

STUDY OF VARIOUS BUG TRACKING TOOLS

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ABSTRACT- As per the size of software increases in modern software organizations, number of defects is also increasing. Bugs are inevitable in software. Bugs reduce the reliability of software by increasing the risk. It is not always easy to track and mitigate issues caused by bugs. So as Bug tracking softwares are introduced. Bug tracking tools are a preventive measure that not only finds bugs but also do the debugging process. It handles cross communication between different team members and keeps the track of bug handling which makes it scalable. For a software industry it is very important to know about usage of any bug tracking software as per their requirements. This paper focuses on some most popular bug tracking tools that are currently being used in software firms. Presented study helps to select the tool that provides the best solution in context to the requirement of industry. A Comparative matrix is given to provide better analysis and visualization of same.

Keywords — Software Testing, Bug Tracking Tool, Debugging, Bug.

I. INTRODUCTION

Overall motive of software development is to provide bug free software. In this journey developer faces many bugs and failures. It is not always easy to resolve every type of defects. Maximum number of defects arise from issues in design or in programmer's code[1]. Neither Developer can keep track of bug resolving process not software tester keep record of bug reporting. For this bug tracking software is needed. Bug tracking softwares can be used by developers, testers, customers and operational staff. Number of team members can access parallel this tool. Bug tracking tools not only provides the clear and centralized view of all testers bug reporting but also shows the stages and status of bugs. It can remind developers of priorities and severities of resolving bugs. Stakeholders can take benefit of these tools by generating productivity report of programmer and attitude towards risk handling. Although it is not a perfect criteria to measure efficiency of a programmer yet can provide a coverall idea of productivity.

Research Gap:

In this section various issues related to reporting and tracking bugs without any tools are discussed. After bug filing various processes like traversing of code, execution of test cases, debugging process occurs. To track

the whole document is not a favorable task to find issues and when defect encountered, keep track of those bugs is also a tedious job. There may be hundreds of bugs and can't be controlled without a software.

Further there are communication related issues in between testers and developers. Some bugs are not properly communicated to developers or there may be scenario that developers not taking bugs severity at priority and resulting crash of software. Moreover both testers and developers can't work parallel on same bug as bugs are maintained manually and a single person can modify it at a time. So lack of communication proves to be disaster in software development.

To deal with such challenges bug tracking softwares were introduced but all are not appropriate as per requirement of software industry. Some tools consist of complex and confusing functionalities. Another issue with most of the tools are that these are web dependent containing sequence of hyperlinked pages. They are difficult to navigate.

II. LITEATURE REVIEW:

Any flaw or issue in code is called software bug. There may be any reason for bug including change of requirements, coding error, poor handling of automations tool and many more [2]. Defect free software not only increases the quality of product but also satisfy customer's expectation. Software quality and reliability directly depends upon the defect density. Further it is mapped with customer's requirement and satisfaction level. Debugging procedure has its own importance. It is always necessary to keep track of occurrence of bug record as well the procedure to resolve the issue [3]. Bug may arise during the maintenance phase and even at the time of first deployment also. A single bug can affect the

whole system including crash of software too.

A bug pursuit system is required to overcome these issues. This approach will be proved as successful technique to log the bug into the system without hassle and other team members can take benefit from it using parallel [4]. But developers working in same project are not taking bug pursuit system positively as no developer wants to get bug in his own written code.

Earlier individuals adopting a caterpillar system approach which was not so efficient. As individual logging issues by emailing to concern tester and concern tester reverting back on same email. But technique worked for small project, as project grows number of team members also grows which yields confusion and inefficiency [5].

As the project size increases, quantity of bugs increases so as bug reports increases. To get it minimize data loss may occur and it also includes the essential bug tracking record [6]. Good bug tracking software is the need of era which will work as per software industry requirements and standards.

BUG TRACKING TOOLS:

1. Backlog

Backlog is one of the most user-friendly cloud based bug tracking tool founded by Nulab Incorporation in the United States which is especially made for the development team it is so easy to use that anyone can easily report bug and keep track of a full history of issue updates and status shift. Backlog provides co-ordination, collaboration between the developers and the nontechnical team members. It provides users to place tasks in one place and assign them to other teams. Development team can easily track the bugs and each bug report is automatically directed to the team members assigned and equipped to handle the specific issue. The Development team can easily collaborate with each other to resolve bug and have ability to comment on each issue. They can also collaborate with each other when it comes to reviewing and improving

code. Developers can also propose changes to code and establish a discussion on its recent features with their fellow workers.

Benefits:

- Real time transparency
- Aligned Communication
- Support of centralized repository
- Redundancy removal

2. ReQtest

ReQtest is cloud base bug tracking tools which consists of suits of modules. It has advance and intuitive bug tracking capabilities. It provides easy collaboration between the developer and tester to get best results while fixing the issues. It has filters to search for the subgroups of bug reports and built in features to concentrate on issues tracking. You can also integrate it with Jira that provides you full two way integration and gives you most updated version of the bugs. With ReQtest you can also import your bug report from CSV files. ReQtest provide drag and drop features, So that you can easily drag and drop any column to get grouped view of your bug report. You can also add attachment or videos to clearly describe the bug. You can easily convert your data into graph or pie chart and create powerful report by export the charts to word, PowerPoint, etc.

Benefits:

- Better integration with project management system
- Allows users to plan and implement the test cases
- Better visual presentations of bug report
- Can define and manage requirements efficient

3. BUGZILLA

Bugzilla is an open source bug tracking tool. This free

enables individual developers or whole development teams to converge on a single hub and work on bugs and other issues via the app's web interface or even email. As Bugzilla does not have more customization options but it is a powerful and effective tool in bug tracking in software and hardware. It provides top level security to improve confidentiality of the users. It has advanced query application which remembers your searches and have integrated email capability. It has email notification capability controlled by user preferences. Bug lists can be seen in multiple formats like Atom, iCal, etc. User can also schedule report daily, weekly, hourly etc. and user can generate and reports and charts. It has automatic duplicate bug detection capability.

Benefits of Bugzilla:

- Basic and advanced search capability.
- Email Attachment helps in tracking the
- Bug reports supports different formats.
- Reports can be fed into calendar format
- Results of search can be saved for future reference
- Time can be tracked for all logged bugs

4. Zoho Bug Tracker

Zoho Bug Tracker is an online Bug Tracking tool. It's interface is very user-friendly from all backgrounds. It provides an easy way of organizing and resolve issue of your projects. You can log and track bug through entire life cycle. It is loaded with lots of features. Its dashboard provides you the information that what the other team members are doing. It has drag and drop features and can manage all files at one place. This software has automatic notification feature which alerts you you each time if there are bugs. This software supports third party integration like

integration with Github and bitbucket and provides real time monitoring and can customize and automate bugs. It also provides reporting and statistics of the data. You can add bug via email and has file sharing capabilities.

Benefits:

- Tracking time feature
- Metadata preservation at single location
- Captures reports of real time data
- Can be integrated with big repositories

5. Mantis

Mantis is a free and open source web based bug tracking tool. The name mantis and its logo refer to the Mantidae which is a family of insects. It supports multiple platforms and supports most recent browsers like Mozilla Firefox, Google Chrome, and Safari etc. It has automatic email sending mechanism if any issue is changed in the system. RSS feeds are available to everyone who wants to keep track in the issues which are resolved and have tweeter integration who wish to tweet if any bug is fixed. It also supports the Mobile phone like Android phones, iPhones and windows phones. We can provide additional functionality to this software by installing custom plugins. It has time tracking features. Advance search tools and report bugs and be exported via xls, csv. It has also support wiki and chat system integration which is optional.

Benefits:

- Facility to send notifications through email
- Authorization Access at user level
- Availability of plugin library
- Availability of search and filters option

Comparison between various Bug Tracking Tools

Features	Backlog	Re Q t e s t	B u g z i l l a	Z O H O B u g T r a c k e r	M a n t i s
Pricing	<input type="checkbox"/> Paid <input type="checkbox"/> Free Trial Available	<input type="checkbox"/> Paid <input type="checkbox"/> Free Trial Available	<input type="checkbox"/> Free	<input type="checkbox"/> Free	<input type="checkbox"/> Paid <input type="checkbox"/> Frree Trial Available
Integra-tionSupport	<input type="checkbox"/> Microsoft Excel	<input type="checkbox"/> Integrate with JIRA	<input type="checkbox"/> Tinder - box <input type="checkbox"/> CVS <input type="checkbox"/> Bonsai <input type="checkbox"/> Subversion <input type="checkbox"/> perforce SCM	<input type="checkbox"/> Bitbucket <input type="checkbox"/> GitHub <input type="checkbox"/> ZOHO <input type="checkbox"/> Workato	<input type="checkbox"/> ZOHO <input type="checkbox"/> Toggle <input type="checkbox"/> Test Rail
Features	<ul style="list-style-type: none"> • Task Management • Gantt and Burndown charts • Git Repositories • Role Base Access • Quick and organised issue reporting • Knowledge sharing • File Sharing • Jira and Redmine Importer • Accessibility • Security 	Requirements management module Jira Integration Bug Reports Robust bug Tracking Agile board Visualization Intuitive test management Streamlined requirement Management	<ul style="list-style-type: none"> • Advance search capabilities • Email notification controlled by user • Bug list in multiple format • Reports and charts • Support for multiple database • Excellent security • Localization • Scheduled Reports • Private attachment and Comments 	<ul style="list-style-type: none"> • Custom workflow • File sharing • user management • Email notifications • Bug Dashboard • Bug Report • Severity • Configuration and Classification • Integeration • Interactive forums 	<ul style="list-style-type: none"> • Notifications • Plugins • Audit trail of changes made to issues • L o c a l i z a t i o n • Wiki documentation and integration • Graphing of rela tionship betwee issues • Roadmap s <ul style="list-style-type: none"> • F u l l t e x t s e a r c h • Project management and time tracking with CodevTT

Platform Supported	<input type="checkbox"/> Web Based <input type="checkbox"/> iPhone Apps <input type="checkbox"/> Android Apps <input type="checkbox"/> Windows <input type="checkbox"/> Mac <input type="checkbox"/> iPhone/iPad <input type="checkbox"/> Linux	<input type="checkbox"/> Web Based <input type="checkbox"/> Windows <input type="checkbox"/> Mac	<input type="checkbox"/> Windows <input type="checkbox"/> Linux <input type="checkbox"/> Mac <input type="checkbox"/> Web Based	<input type="checkbox"/> Web <input type="checkbox"/> Android <input type="checkbox"/> iPhone <input type="checkbox"/> Windows <input type="checkbox"/> Mac	<input type="checkbox"/> Web Based <input type="checkbox"/> Window phone app <input type="checkbox"/> Linux <input type="checkbox"/> iPhone/ipad <input type="checkbox"/> Mac <input type="checkbox"/> Android User
Satisfaction level	<input type="checkbox"/> 98%	<input type="checkbox"/> 100%	• 97%	<input type="checkbox"/> 100%	<input type="checkbox"/> 88%

Conclusion

In this paper most popular bug tracking tools are presented with detailed discussion. Existing bug tracking softwares don't effectively provide all of the functionalities required by software organisations. Resulting developers cant provide reliable and quality products. Various criterias are choosen that suits software industry standards to validate survey of tools. This work not only proves the tendency to project a selective criteria for selection of tools as per customer requirements but also draws attention towards delivery error free quality softwares. In future emerging model will be proposed for bug tracking system which will be further evaluated based on some characteristics.

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