

Project Management Tool based on the Current Trends: Techtool

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Abstract

Background/Objectives: Modern day projects involves people from different geographical location working together so managing the workflow, handling the deadlines have become very important feature of a project management tool. TechTool provides the user interface to manage such projects. **Methods/Statistical Analysis:** The method of building this application is use of server side scripting as Hypertext Processor (PHP), query language as SQL and client side scripting using Hypertext Markup Language (HTML), Cascading Style Sheets (CSS), JQuery and JavaScript. The method of analysis is done by user reviews and studies based on similar past projects. **Findings:** Software project management is a very important part for building a quality software, Software project management should be up to date with latest technologies and needs of current organizations. Now-a-days it is very common for an organization to be based on different geographical locations so such a system is desired. If companies apply the traditional project management techniques, the schedule will slip away during testing. To be able to avoid these problems, software project management tools focused on matching user requirements to deliver products with utmost coronation among all the drains that are working in the organization¹. Many new techniques are available in TechTool based on current trends which will make the work easier and on time with better quality. Interaction between people based in different location is physically impossible but TechTool will provide a platform for them to interact with the manager as well as among themselves. **Improvements/Applications:** There are many improvements from the existing systems that results to better quality of the project and its on-time completion.

Keywords: Better Quality, Current Trends, Geographical Location, Project Management, Resource Management

1. Introduction

When comparing large projects that successfully achieved their cost and schedule estimates against those that ran late, were over budget, or were cancelled without completion, six common problems were observed: poor project planning, poor cost estimating, poor measurements, poor milestone tracking, poor change control, and poor quality control¹.

There is an immense need of a good software project management tool in software industry; there have been a lot of failures because of improper management techniques. Management not only includes managing resources and the organization, it also involves proper management reviews and managing interaction among the team. As the industries maintained a matured analysis of failure in project management. It is been a hard task to

make feasible schedule of project without unrespectable problem. A common taxonomy for categorizing groupware systems is based on time and space within which there are four system types. Systems are defined as those which support interaction at the same-time/same-place, same-time/different places, different-times/same-place, and different-times/different places².

Uncertainty covering both internal and external entities and events is an intrinsic part of the planning and scheduling of any project and matters are worse for large projects where conflicts for resources are more common³ has shown that the following are the most common causes:

- **Interaction:** Communication plays a very major role when a team is working on a project. When the

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- communication among the members in the team is insufficient; it leads to development of faulty software.
- **Unexpected error:** As the working group in an organization is more, tracking of work would be impossible. If they don't have a proper track the achievement of project goal will be deviated from the actual track. When there goal is been deviated it will involve cost, time and human resource in it.
 - **Improper estimation:** This is the reason of maximum number of failures or delays in a project. It is very important to estimate the resources correctly or else this will lead in extension of the deadlines. When a project gets delayed, it affects the time period required for testing and maintenance, which in turn leads to a development of faulty software.
 - **Risk Analysis:** Advocates of software risk management claim that by identifying and analyzing threats to success (i.e., risks) action can be taken to reduce the chance of failure of a project. The first step in the risk management process is to identify the risk itself, so that appropriate countermeasures can be taken⁴ so we need to focus on the risk management which will provide the better risk identification and error recovery is shown in Table 1.

Table 1. Risks and risk types

Risk types	Expected Risk
Features	The cloud used to store data fails and the backup data is also lost, Reusable components are showing interface mismatch.
Members	It is not possible that a team comprises of people with all the skills needed. Some important staff are unavailable at critical times. Staff training and certification is not done.
Lack of members	If the existing project manager quits the job and a new one comes along. Overall finance of an organization might affect the specific project budget.
Tools	Any project can't be solely dependent on automated tools. Integration among the tools might not be possible
Welcome changes	Major requirement changes are proposed. Customers don't understand the effect of requirement changes later in the lifecycle.
Underestimate	The time required is underestimated. Mean time to repair is underestimated. Effort is underestimated.

- **Specifications:** It is very important to get the requirements of a software right since the entire project is built on the requirement specifications. Incorrect specifications will lead to a project failure even though the software is error free.
- **Complexity:** A role of a project manager is extremely complex; it increases with increasing complexity of the project. Some project deals with only one domain but now-a-days multi domain software are being developed. Hence the inabilities of a manager to deal with multi domain complexity play a major role in a project's failure.

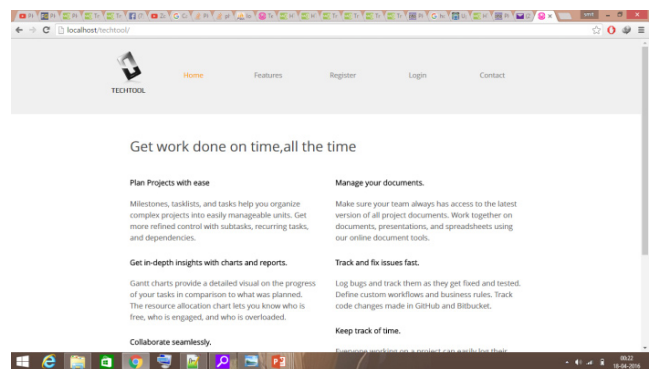
2. Proposed System

Project management software has the capacity to help plan, organize, and manage resource tools and develop resource estimates. Any software project management tool should be able to estimate, plan, schedule, monitor budget management, allocate resources, and manage quality and documentation of a project is shown in Figure 1. The previous version of the project management tools have focused on the single area located company where the projects are not covered overseas.

Previous versions have failed to focus on the part that if a software organization has various working branches they should be able to work on a single project despite the differences in their geographical location. As the day to day trend and the need from the customers are increasing, it is becoming extremely essential for a project manager to be able to manage globally located workforce shown in Figure 2.

The proposed tool has following features:

- To-do lists
- Milestones tracking

**Figure 1.** Homepage of TechTool.

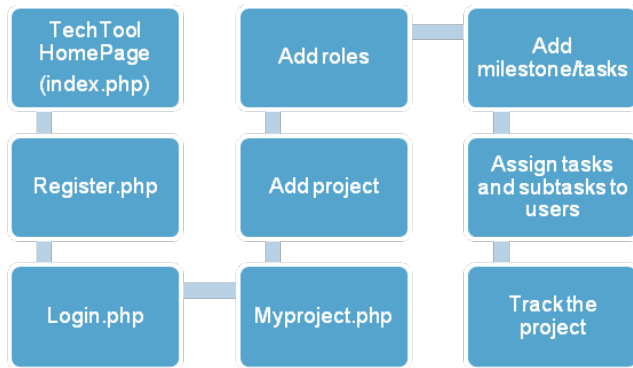


Figure 2. Block diagram of TechTool.

- Messaging
- Calendaring
- Project tree view
- File management
- Role-based user permissions
- Multilingual interface
- ORK Breakdown Structure
- Managing timely completion of tasks.
- Managing an organization that is spread globally
- Interactive Gantt Charts
- Project Portfolio
- Workspace Calendar
- Portfolio resource loading
- Project Resource loading
- Project dashboard
- Document management

3. Software Development Activities

There is a clear need to investigate a software paradigm based on automation, which augments the effectiveness of the costly and limited supply of people producing and maintaining software⁵. Analysis of software development lifecycle and traditional software project management methodologies is very essential to build a good project management tool.

3.1 Software Development

It is a process of planning, documenting, creating, testing, deploying and maintaining a software product. A software development is a set of pre-defined steps that is used to plan, control and monitor the process

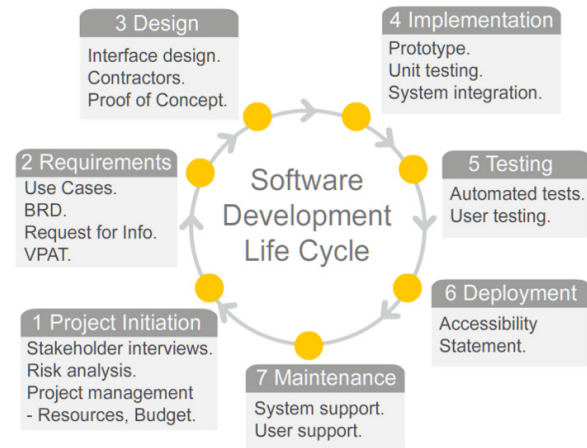


Figure 3. Software development lifecycle⁸

of development of software. The development process comprises of many stages as explained in Figure 3.

Analyzing the problem: The market should analyze properly, end-users and customers must be involved since requirement gathering phase.

Gathering requirements by users/clients: Requirement gathering is a rather a rigorous process of collecting information about the need of the market and converting the need into specifications.

Building architecture: After the requirement gathering is done and Software Requirement Specifications (SRS) is made, designers and developers build the basic architecture of the software and its framework. Architecture involves the high level design while some low level designing is also done.

Implementation: Development phase involves actual by developers. This is the part of the development process which results to a lot of errors and bugs. Software manager divides the work of this phase using a work breakdown structure of how the modules will actually be developed. Partly, unit tests also are written in this phase.

Identifying Bug: As soon as the coding of a particular module is done, module tests, unit tests and acceptance tests are performed. Later on, integration testing is also done.

Ready to Release: Deployment phase starts as soon as the product is ready to go operational. Sometimes beta version is released to check for user reviews.

Tracking after Release: Maintaining the software is a very important part of SDLC. Tracking the software to getting feedback about the product.

3.2 Software Project Management

SPM (Software Project Management) is basically defined on the process of decision making. It is the responsibility of managers to design this process and optimize it to obtain minimum cost and maximum production⁶.

Most software engineering research emphasizes technical matters above behavioral matters. We have evidences that factors related to organizational behavior have a great impact on software development and developers⁷.

A discipline of estimation, controlling, coordination, leading, and resources to make new way of process. Figure 4 shows project details list below

Management: This involves management of resources that includes cost, effort and quality of a software project.

Management process: It is a process of planning and controlling the individual processes by monitoring, reviews and audit information

Process: Set of functionality forming an activity. Many such activities come together as a process.

Project: It is a set of processes together forming a chain of execution which results into a desired output.

3.3 Branches of Project Management

Effort management: It is a project manager's job to manage resource including time and effort efficiently. It should not happen that only few people in the team are doing most of the work.



Figure 4. Software project management⁹

Workforce management: TechTool provides an efficient method of workforce management, since it allows the manager to interact with each member of his team from anywhere at any time despite of their location.

Project simulation management: It is about how the project works in a simulated environment based on which further development will be done.

Project risk management: Based on sound conceptual foundations yet developed to meet practical concerns, Project Risk Management has become recognized as a standard work on its subject. It sets out the key issues and concepts involved in effective risk and uncertainty management in a clear and accessible way, providing a comprehensive discussion of risk management processes set firmly in the context of the project management task as a whole and focused on improving performance⁸.

3.4 Other Software Project Management Tools

There are many project management software available in the market, they are of many types:

Desktop: These are single user applications used by the manager or experts on their desktops.

Web-based: TechTool is a web based tool which is available for the manager and his team to use at any point of time.

Personal: It is usually used at home to manage lifestyle choices. Such as expense manager, etc.

Single user: Only one user per tool that is it is specifically designed for a single organization.

Collaborative: It supports multiple users to edit, modify and develop different sections of the project at any time.

Visual: Tools with interactive charts and tables that models the changes in project data. Examples of project management software where project data visualization is the key approach include Assembla, DropTask, GamePlan and Targetprocess.

The project management tools such as 2-plan, AceProjects, Actionspace, Advanced Projects, Binfire, Apache Bloodhound, Collabtive and Fossilscom have various features as Collaboration, Tracking system, Scheduling, Portfolio management, Resource management, Document management, Workflow system, User categories management, Permissions management, Project dashboard and Interactive Gantt.

4. Results

TechTool provides an easily understandable interface to the project managers without compromising on the feature proposed.

4.1 Main Focus

Our main focus is to overcome the gap which is raised when the single project work is done overseas i.e. module are shared across the branches of the organizations.

When such work is done they should be the transparency among the work that is done by every individual who are involved with the projects. By this the whole team will be having the clarity about that has been done in the project and milestone that are been achieved and what have to achieved by the team. We mainly focused on dealing with bugs that occur during the development of the software as the major quality of the software depends on the bugs to be cleared. So the status of the bugs will be visible on the dash board along with the pending bugs are shown in Figure 5.

4.2 Final System

- As soon as you open TechTool website, it leads you to its homepage which has all the information about its features as well as register and login page is shown in Figure 6.
- After user has registered and his/her email is verified, they will be asked to login. After logging in, they will be directed to their dashboard.
- Here, they can create roles and projects in Figure 7.
- It provides an access to add members on their projects and assign them roles.
- After the group members have accepted the invite, they will be provided with their own logging details.

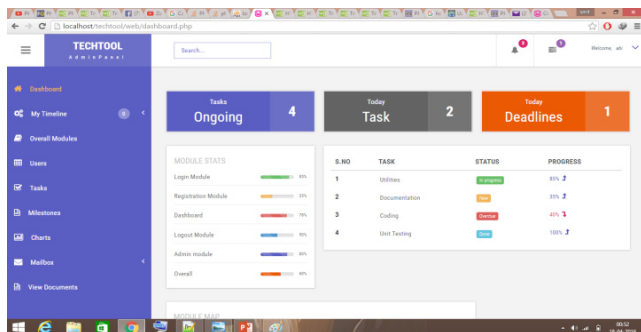


Figure 5. Dashboard of the TechTool¹⁰.

- Their dashboard will only show work assigned to them by the project head and their completion dates in Figure 8.
- Privileges will be given to them according to their roles in the project.
- In a project manager dashboard, all the subordinates roles, their task and percentage task completed will be visible.
- It can also provide the work breakdown structure of the project.
- Documentations can also be uploaded and it will be visible to all the users added under the manager.

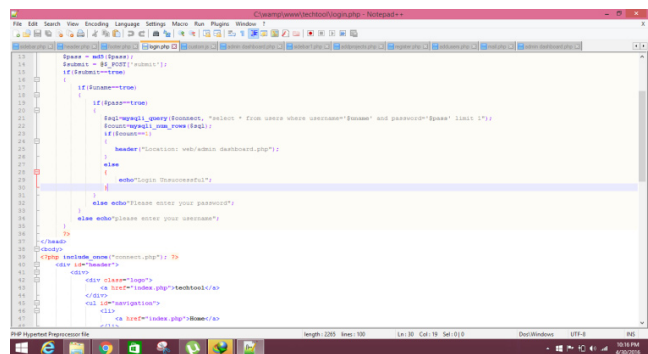


Figure 6. PHP code of login page.

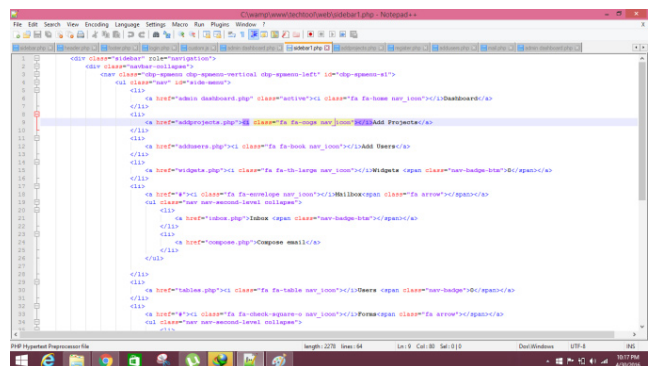


Figure 7. PHP code of the sidebar of TechTool.

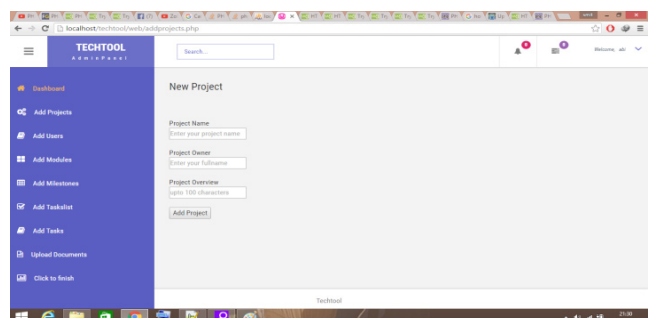


Figure 8. To add a new project in TechTool.

5. Conclusion

Software project management is very essential to produce very good quality and highly reliable software's. A project manager has a lot of tasks in hand, TechTool makes it easier for the project manager to manage all of the project's resources at a single portal, and it also makes the HR team easier as they can hire staff that globally located. TechTool helps project managers to track their work.

5.1 Future Enhancements

The system will be having the highly adaptive system which can be accessed from any device. In the near future it will made available to access from various platform so that work of the organization can run smoothly irrespective of the location of that needed person.

6. References

1. Jones C. Software project management practices: Failure versus success. *Crosstalk: The Journal of Defense Software Engineering*. 2004 Oct; p. 1–5.
2. Ellis CA, Gibbs SJ, Rein GL. Groupware: Some issues and experiences. *Communications of the ACM*. 1991 Jan; 34(1):39–58.
3. Maroto C, Tormos P. Project management: An evaluation of software quality. *International Transactions on Operational Research*. 1994 Apr; 1(2):209–21.
4. Schmidt R, Lyytinen K, Keil M, Cule P. Identifying software project risks: An international delphi study. *Journal of Management Information Systems*. 2001; 17(4):5–36.
5. Balzer R, Cheatham E, Green C. Software technology, using a new paradigm. *Computer*. 1983 Nov; 16(11):39–45.
6. Sadabadi AT, Kama N. A conceptual-operative framework for in-process decision support of software project management practice. *International Journal of Software Engineering and its Applications*. 2014 Feb; 8(1):287–302.
7. Nagarajan R, Joseph A, Sujatha S. Behavioral aspects of software project management: In-House software development. *Indian Journal of Science and Technology*. 2015 Feb; 8(S3): 1–9.
8. Chapman C, Ward S. *Project risk management: Processes, techniques and insights*. Chichester, UK: John Wiley; 1996.