better decisions and a small percentage of 22% believed the opposite result.

Table 3. Information adequacy descriptive analysis results

INFORMATION ADEQUACY		
QUESTION NUMBER	QUESTION	MEAN SCORE
1	Scrum activities help me better understand the vision and objectives of each project.	2.95
2	Scrum makes my role clear to fulfill my company objectives.	3.00
5	I think the Scrum framework makes everyone's responsibilities more clear.	3.39
9	Scrum meetings provide more information for team members to make better decisions.	3.46

Regarding Colleagues and teamwork, questions 4 and 17 did not pass the Chi-Square significance level criteria. On the other hand, with the mean of 3.54, the majority, 63.4%, believed that Scrum increases the collaboration among the team members, and a small percentage of 19.6% disagreed.

Table 4. Colleagues and teamwork descriptive analysis results

COLLEAGUES AND TEAMWORK		
QUESTION NUMBER	QUESTION	MEAN SCORE
3	Scrum decreases the	3.54

	collaboration between team members.	
4	Scrum helps to create a friendly environment with other team members.	3.10
17	Scrum meetings allow me to get more constructive feedback from others.	3.10

When it came to Employee Empowerment, based on the Chi-Square test and the mean Scores, the overall result of the questionnaire was neutral for this category.

Table 5. Employee empowerment descriptive analysis results

EMPLOYEE EMPOWERMENT		
QUESTION NUMBER	QUESTION	MEAN SCORE
6	Using the Scrum framework gives me more freedom to make proper decisions to do a better job.	2.63
8	Scrum gives me more authority to share my constructive feedback with other team members..	3.27
15	I feel more involved in decision-making when the company I'm working for uses Scrum.	2.76

Tasks and working Condition category didn't pass the Cronbach's alpha reliability test. However, the Chi-Square test showed a significance level of 0.6% for question number 19, which stated that Scrum improves the balance between work and life. 48.8% of the participants believed that Scrum has an adverse effect on the work and life balance compared to 14.7% who believed differently.

When it came to the Recognition factor, Although the Category questions passed the Cronbach's alpha reliability test, only question 18 passed the Chi-Square test criteria. With the mean of 2.46, 46.3% of the respondents disagreed with the statement that Scrum affects employees being praised when they do an excellent job at the company.

Table 6. Recognition descriptive analysis results

RECOGNITION		
QUESTION NUMBER	QUESTION	MEAN SCORE
12	Scrum helps hard workers getting recognized faster at the company.	2.68
13	By using Scrum, my opinions are heard and valued by managers.	2.61
18	By using the Scrum framework, I feel more praised when I do a good job at the company.	2.46

When it came to Fairness, only one question with a significance level of 2.3342% met the Chi-square test criteria of less than 5%. A large percentage of the respondents' (48.8%) opinion was, Scrum does not affect the equality of the team members, and 19.5% had the opposite opinion.

It is important to note that the Personal development category's statements did not pass the reliability test. On the other hand, the Overall category passed the Cronbach's alpha reliability test. It is important to note that 63.4% agreed or strongly agreed that Scrum increases the transparency at the company, and 29.3% believed that Scrum does not improve the transparency. Similarly, a large percentage of 56.1% of the respondents believed that Scrum brings value to the company, while only a minority of 21.9% disagreed with the statement. Question 23 did not pass the chi-square test with a significance of 7.71%; however, like the previous items, the majority of

the respondents(51.3%) believed that Scrum has a positive impact on a company's culture and 26.8% disagreed. Question 24 and 25 failed the significance level of less than 5%.

Table 7. Overall descriptive analysis results

OVERALL		
QUESTION NUMBER	QUESTION	MEAN SCORE
7	Scrum increases the transparency at the company.	3.34
22	I think using the Scrum framework brings value to my company.	3.34
23	Scrum has negative effects on my company's culture.	3.34
24	I think Scrum is a suitable software project management framework for my company.	2.95
25	I prefer using other software project management frameworks over Scrum at my company.	2.8

4.2. Interview

Eight themes resulted from thematic analysis as the table 7 shows:

Table 8. Overall descriptive analysis results

CODES	THEME
<ul style="list-style-type: none"> ● more information for employees ● make project goals clear ● make responsibilities more clear 	information adequacy
<ul style="list-style-type: none"> ● Helpful teammate ● Useful feedback from others ● Supportive 	Colleagues and teamwork
<ul style="list-style-type: none"> ● Overwork ● Intense work ● No time for myself ● Stay longer at work ● Personal life ● Workload 	Tasks and Working Condition
<ul style="list-style-type: none"> ● Freedom to make decision ● Authority of the employee ● Involvement in making decisions 	Employee empowerment
<ul style="list-style-type: none"> ● Create value ● Stress ● Work and life balance ● Working time ● Personal life time 	Tasks and Working Condition
<ul style="list-style-type: none"> ● Praise ● Recognize ● Value employees 	Recognition
<ul style="list-style-type: none"> ● Fair workload ● Divide tasks equally ● Treating employees equally 	Fairness
<ul style="list-style-type: none"> ● Self improvement ● Improving skills ● Teaching others 	Personal development

- | | |
|--|--|
| <ul style="list-style-type: none"> ● Training ● Pair programming | |
|--|--|

Information Adequacy:

One of the senior developers working with Scrum mentioned that although clearing the goals of the project is not exactly connected to the Scrum framework, using Scrum makes the responsibilities much more clear because it helps the engineers understand what is needed from them better. In addition, another manager noted that Scrum does not provide information itself because it is just a framework. However, Scrum enables people to communicate via different rituals, including daily standups, retrospectives, sprint demos, sprint grooming, and backlog grooming. It is important to note that Scrum is not a silver bullet, but it allows employees to communicate. For example, it gives developers the ground to share their failures and successes. However, not only Scrum but other agile methodologies like Kanban try to do the same thing. Furthermore, another Agile coach who was working with Scrum for years mentioned that Scrum is an advantageous framework to start with, and it brings visibility to the company. Company members can easily understand what is happening in the company, projects' goals, who is doing what, and what the team will do for the next development cycle just by looking at the Scrum boards. Scrum boards bring visibility to the company and show which tasks have higher priority and are more important to be finished as soon as possible. Besides, every day there is a daily Scrum meeting that helps the whole team keep themselves on track to reach the project's goals.

One of the Scrum experts mentioned: "Scrum does not do anything; it is just a framework that provides exciting opportunities. Especially when it comes to the last version of Scrum, there is a huge focus on the product goal and the Project's goals. In many companies, the reasoning for doing things is overlooked most of the time. However, Scrum specifies that one of the rules is that the product owner should always specify the goal of each Project."

One of the interviewees who was familiar with Scrum said that when it comes to Scrum, one of the main features is to provide the team continuous feedback and continuous engagement, which is very valuable. In other words, Scrum provides collective wisdom and collective feedback. For example, if they are given a task and then left for a long time without continuous feedback and engagement, if a person or the whole team put the first step in the wrong direction, the more they go forward, the more they get distracted from the primary goal. Consequently, when using Scrum, people get feedback all the time. The company can make sure that the goals of the

projects are always clear and transparent to everybody. Another Agile Coach and Scrum Master mentioned the way Scrum can provide the tool to provide information and make information available to everyone in the team at a startup company. He mentioned, "Scrum provides radical transparency at the company. It means what teams are doing is known, open, and visible to everybody since all the Backlogs are open to everyone. Consequently, everyone can check the teams' backlog and understand the status of where they are, the roadmap, and even the plan for the next quarter or next year. The other side of transparency is about the team; for example, a Scrum Master at a company provides different KPIs(Performance indicators) such as velocity, which measures everything that team does, and it is also open to everyone whether it is on cloud or on a virtual whiteboard in the office. By doing this, it brings much transparency and provides information for everyone at the company about the goals, plans and current state of the projects.". However, one of the participants mentioned that in the case of smaller Startups, usually, the level of communication among team members is high to get enough information about different matters, and using Scrum might not be necessary. Two of the interviewees believed that the focus of Scrum is to make the short-term goals clear but not the long-term goals and the vision of the company. Another professional project manager who was working for a startup mentioned that, "When a company is using Scrum, it does not guarantee that it provides more information for the team members and it is heavily dependent on how the company implements the Scrum framework. Nevertheless, the important thing about Scrum is that it has different meetings and different meetings can provide more information for employees; for example, in the company that I'm working for, there are different meetings like daily Scrum, Sprint Planning, Sprint Review, Demo Day.". The same agile professional mentioned that there are four-week Sprints in the startup that he is working. During the first week of every product development, they have a Sprint Planning meeting; during the second week, they have one more meeting named Sprint Walkthrough. He mentioned that during the Sprint Walkthrough meeting, all the team members are participating in that event, which helps everybody see what other teams are doing. So they can even give advice or receive feedback, and this was something that they added to their Scrum framework, and the original Scrum does not have this event. Although he noted that Scrum is very flexible, it can be beneficial for employees in Startups. He also pointed out another meeting that was invented at their start-up company, which is not a part of the original Scrum named Sprint update. He said "that Sprint update is very useful for our customer team because it gives them an idea of how much of the stuff is done and how much the development team could achieve during Sprint so it gives the customer team a lot of information about what is ready and what is not ready. By doing this, they can easily understand if there is

any delay or if things are going to be prepared even earlier than they thought they would be.”. He also pointed out that because Scrum is flexible, they can have different meetings based on the needs of their projects. For example, sometimes the start-up had personal meetings, public meetings with a sharing screen when there was an online meeting. Moreover, the Product owner who was working for the Start-up mentioned that those kinds of meetings could provide much information for different departments and individuals working under the Scrum umbrella.

Colleagues and Teamwork:

When it came to Colleagues and Teamwork, some interviewees mentioned that because Scrum divides the tasks into smaller parts, it allows people to work towards the same goals with different work items. There are different rituals and activities when it comes to the Scrum framework, like daily standups or any other activities in which each of the team members can communicate in a timely and fast manner. It creates a balance between team members who speak too much or do not speak at all or those who are in the middle and speak very efficiently and effectively. In other words, there are different personalities in the team, and people have different expectations, and in this case, Scrum can be helpful to equalize opportunities and downsize the expectations. One of the professionals mentioned, "giving everyone the opportunity to talk on a daily basis is very important since when it comes to startups, one of the biggest challenges is the emotional stability of the team. It is a very anxious place to be, especially during the starting periods because there are so many things to do and so many things that nobody has any idea about, and each individual tries to do many things at the same time. So getting that anxious state away and calming everybody down is when startups need something like Scrum, and generally, those rituals will help the startups a lot to curb the chaos in the team. Scrum is not a silver bullet for all teams. Because all the people work differently and they have a different understanding. Moreover, that is why Scrum is implemented differently in every team."

Some of the participants believed that Scrum provides a room so everyone can get feedback from their teammates. During Sprint Retrospective, people talk about how their plans worked during the previous sprints so they can evaluate their performance even to measure the Scrum itself and check if Scrum is helping the team or preventing the team from reaching their goals. In addition, every team member has a commitment to the whole team to share information every morning during the daily standup meeting. As an example, everyone explains what they did yesterday, what they are going to do today, and what they plan to do for the next day. Furthermore, if any teammates need help, they can ask their teammates if they are struggling with something. In

general, the Scrum framework encourages people to seek help as soon as someone faces an impediment. However, one of the participants noted that in the case of some startups, the members communicate very well without any methodology. In general, having a methodology and a structure such as Scrum can be very helpful. Another expert mentioned that Scrum is mainly about teamwork, and it creates an environment for teamwork to happen. For example, Scrum has a massive focus on sharing knowledge among team members. When somebody is excellent at something, they try to coach other people and train other people to improve the whole team's knowledge. In a good Scrum environment, there are some situations that, for example, two people only work on one task and they do pair programming, which means that somebody who is very good at something only trains the other teammate, and that is one of the reasons that makes Scrum a handy methodology for improving teamwork.

Employee empowerment:

During the planning period, the product owner and the Scrum master should remind the team that they are a part of the product and they need to finish all the tasks to build the final product. However, if they feel something is not correct and needs to be changed, whether it is the business model or the project's direction, they need to share it with others. In a proper Scrum environment, everyone has enough authority to speak because one of the essential parts of Scrum is to enable people to speak their minds without being worried about the consequences and without spreading fear in the team. In addition, there is a wrong understanding of Scrum that Scrum teams can work on whatever they want to work. However, in reality, the team members can choose some tasks and say no to some of the tasks, but there is a specific number of tasks that they have to finish to build the product. Hence, it gives the team the freedom and the authority to make decisions as long as it does not hurt the company's vision about the product. In addition, if Scrum is implemented correctly, it brings people on board to talk about the features that they are going to work with the manager and product owner, so Scrum gives people the courage to bring everybody for planning. As mentioned, it is important to note that in the Scrum framework, the manager does not allow to assign the tasks to team members, but each team member can choose what they want to do based on their skills and capabilities. So Scrum gives the team a sense of ownership to be much more creative and happier when they are doing the work. However, it really depends on the industry. For example, in the case of a team operating in a financial company, there are stringent rules that restrict the development team's freedom and put different boundaries around the developers because of the regulations. Furthermore, not only developers can choose the tasks, but also they can say how much time they need to finish the

tasks based on their skills, and there is also the opportunity that multiple people are going to work on one task. In addition, Scrum brings the idea of autonomous teams, and it means that it removes the necessity of micro-managing the team members, and this by itself gives the team the freedom to some extent. It is important to note that some people mentioned that the team's health in Scrum heavily depends on the Scrum master. If the Scrum master is not eligible or professional, using the methodology doesn't bring any benefits neither for the team nor for the company. A few of the participants mentioned that a system or routine puts some restrictions around people who are working under the Scrum umbrella. However, it is also important that too much freedom does not mean that it will benefit the people and the company. However, in general, those participants mentioned that they believe that Scrum creates a somewhat creative environment.

Tasks and Working Condition:

One of the senior engineers working with Scrum methodology mentioned that Scrum reduces stress in the working environment since it makes the work more structured, and everyone knows what the plan is and what they are supposed to do. He continued that they have two-week Sprint planning, and it allows them to have a better understanding of what they are going to do during each next two weeks, and they can also manage their time and plan to finish their tasks on time. He added, "because everyone knows what they exactly need to do before the deadline, you can easily plan your work and personal life. For example, employees can easily plan if they want to take a few days off. So I think Scrum makes more balance between life and work for employees because the structure of Scrum allows you to make plans for your working days and your vacations.". The other Scrum professional mentioned that Scrum has different rituals like daily standups and Retrospectives, and those rituals help reduce the stress from employees. However, the stress in the working environment is also heavily dependent on the culture of a company. When Scrum is implemented, if people are scared of talking and consequences, then the working environment becomes stressful, but when people are able to talk when something is wrong, it reduces the stress, and this culture that everybody can speak their mind can spread through the organization like a wildfire and reduces the stress in the working environment. The participants also added that when people are stressed, even small tasks feel like a lot, and by reducing the stress, it is possible to give the employees the feeling of having a smaller workload at work. Some of the participants compared Scrum with other traditional methodologies. They mentioned that in traditional methodologies, there are no two-week Sprints. Although not having the two-week deadline might cause less stress and a smaller sense of urgency at the beginning, it

tends to get very stressful by the end of the project. Because when it comes to a traditional method like Waterfall, employees have much time, and we humans tend to procrastinate. Moreover, when it comes to the end of the project, employees have to finish a huge project in a limited amount of time before the deadline. On the other hand, when it comes to Scrum, the team tries to deliver every two weeks or one week. Although there is always a deadline coming, it can cause stress; it depends on how the team sets its goals. The team's goals should be achievable, and since the team members are picking their tasks, they have control over how much they are able to do during the next two weeks. The team can practice keeping the workload sustainable, and there are ways to help the team to achieve this sustainable workload. For example, Scrum master can measure the capacity and the velocity of the team during the time, and it allows the team to understand how much they can finish for two weeks and not to take more than what they are capable of doing. One of the Agile coaches mentioned that "Although having two-week deadlines can be stressful by itself if the Scrum master manages the team and the tasks properly, the stress related to a two-week deadline can be minimized. We are humans, and we need a sense of urgency in order to accomplish our goals. So I believe if Scrum is implemented properly, it reduces the stress both for the teams and managers.". Furthermore, many of the participants mentioned that Scrum makes things more predictable, and this predictability reduces the stress. In addition, micromanaging is always stressful for the team members, and Scrum is trying to avoid that and make the teams autonomous. In general, if Scrum is implemented correctly, it can reduce stress. It is important to note that one of the main responsibilities of the Scrum master is to protect the team from getting overloaded by many tasks. This makes the environment for employees less stressful and makes a better work and life balance for the employees who are working under the Scrum umbrella. In addition, Scrum is a very lightweight methodology, and it can be implemented almost everywhere. For example, teams have long-term goals in many companies but no short-term goals to motivate the team members. What Scrum does is that Scrum converts the long-term vision into smaller steps that are understandable and clear to reach. Also, not knowing what to do can be stressful for employees, and by implementing Scrum, the startup can help employees work based on a sustainable basis, which means that they are always moving since there are always some goals to achieve. In addition, because goals are not far from the team and always one or two weeks ahead, the team has the feeling that the goals are always reachable, and they are always doing something to reach the goals. One of the Agile coaches mentioned that, because of the structured meetings that they have, the team members could understand the purpose of what they are doing, and it gives them a feeling of safety at work, and they feel and make them happy in their work. she mentioned, "I found Scrum reduces stress for

my team." However, a couple of Scrum professionals mentioned that Scrum is not for everyone; it depends on the people. For example, if people do not want to work in a team, then using Scrum might be stressful and difficult since every morning they have to report about what they did and what they are going to do, and some people do not like it. Some people do not like the structure and routine, and in this case, structure probably increases their stress.

Recognition:

Interestingly, all of the participants believed that since Scrum has tools to track the record of the engineers, it is easier to measure how much effort they are putting into their job. Moreover, having everything measurable helps the managers to praise those who did an excellent job at the company. In addition, Scrum brings much visibility to the company. In the case of smaller startups, it might not be obvious since they are smaller than mature and bigger companies, and everybody can see how much others are doing; this visibility is more useful in bigger companies or later-stage startups. Furthermore, there are Demo meetings and a strong feedback loop in Scrum, which helps people get positive feedback from others. For example, in demo meetings, the engineers and employees present what they have done during the Sprint to stakeholders and managers. Everyone can join in the demo meeting. At the end of the meeting, managers and different company members praise the person who presented their job. This event can motivate developers to get good feedback and get praised by high-level managers.

Fairness:

Although Scrum brings transparency to the company, everyone knows what others are doing, and everyone chooses what they want to work on during the Sprint; Scrum is mainly about the teams, not the individuals. One of the Agile experts mentioned: "Scrum is a very lightweight framework, and it does not provide recipes for everything, and because Scrum gives the team the freedom to divide tasks and take ownership, it heavily depends on the team how they are going to divide the tasks among themselves."

Personal development:

One of the senior developers working with Scrum mentioned that Scrum teaches the developers and managers how to manage their time and how to divide the workload they can finish within a Sprint. Besides, it gives everyone the work items to reach the goal of each project, especially when it comes to junior developers; using the Scrum framework helps them become senior developers. In addition, Scrum helps people speak their minds without being worried about being

judged and fearing the consequences. Consequently, it opens the room for people to share their knowledge and ideas, leading to the employees' personal development. In addition, because of the transparency that Scrum brings to the company, it is difficult for people to hide their weaknesses which means that they need to ask for help from others, and it improves both the one who teaches and the one who is learning. One of the Agile coaches mentioned that Scrum mainly focuses on teamwork rather than individual work. However, there are some practices in Scrum that can affect each employee's personal development a lot. For example, after each Sprint, if someone or the whole team can not deliver what they promised during the Sprint Retrospective or Demo day, it is easier for the Scrum master or manager to find the team's weakness. They can provide the team with proper training, which helps the team and every individual improve their knowledge. There is another argument that team members might not find any time for personal development because there are deadlines every two weeks. However, it is essential to mention that tasks are not chosen for the team members when Scrum is appropriately implemented. The employees can choose the workload that they think they are able to finish during the next Sprint. Consequently, if someone wants to put some time into personal development, they can take items that do not consume one hundred percent of their time. However, they can take items for eighty percent of their time and assign the rest of twenty percent to their personal development. However, it is also worth mentioning that this ability depends on employees' ability to manage their time.

Last but not least, there is a concept in Scrum adopted from another methodology named Extreme Programming, which is about pair programming. It means when someone in the team knows a topic very well, they can teach other team members who do not know enough about the topic. To follow the Pair Programming method, two or more people take only one task, and the one who is weak at some area do the tasks and those employees who are adept at that specific field, give advice and train the employee to learn that specific skill as well.

5. DISCUSSION

By conducting the questionnaires and interviews, the researcher tried to test the research hypothesis that Scrum improves employee satisfaction in software startup companies.

As the result section showed, the thematic analysis resulted in eight themes which were the exact same categories in the questionnaire. Regarding information adequacy, the result showed that Scrum provides different rituals to facilitate the flow of information in the company. In addition, Scrum brings visibility to the company by bringing managers and people from the business and developers to the same table for planning the development of the product. Furthermore, the product plan, tasks, roadmap, vision, and all the tasks are visible to everybody at the company so everybody can clearly see the goals of the projects. The results for this theme align with the result from the questionnaire that Scrum makes everyone's responsibilities clearer and Scrum meetings provide more information for team members to make better decisions.

When it came to colleagues and teamwork, the results showed that through the daily standups, employees can communicate with each other, give each other feedback, share the problems and what they did and are going to do during the next day. Those activities help to improve the teamwork among the team members considerably. The interview result for this part also aligns with the questionnaire result that using the Scrum framework increases the collaboration among team members or in other words, using Scrum improves teamwork. The findings support the Kautz et al. (2014) research that using the Scrum framework Strongly improves teamwork.

Regarding Employee Empowerment, even though the results in the questionnaire were not strong enough to test the hypothesis, the interview's result showed that when using Scrum, the environment is open for receiving feedback, and people can express their opinions without being worried about the consequences. In addition, team members can choose their own tasks and question every decision during the planning and different meetings. Furthermore, for every task that the team members receive, they have the freedom to choose how much time they need to finish the task. However, a few of the participants mentioned that Scrum brings a strong structure to the company and it means some restrictions for some people and not all the people like such structure.

In the case of Tasks and working conditions, many of the participants believed that a structured management framework, specifically Scrum, reduces the stress among team members by bringing structure and making things predictable by specifying everyone's tasks and responsibilities clearly. In addition, Scrum builds an open and transparent environment where everyone can share their problems. On the other hand, a few interviewees mentioned that Scrum could cause some stress, and it is the fact that every two weeks or every Sprint, the team needs to deliver something. It means that in every Sprint, there is a deadline approaching the team, and it can be stressful for some people. However, other experts mentioned that, since in Scrum, one of the points is to keep the workload sustainable, and employees are the ones who choose those tasks based on timeframe. Also, the Scrum master knows the capacity and the speed of the team based on previous measurements. Consequently, it is possible to avoid any excessive workload on employees' shoulders. This section aligns with Mann & Maurer (2005, p. 1), which states that Scrum reduces overtime work and leads to more employee satisfaction. The findings of this section also aligned with Bhatti's (2012) research findings that Scrum reduces stress by giving employees more control over their daily tasks.

Regarding the Recognition factor, all participants were positive since they mentioned that in Scrum, the performance of team and individuals is visible and measurable, and everyone is presenting their work results to others. Consequently, it gives the higher managers and anyone at the company the opportunity to praise those who did an outstanding job. However, when it came to Fairness, although some people mentioned that since employees have the opportunity to choose their own tasks, Scrum can bring Fairness to some extent, most of the interviews believed that Scrum does not affect this part because it is a lightweight framework. It does not have instructions and solutions for everything.

In the case of Personal development, the findings aligned with Tessem and Maurer(2007) and Bhatti(2012) that using Scrum improves sharing knowledge among the team members and self-improvement, leading to higher employee satisfaction. Most of the participants mentioned that although Scrum does not have many activities exactly for employees' personal development, it gives the employees many opportunities to improve themselves. For example, building a strong feedback loop or when multiple developers pick one task and the ones who are more experienced help less experienced ones to train them to improve their skills for future tasks and projects. In addition, employees have the flexibility to choose their own tasks, which indirectly gives employees the opportunity to reserve some time for personal development. Furthermore,

the transparency that Scrum brings to the company helps managers find the weak spots of the team and provide the teams with proper training, which improves the individual's skills in the team.

It is important to note that some participants mentioned that Scrum is a lightweight framework and it is mainly created for small teams, and this aligns with the findings of Rising & Janoff (2000, p. 27) and Dikert et al. (2016). However, this is the opposite of the findings of Yau & Murphy (2013), which states that Scrum is trying to solve the problems that do not exist in startups.. However, a few participants mentioned that the level of communication in smaller startups is usually high enough without any framework. In addition, the interviewees revealed that using Scrum led to more happy employees, which aligns with the Kautz et al. (2014) conclusion that Scrum increases work pleasure for employees. The findings also encourage the software startup companies to implement a systematic approach specifically Scrum framework, to improve employee satisfaction in their company which leads to more satisfied customers in the end (Jeon & Choi, 2012) and prevents startups from losing employees. The findings also provide a solution for the problem that Baumeister et al. (2017) mentioned that there is a growing need for a systematic approach to deal with startup's high uncertainties and stressful situations.

CONCLUSION

In conclusion, This paper aimed to find how Scrum affects employee satisfaction in startup companies, and there was a need for more information regarding this matter. According to both the quantitative Likert Scale questionnaire and qualitative Interviews analysis, the paper targeted eight employee satisfaction factors, including Information Adequacy, Colleagues and Teamwork, Employee empowerment, Tasks and Working conditions, Recognition, Fairness, Personal Development, and Overall satisfaction. The results indicate that Scrum can dramatically improve employee satisfaction by improving seven of eight employee satisfaction factors except for Fairness. The results showed that the biggest impacts of Scrum on employee satisfaction are related to Information adequacy and Colleagues and Teamwork factors. Almost all the interviewees and a majority of survey participants mentioned that using Scrum improves the Information adequacy factor by providing more information for everyone in the startup to understand the goals of each project, the state of each project, and what everyone is doing at the company by bringing transparency to the company.

Similarly, most interviewees and survey participants believed that Scrum has a significant effect on Colleagues and Teamwork factors since there are different meetings and rituals in the Scrum framework that allow people to give each other feedback and ask for help when there is an obstacle. Followed by Colleagues and teamwork, The results showed that Scrum improves employee empowerment by giving the employees the power to choose their own tasks, workload and talk about the problems and impediments without being worried about the consequences. Moreover, almost all the participants in the interview mentioned that having different meetings and demo days gives the employees the opportunity to present their work for others in the company, and it improves their chance of being recognized and praised by their managers. In addition, using different charts and measuring the performance and the velocity of the teams increases the chance of standing out and being recognized when a team shows high performance. Moreover, using Scrum can result in a less stressful working environment because it brings structure in the workplace even though there is a possibility that Scrum increases the stress if employees can not handle to balance their workloads. Last but not least, some Interviewees

mentioned that although Scrum does not have specific rituals for personal development, it gives the employees many opportunities to develop themselves by bringing a strong feedback loop in the company. As an illustration, it gives multiple employees the opportunity to work on one task; Consequently the more experienced and knowledgeable team members could teach those who are less experienced and skilled about that specific topic. These practices lead to the personal development of all the team members who are working under Scrum umbrella. Moreover, this research proved that in case software startup companies use Scrum framework they can prevent losing both customers and employees by improving employee satisfaction in the company.

However, The results showed that Scrum does not affect Fairness because Scrum tries to make the team autonomous and prevent others from micro-managing the team. Team members should divide the tasks among themselves based on their abilities and capacities. Consequently, Scrum does not offer a way of bringing Fairness, neither about salary nor workload.

In addition, It is also important to note that Scrum can be useful when there is a need for structure and routine. Nevertheless, if the team does not want to have structure, Scrum might even lead to dissatisfaction. Furthermore, the findings revealed that Scrum is not a silver bullet and it is lightweight and does not explain how to do things precisely and it's just a useful tool. To make the Scrum framework worthwhile for the employees, Scrum has to be implemented correctly. To better reveal the implications of the current findings, future researchers could address how to implement Scrum correctly and in more detail in startups to improve employee satisfaction. Moreover, more empirical case study research is needed to evaluate the effect of Scrum on employee satisfaction since this paper only used surveys and interviews. This research revealed that Scrum could considerably improve employee satisfaction in different areas when it comes to Startups, and it challenges the assumption that it can waste employees' time and companies' resources.

LIST OF REFERENCES

- Ajith Jerom, Rajamohana (2020), A Survey on Comparative Analysis of Agile Software Development Methodologies
- Azanha, A., Argoud, A.R.T.T., Camargo Junior, J.B.d. and Antonioli, P.D. (2017), "Agile project management with Scrum: A case study of a Brazilian pharmaceutical company IT project", *International Journal of Managing Projects in Business*, Vol. 10 No. 1, pp. 121-142. <https://doi.org/10.1108/IJMPB-06-2016-0054>
- Bannerman, P. L. (2008). Risk and risk management in software projects: A reassessment. *Journal of Systems and Software*, 81(12), 2118–2133. <https://doi.org/10.1016/j.jss.2008.03.059>
- Baumeister, H., Lichter, H., & Riebisch, M. (Eds.). (2017). *Agile Processes in Software Engineering and Extreme Programming*. In *Lecture Notes in Business Information Processing*. Springer International Publishing. <https://doi.org/10.1007/978-3-319-57633-6>
- Bhatti, M. (2012). *Implementing Scrum in Distributed Teams*. The University of Kansas, 10. <https://kuscholarworks.ku.edu/bitstream/handle/1808/9282/Bhatti%20c%20Muhammad%20EMGT%20Field%20Project.pdf?sequence=1&isAllowed=y>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>
- D.H. Tsai, S., & Lan, T.-T. (2006). *Development of a Startup Business — A Complexity Theory Perspective*. National Sun Yat-Sen University, 1. <https://inficon.com/content/startup-complexity.pdf>
- Diekmann, K. A., Barsness, Z. I., & Sondak, H. (2004). Uncertainty, Fairness Perceptions, and Job Satisfaction: A Field Study. *Social Justice Research*, 17(3), 237–255. <https://doi.org/10.1023/b:sore.0000041292.38626.2f>
- Digital.ai. (2020, May). 14Th annual state of agile report. <https://stateofagile.com/#ufh-i-615706098-14th-annual-state-of-agile-report/7027494>
- Dikert, K., Paasivaara, M., & Lassenius, C. (2016). Challenges and success factors for large-scale agile transformations: A systematic literature review. *Journal of Systems and Software*, 119, 87–108. <https://doi.org/10.1016/j.jss.2016.06.013>
- Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, Phone, Mail, and Mixed-Mode Surveys: The Tailored Design Method* (4th ed.). Wiley.

- Dyba, T., & Dingsoyr, T. (2009). What Do We Know about Agile Software Development? *IEEE Software*, 26(5), 6–9. <https://doi.org/10.1109/ms.2009.145>
- Giardino, C., Wang, X., & Abrahamsson, P. (2014). Why Early-Stage Software Startups Fail: A Behavioral Framework. 27–41. https://doi.org/10.1007/978-3-319-08738-2_3
- González-Cruz, T. F., Botella-Carrubi, D., & Martínez-Fuentes, C. M. (2020). The effect of firm complexity and founding team size on agile internal communication in startups. *International Entrepreneurship and Management Journal*, 16(3), 1101–1121. <https://doi.org/10.1007/s11365-019-00633-1>
- Green, P. (2011). Measuring the Impact of Scrum on Product Development at Adobe Systems. 2011 44th Hawaii International Conference on System Sciences, 1. <https://doi.org/10.1109/hicss.2011.306>
- Haase, A., & Eberl, P. (2019). The Challenges of Routinizing for Building Resilient Startups. *Journal of Small Business Management*, 57(sup2), 579–597. <https://doi.org/10.1111/jsbm.12511>
- Hackman, J. R. (1980). Work redesign and motivation. *Professional Psychology*, 11(3), 445–455. <https://doi.org/10.1037/0735-7028.11.3.445>
- Hanaysha, J., & Tahir, P. R. (2016). Examining the Effects of Employee Empowerment, Teamwork, and Employee Training on Job Satisfaction. *Procedia - Social and Behavioral Sciences*, 219, 272–282. <https://doi.org/10.1016/j.sbspro.2016.05.016>
- How TRUMPF Used Scrum to Drive Its Agile Transformation. (2019). Scrum.Org. <https://www.scrum.org/resources/how-trumpf-used-scrum-drive-its-agile-transformation>
- Is a Rigorous Agile Methodology the Best Development Strategy for Small Scale Tech Startups? (MS-CIS-13-01). (2013). Alex Yau, University of Pennsylvania. https://repository.upenn.edu/cis_reports/980/
- Jeon, H., & Choi, B. (2012). The relationship between employee satisfaction and customer satisfaction. *Journal of Services Marketing*, 26(5), 332–341. <https://doi.org/10.1108/08876041211245236>
- Kaim, R., Härting, R. C., & Reichstein, C. (2019). Benefits of Agile Project Management in an Environment of Increasing Complexity—A Transaction Cost Analysis. *Intelligent Decision Technologies 2019*, 195–204. https://doi.org/10.1007/978-981-13-8303-8_17
- Kautz, K., Johansen, T. H., & Uldahl, A. (2014). Creating Business Value through Agile Project Management and Information Systems Development: The Perceived Impact of Scrum. *Creating Value for All Through IT*, 150–165. https://doi.org/10.1007/978-3-662-43459-8_10
- Kautz, K., Johansen, T. H., & Uldahl, A. (2014b). Creating Business Value through Agile Project Management and Information Systems Development: The Perceived Impact of Scrum. *Creating Value for All Through IT*, 150–165. https://doi.org/10.1007/978-3-662-43459-8_10

- Krill, P. (2010, January 23). Agile software development is now mainstream. InfoWorld. <https://www.infoworld.com/article/2629463/agile-software-development-is-now-mainstream.html>
- L. Williams and A. Cockburn, "Agile Software Development: It's about Feedback and Change," in *IEEE Computer*, vol. 36, issue 6, pp. 39–43, 2003. DOI: 10.1109/2.947100
- LIU, Y. I. N. G. C. H. E. N. (2018). SCRUM IN CONSTRUCTION INDUSTRY TO IMPROVE PROJECT PERFORMANCE IN DESIGN PHASE. Harrisburg University of Science and Technology, 4. https://digitalcommons.harrisburgu.edu/pmgt_dandt/31/
- LRN Transitions to Scrum to Deliver More Value with its “Scrum Loaded” Initiative. (2019). Scrum.Org. <https://www.scrum.org/resources/lrn-transitions-scrum-deliver-more-value-its-scrum-loaded-initiative>
- LeCompte, M. D., & Goetz, J. P. (1982). Problems of Reliability and Validity in Ethnographic Research. *Review of Educational Research*, 52(1), 31–60. <https://doi.org/10.3102/00346543052001031>
- Lei, H., Ganjeizadeh, F., Jayachandran, P. K., & Ozcan, P. (2017). A statistical analysis of the effects of Scrum and Kanban on software development projects. *Robotics and Computer-Integrated Manufacturing*, 43, 59–67. <https://doi.org/10.1016/j.rcim.2015.12.001>
- Lund, D. B. (2003). Organizational culture and job satisfaction. *Journal of Business & Industrial Marketing*, 18(3), 219–236. <https://doi.org/10.1108/0885862031047313>
- Mann, C., & Maurer, F. (2005). A case study on the impact of Scrum on overtime and customer satisfaction. *Agile Development Conference (ADC'05)*, 1. <https://doi.org/10.1109/adc.2005.1>
- MartÁn, M. Á. A. (2020, April 10). *post_title*. Gestion.Org. <https://www.gestion.org/cual-es-el-ciclo-vital-de-una-startup/>
- Matharu, G. S., Mishra, A., Singh, H., & Upadhyay, P. (2015). Empirical Study of Agile Software Development Methodologies. *ACM SIGSOFT Software Engineering Notes*, 40(1), 1–6. <https://doi.org/10.1145/2693208.2693233>
- Matzler, K., Fuchs, M., & Schubert, A. (2004). Employee Satisfaction: Does Kano's Model Apply? *Total Quality Management & Business Excellence*, 15(9–10), 1179–1198. <https://doi.org/10.1080/1478336042000255569>
- Rehman, F. U., Maqbool, B., Riaz, M. Q., Qamar, U., & Abbas, M. (2018, April). Scrum Software Maintenance Model: Efficient Software Maintenance in Agile Methodology. 2018 21st Saudi Computer Society National Computer Conference (NCC). <https://doi.org/10.1109/ncg.2018.8593152>

- Rising, L., & Janoff, N. S. (2000). The Scrum software development process for small teams. *IEEE Software*, 17(4), 26–32. <https://doi.org/10.1109/52.854065>
- Rubin, K. (2012). *Essential Scrum: A Practical Guide to the Most Popular Agile Process* (Addison-Wesley Signature Series (Cohn)) (1st ed.). Addison-Wesley Professional
- Saunders, M. N. K., Lewis, P., & Thornhill, A. (2015). *Research Methods for Business Students* (7th Edition) (7th ed.). Pearson.
- Scrum Challenges: An Agile Process Reengineering in Software Engineering. (2020). *International Journal of Innovative Technology and Exploring Engineering*, 9(4), 1233–1241. <https://doi.org/10.35940/ijitee.d1567.029420>
- Scrum Guide | Scrum Guides. (2020). Scrumguides. <https://www.scrumguides.org/scrum-guide.html>
- Strategy Under Uncertainty. (2014, August 1). *Harvard Business Review*. <https://hbr.org/1997/11/strategy-under-uncertainty>
- T. (2021). *Foundations of Mixed Methods Research* Teddlie. Sage Publications, Inc.
- Tessem, B., & Maurer, F. (2007, June). Job Satisfaction and Motivation in a Large Agile Team. *Lecture Notes in Computer Science*, 54–61. https://doi.org/10.1007/978-3-540-73101-6_8
- Tomažević, N., Seljak, J., & Aristovnik, A. (2014). Factors influencing employee satisfaction in the police service: the case of Slovenia. *Personnel Review*, 43(2), 209–227. <https://doi.org/10.1108/pr-10-2012-0176>
- Tomy, S., & Pardede, E. (2017). Opportunity Evaluation Using Uncertainties in Software Entrepreneurship. *Entrepreneurship Research Journal*, 7(3). <https://doi.org/10.1515/erj-2016-0044>
- Ugboro, I. O., & Obeng, K. (2000a). Top management leadership, employee empowerment, job satisfaction, and customer satisfaction in TQM organizations: an empirical study. *Journal of Quality Management*, 5(2), 247–272. [https://doi.org/10.1016/s1084-8568\(01\)00023-2](https://doi.org/10.1016/s1084-8568(01)00023-2)
- Zaech, S., & Baldegger, U. (2017). Leadership in start-ups. *International Small Business Journal: Researching Entrepreneurship*, 35(2), 157–177. <https://doi.org/10.1177/0266242616676883>

APPENDICES

Appendix 1. Survey statements

1. Scrum activities help me better understand the vision and objectives of each project.
2. Scrum makes my role clear to fulfill my company objectives.
3. Scrum decreases the collaboration between team members.
4. Scrum helps to create a friendly environment with other team members.
5. I think the Scrum framework makes everyone's responsibilities more clear.
6. Using the Scrum framework gives me more freedom to make proper decisions to do a better job.
7. Scrum increases the transparency at the company.
8. Scrum gives me more authority to share my constructive feedback with other team members.
9. Scrum meetings provide more information for team members to make better decisions.
10. I feel I create higher-quality products and more value by using the Scrum framework.
11. Scrum pushes me to go beyond my limits to be more productive.
12. Scrum helps hard workers get recognized faster at the company.
13. By using Scrum, my opinions are heard and valued by managers.
14. Scrum helps to distribute the work between team members evenly.
15. I feel more involved in decision-making when the company I'm working for uses Scrum.
16. Scrum provides me more opportunities to improve my skills besides doing my regular tasks at work.
17. Scrum meetings allow me to get more constructive feedback from others
18. By using the Scrum framework, I feel more praised when I do a good job at the company.
19. Scrum improves the balance between my work and personal life.
20. Scrum increases my stress level during working time.
21. By using Scrum, employees are treated more equally at the company.
22. I think using the Scrum framework brings value to my company.
23. Scrum has negative effects on my company's culture.

24. I think Scrum is a suitable software project management framework for my company.
25. I prefer using other software project management frameworks over Scrum at my company

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