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Comparative Analysis of Bugzilla and Tracker Bug Tracking System

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Abstract: No one is perfect in this world. Same goes for software development. It is very difficult to develop the software without any errors or bugs. For the successful delivery of software project, it is necessary to remove all these error and bugs. Bug tracking system is a process of finding of bugs, recording of bugs reporting of bugsand last but not the least tracking of all these bugs. Tracking of bug includes, whether the bug is solved or not, if bug is not solved what steps to be taken for solving the bug.

Many bug tracking tools are available in the market. Some of them are open source while some are proprietary. This study focuses on comparative analysis of open source bug tracking tool namely Bugzilla and tracker.

Keyword: *Bug, Bug tracking system, priority, severity, assignee, issue status*

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I. Introduction

Important phases of software development life cycle are planning and requirement analysis, defining requirements, Designing the Product Architecture, Building or Developing the Product, Testing the Product[1, 2]

All these phases need to be executed carefully. All these phases are dependent on each other. Mistakes or error in any one of these phase will cause errors in next phase. In some case it may happen that there is misunderstanding between the system analyst and the customer. This misunderstanding may lead bugs in software. The bug can be introduced during any software phase of software development life cycle. Every Software developer is trying to contribute towards bug free software. Different types of bugs are reported daily using software configuration management tool. Once the bug is reported, it is important to work on these bugs and resolved the bug as soon as possible. For this purpose, designing of bug tracking system is required. Bug tracking system will record all the bugs; keep track of bugs, person who is solving the bug etc.

Bug tracking system is important part of proprietary software, as well as open source software. In proprietary software, dedicated team is assigned for solving the bugs whereas in case of open source software, the bug is picked up and solved by any one.

The paper is organized into following section. Section II describes literature review of the respective study. Section III describes bug tracking system.Section IV describes tracker tool for bug tracking system.Section V describes Bugzilla bug tracking system. Section VI describes comparison of Bugzilla tool and Tracker tool based on platform characteristics. Section VII describescomparative analysis based on support characteristics of Bugzilla and tracker tool. Section VIII describes conclusion of the study.

II. Literature Review

Afreen Patel and et.al have deployed a project on a web server. This project is used using a web browser. They made use of online defect tracking throughout the defect life cycle. The project enables the effective management of defects and communication with related members for each project [3]

V.B. Singh andet.al havereviewed and compared different bug tracking systems using classification criteria. This study will help the developer to select the bug tracking tool according to requirement and constraint. Theoretical framework is proposed for bug tracking and reliability assessment system (BTRAS) reporting and tracking. [4]

Thomas Zimmermann and et.al have proposed four areas for improvement of bug tracking system. These areas include Tool-centric, Information-centric, Process-centric, and User – centric, Different types of choices are provided to collect bug related information. [5]

Catherine V and et.al have evaluated seven free and open source defect tracking tools on the basis of database, server and other software required to run them; the effort required to install, learn and use them; as well as the ability to export data from them. Result of the study shows that Buggit, Bugzilla, Mantis and Bugtrack, are easy to install and learn. This study then examined the type of data reported for defects by these tools. Bugzilla provides the

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type of data necessary for applying all three defect estimation models discussed. [6]

K.Lavanya and et.al have developed defect REPORTING tool. This system acts as an interface between the employees thereby enabling them to forward their issues to the centralized report tracking system. Hence, making the work easy for both the issue raiser and the resolver [7]

III. WHAT IS BUG TRACKING SYSTEM

Bug tracking system provides a way for reporting a bug.Bug tracking system consists of standard procedure for reporting and tracking of bugs.This procedure consists of number of steps to be followed.

These steps are as follows [8, 9]

- The bug should have relevant title. So title of bug is important while reporting bug.
- The bug report should contain its detailed description. It includes when the bug occurs, in which part of coding it occurs, exact what bug has occurred, whether it affects other parts of coding, and how it occurs. If possible also include the set of input, expected output and the output that has occurred.
- Mention project version.
- Provide screenshot or attachment with actual error message. If there is no error message, then provide set of input, expected output and the output that has occurred.
- Provide priority for solving bug. Priority may be low, medium or high.
- Try to specify severity of bug. The severity includes frequency of occurrence and how it affects execution of other parts.
- The bug reports also contain status of the bug. It includes new, opened, confirmed, closed, etc.
- The person who is reporting the bug.
- The name of the person who is solving the bug i.e. to whom the bug is assigned.
- Include the earlier bug report if any.

IV. Tracker tool for bug tracking system

Tracker tool is used for collecting bugs. Ticket management concept is used in tracker tool for collection and solving of bugs. Steps used in tracker system are [10]

1. **Ticket Management**
   - Ticket management includes collecting tickets from users. Ticket means collecting bugs from users. The screen shot below shows reporting of bug in Moodle using bug tracking system.
2. **Assignee**
   - Assignee is a person who solves a bug. So he is actual resolver of the bug. A bug/ ticket can be solved by an individual person or by a group of uses.
3. **Bug type**
   - It includes type of the bug. There are 2 types of bug. They are standard issue types and all sub task issue types.
   - Standard issue type shows whether the bug is related to cloud bug or improvement related bug. It includes bug, epic, improvement, cloud bug, new feature, release test, review, story and task.
   - Sub task issue types shows whether the bug is functional or technical.
4. **Issue status**
   - To opened or blocked.
   - In Moodle bug tracking system there are different type of issue status like,
     - Open- The bug is open for removing the problem.
     - Reopened – The bug was closed previously but again reopened.
     - Development in progress – The bug solving process is going on.
     - Waiting for peer review – The bug is solved fully and it is in queue for review process.
     - Problem during testing – Problem is encountered while solving bug.
     - Waiting for integration - The bug needs to be integrated with other component and it is in waiting.
     - Waiting for testing – The bug is in queue for testing.
5. **Description** – Provide complete description of the bug occurs, output and expected output.
6. **Affects version** – Current version in which bug occurs.
7. **Component** – Other component affected due to bug.
8. **Security Level** – It determines who can be viewer of the bug. If the security level is very high, then very less number of people can view the bug. There are different types of security level like minor security issue, serious security issue etc.
9. **Assigning priority to issue** – It determines severity of the bug. Priority can be major, minor, and critical.
   - If the priority is critical then it causes crashing of server or loss of data etc.
   - If the priority is major then it causes function loss and incorrect output.
   - If the priority is minor then it will not affect any part of the project. It is possible to work in other parts of the project.
10. **Attachment** – It allows user send file as an attachment to view the bug. It will help the developer to exactly view the bug.
11. **Close the bug** – It includes closing of bug with notification like fixed, not fixed, not a bug, duplicate etc.

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V. Bugzilla Bug tracking system

- It is an open source bug tracking system.
- It can be used as test management tool also.
- Steps in creating bug report are as follows [11,12]
  - Enter Product in which bug occurs. For e.g. – project name
  - Enter Component of the project in which bug occurs.
  - Give Component description in detail to know the bug.
  - Select project version.
  - Select severity of the bug.
  - Select Hardware
  - Select OS
  - Enter Summary
  - Enter Description
  - Attach Attachment
  - Submit

VI. Comparison of Bugzilla tool and Tracker tool based on platform characteristics

The table below shows comparative analysis of Bugzillatool and tracker tool based on software type, system architecture, operating system, webserver, back end, programming language and web browser

Table 1: Comparison of Bugzilla tool and Tracker tool based on platform characteristics

Tool Name/ Features	Bugzilla	Tracker
Software type	Open Source software	Open Source software
System Architecture	Client server / Web based	Client server / Web based
Server Operating System	Linux	Windows, Linux and others
Web server	Apache or IIS	MYSQL
Back end	MYSQL, Oracle	MYSQL, Postgres SQL, Oracle
Programming Language	TCL/Perl	PHP
Web browser	Any	Any

VII. Comparative analysis based on support characteristics of Bugzilla and tracker tool

The table below shows comparative analysis of Bugzilla tool and tracker tool based on language support, email notification, web interface, and maintenance support.

Table 2: Comparison of Bugzilla tool and Tracker tool based on support characteristics

Tool Name/ Features	Bugzilla	Tracker
Language support	Yes	Yes
Web Interface	Yes	Yes
Email Notification	Yes	Yes
Maintenance support	Yes	Yes

From the table it can be observed that Bugzilla and tracker, they both are supporting all four features. Both of them are supporting Multilanguage support. They have complete web interface to achieve the task in friendly way. When any new update comes, email can be sent to registered users. Even maintenance support is available in the form of forum communities.

VIII. Conclusion

Researcher has compared two bug tracking tool namely Bugzilla and tracker based on platform and support characteristics. Steps are described in reporting and in tracking of bug. User can choose the tool according to their requirement. It is found that both the tools are user-friendly, less error prone and powerful in solving bugs.

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