SCRUM Methodology Adoption Benefits for Employees and IT Organization

(Nawaz Ali Hamdulay)
(B.E - IT, MBA - IT, PhD Scholar - JJTU)

ABSTRACT

SCRUM methodology is to deliver the working versions of desired software's in shorter iterations, and then it combines the smaller version of software to the complete build of the software according to customers' feedback and requirements'. Applying SCRUM methodology has eliminated all the problems faced by the software development team during the period of software development. Organization in IT industry, which welcomed the change in development environment for their teams and involved their customers when planning out for iterations sessions helped the organization to improve the quality of the product, enabled faster deployment of the software product and in the end they were able to deliver users the system just they needed for their business needs. This research paper also discusses some of the potential benefits and constraints in SCRUM adoption methodology. This study has also highlighted all the SCRUM meetings, SCRUM backlogs, charts and DoD in SCRUM methodology. For the research study qualitative and quantitative data was used and data has been collected by questionnaire method and this research study has collected sample of 200 respondents and those 200 respondents were from IT sector respectively of Mumbai region only. It was observed that impact of adopting SCRUM methodology improved employee's performance, boosted teams moral and organizational performance and SCRUM methodology has satisfied the customer needs and retained customers for organization and has delivered quality end results of products as the customer needed for business needs. SCRUM methodology has helped the IT organizations to grow more software teams locally and remotely and has maintained its standards in IT industries all over the world.

Keywords: *SCRUM, Methodology, Traditional, Software Development, Adoption, IT Employees, IT Organizations.*

INTRODUCTION

Software Development consists of phases like planning, analysis, design and implementation. SDLC models were created throughout the period like Waterfall, Rad, Spiral, Rapid, Iteration and V-model and many more. Software development process is also called as SDLC (software development lifecycle). In the new era many new methodologies are being practiced such as, SCRUM methodology, Agile methodology, Kanban, DevOps, Lean Management and many more. Agile methodology is made up of many methodologies and SCRUM is an agile process only but SCRUM has become the most famous and favorite methodology of IT professionals and it is a powerful methodology which has provided and still providing benefits to IT companies. SCRUM methodology is simplest methodology for managing extremely difficult projects of software products. SCRUM methodology is adopted by many IT companies to overturn the success rate of project success when compare to other traditional methodologies.

SCRUM was introduced by Ken Swaber in 1995. Then it was included in agile methodology as it contains same concepts of agile methodology. SCRUM word came from rugby game as in rugby there is SCRUM method where players pack closely together with their heads down and trying to gain possession of the ball and start the play again.

In software development SCRUM method is used to pack the team, where everyone in the team acts together for one goal and that is success. SCRUM methodology delivers the project products within time and with minimal budget.

LITERATURE REVIEW

Devi.R.V and Shaik.N [2012], the authors mention about a measurement model. Human capital is an vital asset for groups below excessive competition. Training and Development feature permits human capital to unharnessed their dexterity. This literature assessment primarily based totally article offers different viewpoints of numerous authors concerning the importance of schooling & improvement.

Eman.A.A[2015], the author states how software improvement has turn out to be a noticeably consequential hobby for the society and plenty of businesses, with maximum of them making an investment lots resource. The paper explains numerous methods wherein agile technique affects software program improvement.

Jehanzeb.K and Dr.Nadeem.A.B[2013], the authors state about worker education and improvement application and its benefits to the agencies. The cause of this paper is to give a conceptual observe set up at the worker education and improvement application and its advantages.

Joslin.R and Müller.R [2016], spoke with 19 employees, program, and senior IT chiefs from 11 enterprises crosswise over four nations who all have nitty gritty learning of their organization's methodology(s). A deductive methodology was utilized to approve a hypothetically determined research model.

Mahalakshmi.M and Dr.Sundararajan.M [2013], the authors of this paper offer an overview of Scrum Methodology, describes approximately it and distinction among Traditional SDLC and SCRUM. Many new software program improvement approaches had been delivered to in shape the brand-new cultures of the software program improvement agencies.

Mike.M [2014], the author in the research study focuses on different engineering practices supported by other agile methodologies. In the study author has also focused on SCRUM methodology and SCRUM product owner and how closely he/she works with the SCRUM team in order to classify and prioritize system functionality in SCRUM product backlog.

Pope.R, Michelle.E and et al [2011], the authors of this article, have discover an tailored model of Scrum challenge control technique, a framework of organization conferences and system questions used to arrange collaborative teamwork and borrowed from the software program improvement world.

Putu.A.G.P and et al [2015], the creator has explored on the usage of SCRUM technique. The creator expresses that, Agile Software improvement is one of the strategies in the advancement of a product. The word Agile intends to be quick, lightweight, free-moving, alert. Agile is a word used to depict a procedure model idea which is unique in relation to the current procedure model ideas. Light-footed programming advancement ideas begat by Kent Beck and his 16 associates by expressing that the Agile Software Development is an approach to assemble programming by doing it and helping other people to fabricate it at the same time.

SHEEBA HAMID [2011], the author mentions about how powerful education is an investment within side the human sources of an organization, with each instantaneously and lengthy variety returns. Education in tourism corporations in India has now no longer accomplished the favored effects so far.

Shankarmani.R, Pawar.R and et al [2012], the authors of this research paper mention about Agile philosophy. Agile Philosophy is to supply operating variations of the software program in brief iterations, then replace the software program in accordance to the feedback from the customer. This paper also discusses the constraints in agile adoption.

OBJECTIVES

This study has focused on how SCRUM methodology impacts the employees and IT organizations.

The objectives are as follows:

- To study the impact of SCRUM methodology on IT organizations.
- To identify the impact of SCRUM methodology on employees and customer satisfaction.
- To explore the impact of SCRUM methodology while developing software products.
- To explore the potential benefits and limitations of SCRUM methodology.

RESEARCH METHODOLOGY

Both qualitative and quantitative methods have been used for the research study. While conducting this study primary data was gathered through survey questionnaires, were prepared for data collection. There were 10 questions that the participants or respondents had to answer and the questions were based on practice of SCRUM methodology by individuals and IT organizations. The respondents were given sufficient time frame to understand and ask clarification about the study and questionnaire if they had any before completion of the questionnaire. The targeted 200 respondents were individuals and employees in IT organizations. While conducting the study the response rate was 100%.

SCRUM METHODOLOGY

- **Product Backlog**

The SCRUM product backlog is a list of all things that needs to be done within the project.

SCRUM product backlog replaces the traditional software requirement specification (SRS) artifacts. Items in SCRUM product backlog can be user centric example in the form of user stories. The owner of SCRUM product backlog is SCRUM Product Owner. SCRUM product backlog is a living document and all entries are estimated.

- **Sprint backlog**

The activities in Sprint backlog are entered from SCRUM Product Backlog and Sprint backlog activities should be completed in the period of the sprint as committed by the SCRUM team. Sprint backlog task have to be estimated on per hour bases in order to track progress and remaining efforts. Sprint backlog is a living artifact and is updated on a daily bases. There is a Sprint task board for the team to see their progress on daily bases.

- **SCRUM Burndown chart**

The SCRUM burn down chart is a displayed chart showing the completed work per day against the projected rate of completion for the current project product release date. The main purpose is to enable the project is on track to deliver the expected product within the estimated schedule. It also provides quick visualizations for reference.

SCRUM Roles are PRODUCT OWNER, SCRUM MASTER, and SCRUM team.

- ***Product Owner***

SCRUM framework, central role is SCRUM Product Owner. SCRUM Product Owner performs two roles of classic product manager and project manager. SCRUM Product Owner represents the end customer or we can say he/she is a customer representative and also represents stakeholders and takes care of them. SCRUM Product Owner is responsible to maximize the profit of the product by ensuring the right work is done at the right time. SCRUM Product Owner maintains the product backlog and works very closely with the SCRUM team. No one else is allowed to instruct the SCRUM team to work from a different set of priorities. Many SCRUM Masters can report to a single SCRUM Product Owner and different teams SCRUM Product

Owners working on same project can report to the Chief SCRUM Product Owner that is selected by the management for the dedicated project.

- ***SCRUM Master***

SCRUM Master ensures that the SCRUM team adheres to SRUM theories and SCRUM practices and rules. He/she helps the SCRUM team members and is responsible for removing obstacles from their way to complete the development of the product. SCRUM Master guards the SCRUM team from all the external requests and disruptions in the project. SCRUM Master is a part of SCRUM team has a role as servant – leader for the SCRUM team. He/she is responsible for managing the process. SCRUM Master is the only responsible person to conduct the daily scrum meetings and sprint planning meetings for the team members. SCRUM Master maintains the sprint backlog and all the required documentation.

- ***SCRUM Team***

SCRUM team is a collection of dedicated individual's working together to achieve a single goal dedicated to their team to deliver the requested and committed product on time in given increments. SCRUM team includes 5 to 7 people in a particular SCRUM team. All members follow a common goal and adheres the same norms and rules and show respect to each other in the team. SCRUM Team members can be Programmers, testers, user experience designers, etc. Every team player in SCRUM team contributes their best for each sprint as they are responsible for failure or success of the product that they are responsible to deliver. Different kinds of teams are there, like component team and feature team.

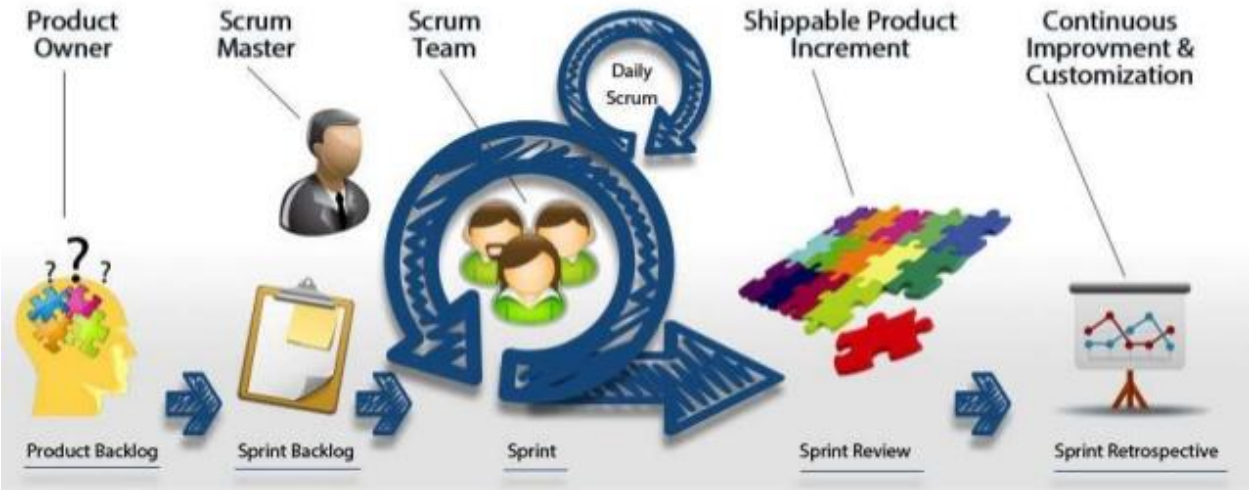

Figure 1: SCRUM Methodology Framework

Definition of Done (DoD)

When an activity from the Sprint Backlog is completed, the **Definition of Done (**DoD) is used. DoD may vary from one SCRUM team to another but must be consistent within one team. Different DoD at various levels:

- DoD for a SCRUM Product Backlog item(e.g. writing code, tests and all necessary documentation)
- DoD for a sprint(e.g. install demo system for review)
- DoD for a release(e.g. writing release notes)

Meetings in SCRUM Methodology

- **Sprint planning meeting**

Sprint planning meeting starts with a WHAT – meeting. In this session realistic Sprint Backlog is defined containing all items that can be fully implemented till the end on the Sprint. Sprint planning meeting is conducted by the SCRUM Product Owner and defines the Sprint goal. Product owner prioritize the items which are more important for the current Sprint.

- **Daily stand up meeting**

Daily stand up meeting is a short 15 minutes meeting and it is conducted at start of the day. Daily stand up meeting is attend by Scrum master and SCRUM team members. Each team member should answer three questions:

- ✓ What has he/she accomplished since the last daily SCRUM meeting?
- ✓ What has he/she is going to accomplish until the next SCRUM meeting?
- ✓ What are the impediments that prevent he/she from accomplishing his/her tasks?

- **Sprint Review meeting**

At the end of each Sprint a Sprint Review meeting is conducted. In this meeting the SCRUM team shows which items from SCRUM Product Backlog they have completed according to DoD. It is an informal meeting. The participants of Sprint Review meeting are SCRUM Product Owner, Scrum master, SCRUM team and additional management, customers and other project members might attend to if they wish..

- **Scrum retrospective meeting**

Scrum retrospective meeting should be time - boxed say 3 hours maximum. Participants of Scrum retrospective meeting are SCRUM Product Owner, Scrum master, SCRUM team and customer. In this the last sprint is discussed and three things are checked what went well during the sprint, what didn't and what improvements could be done for the next sprint. In this meeting actionable suggestions to improve performance are available at the end of the meeting.

Impact SCRUM methodology on IT organizations

ROI

ROI for a SCRUM product project is always calculated by the total revenue generated from a product versus the expense of the sprints required to develop that specific product of the project. Scrum methodology has high potential to generate return on investment (ROI) much faster than traditional development methodologies, as working software products can be delivered to its right consumers on right time as the markets needs all over the world . SCRUM methodology

each sprint, and the dedicated SCRUM teams develop more features that are translated into major growth in revenues of the organization.

Impact SCRUM methodology on Employees and Customer Satisfaction

- **Employee**

SCRUM methodology has improved individual's performances and has increase team moral and team performance and has made workload less on each team player of SCRUM team and has increased employee retention rate. SCRUM methodology taught team ethics to employees in organizations that adopted SCRUM methodology.

- **Customer Satisfaction**

There are many known metrics that are used to measure customer satisfaction of software products. Net Promoter Score (NPS) is one of metrics which measures if the users would recommend the software product to other users or do nothing or recommend against using it. Hence using a stable customer satisfaction metric and therefore it should measure for every release and then it indicates whether the SCRUM teams are meeting their end goals to provide value products to customers.

Impact SCRUM methodology on while developing software products

- **Time to Market**

It is the time taken by a project product to start providing value to consumer, or we can say the time it takes to start generating revenue. It can be calculated by taking the period of the number of sprints before a SCRUM team releases the final product to the production. It can be also calculated by depending on the organization's alpha and beta testing strategies.

- **Capital Redeployment**

IT is used to measures if it is worth of time to continue a SCRUM product or we can also say if the economic value of the product now exceeds its costs. In this situation the SCRUM team should be redeployed to other more profitable software products for the organization.

To now the capital redeployment organization can calculate the revenue value of the remaining product items in the product backlog (V), the actual cost (AC) of the sprints needed to complete those product items and the opportunity cost (OC) of other product work the SCRUM team could do or should take over. Therefore **V < AC + OC**, the product should end right now and the SCRUM team should be redeployed to other software product projects.

Data Analysis

Q1. Does your organization practice SCRUM Methodology?

Opinion	Respondents	Percentage
Yes	128	64
No	72	36
Total	200	100

Table 1.1

Sample Standard Deviation, s	39.597979746447
Variance (Sample Standard), s^2	1568
Population Standard Deviation, σ	28
Variance (Population Standard), σ^2	784
Total Numbers, N	2
Sum:	200
Mean (Average):	100
Standard Error of the Mean ($SE\bar{x}$):	28

Table 1.2

Primary Resource

64% of the respondents have said yes that their organization practice SCRUM Methodology and 36% respondents have said that their organization does not practice SCRUM Methodology.

Q2. Are you a part of SCRUM team?

Opinion	Respondents	Percentage
Yes	128	64
No	72	36
Total	200	100

Table 2.1

Sample Standard Deviation, s	39.597979746447
Variance (Sample Standard), s^2	1568
Population Standard Deviation, σ	28
Variance (Population Standard), σ^2	784
Total Numbers, N	2
Sum:	200
Mean (Average):	100
Standard Error of the Mean ($SE\bar{x}$):	28

Table 2.2

Primary Resource

64% of the respondents have said yes they are part of SCRUM team and 36% respondents have said that they are not part of SCRUM team

Q3. Have you attended SCRUM meetings like daily sprint meeting, sprint review meeting and sprint retrospective meeting?

Opinion	Respondents	Percentage
Yes	128	64
No	72	36

Total	200	100

Table 3.1

Sample Standard Deviation, s	39.597979746447
Variance (Sample Standard), s^2	1568
Population Standard Deviation, σ	28
Variance (Population Standard), σ^2	784
Total Numbers, N	2
Sum:	200
Mean (Average):	100
Standard Error of the Mean (SE$\bar{x}$):	28

Table 3.2

Primary Resource

64% of the respondents have said yes they have attended SCRUM meetings like daily sprint meeting, sprint review meeting and sprint retrospective meeting and 36% respondents have said that they have not attended SCRUM meetings like daily sprint meeting, sprint review meeting and sprint retrospective meeting.

Q4.What role you play in SCRUM team in your organization?

Opinion	Respondents	Percentage
SCRUM Product Owner	15	7.5
SCRUM Master	15	7.5
SCRUM Team Member	98	49

None of the Above	72	36
Total	200	100

Table 4.1

Sample Standard Deviation, s	41.785164831552
Variance (Sample Standard), s^2	1746
Population Standard Deviation, σ	36.187014245444
Variance (Population Standard), σ^2	1309.5
Total Numbers, N	4
Sum:	200
Mean (Average):	50
Standard Error of the Mean (SE$\bar{x}$):	20.892582415776

Table 4.2

Primary Resource

7.5% of the respondents have said they are SCRUM Product Owner and another 7.5% of the respondents have said they are SCRUM Master, 49% of the respondents have said they are SCRUM team members and rest 36% of the respondents have said they do not play any role in SCRUM teams.

Q5. Do SCRUM Product Owner and SCRUM Master play an important role while handing the project?

Opinion	Respondents	Percentage
Yes	152	76
No	48	24
Total	200	100

Table 5.1

Sample Standard Deviation, s	73.539105243401
Variance (Sample Standard), s^2	5408
Population Standard Deviation, σ	52
Variance (Population Standard), σ^2	2704
Total Numbers, N	2
Sum:	200
Mean (Average):	100
Standard Error of the Mean ($SE\bar{x}$):	52

Table 5.2

Primary Resource

76 % of the respondents have said yes SCRUM Product Owner and SCRUM Master play an important role while handing the project and 24% of the respondents feel that SCRUM Product Owner and SCRUM Master do not play an important role while handing the project.

Q6. Do you think SCRUM Methodology is beneficial for employees and IT organizations?

Opinion	Respondents	Percentage
Yes	200	100
No	0	0
Total	200	100

Table 6.1

Sample Standard Deviation, s	141.42135623731
Variance (Sample Standard), s^2	20000
Population Standard Deviation, σ	100
Variance (Population Standard), σ^2	10000
Total Numbers, N	2
Sum:	200
Mean (Average):	100

Standard Error of the Mean (SE$\bar{x}$):	100

Table 6.2

Primary Resource

100% of the respondents have said yes that SCRUM Methodology is beneficial for employees and IT organizations.

Q7. Do you think SCRUM Methodology is beneficial for customers?

Opinion	Respondents	Percentage
Yes	200	100
No	0	0
Total	200	100

Table 7.1

Sample Standard Deviation, s	141.42135623731
Variance (Sample Standard), s^2	20000
Population Standard Deviation, σ	100
Variance (Population Standard), σ^2	10000
Total Numbers, N	2
Sum:	200
Mean (Average):	100
Standard Error of the Mean (SE$\bar{x}$):	100

Table 7.2

Primary Resource

100% of the respondents have said yes that SCRUM Methodology is beneficial for customers.

Q8. Have you heard about Product Backlog and Sprint Backlog?

Opinion	Respondents	Percentage
Yes	200	100
No	0	0
Total	200	100

Table 8.1

Sample Standard Deviation, s	141.42135623731
Variance (Sample Standard), s^2	20000
Population Standard Deviation, σ	100
Variance (Population Standard), σ^2	10000
Total Numbers, N	2
Sum:	200
Mean (Average):	100
Standard Error of the Mean ($SE\bar{x}$):	100

Table 8.2

Primary Resource

100% of the respondents have said yes that they now about Product Backlog and Sprint Backlog.

Q9. SCRUM Methodology does not compromises on Functionality, Time, Budget and Quality?

Opinion	Respondents	Percentage
Strongly Agree	150	75
Agree	50	25
Disagree	0	0
Strongly Disagree	0	0
Total	200	100

Table 9.1

Sample Standard Deviation, s	**70.710678118655**
Variance (Sample Standard), s^2	5000
Population Standard Deviation, σ	50
Variance (Population Standard), σ^2	2500
Total Numbers, N	4
Sum:	200
Mean (Average):	50
Standard Error of the Mean ($SE\bar{x}$):	50

Table 9.2

Primary Resource

75% of the respondents have said that they strongly agree and 25% of the respondents have said that they agree with SCRUM Methodology does not compromises on Functionality, Time, Budget and Quality

Q10. Do you think SCRUM Methodology provides complete customer satisfaction and customer retention?

Opinion	Respondents	Percentage
Yes	200	100
No	0	0
Total	200	100

Table 10.1

Sample Standard Deviation, s	141.42135623731
Variance (Sample Standard), s^2	20000
Population Standard Deviation, σ	100
Variance (Population Standard), σ^2	10000
Total Numbers, N	2

Sum:	200
Mean (Average):	100
Standard Error of the Mean (SE$\bar{x}$):	100

Table 10.2

Primary Resource

100% of the respondents have said yes that SCRUM Methodology provides complete customer satisfaction and customer retention.

KEY FINDINGS

- From the previous studies and sample survey it was found that SCRUM methodology benefits employees and IT organization in IT industry all over the world.
- It is observed that the SCRUM methodology increases customer satisfaction rate and customer retention rate.
- It is observed that the SCRUM methodology delivers product in time and is cost efficient for the given product.
- The study has found out that SCRUM methodology does not compromises on Functionality, Time, Budget and Quality of the product.

Advantages of SCRUM Methodology

- This methodology provides customer satisfaction by lowering the turnaround time and responsiveness to all given requests.
- SCRUM methodology has increased the quality of the product.
- SCRUM methodology is extremely quick and can adapt to changes very easily and frequently.
- SCRUM methodology has a nature to expect and accept the changes that come on the way of software development period.
- SCRUM methodology estimates prefect development time for creating product and is cost effect.
- SCRUM methodology keeps the project schedule on time.

- SCRUM methodology has an ideal nature of rapidly changing and accumulating requirements by the project customer.
- SCRUM methodology is beneficial to customers and SCRUM Product Owner, SCRUM Master.
- SCRUM methodology freezes schedule of sprint that is minimum two weeks and maximum four weeks.
- SCRUM methodology lists the top feature and the next feature in form of product backlog and sprint backlog.
- SCRUM methodology never changes the schedule of sprint.
- SCRUM methodology adjusts the Product Backlog and Sprint Backlog if needed to meet release dates of the product.
- SCRUM methodology work proceeds and completes are more logically done through Definition of Done (DoD).

Disadvantage of SCRUM Methodology

- In SCRUM methodology documentation has become very minimal.
- Dedication of all the team members in each SCRUM teams is highly important.
- In SCRUM methodology the most essential need is team work.
- In SCRUM methodology if team members do not cooperate well with each other, then each sprint in project will face failure.

Comparison between Traditional Waterfall Methodology and SCRUM Methodology

Waterfall Methodology	SCRUM Methodology
This methodology deals with projects	This methodology deals with products
Consists of different phases	SCRUM methodology consists of daily sprint meeting, sprint review meeting and sprint retrospective meeting
This methodology does not expect changes	This methodology does expect changes and also accept the changes

Documentation is more	Documentation is minimal
Probability rate of success is low	Probability rate of success is high
It is sequential	It is overlapping
Project cost increases	Project cost does not increases
Team flexibility is limited	Team flexibility is not limited

Table 11: Waterfall Methodology vs SCRUM Methodology

CONCLUSION

The study has stated the different adoption benefits of the SCRUM methodology in the IT industry and the benefits for the employees of the IT organization and the benefits over the traditional waterfall methodology or model. The study has also proved through the survey of 200 respondents that SCRUM methodology is very beneficial for customer satisfaction and retention and reduces the project budget and time and delivers only working or full functionality products in IT markets and other markets of the world. Further studies or research can be carried on SCRUM methodology and other different methodologies available in IT industry to boost the functionality and quality factor of software products and its development and to ease the pressure on employees working in IT industry.

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