

Software Project Planner and Controller

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Abstract— The software industry has always been challenged to deliver quality products to the market at cheaper price, faster pace and better quality year after year. One recent trend to address this challenge has been to build products using agile methodologies. Implementation of agile methodologies require the teams to have the right tools, processes and metrics to measure the success of the processes. The software components of this project are an agile project tracking tool, a process transformation tool and a reporting tool. Project tracking tool will be monitoring the objectives in the various projects and helping company to achieve the target of on time delivery. The process transformation tool will be designed and developed to transform the high level Companywide metrics into team level metrics which will be helping us to follow the process and its measures for a quality end product. This tool will manage to ease the access to various portals & tools and collect required metrics which are project related by gathering those necessary metrics and aggregating them via this tool. The reporting tool will be a breakthrough to track the effort of the employees. Employees can view where and when they have given their efforts in a simpler way using this reporting tool rather than wasting time to count it every week. The tool will also be helpful to the managers to track the effort count and to know which individual is working on which phase of any project.

Keywords: Project, manage, level, metrics, portal, reporting.

I. INTRODUCTION

Tight deadlines, limited resources, tricky stakeholders and demanding customers- for anyone who has ever managed a project, these things are all too familiar. As a manager one wants to deliver high quality projects to meet the specification, stakeholder needs deadline- and budget!

“Project Management as knowledge field is both an art and a science”. Project management is the application of knowledge, skills, tools, and techniques to project activities in order to meet or exceed stakeholder needs and expectations. Project planning defines the project activities and end products that will be performed and describes how the activities will be accomplished. The purpose of project planning is to define each major task, estimate the time and resources required, and provide a framework for management review and control.

A. Agile Project Planning And Management

Agile Project Management is an iterative process that focuses on customer value first, team interaction over tasks, and adapting to current business reality rather than following a perspective plan. Agile project management is how you deliver high value and technical quality within your time and budget constraints. However, the principles go beyond software development. It is a mind-set of people

who need a management approach that builds consensus quickly in a fast paced environment.

B. Scrum

Scrum is an iterative and incremental agile software development framework for managing product development. It takes a cooperative team of employees to complete a project. It defines "a flexible, holistic product development strategy where a development team works as a unit to reach a common goal", challenges assumptions of the "traditional, sequential approach" to product development, and enables teams to self-organize by encouraging physical co-location or close online collaboration of all team members, as well as daily face-to-face communication among all team members and disciplines in the project.

A key principle of Scrum is its recognition that during a project the customers can change their minds about what they want and need, and that unpredicted challenges cannot be easily addressed in a traditional predictive or planned manner. As such, Scrum adopts an empirical approach- accepting that the problem cannot be fully understood or defined, focusing instead on maximizing the team's ability to deliver quickly and respond to emerging requirements.

II. BUSINESS SURVEY

A Software Development Life Cycle (SDLC) is essentially a series of steps, or phases, that provide a model for the development and lifecycle management of an application or piece of software. SDLC is a process followed for a software project, within a software organization. It consists of a detailed plan describing how to develop, maintain, replace and alter or enhance specific software. The life cycle defines a methodology for improving the quality of software and the overall development process.

Various SDLC models have been studied and compared such as SDLC Waterfall model, and SDLC V-model. To overcome the disadvantages in these models, Agile Software Development model with Scrum methodology is being used in building the tool.

A. Project Reporting

Various project reporting tools were evaluated to build the reporting tool. The tools evaluated include BIRT, JasperSoft Studio, Pentaho and Tableau. Out of all these Tableau is the more advantageous and easy to use software. Hence “tableau-desktop” is used as a reporting tool to generate reports and is integrated on the SPPC tool. Reports are generated based on the data present in the tool which are filled by the employee.

III. SYSTEM ANALYSIS

There are so many problems the business is facing presently such as: Undefined goals, Scope management, Inadequate skills for the project, Lack of accountability, Improper risk

management, Ambiguous contingency plans, Poor communication, Improper deadlines, Resource deprivation, Lack of stakeholder engagement, etc. The proposed system overcomes all the above business problems.

There are so many such systems existing in the market but with few drawbacks like low performance, less user friendly, poor functionality, cannot be used for large teams, limited API's, unable to integrate with external systems, bad user interface, problems in reporting etc. All these problems are overcome by the SPPC tool. This tool is very effective for the managers to plan and track a particular project along with the tracking of individual employee.

The proposed system is a project planning and tracking tool for Scrum teams. To summarize the Scrum planning process, the customers pick the features to be added to each development iteration. The developers estimate the effort to complete the stories either at the story level or by decomposing the story into tasks and estimating those. Information about team development velocity from the previous iteration is used to estimate if the team can complete the stories proposed by the customer. If the team appears to be overcommitted, the set of stories are renegotiated with the customer. This tool is created to support this process and address issues experienced in a long-term real-life project.

The tool that is developed is known as DRUID. Druid is a Java Web application designed to support team management according to the scrum methodology. However, this tool is found to be flexible enough to provide valuable support for other mainstream agile approaches in the heat of project delivery. Although unsophisticated, Druid provides a handy tool to support your team whether you are experienced with, or just launching into, the rewarding world of agile software development. It supports recording and tracking projects, iterations, user stories and tasks. It models itself along the Scrum process decomposing stories into tasks analyzing the project through completion of tasks, and in the end, collating all stories to complete the project. Druid displays tasks and story statuses for developers and customers, with the facility to attach notes to stories and tasks, and generate distributed and integrated tokens with email notifications. Druid comes with an integrated online time tracker that generates both individual and team time sheets. Other highlights include the different charts for iteration velocity, Scrum burn down, distribution of task types, dispositions, and more, the facility to generate metrics such as team velocity and individual hours, and the facility to export such project and iteration information in XML and PDF formats.

The reporting tool is integrated on Druid. This is used to generate reports like dashboards using the data that is present in Druid. The reports include Burndown charts which is a graph that tells about the actual and the estimated time, Productivity which tells about the productivity of each employee, a leave calendar which gives the information about the presence and absence of employee, rework and reusability graph and so on. Other reports include Scheduled Variance Index (SVI), Effort Variance Index (EVI), and Test Coverage- which is the ratio of total number of test case present over number of test case executed.

IV. IMPLEMENTATION

The high level architecture of DRUID is as shown in the figure below. It has four main modules:

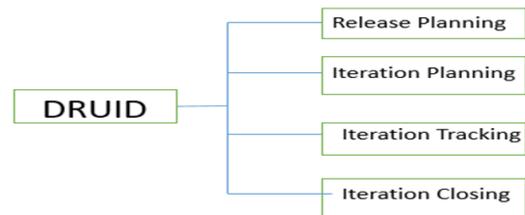


Fig. 1: System Architecture

A. Release planning

Cutting corners in project planning is a recipe for disaster, no matter what the reason. The initiation phase is critical to the success of the project as it establishes its core foundations. Effective project planning takes into consideration all aspects of planning including stakeholder engagement, benefits mapping, risk assessment, as well as the actual plan (schedule) itself. The three most cited factors for project failure are:

- lack of stakeholder engagement,
- lack of communication, and
- Lack of clear roles and responsibilities.

These factors therefore, need to be considered very early on in the creation and planning of any project.

This is the first phase in project management. Here scope and plan of the project is defined. The entire project is divided into several iterations. Each iteration is further divided into stories. The stories are defined, prioritized, estimating the values of stories and estimating the stories. In the define plan phase, the available human resource and their working hours is estimated. The time boundary to complete each story is set.

As shown in the figure below, release planning consists of various phase and this is the largest phase in the entire process. Here all the initial planning, division on the project and assigning the particular tasks to particular employee is done. Once this is done properly, the phases that follow becomes easier.

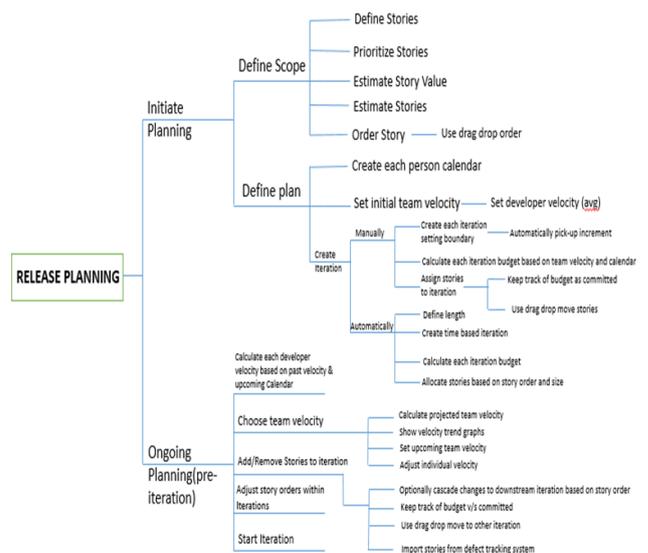


Fig. 2: Release Planning

B. Iteration planning

Iteration planning is the second phase in project management. Each story is divided into tasks. "Tracker" is an authenticated user of the project and he assigns each tasks to people. He also keeps track of all the tasks that has been done and that has to be done. The acceptor should complete the task assigned to him within the given deadline.

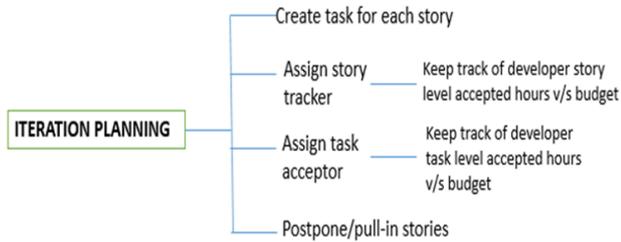


Fig. 3: Iteration Planning

C. Iteration tracking

Iteration tracking is the third phase in project management. It is the acceptor's responsibility to fill in the time entries in daily basis. Everyday a stand-up meeting will be held in which each acceptor is supposed to report the summary of his previous day's work. This information will be saved in the database. The reporting tool will fetch this data and generates the required reports such as "burndown charts". A burndown chart is a pictorial representation of the progress of the work with respect to time. It is a graph which is plotted using the total estimated hours v/s actual hours.

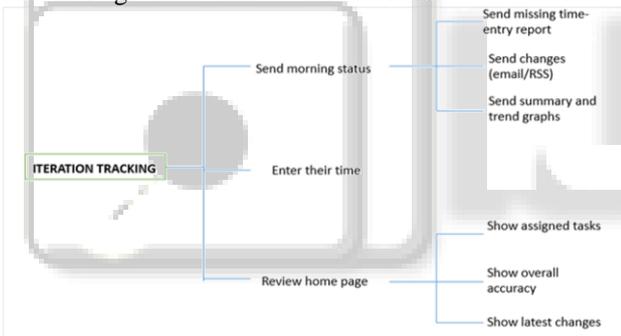


Fig. 4: Iteration Tracking

D. Iteration closing

Iteration closing is the final phase in the project management. The stories which are completed are closed, all the unfinished stories are continued, the story evaluate accuracy is reviewed by the tracker and the project manager. The project also has a feature of importing and exporting templates. Here the productivity/velocity of every acceptor is estimated based on the tasks completed in given time. Hence the overall team velocity is calculated.

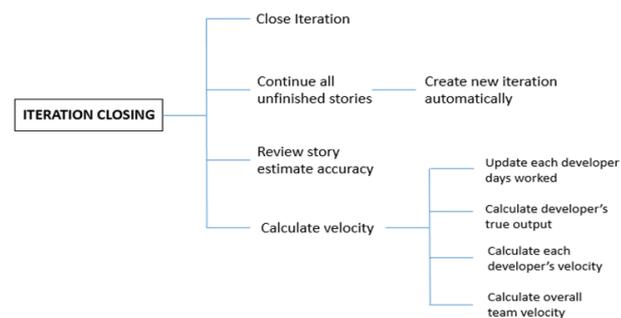


Fig. 5: Iteration Closing

V. CONCLUSION

The project tracker tool built helps in planning the project. The entire project is divided into many iterations and iterations are divided into stories and user stories are finally divided into tasks. These tasks are assigned to different people and it helps the product owner and the manager to come to know what all work is assigned to whom and the status of the work. It is mandatory for the employees to fill in the values inside the tool regularly about their progress. The tool helps in effective project planning and tracking. From the values entered by the users, various reports are generated like Schedule Variance Index, Effort Variance Index, Productivity, Burndown Charts etc.,. On analyzing these reports, various managerial decisions can be taken to lead the project in proper direction and finish the project as expected by the product owner, within the deadline. Hence, the efficiency of Scrum implementation is understood.

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