Adaptation of scrum activities and artifacts to Milton's knowledge management model

[1] Zeinab Tavakoli, [2] Taghi Javdani Gandomani, [3] Majid Ghasemi

[1,2]Dept. of Computer Engineering

Boroujen Branch, Islamic Azad University

Boroujen, Iran

[3]Dept. of Computer Engineering

Farsan Branch, Islamic Azad University

Farsan, Iran

Email: [1]zizi_tavakoli@hotmail.com, [2]tjavdani@yahoo.com, [3]Majid.ghasemi@gmail.com

ABSTRACT

Application of specific activities and artifacts in Agile methodologies implies a different viewpoint toward development process in these methods. This viewpoint is fixed in minds due to obligation to Agile dominant principles and values in order to retain dynamicity of these methods. In fact, foundation of Agile methods is made by implicit knowledge which only in case of proper management leads to keeping of dynamic nature of these methods. Milton's model is one of the models of knowledge management. This model is based on the sharing of knowledge between actions groups. Therefore, the present study is an attempt to attain this goal through adaptation of activities and artifacts of Scrum Agile methodologies to one of the well-known knowledge management models.

Keywords: knowledge management; Agile methodologies; implicit knowledge; Scrum; Milton's knowledge management model

1. INTRODUCTION

Agile software development indicates a new approach based on achievements such as high quality, fast delivery, embracing the required changes and light-weight documentation [1, 2]. In this approach, focusing on shared collaboration and direct communications has made developmental process to encompass specific activities and artifacts which have often not explicit descriptions [3]. These artifacts require utilization of two principles including synergy and feedback and learning [4]. Synergy as a principle is connected with collaboration of knowledge and skill of individuals in order for shared resources to be achieved. Based on this principle, there should be individuals who are capable of sharing knowledge easily and can be adapted to goals of project [4]. Based on feedback and learning as a principle, focusing of Agility on project implementation against the ongoing programming should result in deepening of learning [4]. Observation of these principles by Agile activities requires utilization of mechanisms capable of keeping implicit knowledge dynamic as well as facilitating division of knowledge existing in the activities. It refers to mechanisms which make searching and scanning of the environmental knowledge feasible. These mechanisms are capable of reorganizing resources and checking up the unstable environment [5, 6]. It seems that due to having capacity to extract values from invisible assets knowledge management can be an efficient approach in this regard. Therefore, the present study focusing on Scrum methodology is an attempt to adapt the activities and artifacts existing in this method to one of the knowledge management models based on communication activities of the related procedures. This study is organized into five sections. Scrum activities and artifacts are discussed in Section II. In Section III, Milton's knowledge management model will be elaborated. Adaptation of Scrum activities and artifacts to Milton's knowledge management model will be described in Section IV. Finally, conclusions will be presented in Section V.

2. SCRUM ACTIVITIES AND ARTIFACTS

Scrum is a process which regularly applies the best activities related to shared activities [7]. This process produces in the form of small iterations through specification of the team to the managed specialized groups [7]. Figure 1 shows Scrum activities and artifacts.
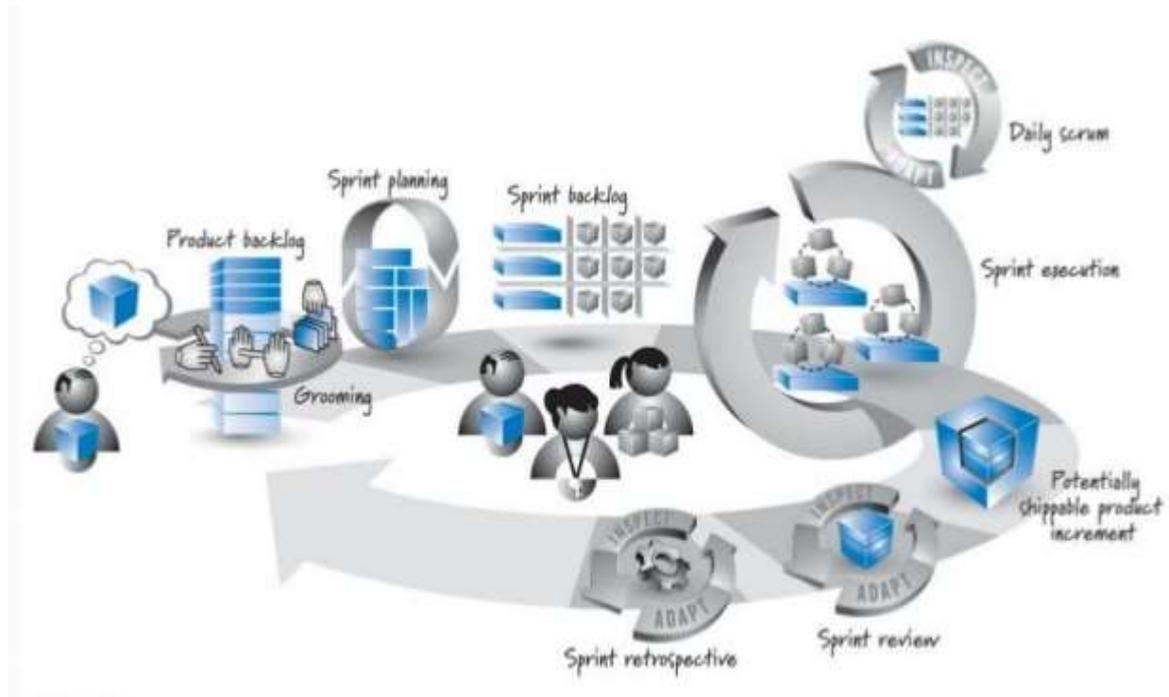
Figure.1 Scrum activities and artifacts [8]

As is seen in this figure, product owner who has a mental image of the product gathers product's backlog in the form of a prioritized list. In order to be sure of rational commitment of the developmental team, another backlog is made through an activity called sprint planning by Scrum team members, known as sprint backlog. Sprint backlog consists of the team's activities and tasks which are planned in order to design, build, consolidate, and examine characteristics chosen in sprint. Sprint is done in order to accomplish these activities and features. In order to harmonize, check and adapt activities, daily Scrum is done day by day to manage affairs. Finally, the team finishes sprint by two activities based on checking and adapting which are called sprint review and retrospective meeting [7, 8].

3. MILTON'S KNOWLEDGE MANAGEMENT MODEL

Milton's model has been formed according to two viewpoints based on connecting and collecting values from knowledge. These viewpoints complement each other [9, 10]. Connection in this model refers to connecting individuals to each other and making communities of practice in a way that individuals can share their knowledge. Email and face-to-face meetings are examples of these groups. In this regard, utilization of the peer assist as a mechanism for facilitating interaction of the team's business and knowledge in the work sessions can be useful [9]. Collection is a mechanism which builds a valuable knowledge criterion and it covers major activities of the company and can have long-term efficiency as well [9, 10]. After Action Review (AAR) and retrospect are two activities which help collection as a mechanism. AAR is a mean of knowledge gathering during activity. It refers to a convention which is held by the team members for a short time. A team has to keep it in order to be in line with changing circumstances and make revisions during the project based on what has been learned. Retrospection is related to knowledge gathering done at the end of the project while all of the members are present (if possible). It is a fast and efficient way of knowledge achievement before project is accomplished [9, 10]. Figure 2 shows Milton's knowledge management.

As is seen in this figure, Milton's model consists of knowledge assets and three groups of learning including learning before action, learning during action and learning after action. Based on Milton's model, knowledge assets consist of reliable knowledge which is achieved and saved for reuse. Learning before action leads to becoming confident of start of the project based on knowledge and awareness. Learning during action based on the action groups leads to knowledge sharing among people who do activities and better accomplishment of the duties. Learning after action help knowledge to be gathered in order to be used in the future [9].
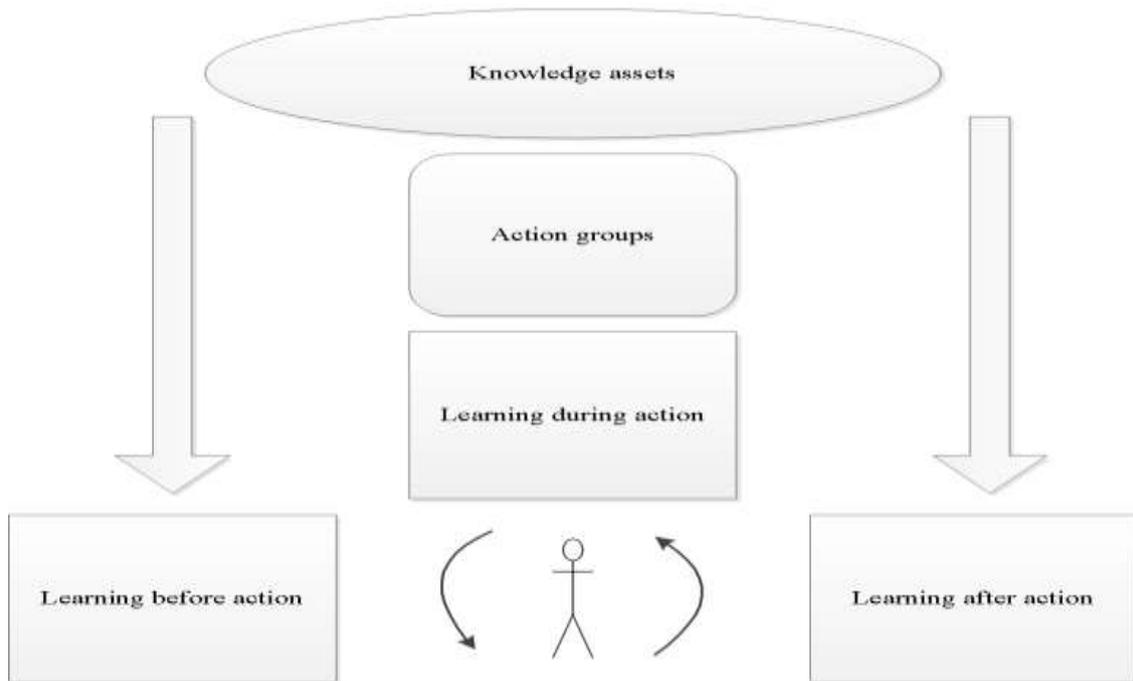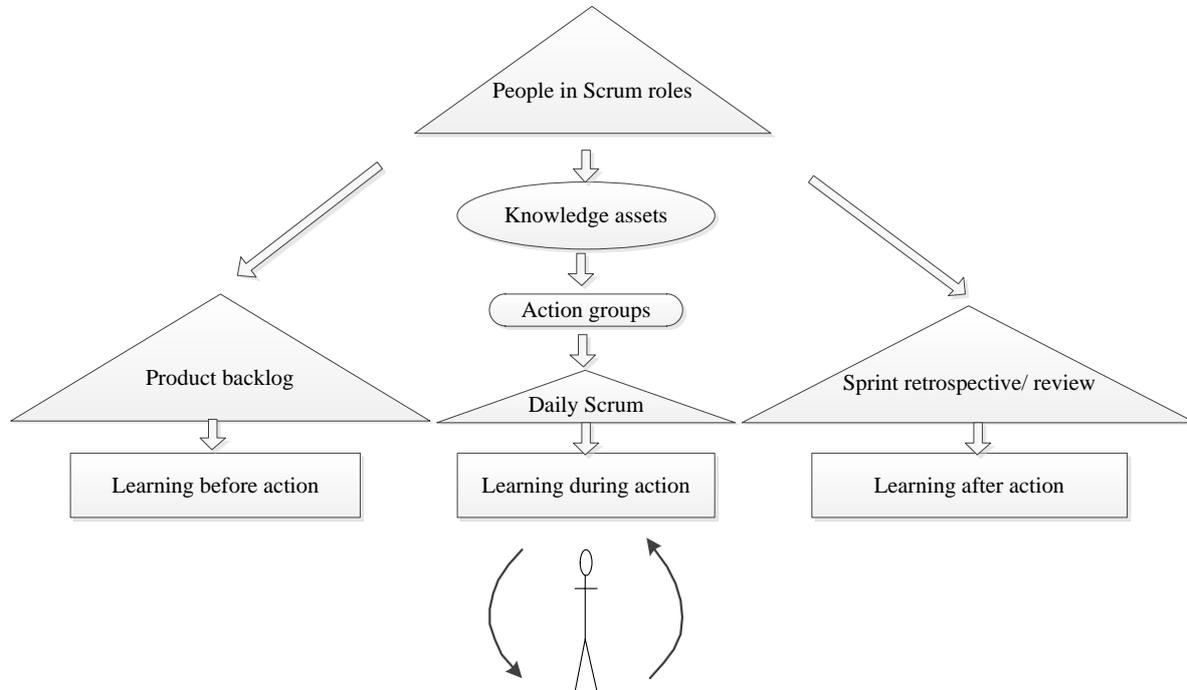
Figure.2 Milton's knowledge management model [10]

4. ADAPTATION OF SCRUM ACTIVITIES AND ARTIFACTS TO MILTON'S KNOWLEDGE MANAGEMENT MODEL

Based on Milton's model, knowledge assets consist of rules behind activities, a list of the individuals with related experiences or stories from the past which have been achieved and stored in the form of a reliable knowledge [9]. In Scrum teams as in other Agile teams, individuals are sources of the reliable knowledge, who have different experiences in the activities, rules and principles related to the project stored in their minds as implicit knowledge. Learning before action in Milton's model, at the beginning of a project or part of a work, leads to becoming sure that the project is started based on knowledge and awareness through making knowledge accessible. In Scrum methodology, project is started with an activity called product backlog preparation. Product backlog leads to learning before action and building confidence that the project will begin based on knowledge and awareness through making features and requirements accessible in the form of a prioritized list.

In Milton's model, action groups which are shown as actors in Figure 2 are networks predicted to help in better accomplishment of the duties in the process of knowledge sharing among activities administrators. These groups can encompass some skills within the organization or some members of society who have common feeling toward a specific goal and are interested in sharing their related experiences and knowledge. They learn during action through confidence and royalty based on mutual reliance and doing related activities [10]. Scrum team is also consisting of individuals with different roles and responsibilities who accept commitments and that way they help short-term programming and decision-making activities be strengthened [11]. Daily Scrum which is done day after day for managing affairs and harmonizing, checking and adaptation of activities [8] is a sign of individuals' common feeling toward a goal and their interest in sharing their related experiences and knowledge, and it leads to learning during action through AAR, as well.

Based on Milton's model, learning after action, through retrospective, leads to collection of knowledge from all of the individuals engaged in project at the end of it for future use. Scrum team, in continuation of its activities, finishes Sprint through two activities accompanied by checking and adaptation named sprint revision and reconsideration. Sprint revision and reconsideration like retrospect as a mechanism in Milton's model leads to gathering knowledge related to revision changes in future sprints and somehow learning after action through consideration of the accomplished activities. In the above-mentioned activities, guidance of Scrum Master in the form of consultant as a mechanism for facilitating knowledge interactions and face-to-face communications of the

team members in conventions covers viewpoints toward building communications and knowledge gathering in Milton's model. Figure 3 shows adaptation of scrum activities and artifacts to Milton's knowledge management model as a presented framework.

Figure3. Adaptation of Scrum activities and artifacts to Milton's knowledge management model

5. CONCLUSION AND FUTURE WORK

Agile software development, due to focus on shared collaboration and direct communications, has made developmental process to encompass specific activities and artifacts which have often not explicit descriptions. It indicates the need for mechanisms such as knowledge management capable of keeping dynamicity of the implicit knowledge as well as facilitating the process of sharing knowledge existing in activities. Therefore, the present study focused on adaptation of activities and artifacts existing in Scrum method to Milton's knowledge management model. This adaptation showed that each of the activities and artifacts existing in Scrum, through adaptation to a part of Milton's model, can be a mechanism for maintaining dynamicity of the implicit knowledge and resolve the problem of lack of an explicit description of production as a process in Agile methods within a range. As a future work, we want evaluate the proposed model in Scrum teams in the real environment. With the aim of measuring the efficiency of this model in the sharing of implicit knowledge.

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AUTHORS PROFILE

Zeinab Tavakoli received Ms. of Software Engineering from Islamic Azad University, Khomein branch, Iran. Currently, she is lecturing in Islamic Azad University. Her research interests are Knowledge Management and Agile Software Development.

Taghi Javdani Gandomani received his Ph.D. in Software Engineering from University of Putra Malaysia, Malaysia. His research interests in software engineering are Agile software development, development methodologies and empirical studies. He is an Assistant Professor in Islamic Azad University, Iran and has more than 15 years' industry experience in software development.

Majid Ghasemi is doing his Ph.D. in Computer Engineering in Science and Research Branch of Islamic Azad University, Iran. He is also a faculty member in Department of Computer Engineering, Farsan Branch, Islamic Azad University, Iran.