EXPLORATION PROJECT MANAGEMENT SYSTEM (EPMS)

By

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2002-NUST-BIT-176

Project Report in partial fulfillment of
the requirements for the award of
Bachelors degree in Information Technology (BIT)

In

NUST Institute of Information Technology (NIIT)
National University of Sciences and Technology (NUST)
Rawalpindi, Pakistan

(2007)

CERTIFICATE

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DEDICATION

In the name of ALLAH, the Most Gracious, the Most Merciful.

To my dear Family especially to my Parents.

ACKNOWLEDGEMENTS

The Allah Almighty for everything he has blessed me with and gave me the strength to work on this very project. I am grateful to Dr.Hafiz Farooq who provided us with every opportunity to complete this project and guided us with every deficiency that we had in our work. My external supervisor Mr.Shaji Alam, without his support this project was not possible and his help was the major point in getting what ever we wanted from the organization.

My Committee members Mr.Ali Haider and Dr.Aamir Shafi who were quite supportive and critical of our work and provided us with the best possible suggestions so that we can come up with the most efficient and reliable solution. At the end I would like to thank my group member M Khurshid Alam who was always their whenever I asked him for some help and Mr.Maqsood-ul-Hasan who has been a constant source of inspiration during my stay at NIIT.

ABSTRACT

Project management has become one of the most challenging and demanding aspect of managerial sciences all around the world. Success and failure of any underlying project mainly depends upon the maximum resource utilization, management of its different phases and finally their integration into the final product. EPMS is one such project that focuses on different tasks and phases involved in projects that exploration department of Oil and Gas Development Corporation Limited (OGDCL) undertakes for exploring the natural resources i-e gas and oil reserves in Pakistan. So far all the work and management of tasks is dealt manually and is paper based which makes every procedure redundant and cumbersome and it overstretches the budgets off the limits and it is hard to keep track of whether the tasks assigned are accomplished on time or not. For this project we shall have to understand the project management and related procedures adopted by OGDC Company in detail. The core objective is to optimize resource utilization and reduce communication time and costs which in turn will increase the synergy between the undertaken project and its progress. The major areas of work include Project estimation, Project Management, Human Resource Management, Resource Scheduling, Quality assurance, Communication and data acquisition.

The undertaken project will completely automate the process of project management for the exploration department of OGDCL. We will begin with the human resource allocation for the underlying project which will include officials from top management to the personal belonging to the clerical staff. The tasks that are

assigned to every personal are being tracked by the system and are compared to the time lines that are allocated for the particular task assigned. Each project will have a set time line that will be divided half yearly, quarterly or monthly as the need may be and the progress of each phase is judged by the time line set. The undertaken project will have a certain budget assigned and resources charge at the rate of per hour. The system will track the financials of the project and will also estimate about a particular project that how long it will take to generate profits. The system will analyze the overstretched schedules and will point out the task that becomes the cause of the delays in a particular project. Then there will be a module for data acquisition from local and international firms and usage of the acquired data. Drilling and critical timeline modules will as well be included according to the needs of a particular project. The end deliverables will include an identification and implementation of processes necessary for carrying a successful project. The implementation will be done to develop a tool which will help project managers to manage projects both effectively and efficiently, an interface for the top management to analyze the performance of the concerned project.

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Chapter 1

INTRODUCTION

1.1 PURPOSE

This project intends to automate the project management in the Exploration Department of one of the leading Corporations of Pakistan i.e. OGDCL. Project management activities are performed manually which requires a lot of paperwork and wastage of time and cost. Another drawback of manual project management is wastage of time in communication with Client especially in case of offshore clients. And above all, because of this manual operation after project reviews, lesson learned from the project and very important information related to team capabilities and weaknesses are lost.

This project EPMS will provide Project managers and clients with an interface to access and monitor the project work and the performance of the developers. We intended to provide a generic solution for all Software Development Institutes. The core objective is to optimize resource utilization and reduce communication time and costs which in turn will increase the synergy between client and progress of the project. The major areas of work include Project estimation, Project Management, Human Resource Management, Resource Scheduling, Quality assurance and Reporting through web based front end. The end deliverables will include an identification and implementation of processes necessary for a successful project in OGDCL. The implementation will be done to develop a tool which will help project

managers to manage related projects effectively and efficiently, an interface for client to analyze the performance of the concerned project.

1.2 PROBLEMS WITH CURRENT SYSTEM

The management activities that are being performed at the Exploration department at OGDCL are quite hectic in a way that project manager has to do all the work manually and he has to ask his sub-ordinates or the staff under him about a particular task that is of some priority to the ongoing project. The manger will call the relevant personal and tell him that what is it that he wants him to do. This may involve or introduce delays and inconsistencies since there are no standards defined or the employee that is being assigned the task may get it totally wrong and in return the task does not fulfill the original requirement that was supposed to be expected out of it.

Secondly the track has to be recorded or files have to be maintained about whatever steps or procedures are being adopted or acquired during an ongoing project. These files or records so far are being recorded in hard format that is for the information, the text files of unlimited length are being stored and the seismic analysis related information are stored on cartages or in the form of tapes, which kept on accumulating and the size of this manual database kept on increasing. This data is prone to the changing times as some of data is very old and the document related to that old data are so delicate that they require special dedication or care so that such data could not be lost or damaged. This collection of data needs to be stored in some place and therefore as it is not in soft format the huge data repository requires some personal to take care of it. This need is fulfilled by hiring extra staff that is responsible

only for taking care of that repository or that pile of files. Hiring new staff would definitely require some staff to be trained so that they can keep up with the trends and norms of the OGDCL and they have to be paid at the end of the month as well so this is going to cost the corporation as well when they can save on this account by implementing or automating the whole system.

Project that are been done in OGDCL are of such kind that they are divided into different phases and tasks and the priority of each phase or task is such that the some of next tasks or phases depend upon their successful and in time completion. As some of the task or phases are done at the fields e.g. the drilling phases or the seismic analysis phase, the importance of the communication between the field manager and the project manger who is sitting in the head office. The communication channel in this regard is very critical and should be reliable so that the decisions that have to be made are without any delays and the critical time is consumed to its maximum capacity and any flaw in this channel will result in a delay which will not only delay the next task that are queued in the pipe line but as well will increase the time and the budget the two most important factors of any project which will increase the turnover period for that project and hence will affect its productivity.

The data library that OGDCL is using is isolated from the main head office. It is called Technical Data Library (TDL). TDL contains every type of information that is required by any of the department in OGDCL. Land Mark Resources has designed a database for that library which has certain flaws. First of all the solution provided by LMKR is database designed in ORACLE and it has scanned all the text files into .pdf

format so that they could be tracked by anyone in the time of need and they can get any information they want from those document they just search the database and get it from there. So far it runs smooth but what about the fact that a person who only requiring a particular amount of date say 5% of the whole document has to go through the entire document and then get his required information. This way it becomes quite cumbersome and the person requiring some information would not go in unnecessary details to get his part, rather he wants a solution where he can get only that part which he wants.

These are some of the major problems that exists in the current system working for the relevant department and the project undergoing that department and we have tried our best to come up with a solution that not only solves the above but can prove to be helpful in any upgrades that the systems requires at certain point in time and will be more then willing to accommodate those changes.

1.3 PROBLEM STATEMENT

"Exploration department of OGDCL gets all its work and project management dealt manually and is paper based which makes every procedure redundant and cumbersome and it overstretches the budgets off the limits and it is hard to keep track of whether the tasks assigned are accomplished on time or not."

1.4 MOTIVATION

The aim behind this project is that we basically wanted to provide the automation to the whole project management process of the exploration department of the OGDCL and to remove all the flaws that exist in the current system.

Secondly we as students were totally unaware of the projects that such energy sector corporate undertakes and what are the procedures they accomplish to complete their procedures successfully.

This whole new domain was very encouraging for us students to delve into it and explore the managerial tasks that need to be automated in order to achieve their goals within the estimates cost and time as these two factors are of the utmost importance for any project that OGDCL's exploration department undertakes.

So this was not just a project but an opportunity for us students to explore the new horizons and make our progress with what ever expertise we have for that domain, this will not only make the whole point clear to us about the project management and its different aspect but will give us a chance to work us with industry which will prove to be very fruit full in our future if we have to manage any projects all by ourselves. The biggest motivation was that from the day one we wanted to do a project in collaboration with some present industry and we surveyed many public limited companies and they all were somehow completely or some part of them was automated and the procedures were not that hectic and out dated as those of OGDCL which is the highest revenue generating company of Pakistan and the services they are getting from different companies are not helping them just because they have lack of

tech Savoy personal and technology oriented staff so they have to spend even more on training their staff for those solutions that some of the companies provide them and as they no very less about the latest technology so such service providers take advantage of that and charge them with even higher prices .

So if we cut the story short the crux would be that the energy sector of Pakistan holds a potential for us fresh graduates to explore the new ways and methodologies for project management this way as well as we are familiar with the management of software related projects so this was the entirely new domain.

1.5 PROPOSED SOLUTION

This system is the replacement for the current manual system used by the organization. This is one large system that will consist of different modules as specified earlier in this document. *Project Manager* will be able to initiate the project. He is also responsible for Time sheets and Project Closeout. *Project Manager* will be able to prepare SRS, WBS, Select *Team Lead*, Review Project and time log, estimate time, cost and resources needed, and request resource allocation. QA team member will be responsible for controlling and time extensions related to a particular task in a phase, Test cases creation based on existing Use cases using pre-designed templates, and generate Reports. Thus different interfaces and privileges are given to different users depending on their use and requirements. Project Manager will be able to view Project status, all ongoing activities and give feedback. Supervisor will be able to update his/her status on different activities, technical and management issues using his/her specific Interface.

EPMS provides the central based data repository. Different Interfaces are designed for different usage based on their roles and privileges. Project Manager initiates the project by using certain Interfaces in which he/she initiate and defines the project. He will be able Create Work Packages and WBS, review time log and request for resources allocation. Supervisor will be able to use his Interface to update his status and issues. QA module will be responsible for quality control and generate Reports and reviews and feedback. Project Manager will be given with the Interface to submit his/her feedback on project, list changed requirements, express views on developer's performance and view current status of Project and its activities. So the proposed solution could be divided into sub-modules where each module has a separate functionality and can be considered as a separate entity. The following sub-modules can be extracted from the over all business process:

1.5.1 Role Assignment/Administrative View

This role is responsible for the whole system to run smoothly no matter what. He has the complete view of all the activities that are going on. He can add, update or delete any role i-e. Managerial, supervisory or employee into the system. He/she is held responsible for any flaw and technical fault that any of the users finds during the usage of this very software. He/ she is responsible for any of the maintenance and upgrading of the system when ever required and is also responsible for giving certain amount of help to the users of the system.

1.5.2 User Profile Maintenance

1.5.2.1 Managerial Interaction

- Cost And Budgeting
- Phase Distribution and Assignment(Work Breakdown)
- Data Acquisition
- Create a new project.
    - Feed Back system
    - View Feed Back
- Give Feed Back
- Human resource Management.
- Quality Control and Time Extension.
- Report Generation

1.5.2.2 Supervisors View of the EPMS

- Phase Information
- Phase Distribution into Sub-Tasks
- The Cost Distribution between Tasks
- Task Assignment to Employees
- Report Generation On completion Of the Task
- View Feed Back
- Give Feed Back
- Assigning working hours for employees.

- Observing the progress of tasks
- Support to the employees under him

1.5.3 Data Acquisition

This is the module which is responsible for extracting the relevant information about any procedure e.g. post drilling phase from the database that has already been designed by LMKR. But we are providing a solution that will

- Search the relevant document from the database repository which any employee, supervisor or a manager required during any phase of the ongoing project.
- Without downloading the whole document, the user will be able to extract the part that he/she requires and not the whole document.
- Improve usability and efficiency.

1.5.4 Video Conferencing

Through this module different personal ca communicate live via video conferencing.

1.6 ARCHITECTURAL DIAGRAM

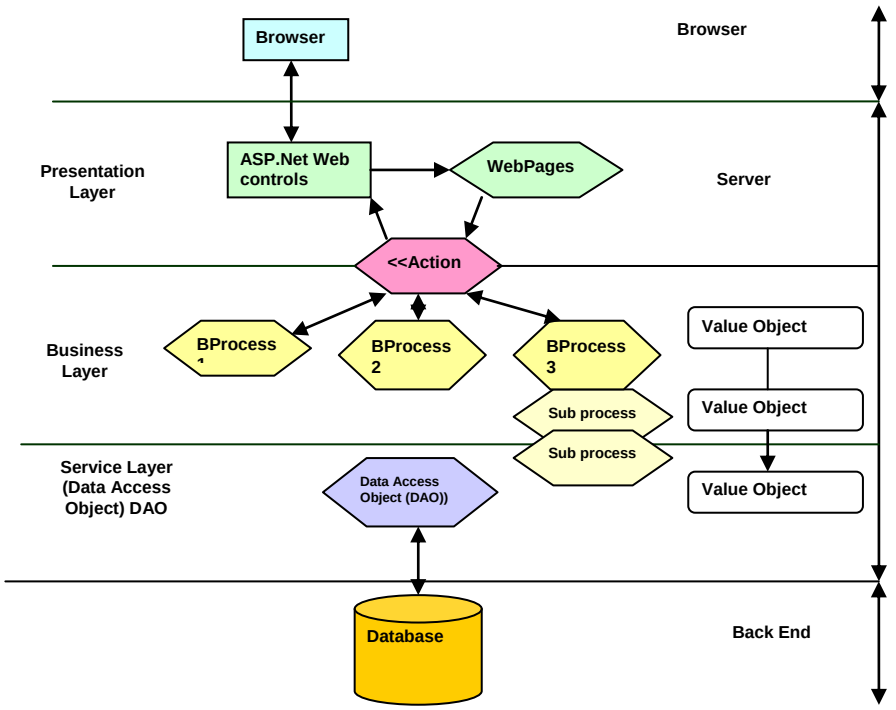


Figure 1: Architecture Diagram of EPMS

1.7 KEY OBJECTIVES

The key objective of this very project is that we should be able to develop a system that can be implemented with ease and is very easy to use and has the potential to give benefit or be fruitful to the industry in terms of reducing its cost and in becoming time efficient and its interface to its users is so simple that the learning

curve of the users about this product is minimized to its maximum. Some of the other key objectives that we have tried to achieve are:

1.7.1 Reliability

Reliability is one of the major players in the success of any project that is to be developed and deployed, if it is not reliable and prone to errors or crashes every now and then , than there is no need to build up such a system and an organization where its all about reliability and efficiency both in terms of cost and time, we are left with no choice but to develop a system that is of such a status and repute that is barely crashes and hangs over other then an operating system or network error.

This is essential as the managerial process should be robust and fast enough so that every phase and each task related to that phase is completed in time and in the required specified budget with the required human and technical resources required. Other than that the system is not supposed to produce more then a few inconsistencies within fist couple of months of its deployment and that is due to the fact that the new systems when implemented and deployed face some problems at first but with the passage of time every thing goes smoothly once the operating environment cope up with the newly built system. The number of discrepancies is expected to be null after few weeks of its deployment.

1.7.2 Availability

Communication whether inter-organization or intra organization of any form be it information retrieval or information giving is very critical factor for a system that any organization is going to deploy because they want best results out of it and if a

system is so used to crash down or shutting down or produce any kind of inconsistency, it may give the user a hard time who is always in a hurry to get things done in time and of high quality stature.

So keeping in view all these aspects we have tried our level best to come up with a solution that gives the maximum availability to its users whenever and wherever they require it and it never disappoints them regarding the availability of the information just because of the fact the system is down so we cannot proceed further. Our system is never going to become the trouble maker rather it should be the trouble shooter.

1.7.3 Security

Security is as well once of the most important objective of the proposed and implemented system which makes sure that no one gets anything more then he is authorized to take and it is made clear and sure that any form of security breach is not accommodated by the very system.

So for this very system we have allotted each user profile with a pair of username and password which he or she chooses for him/herself so that he/she can have the access to only his/her accounts and the level of access he/she has been authorized to view and other then that their rights have been restricted.

1.7.4 Efficiency

The main reason to design and develop this system is that we wanted to make the project management process of the organization fast enough so that every phase and every task related to a particular phase are complete on time with the specified

budget so that we can decrease the break even point of the projects that OGDCL under takes and as a result the productivity can be achieved in minimum time expected.

So efficiency both in terms of time and financially is necessary and this system helps the management to achieve both by facilitating the observation and the decision making process of the projects that they are dealing with at a particular point in time.

1.7.5 Maintainability

After a project is completed successfully this very system will be responsible to maintain its status and if there is any change required or any update necessary for that project the system is easy to be updated and maintained. We will have system administrator responsible for the system maintenance who keep upgrading the system by getting the constant reviews from the users of the systems and higher management as the need may be. And we will also be available for any queries during the first few months of its deployment so that the smooth running of the system is made possible no matter what and it should serve its root cause.

Chapter 2

LITERATURE REVIEW

In this chapter I will mainly discuss the related and important literature that I have been through during the review phase of this project. The technique that I used for my surveys was “Divide and Conquer” such that I have divided my tasks into subtasks and the research was conducted for each task.

I searched and read the work that has been done already in the relevant field and what are the procedures that the related industry does adopt to complete its tasks and projects. I have studied some reports and tried to understand that what are the basic steps that are required to be done in order to complete the oil and gas projects that OGDCL undertakes.

Then there are different tools ant techniques that were required for the completion of this final year project and there brief details are provided in this chapter as well. I have as well discussed the feasibility of each technique that has been used in this regard.

2.1 PROJECT MANAGEMENT IN OGDCL

Oil and Gas Development Corporation of Pakistan is basically an energy sector company which is responsible for the oil and gas needs of the country. Different projects that are being taken by OGDCL require few specific predefined tasks that are necessary for accomplishment for acquiring the organizational goals and objectives. Following is the stepwise explanation of a project that is undertaken by the exploration department of the OGDCL:

- Each project is divided into various phases that are required to be completed in order to get the objective out of the project. Some of the phases are:
- Post drilling Phase where the information about the area where the drilling is to be done is obtained so that they can understand the geological information of the area and it could help them in the drilling phase:
- Seismic analysis is carried out and in this phase different types of seismic rays are passed through a particular area so that when they strike the surface and comeback related information from the retrieval of those rays could be used to further clarify their assumptions based upon the post well surveys and now through seismic analysis.
- The data acquisition is similar to the post drilling phase the difference being in this case, the information may be bought from another company which has got the relevant information in case it is not there with the OGDCL's TDL.
- Similarly each phase can be distributed into different tasks and the accomplishment of each task is highly responsible for the successful completion of the phase to which that particular task belongs to.
- When ever the exploration department undertakes a project first of all it is calculated that whether the project would be feasible for the organization.
- Its productivity is calculated so that to know how long is it going to take for that project to be profit ale for the organization.
- How much are they going to spend on that particular project and is that project worth it.

- What would be the time duration of that project and what is the time cushions for each task or phase in that particular project.
- The management is then responsible for the responsibilities that are to be assigned to the particular roles e.g. supervisors and employees so that they work upon the particular task or phase that has been assigned to them so that they try their best to complete their duties related to a particular phase or task in the assigned to them.

2.2 KEY SUCCESS FACTORS IN ENERGY SECTOR

Key success factors are those elements which are necessary for any business or company to focus upon so that they should looks at them before starting a project or a business and if they completely neglect those points, they will not only suffer financially but their losses their method of delving into any particular project or a business is also questionable. Following are the key success factors for a company that is related to energy sector e.g. oil and gas.

2.2.1 Feasibility Analysis

The feasibility analysis of the project should be such that before starting off with a project they should know about the feasibility and their estimation should be accurate to the max so that they come to know that whether the project is going to generate revenues or its is going to be a loss game for them. So feasibility analysis is the most important and crucial element upon which the success and failure of any project falls heavily.

2.2.1.1 Time and Cost

The projects being undertaken by the energy sector companies are of such kind that they require huge amount of money and they should be completed in time so that they can estimate the productivity of the project and the turn over or the break even point should be minimized. If the undertaken project is not completed in time it is not only going to cost them more but will increase the time for the project to be productive and this way the company will face heavy losses, and when the company completes the project, it would in order to compensate for the losses charge more for the oil or gas that they would produce eventually.

2.2.1.2 Communication

Communication is another factor that is the focal point for the success or failure of any project. If the communication link between the top management and their subordinates is such that it introduces delays and affects the decision making process then this is certainly going to affect the project and the effect will definitely increase the cost and time for a particular project. So the communication medium should be strong enough so that the procedures are not delayed because of the poor or delays in the decision making process.

2.2.1.3 Reliability

It is another important factor for the successful completion of the project such that every method that a company takes should be reliable enough that the projects that the exploration department undertakes are run smoothly without any delays and they are completed in time. The key success factors are the means by which a company can achieve a certain amount of success in what ever it does. As there is no

hard and fast rules for the success of any business but if a particular pattern or step wise procedures are adopted then at least the percentage of the success could exceed a certain limit. No company can do any wonders in the market without knowing its key success factors.

If the business operates on cutting edge and latest up to date technology and stays there as the technology changes but it should be always remembered that the fundamentals of any project management task should always remains the same the methodologies are prone to changes.

2.3 Tools and Techniques Used

This portion includes the tools and techniques that I have used to implement my project and the review of which is necessary for the better understanding of the project being undertaken by me and its details. The tools as well that have been used are described in this portion of this chapter:

Microsoft Visual Studio 2005 has been used as tool for system development. ASPX is used for developing web pages and the language used for code implementation is C#. As the data stored in the database is not of very large size, so, in order to reduce the processing and memory overheads of computer systems, Microsoft access has been used as a database. In order to generate reports, Crystal Reports feature has been used.

Chapter 3

SOFTWARE REQUIREMENT SPECIFICATION

3.1 INTRODUCTION

3.1.1 Purpose

This project intends to automate the project management in the Exploration Department of one of the leading Corporations of Pakistan i-e OGDCL, Project management activities are performed manually which requires a lot of paperwork and wastage of time and cost. Another drawback of manual project management is wastage of time in communication with Client especially in case of offshore clients. And above all, because of this manual operation after project reviews, lesson learned from the project and very important information related to team capabilities and weaknesses are lost.

This project EPMS will provide Project managers and clients with an interface to access and monitor the project work and the performance of the developers. We intended to provide a generic solution for all Software Development Institutes. The core objective is to optimize resource utilization and reduce communication time and costs which in turn will increase the synergy between client and progress of the project. The major areas of work include Project estimation, Project Management, Human Resource Management, Resource Scheduling, Quality assurance and Reporting through web based front end.

The end deliverables will include an identification and implementation of processes necessary for a successful project in OGDCL. The implementation will be

done to develop a tool which will help project managers to manage related projects effectively and efficiently, an interface for client to analyze the performance of the concerned project.

3.1.2 Document Conventions

Main headings used in this document are bold having Times New Romans font with size of 18. The sub headings are also bold, but with font size of 14. Different users and product name is identified with italic font so that their roles can be understood easily and with out any ambiguity.

- The term ‘Project Manager’ means the user having an account with all privileges.
- The term ‘Employee’ means the user having an account with limited privileges.
- The term ‘User’ includes both ‘Manger’ and ‘Employee’.

3.1.3 Intended Audience and Reading Suggestions

Project managers, System Developers, Technical writers, System Analysts, and QA Team Members can use this document. This document describes the project scope, system details and requirements as well. Users are categorized as Program Manager, Project Manager, Supervisors, Technical/Team Lead, and HR Manager and QA Team each having different priorities and privileges to use the system. This system is to be run on any window-based operating system by Microsoft with no hardware and special software constraints. Any user can see the User Documentation section to get help regarding the use of the system or other basic issues.

Managers must study this document in detail to become familiar with the system and its specifications so that any failure can be overcome easily. System requirements, Hardware and software interface section must be studied in detail and

then analysis models, to understand the technical issues involved in the development of this system.

3.2 PROJECT SCOPE

EPMS is intended to supply the users with facilities such as cost and time estimation, Work Package creation, Resource allocation, Task assignment, Performance Review, Statistical Reports, and Quality Assurance, . This system will replace the existing manual system used by the company. There are many problems in the current system including increasing requirement for manpower, increased manual work, decentralization of data, lack of communication and difficult integration. The new system will resolve all these issues. The company's main objective is to enhance its performance and efficiency by providing a complete visual solution for internal users and external customer to manage and track any individual project. Also, the company's major concern is its customers. This system will allow Manager to directly assess the project progress and interact with the concerned Supervisors. This online system will not only allow Managers to view these records but may also add his/her comments, suggestions, state changed requirements, and rank concerned Supervisors. This online system will provide the Managers with web-browser bases application so that they can know about the latest status on Project work. This will assist company in evaluating its internal resources, effectiveness in Project completion and user's involvement during the project.

This will introduce the concept of customer satisfaction in the company. This may be the trend in future for all the Exploration Projects in the country. This system

will solve many issues in the current system and will help in achieving the goals and objectives of the organization in many ways.

3.3 OVERALL DESCRIPTION

3.3.1 Product Perspective

This system is the replacement for the current manual system used by the organization. This is one large system that will consist of different modules as specified earlier in this document. *Project Manager* will be able to initiate the project. He is also responsible for Time sheets and Project Closeout. *Project Manager* will be able to prepare SRS, WBS, Select *Team Lead*, Review Project and time log, estimate time, cost and resources needed, and request resource allocation. QA team member will be responsible for controlling and time extensions related to a particular task in a phase, Test cases creation based on existing Use cases using pre-designed templates, and generate Reports. Thus different interfaces and privileges are given to different users depending on their use and requirements. Project Manager will be able to view Project status, all ongoing activities and give feedback. Supervisor will be able to update his/her status on different activities, technical and management issues using his/her specific Interface.

3.3.2 Product Features

EPMS provides the central based data repository. Different Interfaces are designed for different usage based on their roles and privileges. Project Manager initiates the project by using certain Interfaces in which he/she initiate and defines the project. He will be able Create Work Packages and WBS, review time log and request

for resources allocation. Supervisor will be able to use his Interface to update his status and issues. QA module will be responsible for quality control and generate Reports and reviews and feedback. Project Manager will be given with the Interface to submit his/her feedback on project, list changed requirements, express views on developer's performance and view current status of Project and its activities.

3.3.3 Operating Environment

The project is to be developed using the Microsoft's .Net frame work 2.0 and the database is implemented in Microsoft access. For reports we have used the crystal reports and the programming language used is C sharp and for web controls we have used the ASP.NET. PDF API's are used as well for the searching operations that we have provided our users with. For further information see chapter 2.

3.3.4 Design and Implementation Constraints

The system must be developed using technologies that are easy to understand by the company's employees who will be using this system. Hardware dependant protocols or standards must not be used. This system must be completed in 2 month time to satisfy the client's requirements. Easy interface must be developed for the Internal and External User. Only Managers must be allowed to view the Project Cost Information, Company Policies and Customer Personal Information. Developers may update their status and view Customer feedback. But customers have no right to view or change structural/technical information of the proposed project. No external user must access the company's central database repository and thus no internal record may be changed by any unauthorized user.

3.3.5 User Documentation

User documents must be provided along with the delivery of the working system. System documentation must be provided to Managers, Analysts, QA Team Members and Supervisors. User Documentation must be established for the use of Managers and Supervisors. The flow of system functions, different components, constraints, technologies used must be discussed in the User Documentation. Separate tutorials on the technologies used for the development of this system and web links might be given to user as well.

3.3.6 Assumptions and Dependencies

Different modules interact among themselves. Each Module may be dependant on the inputs of other module and will be producing outputs for different modules. In accurate or incomplete module will result in inconsistency, and less effective generic product, and will result in Customer dissatisfaction.

3.4 SYSTEM FEATURES

EPMS will provide the following system features:

3.4.1 Role Assignment

3.4.1.1 Description and Priority

A valid username and password will be provided to the user of the system. Without proper authentication, user will be not allowed to enter the system. This feature is of high priority as it provides the user access and rights security to the system.

3.4.1.2 Stimulus/Response Sequences

This feature will enable the user to enter the system and use all functionalities provided by the system.

- The user initiates the EPMS application.
- User is asked to enter a username and password.
- Given username and password is authenticated.
- After authentication, user is taken to the main interface of the application.

3.4.1.3 Functional Requirements

REQ-1: Database connection must be established.

REQ-2: If database does not exist, new database will be created.

REQ-3: If the user enters invalid username or password, he is again asked to enter correct entries.

REQ-4: At most, three retries should be available to the user for entering correct username or password, if still incorrect entries, the program should be terminated.

3.4.2 User Profile Maintenance

3.4.2.1 Description and Priority

This feature will provide a separate user profile so that multiple users can be logged in. It will increase the security measure. Every user of the system will have User Profile.

3.4.2.2 Stimulus/Response Sequence

- User clicks the option to create a new user profile from the menu bar.
- A dialog is prompted to the User.
- User fills the entries in the dialog.
- Profile type is selected by the User.
- Dialog fields are validated properly.
- If the dialog fails to validate, error message is shown and returns to dialog.
- If the dialog successfully validates, the application updates the profiles in the database.
- User is prompted an acknowledgement message after successful updating of database.
- Manager is returned to the previous state.

3.4.2.3 Functional Requirements

REQ-1: The database should be available for use by the application. If it is not, user will be returned to previous stage after an error message prompt.

REQ-2: The dialog will include user particulars like his name, identity and also his username and password and more and all possible required information as required by HR.

REQ-3: Dialog will be properly validated before submission. It includes validation for empty fields and proper entry for each field.

REQ-4: If the creation of profile is for the first time for application, user password is not required.

REQ-6: If the form can not be shown due to some error, the application should not crash but user should return to its previous position.

3.4.3 Managerial Interaction

3.4.3.1 Stimulus/Response Sequence

If the person logging in is Manager he can click on following options that should be present on his profile:

- User clicks the option to create a new project.
- A dialog is prompted to the User.
- Options that dialog includes are:
    - Project Description
    - Assigning Resources that include
        - Human Resources
        - Machinery & Equipment
- Cost And Budgeting
- Phase Distribution(Work Breakdown)
- Data Acquisition
- Feedback

3.4.3.2 Project Description

- User clicks the option to the description of the project.
- A dialog is prompted to the User.
- User fills the entries in the dialog.
- Dialog fields are validated properly.
- If the dialog fails to validate, error message is shown and returns to dialog.
- If the dialog successfully validates, the application updates the projects in the database only when the manager submits the newly created project.
- The project is visible on the project manager's profile.
- User is prompted an acknowledgement message after successful updating of database.
- Manager is returned to the previous state.

3.4.3.3 Functional Requirements

REQ-1: The database should be available for use by the application. If it is not, user will be returned to previous stage after an error message prompt.

REQ-2: The dialog will include project's particulars like his name, identity more and all possible required information as required by HR.

REQ-3: Dialog will be properly validated before submission. It includes validation for empty fields and proper entry for each field.

REQ-4: If the form can not be shown due to some error, the application should not crash but user should return to its previous position.

3.4.3.4 Human Resources

- User clicks the option to the Human Resources of the assign Resource option.
- A dialog is prompted to the User which contains fields regarding:
    - A list Containing available Supervisors
    - Manager Selects one
    - Assign Phase
    - Give him feed back regarding start and end date of the phase
    - Can hire new Employee out of those whose signing up applications is pending in queue.
    - As soon as the phase is assigned to the user (supervisor) the phase should be visible on the supervisor's profile.
- User fills the entries in the dialog.
- Dialog fields are validated properly.

- If the dialog fails to validate, error message is shown and returns to dialog.
- User is prompted an acknowledgement message after successful updating of database.
- Manager is returned to the previous state.

3.4.3.5 Functional Requirements

REQ-1: Dialog will be properly validated before submission. It includes validation for empty fields and proper entry for each field.

REQ-2: If the form can not be shown due to some error, the application should not crash but user should return to its previous position

REQ-3: The database should be available for use by the application. If it is not, user will be returned to previous stage after an error message prompt.

3.4.4 Machinery & Equipment

3.4.5 Description and Priority

- User clicks the option to the machinery and equipment module of the project.
- A dialog is prompted to the User.
- User fills the entries in the dialog that includes:
    - Equipment Description
    - Set working days

- Set Working hours
- Cost
- Phase where utilized.

- Dialog fields are validated properly.
- If the dialog fails to validate, error message is shown and returns to dialog.
- User is prompted an acknowledgement message after successful updating of database.
- Manager is returned to the previous state.

3.4.5.1 Functional Requirements

REQ-1: Dialog will be properly validated before submission. It includes validation for empty fields and proper entry for each field.

REQ-2: If the form can not be shown due to some error, the application should not crash but user should return to its previous position

REQ-3: The database should be available for use by the application. If it is not, user will be returned to previous stage after an error message prompt.

3.4.6 Work Breakdown Generation

3.4.6.1 Description and Priority

Project Manager can use this feature to develop WBS which will be helpful in identifying tasks and selecting resources.

3.4.6.2 Stimulus/Response Sequence

- User selects ‘WBS’ option from the menu bar or tools bar.
- User uses GUI to develop customized WBS based on Project attributes and requirements it should represent a specific time line related to each phase.
    - The dialog appears giving a description of the project with a button “add Phase”
    - A short form opens within the same window that has the following fields/attributes:
        - Phase name
        - Phase Start Date
        - Phase end date
        - Total cost assigned
        - Priority
        - Submit button:
- Upon the submission the phase is added to the newly created project and a visual time line assigned to it showing percentage of progress.
- The percentages are assigned to phases such that their percentages on their completion when summed up results in 100% completion of the project.

- Once the form is submitted the focus goes to the previous dialog with project description and he can add as much phases he wants to.
- On submission of the phase a table is being populated on the same table containing all the phases that have been added to the project newly created.
- In any case the user clicks on any phase within that table, he is prompted with a form showing him:
    - Description of the submitted phase
    - A graph or time line showing the progress (0% in that case as the phase has just been submitted).

3.4.6.3 Functional Requirements

REQ-1: Dialog will be properly validated before submission. It includes validation for empty fields and proper entry for each field.

REQ-2: If the form can not be shown due to some error, the application should not crash but user should return to its previous position

REQ-3: The database should be available for use by the application. If it is not, user will be returned to previous stage after an error message prompt.

REQ-4: System Requirements should be clear.

3.4.7 Estimation (Cost)

This is a non-interactive module:

- User selects ‘Cost & Budgeting’ option from the menu bar or tool bar.
- A dialog is prompted telling about the
    - All the phases that were created
    - Their cost assigned
    - The total cost of the project is the sum of the cost incurred on all the phases.
    - Time lines showing the percentage of the amount that has been utilized on each phase(0% in this case)

3.4.7.1 Functional Requirements

REQ-1: Dialog will be properly validated before submission. It includes validation for empty fields and proper entry for each field.

REQ-2: If the form can not be shown due to some error, the application should not crash but user should return to its previous position

REQ-3: The database should be available for use by the application. If it is not, user will be returned to previous stage after an error message prompt.

REQ-4: System Requirements should be clear.

3.4.8 User Feedback

3.4.8.1 Description and Priority

This feature will allow the customer to give feedback about the product. The user will logon to the website and open the feedback form from a link.

3.4.8.2 Stimulus/Response Sequence

- User fills the form having fields related to the project and comments.
- User submits the form.

If submitted, user is given the acknowledgement.

3.4.8.3 Functional Requirements

REQ-1: Database should be ready to accept the form.

3.4.9 Analyze User Feedback

3.4.9.1 Description and Priority

This feature will allow the User to view the feedbacks submitted by concerned Users. This feature will help the management team of the company.

3.4.9.2 Stimulus/Response Sequence

- The User opens the feedback window.
- System checks the database and returns the list of feedbacks.
- User selects a feedback to see its detail.
- A new window is opened and the detail is shown to the User.

3.4.9.3 Functional Requirements

REQ-1: Database connection must be established.

3.4.10 Time Log Maintenance

3.4.10.1 Description and Priority

This function will allow different users to fill Time log. It is a high Priority function as this time log is used to evaluate performance of the project and is useful in ensuring the timely completion of the project and finally, to show the current status to the customer.

3.4.10.2 Stimulus/Response Sequence

- User selects ‘Time Log’ option from the Menu Bar or Tool Bar.
- User fills the time log
- System displays time log.

3.4.10.3 Functional Requirements

REQ-1: Time Log templates must be available to user in a compatible format.

3.4.11 Quality Control & Time Extensions:

3.4.11.1 Description and Priority

This feature will enable the manger to view the progress of the over all project.

3.4.11.2 Stimulus/Response Sequence

- User selects ‘view quality report’ option from the menu bar or tools bar.
- A dialog opens up which contains

- Timelines showing the total percentage of the phases that are still going and that which are completed.
- If the time limit for a particular phase has been expired and the time line does not show a 100% complete result, the manager clicks on that phase and extends its time duration with the feed back to concerned supervisor.
- Only if a phase is 100% completed is closed out.
- Similarly cost that is assigned to each phase is shown in the form of graphs or timelines.
- If a phases which has consumed its entire budget and is not 100% complete is reallocated some more budgets and that extra amount is updated to the final status report of the project on project completion.

3.4.11.3 Functional Requirements

REQ-1: Dialog will be properly validated before submission. It includes validation for empty fields and proper entry for each field.

REQ-2: If the form can not be shown due to some error, the application should not crash but user should return to its previous position

REQ-3: The database should be available for use by the application. If it is not, user will be returned to previous stage after an error message prompt.

REQ-4: System Requirements should be clear.

3.4.12 Report Generation

3.4.12.1 Description and Priority

It's the most prominent feature of the *EPMS*. QA Team Members will be able to generate different reports both for external and internal users based on existing data. It is a high priority function.

3.4.12.2 Stimulus/Response Sequence

- User selects 'Generate Reports' option from the menu bar or tools bar.
- The manager will generate the report when all the phase are completed 100% by populating a form that includes:
    - A description of the project
    - Specified end date
    - Actual end date
    - Specified budget
    - Actual cost incurred
    - Success
    - Submit.
- On submission of the report the database is updated specifying the project to be completed.
- Feed back is generated to all the supervisors regarding completion of the project

- The project is populated on the project manager's profile and he can view the project information anytime he likes to.
- A report is shown to the User and other Users as specified by the current User. Reports can also be scheduled.

3.4.12.3 Functional Requirements

REQ-1: Database connection must be established.

REQ-2: Proper Data must be selected.

REQ-3: Valid Date must be selected for scheduling a Report.

3.5 SUPERVISOR'S INTERACTION:

3.5.2 Description & Priority

If the person logging in is a "Supervisor" he can click on following options that should be present on his profile:

3.5.2.1 Stimulus/Response Sequence

- Only options that he has to interact with EPMS are:
- **View phases that have been assigned to him by the manger**
    - Upon clicking any phase a dialog opens up having information about the phase.
    - The supervisor has the option to fill in the time log telling about the current status of the phase
    - Submitting that time log will update the database regarding

- Its progress in terms of cost and time and the time lines are updated as well so that if the manger wants to see the progress of any phase he can view the progress and give his feedback.
- Upon completion of the phase a supervisor can submit a status report about 100% completion of the phase.
- All the submitted phases are visible to Q&C so that any unsuccessful phase can be reassigned the time and cost and successful ones should be closed out.

When a phase is submitted by the Manager, it is visible to supervisor on his profile he can:

- Distribute this phase into further tasks:
- When he clicks on task distribution, the dialog appears with the phase information and a button with caption" add task".
- Upon clicking that button a short form appears on the same dialog box asks about the following details:
    - Task name
    - Start date
    - End date
    - Cost assigned

- Employee name from list of available employees.
- Add button

- Once the form is submitted the focus goes to the previous dialog with phase description and he can add as much phases he wants to.
- On submission of the task a table is being populated on the same page containing all the tasks that have been added to the phase submitted.
- In any case the user clicks on any task within that table, he is prompted with a form showing him:
  - Description of the submitted task
  - A graph or time line showing the progress (0% in that case as the task has just been submitted).

3.5.2.2 Functional Requirements

REQ-1: Dialog will be properly validated before submission. It includes validation for empty fields and proper entry for each field.

REQ-2: If the form can not be shown due to some error, the application should not crash but user should return to its previous position

REQ-3: The database should be available for use by the application. If it is not, user will be returned to previous stage after an error message prompt.

REQ-4: System Requirements should be clear.

3.5.3 Report Generation

3.5.3.1 Stimulus/Response Sequence

- User selects ‘Generate Reports’ option from the menu bar or tools bar.
- The supervisor will generate the report when all the tasks are completed 100% by populating a form that includes:
    - A description of the phase
    - Specified end date
    - Actual end date
    - Specified budget
    - Actual cost incurred
    - Success
    - Submit.
- On submission of the report the database is updated specifying the phase to be completed.
- Feed back is generated to all the employees regarding completion of the project
- The phase is populated on the project supervisor’s profile and he can view the phase information anytime he likes to.

3.5.3.2 Functional Requirements

REQ-1: Database connection must be established.

REQ-2: Proper Data must be selected.

REQ-3: Valid Date must be selected for scheduling a Report.

3.5.4 User Feedback

3.5.4.1 Description and Priority

This feature will allow the customer to give feedback about the product. The user will logon to the website and open the feedback form from a link.

3.5.4.2 Stimulus/Response Sequence

- User fills the form having fields related to the project and comments.
- User submits the form.
- If submitted, customer is given the acknowledgement.

3.5.4.3 Functional Requirements

REQ-1: Database should be ready to accept the form.

3.5.5 Analyze User Feedback

3.5.5.1 Description and Priority

This feature will allow the User to view the feedbacks submitted by concerned Users. This feature will help the management team of the company.

3.5.5.2 Stimulus/Response Sequence

- The User opens the feedback window.
- System checks the database and returns the list of feedbacks.
- User selects a feedback to see its detail.
- A new window is opened and the detail is shown to the User.

3.5.5.3 Functional Requirements

REQ-1: Dialog will be properly validated before submission. It includes validation for empty fields and proper entry for each field.

REQ-2: If the form can not be shown due to some error, the application should not crash but user should return to its previous position

REQ-3: The database should be available for use by the application. If it is not, user will be returned to previous stage after an error message prompt.

REQ-4: System Requirements should be clear.

3.6 EXTERNAL INTERFACE REQUIREMENTS

3.6.2 User Interfaces

EPMS uses a very simple and user friendly GUI. All the functions can be accessed through the menu bar and tool bar. Proper pop-up help is available for each tool. User will have the option to change the font settings. Standard font will be 12pt. Times new roman.

3.6.3 Hardware Interfaces

The standard hardware is used for input and output. A standard printer is required for printing purposes. No special networking equipment is necessarily required; a network of any type/topology should be available if required. The system must have the access to internet through any mean.

3.6.4 Software Interfaces

The interfaces are implemented using ASP.Net and crystal reports where ever needed and the interfaces are designed such that they are very easy to use and user friendly.

3.6.5 Communications Interfaces

Standard network protocols like HTTP will be used to communicate if the application and the database server will reside on different machines. No special protocols are defined to be used server itself will resolve that.

3.7 OTHER NONFUNCTIONAL REQUIREMENTS

3.7.2 Performance Requirements

Each stakeholder of this project must complete his/her work on time. Estimation module should be completed efficiently and properly because it is the main module and whole working of project depends on that module. Client should provide his/her feedback on timely basis this will help in change management and correction if required.

3.7.3 Safety Requirements

The database must be safe. No unrelated person should be allowed to access the database.

3.7.4 Security Requirements

Every user of this software will be given a user name and password and access to different modules will be role based. No unauthorized user will be able to access this software. Hence, such identification mechanism will enhance the security of the system.

3.8 QUALITY ATTRIBUTES

This software will be generic software which will be used by any related organization. Software will be platform independent and Interoperable. Software will be flexible and will be easy to modify in later stages according to changed requirements. *The system is made flexible so that any need or changing requirements of the company can be meat at any time with ease and minor changes. The system is reliable and robust. It has no failure in normal circumstances. There is no special issue of shut down or software failure.*

3.9 OTHER REQUIREMENTS

Software should be flexible so that it may be expanded according to changed requirements. Database design should not be very complex but it should be flexible and database access should be efficient.

Chapter 4

SYSTEM DESIGN

The design of any system or any application posses a vital concern to its functionality and efficiency at the same time. A well designed application or system will function in accordance with its design; a poorly designed application is as good as none at all. The design of the system must be conceived such that it facilitates the tools that are been used along with its contents. It must also provide a user friendly interface for its users to interact with it. This section gives the detailed explanation of the system design, the required model, the entity relationship diagrams, use cases and sequence diagrams. The professional approach adopted in such application is a speedy execution and reliability and user interfaces as well play an important role. Yet another consideration that is vital to the design of such an application is the support available in tools that have been in use so that they can be incorporated in the system keeping in view the system requirements in terms of hardware as well as software.

4.1 DATABASE DESIGN

A database has been designed for the system so that the information should be available and it can be updates, inserted or deleted at the time of requirement.

4.1.1 DBMS Functions

4.1.1.1 Data Definition

This includes describing:

- Files
- Record Structures

- Field Names, Types and Sizes
- Relationship between records of different types
- Options/information to make search fast

4.1.1.2 Data Entry and Validation

Validation may include:

- Type checking
- Range checking
- Consistency checking

4.1.1.3 Updating

Updating involves:

- Record insertion
- Record modifications
- Record deletions

4.1.2 Data retrieval on the basis of Selection Criteria

The data retrieval on the basis of some criteria is facilitated by the query language and with which the characteristics of the specified required records may be specified. Query language differs enormously in power and sophistication but the standard which is becoming increasingly common is based upon the relational operations and some of them are:

- Selection on the basis of some field value
- Selection of particular fields from records to be displayed

- Linking records together from two different files on the basis of matching field values.

Arbitrary combination of those operators makes the DBMS to answer a particular query with a very large no of records.

4.1.3 Record Definitions

Most systems describe or provide the facility for describing that how summary reports from the database is to be created and laid out on the page.

These may include obtaining:

- Counts
- Totals
- Averages
- Maximum and minimum values

4.2 ERD

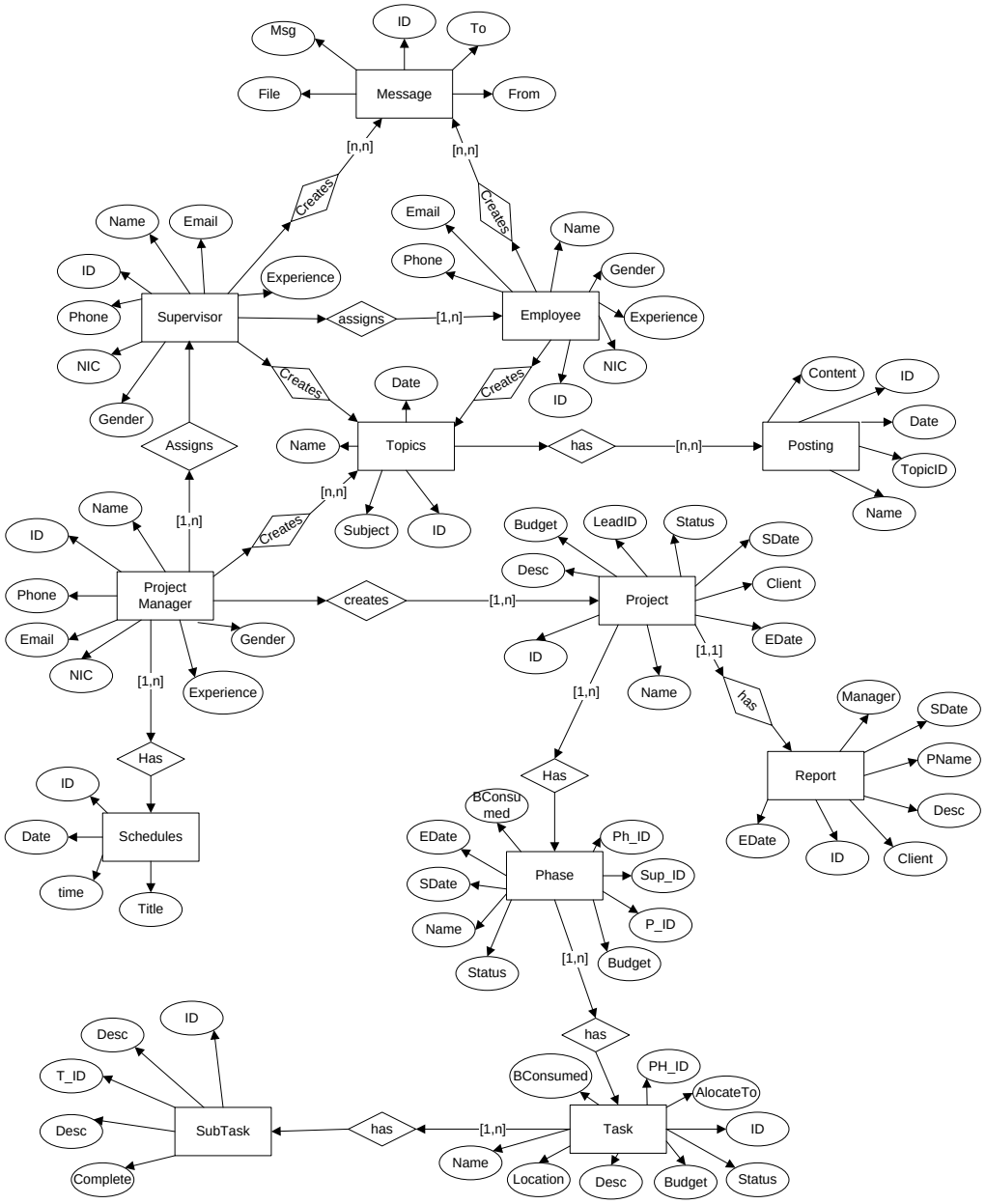


Figure 2: ERD OF EPMS

4.3 RELATIONAL DESIGN

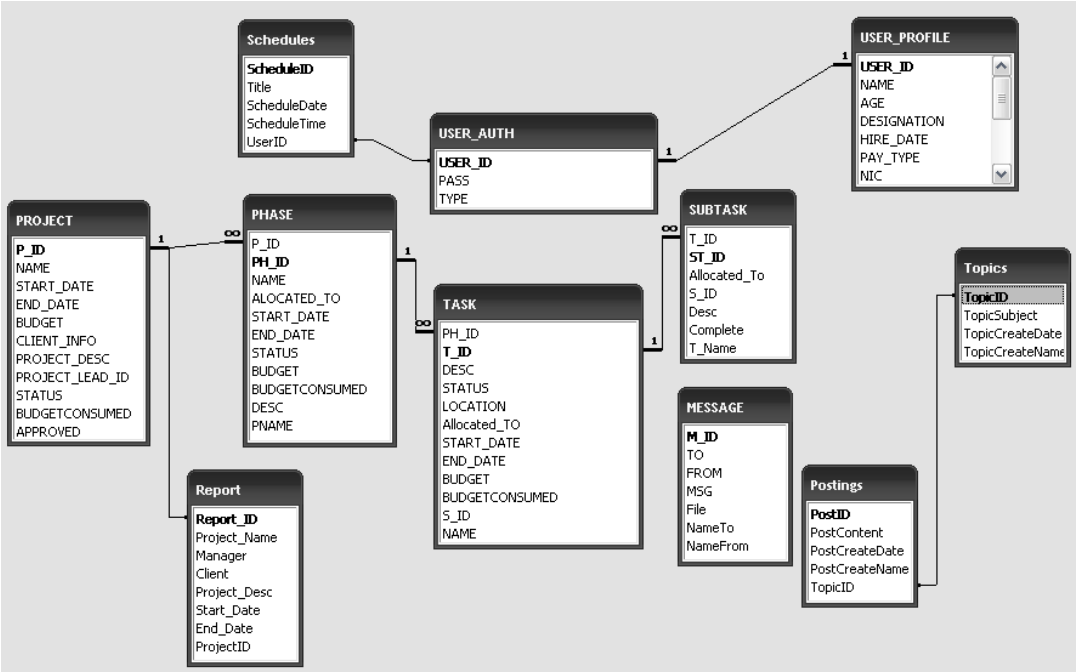


Figure 3: Relational Diagram of EPMS

Chapter 5

SYSTEM IMPLEMENTATION

5.1 PROCESS MODEL

For the development of the EPMS the approach I followed is the modular approach where by the system is divided into different modules and each module acts as a separate entity. On completion of the project all of those modules are integrated so that we get the overall complete picture. The most difficult phase of the system development was the requirement gathering as no body was clear about what they wanted out of the system and how is the system going to work secondly the personal at the OGDCL is not very computer literate so we have to make them understand most of the things which was very time consuming. So understanding the requirement was really very demanding and then devising a solution over those requirement specifications was a hectic job as well. The software engineering techniques were used in order to follow a specific pattern so that we can achieve our aim following the standards and well established procedures which are adopted all over the world.

The architecture of the software approach adopted is given below:

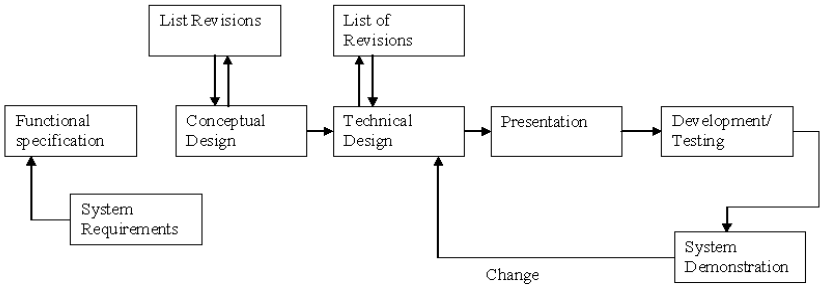


Figure 4: Approach to Design

5.2 SCREEN SHOTS

5.2.1 Login Page

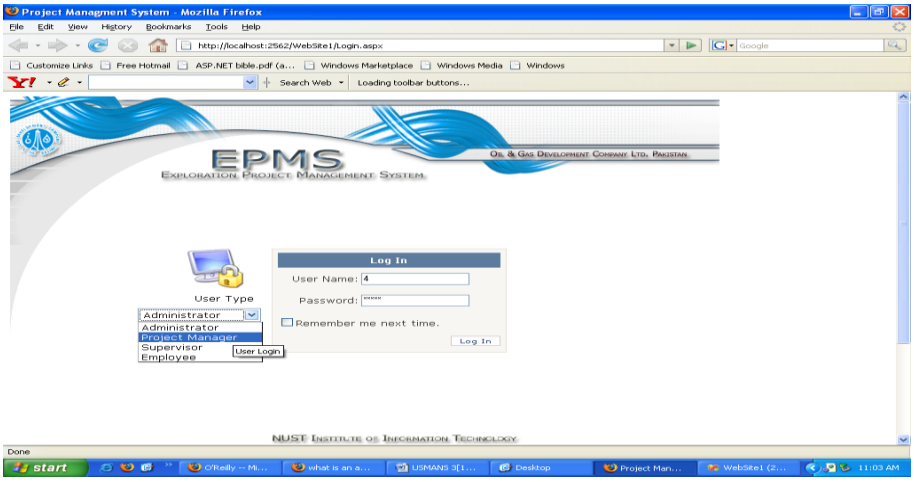


Figure 5: Login Page

Description

Through this page, the four profiles that we have defined for our project i-e. HR manager, Project manger, supervisor and Employee can have the access to their specific accounts in the system so that they can use them for whatever use they have e.g. project manager can create new projects supervisors can have a look at the phases that have been assigned to them and employees can have a look at the tasks that have been assigned to them by the supervisors. Similarly the HR Manager can hire new employees submit new job openings and can perform all other HR related activities.

5.2.2 Add New User Page

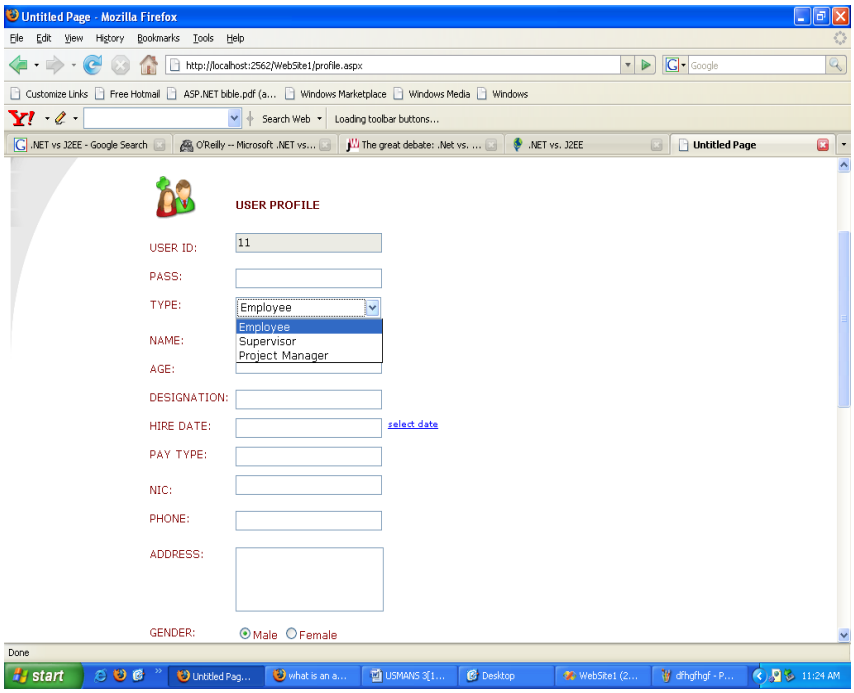


Figure 6: Add New User

Description

The Add new User page id responsible for adding up the new personal (Project Managers, Supervisors and employees) to the system so that they can participate in the activities which are assigned to them and if some new staff is to be hired as well through this page.

5.2.3 New Project Details

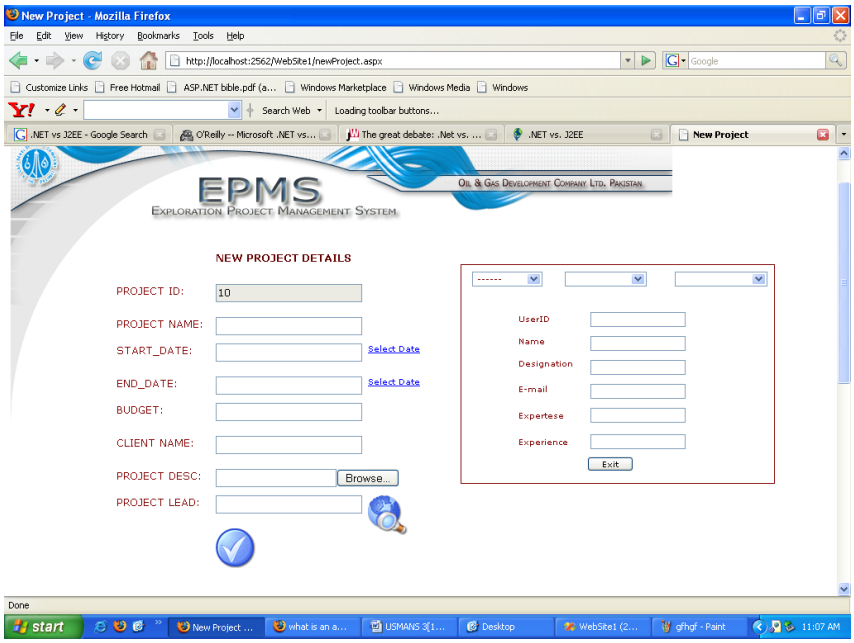


Figure 7: New Project Details

Description

This page shows that if a new project is to be initiated and is being accepted than what are different attributes e.g. projects name, the starting date, the total time required, the budget allocated to it, the clients involved if any, the description of the project that could be browsed as well from within the system the project manager details for that specific project etc.

5.2.4 Edit Phase Info Page

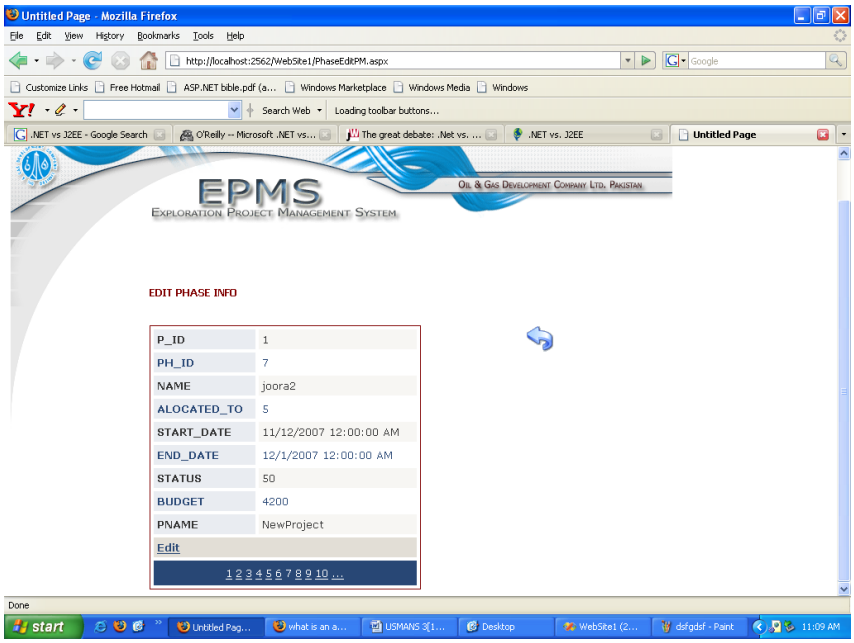


Figure 8: Edit Phase Info Page

Description

If there is a certain amount of change that is needed to a particular phase of the project then this pages gives the information about the phase and we can edit the information that we require to be edited so that the overall description of the project whose phase it is could be updates on the similar grounds.

5.2.5 “Pdf” Document Search Page:

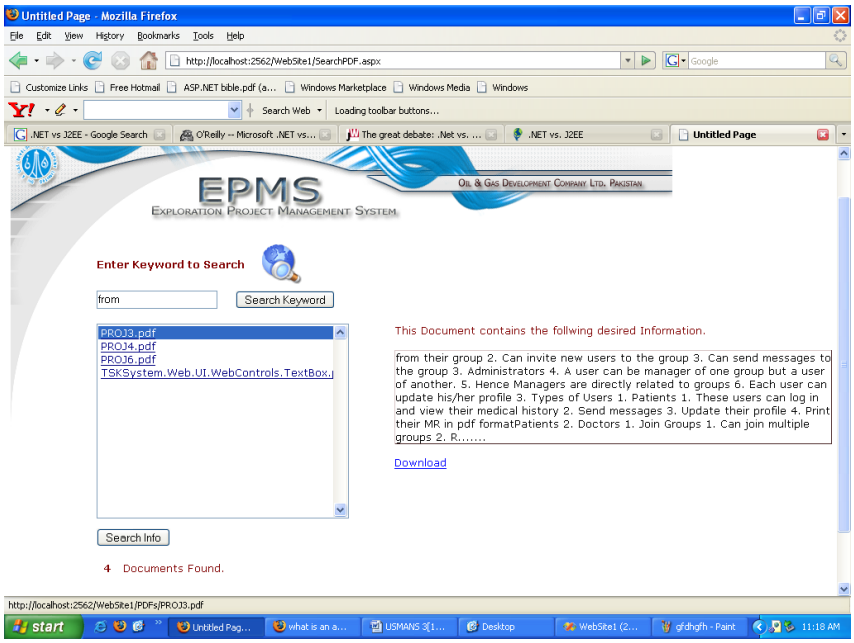


Figure 9: Pdf” Document Search Page

Description

This is the most important and exciting part of the system where we will utilize the database that is implemented by LMKR for the OGDCL and we will provide this functionality over that Database such that the document that is to be searched for a particular part of information and not the whole document could be visible to the user only and rest information is not to be seen by the seeker.

5.2.6 Current Task Status Page

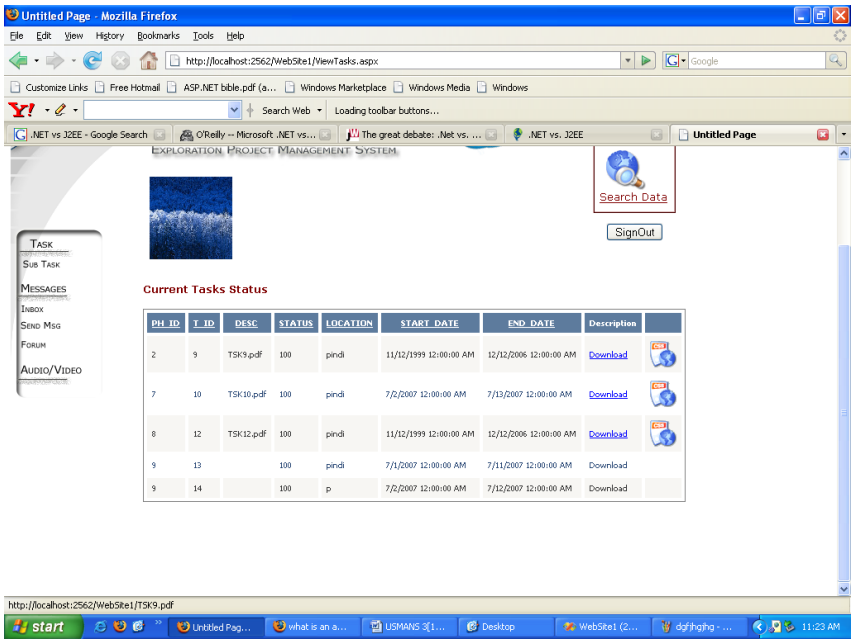


Figure 10: Current Task Status Page

Description

This page gives us the status of any task belonging to a particular phase of the project to be seen by the manager or the supervisor.

5.2.7 Update Budget Page

Figure 11: Update Budget Page

Description:

If any particular phase or task exceeds the time that has been assigned to it then the time lines for that project are to be updates and changed and this change will be visible to over all the time lines of the project to which it belongs and at the end this extension will increase the overall time period of the project.

5.2.8 Add new phase Page

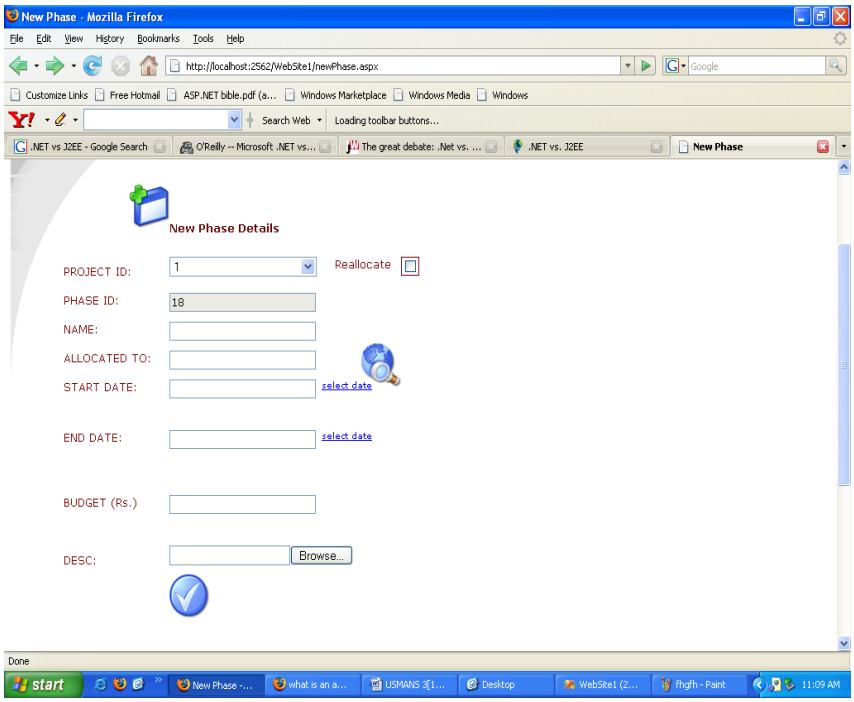


Figure 12: Add new phase Page

Description

If a new phase is to be added to the project then this page would be accessed by the user and all the attributes of the new phase are to be entered e.g. project ID, phase ID, Name, allocated to the personal, its start date etc.

5.2.9 Search Project Page

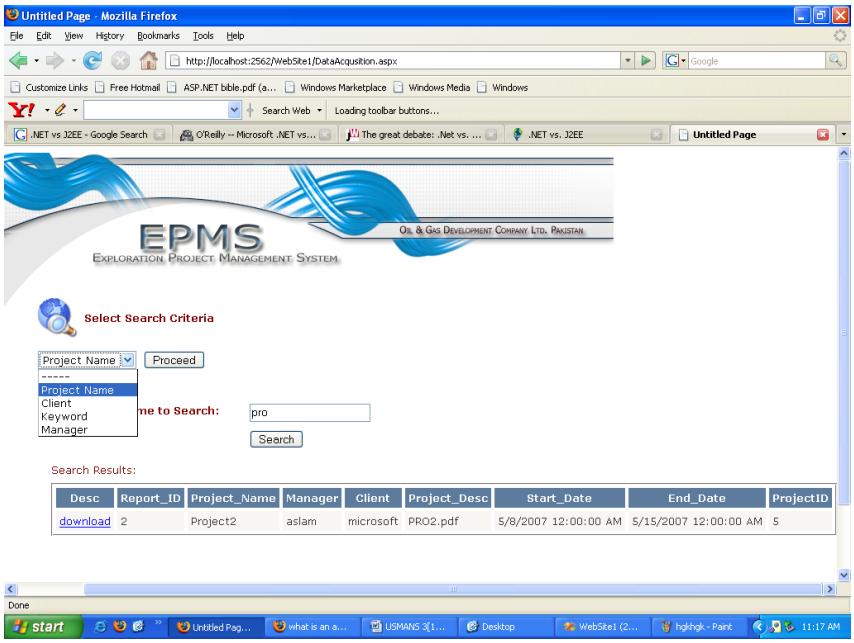


Figure 13: Search Project Page

Description

If a manger wants to search a particular page for some kind of information retrieval he can access the information through this page which contains a text string where the criteria for the search is to be entered and the page will bring the results accordingly.

5.2.10 Current Project status Page

Figure 14: Current Project status Page

Description

If a project manager wants to have a look at the status of the project currently undergoing then he can access the information about that project through this page where he can view the projects currently going on and their related information like time span, budget allocated etc.

5.2.11 Discussion Forum Page

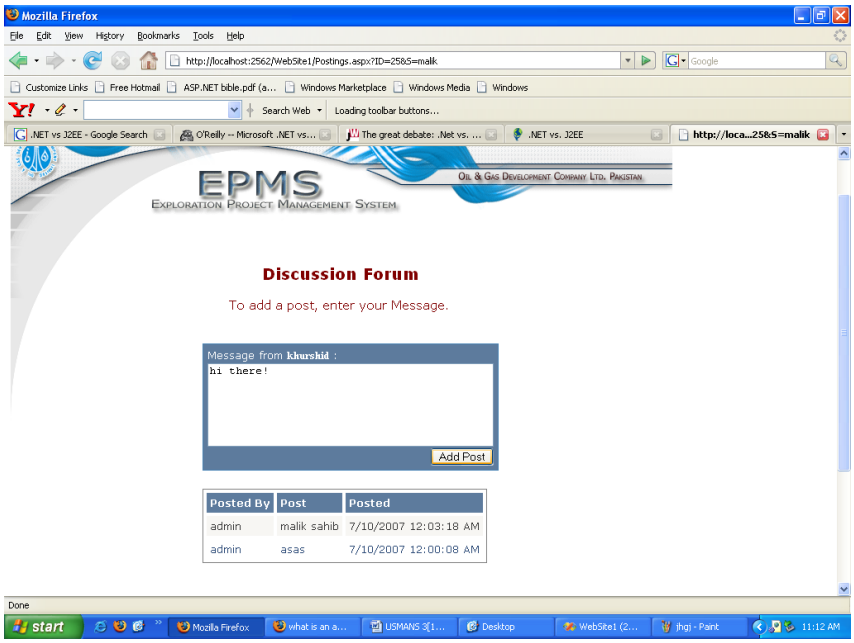


Figure 15: Discussion Forum Page

Description

This again is an interesting part of the system where different roles of the project can discuss issues regarding different phases and tasks of the project that they are working on so that if anyone of them is facing any difficulty they can discuss it on this facility that we are providing them with.

5.2.12 Event Calendar Page

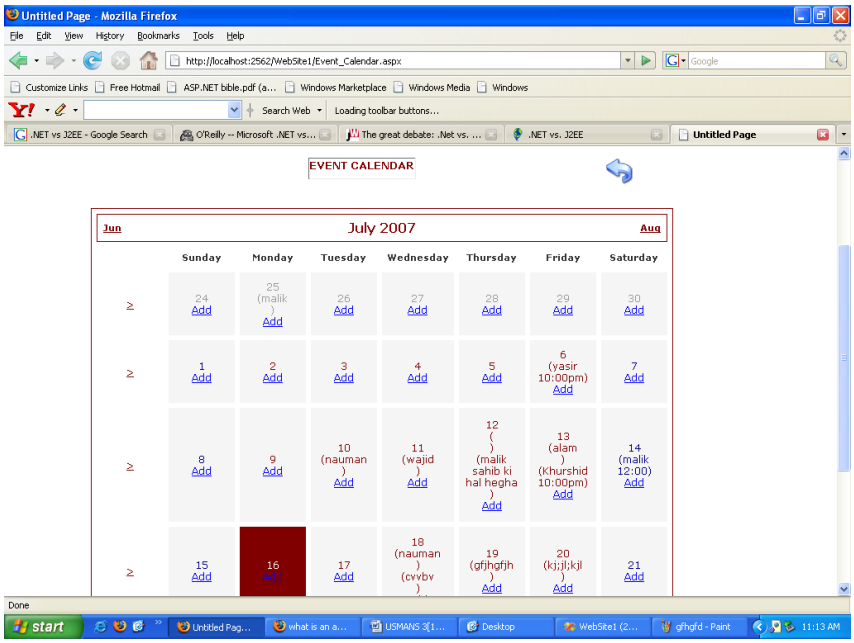


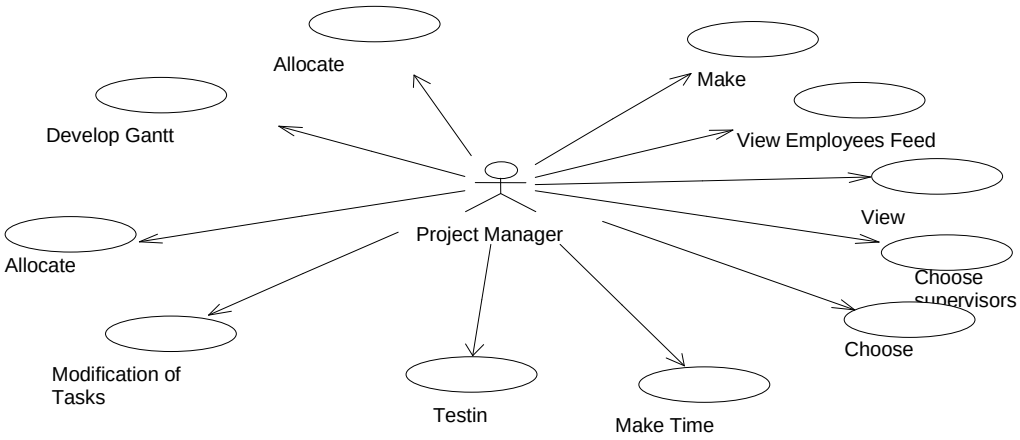
Figure 16: Event Calendar Page

Description

This calendar provides the dates and information about important dead lines for the project e.g. the phases or the tasks that are the part of the project and new events could be added to the project as well.

5.3 USE CASE MODELS

5.3.1 Activities of Project Manager



Use Case Number: 1 **Use Case Name:** Activities of Project Manager
Summary: Project Manger will initiate the project and distribute the tasks and phases.
Alternative Paths: Not Applied
Assumptions: Program Manager will provide the initial work information
Preconditions: Proper Initial project acceptance and Budget information
Post conditions: Work breakdown Structure.

5.3.2 Activities of Supervisor

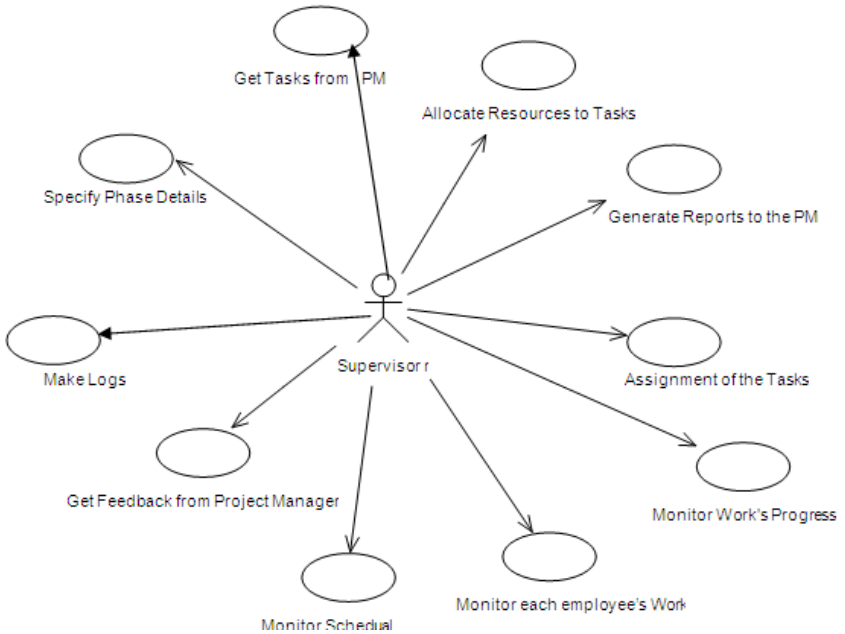


Figure 17: Activities of Supervisor

Use Case Number: 2 **Use Case Name:** Activities of Supervisor
Summary: Supervisor will be responsible for the task assignment to the employees and monitoring their progress according to their set timelines
Alternative Paths: Not Applied
Exception Paths: Tasks could not be completed if not followed a pattern.
Assumptions: Project Manager will provide phase breakdown structure to supervisor
Preconditions: Project Manager will provide work breakdown structure to supervisor.
Post conditions: Individuals tasks from Work breakdown structure.

5.4 SEQUENCE DIAGRAMS

5.4.1 Login Sequence Diagram

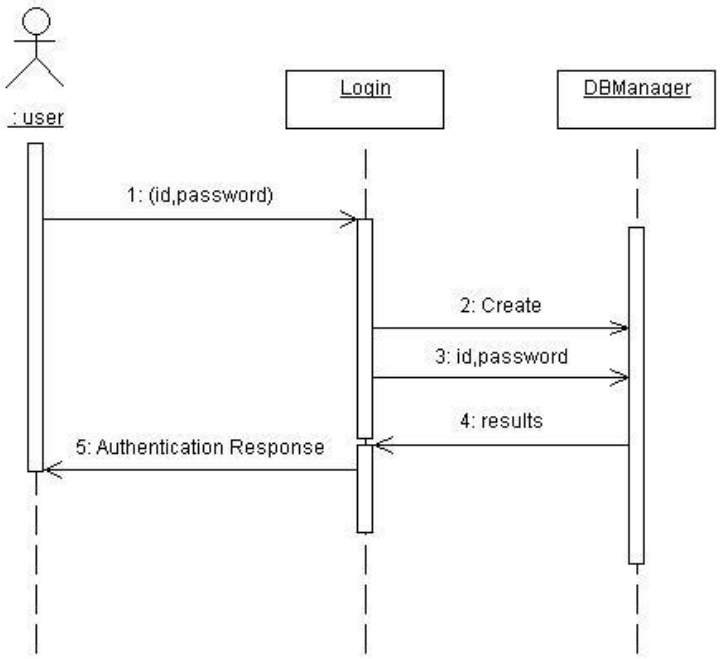


Figure 18: Showing the sequence of Login

5.4.2 Sequence diagram of Viewing Employee history:

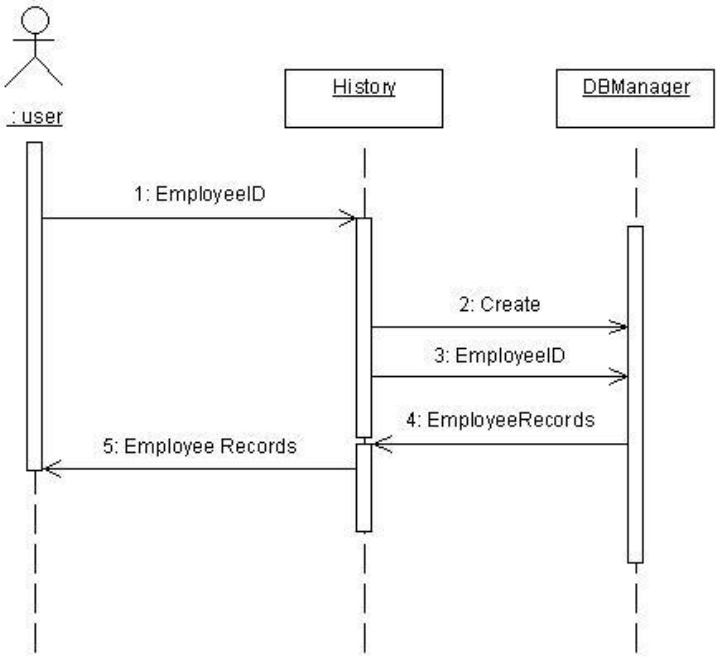


Figure 19: Showing the sequence of viewing employee history.

5.4.3 Sequence diagram of generating budget report:

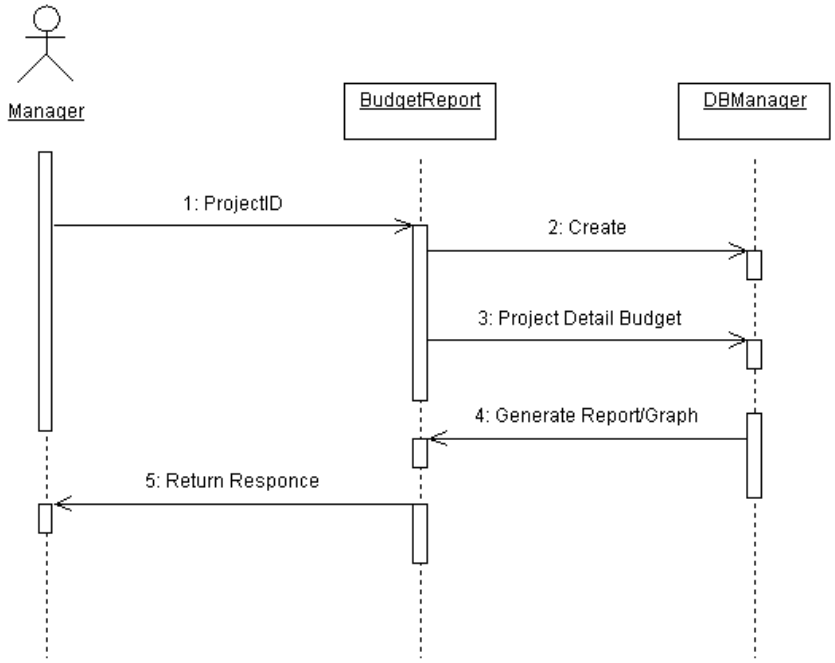


Figure 20: Sequence of generating budget report.

5.4.4 Sequence diagram of updating budget

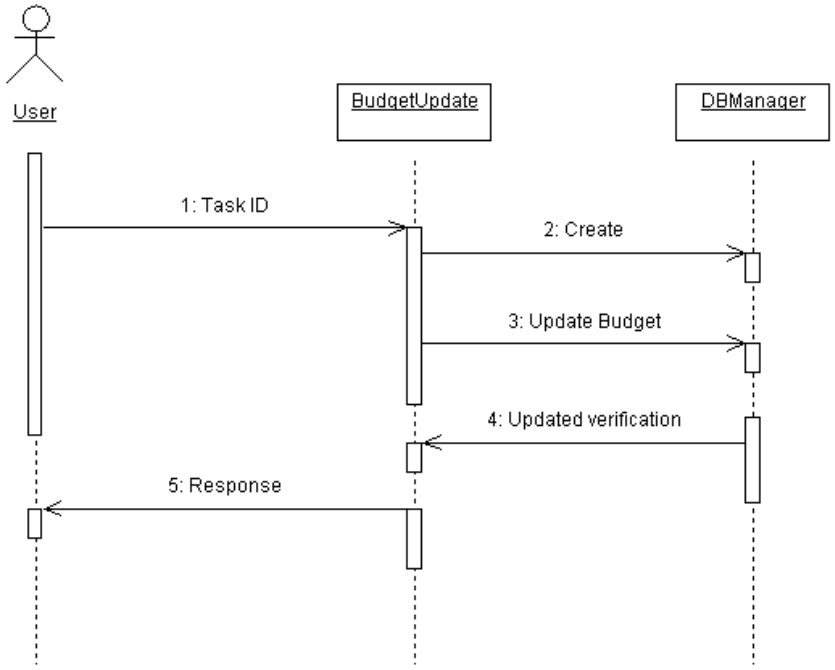


Figure 21: Showing the sequence of updating budget.

5.4.5 Sequence diagram of data acquisition

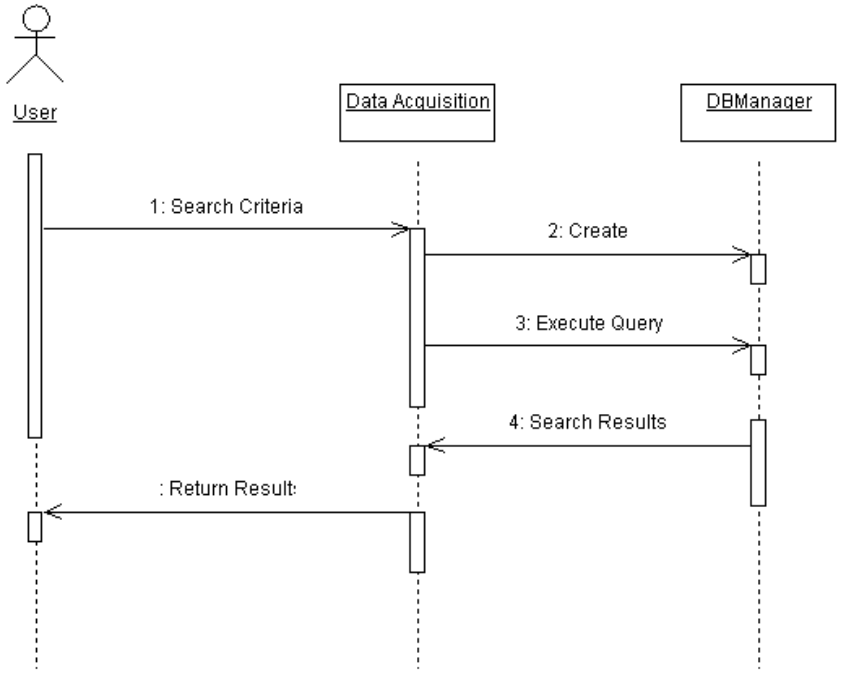


Figure 22: Sequence diagram of data acquisition

5.4.6 Sequence diagram of Phase details

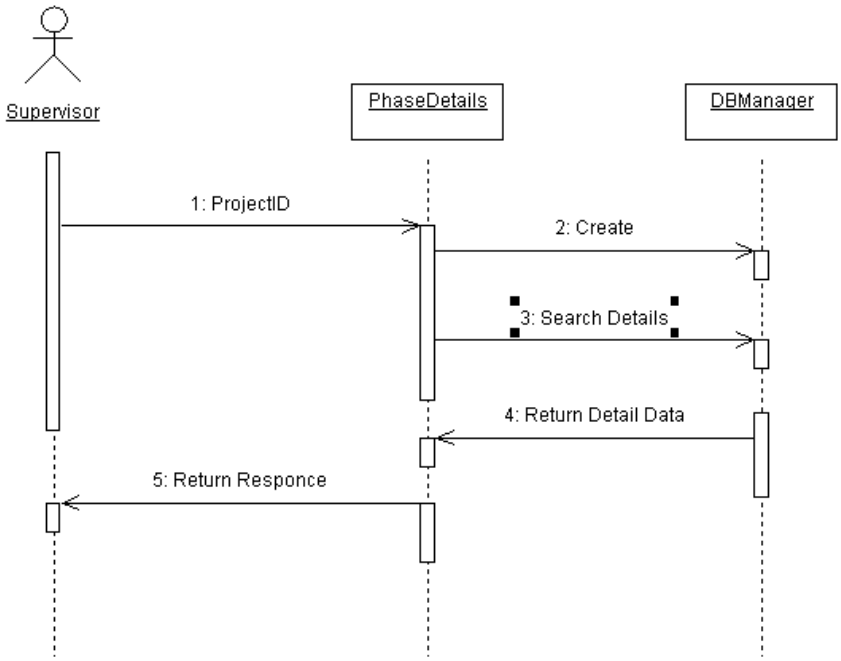


Figure 23: Sequence diagram of Phase details

5.4.7 Sequence diagram of forecasting expected completion project date

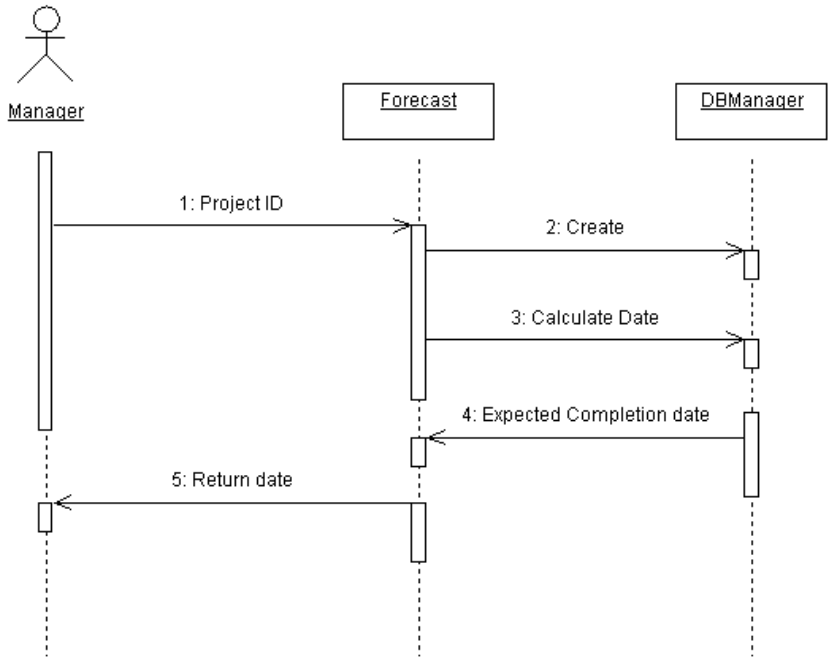


Figure 24: Sequence diagram of forecasting expected completion project date.

5.4.8 Sequence diagram of Inserting Report data

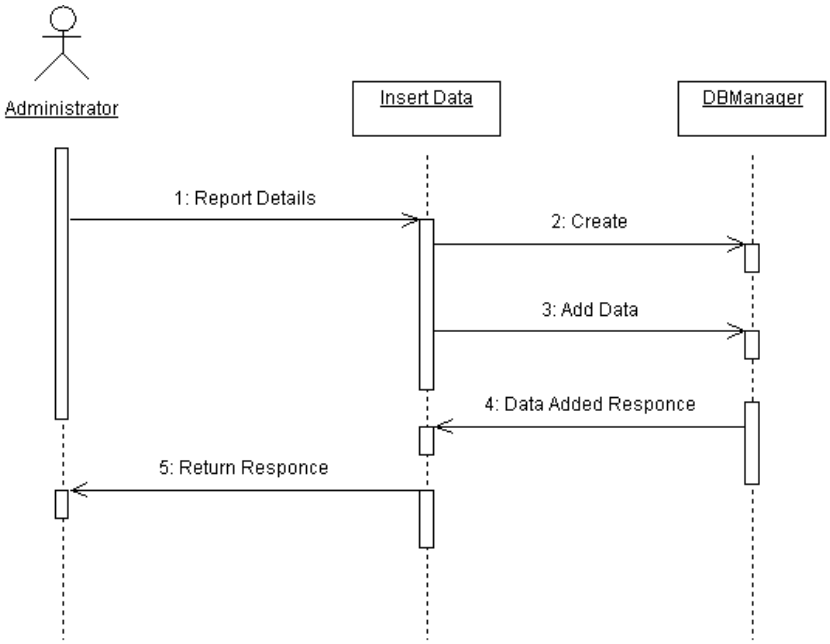


Figure 25: Sequence diagram of Inserting Report data

5.4.9 Sequence diagram of creating new phase

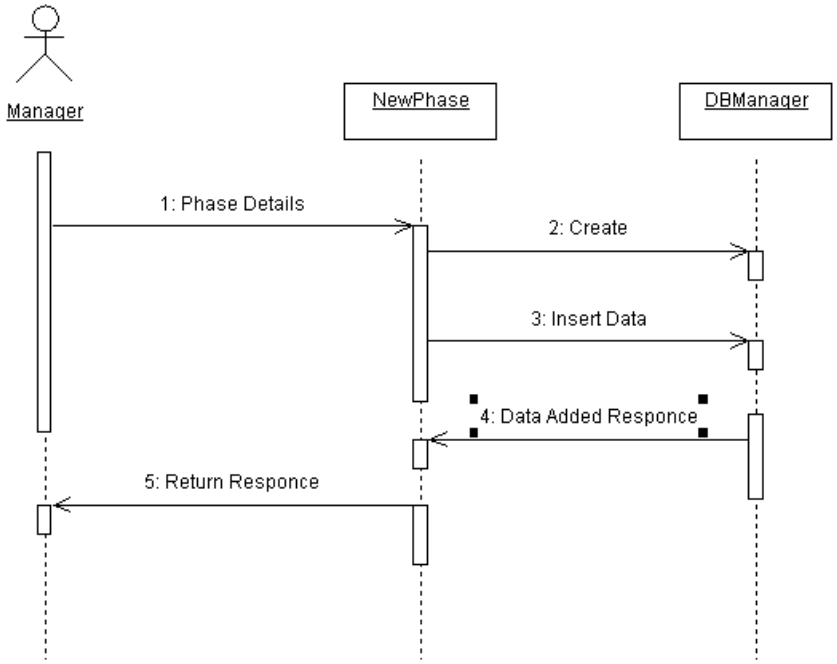


Figure 26: Sequence diagram of creating new phase

5.4.10 Sequence diagram of creating new task

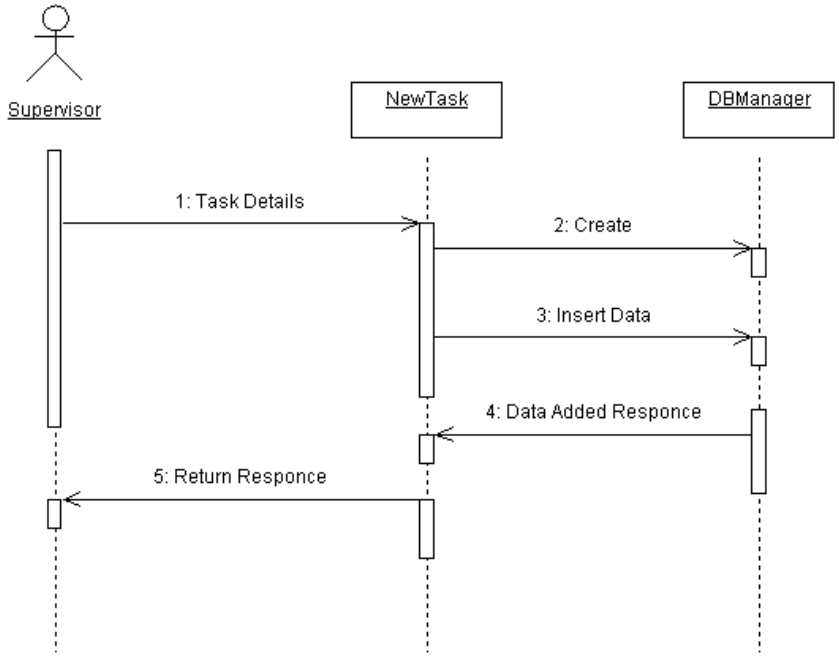


Figure 27: Sequence diagram of creating new task

5.4.11 Sequence diagram of displaying details of the project

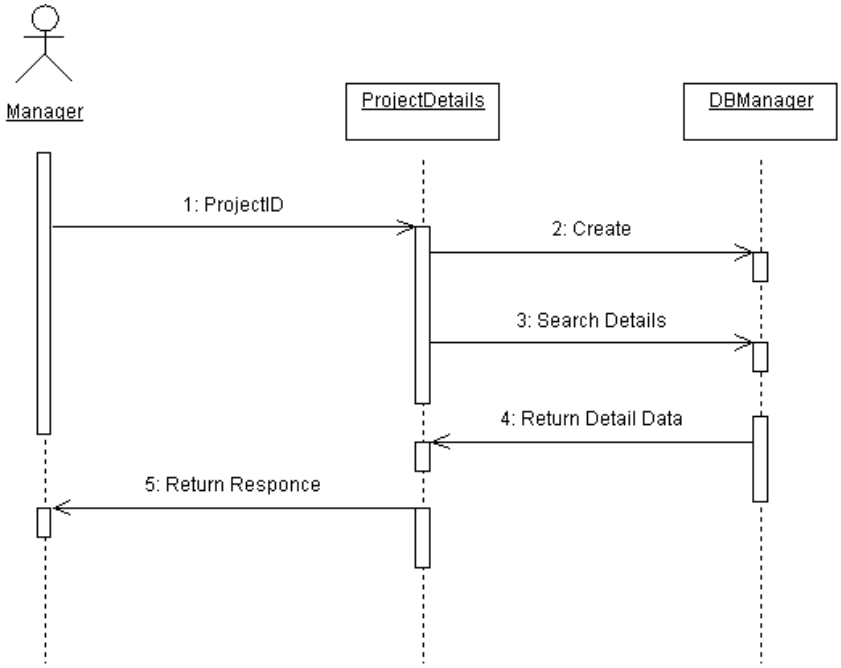


Figure 28: Sequence diagram of displaying details of the project

5.4.12 Sequence diagram of creating new project

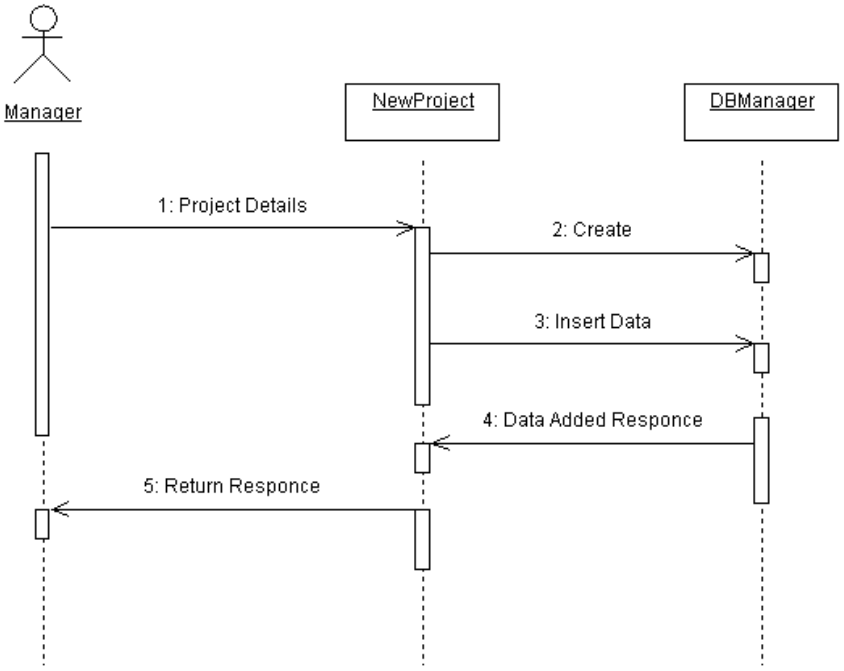


Figure 29: Sequence diagram of creating new project

5.4.13 Sequence diagram of quality assurance

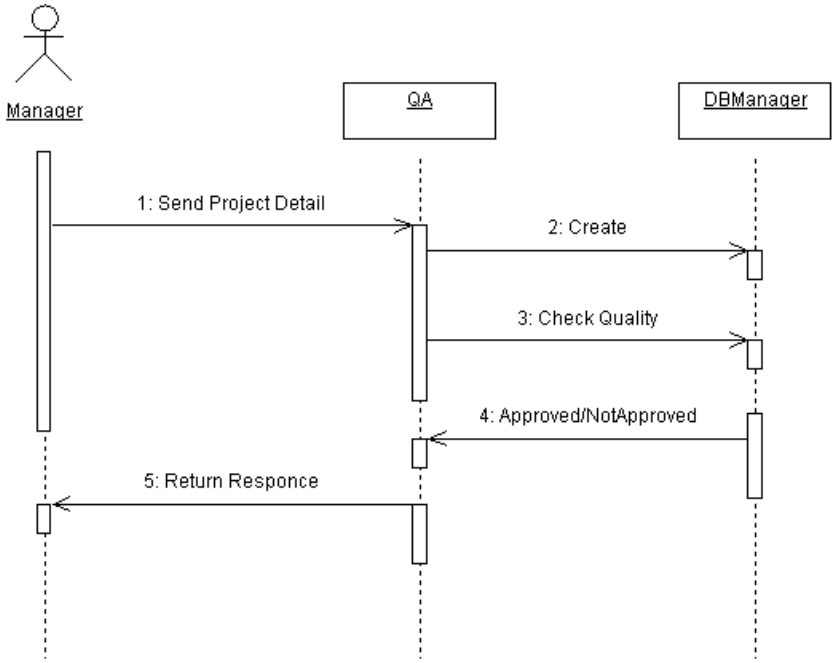


Figure 30: Sequence diagram of quality assurance

5.4.14 Sequence diagram of adding new sub-task

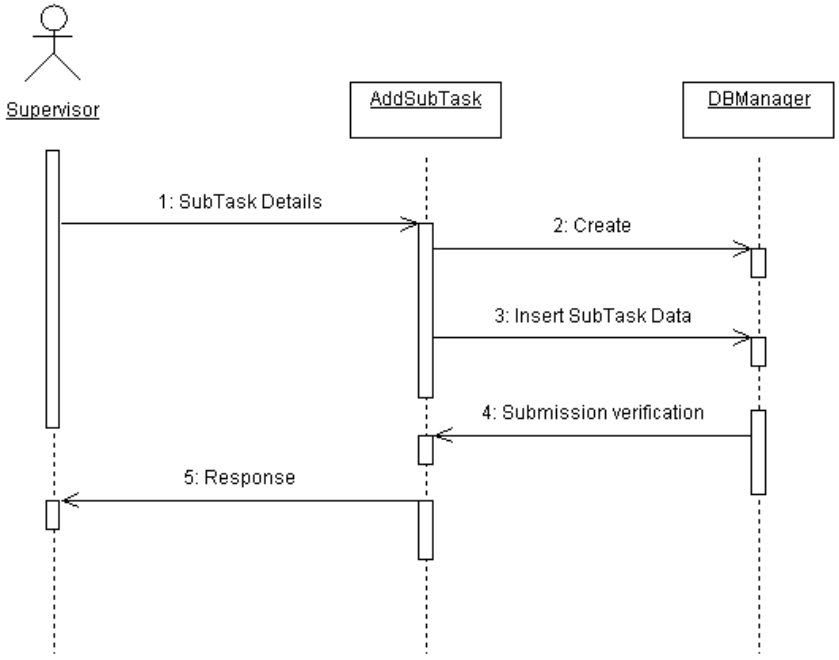


Figure 31: Sequence diagram of adding new sub-task

5.4.15 Sequence diagram of generating status report

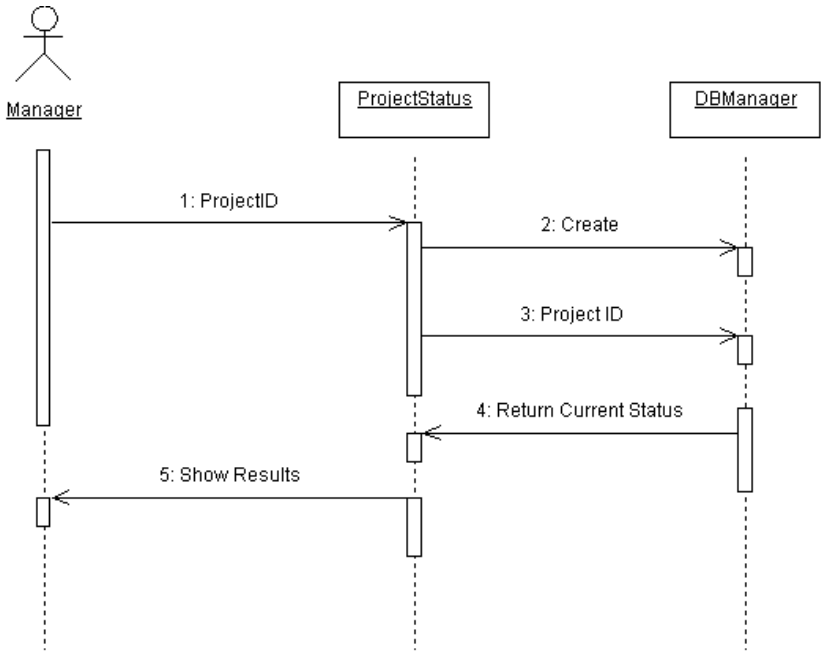


Figure 32: Sequence diagram of generating status report

5.4.16 Sequence diagram of generating time lines report

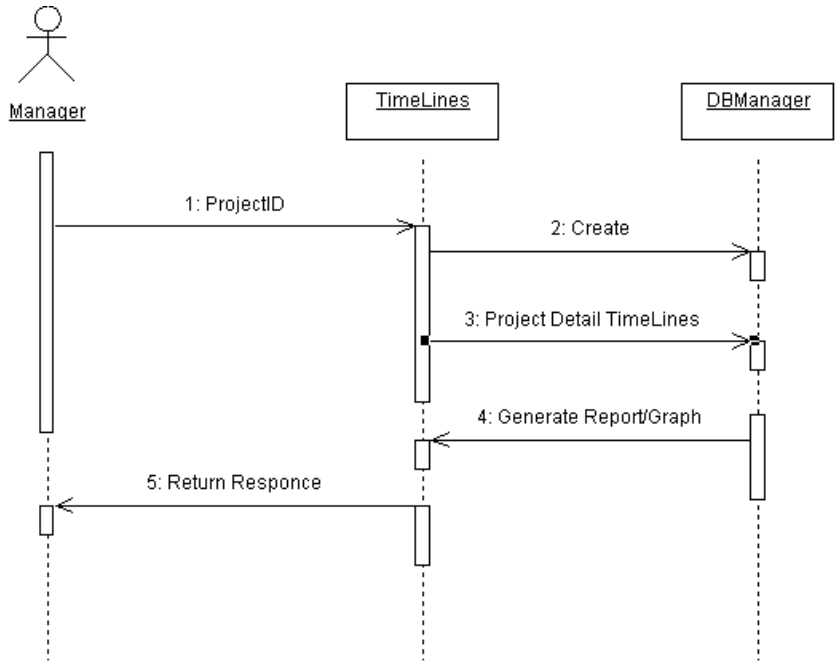


Figure 33: Sequence diagram of generating time lines report

5.5 CLASS DIAGRAMS

5.5.1 Task generation & Assignment

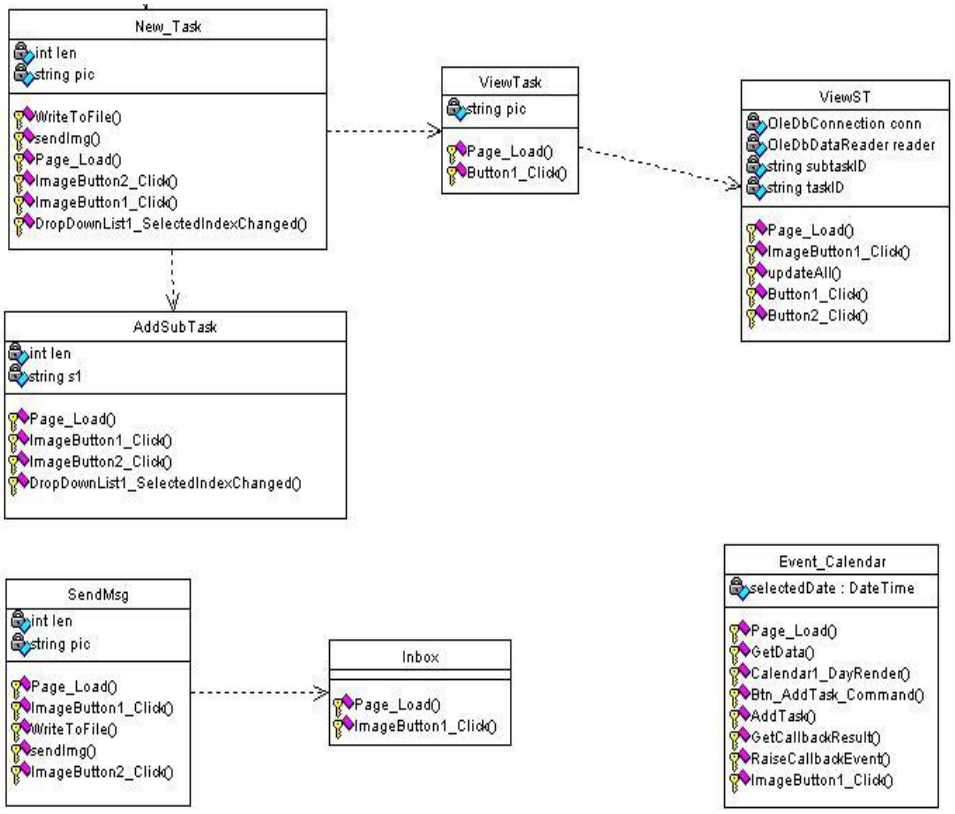


Figure 34: Task generation & Assignment

5.5.2 Report Generation

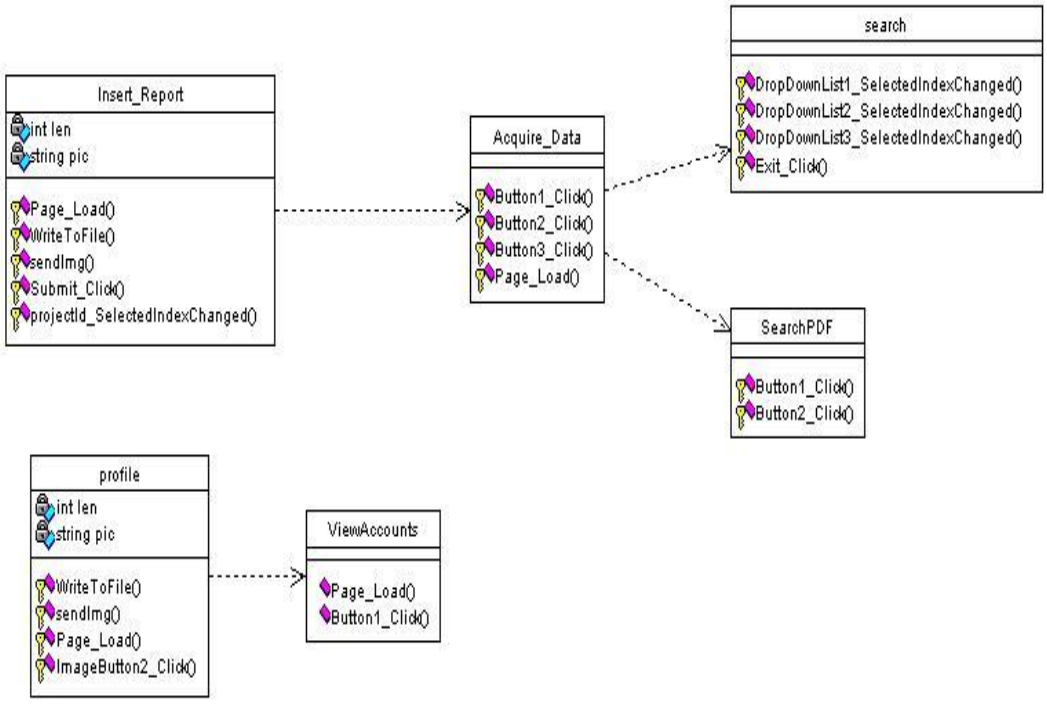


Figure 35: Report Generation

5.6 Video Conferencing

Figure 36: Video Conferencing

5.7 Managerial View Classes

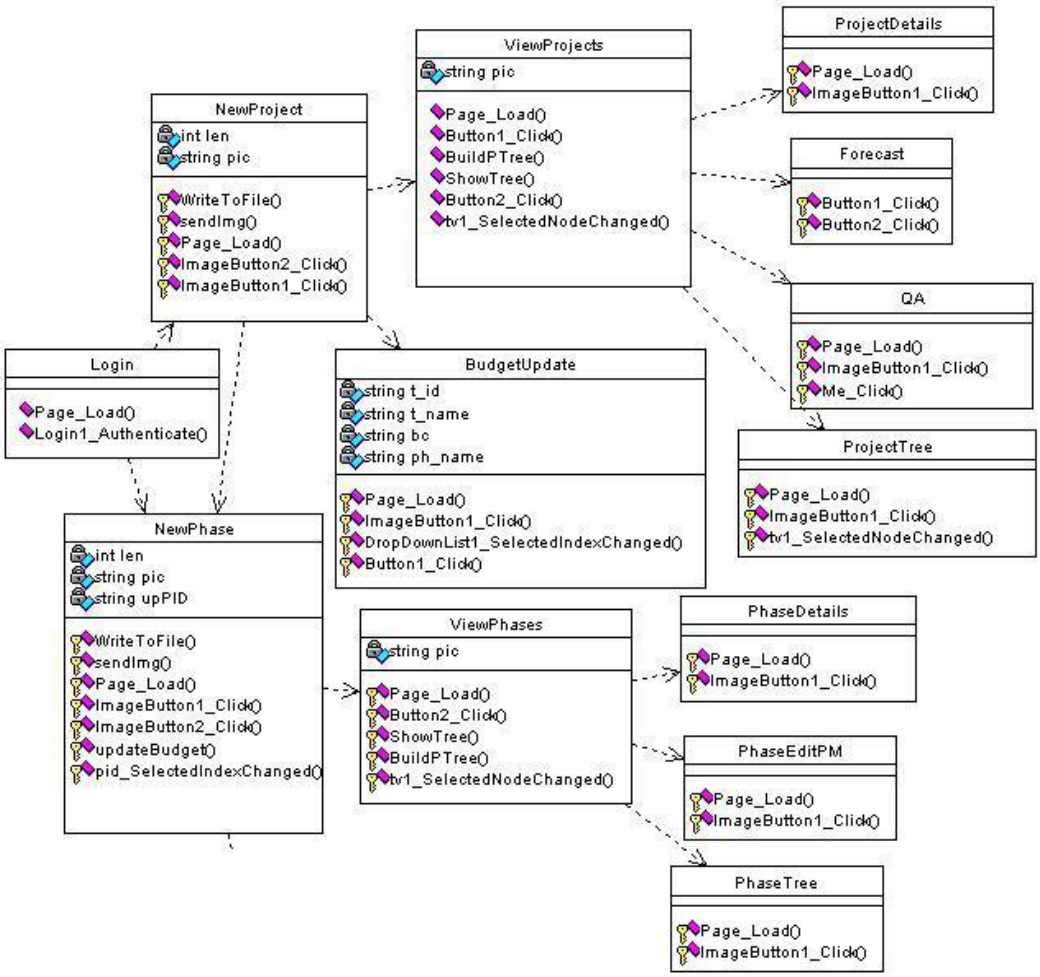


Figure 37: Managerial View Classes

Chapter 6

CONCLUSION

EPMS is a fully automated system which will replace the hectic manual project management. It has made the project management system more efficient and accurate in terms of calculating the timelines, status and budget. Now by using the system, managers can easily manage projects no matter how huge they are and how mush distributed they are. The scope of the project was bit limited due to the time constraints. There is always being a space to improve this project according to the upcoming user requirements and future challenges. EPMS is generic web based software which can well fit to any oil and gas organization by making little amendments. The problems that were addressed and solved were the time and budget calculations and were updated and accurately. For the offshore projects, interaction between different users of the system located at different geographical locations has been solved mainly through the audio and video communication system. Now users can have live communication with others members through this dynamic feature.

In future, the system can be made more generic enough to be accommodated in any type of oil and gas organizations. Either they are in drilling field, or processing or in exploration. As far as the technology is concerned, web ontology can make a spectacular change in this particular industry by enhancing and implementing the system using ontology. But at current moment, we have a big constraint that today web browsers don’t have any support for the ontology although this technology has opened new ways to make the product much more useful and optimal. If we talk about

the financial perspective, what I suggest is to make the whole system a web service and let the companies to use it and pay for it. This will be much useful to make the system even more efficient and purposeful by not getting just money but feedback and suggestions for improvement as well.

APPENDIX A: GLOSSARY

EPMS ：Exploration Project Management System

OGDCL: Oil and Gas Development Corporation Limited

TDL: Technical Data Library

LMKR: Land Mark Resources

CLI: Common Language Infrastructure

ASP: Active Server Pages

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