Vol. 3 No. 3 (2025)

Spectrum of Engineering Sciences

Online ISSN
3007-3138

Print ISSN
3007-312X

Scrum-Driven Quality Improvement: Mitigating Software Failures Effectively

Noreen Khalid[1]
School of Computer and Information Technology, Lecturer, Beaconhouse National University. noreen.khalid@bnu.edu.pk

Abstract

The pressure on developmental teams increases due to the technical advancement of 21st century, accomplishing the projects within specific time frame. Various Incremental development process initiated to achieve the growing customers' demands. But it is a challenge for developers to opt the best methodology for quality enhancement of Software failure. During this process risk management, right product, time limitation and error rate should be kept in mind to avoid the risk of failure. In this study, one of the most famous agile methodologies, Scrum, was introduced to analyze the improvement of software failures. Through this analysis, we can suggest the implementation of Scrum for quality enhancement of software failures. For further study, researchers can work on Scrum flexibility and use of scrum model in all kind of software; also can work on scrum architecture to improve the performance and efficiency in software development management.

Keywords: Agile Methodology, Scrum, Software Failure, Risk Management

Introduction

In the 21st century, Technology 4.0 plays a pivotal role in designing systems and architectures for developing software for the latest technological gadgets (Schulte, 2025). In the early 1990, Agile methodologies such as Scrum and Kanban developed due the limitation of conventional procedures like waterfall model and spiral model (Jibgah et al., 2025). Agile development methodology has been define as "the constant willingness of a system to change the customers' requirements, positively and immediate grip modify, and discover from alteration while causal to supposed client worth by the means of mechanism and relations along its surroundings". These methodologies provide an iterative and incremental loop, that provides the delivery of final product

Spectrum of Engineering Sciences
Online ISSN
3007-3138
Print ISSN
3007-312X
SPECTRUM OF ENGINEERING SCIENCES

with the continuous interaction with the client, and elaborate the much needed documentation (Zomerdijk & De Waal, 2023).

The most popular technique from agile methodologies is Scrum (Ardilla & Hakim, 2025) and this technique is useful for scrum teams whose role provides a management formwork which directly relies on the teamwork, people in these teams and the way they interact with each other. In this formwork, teams investigate the best ways to get things done, determine the problems to solve them and work with other parts of the organization to solve the issues (Kobiljski, 2025). Product owner is a part of a team and he works together with the team to verify what is needed to be done (Shastri et al., 2021). He selects the most valuable tasks for their further development and provides the highest value of a product at each period of time. The change is more important than buying a new product. All the Scrum elements are developed to make sure that everyone at any period of time has the information needed to make good decisions regarding the project (Weidlich, 2025). In the scrum the entire work has been done base on standards that are essential to whole process and main beliefs of the cooperation. By the use of scrum and continuous improvement scrum generate those standards and rely going on them. There are certain values, meeting point, valor, honesty, assurance and admiration.

Scrum master is needed to have an ideal understanding of the scrum structure and be capable to educate other people the entire explanation of that procedure. Moreover, product owner is a man who is the main concerning person for production the ending decision maker for the squad in a development. The members of work squad obtain an accountability of completion the quantity of labor throughout the whole Sprint. After that the job of members of teams are being evaluated in the form of grouping. The exertion of every single individual is not estimated as it remains the management of a person that is the ideology of scrum advance.

The entire group is accountable for creature of utmost dynamic product, enhancing their effort practice, the significant question conversation serving owner of whole product and many more. The squad is also accountable for the resolve of the extent of employment that

Spectrum of Engineering Sciences
Online ISSN
3007-3138
Print ISSN
3007-312X
SPECTRUM OF ENGINEERING SCIENCES

determine how much work has been completed inside one sprint and for the formation of the addition of the result at the ending of every single sprint.

Software quality highlights the worth of the software. But the low quality software faces risk of failure, if the risks of software remain uncontrolled later on they turned into failures. The reasons of these failure can be the occurrence of certain predictable and unpredictable factors. The problems occur not only during development of the project but also in new projects and also occur in the improvement of existing (COTS) software projects. In the light of above discussion, the scrum model is the best choice for elimination and reducing the various types of failures and also enhance the quality of software development.

Research Questions

The researchers believe that if he wants to adopt the best software engineering method, he will have to compare the method with the existing method, so the following questions can be asked by software personnel.

1. Do the software project management practice requirement risk assessment in software projects?
2. What kind of tool is appropriate for the analysis of failures that occurs in software development?
3. Is the Scrum is suitable for small organizations?
4. What are the measurement goals in an agile software development process?

Objectives of Study

The main reason of that investigation is

1. To view various practice of analysis of failures in software projects.
2. To examine the tools and techniques that is suitable for the quality enhancement of software development.
3. To design the model that can tackle various failures.
4. To deliver the final product in an efficient manner with in limited time, cost and schedule and the development.

This paper is categorized into five sections. Section two consists of related work, 3rd section summarizes methodology and section four

Spectrum of Engineering Sciences
Online ISSN
3007-3138
Print ISSN
3007-312X
SPECTRUM OF ENGINEERING SCIENCES

highlights the results with discussion. Last section comprises the study conclusion.

Related Word

In Agile methodology, Scrum is an emerging technique of software development. In the light of the study of Valpadasu Hema et al. (2020), Scrum produces a well-structured flexible framework for changing in software development in the world of competition and it accommodates swift variations through an iterative and incremental behaviour. Moreover, they highlighted that this approach permits to sustained development, client-oriented advancement, and effective project management, supporting its importance in modern software engineering practices.

The study of Santoso et al. (2025) identified 12 main practices for project success out of 68 Agile practices and they also emphasized on clients feedback, clear management requirement, and team collaboration. In this research, it was concluded that the role of Agile approach for the promotion of flexibility and efficiency remained very crucial to make it a significant approach for software development projects. In software development, the research of Moiseienko et al. (2025) evolved around agile approaches to support several sectors. The analysis of the study about Scrum and Kanban approaches highlights their pros and corns, representing their suitability for various types of project. Additionally, Scrum gives a structured framework along with well-defined roles and sprints, Kanban stresses continuous workflow management. The Agile practices in form of task tracking, collaboration, and workflow visualization are considered more crucial in the presence of project management tools like Jira, Trello, and Work section. The findings of this study underscores the increasing implication of agile technique in modern project management which make the teams more efficient and suitable.

This paper mainly focuses on the development of management that provides the framework of scrum for the Research and development process. The proposed model describes five main dimensions the abilities, social networking, choices, results, information results. The framework of scrum implement hybrid model where the work is done by

Spectrum of Engineering Sciences
Online ISSN
3007-3138
Print ISSN
3007-312X

the combination of technical experts as well as according to the needs of staff members. Every team member accepts the work according to their interest and specialization and expertise and keeping in view the available time limit, the required staff and the deadline. It shows that the capable software engineer can manage their work with low budget. In other hand the most talented can work with high technical expert can work within order to produce high yield product. The principles are very helpful in the establishment of squad members for the reason of transparency and ingenuousness. That hybrid approach enhances the importance of collaboration among team members. By different functions in the framework of scrum people can easily communicate with each other for the assurance of the better result of various products. In that framework of scrum mostly the focus is done on communication and collaboration to ensure reliability and efficiency. They provide the facilities for the betterment of quality work and the development of team members played a vital position for team building in order to cope with the workload. On the other hand information about fundamental associations in obstacle which come to pass at the same time like harms that cause the development team and the customer's misconception by the help of product owner. Detect the misconception and measurement of the satisfaction of customers is the main critical mechanism in Research and Development threat evaluation (Tsoukalas, 2016). System design and development methods are needed for attaining the specific goals. Most under developing countries have low budget, infrastructure. In these developing countries there is a huge difference between education and occupation. Culture plays an important role in ICT development and use. Discount usability is a new and simple method that is introduced and integrates with agile methodology. This paper presents many research questions about the history of Ethiopia that target the main usability characteristics and shows how this method is useful in adaptation and its integration into agile developmental method like scrum (Teka *et al*., 2017).

Most of the setups are being establish for the sake of solving the real life problems and they see those opportunities which no one can see .Sometimes the setup is run by the individual who don't have so

Spectrum of Engineering Sciences
Online ISSN
3007-3138
Print ISSN
3007-312X

much investment to start a new business but they are very talented in order to present new ideas and they can ask for someone help to start a new business. Most of the newly establish business like facebook, Amazon and Google became the highly profited business while some of the new setups are failed due to the careless nature of investors they don't have roadmap to do work ,there arise conflicts between investors and the managers has been newly hired they have less management experience. The most important and the best method for new startup of business have been discussed in this paper in order to provide the best organization and tracing of failures. The framework of scrum is very helpful for the start of small as well as larger business in order to achieve the best quality product and earning of maximum profit. This research paper mainly focus on the proposal of scrum for providing the management feature in software development in order to protect from inappropriate, undefined and unclear road map and to resolve the conflicts arise among various team members (Thongsukh *et al.*, 2017).

Materials and Methods

In this section, the main focus is to present the detail description of a systematic framework that has been developed after a detail analysis. The main objective of this research is the proposition of scrum model for the quality enhancement and elimination of failures from development in small organizations.

The Agile Methodology

Agile software development process includes time interval and repetitions. The objective of agile technique is to terminate functionalities or goods in small repetitions. Basically, Scrum is a straightforward progress procedure which focuses on the excellence of the planned technique, squad and method of preservation (Žáček et *al*, 2024). This methodology stress on relationship statement and normally switch of in sequence between improvements of a variety of, members of teams (Altuwaijri & Ferrario, 2021). The speed of achievement is increase in software development due to its ability and it is one of the best commonly used procedure in agile software development (Putrianasari et al., 2024).

Spectrum of Engineering Sciences
Online ISSN
3007-3138
Print ISSN
3007-312X

Description of Systematic Framework

In this research, a systematic framework has been presented in order to eliminate the failures and enhance the quality of software development by using scrum methodology. This framework performs following tasks:

1. To manage the requirements for requirement engineer
2. To control the scope of project
3. To escape from cost overrun.
4. To overcome time overrun.
5. To enhanced quality by controlling all factors of failures.

Proposed Framework

As per the basic assumptions of this model, all the primary requirements are collected from a consumer and provided to requirement engineer along with delivery time. During this requirement gathering phase, feasibility of the study is performed and final project plan is discussed in the light of all necessary evidence of requirements from the customer. In the next step, all the functional and non-functional necessities are recognized to produce final authenticated document by the customer. At the end, the approval of final documentation is signed in presence of collectively growth team and the customer side and handed it. Due to the repetition nature of that representation frequently change are directed by fast repetition. In this way the requirements has been managed and able to satisfy the requirements.

Scope and Cost of project

Scope and cost of project overruns when the development goes beyond the control of developer and the huge resources are required by the use of Jira base software with respect to time and the cost. This software is used for tracing of errors, concern track, and management of project.

Case Study

The case study of Airport Management System provided strong results and gave evidence to control scope, cost and time overrun of this system. The work is done in order to manage following modules of airport management system:

1. Departure time of flight.
2. Ticket management system.
3. Attendance of employees.

Spectrum of Engineering Sciences
Online ISSN
3007-3138
Print ISSN
3007-312X

4. Schedule of available flights.

Phases of Sprint

The major purpose of scrum is to build up and distribute software artifact rapidly to the client with smallest amount of defect and obstacles as probable. In scrum, project broken down into sprint which contain chain of repetitions. Chance of every single sprint advancement members of teams assign to distribute a number of attributes that are a component of backlog of product. Basically, Scrum has been divided into three main phases, including Pre- sprint, Sprint and Post- sprint.

Development of Sprints by Using Jira Software

In above case study, this project is divided into 4-week sprint by the use of Jira tool in order to manage four modules of airport management system. This project is not developed according to a traditional and sequential method. Daily meet-ups are required to complete it and two software developers, one system analyst and one graphic designer are team members.

Sprint Week-1

In 1st Sprint, Jira software is used for airport management system and roles have been assigning to Scrum team members. Diverse responsibilities have been assigned in 1st sprint beside with explanation are as follows:

- Construct data flow diagram of module 1
- Setting up and pattern of Jira 7.8.0.
- Classification of the entire feasible attribute of management login.
- Generate a variety of login of team members' accounts.
- Improvement of database management system.
- Changes in database system.
- Allowing customers to make adjustment in the exertion.
- Plan of root record

Sprint Week-2

During 2nd sprint, 6 gatherings were carried out with the product owner for assembling diverse requisite and a concise opening of Jira has been argued. The undertakings which were assigned in subsequent ways.

- Write down the entire necessities of consumers.
- A whole conversation on ease of use of price, timetable and

Spectrum of Engineering Sciences
Online ISSN
3007-3138
Print ISSN
3007-312X

accessibility of occasion.

- User stories were created.
- Create a team of five members; 1 web developer, 2 Software developers, 1 System analyst and 1 Graphic designer.
- The team login had been created.
- In order to manage the airport management system the tasks has been allocated to the team members.
- Users are able to select travel dates.
- Users are being able to specify return journey, add destination and class of journey.
- User can login by using the valid flight credential.
- User can search the flight by date, by flight number and by the use of valid card owner.
- Task all fields that have been presented in the standard issue.
- Arrange and upload ultimate details of week 2.
- Organize ERD, UML and the entire necessary in sequence during 2nd week.

Sprint Week-3

In 3rd sprint, work was done to thrash out the whole necessary subtask for construction module 1 and the subtask are as follows:

- Inscription of flight management module.
- Functioning on flight module, complete a number of alteration of ERD as at fee detail related.
- Making database design of flight module.
- Some modification are made again in flight module ERD, and changed the database design, relating to specific entity.
- All subtasks are an essential part of their parent.
- All subtasks are visible on the main screen of the parent.
- Subtasks always belong to the same project as their parent.
- Subtask has all fields that are present in the standard form.
- Subtasks cannot have a subtask of their own.
- Start working on Flight module.
- Flight is able to search by date, search by flight number.
- Addition of further sections, sessions, in main ERD.
- Scripts writing and DB design of flight module.

Spectrum of Engineering Sciences
SPECTRUM OF ENGINEERING SCIENCES
Online ISSN
3007-3138
Print ISSN
3007-312X

Sprint Week-4

In week 4 sprint, certain sessions has been conducted among the owner of the products continual the progress of each module has been conferred with detail discussion. The responsibilities has been allocated beside with detail explanation are as follows.

- ERDs of all modules has been considered at till are in printed along with their DB-design.
- Discussion on all above modules.
- Detail meetings on all modules by considering ERDs.
- Some modifications were made in order to provide better changes.
- Discussion about the scope, cost and deadline of each module, setting up of all attributes of airport management system.
- Submission of total ERD and data base design to various managers of product in order to evaluate some reasonable faults of preceding exertion on entire modules.

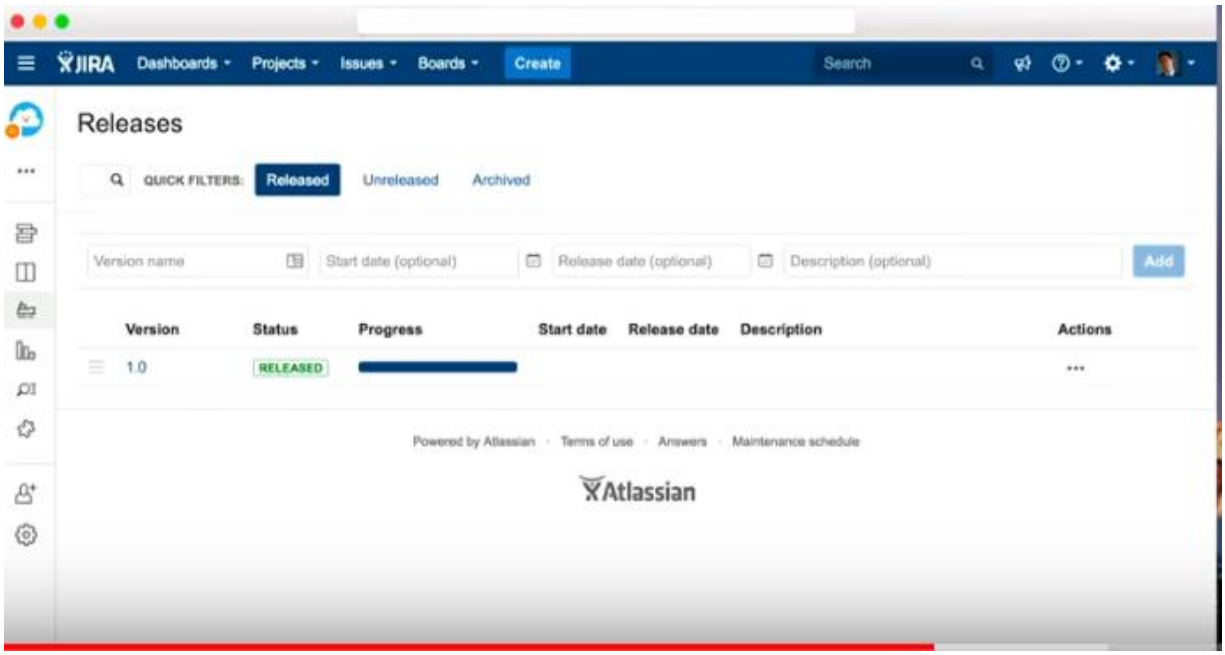

Figure 3.6: Release of 1st Module

The first module schedule and departure time of flight has been successfully released. The scope of flight schedule management has been under controlled and throughout the release of 1st module the cost remained affordable.

Spectrum of Engineering Sciences
Online ISSN
3007-3138
Print ISSN
3007-312X
SPECTRUM OF ENGINEERING SCIENCES

Time of Project

The management system accomplished within the estimated time so it protect the project from time overrun. Meanwhile, the requirements have been managed the customer has been satisfied, the scope and cost of project remain controlled. So the quality of software development has been increased.

Testing Phase of project

In reality, software testing is strongly needed to indicate the flaws and bugs that have been occurred throughout the stages of software development. It's fundamental to make surety of the consistency and trust of customers and the approval in the appliance. Excellence of the products that has been distributed to the clients help in obtaining the confidence and trust level of customers. To test the products for quality has been required in order to the provide the services to the clients as the release of elevated quality of products and the application of software that required minor preservation of budget and therefore consequences into additional precise, reliable and consistent outcome of final delivery of product.

Path Coverage

Path coverage examines the entire pathway of the complete program. This is the whole procedures which make sure that all important path flow of the plan has been passed through at last one time. Coverage of path ways has been additional dominant than coverage of whole pathways of each program. This method is very helpful for test of the composite plan.

Vera Code

Vera code is a white box testing tool that has been used for the identification and resolving the management system flaws quickly and easily at very less cost. It provides support to numerous applications and provides the security of desktop. It enables to scan software for flaws and vulnerabilities efficiently. It is not costly the data for testing has been submitted to online portal and the bugs has been identified in subject of time period.

Spectrum of Engineering Sciences
SPECTRUM OF ENGINEERING SCIENCES
Online ISSN
3007-3138
Print ISSN
3007-312X

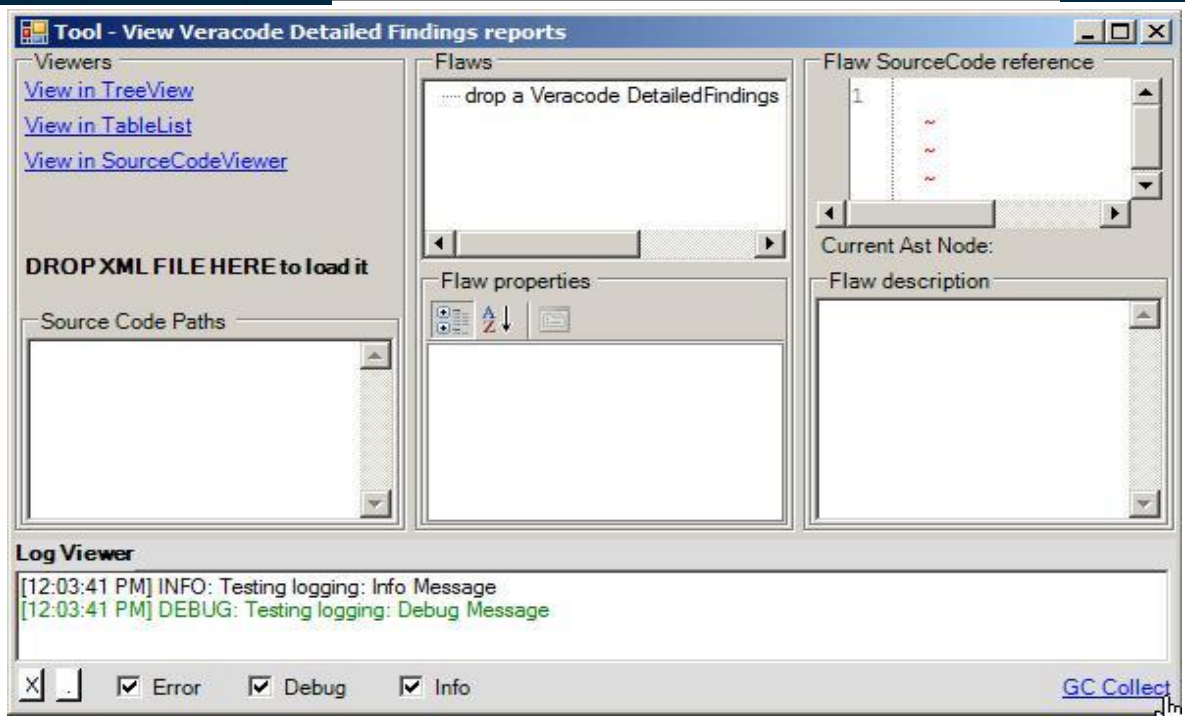

Figure 3.7 Structure of Vera code

Results and Discussion

In this section, the consequences has been gathered from various Software developers. The final outcome of results have been collected from various respondents and placed in the table. The percentage is calculated by considering various factors.

Results of Analysis

Requirement Analysis Phase

Table No. 4.1 Familiarity with Agile Methodologies

Type of Response	No of Respondents	Respondents Percentage	Mean	S.D
Yes	18	90	1.24	0.361
No	0	0		
May be	2	10		
Sum	20			

Chi-Square Tests

Test	Value	d.f	P-values
Pearson Chi-Square	10.093[a]	4	0.039
Likelihood Ratio	06.119	4	0.190
Linear-by-Linear Association	0.312	1	0.577

Spectrum of Engineering Sciences
SPECTRUM OF ENGINEERING SCIENCES
Online ISSN 3007-3138
Print ISSN 3007-312X

N of Valid Cases	20

a. 7 cells (77.8%) have expected count less than 5. The minimum expected count is .10.

The chi-square test measures the discrepancy between the observed cell counts and what you would expect if the rows and columns were unrelated. The two-sided *asymptotic significance* of the chi-square statistic is greater than 0.10, so it's safe to say that the differences are due to chances of variation. The magnitude of the difference between the observed and expected values compared to its corresponding expected value is large for categories factor affecting and achievement of secondary school. If you choose level of 0.05, the p-value (0.039) is less than alpha. You can reject the null hypothesis that is the proposed model is very successful to in order to enhance the quality of software development.

Table No. 4.2: Framework of Agile Methodology

Type of Response	No of Respondents	Respondents Percentage	Mean	S.D
Yes	17	85	1.25	0.3875
No	1	5		
May be	2	10		
Sum	20			

Chi-Square Tests

Test	Value	d.f	P-values
Pearson Chi-Square	7.500[a]	4	.012
Likelihood Ratio	8.469	4	.076
Linear-by-Linear Association	0.000	1	1.000
N of Valid Cases	20		

a. 9 cells (100.0%) have expected count less than 5. The minimum expected count is 0.60.

The chi-square test measures the error between the watched cell checks and what you would expect if the lines and sections were inconsequential. The two-sided asymptotic importance of the chi-square measurement is more noteworthy than 0.10, so it's protected to state

Spectrum of Engineering Sciences
Online ISSN
3007-3138
Print ISSN
3007-312X
SPECTRUM OF ENGINEERING SCIENCES

that the distinctions are because of chance variety. The extent of the distinction between the watched and anticipated that qualities thought about would its comparing expected esteem is substantial for classes factor influencing. On the off chance that you pick and a-level of 0.05, the p-esteem (0.012) is not as much as alpha. You can dismiss the invalid speculation and reason that is the proposed model is very successful to in order to enhance the quality of software development.

Table No. 4.3: Reliability of Scrum Model

Type of Response	No of Respondents	Respondents Percentage	Mean	S.D
Yes	13	65	1.55	0.6475
No	3	15		
May be	4	20		
Sum	20			

Chi-Square Tests

Test	Value	d.f	P-values
Pearson Chi-Square	3.184[a]	4	0.528
Likelihood Ratio	3.234	4	0.519
Linear-by-Linear Association	1.994	1	0.158
N of Valid Cases	20		

a. 8 cells (88.9%) have expected count less than 5. The minimum expected count is .10.

The chi square test events the error amid the watched compartment checks and what would you expect the lines and sections were inconsequential. The two sided significance importance of the chi square measurement is more noteworthy than 0.10. So, it is protected to state that the distinctions are because of casual variety. The extent of the distinction between the watched and anticipated that qualities thought about would its comparing expected esteem is substantial for classes factor influencing. On the off chance that you pick level of 0.05, the p-value (0.000) is not as much as alpha. You can dismiss the invalid speculation and reason that the proposed model is very successful to in order to enhance the quality of software development.

Spectrum of Engineering Sciences
Online ISSN
3007-3138
Print ISSN
3007-312X

Table No. 4.4: Requirement Analysis for Identifying Failures

Type of Response	No of Respondents	Respondents Percentage	Mean	S.D
Yes	15	75	1.4	0.54
No	2	10		
May be	3	15		
Sum	20			

Chi-Square Tests

Test	Value	d.f	P-values
Pearson Chi-Square	06.250[a]	4	.001
Likelihood Ratio	07.110	4	.130
Linear-by-Linear Association	0.006	1	.940
N of Valid Cases	20		

a. 8 cells (88.9%) have expected count less than 5. The minimum expected count is 0.20.

The chi-square test measures the discrepancy between the observed cell counts and what you would expect if the rows and columns were unrelated. The two-sided *asymptotic significance* of the chi-square statistic is greater than 0.10, so it's safe to say that the differences are due to chance variation. The magnitude of the difference between the observed and expected values compared to its corresponding expected value is large for categories factor affecting and achievement of reliability. If you choose level of 0.05, the p-value (0.001) is less than alpha. You can reject the null hypothesis that is the proposed model is very successful to in order to enhance the quality of software development.

Table No. 4.5 Implementation of Time limiter in scrum model.

Type of Response	No of Respondents	Respondents Percentage	Mean	S.D
Yes	12	60	1.7	0.81
No	2	10		
May be	6	30		

Spectrum of Engineering Sciences
Online ISSN 3007-3138
Print ISSN 3007-312X

Sum	20

Chi-Square Tests

Test	Value	d.f	P-values
Pearson Chi-Square	5.185[a]	2	.005
Likelihood Ratio	4.824	2	.090
Linear-by-Linear Association	1.668	1	.197
N of Valid Cases	20		

a. 4 cells (66.7%) have expected count less than 5. The minimum expected count is .20.

The chi-square test measures the error between the watched cell checks and what you would expect if the lines and sections were inconsequential. The two-sided asymptotic importance of the chi-square measurement is more noteworthy than 0.10, so it's protected to state that the distinctions are because of chance variety. The extent of the distinction between the watched and anticipated that qualities thought about would its comparing expected esteem is substantial for classes factor influencing. On the off chance that you pick level of 0.05, the p-esteem (0.005) is not as much as alpha. You can dismiss the invalid speculation and reason that is the proposed model is very successful to in order to enhance the quality of software development.

Table No. 4.6 Hiring of Technical Trainer to enhance quality of Software development.

Type of Response	No of Respondents	Respondents Percentage	Mean	S.D
Yes	18	90	1.15	0.2275
No	1	5		
May be	1	5		
Sum	20			

Spectrum of Engineering Sciences
Online ISSN
3007-3138
Print ISSN
3007-312X

Chi-Square Tests

Test	Value	d.f	P-values
Pearson Chi-Square	5.584[a]	4	.032
Likelihood Ratio	5.850	4	.211
Linear-by-Linear Association	.003	1	.958
N of Valid Cases	20		

a. 8 cells (88.9%) have expected count less than 5. The minimum expected count is .20.

The chi_square test events the error amid the watched compartment checks and what would you expect the lines and sections were inconsequential. The two_sided Significance importance of the chi_square measurement is more noteworthy than 0.10. so it is protected to state that the distinctions are because of casual variety. The extent of the distinction between the watched and anticipated that qualities thought about would its comparing expected esteem is substantial for classes factor influencing. On the off chance that you pick an a-level of 0.05, the p-esteem (0.032) is not as much as alpha. You can dismiss the invalid speculation and reason that the proposed model is very successful to in order to enhance the quality of software development.

Table No. 4.7 Risk Factor in Scrum Model

Type of Response	No of Respondents	Respondents Percentage	Mean	S.D
Yes	6	30	2	0.6
No	8	40		
May be	6	30		
Sum	20			

Chi-Square Tests

Test	Value	d.f	P-values
Pearson Chi-Square	7.532[a]	4	0.010
Likelihood Ratio	6.963	4	0.138
Linear-by-Linear Association	4.826	1	0.028
N of Valid Cases	20		

Spectrum of Engineering Sciences
Online ISSN
3007-3138
Print ISSN
3007-312X

a. 8 cells (88.9%) have expected count less than 5. The minimum expected count is .30.

The chi-square test measures the discrepancy between the observed cell counts and what you would expect if the rows and columns were unrelated. The two-sided *asymptotic significance* of the chi-square statistic is greater than 0.10, so it's safe to say that the differences are due to chance variation. The magnitude of the difference between the observed and expected values compared to its corresponding expected value is large for categories factor affecting and achievement of secondary school. If you choose and a-level of 0.05, the p-value (0.010) is less than alpha. You can reject the null hypothesis that is the proposed model is very successful to in order to enhance the quality of software development.

Table No. 4.8 Implementation of Meeting Controller in Scrum

Type of Response	No of Respondents	Respondents Percentage	Mean	S.D
Yes	13	65	1.4	0.34
No	6	30		
May be	1	5		
Sum	20			

Chi-Square Tests

Test	Value	d.f	P-values
Pearson Chi-Square	11.607[a]	4	.021
Likelihood Ratio	8.362	4	.079
Linear-by-Linear Association	1.338	1	.247
N of Valid Cases	20		

a. 8 cells (88.9%) have expected count less than 5. The minimum expected count is 0.10.

The chi-square test measures the error between the watched cell checks and what you would expect if the lines and sections were inconsequential. The two-sided asymptotic importance of the chi-square measurement is more noteworthy than 0.10, so it's protected to state

Spectrum of Engineering Sciences
Online ISSN
3007-3138
Print ISSN
3007-312X

that the distinctions are because of chance variety. The extent of the distinction between the watched and anticipated that qualities thought about would its comparing expected esteem is substantial for classes factor influencing. On the off chance that you pick and a-level of 0.05, the p-esteem (0.021) is not as much as alpha. You can dismiss the invalid speculation and reason that is the proposed model is very successful to in order to enhance the quality of software development.

Table No. 4.9 Introduction of new features in Scrum.

Type of Response	No of Respondents	Respondents Percentage	Mean	S.D
Yes	16	80	1.3	0.41
No	2	10		
May be	2	10		
Sum	20			

Chi-Square Tests

Test	Value	d.f	P-values
Pearson Chi-Square	13.861[a]	4	0.008
Likelihood Ratio	11.873	4	0.018
Linear-by-Linear Association	0.678	1	0.410
N of Valid Cases	20		

a. 8 cells (88.9%) have expected count less than 5. The minimum expected count is 0.30.

The chi square test events the error amid the watched compartment checks and what would you expect the lines and sections were inconsequential. The two sided Significance importance of the chi square measurement is more noteworthy than 0.10. So it is protected to state that the distinctions are because of casual variety. The extent of the distinction between the watched and anticipated that qualities thought about would its comparing expected esteem is substantial for classes factor influencing. On the off chance that you pick and a-level of 0.05, the p-esteem (0.008) is not as much as alpha. You can dismiss the invalid

Spectrum of Engineering Sciences
Online ISSN
3007-3138
Print ISSN
3007-312X

speculation and reason that the proposed model is very successful to in order to enhance the quality of software development.

Table No. 4.10 Scrum is best for Small organization.

Type of Response	No of Respondents	Respondents Percentage	Mean	S.D
Yes	12	60	1.7	0.81
No	2	10		
May be	6	30		
Sum	20			

Chi-Square Tests

Test	Value	d.f	P-values
Pearson Chi-Square	8.971[a]	4	0.002
Likelihood Ratio	7.701	4	0.103
Linear-by-Linear Association	6.054	1	0.014
N of Valid Cases	20		

a. 8 cells (88.9%) have expected count less than 5. The minimum expected count is 0.10.

The chi-square test measures the error between the watched cell checks and what you would expect if the lines and sections were inconsequential. The two-sided asymptotic importance of the chi-square measurement is more noteworthy than 0.10, so it's protected to state that the distinctions are because of chance variety. The extent of the distinction between the watched and anticipated that qualities thought about would its comparing expected esteem is substantial for classes factor influencing. On the off chance that you pick an a-level of 0.05, the p-esteem (0.002) is not as much as alpha. You can dismiss the invalid speculation and reason that isthe proposed model is very successful to in order to enhance the quality of software development.

Spectrum of Engineering Sciences
Online ISSN
3007-3138
Print ISSN
3007-312X
SPECTRUM OF ENGINEERING SCIENCES

Table No. 4.11 Scrum provide better result than other methodologies.

Type of Response	No of Respondents	Respondents Percentage	Mean	S.D
Yes	12	60	1.65	0.7275
No	3	15		
May be	5	25		
Sum	20			

Chi-Square Tests

Test	Value	d.f	P-values
Pearson Chi-Square	9.672[a]	4	.046
Likelihood Ratio	5.511	4	.239
Linear-by-Linear Association	0.143	1	.706
N of Valid Cases	20		

a. 7 cells (77.8%) have expected count less than 5. The minimum expected count is .10.

The chi square test events the error amid the watched compartment checks and what would you expect the lines and sections were inconsequential. The two sided Significance importance of the chi square measurement is more noteworthy than 0.10. So, it is protected to state that the distinctions are because of casual variety. The extent of the distinction between the watched and anticipated that qualities thought about would its comparing expected esteem is substantial for classes factor influencing. On the off chance that you pick level of 0.05, the p-esteem (0.046) is not as much as alpha. You can dismiss the invalid speculation and reason that the proposed model is very successful to in order to enhance the quality of software development.

Conclusion

Software quality is considered as the main part of software development. Trend of using agile methodologies is increasing day by day. In this research it has been concluded that that by the use of scrum the quality of software development can be enhanced for small organizations. The main reason of software failures are poor management, testing and

Spectrum of Engineering Sciences
Online ISSN
3007-3138
Print ISSN
3007-312X

deployment. Agile methodologies are helping to manage good software management due to its iteration and incremental behaviors. In all iterations great planning about project and teamwork and team management maximize the performance and quality of software. Iterations and increments are causes of strong management. All agile methodologies are effective and better than traditional development methodologies but scrum is one of the best methodologies which are using lot of time in software development industry. Many software development companies are following scrum methodology using Scrum model. In this research it has been concluded with full confidence that scrum is fastest and Empirical, Adaptable, flexible methodology. Scrum master is playing an important role over all in this model. Scrum is suitable for short term software development projects, how we can use this for long term software and for large or complex software projects development; this is under research and can be research in future. Researchers can work on Scrum flexibility and use of scrum model in all kind of software; also can work on scrum architecture to improve the performance and efficiency in software development management.

Reference

Altuwaijri, F., & Ferrario, M. A. (2021). A Framework for the Adoption of Agile within Software SMEs in Saudi Arabia. ACM International Conference Proceeding Series, 73–77. https://doi.org/10.1145/3501774.3501785

Ardilla, Y., & Hakim, A. K. (2025). Digitalization of Correspondence Information Systems Using Scrum Model. *Journal La Multiapp*, *6*(1), 23-33.

Hema, V., Thota, S., Kumar, S. N., Padmaja, C., Krishna, C. B. R., & Mahender, K. (2020). Scrum: An effective software development agile tool. In *IOP Conference Series: Materials Science and Engineering*. 981(2), 022060.

Jibgah, D., Ananya, T., Elly, B., & Grace, S. (2025). The Integration of Agile Methodologies with Lean Six Sigma in Software Engineering Projects.

Kobiljski, D. (2025). ULOGA SKRAM MASTERA I VLASNIKA PROIZVODA U USPEŠNOM UPRAVLJANJU PROJEKTIMA. *Zbornik radova Fakulteta tehničkih nauka u Novom Sadu*, *40*(01), 1974-1977.

Spectrum of Engineering Sciences
Online ISSN
3007-3138
Print ISSN
3007-312X

Moiseienko, N., Moiseienko, M., & Lubentsova, D. (2025). A web-based Kanban application for enhancing agile project management practices. In *CEUR Workshop Proceedings* (pp. 131-138).

Putrianasari, R., Budiardjo, E. K., Mahatma, K., & Raharjo, T. (2024). Problems in The Adoption of Agile-Scrum Software Development Process in Small Organization: A Systematic Literature Review. *Sinkron: jurnal dan penelitian teknik informatika*, *8*(1), 495-504.

Santoso, J. T., Raharjo, B., & Wibowo, M. C. (2025). Agile Project Management Practice to Support Project Management Success. *Calitatea*, *26*(204), 337-349.

Schulte, R. (2025). New venture risk management: Theoretical framework and research perspectives. *Journal of the International Council for Small Business*, 1-20.

Shastri, Y., Hoda, R., & Amor, R. (2021). Spearheading agile: the role of the scrum master in agile projects. *Empirical Software Engineering*, *26*, 1-31.

Teka, D., Dittrich, Y., & Kifle, M. (2017). Integrating discount usability in scrum development process in Ethiopia. In *2017 International Conference on Computing Networking and Informatics (ICCNI)* (pp. 1-8). IEEE.

Thongsukh, S., & Ayuthaya, S. D. N. (2017). Startup framework based on scrum framework. In *2017 International Conference on Digital Arts, Media and Technology (ICDAMT)* (pp. 458-463). IEEE.

Tsoukalas, K. (2016). R&D Capabilities Predictability and Risk Control in Scrum Framework. In *2016 International Conference on Collaboration Technologies and Systems (CTS)* (pp. 551-556). IEEE.

Weidlich, M. (2025). How Agile Software Development Teams are Led and Lead Themselves–A Literature Review on the Duality of Agile Leadership.

Žáček, M., Hamplová, A., Tyrychtr, J., & Vrana, I. (2024). Improvements for the Planning Process in the Scrum Method. *Applied Sciences*, *15*(1), 202.

Spectrum of Engineering Sciences
Online ISSN
3007-3138
Print ISSN
3007-312X

Zomerdijk, J., & De Waal, B. (2023). The Influence of Hybrid Working in the Context of Agile Software Development within the Dutch Financial Sector. *Communications of the IIMA*, *21*(1), 7.