Requirement Capturing Tools and their Effectiveness for Product Back Log

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ABSTRACT: *Scrum is rapidly being adopted as an effective project management methodology for small and medium software projects. An important artifact of the Scrum framework is its Product Back log which serves as its basic requirement capturing document. This paper investigates different methods of requirement capturing in the Product Back log and identifies their pros and cons.*

1. Introduction and Background

Agile development methodology is rapidly being adopted in place of traditional waterfall model. There are many frameworks that have been developed under the agile umbrella. Scrum being one of the widely accepted ones is the focus of this study. With the help of a bunch of roles, activities and artifacts Scrum enables its users to develop customer oriented software projects. Scrum divides the whole development task into timed Sprints which usually last from 2 to 4 weeks. Scrum framework includes the Product Owner, Scrum Master and the Team as active roles. The Product owner is the customer's voice in the whole project life cycle whose main task is to capture the product's requirements effectively in the Product Back log. Before the sprint starts the Team sits with the PO and the SM in in a Sprint Planning meeting and picks a prioritized requirement in the Product Back log which can be fulfilled in the designated sprint time block. After this the sprint starts and the Team under the supervision of the Scrum Master works towards achieving its goal in the given time limit. Any hindrances are discussed in the Daily Scrum meeting. After the sprint is finished a workable installment of the product is delivered. The installment and the Team's progress during the finished sprint are reviewed in the Sprint Retrospective meeting. The whole process is repeated. The Scrum Master supervises the Team's progress and providing support in case of any obstacle [1] [2].

One of the biggest strengths of the Scrum methodology is that it helps to build customer oriented software. It keeps the customer involved during the whole development process with the aid of Product Back log which is kept open for additions and alterations throughout the project. It is important for the Product Back log to have a simple and effective format for requirement capturing. In this paper we will look at some techniques for writing effective Product Back log and draw comparisons between them.

2. Tools for requirement capturing

2.1 User Stories

User story is the most popular tool for requirement capturing in Product Back log. User stories provide a mean to capture product functionality as explained by the Product Owner. A user story contains a name a brief description of the problem/ requirement and an acceptance criterion. User stories are mostly written in everyday language and generally follow the pattern:

As a <role>, I want <functionality> so that <goal>,

With the above format user stories may look deceptively simple but they are not. An effectively written user story not only conveys the desired feature of the product but also points out its context and business value [3].

2.2 Use cases

Use case is a popular UML modeling methodology which describes how the product under development will behave under certain scenarios. Use case framework also describes the system's behavior with respect to different roles (called actors) that interact with the system under some condition. Use cases are associated with the functional requirements of a system. The framework consists of an actor (who is basically a user of the system) and use cases (set of scenarios that work towards a goal) [4].

2.3 Story maps

Story map is a relatively new concept introduced by Jeff Patton, in 2008. It is an extension to the existing user story idea adding another dimension to it. The top row of the map consists of activities which are basically large functionalities which can be further decomposed into smaller tasks which are arranged under the activities thus forming a kind of grid. The map gives the project a 'backbone' which is the activities and the tasks bring more implementation details [5].

2.4 User persona

User personas are beneficial when product demands high user experience. A persona is a detailed crafted biography of a fictitious user representing a potential customer group and one is created for each category of the targeted users. It usually consists of a name, picture, education, work, demographics and personal slogan, values or goals. A persona builds a mental map of users from different demographic and interest groups. The developers can then make design and implementation decisions keeping the personas in mind. Personas help to bring the developers and designers in context with goals and behaviors [6].

3. Analysis

There are three matrices upon which this paper will review the above tools for capturing requirements in Product Back log: ease of use, communication power and usability.

3.1 Ease of use

With respect to ease of use, user stories stand out because of its simple structure which effectively conveys the desired meaning. Story map is a modified version of user story hence it resembles its ease in designing but as another dimension is added prioritizing the tasks must be accurate. Use cases require quite an effort on the modeling part and decisions have to be made on choosing the right actors and scenarios. Their formal approach also adds to complexity. Personas are toughest in designing as whole fictitious personality has to be identified and crafted. It requires a solid knowledge base and observation of the target audiences.

3.2 Communication Power

How effectively the above mentioned tools can communicate user's perspective to the developers is an important point. The user story's format allows the requirement to be specified in one to two lines with concise context. This seemingly simple format greatly adds to the requirement engineering process. Story map also works on the same lines adding a proper structure to the idea of "*story*" by listing larger building blocks of the product on top and adding their tasks below them. Use case modeling also captures the requirement within its scenario and responses. But use case only has provision for functional requirement, it cannot deliver nonfunctional requirements. Personas add customer's perspective into the requirement process.

3.3 Usability

The Product Backlog does not necessarily need to be confined to being a requirement source document. It can also be employed to verify and specify design models. Use cases can be used for modeling and requirement verification purposes. Likewise story maps helps in the planning phase. Personas are used mainly for the improving the user experience. User stories are also helpful in the planning and prioritization areas.

4. Conclusion and future work

The above analysis indicates that there is no tool which can be called the "*silver bullet*" for effective requirement representation. In ease of use and communication user story and story map lead but in terms of a more formal and precise representation use cases are better candidates. When developing for user centered products personas can be effective. There is a need of case study that can compare the effectiveness of these tools.

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