Agile Project Management Tools

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The main issue addressed by this paper refers to the ways a software development team can organize and quantify their work during the development process. This paper exposes one of the well-known software products in the ICT industry and tries to create a clear image over its functionalities, also being compared to another product from its class.
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Introduction

Agile software development represents the priority of nowadays ICT industry. Using this kind of methods and solutions gives the opportunity for both the developer and client to have a more open and flexible image on the project and product that has to be developed. The agile methodology promotes the collaboration between teams, permitting them to be self-organized and making decisions independently.

One of the best known documents on this subject is the "Agile Manifesto" which was introduced in 2001, after almost two decades of using the agile methodology. [1] The main principle of the Agile Manifesto is to ensure that the developing process is done in an efficient way and providing high quality results, but the most important aspect would be making individuals (developer team members) help each other in the development process. For example, most of the principles focus on team work and ability to adapt to changes, but never the less being able to satisfy and understand the client's needs. [2]

Many times now, agile was compared with the traditional way of developing products, but there are many differences between them. For example, when we use agile methods for developing a product, we must take into account that there is some estimation that cannot be made in the early stages of the development, the main focus of it being complex projects with dynamic characteristics. If we are to say it in a simple way, agile methodology is represented by many changes during the developing work, flexibility and team work. [1]

Under the agile developing there are some popular methodologies such as "Adaptive software development", "Agile modelling", "Agile Unified Process", "Crystal Clear", "Scrum", "Scrum ban" and many others. The difference between them is the main focus during the development process. Some of them are concerned of the practices that are used ("Extreme Programming", "Agile modelling"), while others focus on the management part of the software project. [3]

Project management appeared as a need to evolve in a stable and secure system, this being the main source of reducing the risks concerning the product development to a minimum. If we are to look into the real meaning of this concept, "project" refers to intention, deciding to do something valuable, both economically and productive. [4]

In order to have the desired results in terms of team communication and resource allocation while working under the agile methodology, it is advisable to use a special conceived tool that will help developers plan their work. As this industry is growing and more and more people are learning and developing under it, of course, there are a couple of this tools that must be compared, taking into consideration the needs of the development team.

When we say "management tool", some of us may think it is unnecessary because they can easily plan their work according to what their manager gives them as tasks. But if we are working in a medium scaled company, where every day there are new challenges and the

focus is based on continuous innovation, adaptability, and reliable results, [5]there is definitely the need to have such a tool. During the next sections of this article, it will be presented two of these tools and their characteristics in order for the developer to decide which one is better suited for his work. We will analyze one of the well-known products in the industry: JIRA, but we will also present another tool, Tuleap, in order to have a better understanding on project management and its needs. JIRA is a proprietary issue tracking product, developed by Atlassian that provides numerous advantages such as bug tracking, issue tracking, and project management functions. It is capable of estimating the time and work the development team will put into providing the best results. Tuleap was released by a French company, Enalean, and is an alternative agile project management tool.

The main purpose of this kind of tools used during the development process is being able to track the status of each task, user story and project that is in production. There are a couple of roles in the agile development team such as Scrum Master, Product Owner, and development team. Within the management tool that one company is using, there are a couple of rules that must be respected, these also being mentioned in the agile methodology. The changes that are made to the product backlog, the sum total of needs for the new software product, will be made only by the Product Owner, and the Scrum Master will be the one responsible for the communication and synchronization between the development members of the team. [6]

As we can see in the InfoWorld online journal [7], JIRA is a popular tool used for tracking the evolution of a product development process, having the possibility to create and manage user stories, sprint backlogs and visualizations of team activity. Another important survey on its efficiency was conducted by Finances Online that states a couple of extra facilities for this tool. [8] Some of them are worth mentioned such as:

- Polished user experience
- Powerful search and filtering

- Advanced security and administration
- Customizable dashboards and wallboards.

Tuleap integrates forge system functionalities that enables teams to manage software sources (using Subversion, Git or CVS); share technical or project documentations; track bugs; consolidate communications with customers, developers or third parties. [9]

Methods

In order to have a better understanding about project management and project management tools, our purpose was to take different sources and make a summary in order for the development teams to choose the suitable tool for their work. We will explain in the sections that follow the importance of having a powerful and reliable tool which will take care of the entire planning of the development and we will give grades from 1 to 10 (1 – poor performance; 10 – best performance) in order to have a final image of each.

The main purpose of such a tool would be the ability to have the continuously and permanently control over the project that the development team is working on. In order to be able to do this, there are a couple of factors that must be taken into consideration and these are as follows [10]:

- Agile reporting and metrics – the advantage to having a project management tool is that the team doesn't need to keep in mind all these information, just look over the reports that you can build with a tool like JIRA and have a better understanding of the project. Also, it would impact the quality and overall progress of the development process.
- Communication – By using an agile project management tool all the members of the development team will be able to communicate updates, even if the team members are based in the same location or there are international teams. Of course, there are other benefits like being able to give feedback, share task lists and user stories.
- Project assessment – By having the ability to identify and clear all the obstacles that come in the way of the development

process, being able to evaluate the performance and estimations on cost and revenue.

The study is based on these three assets that most of the agile management tools have, but the products that we are willing to present are Jira and Tuleap. Having to research about them made us realize there is more than just a duty that comes from both Atlassian and Tuleap, but a consciousness that the developer of this product has on his clients. Being able to understand their needs and the most important aspects regarding a project management tool not only makes them good, but the best in the IT&C industry, a branch that is willing to grow fast and powerful.

During the study of JIRA and Tuleap, there were used many sources of interest and also hardware equipment such as laptops. The tool was installed on the machines and used in order to have a better understanding of its insides. We discovered that there are a lot of functionalities that the developer team could use, as for example charts, backlog management, sprint creation, attachments available into user stories.

Results Analysis

An agile tool should be as simple as possible since the developers should focus on product delivery and they do not need extra work. In order to make the right decision when choosing the agile tool, we have to take into consideration the key factors for the process, or more explicitly what are the needs of our company. As it is listed, there are a lot of features that should be considered when making such an important decision: Centralized Story & Defect Management, Release and Sprint Planning, Online Storyboard, Task board, Project Tracking, Team Collaboration, Acceptance Test Management, Burn down, Velocity and Test Trends, Integrations (IDEs, CI, and Source code), Multi-Project Support, Sprint Review and Retrospectives, Impediment Management, Customizable Workflow and Views, Program Management, Themes, Goals, and Requests, Team Room, Customizable System Setup, Configurable

Security, Advanced Reporting & Dashboards, Agile Portfolio Management, Regression Test Management, Customer Idea Management, Product Road mapping, Agile Visualization, Custom Reporting and Analytics, Planning Room.

JIRA is a powerful tool for any form of task or project management, small or large, if we are to talk about resource management, work planning and reporting of the results. It gives the development team the flexibility to plan and adopt any agile practices, whether it will be "Adaptive software development", "Agile modeling", "Agile Unified Process", "Crystal Clear", "Scrum", "Scrum ban" or a mixed methodology. Teams can create and estimate stories, measure team velocity, and report on progress. Jira is a web based product, which offers a proprietary license and has Java as its programming language, but it does not offer a document and portfolio precise management. As well as Jira, Tulip is a web based tool, but it has a GPL (general public license), which makes it more accessible to the users.
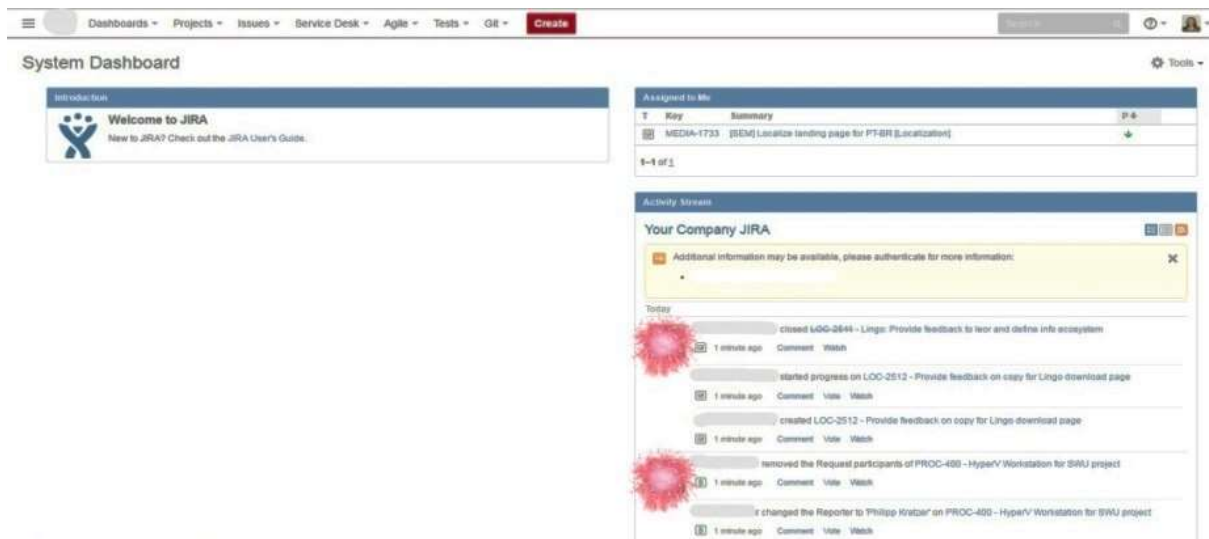
JIRA has integrations with other tools such as PDF View Plugin, Script Runner, Draw.io Diagrams, Email This Issue, Jira Workflow Toolbox, and can be adjusted to work for almost any business workflow. There are a number of add-ons and other applications such as Bamboo, JIRA Agile and Service Desk that you can buy and extend its services if needed. It supports a wide range of project management techniques that allows the user to mix and match a lot of them with different projects within the organization. This means it can be run by different teams with different project management styles, with many tasks, without a problem. JIRA will allow users to scale, and is very flexible. It can be an issue tracker, a classic project management and an agile tool all at the same time [11]. Talking about the integration level, Tuleap does not offer communication software such as HipChat and Slack, which could lead to less efficient team work.

There are a couple of parameters that must be entered in order to create a story such as the name of the project that the task is assigned to, the type of the issue that can be, among others,

task or impediment, a small summary that has the purpose to indicate what that task is about. Also, some other things important to be mentioned when users create a task is assigning priorities, the values for this field being from "Normal" to "Critical", and story points. Of course, the task must be assigned to a member of the development team, being able to assign the task to the current user by selecting "Assign to me" option. With JIRA, we can add attachments for our stories, or briefs, as the developers call them. A brief has a predefined format that must be completed with relevant information for the development team. Other information that can be provided

when creating tasks are epic links, labels, the name of the sprint where the task will be available, and of course its business value. We will give a 9 score for usability of Jira.

JIRA is helping prioritize the tasks, so the users can determine the estimated time for a project, score them by business value, and organize them into different categories. The communication is improved by the comments on tickets that are emailed to the person who created them, so it is easy to follow the conversation messages without having to schedule meetings or send emails. This quality of the tool will be given a 10 in term of quality of the management planning.

Fig. 1. View from user account

All the pre-installed tools for reporting allows users to have very useful dashboards for clear data representation and there are some other features like saved searches, workflow, labels, advanced search query, linked issues, follow issue, history, batch updates and view in issue navigator who will seriously make it easier for anyone to work with JIRA. Figure 1 above presents the view from one user account. As we can observe, there are a lot of options as they were stated above that help the user decide what action to take next.
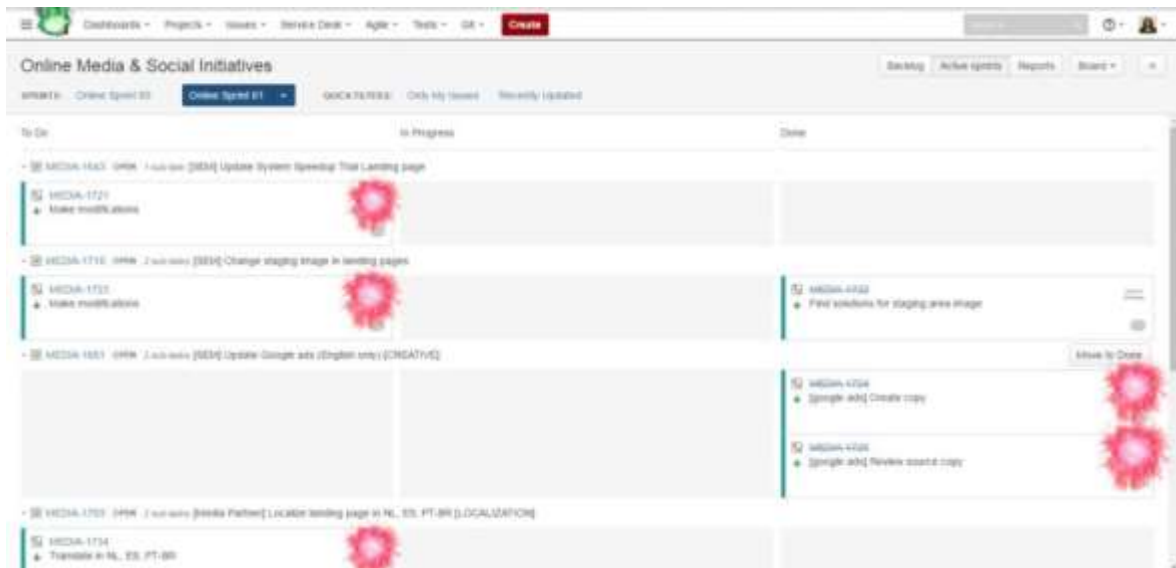
Also, this window provides an overview of the stories assigned to the current user and a brief about the tasks that other users are working on. For the relevance of the information provided we will give Jira a 9 score.

If we are to talk about keeping track of what user stories are to be done and which of them are in progress or already finished, JIRA provides such a report, as we can see in Figure 2. It keeps a lot of information about the tasks, the development team members that are assigned to do them. We can run this report for the current sprint or have an historical background on what was finished or not during previous sprints. In terms of reporting, Jira will receive an 8 due to its reduced flexibility on selecting the time ranges of the reports.

JIRA is a customizable tool which allows users adjust functionalities in order to satisfy various requirements for metrics and charts expected by stakeholders. Also, the licensing

model is per use and bands, you start with 10 users at 10 USD/month, and if you pass the 10 users will automatically switch to the 15 users at 50 USD and so on, but if you use less than 10 again it charges you 10 USD/month again, which is very helpful for your business. In terms of costs, Jira is a lot expensive than Tuleap, the last one being free for students and academic research.

Fig. 2. JIRA sprint state

The latest versions of JIRA, from JIRA 6.0 to 7.1, can be used on a variety of platforms (Windows, Linux/Solaris) and can be integrated with a wide range of databases (Oracle, MySQL, PostgreSQL, Microsoft SQL Server). They can also be used on a variety of web browsers such as Google Chrome, Internet Explorer, Mozilla Firefox, Safari, Safari Mobile and Android standard browsers.

The down side of the previous versions is that they are not mobile ready, the sprint management tools are not highly developed and it needs better technical support. It can be slow and its configurability comes with some sacrifices in its ease of use. Some of the advanced configuration is near impossible without an expert in the software guiding teaching you.

Also the rank is only applicable in the context of a sprint, which is not really powerful if you want to prioritize across several teams regardless of sprint. While configurable, JIRA requires a certain amount of effort to extend its data schema with new attributes, especially if those attributes need to be calculable or carry some logic behind them – as for example

if you need to calculate the amount of re-opens per ticket throughout the project, it's far from an easy task to do. JIRA has a great UI, but some clicks could be reduced in some areas by allowing lists to be editable without having to actually go into the tickets.

Discussions
Managing to make a proper evaluation for Jira by giving all its functionalities grades and calculating a mean of 9 is an indicator of its complexity and high level results. Creating and assigning tasks as well as managing to track the evolution of one project is done in an easy and reliable way, as described in the above sections of the article. Also, the reporting of the results, being it less effective than on other tools, gives the user an important clue on how the development team is working across their projects. Given that JIRA is not a free software tool, it provides a lot more usability opportunities than an open source one.

Our research concluded that Jira is, as all our research articles and papers say, a very useful agile management tool, with a lot of customization plug-ins such as PDF View

Plugin, Script Runner, Draw.io Diagrams, Email This Issue, and provides the users the possibility to communicate effectively during the development process with software products that can be integrated such as Slack and HipChat.

Conclusions

The scope of our research was to provide reliable information about agile methodology and to offer a perspective about the best project management tools listed on market at the moment.

We concluded that using agile methods and solutions gives the opportunity for both the developer and client to have a more open and flexible image on the project and product that has to be developed than using the traditional way of developing products.

Agile methodology is represented by many changes during the developing work, flexibility and team work. The agile methods are suitable for complex projects with dynamic characteristics when the estimation cannot be made in the early stages of the development.

In order to have the desired results in terms of team communication and resource allocation while working under the agile methodology, we have presented two special conceived tools that will help developers plan their work.

We compared two of the well-known products in the industry Jira and Tuleap in order for the developer to decide which one is better suited for his work. The main purpose of this kind of tools used during the development process is being able to track the status of each task, user story and project that is in production. We discovered that there are a lot of functionalities that the developer team could use, as for example charts, backlog management, sprint creation, attachments available into user stories.

For comparing the previously mentioned tools we have taken into consideration the following factors:

- Agile reporting and metrics
- Communication
- Project assessment

The result of this comparison, lead us to the conclusion that Jira is the most suitable solution for developer team when we talk about project management. We presented the many advantages of this tool to support our opinion and we will briefly remind the most important ones.

Jira can handle any form of task or project management, small or large, if we are to talk about resource management, work planning and reporting of the results. Jira gives the development team the flexibility to plan and adopt any agile practices. Teams can create and estimate stories, measure team velocity, and report on progress. Jira is a web based product, which offers a proprietary license and has Java as its programming language, but it does not offer a document and portfolio precise management.

Jira is helping prioritize the tasks, so the users can determine the estimated time for a project, score them by business value, and organize them into different categories. The communication is improved by the comments on tickets that are emailed to the person who created them, so it is easy to follow the conversation messages without having to schedule meetings or send emails. This quality of the tool will be given a 10 in term of quality of the management planning.

Jira integrates a lot of customization plug-ins such as PDF View Plugin, Script Runner, Draw.io Diagrams, Email This Issue, and provides the users the possibility to communicate effectively during the development process with software products that can be integrated such as Slack and HipChat.

In conclusion we recommend Jira for project management purposes, even that JIRA is not a free software tool. The fact is that it provides a lot more usability opportunities than an open source one and companies that invested in this tool saved a lot of time and money that worth more than costs involved in purchasing and maintaining the tool.

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