A Basic Prototype for Enterprise Level Project Management

Saurabh Malgaonkar, Abhay Kolhe
Computer Engineering Department,
Mukesh Patel School of Technology Management &
Engineering, NMIMS University,
Mumbai, India.

Tejas Hirave
Computer Engineering Department,
Shah and Anchor Kutchhi Engineering College, Mumbai
University,
Mumbai, India.

Abstract— Project management system which we have proposed is a network based Enterprise Project Management (EPM) system, it can be configured and customized for the organization, unlike a web-based application which would have to have a generalized scheme with minimum customization. Being a network application we will still be able to use the network based software technologies which are used in web based applications and which help make web applications faster and better like XML, AJAX, JavaScript, etc. While using J2EE to make the connected components communicate faster (response time is reduced), make the system scalable allowing multiple simultaneous access. It involves features such as requirement analysis, allocation of the resources, project designing and its planning followed by scheduling and also responsible for managing the cost and the system administration which can handle complex projects. The system was implemented on an enterprise scale where many users simultaneously access the system and also insert and retrieve information; security is also provided so that misuse does not occur. Enterprise Project Management (EPM) is responsible for developing an organization that processes the integral management and adapting to the changes of a transformation.

Index Terms—content management, project management, J2EE, web programming

I. INTRODUCTION

Project management has been practiced since early civilization. Previously creative architects, engineers or builders were used to managing the civil engineering projects. Project Management has been developed from various fields of applications such as defense, construction, civil engineering projects. The Henry Gantt called the father of planning and control techniques. He used the Gantt chart as a project management tool; and Henri Fayol has created the 5 management functions which have formed the base of project and program management. His work is the foundation for modern project management tools including work breakdown structure (WBS) and resource allocation. There are various approaches to successfully complete a project.

Some of the highlights of the requirement gathering phase included:

• Collecting project management ideas.
• Analyzing the requirements of customers.
• proposed solutions for project and justify it.
• Submitting the proposal request of the project.
• Forming the team for Project management.
• Preparing the document for requirements.

In “Enterprise Project Management System”, all the information (functionality) regarding

• Project Details
• Project List
• Archived Project
• Resource Management
• Scheduling
• Deadlines
• Memo
• Estimation Calculations
• User Communications
is accounted for and implemented.

II. EXISTING TECHNOLOGY

There are many project management tools like Microsoft Project [2] (MSP, MSOP or WinProj). After having analyzed and tested them over a period of time there were some key points noted about them

Drawbacks:
1. MS Project is incapable to solve the production related problems in available material. Additional software is required to manage a complex activity that produces physical goods.
2. It is also in most cases individual system software. It works on the individual system and later the data can be consolidated onto a server and database (using MS Office Project Server).
3. It does not have a message passing system for the members of a project to communicate with each-other.
4. It is propriety software and a license is needed to be procured for its usage.
5. No archives of project is available, it only handles current projects.

So considering the above points we added more features in designing and developing our framework.

III. DESIGN

The idea of our project is to implement a management system framework [1] on the enterprise level for managing all
the projects which are being done by the organization. The system constitutes of a relational database for storage of the data. A relational database has been chosen on the basis of the fact that it is easier to insert, update and manage a relational database especially when it comes to data which has relevance to its different sub-parts and it also provides us a lot of functionalities like joins, foreign key and surrogate key. The RDBMS manages the relational database. The system is implemented over a network name as it is for a particular organization. We created a web server (web server provides service by sending the requested pages over the network to the requesting client) for servicing the requests of the clients over the networks. The idea behind using a web browser is that we would also be using web technology like HTML, AJAX, etc, for the various dynamic needs like session tracking, dynamic redirection etc. There are two users participating in the system:- Employees & Managers

The employee uses actions to interact with the system, some of the important actions are
- View Project List
- View Project
- View Schedule
- View Deadline
- View Sent/Received Memos
- Perform communication (chat, forum or e-mail)

The manager uses actions to interact with the system, some of the important actions are
- Add/Update/View Project List
- Add/Update/Delete/View Project
- Add/Update/Delete/View Schedules
- Resource Management
- Create Memos
- View Sent/Received Memos
- Perform communication (chat, forum or e-mail)

Because the efficient design the system is highly flexible in terms of addition or updating of functionalities and security aspects.

IV. IMPLEMENTATION

The entire system was developed on Java technology [3][5] which is platform independent and very economic hence suitable for all kinds of enterprises.

Ajax [4] is a web development tool used on the client-side to create web applications asynchronously. With Ajax, without interfering with the display and behavior of the existing page web applications can send data to and retrieve data from a server asynchronously. The object XMLHttpRequest is used to send and receive data.

AJAX is based on internet standards, and uses a combination of:
- The object XMLHttpRequest is used to exchange data asynchronously with a server.
- JavaScript/DOM object is used to display/interact with the information.
- CSS is used to style the data.
• XML is often used for transferring data among Incorporated Technologies.
• HTML (or XHTML) and CSS for presentation.
• The Document Object Model (DOM) for dynamic display of and interaction with data
• XML for the interchange of data and XSLT for its manipulation.
• The XMLHttpRequest object for asynchronous communication
• JavaScript is used to bring these technologies together.

A servlet is a Java programming language class used to enhance the functionalities of servers that accesses the application via a request-response programming model. Servlets can commonly respond to applications hosted by Web servers. Java Applet that runs on a server instead of a browser. MySQL [6] is the Relational database management system (RDBMS) that provides multi-user access to a number of databases runs as a server.

JavaServer Pages (JSP) is a technology that helps to generate web pages dynamically based on HTML, XML, or other document types. A web server compatible with servlet container is required to deploy and run the program. The servlet container must support JavaServer Pages (JSP) specifications and the JCP (Java Community Process) and Servlet. Apache Tomcat is a widely used servlet container/web server.

Testing is an application which is very important for success of application. Testing focuses on testing fundamentals including test plans, test procedure. Developers & users should participate in testing.

In early development of life cycle of project we start partial testing procedure in which we analyze for various datatypes & their capabilities. Then during system design we check response of different form with each other & their compatibility with advanced datatypes & query processing. Then in early development of source code, we keep on checking how the database is behaving with jsp forms. We check all the fields for proper & expected value where there was bug we make changes in coding & perform cycle procedure during system testing like we follow in development of project.

<table>
<thead>
<tr>
<th>TABLE I. TEST CASES</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
</tr>
<tr>
<td>-----</td>
</tr>
<tr>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
</tr>
<tr>
<td>3.</td>
</tr>
<tr>
<td>4.</td>
</tr>
<tr>
<td>5.</td>
</tr>
<tr>
<td>6.</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>7.</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>8.</td>
</tr>
<tr>
<td>9.</td>
</tr>
<tr>
<td>10.</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

### V. RESULTS

The following as some output screens of operations of the user.

![Fig 4. Basic entry of project details](image)

After carrying out successful testing at the local server (localhost), the entire system was deployed on a dedicated server having the following configuration:

- **Dual Xeon Processor 2.4 GHz**
- **8GB DDR3 RAM**
- **4TB HDD**

Client Machines had the following configurations:

- **Dual Core Processor 1.8GHz**
- **2GB DDR3 RAM**
- **160 GB HDD**

Web Browsers used: Internet Explorer, Mozilla Firefox & Google Chrome

The results were up to the standards as the system was successfully deployed and could handle more than 1000 users simultaneously at single instance of time without any of delays.

Each project details are to be entered and indexed accordingly which can then be accessed or viewed in project archives.
All the previously entered project details along with their information related to the resource allocation, deadlines, memos and tasks could be retrieved and updated.

VI. CONCLUSION

We were successful in creating a common framework (prototype phase) for project management scenarios; the system follows the object oriented programming methodology hence it is easy to customize in terms of updating or adding new functionalities to it. Since it is based on a platform independent technology it is highly portable and available to all types of users. It is very lightweight and portable in nature. Clients only require a web browser to enter and access the system to perform the operations.

VII. FURTHER WORK

As the enterprise requirements keep on changing over the period of time it is necessary to facilitate the updates accordingly as the system framework is highly customizable in nature.

As the data grows the system can be hosted on a cloud service that will make it more reliable in terms of performance and availability.

REFERENCES