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BUG TRACKING SYSTEM (BTS)

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Abstract - *A bug tracking system (BTS) is a software application that is designed to help programmers to keep track of reported software bugs in their work. A major component of bug tracking system is a database that records facts and known bugs submitted by the tester. Bug Tracking System is an ideal solution to track the bugs of a product, solution or an application. Bug Tracking System allows individual or groups of developers to keep track of outstanding bugs in their product effectively.*

Key Words: Error, Bugs, Software Development Life Cycle (SDLC), bug categories, bug priorities Bug Tracker.

1.INTRODUCTION

Bug tracking is a system which is used to solve out any type of bugs in any software. It is mostly useful for any software company. In this system we have design different types of user permission like developer, tester having different rights to connect software.

A bug tracking system helps us to keep track of bugs detected by tester of software and provide complete details regarding bugs to the developer as well as project manager of the software being tested. Bug Tracking System ensures the user of it will be able track the bug details as well as the status of debugging.

For many years, bug-tracking mechanism is employed only in some of the large software development houses. Most of the other small firms and developers never bothered with bug tracking at all, instead they simply relied on shared lists and email to monitor the status of defects. This procedure is error-prone and tends the developer to consider the bug as insignificant which ends up being dropped or ignored.

Bug Tracking System plays a vital role in the testing phase. The Bug Tracking System maintains the different user interfaces separately i.e., it provides separate environments for project manager, developer and tester. Bugs will be assigned to a person along with a bug id, screenshot, description, project name, etc. Bug can be submitted to the tester with an attachment for detailed report of the bug. Admin can maintain users, projects, organizations, bug categories, bug priorities, status of bug etc.

2. OBJECTIVES OF BTS

The following are the objective of our work.

a) Application to keep track of bugs detected in a project being developed.
b) Real-time tracking solution to keep track of the bugs detected.
c) Tool to track the performance of the developer
d) To make an application bug free.
e) Efficient communication medium for project manager, developer and tester.
f) Maximum possibility for reporting a bug and debugging the issue.
g) Bug Tracking System is to test the application for the bugs and report it to the project manager and developer.
h) Store the bug information with a unique id in the database.
i) Easy to keep track of the bug and its resolving status.

3. FUNCTIONALITIES

The functionalities of our work is as discussed below

3.1. Web Based

Programs that are not web based require to be downloaded and installed onto each computer to run it. This can be time consuming and can create a lot of hassle. Web based bug tracking system, on the other hand offer a program that does not have to be downloaded. This is a big advantage since it can be accessed from any computer, anywhere. This means the tool can be used by multiple people at different computers without hassle of having to install on each computer. It also is always updated, automatically.

3.2. Increased Productivity

The Bug Tracking System can dramatically increase the productivity and accountability of individual employees by providing a documented workflow and positive feedback for good performance.

3.3. Quality of the Software

Bug tracking helps to improve the quality of software. Without keeping track of the bugs, there would be no way to

maintain control of what each person on the team works on, fixes and finds problems with. Bug tracking system allows prioritizing and making decisions that affect the quality of the software.

3.4. One Shared, Central Location

Keeping all the issues in one place makes them much easier to find. One doesn't have to worry about finding the latest message in an email chain, and work won't stop even if someone accidentally deletes the 'bugs' document from the local storage.

3.5. Accountability

An issue tracker allows assigning issues to specific people, so it's easy to see who is working
on what at any given moment.

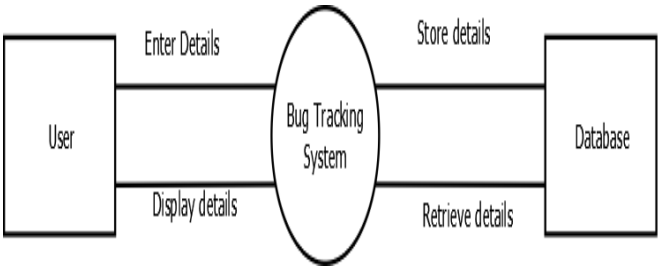
3.6. Paper Trails

If you ever need to refer to previous updates to an issue, or need to review issues that were resolved in the past, bug tracking software can help. Every update is permanently logged, allowing you to quickly see who worked on the issue, how long they worked on it, and how the issue progressed to completion.

4. SYSTEM DESIGN

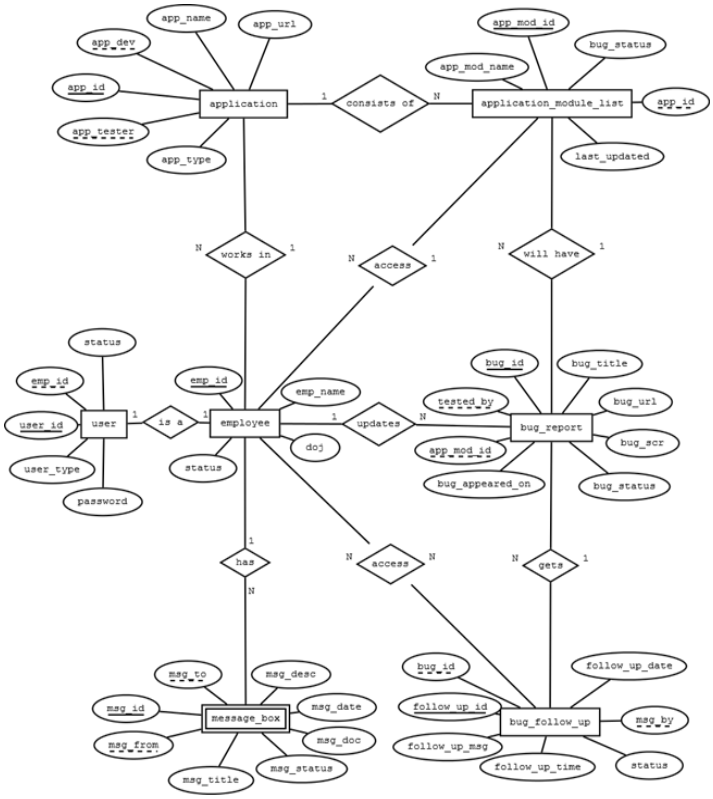
4.1 Context Diagram

A system context diagram (SCD) in engineering is a diagram that defines the boundary between the system, or part of a system, and its environment, showing the entities that interact with it. This diagram is a high level view of a system. It is similar to a block diagram. So in the below depicted diagram we have showcased the working principle of our work.



4.2 ER Diagram

The following ER Diagram is created to represent attributes as well as entities and relationships. It is typically implemented as a database.



5. MODULES

5.1 Dashboard

This module is first interface to the user after login into the system. This provides quick access to frequently used modules by the user. It also has various information blocks to display application related information or data in list or graphical chart. It may contain various input blocks (forms) to quickly enter data. The dashboard will also have navigation menu to access other modules in the application.

5.2 Project Application Management

When a new application is added for testing, the application needs to be managed by the user. This module allows the user to manage and edit an application details such as application id, developer details, tester, status of application, etc. At this module user can also edit application details and even delete application from the system.

5.3 Application list and details

This module lets the user to view and manage the list of application assigned to a user. It only shows those application which the user will access. The user can sort this list by various parameters like last updated. It also shows the details of the application like current working team, application id, application status, etc.

5.4 Developer management

This module allows adding, editing, viewing and deleting the details of developer from the list of developers. It also lets the user to grant and revoke permission to access a project application.

5.5 Developer performance

This module is to track and generate report on the performance of a developer. The performance of the developer is based on total number of bugs fixed, average time taken to fix a bug, etc.

5.6 Tester Management

This module allows the user to add, view, edit, and delete a tester from the system. It allows assigning and revoking permission from a tester to test an application.

5.7 Bug tracking and status management

At this module the user will be able to update bug details that have been generated at the application. After adding the bug details, a unique bug issue id will be generated. Keeping the reference of the unique id, the bug status can be tracked.

5.7.1 Bug update

This module allows to create a new bug entry in system along with detailed information about the bug which includes bug id, bug name, bug priority, project name, bug location, bug type, cause of the bug, screenshot image of the bug, data used to generate bug or situation that caused the bug, error id (if any).

5.7.2 Bug report

This module will be accessed by the developer user to get update on bugs that has been traced by the tester at the application. The user will be able to access complete details of the bug.

5.7.3 Bug follow up

This module helps to keep track of all the bugs that have been assigned to a user. It displays all the changes that have been made to the bug report since the creation of the bug.

5.8 Application Status

This module allows tracking the current status of the application like developer team, testing team, reported bugs, fixed bugs, etc. and also displays the status of bugs present in the application.

5.9 Report

In this module the project manager will be able to generate reports at various stages like application being tested, bugs tracked by tester, bugs resolved by developer, developer performance, tester performance periodically.

5.10 Profile management

This module holds the account information for the user. It has facility for the user to update profile details like name, email, contact no, etc. Using this module user can change the password periodically or whenever required.

5.11 Login

This module is responsible to authenticate user with login credentials entered. This module validates the input with the database and allows the valid user to access proper and respective control panel. After validating the user, it also creates a session for the active user. Before validating the credentials, it encrypts the input with proper algorithm.

5.12 Logout

This module is responsible to securely logout the active user from the application. It also destroys the active session for the user from the server.

6. USERS OF BTS

6.1 Project Manager (Admin)

The project manager is also the administrator of the system. He/she has access to all the modules of the system. The project manager assigns a developed application to the Testers for testing. The tester tests the application and identifies bugs in the application. When the tester encounters a bug, he generates a unique id number for each individual bug. The project manager interface uses the following modules.

a) Admin Dashboard
b) Project Application Management
c) Developer Management
d) Tester Management
e) Bug Tracking and Status Management
f) Developer performance
g) Application Status
h) Report
i) Admin profile Management

6.2 Tester

Tester can access to the projects or bugs assigned by the manager, can view the assigned projects and can add a new

bug to the list and send the bug back to the manager and the developer. Tester can login to the system and access the assigned projects list. Whenever the tester encounters a bug he adds the bug id and information in the application. Following are the modules use in this interface.

a) Dashboard
b) Application list and details
c) Bug Update
d) Bug follow up
e) Application Status
f) Report
g) Tester profile Management

6.3 Developer

The is the one who develops the application as per customer requirements and is responsible for the bug fixes. Can access the task or bug assigned by the manager, view assigned projects and resolving the assigned bug. Developer can view the bugs list assigned by the manager. Following modules are used in the developer module.

a) Dashboard
b) Application list
c) Bug Report
d) Bug follow up
e) Developers Profile Management.

7. FUTURE WORK

The development of this project surely helps to solve and address all the problems faced by software testers and developers. It can be implemented in almost any software development firms even freelance developers can make use of this system on being upgraded in the future. Both in-house development and outsourced projects can be tested and the bug issues can be fixed with ease using this system.

Moreover, some parts of the project have remained uncompleted due to some limitations of the project, which makes a place for future enhancements. Though that was not the part of the objective of the project it would be great to implement provided we'd have enough time. Some of those limitations which make scope for future developments are as follows.

7.1 Prioritize bug based on severity

Bugs can be set by the tester to ensure that the important bugs are given a higher preference by the developer to fix them as soon as they are found.

7.2 Generate reports on the overall performance of the system

The system admin can generate report on the bug tracking system's performance from time to time to prevent or fix any kind of inconvenience that might be faced by the users while using the system.

7.3 Allowing any user to report bugs at ease

Reporting bugs of any know software could be done by any public user at any point of time which would analyzed by the tester and the validated bugs would be forwarded to the developer for fixes.

7.4 Making site responsive to work with mobile

Optimization of the system to use in mobile devices would benefit the users with faster and easier accessibility of the web application.

7.5 Developing mobile app

A mobile app for the Bug Tracking System would help the user to easily access the system as well as to store and access data locally. It will also help to get real-time updates and notification and the ongoing projects.

7.6 Email/SMS notification to tester/developer

Automatic SMS alert and email notification to the testers and developers about bug reports, bug fixes, etc. can be introduced to help the users keep track of the projects without logging into the system.

7.7 Discussion forum

A discussion to get the user to interact with the team members to discuss about various types of bugs and the ways to solve them. Also help each other to solve a problem by working together in a group.

8. CONCLUSIONS

A good Bug Tracking System (BTS) will do the task like reporting, managing and fixing the bugs (if any). We are trying our best here in this work to build an automated Bugs Tracking System which will help the developers and user to choose and to find out the bugs as per their requirement and constraints.

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