Risk Management Board for Effective Risk Management in Scrum

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ABSTRACT
Projects that are developed by using agile methods are projected to give good results and more successful in producing high quality software that satisfies the needs of customer effectively at a faster pace. Software developing organizations that have been employing Scrum are recommended as starting point for organizations with small teams and with no distinct processes. Actually while using scrum it is able to identifying risks that occur in project development but it has no practices to identify the cause, factors to evaluate and handle the risk management effort. This study aims to introduce new roles and new team for Risk management that are effective in Risk management activity. The new roles and new teams of Scrum are useful for organizations that are experiencing high failure rates with respect to risk while using Scrum.

Keywords
Scrum, Risk management, Sprint, Transition product backlogs, Enterprise Transition team(ETC), Scrum rollout team(SRT), Scrum development team(SDT), Risk Management Board(RMB), Risk Management Team(RMT).

1. INTRODUCTION
The role of risk management (RSKM) is to recognize probable problems earlier than they happen, so that risk-handling actions can be designed and invoked as needed across the development of the product or project to mitigate adverse impacts on achieving objectives [7]. Risks are normally understood as a likelihood of threat, damage, liability, loss or other negative occurrences that are caused by external or internal vulnerabilities that diverges the expectation of an outcome which may be solved through proper action [1].

As previously mentioned, in Scrum, risks are identified, but it does not mention practices to define sources, parameters or categories to analyze and control the risk management effort. So risk the assessment, categorization and prioritization of these risks occur in an informal manner. Therefore, all of the specific practices of RSKM are unsatisfied, except SP 2.1[8] identifies risks, because it is partially satisfied. As a result, all of the specific practices of RSKM are unsatisfied, except Specific Practice 2.1 that identify risks which is partially satisfied and the process area is shown in the Fig.1 where the satisfied rate is 0.0 percent, partially satisfied rate is 14.3 percent and unsatisfied rate is 85.7 percent [2].

In this work a new solution for Risk Management in Scrum is proposed, for which the detailed study of Scrum is presented to analyze the overall activities that are performed in Scrum, so that it finds a way to introduce new concepts into Scrum.

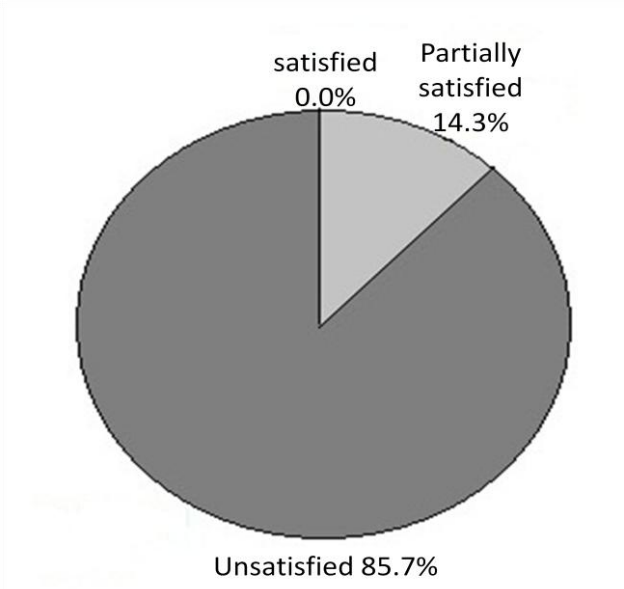

Fig. 1 General coverage for risk management process area

1.1 Scrum Summary
To manage project development through iterative and incremental methods we have modern software development process models like Agile methodologies in which Scrum and Extreme programming (XP) [7], [4] are widely used in current trend of software development. This study focuses on Scrum which is based on the three characters the first and important character is Scrum master who is catalyst and in charge for scrum team and process. The second is the product owner who is responsible for development and business objectives. The third is product development team with below nine members which is cross-functional, self-organized in nature.

1.1.1 Scrum: Frame and Spirit
Scrum practices are used by making use of its iteration where requirements are handled and incremental process where the project is repeated as per the framework as shown in the Fig.2. In the framework the lower circle stands for an iterative development actions one after of the other that gives the increment of the product as the output of each iteration. The upper circle describes about the daily inspection activity that is carried-out during the iteration. Here in this activity each member in the team meets the other to examine their actions and to make suitable changes.

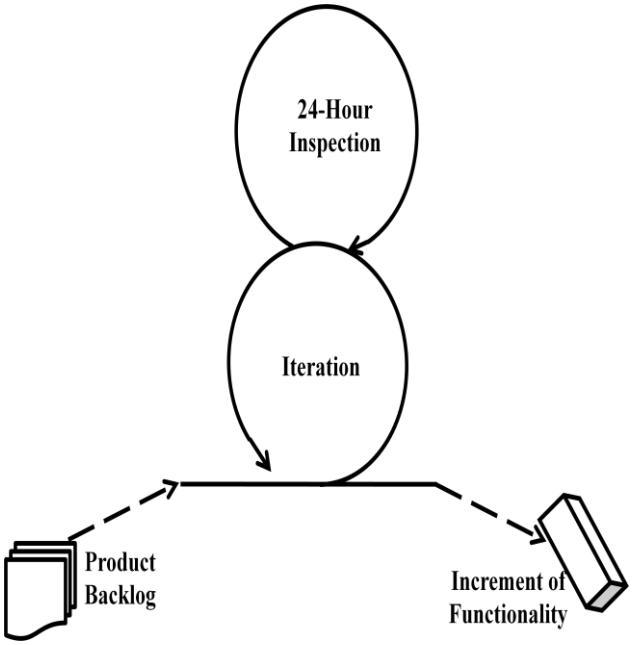

Fig. 2 Scrum Framework

As in the frame from the beginning of the iteration the developing teams assess their work that is to be processed followed by picking proper transferable functionalities that can be handled by them at the end of the iteration. After picking the right functionalities the team single handedly continuous to process to the iteration. When the iteration is completed the team and the stakeholder meet together to review the work that was completed in the previous iteration for reviewing the project.

Within the iteration lies the spirit of the scrum where the team tries to understand the requirements and the technology, and knows ability and aptitude of each other. As the team faces new challenges the team has to choose the best way to build the functionalities by changing their daily approach, and then picks a best way that they can do the work. This whole process is the spirit of productivity of scrum.

In the project development throughout the life cycle scrum has four objects that are worked out by the scrum team. Among the four the first one is the prioritized list of the whole things necessary to complete the product called product backlog, the second object is a list of assignment to execute throughout a sprint called sprint backlog, the third object is the chart that illustrate the development of project for a period of time called release burn down charts and the last object is the chart that illustrate the development of sprint for a period of time.

All the objects discussed above as a part project development is executed by the following five types of meetings that held through-out the scrum life cycle. The first the collecting the product backlog by the team called release planning meeting, the second type of meeting is that development team and the client sits together to define goals for the next sprint called sprint planning meeting, the third meeting is for developing team of the project to spot individual concern and potential developments in the methodology practice called daily scrum, the fourth type of meeting is for the client and the stakeholder where the working software is explained called the sprint review and the last and fifth type of meeting is personnel assessment with respect to the last sprint to find out developments when scrum is used called sprint retrospective meeting.

1.1.2 SPRINT (Simplified Process for Risk Identification)

Sprints are cyclic in nature to carry-out the work in development of project in scrum. A sprint is the fundamental component of project development in scrum and it last between one week to one month [4]. Each and every sprint is time boxed [3] means that they can be stopped at any particular time irrespective of completion of work, if allotted work is not finished the time will never be altered. So the team has to complete the work by the particular time allotted for the sprint. The items which are selected from the prioritized list can never be changed during the sprint

In daily scrum team gets together to check the status of work and alters to finish the work that is left. After the completion of the sprint the development teams assess the work with stakeholders to explain what has been done, from this the development team tries to get the advises from the meeting that can be carried in to the next sprint to process and to continue the work.

Before the sprint starts a planning meeting is to be conducted in which different aspects are discussed like spotting the everyday jobs and a predictable commitment for the sprint is prepared, after that a assessment activity or retrospective meeting [6] is conducted in which the overall development is assessed. After this issues for the next sprint will be sorted-out and made ready.

As a whole in each sprint the development team brings out a part of the product that are completed and that has got its shape. In each and every sprint planning meeting a list of prearranged requirements is determined which are called as product backlogs. These product backlogs are carried and are to be handled in the sprint. In the sprint meeting itself the product owner brings to the notice of the development team the items in the product backlog which the owner wants to be completed immediately. Then such things are given with highest priority by the development team and then they assess how much of those prioritized tasks they can commit to complete during the coming sprint. Such selected prioritized items are noted in the sprint backlog [4].

The selected prioritized items by the product owner noted in the sprint backlog and this sprint backlog is the material that belongs to the development team. These items in the sprint backlog cannot be altered by anyone except the development team itself. In each sprint that has goals cannot be changed during the sprint also. As the product development is time boxed the sprint must be completed in specified time. During the sprint if the tasks are not finished on any grounds they are to be left-out and return to the product backlog. If the sprint is successfully completed the team guides the product owner in using the product.

If the sprint backlog is handled properly then the product will be as per the requirements of the customer if they are not solved then the product backlog list increases that cause major problems for the development team.

1.2 Meetings

Fig. 3 Daily Scrum Meetings

Every day to assess the status of the project a meeting is held during the sprint called daily scrum or also called as daily standup. Generally there is no specific location to conduct the meeting and it is a formal process that spans for 15 minutes which is time boxed. This meeting is to discuss the fore coming work that is to be done in coming day and that too brisk in nature but relevant. So these meetings are used only to discuss the work to be done and these meetings are not used to discuss and find solution for problem that they face. All the team members of the development team attend this meeting which makes any kind of information to spread through-out the team.

1.2.1 Backlog grooming: story time

This backlog grooming meeting is not a formal part of scrum process which is generally very short, where everyone in the development team attends and discuss and the team itself decides the number of meeting required to groom the backlog in a week. In this meeting the team members gather the product backlogs and estimate the existing backlog by using effort. This makes individual stories and large stories to break into smaller stories.

1.2.2 Scrum of Scrums

These are the meetings that are held at the end of each day to talk about the work that has been carried out. This meeting is between various teams from scrum development and a chosen person from team which purely depends on the team will attend the meeting. The chosen person should be a technical person and best person to know and comment on the issues that arise in the meeting and can change from project to project. Its main aim is to see overlap areas and integration.

1.2.3 Sprint planning meeting [3], [4]

Every sprint has two parts of meetings and the sprint starts with the meeting. Depending on the sprint span the meetings will last its duration nearly up to 8 hours. In the first for hours of eight entire team sits together to discuss and in the next four hours only development team discuss the issues [5] . Among the two parts the first part of the sprint planning meeting is to assess the product backlog. Here in this part of meeting the product owner explains his view on the product for the next sprint, for which the team and the product owner have a good discussion driving away uncertainty. So by the end of this meeting the team will have a specific goal on the coming sprint to process. After having a specific goal for the next sprint now in the second part of the sprint meeting the team decides how the work will be built. Here in this part of the meeting the team starts to decompose the product backlog items into work tasks and guessing the time taken for the items. The role of the product owner here is not that much significant but he should be available for the meeting and most of the teams try to work without the product owner. But this activity of keeping aside the product owner may get the wrong impression at all levels, so the scrum master controls this part of the meeting by keeping in mind the product owner's thoughts and view. After completing the meeting the sprint backlog is the result of this meeting.

1.2.4 Sprint review meeting [4]

At the end of every sprint an evaluation of the work done in the sprint is carried out called as sprint review. In this the development team explains their work during the sprint. In this meeting various people who are interested may attend which includes Scrum Master, Product Owner, Team Members, customers, stakeholders, experts, executives, and others who are interested, this meeting will last for some time and this is time boxed.

1.2.5 Sprint retrospective [4]

After reviewing the sprint the development team go for a discussion about the product and the status of it, this meeting is called sprint retrospective. If there are any suggestions the scrum master, the product owner discuss together and the scrum master tries to work out on the suggestions that are made in this retrospective meeting. For this effort the team search for the root causes and go for small changes in the next sprint and the results of the changes are to be assessed at the next sprint retrospective.

Collectively, the Sprint Plan meeting, the Daily Scrum meeting, the Sprint Review meeting, and the Sprint Retrospective meeting implement the practical check up and adaptation practices within Scrum. Fig.4 provides an in detail the overall process.

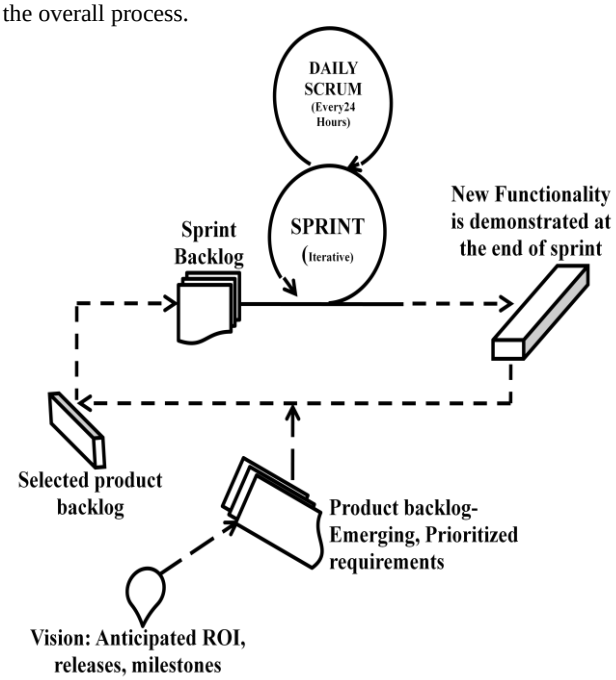

Fig. 4 Scrum process overview

In SPRINT (Simplified Process for Risk Identification) the team of the Scrum considers a risk as a possible obstacle for the project in quality factor. The risk identification occurs in an iterative way, during daily meetings and registered on white-boards, flip charts or obstacles list. But, this risk identification doesn't occur in a efficient and parameterized

approach, using for example, risk categories and sources. So, this practice is partially satisfied.

2. WHERE SCRUM FAILS

People often tend to define risks as threats like conditions, situations and events that could damage the well-being and efficiency of the organization. Managing risk is common in Scrum on a daily basis. Finding, analysis, and mitigation for risk seem to happen naturally in Agile, and particularly in Scrum. But when risk management comes practically with Agile-Scrum it is not as good as with traditional management practices because of its approach toward them [2].

Inspite of each and every thing that is carried out in the course of product development as specified in scrum it is experiencing high failure rate in terms of managing risks as shown in the Fig. 1.

Here are the flaws that are the root causes for happening of risk especially in organization that are using scrum process model in software development. These are identified as factors that responsible for increasing unsatisfactory and making satisfactory rate more negligible. It is analyzed that the following flaws are with organizations that uses scrum for project development.

Flaw #1: Overlooking of backlogs. Transition product backlogs are not further carried to next sprint.

Flaw #2: Short of brain storming people.

Flaw #3: Conflicts become conflagrations that destroy productivity.

Flaw #4: Scrum goes against the grain and feels of risk.

Flaw #5: Scrum shows quality assurance without expertise persons.

Flaw #6: Scrum hides reality.

Flaw #7: Too much of commitment – little bit of progress.

Flaw #8: Cost estimation of the product is rarely done before committing the product.

3. SCRUM TEAMS AND ROLES

3.1 Scrum: Existing Roles

As a whole scrum project development is based on three different roles in the team: the Product Owner, the team, and the Scrum Master. All management responsibilities in a project development are divided between these three roles of scrum to carry-out the project development

3.1.1 Product Owner

Product owner in product development by using scrum process model is a higher-ranking decision-making person in the enterprise. The work for the development team and ensuring the responsibility in getting the required outcome in the form of product is assigned and managed by this executive so called product owner. He is also responsible in managing the financial matters like financial support for the project and gathering the requirements that are needed for the development of the product

The product owner is responsible for using the list of requirements of the customer called product backlog to make sure that the requirements with highest priority are processed first and built upon. For every iteration the list of requirements are prioritized and processed, the unprocessed requirements are carried for the next iteration.

3.1.2 The Team

Product developing activity is carried out by the self-manning, self-organized and cross-functional team of the scrum. The product backlog that is prioritized by the product owner is taken in to account and they are developed into functionalities within iteration. The entire team members are collectively involved in making each and every iteration a successful one and so the project

3.1.3 Scrum Master

Scrum process that is adapted by the organization is to be known well to the people of the developing organization and it is the main responsibility of the scrum master to teach it to them and fits within the organization. Scrum master sees and guide that every one follows its rules and practices.

3.2 Scrum: Existing Teams

When using Scrum in project development every organization has to adapt three types of Scrum teams that exist with scrum process model. They are the Enterprise Transaction team (ETC), Scrum rollout team (SRT) and Scrum development team (SDT).

3.2.1 Enterprise Transaction Team (ETC)

The first type of team in scrum is Enterprise Transaction Team or ETC that is responsible for managing the adaption of scrum into the organization to develop projects. This Enterprise Transaction Team consists of senior management people of the organization. . The rest of the ETC team consists of the heads of development unit, human resources people, administration unit, and finance people

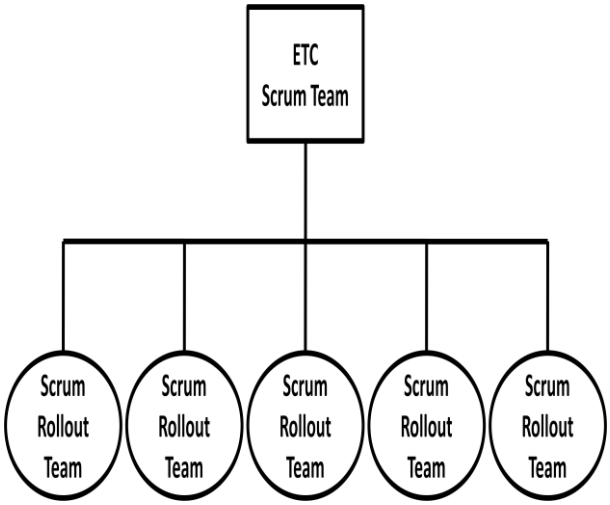

Fig. 5 Enterprise transition project organization

The ETC scrum team sets a goal for each and every iteration or sprint. The development team then works together and does whatever that is necessary to reach the goal.

The scrum master holds ETC team together and guides them in using the scrum process model effectively and in the approved manner such that it turn out to give good results.

3.2.2 Scrum Rollout Team

The Second type of team in scrum is Scrum Rollout Team or SRT that is responsible for implementing the adaption and sees that the organization is effectively changed to it.

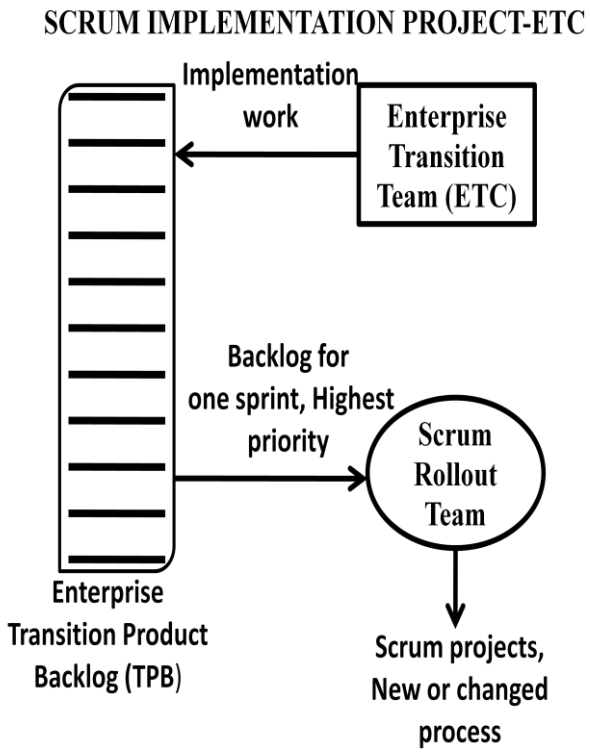

Fig. 6 Scrum adoption process diagram

Scrum rollout teams are formed by the Enterprise Transaction Team to carry out the work that is related to the organization change called for by the highest priority Transition product backlog work. A prioritized list of work that desires to be finished carry-out the adoption

The composition of the scrum rollout team comes from either management or from the other sources. Team members in this team are not required to work full time in the rollout team. However, their accessibility and capability will determine the pace of the Scrum adoption and enterprise change to the new environment.

Each team appoints its own Scrum Master. One member of the ETC team will be the Product Owner for each team during each Sprint.

3.2.3 Scrum Development Team

The third type of team in scrum is Scrum development Team or SDT that is responsible for building the products for the organization by using scrum process model. The entire product development activity is shown in the framework of the scrum. Main people in the scrum development are the product owner and the scrum master and they are considered as the first people on the scrum team and these two people play a key role in selecting the scrum development team members that develops the product.

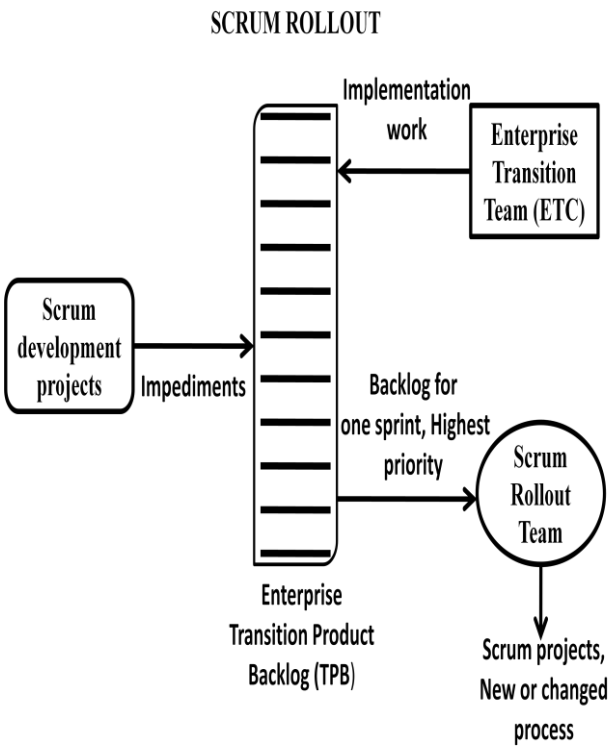

Fig. 7 Scrum rollout

The team is also selected based on the work that is to be handled in each increment. For example, if user documentation is part of an increment to be carried out, the team should have a technical writer.

4. PROPOSED RMB FOR SCRUM

This work mainly concentrates on the backlog items that are not solved in the sprint and could not be given high priority in the coming sprints. Such backlog items are considered as the elements that are increasing the unsatisfactory rate in scrum. The scrum is not having enough recourse to handle them, so this model is proposed

The Fig.8 shows how the team is integrated with the scrum and when risk management activity is to be performed the new proposed team considers the risks as a task and performs it. The work organizing mechanism shown here is a top-down decomposition of products, system architectures or business operations.

In Fig.8 scrum team exists at each node are in the decomposition. Each scrum team at each node is committed to its work. Actually in scrum the bottom-most node is where the overall development occurs. Most product backlog requirements selected for sprint relate to this level. With addition of new team for risk management especially it handles the unsolved and left- out backlogs which are not considered for the next sprint at this level only.

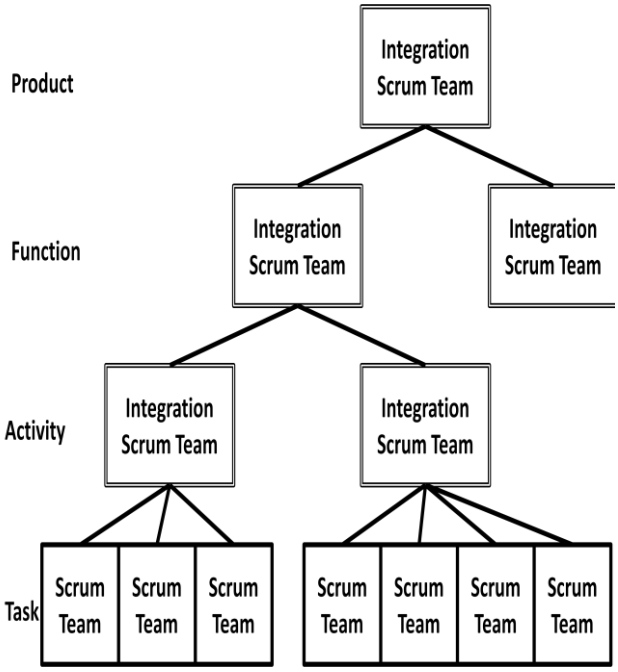

Fig. 8 Enterprise work organization, decomposition

At the lowest level called task level different scrum teams performs different tasks and the newly introduced team performs the risk management task.

The following figure 9 shows the involvement of scrum master in different aspect of product development life cycle. The role of scrum master and the product is crucial in all aspect of development in scrum.

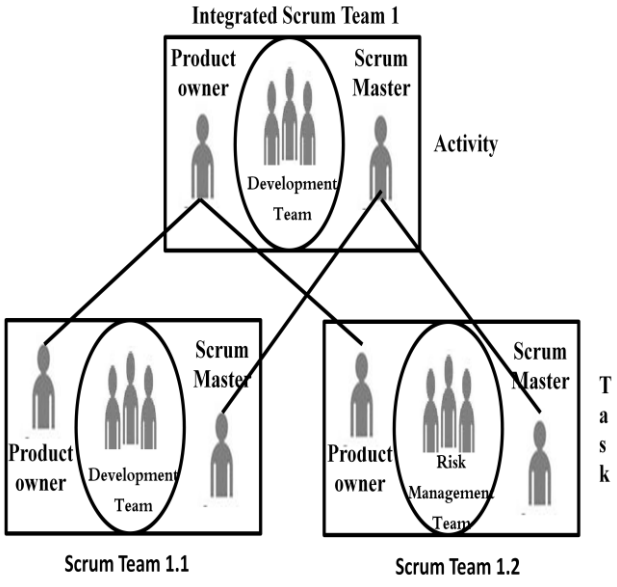

Fig. 9 Scrum relationships with new team

The new roles introduced in this work are under the control of scrum master. Scrum master coordinate the new team introduced and as a key person in the other teams he acts as an intermediate person in supporting the new team in risk management activity. The facts required for the new team (where scrum master is also a member of the new team) to manage risks are provided by the scrum master.

4.1 New Roles to Adapt

In this proposed work for effective management of backlogs the following roles are introduced in addition to the roles that are actually present with scrum.

4.1.1 Risk Coordinator

Risk coordinator is responsible for risk identification and management of risks with the coordination of Risk management team and Risk management board in Scrum development process. Risk coordinator reduce the backlogs that are left-out in every sprint as these backlogs are the primary factors in making the scrum process not good in handling risks.

4.1.2 Risk Professionals

With respect to the risks identified by the Risk coordinator these are brain storming people who are responsible to solve the risks with immediate effect that reduces the unsolved backlog of every sprint.

4.2 New Teams Introduced

In this work for efficient management of backlogs the following teams are introduced in addition to the teams that are actually present with scrum.

4.2.1 Enterprise Transition Risk Organization (ETRO)

In addition to Enterprise Transaction Team (ETC) a new organization board is introduced in Scrum termed to be as Risk Management Board (RMB) which has Scrum master, Product owner, Finance and Risk coordinator as team members.

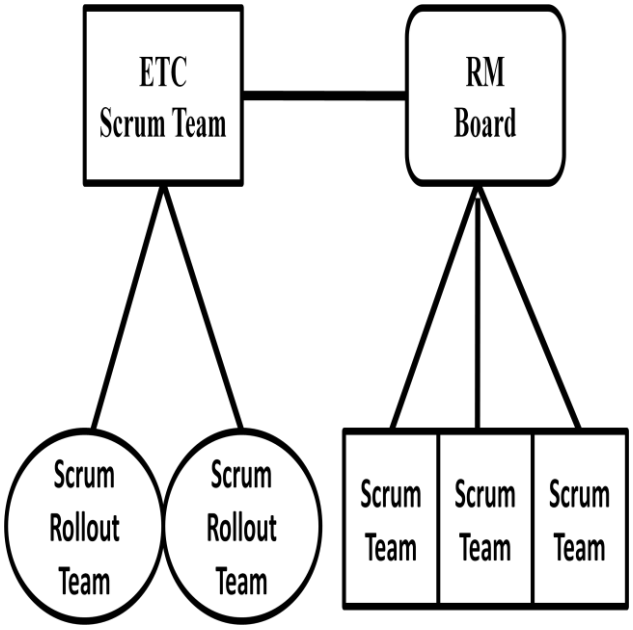

Fig. 10 Enterprise transition project Risk organization

With respect to scrum organization, scrum on hand teams in most of the product developments showing high unsatisfactory rate. The proposed integrated scrum introduces a new scrum organization board which is termed as Risk Management Board (RMB) with Risk Management Team (RMT) for effective risk identification and management. This improves rate of satisfaction in scrum development process.

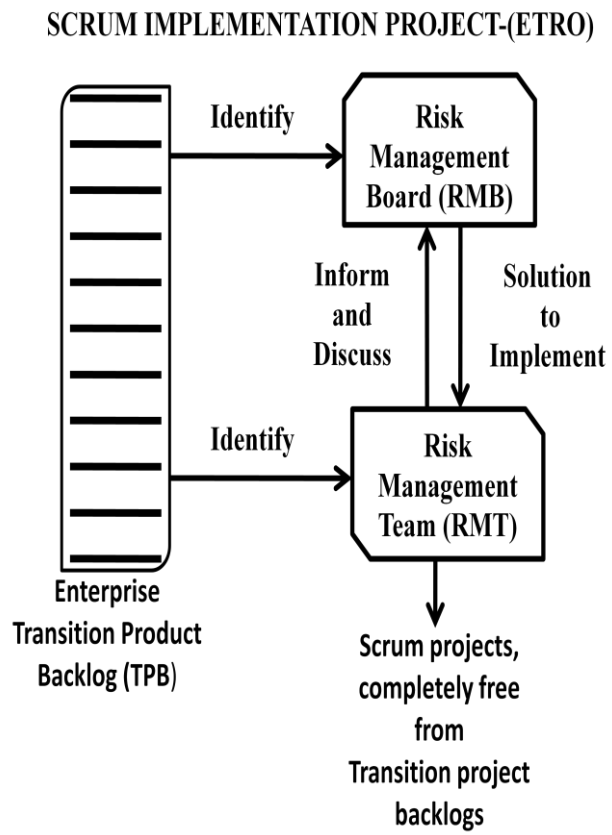

Fig. 11 Scrum risk management process

In RMB the following roles are adapted. They are scrum master, Product owner, finance administrator are the people from the existing teams and Risk coordinator, Risk professionals are newly adapted and introduced team members that are particularly here to handled the unsolved backlog items. The Risk coordinator is a challenging role which is introduced in scrum from first sprint to end of the product development process along with RMT. The key assessment of risk coordinator along with risk management team is to attend the scrum meetings and observing the development process whenever hazard arises depending on the feasibility studies minor risks are attended by RMT and major risks are taken over to RMB for making the decision with the help of risk coordinator.

The risk management activity by the new team and team members is as shown in the Fig.11. The Risk management board and Risk management team verifies the Enterprise transition product backlog (TPB) finds the backlog items that are not considered for the next sprint. First the Risk management board tries to handle the backlog items, if possible the board itself attends and solves the problem, if the Risk management board itself could not solve the items from the backlog list those backlog items are handled by the Risk management team which has Scrum master, Risk professional, Product owner. The Risk management team discusses about the backlog items with the Risk management board where a solution is made and that will be implemented by the Risk management team. Thus the unsolved backlog items will be solved by new Risk management team, generally which are left-out as unsolved items in actual scrum.

5. FEASIBILITY STUDY

5.1 Technical Feasibility

5.1.1 For Small Projects

Risk management team with Risk management board that has skilled people who are not there in actual scum concentrates on backlogs of each sprint which improves the overall risk management activity. Due to economic factors a Risk management board and Risk management team are adopted for more projects with respect to role of scrum master.

5.1.2 For Big Projects

For large scale projects Risk management board and Risk management team is adapted with respect to the role of scrum master.

5.2 Economic Feasibility

5.2.1 For Small Projects

Risk management team with Risk management board in small projects is used in more than one product development. The economic burden due to the introduction of Risk management team is shared by all the product development teams, which looks like the burden on the individual product, will be very small that can be handled by small teams for quality purpose.

5.2.2 For Big Projects

Burden will be on individual products but as it is a large scale project where the intention is to meet all the goals of the customer as a primary objective and for the satisfaction of the customer they expect a good quality product. As it is a large scale product if the economic factor is increased simultaneously the risks are reduced as the transition product backlogs are handled. So for quality purpose large products should bear little bit of economic burden.

5.3 Operational Feasibility

As the transition product backlogs are properly handled by Risk management team with Risk management board the overall performance of the product as per the requirements of customer will be increased. As the backlogs in between the sprints are solved up to greater extent the number of sprint cycle may be reduced.

6. CONCLUSION

The study of the current paper starts with findings which are identified with respect to scrum practices that require solutions for different type of projects. Here work analyses adaption of new roles and teams with respect to scrum methodology. From this study it is concluded that from risk identification to solving the risks a risk management team extends its part which makes the success rate high when compared with projects activities which are established with the help of scrum.

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