

CENG491 ANALYSIS REPORT

MISS PROJECT

SOFTRUNNER

Zerrin Bozel 1297571
Burcu Ardiç 1297472
Pınar Çelikoğlu 1297613

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1. INTRODUCTION

(CONFESS: ☺)In last semester, in Ceng350 course, we made an online cinema ticket selling system project. We haven't used a project management tool because of various reasons. Now, after getting familiar with capabilities of project management tool, we realized how much redundant and useless effort we spent. We made project planning mostly manually (except Gantt charts). As a result of this, some tasks had to be done twice or more, some tasks were done at the submission day, even some of them couldn't be achieved on time. If we had used a project management tool efficiently, we could manage a much more high-quality product in shorter time. Also we would have had a more accurate historical data, from which we could benefit a lot, especially in the estimation and timing phases. Having understood the importance of a project management tool, and the significant role it plays during project management, we started to search to do the best. In order to respond to the customer needs, we broke down our limits and thought about new features that will ease and spread the usage of our tool. With this goal, we conducted surveys (they are given as appendix in hardcopy) among the project managers and computer engineers. Besides, we made an interview with the segment manager of Siemens PSE TR, Vedat Uslu. We conducted meetings to understand customer needs, and compare with our capabilities. By this way, we completed our detailed analysis. This report is the document of these requirements analysis.

1.1. Goals and Objectives

Our objective is to build an attractive project management tool which is easy to use for both project managers and project employees. And important of all, we aim to construct a totally reliable system in which people can trust. With this project, efficiency in project planning will be increased; the phases will be made easier. Our goal is creating a satisfaction chain which includes every-one who are somehow related with planning, students, managers, teachers, even housewives, etc...

Since there are similar projects in use, our system should be the number-one with its additional qualities&functionalities. That is it should (and will) come up with innovative ideas and provide a structure refreshing itself.

Finally, we are aiming this project to be used by the maximum number of people. So our product should be environment independent.

1.2. Statement of Scope

First thing to be declared is that *MissProject* is a web-based multi-user operating system independent project management tool.

Our mechanism starts with a log-in process. Only registered users have access to the projects that they are registered to. The right of editing projects is given to only administrators. The users that haven't registered yet (which are strongly recommended to register as soon as possible) can sign-up with a simple process or may prefer not to be registered, but only get benefit from the documents in the web site (We decided that documents about project management, such as tutorials, templates, etc, will attract the users.). When a user logs in the system, he/she will be directed to the company account which he/she is registered to (The user may not be an employee, that doesn't matter. "Company" stands for the group of projects. A housewife can form a "company" with her projects.)

User can only make operations on the projects that he/she is registered to. From this point on, the features of *MissProject* appear. Every feature that can be used during project management will be implemented. The basic features are assigning tasks to groups, assigning resources to groups, dividing the project into subtasks, linking tasks, linking resources, assigning deadlines to projects and tasks, deadline reminders and alerts, Gantt chart wizard, resource graph and network diagram generators, cost calculation, automatic estimation of cost and effort, calendar, project templates, glossary, help, etc.

We tried to understand the needs of potential users. With this aim, we conducted surveys and made an interview. By this way, we obtained an idea of "What features are absent in the tools that are currently been used?" People were mostly complaining about the absence of ease of use. The most frequently used feature of current tools is "Gantt Chart Generation". It has some problems such as difficulty in drawing and printing the charts. We will come over this problem. Another difficulty appears in report generation. We observed a need for flexibility in generating reports and resource-based report generating.

We will also give importance to avoiding conflicts in calendar, by giving priorities to tasks. Filtering according to a certain criteria will be a big advantage. And also shared

workbook, import/export from/to spreadsheet and word processors and converting to html format, etc. are most important and innovative features of our project.

Yet, requirement analysis is still abstract, but in design phase will result at a lower level.

1.3. Success Criteria of the Project

Among the success criteria of our project, security is the first to be mentioned since the information about projects should not be accessed by anyone else. Our subject – online project management- stands on an extra critical point, since important of all, the project details should be held on secure hands. A project, that cannot manage this issue, is nothing but trash! The system should employ a well-tested authentication mechanism.

When all security issues are handled, success of the project will depend on the correctness of tasks. All the tasks should be done correctly; otherwise a tiny mistake will cost thousands of dollars to the user.

If these two are assured, response time, ease of use and the attractive interface will move us one step further. The mechanism will be clear and intuitive to use. Users should not be required to have any additional knowledge or training to use *MissProject*. But in case of any problem, we will have a strong *help* facility. Most web-based applications provide users a complicated system, which repel people who have already doubts about internet&security. Our system will consist of very systematic steps, each of them are clear and easy to use, erasing all the doubts in people's minds.

To reach to a wide range of users, our system should work appropriately in almost all possible environments. Interfaces should be standard so that any browser can be used to access to the system.

2. RISK MANAGEMENT

2.1. Project Risks and Overview of RMMM

Risk management is carried out from the inception of a project until its completion, identifying the risks before they become problems and handling them while there is still time.

The steps to be applied during risk management are *Risk Identification, Analysis, Planning, Tracking and Control*.

The possible risks that threats to the project plan are recognized and assigned to various categories, such as technical risks or schedule risks. The identified risks are characterized by their likelihood of occurrence and the damage that it will do if it does occur. The strategies and specific actions are determined to avoid the risk, eliminate the root cause of the risk, or control the risk. Finally, the strategy planned in the previous step is executed.

We identified and analyzed risks that may surface during the project. Risks will be monitored throughout the project.

- The probability of the loss of one of the project members is very low and all members will work on all parts of the project so this risk is minimized.
- The probability of encountering a failure on Hardware/software development platform is not very high, but in case of such occurrence a systematic backup schedule is kept not to lose information
- The implementation part of the project may require learning of new technology and make us fall behind the schedule. This risk will be handled by using tutorials to train group members regularly from the beginning of the project.
- The probability that the user interface may not be very user friendly is low and this risk can be minimized by writing a detailed and illustrated user manual.
- The probability of the lack of training on the tools that are required is very high, but there are different widely available tutorials on the web that we can use.

2.2. Risk Table

Everybody in the team is strongly encouraged to identify risks and bring them up at the next appropriate meeting. The identified risks will be evaluated for their probability and potential impact that will be prioritized with a value from 1 to 4. (1= catastrophic impact, 2= critical, 3=marginal, 4= negligible). Mitigation strategies will be designed in meetings starting with highest priority risks.

R#	Risk	Probability	Potential Impact	RMMM
1	Falling behind schedule	70%	1	Schedule more meetings
2	Loss of a team member	10%	1	Reorganize responsibilities
3	Hardware/software failure on development platform	40%	1	Keep a systematic backup schedule not to lose information
4	User Interface is not very user friendly	20%	3	Write detailed and illustrated user manual
5	Lack of training on tools	80%	2	Use tutorials to train the members of the team.
6	Staff inexperienced	60%	2	Use self-training method to develop team members

3. ECONOMICAL ANALYSIS

	Cost Name	Cost
Procurement Costs	Consulting	300\$
	Equipment purchase (3 computers, modem, ups)	6,000\$
	Equipment installation	1,000\$
	Management and staff dealing	1,000\$
Start-up Costs	Operating System Software	100\$
	Start-up Personnel	6,000\$
Project-Related Costs	Obtaining applications software	1,000\$
	Preparing documentation	300\$
	Data collection and installing data collection procedures	500\$
	Development management	1,750\$

Ongoing Costs	System Maintenance Cost	350\$
	Rental Costs (For web site)	600\$

3.1. Cost and Scheduling Constraint

The total cost is 18900\$. The budget of this project determined by SoftRunner is maximum 20000\$. So if we can contribute the budget with our cost plan, it seems we will not face with a budget problem, however we should be careful.

SoftRunner Limited Company wants this project to be completed in 8 months (until 7th June,2005). So we have limited time and if a delay in the project occurs, they may decrease the payment 5% per month. And the Gantt chart of the project is as follows:

3.1.1. Gantt Chart

[GANTT_CHART.mpp](#) (are given as appendix in hardcopy.)

3.2. Project Estimation

3.2.1. Historical Data Used for Estimates

No historical data used for estimates.

3.2.2. Estimation Techniques Applied and Results

3.2.2.1 FP-based estimation

Attribute	Average Count	Weight	FP count
External Inputs	2	4	8
External Outputs	1	5	5
External Inquiries	4	4	16
Internal Logical Files	5	10	50
Ext Interfaces	0	7	0
Total			79

Inputs:

- Member registration
- Information of projects

Outputs:

- Graphical output screen

Inquiries

- Registration success
- Company information
- Project information
- Edit success

Files:

- Default file
- Registration file
- Main screen file
- Project file
- Administrator file

Complexity adjustment factor (with respect to the answers of 14-questions) =

$$0.65 + 0.01 * 43 = 1.08$$

$$\text{Total FP} = 79 * 1.08 = 85.32$$

$$\text{Effort} = \text{Productivity} * \text{KLOC}^{\text{penalty factor}}$$

Since we will implement the project using Java, 1 FP is about 50 Lines of Code of Java. And for such a project, the productivity is 3.60, and the penalty factor is about 1.03. Then

$$\text{Effort} = 3.60 * (50 * 85.32 / 1000)^{1.03}$$

$$\text{Effort} \approx 17 \text{ person-months}$$

3.2.2.2 COCOMO model

In order to calculate the effort, duration, and cost by using COCOMO, we have used the COCOMO toll at www.nasa.gov site with the following parameters:

Delivered source instructions (thousands) (KDSI) : 7

Development model: organic

Average cost rate (\$/pm): 2000

And the results are:

Effort = 19 person-months

Duration = 8 months

Development cost = 38000\$

In such projects with small groups like us estimates are highly dependent on the capabilities of the individuals performing the work, so we believe that we can finish this project earlier than the result we have found.

4. TECHNICAL ANALYSIS

4.1. Functions of the Hardware

The hardware's role in our system is very simple. There will be totally 1 PC. In order to use our system, no programs needed to be installed on the PC's. Only an internet connection and an internet explorer will be enough.

4.2. Functions of the Software

All PC's will be installed Windows 2000 as the Operating System. Java, HTML and Oracle will be used as the main software. HTML and Macromedia Flash will be used for constructing the web page and the forms. Oracle will be used for creation of the database and making queries to the database. Java will be used for communication with database via internet.

We decided to use Java because:

- Low cost. (The tools needed to build and test Java programs are available without charge. Sun makes the Java Development Kit (JDK) available over the Internet)
- Platform independence (write once, run anywhere)
- Provides a measure of security
- Doesn't require special permission (e.g. unlike CGI)
- Better interactivity
- Oracle database access
- To achieve desktop applications draw upon user-interface frameworks that provide a varied and flexible set of controls, modal dialogs, and multiple windows since HTML has a limited and static set of controls, mainly forms, active images, and hyperlinks.
- Java is easier to use than C++, and above all: it is portable, WEB-oriented, and provides an ever growing wealth of class libraries for ever new application domains.
- Java is hundreds of times faster than any other language

4.3. Functions of Database

Databases will hold the information of project managers, staff working on projects, projects and project details such as tasks, resources, administrators etc. The project administrators will have the permission of adding/deleting/updating project details. The other staff working on that project will have only limited permissions of making those operations.

4.4. Functions of People

3 people will work in this project. One of them will create the database using Oracle and design the web page of the project management system MissProject. The others will code programs for executing the processes.

5. REQUIREMENT ANALYSIS

5.1. Data Model and Description

3.2.3. Data Description

The information of Administrators, Individuals, Groups, Managers, Tasks, Material Resources, Projects, and Companies is kept and updated when necessary in database.

3.2.4. Data objects and Complete Data Model

[ER_diagram.vsd](#) (are given as appendix in hardcopy.)

3.2.5. Data dictionary

1. Individual Information

- The information of the individuals can be changed through update process.
- Parts for the Individual information are as follows;

<u>Individual ID</u>	: String[10]
Individual Username	: String[10]
Individual Password	: String[10]
Individual Name	: String[30]
Individual Last Name	: String[30]

Individual Company : String[20]
Individual Email : String[30]

- Individual ID is the primary key for the Individual information.

2. Group Information

- Parts for the Group information are as follows;

Group ID : String[10]
Group Name : String[10]

- Group ID is the primary key for the group information.

3. InvolvedIn1 Relation

- InvolvedIn1 Relation shows the relation between the individuals and the groups.
- Parts for the InvolvedIn1 Relation are as follows;

Group ID : String[10]
Individual ID : String[10]

4. Task Information

- The information of the tasks can be changed through update process.
- Parts for the Task information are as follows;

Task ID : String[10]
Task Name : String[30]
Project ID : String[30]
To : Date[DD/MM/YYYY]
From : Date[DD/MM/YYYY]
Duration : String[10]
Priority : String[10]

- Task ID is the primary key for the Task information.

5. InvolvedIn2 Relation

- InvolvedIn2 Relation shows the relation between the tasks and the groups.
- Parts for the InvolvedIn2 Relation are as follows;

Group ID : String[10]

Task ID : String[10]

6. Material Resources Information

- Parts for the Material Resources information are as follows;

Material ID : String[10]

Material Description : String[30]

Material Type : String[20]

Material Serial Number : String[20]

- Material ID is the primary key for the Material information.

7. Reserve Relation

- Reserve Relation shows the relation between the Tasks and the Material Resources.
- Parts for the Reserve Relation are as follows;

Task ID : String[10]

Material ID : String[10]

8. Project Information

- Parts for the Project information are as follows;

Project ID : String[10]

Project Name : String[20]

Company ID : String[10]

To : Date[DD/MM/YYYY]

From : Date[DD/MM/YYYY]

Duration : String[10]

- Project ID is the primary key for the project information.

9. Manager Information

- Parts for the Manager information are as follows;

Manager ID : String[8]

Manager Username : String[10]

Manager Name : String[30]

Manager Password : String[10]

Manager Email : String[30]

- Manager ID is the primary key for the Manager information.

10. Manages Table

- Manages Table shows the relation between the Managers and the Projects.
- Parts for the Manages Table are as follows;

Manager ID : String[10]

Project ID : String[10]

11. Company Information

- Beginner ID is the Individual ID of the manager that first sign up to the system and opens the account of the company.
- Parts for the Company information are as follows;

Company ID : String[10]

Company Name : String[20]

Beginner ID : String[10]

- Manager ID is the primary key for the Manager information

12. Administrator Information

- Parts for the Administrator information are as follows;

Administrator ID : String[10]

Individual ID : String[10]

- Administrator ID is the primary key for the Administrator information

13. Administrates Relation

- Administrates Relation shows the Administrators of the Projects.
- Parts for the Administrates Relation are as follows;

Administrator ID : String[10]

Project ID : String[10]

6. Functional Model and Description

6.1. Description for Functions

6.1.1. Login Process

a. Sign-up

The sign up function follows the below sequence:

- Takes the sign-up request and the data that the user enters to the keyboard.
- Selects the Individual Information table.
- Takes the Individual name, last name, username, company name and the email address that the user enters.
- Checks for the username have become different from other users.
- Inserts the information of the new user into Individual information table, the Manager Information Table and Company Information Table.
- Sends the user's company name, username and password via e-mail.
- Outputs the inserted records.

b. Sign-in

The sign-in function follows the below sequence:

- Takes the sign-in request and the username and password from keyboard that the end-user enters.
- Selects the Individual Information table.
- Checks if the Individual name and the password is valid
- Outputs the activated session.

6.1.2. Account Operations:

a. Update User Information Process:

The Change Information Process is done by the end user if he wants to change any of his information.

It follows the below sequence:

- Takes the change information request and the data that the user enters to the keyboard.
- Selects the Individual Information table.
- Update to the Individual Information table according to user's queries. He may change his password or e-mail.
- Outputs the updated records.

b. Add/Remove Users

The Add/Remove Users processes are done by the administrators of a project if he wants to give/take the right to view the project information, graph and report generation to/from a person.

It follows the below sequence:

- Takes the Add/Remove Users request and the data that the user enters to the keyboard.
- Selects the Individual Information table.
- Inserts to the Individual Information table according to user's queries.
- Outputs the updated records.

c. Add/Remove Administrator

The Add/Remove Administrator processes are done by the manager of a project if he wants to give/take the right to view and update the project, graph and report generations to/from an individual .

It follows the below sequence:

- Takes the Add/Remove Administrator request and the data that the user enters to the keyboard.
- Selects the Administrator Information and Individual Information tables.
- Update to the Administrator Information, Individual Information tables and Administrates Relation table according to user's queries.
- Outputs the updated records.

6.1.3. Project Operations:

a. Update Projects

1. Add/Remove Projects

The Add/Remove Project processes are done by the administrators of a project if he wants to add a new project or remove an existing that he administrates.

It follows the below sequence:

- Takes the Add/Remove Project request and the data that the user enters to the keyboard.
- Selects the Project Information, Manager Information tables.
- Update to the Project Information and Manager Information tables, Manages Relation according to the administrator's queries.
- Outputs the updated records.

2. Edit Projects

The Edit Project process is done by the administrators of a project if he wants to update the information of an existing project that he administrates.

It follows the below sequence:

- Takes the Edit Project request and the data that the user enters to the keyboard.
- Selects the Project Information, Task Information, Material Resources Information, Individual Information, Group Information tables and Reserve, Administrates, InvolvedIn1, and InvolvedIn2 Relations.
- Update to the Project Information, Task Information, Material Resources Information, Individual Information, Group Information tables and, Administrates, Reserve, InvolvedIn1, and InvolvedIn2 relations according to the manager's queries.
- Outputs the updated records.

b. View Projects

The View Project process is done by the administrators or individuals of a project if he wants to update the information of an existing project that he administrates.

It follows the below sequence:

- Takes the Update Project request and the data that the user enters to the keyboard.
- Selects the Project Information, Task Information, Material Resources Information, Individual Information, Group Information tables and Reserve, Administrates, InvolvedIn1, and InvolvedIn2 Relations.
- Update to the Project Information, Task Information, Material Resources Information, Individual Information, Group Information tables and, Administrates, Reserve, InvolvedIn1, and InvolvedIn2 relations according to the manager's queries.
- Outputs the updated records.

c. Graph Generation

The Graph Generation process is done by the administrators or individuals of a project if he wants to draw Gantt charts, resource graphs, network diagrams, etc. for their projects.

It follows the below sequence:

- Takes the Graph generation request and the data that the user enters to the keyboard.
- Selects the Project Information, Task Information, Material Resources Information, Group Information tables and Reserve, InvolvedIn1, and InvolvedIn2 Relations.
- Generate graph according to the user's queries.
- Outputs the generated graph.

d. Report Generation

The Report Generation process is done by the administrators or individuals of a project if he wants to generate reports for their projects.

It follows the below sequence:

- Takes the Report generation request and the data that the user enters to the keyboard.
- Selects the Project Information, Task Information, Material Resources Information, Group Information tables and Reserve, InvolvedIn1, and InvolvedIn2 Relations.
- Generate report according to the user's queries.
- Outputs the generated report.

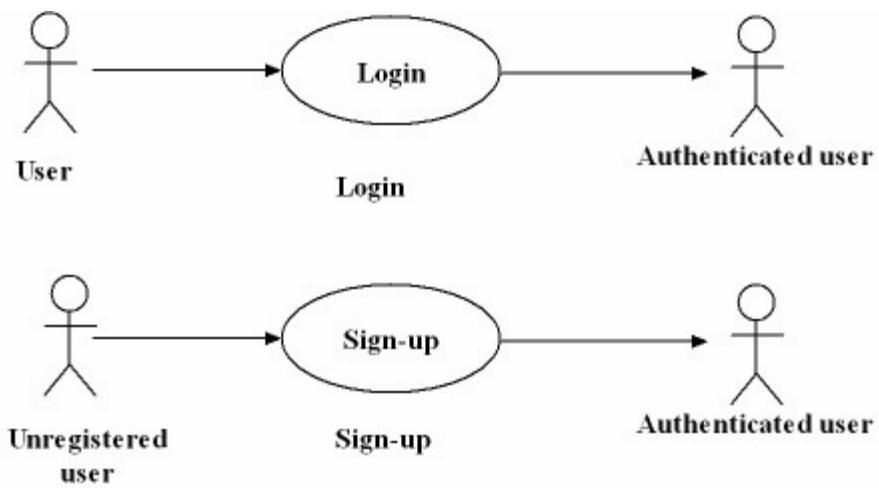
6.2. Functional Modelling

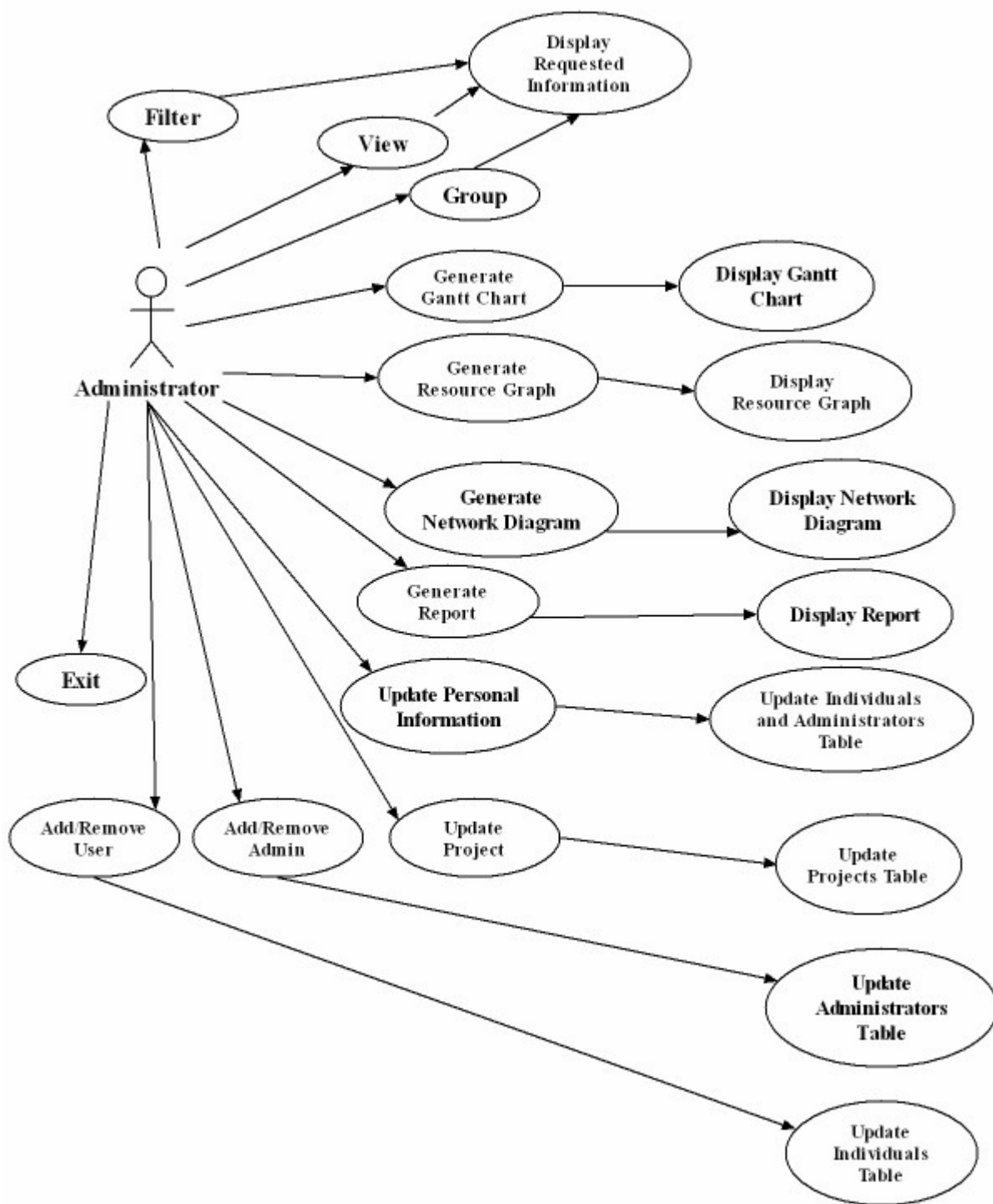
[DFD.vsd](#) (are given as appendix in hardcopy.)

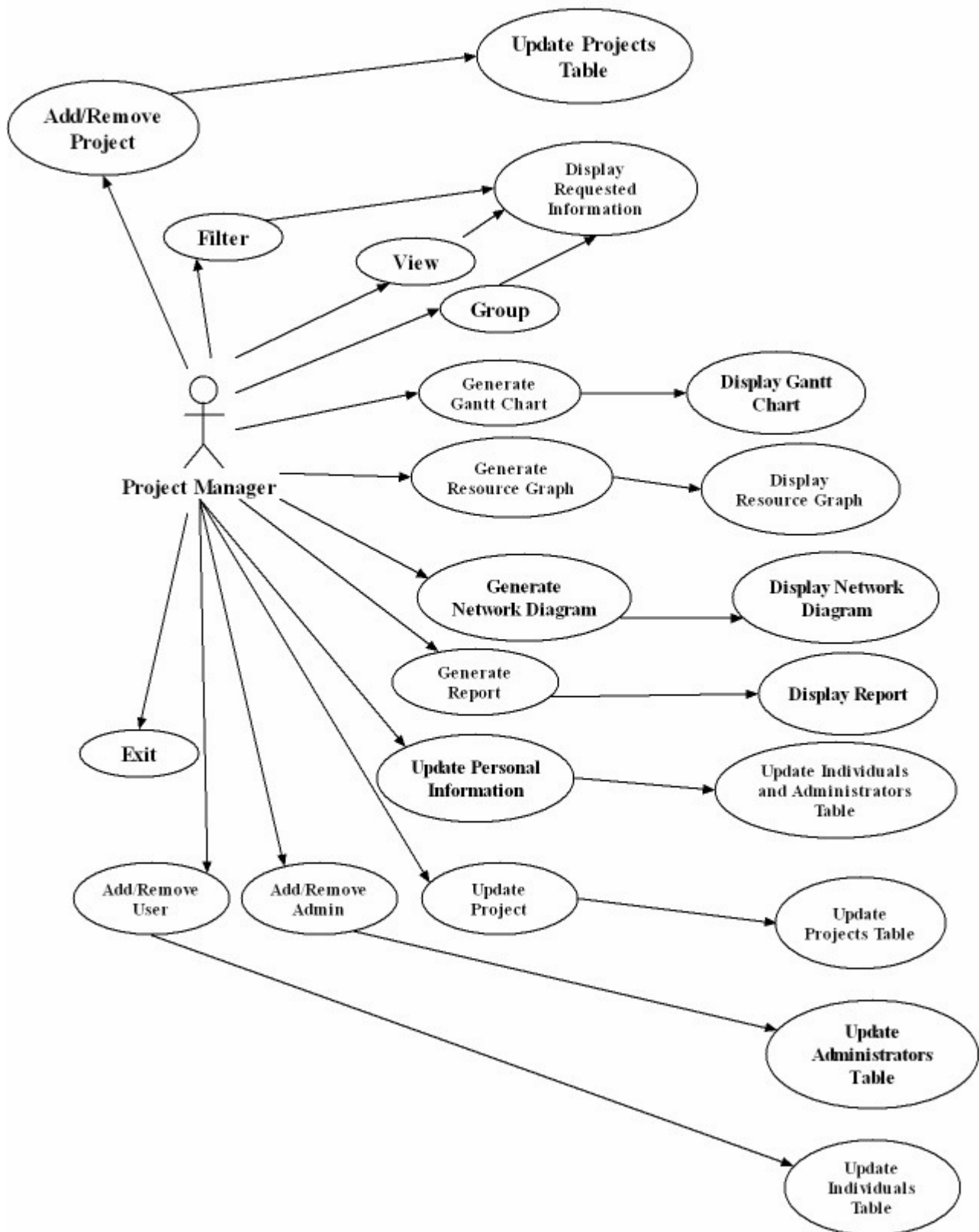
6.3. Behaviourial Modelling

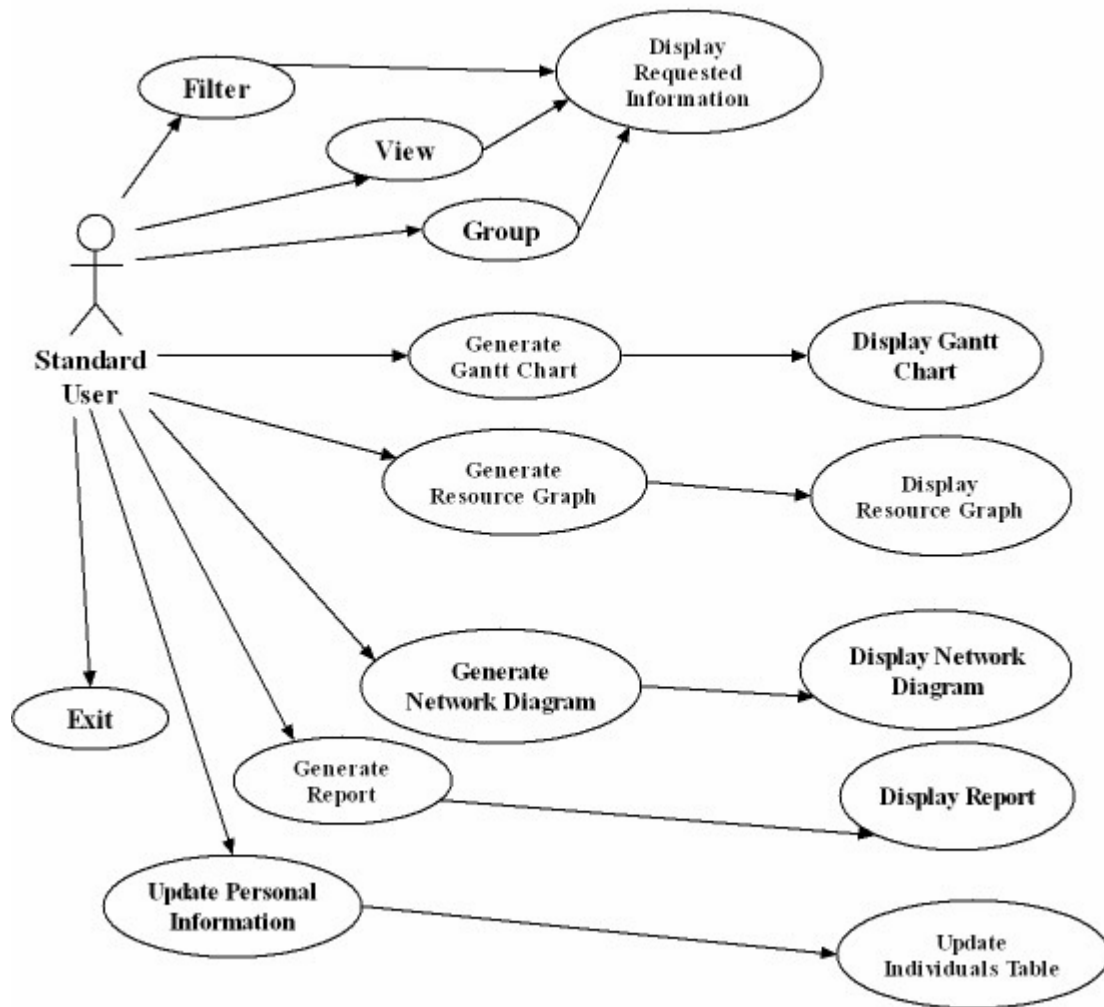
[STATE TRANSITION diagram.vsd](#) (are given as appendix in hardcopy.)

7. USE CASE ANALYSIS









7.1. System Model Scenerios

Scenario Name : Successful Login

Actors : Individual or Administrator or Manager

Precondition : None.

Event Flow : 1. Actor logs in with his user id and password.
2. System checks if the username and password is valid or not.
3. System verifies the login information. The interface for selecting the project operations or account operations appears.

Scenario Name : Authentication Failure

Actors : Individual or Administrator or Manager

Precondition : None.

Event Flow : 1. Actor logs in with his user id and password.
2. System checks if the username and password is valid or not.
3. System launches the login screen again with an error message.

Scenario Name : Signing Up

Actors : Non registered user

Precondition : None.

Event Flow : 1. User clicks Sign Up button on the home page.
2. System launches a screen including a form to be filled.
3. User enters all the required information correctly and clicks the sign up button.
4. System checks whether username entered belongs to any user else or not. Then a screen is opened with a confirmation message, and an e-mail is sent to the user including his company name, username and password for confirmation.

Scenario Name : Updating Information

Actors : Individual or Administrator or Manager

Precondition : User must log in successfully.

Event Flow : 1. User clicks Update Information button.

2. A screen is displayed with the form which the user has filled while signing up. Then, user makes the modifications and click the Save button.

3. System launches a screen with a confirmation message.

Scenario Name : Add/Remove User

Actors : Administrator or Manager

Precondition : User must be an administrator of the project that new user is added/removed.

Event Flow : 1. User clicks account operation button and selects add user or remove user button.

2. System launches a screen including the project that the user administrates.

3. User selects the one of the projects he administrates and click the add user or remove user button.

4. Then, he inserts the information of the user that he wants to add or remove to the project.

5. System enters/deletes the user to/from the InvolvedIn1 relation, and sends a confirmation message.

Scenario Name : Add/Remove Administrator

Actors : Administrator or Manager

Precondition : User must be an administrator of the project that new administrator is added/removed.

Event Flow : 1. User clicks account operation button and selects add administrator or remove administrator button.

2. System launches a screen including the project that the user is administrates.

3. User selects the one of the projects he administrates and click the add administrator or remove administrator button.

4. Then, he inserts the information of the individual that he wants to add or remove as an administrator to the project.

5. System enters/deletes the administrator to/from the Administrator Information table, Administrates Relation and sends a confirmation message.

Scenario Name : Add New Project

Actors : Manager

Precondition : User must log in successfully and user must be a Manager of a project

Event Flow : 1. User clicks project operations button and selects add new project button.

4. Then, he inserts the information of the project that he wants to add.

5. System enters the project to the Project Information table, and sends a confirmation message.

Scenario Name : Remove Project

Actors : Manager

Precondition : User must log in successfully and user must be a manager of the project that is removed.

Event Flow : 1. User clicks project operations button and selects remove project button.

2. Then, he inserts the information of the project that he wants to add.

3. System deletes the project from the Project Information table, and sends a confirmation message.

Scenario Name : Edit Project

Actors : Administrator or Manager

Precondition : User must log in successfully and user must be an administrator of the project that is edited.

Event Flow : 1. User clicks project operations button and selects edit project button.
2. Then, he edits the information of the project, the information of tasks, resources, groups.
3. System updates the project from the Project Information, Group Information, Task Information tables and sends a confirmation message.

Scenario Name : View Project

Actors : Administrator or Individual or Manager

Precondition : User must log in successfully.

Event Flow : 1. User clicks project operations button and selects view project button.
2. The Project Information, Group Information, Task Information tables are selected.
3. Then, he can view the information of the project, the information of tasks, resources, groups, filter these information.

Scenario Name : Graph Generation

Actors : Administrator or Individual or Manager

Precondition : User must log in successfully.

Event Flow : 1. User clicks project operations button and selects Graph Generation button.
2. User selects one of the options generation of Gantt chart, resource graph, network diagram, etc.
3. Then, he receives the information of the project, tasks, resources, groups from Project Information, Group Information, Task Information tables and constructs the graph.
4. System outputs the constructed graph.

Scenario Name : Report Generation

Actors : Administrator or Individual or Manager

Precondition : User must log in successfully.

Event Flow : 1. User clicks project operations button and selects report generation button.
2. Then, he receives the information of the project, tasks, resources, groups from Project Information, Group Information, Task Information tables and generates the report.
3. System outputs the constructed report.

8. REVIEW

With *MissProject*, the end-users will be introduced to an easy, flexible (also even fun?) way of tracking effort on tasks. Also, our tool will provide continuous feedback of team status to both managers and customers; this will accelerate the improvement of project. Additionally, team communication through a shared view of activities will increase a lot. Planning metrics will be collected and calculated easily. Important of all, serving in the web environment, more people will have access to our tool. And with the feedback from them, our tool will refresh itself everyday according to conditions of evolving life.

9. REFERENCES

<http://www.mhhe.com/engcs/compsci/pressman/student/olc/apm.mhtml>

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www.project-management-software.org/project/

<http://www.niwotridge.com/Resources/PM-SWEResources/PMTTools.htm>

<http://www.jsc.nasa.gov/bu2/COCOMO.html>

Questionnaires conducted on Havelsan and MilSoft computer engineers.

The interview with Vedat Uslu (Segment Manager of Siemens PSE TR)