Dissemination of Agile Tools: A Review

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Abstract—In today's era, many software companies are using agile methodologies for their projects or product development. They prefer agile methodologies over traditional methodologies as the number of project failures are less in these light weighted methodologies.But, in agile methodologies,the most tedious things are to manage communication between team members, developers, designers & customers and scheduling & tracking of the project by the project managers. For managing these activities, a number of tools are present in the market. Some of the popular tools are Spreadsheets, JIRA, VersionOne, Mingle and ScrumWorks etc.Many companies are facing difficulties in finding the most appropriate tool for the project management.This paper mainly concentrates on the tools used in the past for project management.

Keyword—Agile tools, Agile methodology, Project management, JIRA, VersionOne

I. INTRODUCTION

Agile methodology is an alternative to traditional project management, typically used in software development. It helps teams to respond to unpredictability through incremental, iterative work cadences, known as sprints.

The Agile software development principles that are followed and advocated emerged from the traditional software development principles and various experiences based on the success and failures in software projects. Customers found it difficult to define their needs because of the fast changing technology and the companies using them in products (Edeki, C., 2015). New methods, now called agile methods were designed to define the changing requirements in software environments. Traditional methods refer to the older and commonly used methods like the waterfall methods.

Agile Software Development emerged in February 2001 when a group of software consultants signed the Agile Software Development Manifesto. Agile

Methods focus on the challenges of unpredictability of the real world by relying on people and their creativity rather than processes (Meso, P., & Jain, R., 2006). The main theme in agile methods is to promote and speed up responses to changing environments, requirements and meeting the deadlines.

II. AGILE MANIFESTO

The purpose of agile manifesto according to (Beck et al., 2001) is that:-

- Agile methodologies prefer working software over detailed documentation.
- Agile methodologies prefer customer collaboration over contract negotiation
- Agile always prefer to responding to change over following a plan
- Agile methodologies give importance to individuals and interactions over processes and tools

III. AGILE VERSUS TRADITIONAL SOFTWARE DEVELOPMENT

Various studies show the benefits of using agile methods over traditional methods based on number of aspects. The very first differentiation between the two is that the agile is driven on principles while traditional methods are rule driven i.e. they follow a certain set of rules to accomplish the tasks. Major difference is that the agile gives importance to people over processes.

Also, Testing is done at all the levels during the project and is not restricted to the specific phase.

Agile uses iterative and incremental methods whereas traditional methods are sequential in nature.Communications and meetings between team members and customers are very low in traditional methods whereas very high in agile environments. Also, documentation is given very less importance in agile development where only required documentation is made and traditional methods support extensive documentation which becomes difficult to manage when used in large sized projects. As agile supports iterative development, thus, working software is produced at the end of each iteration unlike traditional which may take years to present the working software.

IV. LITERATURE REVIEW

Following mentioned is the literature review that has been done so far:

1) Paper titled "**Survey of Agile Tool usage and Needs - 2011**" provided an understanding about all the surveys done till date. It stated that all the surveys were subjective in nature and were conducted by tool vendors only. It proved this survey to be objective in nature for finding out tools usage and need for tools as experienced by software people. The survey was conducted by a Swedish telecommunications company Ericsson, where 121 total responses were collected from 120 different companies and 35 different countries. The results as provided in this paper are:

- Most satisfactory tool aspect is "ease of use"
- Least satisfactory tool aspect is "lack of integration with other systems"
- The most commonly tool is physical wall and paper.
- Most popular agile method is Scrum.
- Agile project management tools are used by distributed team more than collocated teams.

2) "**The relevance of software documentation, tools and technologies – A survey"** paper was the study about the survey results of software professionals to uncover about the importance of software documentation and tools & technologies used to maintain such documents. The survey was done in 2002. The main focus for this survey was to uncover the importance of documentation in industrial software projects and to find out the likes and dislikes of tools and technologies which maintain documentation and their opinions how documentation could be improved.

The results as per this paper suggest that:

1) The useful documentation technologies used were MS word, Javadoc & similar tools, text editors, rational rose and together. Other technologies that participants found useful are ArgoUML, Author-IT, white boards, JUnit, XML editors, digital cameras and Framemaker.

2) One important result came that documents have a finite useful lifetime. But there is reluctance to discard the documentation due to the effort and resources required to produce it.

3) The survey data suggests that tools & technologies, processes should focus on:-

- Content & Updating of documents.
- Availability of documents
- Use of examples and its better integration with the document.

4) Only 23% strongly agree and 49% somewhat agreed that automated tools provide resources that serve as useful documentation. Documentation resulted from automated tools may better communicate the true features of a system.

3) Paper titled "**Agile Tools – The good , the bad and the ugly**" showed the results of survey conducted on project management tools and the sample size taken was 371. Below table shows the tool category and number of people who prefer these tools.

TABLE 1: Agile tools usage

Tool category for Project Management	Answers
Traditional (MS-Project, Dot project)	89
Spreadsheets	60
None	65
Agile (Rally, XPlanner, VersionOne, Mingle, ScrumWorks)	41
Bug Tracking (JIRA, Mantis)	44
Collaboration (Basecamp)	20
Wiki (Trac, Wiki)	24
Other (Paper, VSTS)	12
In-house	16
Total	371

The pros as stated in the paper are that tools are easy to understand and use, flexible in nature and can be adopted by collected teams and are less expensive.

The cons as stated in this paper are that the tools are not suitable for distributed teams, do not support reporting, are not suitable for manual updating of burn down charts.

4) Paper titled "**Agile tool market growing with the philosophy**" stated that the agile development is booming. The application life-cycle management tools market is growing day by day. The rise of agile ALM tool reflects the market need to scale agile from small web driven architectures and teams to cross-enterprise architectures. The Trail Ridge's 2006 survey mentioned that 60% of large development agile organizations and more than 50% of small development agile organizations use office-application based tools for ALM purposes. However, management and distributed teams were not happy with these tools, so some integrated ALM tools are required which are useful for distributed teams.

Rally tool & VersionOne tool are used as they provide good visibility and communication. Also, it reduces lots of documentation. These tools help the developers' senior executives, project managers and user visibility into the development process.

BMS tool is not agile but it brings visibility to a heterogeneous set of tools and methodologies.

ProjectCards tool targets the agile team or project that has neither the time nor expertise to create an excel or wiki-based tool but that does not need a comprehensive integrated ALM platform.

5) In the paper with title "**A feature based tool selection classification for Agile Software Development**" author has developed a classification model which helped in selection of tool which best fits into different level of maturity in projects and companies. Agile software development promotes adaptive arranging, early delivery of product, continuous enhancements, evolutionary development and encourages rapid change. This paper also considers size of the project, the size of the team, stability of the requirements and complexity of the software for a wide range of available tools.

This paper mainly concentrates on satisfactory aspects as well as criteria for selection of tool.

The results of this paper have considered key factors to select a particular agile tool (25 tools) for project management was:-

1) Life cycle management using one agile tool
2) Enterprise scale (Collaboration)
3) Simplicity and ease of use
4) Analytics and reporting
5) Workspace and process
6) Program management
7) Deployment, integrity and security
8) Scrum and Kanban supported
9) Popularity on the web

Finally, the model has been developed by looking into three criteria which are security, tools (open source or proprietary) and teams (collected or distributed).

6) In the paper with title "**Visual backlog in Agile Management Tools for Rapid Software Development**" authors have stated that in Agile Project Management, developers as well as stakeholders actively participate with one another for domain understanding. This study has mentioned the components of APM tool. The components are visual control, collected high performing teams, adaptive control collaborative development and feedback. Adaptive Control increases the collaboration between team members and managers as manager do not act as task instructor or master. It increases working relationship environment. Collaborative feedback means getting feedback from customers as well as from team members after every iteration of the project which helps the developers to concentrate properly on customer requirements and project success. Also, authors suggest that major focus is on earning revenue and learning from mistakes.

7) In the paper with title, "**Agile project management (APM) tooling survey results**" a survey was conducted by its authors from which total 570 responses were made. Out of the total received responses, valid sample size came out to be 525 from 39 countries. The results in the paper proved Scrum to be the most used agile method. Also, the results in this paper were majorly divided into 3 parts: One was Agile Corporate Profile and the other one, APM tools. Further, APM tools were divided into six categories namely Manual, Office, Wiki, Internal, Agile Tool and Traditional. The third one as stated in the paper was the reasons for selecting APM tools when agile manifesto itself propagates people and their collaboration in place of tools and processes. And then the reasons as stated in the paper are that in large organizations, traceability and tracking of project development. And in small organizations, introduction of faster and more efficient processes came out to be main reason behind APM tools adoption in practice.

8) The next paper titled "**Understanding approval rating of agile project management tools using twitter**" aimed at evaluating the tweets on twitter which could help in providing a judgment that which APM tool available is most appreciated and used as many people believe that agile development helps the teams in completing the projects faster and improving the quality of the projects. They used opinion mining or sentimental analysis on tweets using SentiStrength tool for getting the results and these results were compared with the results of Google Trends. As per VersionOne 2013 surveys, the most commonly used tools in descending order are Excel, Microsoft Project, Version One, Atlassian Jira, Microsoft TFS, IBM Clearcase, Leankit, XPlanner and Trello. The sample size used was 84837 tweets and data was collected between September 2014 and March 2015.Sentistrength tools evaluated the comments extracted from twitter and a score was assigned to each comment:

- 1 if the comment is +ve
- -1 if the comment is –ve
- And 0 if the comment is neutral

The results were that out of 84837 tweets, 39756 were neutral, 35409 were positive and rest 9672 came out to be negative. Based on the positive and negative tweets, Trello was the most appreciated tool, followed by Leankit and Microsoft Project.

9) Paper titled "**Scrum Team System Honours project literature synthesis**" presented a detailed study on scrum methodology. It also provided a list of tools that complement Scrum process and play a vital role in its successful implementation. These tools are of two types: Commercial and Open source tools. Scrumworks, ScrumNinja, Scrumwise, VersionOne, TargetProcess and Scrum for Team System form a part of Commercial tools. Furthermore, Xplanner, FireScrum, IceScrum and Scrum Time are some of the examples of Open source tools as discussed in this paper.

V. MOTIVATIONAL REASONS FOR ADOPTING AGILE TOOLS

1) According to the 10th state of Agile survey, the majority of respondents continue to use spreadsheets as one of their agile project management tools. The mostly common used project management solutions were Atlassian/JIRA, Microsoft project and VersionOne.The top three recommended project management tools were VersionOne, Leankit and Atlassian/JIRA.

2) According to Agile Project Management Software User Report – 2015, the top three recommended tools by

project managers were Excel, Scrum boards, Activity streams and Kanban boards.

VI. CONCLUSION

Based on the literature review, we can expect that there is a strong trend of agile project management tools in the coming future as a number of small and large scale industries are purchasing or deploying agile project management tools for managing the things. APM tools can easily detect defects. From the literature studies so far, we can say that most recommended tools for project management are Physical wall & paper, Spreadsheets, VersionOne, JIRA, ScrumWorks and Wiki etc. The tools are used mainly because they have ease of use and are very dynamic & flexible in nature, Product/Release backlog maintenance, Release and iteration plan maintenance, priority settings of backlogs and bug management. We can also say that large organizations are using APM tools because of tracking & traceability in the project and small organizations are using them because of faster and more efficient processes in their project. In future, we can perform a survey on a larger scale about positive aspects of tools and the mostly used tool on certain criterias.

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