American International University-Bangladesh (AIUB)

Improving SDLC Model (SCRUM)

Mehedi Hasan Talha (19-39597-1)

Tanvir Ahmed (19-39324-1)

Nusrat Jahan Mou (19-39583-1)

Dilruba Khanam Jesey (19-39979-1)

A Thesis submitted for the degree of Bachelor of Science (BSc)
in Computer Science and Engineering (CSE) at
American International University Bangladesh in September, 2022

Faculty of Science and Technology (FST)

Abstract

A conceptual framework known as the software development life cycle (SDLC) model describes all of the project's activities, from planning to maintenance. There are various models connected to this process, each of which has a wide range of duties and operations. IT companies all over the world faces some challenges while using those models. Bangladeshi IT companies also faces same kind of troubles. Our main objective is to enhance the Scrum model of the SDLC for Bangladesh's IT industry. Through the research, we gathered some information that can assist various established IT companies in resolving issues related to the SDLC model. According to the survey, poor project management, requirement changes and not having enough expertise are the most annoying barriers to software project success. These problems will be resolved by the upgraded Scrum model we provide. Companies that are trying to grow or that are just getting started with their project methodology can benefit from using this model. A corporation can succeed with a competent project methodology.

Declaration by author

This thesis is composed of our original work, and contains no material previously published or written by another person except where due reference has been made in the text. We have clearly stated the contribution of others to our thesis as a whole, including statistical assistance, survey design, data analysis, significant technical procedures, professional editorial advice, financial support and any other original research work used or reported in our thesis. The content of our thesis is the result of work we have carried out since the commencement of Thesis.

. . . .
Mehedi Hasan Talha
19-39597-1
Computer Science & Engineering
American International University-Bangladesh

. . . .
Tanvir Ahmed
19-39324-1
Computer Science & Engineering
American International University-Bangladesh

. . . .
Nusrat Jahan Mou
19-39583-1
Computer Science & Engineering
American International University-Bangladesh

. . . .
Dilruba Khanam Jesey
19-39979-1
Computer Science & Engineering
American International University-Bangladesh

Approval

The thesis titled **"Improving SDLC Model (SCRUM)"** has been submitted to the following respected members of the board of examiners of the department of computer science in partial fulfilment of the requirements for the degree of Bachelor of Science in Computer Science on **(23rd August, 2022)** and has been accepted as satisfactory.

. . . .

Abhijit Bhowmik
Associate Professor & Supervisor
Department of Computer Science
American International University-Bangladesh

. . . .

Rashidul Hasan Nabil
Lecturer & External
Department of Computer Science
American International University-Bangladesh

. . . .

Dr. MD. Abdullah-Al-Jubair
Assistant Professor & Head (Undergraduate)
Department of Computer Science
American International University-Bangladesh

. . . .

Professor Dr. Dip Nandi
Director
Faculty of Science & Information Technology
American International University-Bangladesh

. . . .

Dr. Tafazzal Hossain
Dean
Faculty of Science & Information Technology
American International University-Bangladesh

Acknowledgments

First of all, we would like to thank Almighty Allah for his favor in allowing us to successfully finish our thesis on schedule. We would like to sincerely thank the Faculty of Science & Information Technology for continuing to include thesis and project credit in the graduating program's curriculum and for our area of knowledge collection.

We would like to express our sincere gratitude to our thesis supervisor, **Abhijit Bhowmik**, for his kind encouragement, direction, constructive criticism, supervision, instructions, advice, and for inspiring us to finish our thesis.

We would also like to thank **Rashidul Hasan Nabil**, lecturer at American International University Bangladesh, for his assistance and contributions as well as for his prior understanding of this position.

Additionally, we would like to express our gratitude to each and every one of our former instructors and course coordinators. They are always willing to patiently assist us with anything pertaining to our thesis.

Keywords

scrum, sdlc, agile, it, improved, bangladesh

Contents

List of Figures

List of Tables

List of Abbreviations and Symbols

Abbreviations	
CS	Computer Science
CSE	Computer Science and Engineering
IT	Information Technology
HCD	Human Centered Design
SDLC	Software Development Life Cycle
FST	Faculty of Science & Technology
etc.	*etc.*

Chapter 1

Introduction

1.1 Core Background Study

The software development life cycle is a technique designed to assist engineering teams in producing high-quality software at the lowest possible financial and human resource cost. Understanding what clients want and then doing a gap analysis based on their demand are necessary for improving software development life cycle models. We are already aware of the significant processes involved in the software development process. Planning, Design, Prototyping, Testing, Deployment, and Maintenance are some few examples. Some of the most frequent questions clients have about their software products are if the items will be delivered on time or within budget, and so on. The country's development teams use SDLC to structure their processes and consistently produce high results. Because SDLC is so significant in software development, we must look for ways to improve the models so that clients may utilize the products with fewer complaints and greater efficiency. We attempted to do so in our research.

There is an essential factor of SDLC which is data integrity. Data integrity is a critical component of any successful software development life cycle. The information we're looking at here is about what a development team is working on and how it corresponds with the company's strategic goals. Unfortunately, engineers are today confronted with a data integrity dilemma. According to a recent survey, In 75 percent of businesses, 31percent of WIP branches are unconnected. According to the report, leaders are quite likely uninformed of what the remaining 31 percent of their team is working on.

Another reason for a failed SDLC model is that a poorly defined and faulty procedure may damage product quality or cause considerable delays. That is why effective software processes and risk-free project management strategies are critical components of any software development project.

Certain measures must be taken in order to improve any software development paradigm. For example, getting features into the hands of customers faster, improving software application quality, reducing QA testing execution time, reducing time spent conducting re-work and detecting errors at the conclusion of the SDLC, and so on.

In order to accomplish this, we ran a survey in which we asked some questions of various software industries. The majority of them employ the agile method.

1.2 Research Motivation and Objective

This study article primarily surveys the types of SDLC deployed. Bangladesh's IT industry and the problems with the SDLC they use In Bangladesh, the use of the software is growing daily, and at the same time, the gaps in the SDLC process are also expanding. When a software project is developing, the software industry encounters daily issues. Not many studies specifically address Bangladesh's IT businesses, according to Bangladesh. We shall therefore attempt to identify the critical aspects of SDLC problems. As a result, it is difficult to find remedies to lessen the impact of the problems on Bangladeshi IT industries.

We surveyed numerous well-known vintage IT firms. We questioned their experiences with various software modelling approaches in this chapter. Furthermore, they frequently employ strategies in their projects, including Working on a questionnaire survey and a literature review to attain our aim. We picked well-known software firms in Bangladesh to conduct our survey questions. After considering their proposals, we determined the essential components of the software. For the inquiry, we generated a swarm of infographics. Our principal purpose in using survey data and infographics is to assist different age IT firms in determining the ideal path for their project growth. Firms will be more efficient in selecting appropriate software development methodologies for their work in the future due to collecting survey data and information. Furthermore, firms will profit from this research report by better understanding the distinct eras of their company's project work system via the employment of various software development model strategies.

Chapter 2

Literature Review

2.1 Introduction

This chapter covers the literature review which focuses on upgraded Scrum model. Scrum is a project management methodology used mostly in agile software development that is gradual and iterative. The scrum technique suggests functional software, adaptability to change, and new business realities in addition to rising communication and collaboration trends. Scrum is a framework for managing teamwork and product development that is centered on the creation of new products. Contrary to popular misconception, Scrum is not a project management technique. Scrum gauges the success of that development by the value that is continuously contributed to the product. The Scrum technique ensures that the client can track progress by releasing new features every few weeks. These brief sprints enable teams to accomplish smaller objectives as they progress toward project completion. One of the many components of the Agile methodology is Scrum. Software development processes can now produce high-quality software in the shortest amount of time thanks to Scrum. Since Scrum is a component of the Agile methodology, it shares many of the same fundamental productivity tenets.

The goal of the study is to establish a technique that uses Scrum to handle the managerial aspects of the software development lifecycle. Scrum is chosen since it has established itself as the best Agile methodology. Because there is less control over the overall flow, the majority of software projects fail. A projects may experience certain growing pains after implementing Scrum, including: opposition to change, a return to waterfalling jobs, team's lack of experience, Lack of support for the process from management. Managing change inside an organization is challenging, but in order to succeed, you have methods at your disposal. The gaps in Scrum have been filled, and the proof of adaption shown that Scrum is the finest framework for Agile. The remedy will link the development-related parts of Scrum. A framework for agile software development is provided by Scrum. A product owner, a scrum master, and a cross-functional development team make up a Scrum team. All technical matters and development are the responsibility of the development team. The product owner directs the project's course through The scrum master oversees and helps the process of ranking requirements interaction. The development process is carried out through a number of sprints. Team members collaborate during ceremonies that are repeated after each sprint or even each day Scrum is a management framework for development at its core rather than a process of development, work Its distinguishing features are numerous instead of iterations and daily standup meetings. In order to define, prioritize, schedule, and assess development activity, the Scrum management framework for software development creates a control loop between the product owner and the development team. Each iteration includes planning, development, testing, and verification and is a little waterfall project or miniature V-model. The iterations, or sprints, that are repeated throughout the Scrum process are its central component. There must be traceability between system/code and backlog items when creating safety-critical systems.

2.2 Related Works

The software development life cycle (SDLC) model has been widely studied and investigated, and other proposals for the improved Scrum model have also been put forth. This study was conducted in preparation for conducting a systematic review, also known as an SLR or SR. A systematic review requires a number of steps, including the identification and selection of primary studies as well as the creation of a review methodology. Since ”Scrum” is the most extensively used agile project management methodology and focuses on daily project management, we selected it. In this review, we primarily look into software project management-related agile approaches. Recently, a rising number of GSD project managers have also given Scrum principles in their development environment considerable consideration.

For a modest software development project, Singhto and Denwattana [1] designed a hybrid approach, a fusion of the conventional waterfall methodology and agile Scrum. In terms of user satisfaction, meeting timelines, and on-time delivery, they were successful. It also addressed issues with bad design. The HERMES 5 sequential process model and the Agile Scrum methodology were combined, with the main emphasis being on requirements engineering, by Schar at al. [2] Explicit security procedures are missing from the Scrum process model.

In order to better engagement with users, Larusdottir et al. [3] and [4] suggested integrating user-centered systems design (UCSD) activities and practices with Scrum the software's usability and user experience. Numerous academics have examined and attempted to comprehend the circumstances in which Agile and UCSD might cooperate. Gupta et al. [5] have changed the development Scrum by incorporating some of the cutting-edge techniques with it. They investigated the internationally dispersed goods and evaluated how evolving techniques affected the quality of the code, cost, a product's quick market entry, and scaling up new users.

In their article [6], V.Kulkarni and colleagues explore and explain the reasons why agile techniques cannot be used with model-driven engineering. They then suggest a change that might be made to agile methodologies to enable MDE. In fact, the new software development method described in this study integrates Scrum and MDE. The authors of this technique suggested using Meta Sprints, which run concurrently with Sprints, to validate models. They suggested two to three months for these Meta Sprints, during which clients would need to provide input on models and prototyping, which goes against the ideals of agility. In actuality, agility advises that client input be given in a period shorter than what was suggested in this strategy.

Scrum has already been proven to be a successful project management method when working with numerous small, nearby development teams [7]. Scrum can be applied to big, dispersed teams, according to Sutherland and Schwaber [8]. Scrum teams are generally seen as effective for co-located projects with a small team size because they are self-organized, supported by robust communication, and promote a collaborative environment. Thus, it appears that the physical isolation of the development team members makes it challenging to adopt Scrum techniques in GSD projects. Other GSD project contextual elements, such as the number of distributed sites, the kind of collaboration, such as intra- or inter-organizational, the number of teams, the size of the project's team, and socio-cultural distance, may also have an impact on Scrum team collaboration processes.

According to a recent survey on the adoption rate of agile techniques, team members that are far dispersed can implement agile practices with success. According to the results of another survey, project management techniques like Scrum are more often used than other agile techniques. Thus, we may contend that Scrum, as an agile methodology, is gaining popularity and can be applied to teams that are spread across the globe. However, the real procedure for substituting Scrum's collaborative practices for the distribution of project stakeholders is not well known. Due to the global project, we have chosen to research, investigate, and explain numerous difficult problems that limit the implementation of Scrum principles. Also investigated are current mitigation measures for these problematic elements.

Agile methodologies are generally regarded as beneficial for projects with significant levels of uncertainty [7]. According to Paasivaara et al. [9], remote software development projects with erratic needs and unreliable implementation technologies can make good use of a variety of agile management techniques. Scrum's creators recommended progressive planning and development utilizing controls to manage the process and its inherent risks since they assumed that the development process was complex and challenging to forecast. The use of ROI with historical data in agile projects has been tested, and it is advised to utilize it to support Scrum projects and provide ongoing project value analysis in accordance with frequent service or product increments. In a case study on scaling Scrum in a significant worldwide distributed software development project at the multinational telecommunications corporation Nokia, Paasivaara and Lassenius [10], [11] provide an example.

The researchers continue experimenting with Scrum while keeping in mind its advantages and disadvantages. Others have improved the current model, while still others have combined it with other software process models. Some have added new roles and practices to it. The proposed IScrum model aims to develop high-quality software for small to medium-sized projects with co-located teams in the shortest amount of time. The suggested model customizes the requirements engineering processes used in the conventional Scrum framework.

2.3 Conclusion

We have followed two papers such as [PRACTICAL SCRUM-SCRUM TEAM: WAY TO PRODUCE SUCCESSFUL AND QUALITY SOFTWARE] and [ISCRUM: AN IMPROVED SCRUM PROCESS MODEL] to establish our model. The model we proposed implements a method that, if 70% of the project is completed, then no more project requirements will be collected, which will solve the problem of requirement changes. The increased size of the Scrum team will ensure enough technical expertise. The purpose of this paper is to propose a customized version of Scrum that will enhance team performance, documentation, and the visibility of the work being done, tested, and maintained. To solve the issues while maintaining the integrity and simplicity of the model, the suggested approach proposes modifying and developing the conventional Scrum methods and responsibilities.

Chapter 3

Research Methodology

3.1 Introduction

The survey we conducted, we found out that Agile is the most used methodology in Bangladesh. Waterfall, Iterative, V Model, Spiral and other software models are also used in Bangladesh, but in a minimum quantity.

There were 10 questions in the survey we conducted. The questions were related to which software models are used mostly in Bangladesh and what are difficulties faced during implementing these models. All of the survey's questions were open-ended. The rest of the questions only allowed one answer, while one answer was permitted for one question.

3.2 Problem Finding

According to the survey report, most of the companies faces poor management as a reason behind project failure. Project requirement change also fails a project. Not having enough expertise is also a reason. The figure 3.1 shows the project failure reasons(According to the survey).

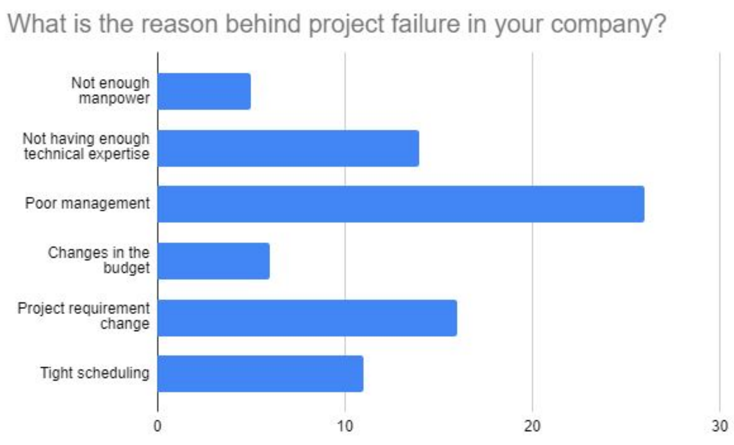


Figure 3.1: Reason behind project failure

The companies which participated in the survey, a good number of them were new companies(0-5 years). But there were many companies with lot of experiences.

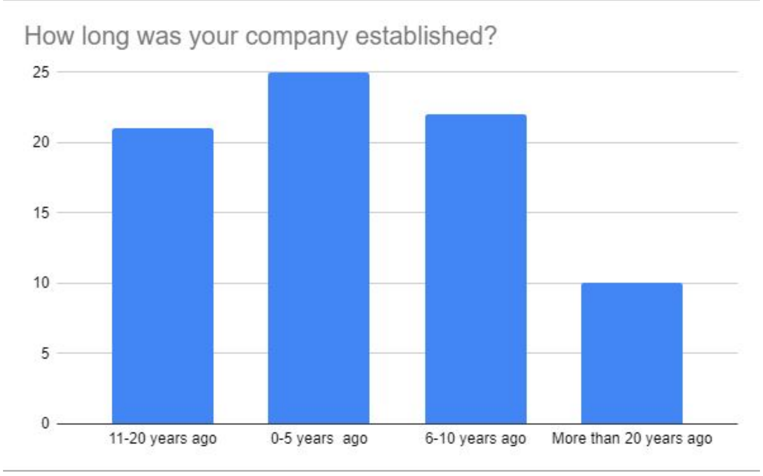


Figure 3.2: Age of the companies

According to the survey, Agile is the most used methodology. And Scrum is one of the most used Agile method [12].

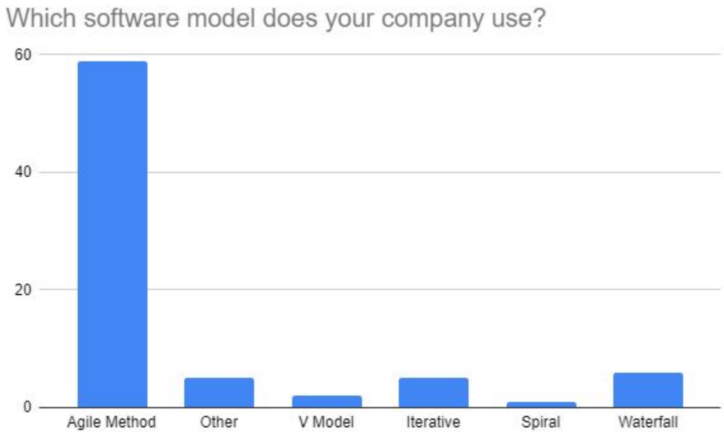


Figure 3.3: Most used models in Bangladesh

3.3 Proposed Model

This paper is focused on 3 major problems while using Scrum in Bangladesh. These are Poor Management, Requirement Changes and Not having enough expertise. Here we followed [13] and [12] to solve these issues.

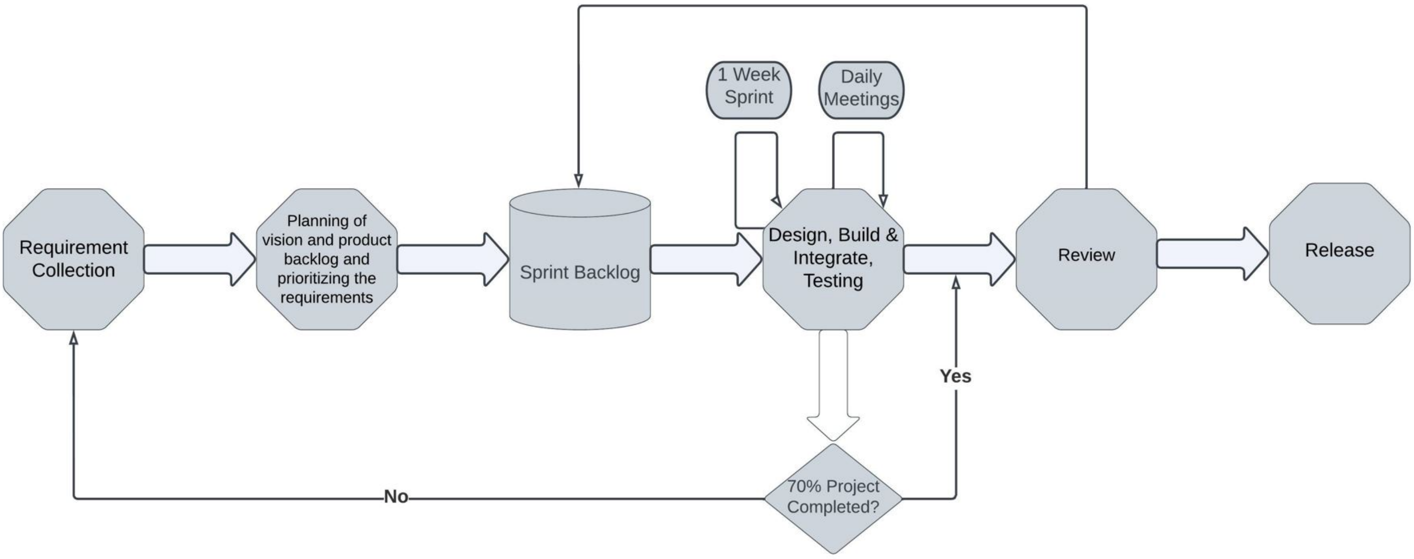

Requirement Collection
Planning of vision and product backlog and prioritizing the requirements
Sprint Backlog
1 Week Sprint
Daily Meetings
Design, Build & Integrate, Testing
Review
Release
Yes
No
70% Project Completed?

Figure 3.4: Proposed Improved Scrum Model

The model created above figure 3.4, will solve the issues that the software companies in Bangladesh suffers. Software projects can be categorized by considering a range of factors referring to the development team, process, technology, and the software product itself: the size and experience of a development team, the schedule, the development methodology and tools, the size and complexity of the software, the hardware platform on which the software will run, the required reliability level, etc [14].At first, all the requirements are collected. But requirement collection is a continuous process [15]. So, here we propose, if 70% of the project is completed then no more requirement will be collected. This method will help reduce the requirement change problem. The three main steps of a typical SCRUM-like process are Inception, Development, and Deliver [16]. Another major reason behind project failure was not having enough expertise. Individual knowledge and quality are needed in agile processes [17].This problem is also solved in section 3.3.1. If this model is implemented correctly, the project failure percentage will be lower.

3.3.1 Scrum Team Structure

The Scrum team typically has 3 to 9 professionals and is small in size [12]. But here we propose to increase the size of the Scrum team. The team members includes Scrum Master, Product Owner, Developers, Database Specialist and Testers. The count of these members are shown here 3.1.

Scrum Master

Setting up Scrum according to the Scrum Guide's definition is the responsibility of the Scrum Master. They achieve this by assisting everyone in the Scrum Team and the organization in understanding Scrum theory and practice [18]. Only One Scrum Master is enough in a project. The Scrum Master shall arrange meetings. The meetings with a length of 90 minutes is convenient [19].

Roles	Count
Scrum Master	1
Product Owner	1
Developers	6
Database Specialist	2
Tester	2

Table 3.1: Scrum Team

Product Owner

A Scrum Product Owner is responsible for increasing the value of the final product that the Scrum Team produces [20]. He shall check the sprint backlogs. Order the backlogs to be completed.

Developers

In our proposed model, we added 6 developers in the Scrum team who will develop the system. The developer team may consists of backend, frontend or full stack developers. The developer team shall have meetings everyday.

Database Specialists

Database specialists are responsible for creating, updating and managing the databases. According to the project need, 1 or 2 database specialists are enough for a project.

Testers

Here we add 1 tester per 3 developers. But if the number can be increased or decreased. Scrum of Scrums used 1 tester per 2 developers [12].

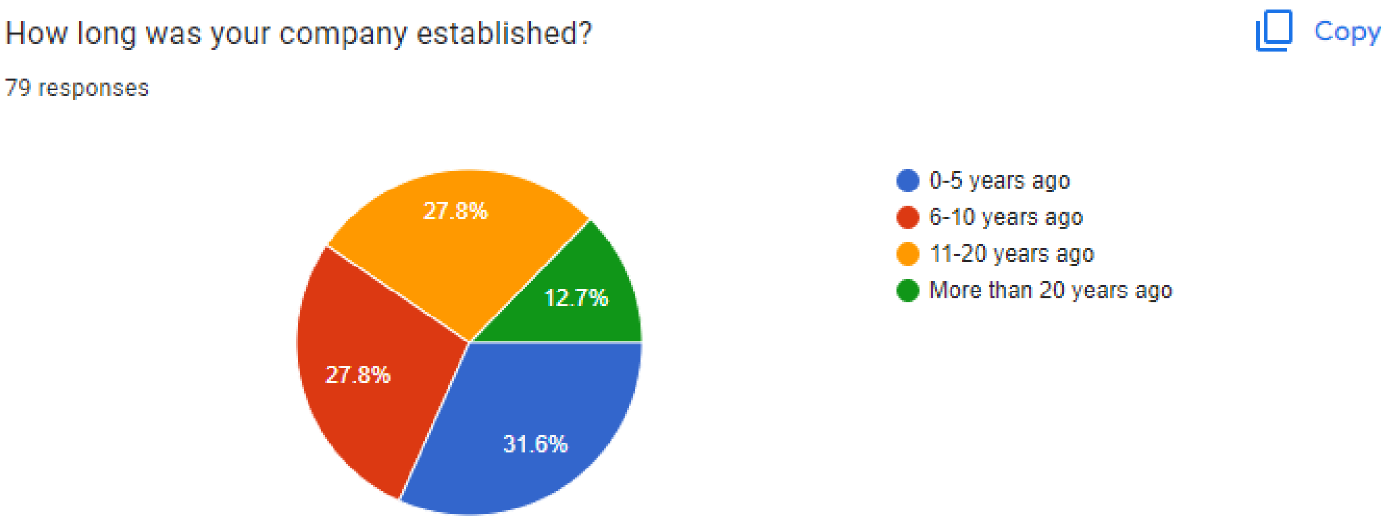
Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper.

Chapter 4

Results or findings

4.1 Survey Results

We conducted a survey for our research, asking different questions about how our country's software development life cycle could be improved. While creating the survey questions, we have tried to relate them to the prior literature reviews and proposed a way that can help us improving the software development models. And we did that with the help of the survey responses. After that, we came up with a solution for how we can enhance the software models after receiving the responses from the companies in the Research Methodology part and proposed an improved model. We will describe the data we obtained from the survey in this section.

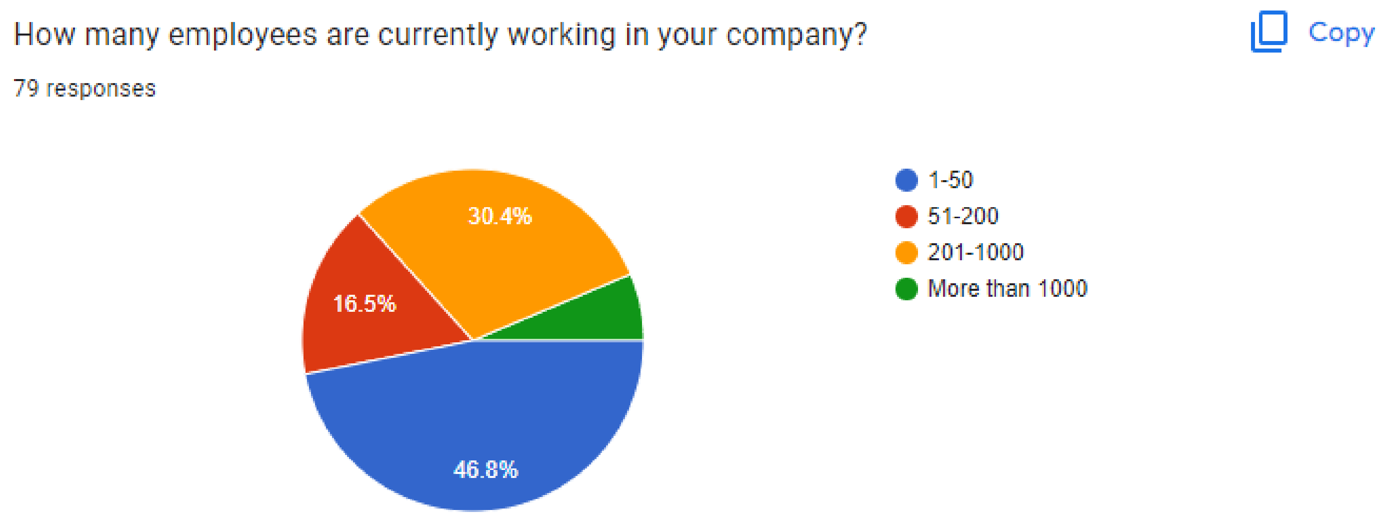


How long was your company established?

79 responses

Figure 4.1: Company's Establishment

We conducted a survey to solicit feedback from many IT-related software companies on how to improve software development life cycle models. We sent emails to well-known and prestigious software companies in our country. As an outcome, we received nearly 80 responses. Our first question was, "How long was your company established?" As a result, 31.6 percent of people said their company was founded 0-5 years ago, while 27.8 percent said it was founded 6-10 and 11-20 years ago. Finally, 12.7 percent of respondents stated that their company was founded more than 20 years ago.

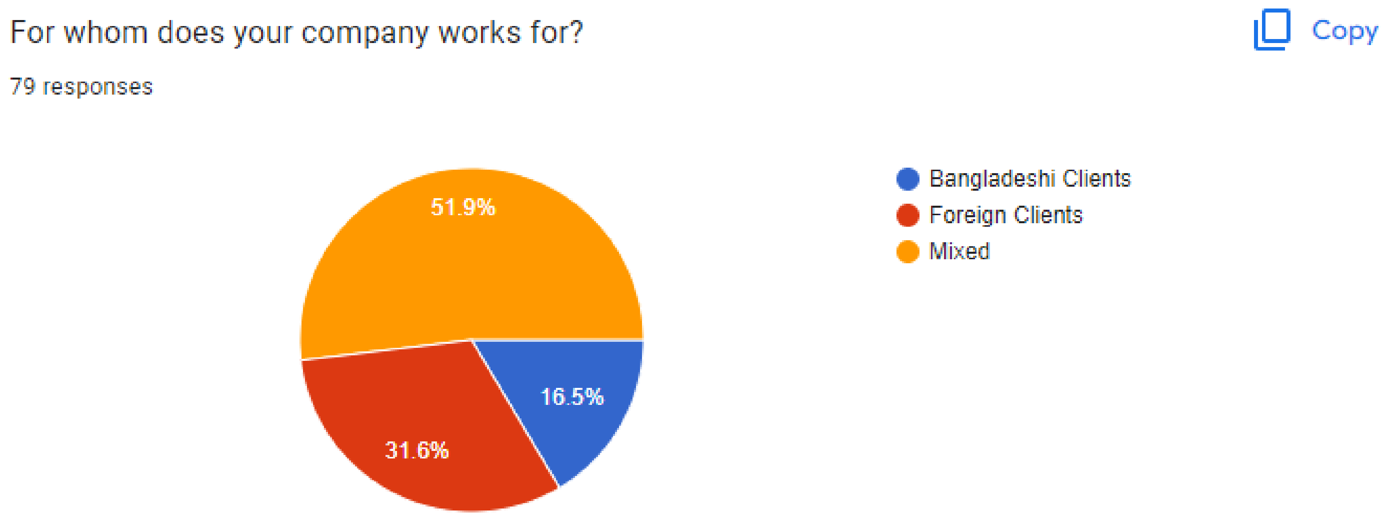


How many employees are currently working in your company?

79 responses

Figure 4.2: Number of Employees

Our second question concerned the percentage of total employees who are currently employed by their company. The response was clear. The majority of respondents said their employee number is 1-50. The average figure is 46.8 percent. The rest of the people said their employee numbers are 51-200 and 201-1000. The percentages are 16.5 and 30.4 percent, respectively. And the rest of them responded that their company employs over 10,000 people. The main goal of this question was to determine the average number of employees working in various companies, which is an important part of our research. The number of employees in various IT companies can provide the specific plans, ideas or records.



For whom does your company works for?

79 responses

Figure 4.3: Company Working for Different Clients

We questioned the companies about whether they serve both foreign and Bangladeshi customers. The majority of them stated that they worked for both foreign and Bangladeshi clients. Only 16.5 percent of businesses work for Bangladeshi clients, compared to 31.6 percent of companies that work for foreign clients. We wanted to find out how many of the companies serve Bangladeshi clients and how many serve foreign clients, so we asked this survey question. Since more companies work for foreign clients than for Bangladeshi ones, we can get a better sense of how to improve the SDLC model in our country because these companies have ideas for improvement as they work for foreign clients and can get a sense of what foreigners think of the improvement of SDLC model.

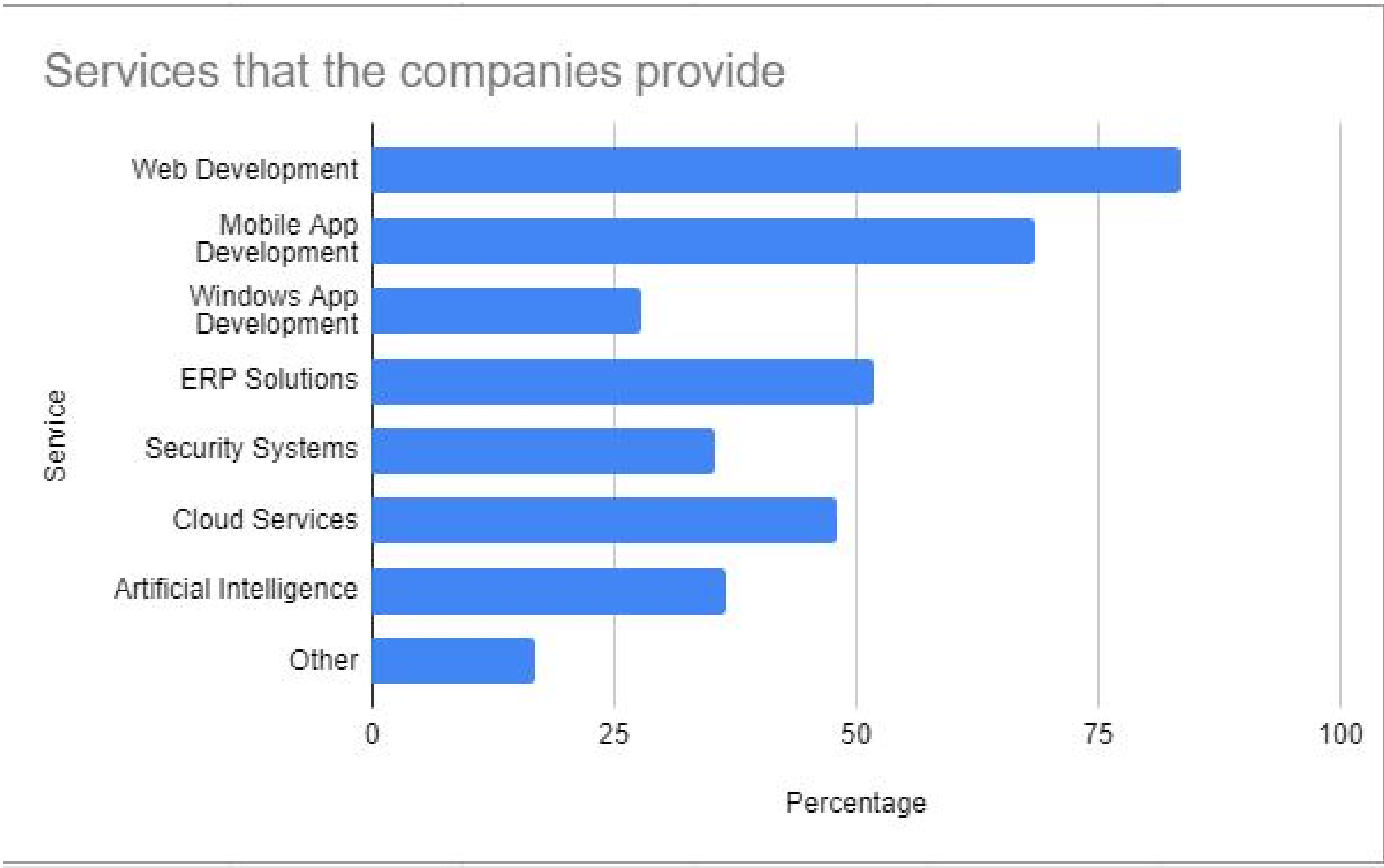
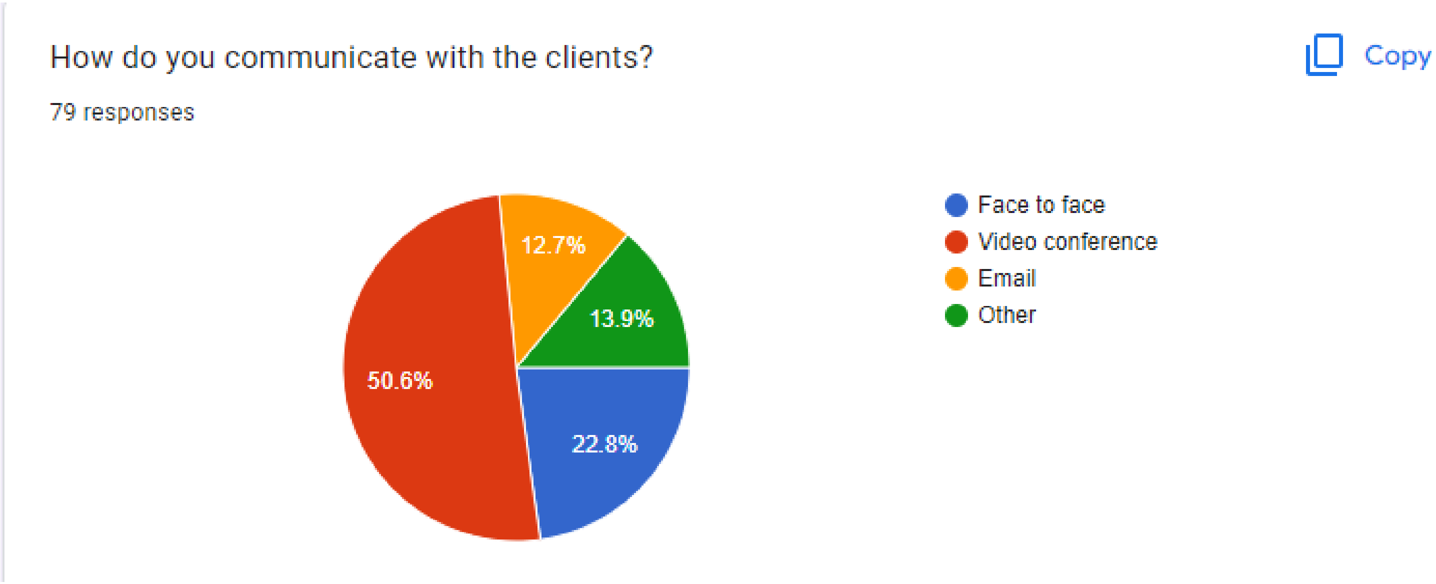


Figure 4.4: Provided Services

We have asked the companies what services they offer to clients. Web development, mobile app development, Windows app development, ERP solutions, security systems, cloud services, and artificial intelligence were the options that we provided. In order to give them the opportunity to list any additional services their company offers, we also created the option ”Others.” We can therefore see that approximately 83.5 percent of respondents indicated that their company offers web development as a service. However, 68.4 percent of respondents said that their company offer mobile app development as a service. 27.8 percent of respondents suggested Windows app development, and nearly 51.9 percent suggested ERP solutions. Finally, 48.1 percent and 36.7 percent of companies said they provide cloud services and artificial intelligence as a service, respectively. Security systems were provided by 35.4 percent of company owners. The remainder of the group responded by selecting a the ‘Others’ option and outlining the services that their company actually offers. We identified which company offers which services from this survey question, and we can now use those services to help us improve our model.

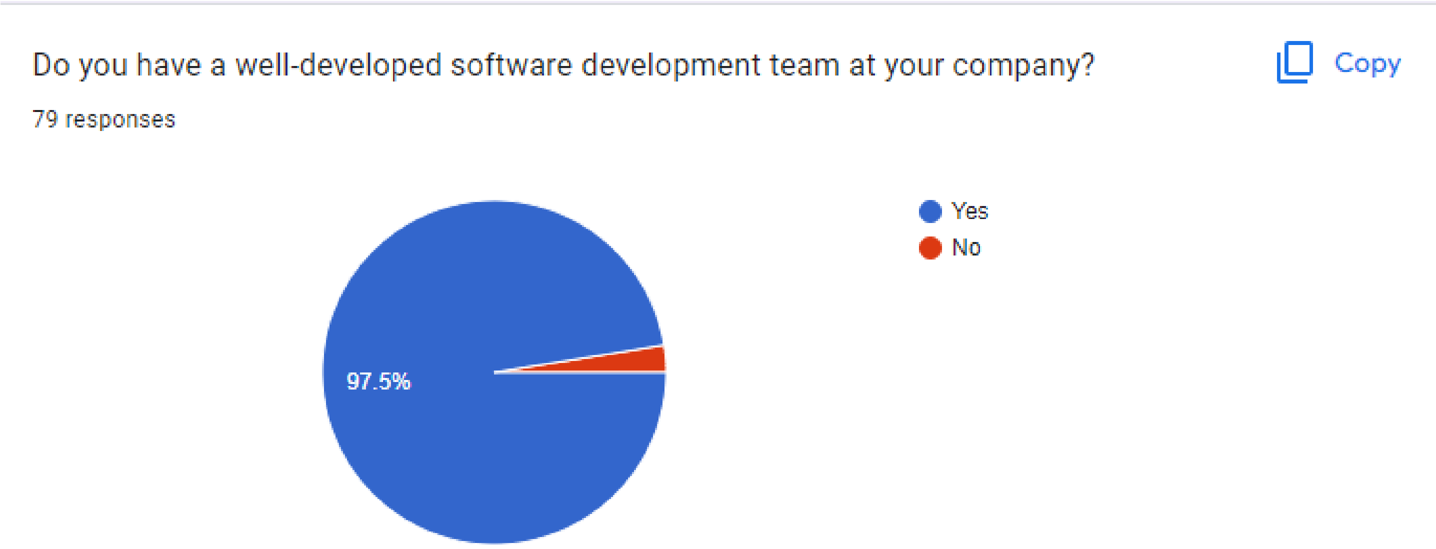


How do you communicate with the clients?

79 responses

Figure 4.5: Communication with Clients

We added a question about how the company communicates with their clients to the survey question. The majority of them responded that they prefer to speak with clients is via video conferencing, and the second majority said that they prefer to interact face to face. In response to a survey, about 12.7 percent of respondents said they prefer email for communication, while the remaining respondents said they prefer other methods. Companies prefer video conferencing over all other methods of client communication because it increases productivity, saves time, lowers travel costs, and generally encourages collaboration. Face-to-face communication is preferred by many other companies because it fosters relationships between team members, their manager, and both because it increases confidence and trust. The others favor email because it boosts productivity, efficiency, and business readiness.

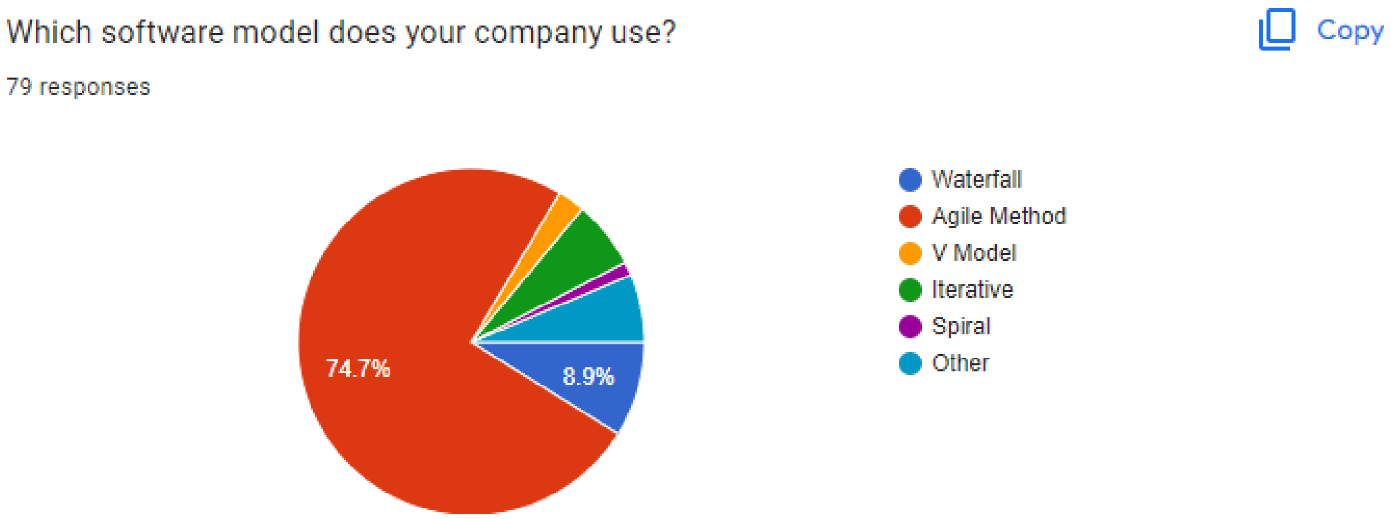


Do you have a well-developed software development team at your company?

79 responses

Figure 4.6: Development

We then inquired as to whether the company owners had highly skilled software development teams working for them. Nearly 97.5 percent of them gave their approval. Few of them claimed to lack a competent software development team.

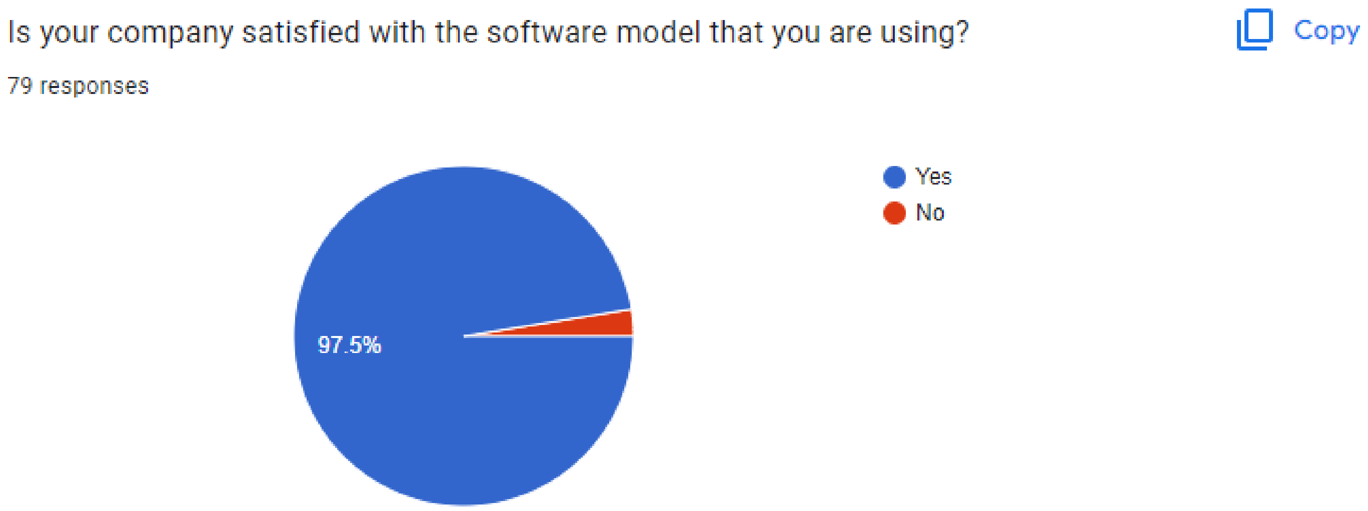


Which software model does your company use?

79 responses

Figure 4.7: Software Models

We then asked them which software models their company uses. The majority of them claimed to employ the Agile method, one of the most widely used models in the software development life cycle. The spiral model and the V model are among those that least frequently used. The waterfall model is the second-most popular model among companies. The iterative model is used by 6.3 percent of people, while the remaining people use other models.

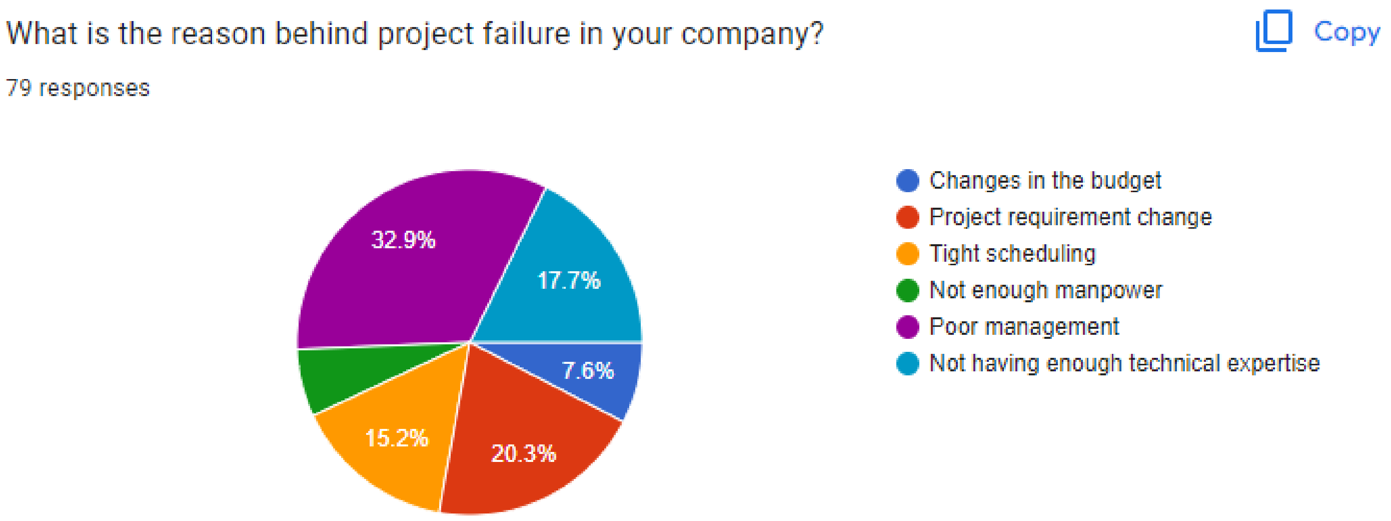


Is your company satisfied with the software model that you are using?

79 responses

Figure 4.8: Satisfaction of Companies about the Models

The owners of the companies were then questioned about their satisfaction with the software model they were utilizing. Nearly all of them expressed satisfaction. Only a few of them expressed dissatisfaction.

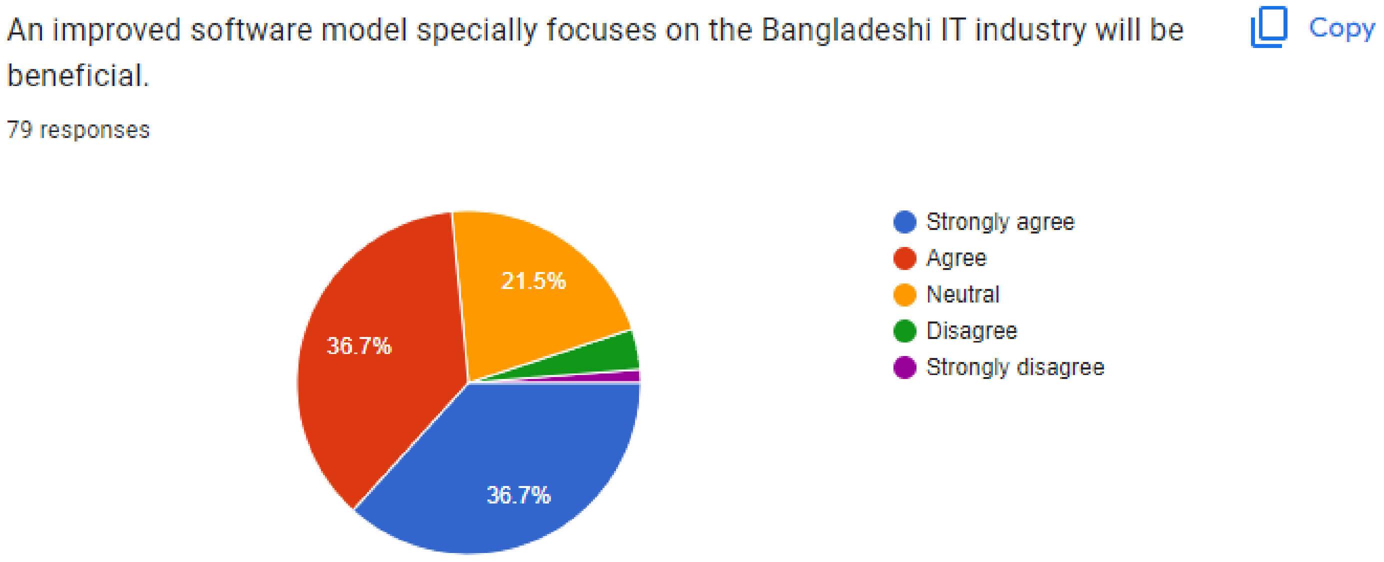


What is the reason behind project failure in your company?

79 responses

Figure 4.9: Project Failure Reason

There are numerous potential causes of software failure. We questioned the companies about the causes of project failure in their organization. Nearly 32.9 percent of them claimed that poor management is to blame for project failures in their organization. The second majority responded that project failure was due to project requirements changing. According to 17.7 percent of software companies, this issue is caused by a lack of technical expertise, and 15.2 percent of software company owners believe that tight scheduling is to held responsible for project failure. The least people thinks that budget changes are to blame for this issue. And the rest of them believe that the problem is a lack of manpower.



An improved software model specially focuses on the Bangladeshi IT industry will be beneficial.

79 responses

Figure 4.10: Improved Software Model

”An improved software model specially focuses on the Bangladeshi IT industry will be beneficial”, we asked the company owners to say in the final round of our survey. The majority of respondents indicated that they agree completely. The same number of people also indicated that they agree with the statement, albeit not strongly. 21.5 percent of respondents had no opinion of the statement. The remainder of them, though a very small percentage, did not agree with the statement at all.

4.2 Result Analysis

We developed a solution for how to enhance the Scrum model with the aid of the survey we conducted. The agile methodology is the most practical model, in accordance with the findings of the survey and the opinions of reputable software industry experts. And we are aware that ”Scrum” is the most practical and reliable agile model [12]. Scrum can be effective in Global Software Development. [8]. It adjusts to business and technical challenges to produce the best products [21]. Typically, higher-quality work results from it [22]. We can use this improved Scrum model to solve the problem in our IT industry. Scrum is a framework for team collaboration. Scrum encourages teams to learn from experiences, self-organize while working on a problem, and reflect on their wins and losses to continuously improve, much like a rugby team practicing for the big game [23]. Therefore, we should utilize our improved Scrum model as effectively as possible in order to get maximum profit.

4.3 Advantage Of Proposed Model

Advantages of the improved Scrum model we propose.:

1. Teams can complete project deliverables more quickly and effectively with the aid of our improved Scrum.
2. Scrum incorporates feedback from customers and decision makers because it is agile.
3. It is higher in quality.
4. Increased capacity to adapt to changes as they take place.
5. The Scrum Master keeps the team motivated and focused.
6. The increased team size will ensure enough technical expertise.

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper.

Chapter 5

Future Work And Conclusion

5.1 Future Work

In this work, we have suggested a model to improve the SDLC model (Scrum) to solve the issues faced using information from a study of the Bangladesh IT industry. By reviewing past literature reviews, we developed the concept. We then identified the hostile management effect areas for the Scrum model that account for the majority of software failure, and we tried to mitigate those impact areas with the suggested approach. A minimum of five positions are needed for our suggested model. For the five roles teams, significant human resources are needed. If new technology is not needed to create the software project, we periodically run out of workers, and the team sits idle. This approach, in our opinion, may be enhanced if future researchers could survey a more significant proportion of businesses. Because we conducted our survey for specific software companies and discovered poor management, we think this model may be improved if future researchers could reach a more significant number of enterprises with their survey. They can also address the shortcomings of this model. It would be preferable if the researchers could conduct in-person interviews and encourage the software companies to divulge the precise reasons why their products fail, release their supporting material, and have open conversations about it.

5.2 Conclusion

For our thesis, we researched several models, including Scrum, agile process models, and others. We extensively studied our issue before starting, reading several papers and books, and learned how important it is for businesses to use the proper project management methodology.Our analysis focused on the firms that needed a sound project approach and were experiencing general problems.We researched to determine if reasonable project management procedures might stop a company from failing. There were several books and articles about agile and other project models, but there was no comprehensive analysis of the ideal project model for American enterprises. The fact that we only examined a small number of subject businesses and their output did not yield a result that all organizations could use, however, limited the scope of our research and findings. The findings may be used for new and existing businesses, but we are also trying to improve them for the following projects.

References

[1] W. Singhto, N. Denwattana, An experience in blending the traditional and agile methodologies to assist in a small software development project, in: 2016 13th International Joint Conference on Computer Science and Software Engineering (JCSSE), IEEE, 2016, pp. 1–5.

[2] B. Schär, S. Jüngling, B. Thönssen, Towards an agile requirements engineering process combining hermes 5 and scrum, in: 2015 International Conference on Enterprise Systems (ES), IEEE, 2015, pp. 98–109.

[3] M. Larusdottir, J. Gulliksen, Å. Cajander, A license to kill–improving ucsd in agile development, Journal of Systems and Software 123 (2017) 214–222.

[4] H. Iqbal, M. F. Khan, Assimilation of usability engineering and user-centered design using agile software development approach, IJ Modern Education and Computer 6 (10) (2014) 23–28.

[5] R. K. Gupta, P. Manikreddy, K. Arya, Pragmatic scrum transformation: Challenges, practices & impacts during the journey a case study in a multi-location legacy software product development team, in: Proceedings of the 10th Innovations in Software Engineering Conference, 2017, pp. 147–156.

[6] V. Kulkarni, S. Barat, U. Ramteerthkar, Early experience with agile methodology in a model-driven approach, in: International Conference on Model Driven Engineering Languages and Systems, Springer, 2011, pp. 578–590.

[7] P. Abrahamsson, O. Salo, J. Ronkainen, J. Warsta, Agile software development methods: Review and analysis, arXiv preprint arXiv:1709.08439 (2017).

[8] E. Hossain, M. A. Babar, H.-y. Paik, Using scrum in global software development: a systematic literature review, in: 2009 Fourth IEEE International Conference on Global Software Engineering, Ieee, 2009, pp. 175–184.

[9] M. Paasivaara, S. Durasiewicz, C. Lassenius, Distributed agile development: Using scrum in a large project, in: 2008 IEEE International Conference on Global Software Engineering, IEEE, 2008, pp. 87–95.

[10] M. Paasivaara, C. Lassenius, Scaling scrum in a large distributed project, in: 2011 International Symposium on Empirical Software Engineering and Measurement, IEEE, 2011, pp. 363–367.

[11] M. Paasivaara, C. Lassenius, Scaling scrum in a large globally distributed organization: a case study, in: 2016 IEEE 11th International Conference on Global Software Engineering (ICGSE), IEEE, 2016, pp. 74–83.

[12] A. Mundra, S. Misra, C. A. Dhawale, Practical scrum-scrum team: Way to produce successful and quality software, in: 2013 13th International Conference on Computational Science and Its Applications, IEEE, 2013, pp. 119–123.

[13] S. Ashraf, S. Aftab, Iscrum: An improved scrum process model., International Journal of Modern Education & Computer Science 9 (8) (2017).

[14] K. Kumar, S. Kumar, A rule-based recommendation system for selection of software development life cycle models, ACM SIGSOFT Software Engineering Notes 38 (4) (2013) 1–6.

[15] Requirements gathering, https://www.inflectra.com/Ideas/Topic/Requirements-Gathering.aspx, accessed: 2022-08-06.

[16] C. Ardito, M. T. Baldassarre, D. Caivano, R. Lanzilotti, Integrating a scrum-based process with human centred design: an experience from an action research study, in: 2017 IEEE/ACM 5th International Workshop on Conducting Empirical Studies in Industry (CESI), IEEE, 2017, pp. 2–8.

[17] U. S. Shah, D. C. Jinwala, S. J. Patel, An excursion to software development life cycle models: an old to ever-growing models, ACM SIGSOFT Software Engineering Notes 41 (1) (2016) 1–6.

[18] What is a scrum master?, https://www.scrum.org/resources/what-is-a-scrum-master, accessed: 2022-08-06.

[19] R. P. Maranzato, M. Neubert, P. Herculano, Moving back to scrum and scaling to scrum of scrums in less than one year, in: Proceedings of the ACM international conference companion on Object oriented programming systems languages and applications companion, 2011, pp. 125–130.

[20] What is a product owner?, https://www.scrum.org/resources/what-is-a-product-owner, accessed: 2022-08-06.

[21] A. Chowdhury, A. Bhowmik, H. Hasan, M. S. Rahim, Analysis of the veracities of industry used software development life cycle methodologies, arXiv preprint arXiv:1805.08631 (2018).

[22] Advantage of scrum, https://www.indeed.com/career-advice/career-development/disadvantages-of-scrum, accessed: 2022-08-09.

[23] Why scrum is useful?, https://www.atlassian.com/agile/scrum#:~:text=Scrum., accessed: 2022-08-09.