SOFTWARE PROJECT MANAGEMENT PLAN

for

ION-CHAT SYSTEM

Version: 1.1

Prepared By

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Change History

This document is the revised version (version 1.1) of ION-CHAT SYSTEM, Software Project Management Plan that was released on April 5th, 2002. The sections from 1 to 5.1.4 was updated from the ION-CHAT SYSTEM Initial Plan **[9]**. The subsequent changes will be mentioned in this part of the Software Project Management Plan.

Preface

The document contains the Software Project Management Plan of ION-CHAT SYSTEM. The mission of the project is to develop a web-based chat system for METU Informatics Institute Online IS Master Program.

The goal of the Software Project Management Plan is to define the technical and managerial processes necessary to develop software work products that satisfy the ION-CHAT SYSTEM requirements. This system is prepared according to IEEE standard 1058-1998 **[1]**. The Software Project Management Plan is in content compliance with the IEEE standard 1058-1998 in which the contents of this standard are rearranged and a mapping is provided. That is, the content compliant Software Project Management Plan is mapped into various clauses and subclauses of the IEEE standard 1058-1998.

In addition to the IEEE standards, functions of project are discussed in section 1.1.3.

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1.1 Project Summary (Subclause 1.1 of the SPMP)

1.1.1 Purpose, Scope and Objectives (Subclause 1.1.1 of the SPMP)

The purpose of the project is to develop a web-based chat system for METU Informatics Institute Online IS Master Program. The name of the project is ION-CHAT SYSTEM and this is also the name of the final product to be delivered.

The objectives of the ION-CHAT SYSTEM are:

- To satisfy the online and real-time communication need for the members of ION-CHAT SYSTEM. That is the students and the instructors of METU Informatics Institute Online IS Master Program.
- To satisfy the above-mentioned need in a platform independent manner.
- To satisfy the above-mentioned needs considering the basic security issues for which the detailed description was given in the software requirements specification.

The scope of the ION-CHAT SYSTEM is:

- The intended target users of ION-CHAT SYSTEM are ION students, instructors of Informatics Institute and acquirers.
- The ION-CHAT SYSTEM will be a text-based system. Any kind of audio-visual extensions are out of scope.
- The ION-CHAT SYSTEM will not be integrated with the existing ION system. It will be used as a stand-alone system.

1.1.2 Assumptions And Constraints (Subclause 1.1.2 of the SPMP)

The assumptions of the project are;

- The DeepBlue consists of 3 (three) people where each person will work 15 (fifteen) hours in a week.

- Informatics Institute System Administration will supply the maintenance of the ION-CHAT SYSTEM.
- The correspondence of the documentation produced to the IEEE Standards **[1, 2, 3, 4]** is subcontracted by Mobilesoft.
- There is not any real budget to use in the project.

The constraints of the project are;

- The schedule of the project is predefined by the customer.
- Since DeepBlue will not have authorization to access to ION system, ION-CHAT SYSTEM will be a standalone system, which means ION-CHAT SYSTEM will not work as an integrated part of the existing ION system rather it will be a separate and independent system.
- Since it is possible to have users from all over the world, the ION-CHAT SYSTEM will be web-based, platform independent.
- Since the project is being developed as part of the graduate course IS 502 (Information Systems Projects), there will be no real payment to DeepBlue by METU-II.
- The software development processes and any kind of documentation will be in compliance with the IEEE Standards **[1, 2, 3, 4]**.
- Each room in the ION-CHAT SYSTEM will consists of four kinds of members, which are instructors, acquirers, reviewie team and reviewer team.
- For the project basically, the existing resources of DeepBlue will be used. The cost of any additional resources that can be needed cannot cause a real budget overflow for the project.

1.1.3 Functions Of Project

According to initial meetings done with customers the users of the ION-CHAT SYSTEM consists of system groups. These are student, instructor, customer and administrator (this will be referred as root from now on).

* The functions of root;

- define users on the ION-CHAT SYSTEM
  - assign each user a unique user-id

- assign each user a password
- assign each user to a system group

- define chat groups on the ION-CHAT SYSTEM
  - assign a unique group name to each chat group
  - assign users to chat groups
- define rooms on the ION-CHAT SYSTEM
  - assign a unique room name
  - assign the reviewie group
  - assign the reviewer group
  - assign the customer

* The functions of instructor;
  - use the chat function
* The functions of customer;
  - use the chat function
* The functions of student;
  - use the chat function

1.1.4 Project deliverables (Subclause 1.1.3 of the SPMP)

- *Initial Plan*: The document will be prepared and submitted to is502@ii.metu.edu.tr e-mail address until February 26th, 2002.
- *Initial Plan Review Report*: The subcontractors will review the initial plan until February 27th, 2002. Then Initial Plan Review Report will be prepared by the subcontractors after the Initial Plan Review and will be submitted to DeepBlue's e-mail address until 24:00 in the same day.
- *Updated Initial Plan*: DeepBlue will update the Initial Plan until March 1st, 2002 and will be presented to the acquirer.
- *SRS*: The document will be prepared and submitted to http://infoant.ii.metu.edu.tr e-mail address until March 17th, 2002.
- *SRS Review Report*: The subcontractors will review SRS until March 20th, 2002. Then SRS Review Report will be prepared by the subcontractors after SRS Review

and will be submitted to http://infoant.ii.metu.edu.tr address until 24:00 in the same day.

- *Updated SRS*: DeepBlue will update SRS until March 22nd, 2002 and will be submitted to http://infoant.ii.metu.edu.tr address.
- *SPMP*: The document will be prepared and submitted to http://infoant.ii.metu.edu.tr address until April 1st, 2002.
- *SPMP Review Report*: The subcontractors will review SPMP until April 3rd, 2002. Then SPMP Review Report will be prepared by the subcontractors after the SPMP Review and will be submitted to http://infoant.ii.metu.edu.tr address until 24:00 in the same day.
- *Updated SPMP*: DeepBlue will update SPMP until April 5th, 2002 and will be submitted to http://infoant.ii.metu.edu.tr address.
- *SDD*: The document will be prepared and submitted to http://infoant.ii.metu.edu.tr e-mail address until April 29th, 2002.
- *SDD Review Report*: The subcontractors will review SDD until May 1st, 2002. Then SDD Review Report will be prepared by the subcontractors after the SDD Review and will be submitted to http://infoant.ii.metu.edu.tr address until 24:00 in the same day.
- *Updated SDD*: DeepBlue will update SPMP until May 3rd, 2002 and will be submitted to http://infoant.ii.metu.edu.tr address.
- *Delivery of Product*: The product will be delivered on May 20th, 2002.
- *User Manual*: The document will be prepared on June 9th, 2002.
- *Demonstration of Product*: The demonstration of the product will be done on June 9th, 2002.
- *Delivery of Final Product*: The final product will include the software, the software source codes and the user manuals. The delivery will be on June 9th, 2002.

1.1.5 Schedule and Budget Summary (Subclause 1.1.4 of the SPMP)

Due Date	Document / Activity Name
26 February 2002	Initial Plan
27 February 2002	Initial Plan Review

27 February 2002	Initial Plan Review Report
01 March 2002	Updated Initial Plan
17 March 2002	SRS
20 March 2002	SRS Review
20 March 2002	SRS Review Report
22 March 2002	Updated SRS
1 April 2002	SPMP
03 April 2002	SPMP Review
03 April 2002	SPMP Review Report
05 April 2002	Updated SPMP
29 April 2002	SDD
01 May 2002	SDD Review
01 May 2002	SDD Review Report
03 May 2002	Updated SDD
20 May 2002	Delivery of Product
09 June 2002	User Manual
09 June 2002	Demonstration of Product
09 June 2002	Delivery of Final Product

Table 1: Schedule of the Project

As explained in subclause 1.1.2, no real budget is associated with ION-CHAT SYSTEM. For hardware and software needs existing resources of DeepBlue will be used.

1.2 Evolution of Plan (Subclause 1.2 of the SPMP)

This is the version 1.1 of the Software Project Management Plan, where subsequenced changes will be mentioned in this part of the Updated Software Project Management Plan. The table below shows the update which is planned to be done to the Software Project Management Plan.

Due Date	Document	Status
26 February 2002	Initial Plan	Created
01 March 2002	Updated Initial Plan	Revised
17 March 2002	SRS	Created
22 March 2002	Updated SRS	Revised
1 April 2002	SPMP	Created
05 April 2002	Updated SPMP	Revised

Table 2: Update Plan of the SPMP

2 REFERENCES (Clause 2 of the SPMP)

[1] IEEE Std 1058-1998, IEEE Standard for Software Management Plans

[2] IEEE Std 830-1998. IEEE Recommended Practice for Software Requirements Specifications

[3] IEEE Std 1016-1998, IEEE Recommended Practice for Software design Descriptions

[4] IEEE Std 1063-1987, IEEE Standard for Software User Documentation

[5] Sommerville, Ian, Software Engineering, Sixth Edition, Pearson Education, 2001.

[6] Pressman, Roger S., *Software Engineering "A practitioner's Approach"*, Fifth Edition, McGraw-Hill, 2000.

[7] Laudon Kenneth C. and Laudon Jane P., *Management Information Systems "New Approaches to Organization & Technology"*, Fifth Edition, Prentice Hall, 1998.

[8] Demirörs Onur, *Lecture Notes* of *IS 507 Introduction to Software Engineering*, Fall 2001.

[9] ION-CHAT SYSTEM Initial Plan, version 1.1, 29 February 2002.

[10] ION-CHAT SYSTEM Software Requirements Specification, version 1.1, 22 March 2002

3 DEFINITIONS & ABBREVIATIONS (Clause 3 of SPMP)

Acquirer: The customer, who specifies the requirements for the product and gets the final product and its documents.

Acquiring organization: It is the company, which will define the requirements for the project and will approve and accept both the product deliverables and the final product, namely METU-II.

Chat group: A group of users working on the same project either as a project developing team or as a reviewer team.

COCOMO: Constructive Cost Model.

DeepBlue: Software development team of ION-CHAT SYSTEM.

DeepBlue's e-mail address: This corresponds to the e-mail addresses of the DeepBlue members stated in Table 3.

FP: Function Point.

IEEE: Institute of Electrics & Electronics Engineering.

ION SYSTEM: Existing informatics online system.

ION: Informatics Online.

ION-CHAT SYSTEM: Informatics online chat system.

IS 502: Information Systems Project course.

METU-II: Middle East Technical University Informatics Institute.

MobileSoft: Subcontractor of DeepBlue.

Reviewer Team: Subcontractor of Reviewie Team.

Reviewie Team: The company that presents the project.

Room: The place where users will chat with each other.

Root: Administrator account of ION-CHAT SYSTEM.

SDD: Software design document. The representation of software system for communicating the software design information.

SPMP: Software project management plan. The controlling document for managing the software project.

SRS: Software requirements specification.

Subcontractor: The company, which carry out the quality assurance of the project.

System group: A group of users, which have a common set of access restrictions to ION-CHAT SYSTEM.

User id: A set of characters that identifies the user.

User: The students, instructors, acquirers and the root.

WBS #: Work Break Down Structure number.

4 PROJECT ORGANIZATION (Clause 4 of SPMP)

4.1 External Interfaces (Subclause 4.1 of SPMP)

Figure 1 indicates the external interfaces of the ION-CHAT SYSTEM.

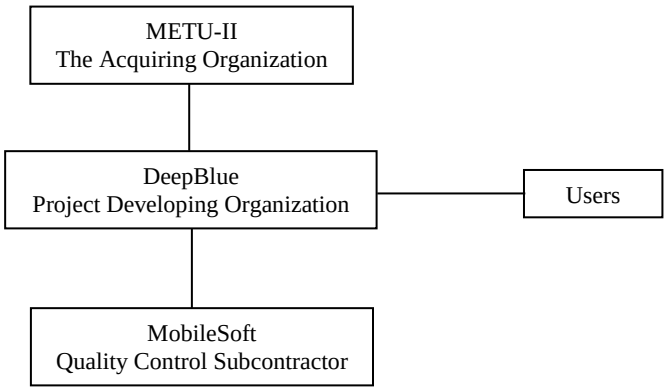

Figure 1: External Interfaces of the ION-CHAT SYSTEM

List of Responsible People to Contact:

METU-II (The Acquiring Organization): METU-II research assistants (Çiğdem Gencel, Murat Yakıcı)

MobileSoft (The Quality Control Subcontractor): Dr. Koray Atalağ, Filiz Doğan, Emre Kösen and Dr. Murat Sincan.

Users: METU-II instructors, ION students, the root and METU-II research assistants.

4.2 Internal Structure (Subclause 4.2 of SPMP)

Since responsibility of the project is shared among the members of DeepBlue, it is a matrix organization **[7]**. The internal structure of the project organization is given in Figure 2.

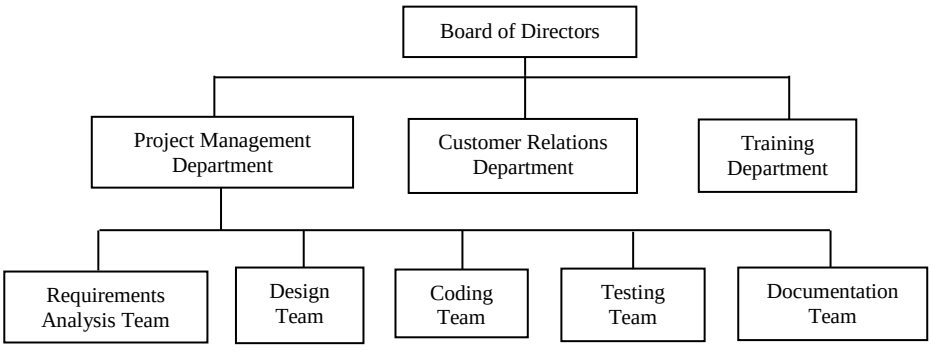

Figure 2: The Internal Structure of the Project Developing Organization

4.3 Roles and Responsibilities (Subclause 4.3 of SPMP)

External Entities:

Acquiring Organization: It is the company, which will define the requirements for the project and will approve and accept both the product deliverables and the final product.
Subcontractor: It is the company, which carries out the quality assurance of the project. In this regard, it is responsible for the preparation of review reports for the project documentation.
Users: They are the people, who will use the system, namely, students, acquirers, instructors and the root. Their opinions will be gathered in an informal manner.

Internal Entities:

Name	E-mail address	Roles & Responsibilities
Ahmet Kara	ahmetkara@gmail.com	Member of board Project manager Customer relations representative Requirements engineer Programmer Head of testing team Instructor for training
Seda Barış	sedabaris@gmail.com	Chairperson of board Project vice-manager Head of training department Requirements engineer Programmer Test Engineer Head of documentation team
Erkin Baykal	erkinbaykal@gmail.com	Member of board Project vice-manager Customer relations representative Head of design team Programmer Test Engineer Instructor for training

Table 3: Roles and Responsibilities of DeepBlue Members

Board of Directors: is responsible from setting corporate strategy, overall direction, mission and vision.

Training Department: is responsible from planning and giving / outsourcing the necessary training for the company personnel at all levels.

Customer Relations Department: is responsible from managing the high-end relations with the customers.

Project Management Department:

Requirements Analysis Team: is responsible for collecting and documenting the system requirements as a whole.

Design Team: is responsible from planning how the required system functionality is to be provided.

Coding Team: is responsible from realizing the products designed.

Testing Team: is responsible from verifying that the developed system represents the requirements in a complete and correct manner.

Documentation Team: is responsible from preparing the system documentations intended for different audiences.

5 MANAGERIAL PROCESS PLANS (Clause 5 of the SPMP)

5.1 Project Start-up Plan (Subclause 5.1 of the SPMP)

5.1.1 Estimation Plan (Subclause 5.1.1 of the SPMP)

In this part of the SPMP, the cost and schedule for conducting the project as well as methods, tools and techniques used to estimate project cost, schedule and resource requirements are specified.

Since it is a convenient method to use in the early phases of project development, the size of the ION-CHAT SYSTEM is estimated according to the function-point (FP) method **[5]**. In counting function points, external inputs, external outputs, external enquiries, internal files and external interfaces of the software are identified. Each instance for each separate class is multiplied with the associated weight factor. The overall sum is calculated to find the function points. Weights for simple, average and complex inputs, outputs, enquires, files and external interfaces, which are used in calculations, are depicted below:

	Simple	**Average**	**Complex**
External input	3	4	6
External output	4	5	7
External enquiry	3	4	6
Internal file	7	10	15
External interface	5	7	10

Table 4: Complexity Factors Used in Function Point Calculation

In order to systematically find complexity levels, references to file accesses, record type accesses and data elements are counted and complexity scores are determined accordingly. The table below depicts the factors used for complexity calculation. For example, an external input that reference four files and nine data types (3 + 2) is considered ‘complex’. (2 - 3 simple -denoted by the letter ‘S’, 4 average -denoted by the letter ‘A’, 5- 6 complex -denoted by the letter ‘C’)

Function	Determinants								
	files			# record types			# data elements		
	1	2	3	1	2	3	1	2	3
Input	0-1	2	3+				1-4	5-15	16+
Output	0-1	2-3	4+				1-5	6-19	20+
Int. File				1	2-5	6+	1-19	20-50	51+
Interface				1	2-5	6+	1-19	20-50	51+
Enquiry	Use the greater of the input and output components								

Table 5: Factors Used in Complexity Calculation

	Files	Rec. Types	Data Elements	Comp.	Score
EXTERNAL INPUTS					
Define new user	User information file	-	Userid Password The system group that the user belongs	S	3
Delete an existing user	User information file	-	Userid	S	3
Define new chat group	User information file	-	Name of the chat group Names of users belonging to the chat group	S	3
Delete an existing chat group	User information file	-	Name of the chat group	S	3
Define new room	Room information file User information file	-	Name of the room Name of the reviewing chat group Name of the chat group being reviewed Name of the instructor Name of the customer	A	4
Delete an existing room	Room information file	-	Name of the room	S	3
Update room information	Room information file User information file	-	Name of the room Name of the reviewing chat group Name of the chat group being reviewed Name of the instructor Name of the customer	A	4
Update chat group information	User information file	-	Name of the chat group Names of users that belongs to the chat group	S	3
Update user information	User information file	-	Userid Password The system group that the user belongs	S	3
Authenticate user during login	User information file	-	Userid Password	S	3
Send chat message	None	-	Message text	S	3
EXTERNAL OUTPUTS					
Login successful message	None	-	Message text	S	4
Login failed message	None	-	Message text	S	4
Successful user addition message	None	-	Message text	S	4
Failed user addition message	None	-	Message text	S	4
Successful chat group addition	None	-	Message text	S	4

message					
Failed chat group addition message	None	-	Message text	S	4
Successful room addition message	None	-	Message text	S	4
Failed room addition message	None	-	Message text	S	4
Successful user info. update message	None	-	Message text	S	4
Failed user info. update message	None	-	Message text	S	4
Successful chat group info. update message	None	-	Message text	S	4
Failed chat group info. update message	None	-	Message text	S	4
Successful room info. update message	None	-	Message text	S	4
Failed room info. update message	None	-	Message text	S	4
Successful user deletion message	None	-	Message text	S	4
Failed user deletion message	None	-	Message text	S	4
Successful chat group deletion message	None	-	Message text	S	4
Failed chat group deletion message	None	-	Message text	S	4
Successful room deletion message	None	-	Message text	S	4
Failed room deletion message	None	-	Message text	S	4
Logout successful message	None	-	Message text	S	4
INTERNAL FILES					
User information file	-	None	Userid System group name Chat group name Real Name	S	7
Room information file	-	None	Room name Name of the reviewer team Name of the reviewie team Authenticated userid list	S	7
EXTERNAL ENQUIRIES					
None	-	-	-	-	-
EXTERNAL INTERFACES					
None	-	-	-	-	-
TOTAL UNADJUSTED FUNCTION POINTS					**133**

Table 6: Details of the Function Point Calculation

Influence Factors	Degree of Influence-DI	Comment
Data Communication	4	Distributed environment
Distributed Functions	4	Client-server architecture
Performance Objective	3	The importance of the online response time is above average.
Heavily Used Configuration	3	Maximum system load is average
Transaction Rate	3	Transaction rate is average
On-line Data Entry	5	All of the transactions are online
End-User efficiency	5	Ease of use is critical
On-line Update	5	Frequently updated user list
Complex Processing	1	Only security issues
Reusability	0	No special requirements
Installation Ease	0	No special requirements
Operational Ease	3	Short start-up time for client
Multiple Site	5	Must operate platform independently
Facilitate Change	0	No special requirements
Sum of Degree of Influence =	**41**	

Table 7: Influence Factors of ION-CHAT SYSTEM

Size Estimation:

Total Degree of Influence (TDI) = Sum of Degree of Influence (DI) = 41
Value Adjustment Factor (VAF) = 0.65 + (0.01 * TDI) = 0.65 + (0.01 * 41) = 1.06
Function Point (FP) = VAF * Unadjusted Function Point (UFP) = 1.06 * 133 =140.89
FP Conversion Factors (Conversion Factor for Line of Code) = 30 (The approximate value for the object-oriented languages) **[8].**
LOC = Function Point * FP Conversion Factors = 140.89 * 30 = 4229

Size = **4,229** KLOC

Effort Estimation:

Since the COCOMO model is a widely used technique, which can be used for small, medium and large-scale projects and since it can be incorporated into different application domains, the COCOMO model is used **[5, 8]**. The ION-CHAT SYSTEM is fairly small project. The selected mode of difficulty for COCOMO is organic. Therefore, the appropriate constraints for COCOMO model are a = 2.4 and b = 1.05.

$$\text{Effort} = a * \text{Size}^{b} \Rightarrow 2.4 * 4{,}229^{1.05} = 10.908 \cong \mathbf{10.9} \text{ person months.}$$

Schedule Estimation:

The total time for the ION-CHAT SYSTEM needed is

$$\text{Total Time} = a * \text{Effort}^{b} \Rightarrow 2.5 * 10.9^{0.38} = \mathbf{6.2} \text{ months.}$$

The COCOMO model assumes 19 working days/month and 8 working hours/day. That is **152** working hours/month. On the other hand, for DeepBlue there are 30 working days/month and an average of 3 working hours/day. That is **90** working hours/month.

According to the COCOMO model the required effort for the project is **10.9** person months. However for DeepBlue, this represents 10.9 * (152/90) = **18.4** person months. (This conversion is done intentionally and without taking into account any imperfections that might be associated).

Since, there are 3 months available to complete the project, an average of 18.4/3 = 6.13 ≅ **6** people is needed.

COCOMO divides effort and time as follows **[8]**;

17% Requirements Analysis
25% Design
25% Coding and Unit Testing
33% Integration and Testing

If it is adapted to ION-CHAT SYSTEM the following table occurs;

Phase	Month-1	Month-2	Month-3	TOTAL
Requirements Analysis	75%	25%	0%	100%
Design	0%	75%	25%	100%
Coding & Unit Testing	0%	0%	100%	100%
Integration & Testing	0%	0%	100%	100%

Table 8: Effort and Time Division

According to this the effort schedule can be shown as following;

Phase	Effort (staff * months)	Month-1 (staff * months)	Month-2 (staff * months)	Month-3 (staff * months)
Requirements Analysis (17%)	0.17 * 18.4 = 3.13	3.13 * 0.75 = 2.35	3.13 * 0.25 = 0.78	3.13 * 0 = 0
Design (25%)	0.25 * 18.4 = 4.6	4.6 * 0 = 0	4.6 * 0.75 = 3.45	4.6 * 0 25 = 1.15
Coding & Unit Testing (25%)	0.25 * 18.4 = 4.6	4.6 * 0 = 0	4.6 * 0 = 0	4.6 * 1 = 4.6
Integration & Testing (33%)	0.33 * 18.4 = 6.07	6.07 * 0 = 0	6.07 * 0 = 0	6.07 * 1 = 6.07
TOTAL EFFORT (staff * months)	18.4	2.35	4.23	11.82

Table 9: Effort Schedule

Assumption: The labor category for all employees of the DeepBlue is the same.

According to the effort schedule the labor schedule can be shown as following;

Labor Category	% Effort	Month-1	Month-2	Month-3
Normal	100%	2.35	4.23	11.82

Table 10: Labor Schedule

Assumptions:

- Since the labor category for all the members of DeepBlue is the same, their payment rates are the same and $1500/month.
- The payment rate for each member of MobileSoft is $10/day.
- Each member of MobileSoft works 1 day/week (1 day/week * 4 weeks/month * 4 people = 16 staff*day/month)
- As details are given in subclause 5.1.3, no cost will be paid for transportation, training, and hardware and software requirements.

- The cost of the electricity consumed by DeepBlue is assumed to be $30/month according to the historical data.
- The assumptions above are done if we assume that we have real budget.

According to the labor schedule and the assumptions above the cost schedule can be shown as following;

	Month-1	Month-2	Month-3	TOTAL
Cost of the staff ($)	2.35 * 1500 = 3525	4.23 * 1500 = 6345	11.82 * 1500 = 17730	27600
Cost of the subcontracted processes ($)	16 * 10 = 160	16 * 10 = 160	16 * 10 = 160	480
Cost of the electricity consumed ($)	30	30	30	90
TOTAL COST ($)	3715	6535	17920	28170

Table 11: Cost Schedule

5.1.2 Staffing Plan (Subclause 5.1.2 of the SPMP)

Since DeepBlue has only three members, all the members will work in every phase of the project. No additional personnel shall be hired for the project. The ION-CHAT SYSTEM phases is shown in Table 1.

The estimated monthly staff requirement is shown in Figure 3.

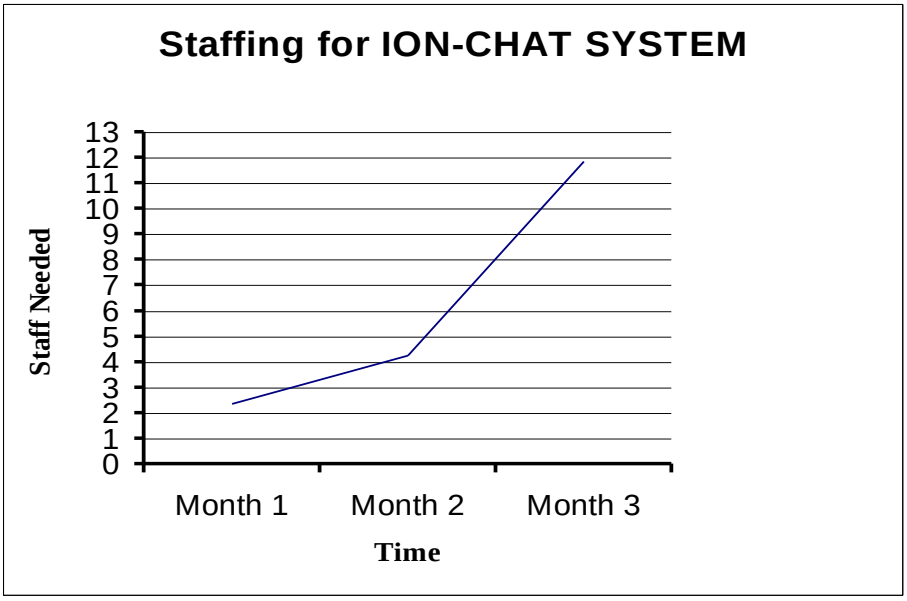

Figure 3: Staffing for ION-CHAT SYSTEM

5.1.3 Resource Acquisition Plan (Subclause 5.1.3 of the SPMP)

- Since both DeepBlue members (as student) and acquirers are located in METU Campus, there will be no transportation cost for meetings.
- Training part of the ION-CHAT SYSTEM does not need any payment. Since, DeepBlue members will do training internally.
- For any kind of hardware and software needs the existing resources of DeepBlue will be used.

5.1.4 Project Staff Training Plan (Subclause 5.1.4 of the SPMP)

Subject	Start	End	Trainer	Method
Standards	19. 02. 02	21. 05. 02	Seda Barış	Lecture and discussion
Java and Networking	01. 04. 02	01. 05. 02	Erkin Baykal	Lectures
Testing	02. 05. 02	05. 05. 02	Ahmet Kara	Lecture and discussion

Table 12: Staff Training Plan

5.2 Work Plan (Subclause 5.2 of the SPMP)

5.2.1 Work activities (Subclause 5.2.1 of the SPMP)

The ION-CHAT SYSTEM work breakdown structures according to the GANTT Chart in Appendix A are as follows (The successor and predecessor activity numbers are taken from Table 13 first column):

Name	Stating the problem statement
WBS #	1
Estimated duration	6 days
Predecessor activity	-
Successor activity	3
Description	Clarifing the problem statement of the ION-CHAT SYSTEM and at the end to bring out a report about it

Name	Training for IEEE Std. 1058-1998
WBS #	2
Estimated duration	1 day
Predecessor activity	-

Successor activity	3
Description	Giving training to Ahmet Kara & Erkin Baykal by lectures and discussions to make a background about IEEE Std. 1058-1998 **[1]**.

Name	Preparation of the Initial Plan
WBS #	3
Estimated duration	10 days
Predecessor activity	1, 2
Successor activity	5
Description	Describing the overall picture of the ION-CHAT SYSTEM and at the end to bring out a report about it.

Name	Training for IEEE Std. 830-1998
WBS #	4
Estimated duration	4 days
Predecessor activity	-
Successor activity	5
Description	Giving training to Ahmet Kara & Erkin Baykal by lectures and discussions to make a background about IEEE Std. 830-1998 **[2]**.

Name	Preparation of the SRS
WBS #	5
Estimated duration	17 days
Predecessor activity	3, 4
Successor activity	6
Description	Presenting the detailed software requirements analysis for the ION-CHAT SYSTEM and at the end to bring out a report about it.

Name	Review meeting for the changes of software requirements with the customer
WBS #	6
Estimated duration	1 day
Predecessor activity	5
Successor activity	9
Description	Reviewing the software requirements of the ION-CHAT SYSTEM to determine that if there is anything that the customer wants to add.

Name	Training for IEEE Std. 1058-1998
WBS #	7
Estimated duration	3 days
Predecessor activity	-
Successor activity	10
Description	Giving training to Ahmet Kara & Erkin Baykal by lectures and discussions to make a background about IEEE Std. 1058-

	1998 **[1]**.

Name	Preparation of the SPMP
WBS #	8
Estimated duration	11 days
Predecessor activity	-
Successor activity	-
Description	Symbolizing all of the SPMP processes that lies below this work activity.

Name	Update of the Initial Plan
WBS #	8.1
Estimated duration	1 day
Predecessor activity	6
Successor activity	10
Description	Revising the changes made to the Initial Plan of the ION-CHAT SYSTEM.

Name	Preparation of managerial process plans
WBS #	8.2
Estimated duration	1 day
Predecessor activity	7, 9
Successor activity	15, 18
Description	Symbolizing all of the managerial process plans that lies below this work activity.

Name	Work plan
WBS #	8.2.1
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Specifing the work activities, schedule, resources and budget details for the ION-CHAT SYSTEM.

Name	Control plan
WBS #	8.2.2
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Specifing the reporting mechanisms and control procedures necessary to measure report and control the ION-CHAT SYSTEM requirements, schedule, budget and recourses, the quality of work processes and work products.

Name	Risk management plan
WBS #	8.2.3
Estimated duration	1 day
Predecessor activity	-
Successor activity	-

Description	Specifing the risk management plan of ION-CHAT SYSTEM for identifying and analyzing ION-CHAT SYSTEM risk factors.

Name	Project closeout plan
WBS #	8.2.4
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Containing the plans necessary to ensure orderly closeout of the ION-CHAT SYSTEM.

Name	Control of the project schedule
WBS #	8.3
Estimated duration	0.5 day
Predecessor activity	10
Successor activity	16
Description	Comparing actual progress to planned progress and to implement corrective action when actual progress does not conform to planned progress.

Name	Control of the budget requirements
WBS #	8.4
Estimated duration	0.5 day
Predecessor activity	15
Successor activity	17, 19
Description	Comparing the planned cost to budgeted cost and implement corrective action when actual cost does not conform to budgeted cost.

Name	Review of the project risk factors
WBS #	8.5
Estimated duration	0.5 day
Predecessor activity	16
Successor activity	-
Description	Specifying ,analyzing and identifying the ION-CHAT SYSTEM risk factors

Name	Review meeting for the content of the SPMP with the customer
WBS #	8.6
Estimated duration	1 day
Predecessor activity	10
Successor activity	-
Description	Reviewing the SPMP’s content to determine that if there is anything that the customer wants to add.

Name	Preparation of technical process plans

WBS #	8.7
Estimated duration	1 day
Predecessor activity	16
Successor activity	20
Description	Specifing the development process model, technical methods, tools and techniques.

Name	Preparation of supporting process plans
WBS #	8.8
Estimated duration	1 day
Predecessor activity	19
Successor activity	21
Description	Containing plans for supporting processes that span the duration of ION-CHAT SYSTEM.

Name	Control of the quality of the SPMP
WBS #	8.9
Estimated duration	1 day
Predecessor activity	20
Successor activity	22
Description	Comparing the actual quality level to the planned quality level and implement corrective action when actual quality level does not conform to planned quality level.

Name	Writing of the SPMP documentation
WBS #	8.10
Estimated duration	1 day
Predecessor activity	21
Successor activity	23
Description	Documenting the activities that have been done for SPMP of the ION-CHAT SYSTEM.

Name	Review meeting for SPMP documentation
WBS #	8.11
Estimated duration	0.25 day
Predecessor activity	22
Successor activity	24
Description	Reviewing the SPMP documentation of the ION-CHAT SYSTEM by MobileSoft to determine quality of the SPMP documentation using IEEE std. 1058-1998 **[1]**.

Name	Update of the SPMP documantation
WBS #	8.12
Estimated duration	2 days
Predecessor activity	23
Successor activity	-
Description	Updating the SPMP documentation to do the necessary changes about the SPMP that is determined either at the Review meeting for the content of the SPMP with the

	customer or Review meeting for SPMP documentation with MobileSoft.

Name	Training for IEEE Std. 1016-1998
WBS #	9
Estimated duration	2 days
Predecessor activity	-
Successor activity	66
Description	Giving training to Ahmet Kara & Erkin Baykal by lectures and discussions to make a background about IEEE Std. 1016-1998 **[3]**.

Name	Review meeting for the changes of software requirements with the customer
WBS #	10
Estimated duration	1 day
Predecessor activity	8
Successor activity	27
Description	Reviewing the software requirements of the ION-CHAT SYSTEM to determine that if there is anything that the customer wants to add.

Name	Preparation of the SDD
WBS #	11
Estimated duration	25 days
Predecessor activity	26
Successor activity	70
Description	Symbolizing all of the SDD processes that lies below this work activity.

Name	Design of the ION-CHAT SYSTEM
WBS #	11.1
Estimated duration	13 days
Predecessor activity	-
Successor activity	65
Description	Symbolizing all of the design processes that lies below this work activity.

Name	Design of the communication protocol between client & server software
WBS #	11.1.1
Estimated duration	2 days
Predecessor activity	-
Successor activity	31, 46
Description	Establishing a design for the communication protocol between the client software and server software to construct the communication protocol.

Name	Design of the user and room information files

WBS #	11.1.2
Estimated duration	1 day
Predecessor activity	-
Successor activity	31
Description	Establishing a design for the user and room information files to state how many fields they have, how these fields are used and when these fields are needed.

Name	Design of the server software
WBS #	11.1.3
Estimated duration	11 days
Predecessor activity	29, 30
Successor activity	-
Description	Symbolizing all of the design processes for server software that lies below this work activity.

Name	Design of the common functions of all users
WBS #	11.1.3.1
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Symbolizing the design process for all users that lies below this work activity.

Name	Design of the user authentication function for server software
WBS #	11.1.3.1.1
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Establishing a design for the user authentication function of server software. All users should use this function to enter the ION-CHAT SYSTEM. Therefore, security issue is a part of the user authentication function. This function is also used to define the user information to the system. The user information file is used.

Name	Design of the functions for root
WBS #	11.1.3.2
Estimated duration	9 days
Predecessor activity	-
Successor activity	-
Description	Symbolizing all of the design processes for root that lies below this work activity.

Name	Design of the user addition function for server software
WBS #	11.1.3.2.1
Estimated duration	1 day
Predecessor activity	-
Successor activity	-

Description	Establishing a design for the user addition function of server software. Only the root can use this function if she/he chooses the user addition function, after the user authentication, to add a user to the ION-CHAT SYSTEM. The user information file is used.

Name	Design of the user deletion function for server software
WBS #	11.1.3.2.2
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Establishing a design for the user deletion function of server software. Only the root can use this function if she/he chooses the user deletion function after the user authentication to delete an existing user from the ION-CHAT SYSTEM. The user information file is used.

Name	Design of the user update function for server software
WBS #	11.1.3.2.3
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Establishing a design for the user update function of server software. Only the root can use this function if she/he chooses the user update function after the user authentication to change information (except the User_id) of an existing user of the ION-CHAT SYSTEM.

Name	Design of the chat group addition function for server software
WBS #	11.1.3.2.4
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Establishing a design for the chat group addition function of server software. Only the root can use this function if she/he chooses the chat group addition function after the user authentication to add a chat group to the ION-CHAT SYSTEM.

Name	Design of the chat group deletion function for server software
WBS #	11.1.3.2.5
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Establishing a design for the chat group deletion function of server software. Only the root can use this function if she/he chooses the chat group deletion function after the user authentication to delete an existing chat group from the ION-CHAT SYSTEM.

Name	Design of the chat group update function for server software
WBS #	11.1.3.2.6
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Establishing a design for the chat group update function of server software. Only the root can use this function if she/he chooses the chat group function after the user authentication to change information (except the chat group name) of an existing chat group of the ION-CHAT SYSTEM.

Name	Design of the room addition function for server software
WBS #	11.1.3.2.7
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Establishing a design for the room addition function of server software. Only the root can use this function if she/he chooses the room addition function after the user authentication to add a room to the ION-CHAT SYSTEM. Reviewie group and reviewer group members' information should be taken from the room information file. Both the user and room information files are used.

Name	Design of the room deletion function for server software
WBS #	11.1.3.2.8
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Establishing a design for the room deletion function of server software. Only the root can use this function if she/he chooses the room deletion function after the user authentication to delete an existing room from the ION-CHAT SYSTEM. The room information file is used.

Name	Design of the room update function for server software
WBS #	11.1.3.2.9
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Establishing a design for the room update function of server software. Only the root can use this function if she/he chooses the chat group function after the user authentication to change information (except the room name) of an existing room of the ION-CHAT SYSTEM. The room information file is used.

Name	Design of the functions for instructor, students & customers
WBS #	11.1.3.3
Estimated duration	1 day

Predecessor activity	-
Successor activity	-
Description	Symbolizing the design process for instructor, students & customers that lies below this work activity.

Name	Design of the chat function for server software
WBS #	11.1.3.3.1
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Establishing a design for the chat function for instructor, students and customers of server software. Instructor, students and customers can use this function after if after the user authentication to chat. Both the user and room information files are used.

Name	Design of the client software
WBS #	11.1.4
Estimated duration	11 days
Predecessor activity	29
Successor activity	-
Description	Symbolizing all of the design processes for client software that lies below this work activity.

Name	Design of the common functions of all users
WBS #	11.1.4.1
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Symbolizing the design process for all users that lies below this work activity.

Name	Design of the user authentication function for client software
WBS #	11.1.4.1.1
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Establishing a design for the user authentication function of client software. All users should use this function to enter the ION-CHAT SYSTEM. Therefore, security issue is a part of the user authentication function.

Name	Design of the functions for root
WBS #	11.1.4.2
Estimated duration	9 days
Predecessor activity	-
Successor activity	-
Description	Symbolizing all of the design processes for root that lies below this work activity.

Name	Design of the user addition function for client software
WBS #	11.1.4.2.1
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Establishing a design for the user addition function of client software. Only the root can use this function if she/he chooses the user addition function after the user authentication to add a user to the ION-CHAT SYSTEM.

Name	Design of the user deletion function for client software
WBS #	11.1.4.2.2
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Establishing a design for the user deletion function of client software. Only the root can use this function if she/he chooses the user deletion function after the user authentication to delete an existing user from the ION-CHAT SYSTEM.

Name	Design of the user update function for client software
WBS #	11.1.4.2.3
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Establishing a design for the user update function of client software. Only the root can use this function if she/he chooses the user update function after the user authentication to change information (except the User_id) of an existing user of the ION-CHAT SYSTEM.

Name	Design of the chat group addition function for client software
WBS #	11.1.4.2.4
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Establishing a design for the chat group addition function of client software. Only the root can use this function if she/he chooses the chat group addition function after the user authentication to add a chat group to the ION-CHAT SYSTEM.

Name	Design of the chat group deletion function for client software
WBS #	11.1.4.2.5
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Establishing a design for the chat group deletion function of client software. Only the root can use this function if she/he

	chooses the chat group deletion function after the user authentication to delete an existing chat group from the ION-CHAT SYSTEM.

Name	Design of the chat group update function for client software
WBS #	11.1.4.2.6
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Establishing a design for the chat group update function of client software. Only the root can use this function if she/he chooses the chat group function after the user authentication to change information (except the chat group name) of an existing chat group of the ION-CHAT SYSTEM.

Name	Design of the room addition function for client software
WBS #	11.1.4.2.7
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Establishing a design for the room addition function of client software. Only the root can use this function if she/he chooses the room addition function after the user authentication to add a room to the ION-CHAT SYSTEM.

Name	Design of the room deletion function for client software
WBS #	11.1.4.2.8
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Establishing a design for the room deletion function of client software. Only the root can use this function if she/he chooses the room deletion function after the user authentication to delete an existing room from the ION-CHAT SYSTEM.

Name	Design of the room update function for client software
WBS #	11.1.4.2.9
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Establishing a design for the room update function of client software. Only the root can use this function if she/he chooses the chat group function after the user authentication to change information (except the room name) of an existing room of the ION-CHAT SYSTEM.

Name	Design of the functions for instructor, students & customers
WBS #	11.1.4.3
Estimated duration	1 day

Predecessor activity	-
Successor activity	-
Description	Symbolizing the design process for instructor, students & customers that lies below this work activity.

Name	Design of the chat function for client software
WBS #	11.1.4.3.1
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Establishing a design for the chat function for instructor, students and customers of client software. Instructor, students and customers can use this function after if after the user authentication to chat.

Name	Control of the project schedule
WBS #	11.1.5
Estimated duration	2 days
Predecessor activity	-
Successor activity	62
Description	Comparing actual progress to planned progress and to implement corrective action when actual progress does not conform to planned progress.

Name	Control of the budget requirements
WBS #	11.1.6
Estimated duration	2 days
Predecessor activity	61
Successor activity	63
Description	Comparing the planned cost to budgeted cost and implement corrective action when actual cost does not conform to budgeted cost.

Name	Review of the project risk factors
WBS #	11.1.7
Estimated duration	1 day
Predecessor activity	62
Successor activity	-
Description	Specifying ,analyzing and identifying the ION-CHAT SYSTEM risk factors

Name	Review meeting for the content of the SDD with the customer
WBS #	11.2
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Reviewing the SDD's content to determine that if there is anything that the customer wants to add.

Name	Control of the quality of the SDD
WBS #	11.3
Estimated duration	2 days
Predecessor activity	28
Successor activity	66
Description	Comparing the actual quality level to the planned quality level and implement corrective action when actual quality level does not conform to planned quality level.

Name	Writing of the SDD documentation
WBS #	11.4
Estimated duration	5 days
Predecessor activity	25, 65
Successor activity	67
Description	Documenting the activities that have been done for SDD of the ION-CHAT SYSTEM.

Name	Review meeting for SDD documentation
WBS #	11.5
Estimated duration	0.25 days
Predecessor activity	66
Successor activity	68
Description	Reviewing the SDD documentation of the ION-CHAT SYSTEM by MobileSoft to determine quality of the SDD documentation using IEEE std. 1016-1998 **[3]**.

Name	Update of the SDD documentation
WBS #	11.6
Estimated duration	2 days
Predecessor activity	67
Successor activity	-
Description	Updating the SDD documentation to do the necessary changes about the SDD that is determined either at the Review meeting for the content of the SDD with the customer or Review meeting for SDD documentation with MobileSoft.

Name	Training for Java programming language and networking
WBS #	12
Estimated duration	31 days
Predecessor activity	-
Successor activity	-
Description	Giving training to Ahmet Kara & Seda Barış about the Java programming language with the special emphasis on the applets and console applications by lectures.

Name	Coding of the ION-CHAT SYSTEM
WBS #	13
Estimated duration	16 days
Predecessor activity	27

Successor activity	-
Description	Symbolizing all of the coding process that lies below this work activity.

Name	Coding of the server software
WBS #	13.1
Estimated duration	15 days
Predecessor activity	-
Successor activity	104
Description	Symbolizing all of the coding process for server software that lies below this work activity.

Name	Coding of the common functions of all users
WBS #	13.1.1
Estimated duration	1 day
Predecessor activity	-
Successor activity	107
Description	Symbolizing the coding process for all users that lies below this work activity.

Name	Coding of the user authentication function for server software
WBS #	13.1.1.1
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Writing a software module using the Java programming language, according to the design specifications described as the work product of the activity number 11.1.3.1.1. The module shall evaluate the authentication information sent by the client software and shall produce a reply to the client software accordingly.

Name	Coding of the functions for root
WBS #	13.1.2
Estimated duration	12 days
Predecessor activity	-
Successor activity	109
Description	Symbolizing the coding process for root that lies below this work activity.

Name	Coding of the user addition function for server software
WBS #	13.1.2.1
Estimated duration	2 days
Predecessor activity	-
Successor activity	-
Description	Writing a software module using the Java programming language, according to the design specifications described as the work product of the activity number 11.1.3.2.1. The

	module shall evaluate the authentication information sent by the client software and shall produce a reply to the client software accordingly.

Name	Coding of the user deletion function for server software
WBS #	13.1.2.2
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Writing a software module using the Java programming language, according to the design specifications described as the work product of the activity number 11.1.3.2.2. The module shall evaluate the authentication information sent by the client software and shall produce a reply to the client software accordingly.

Name	Coding of the user update function for server software
WBS #	13.1.2.3
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Writing a software module using the Java programming language, according to the design specifications described as the work product of the activity number 11.1.3.2.3. The module shall evaluate the authentication information sent by the client software and shall produce a reply to the client software accordingly.

Name	Coding of the chat group addition function for server software
WBS #	13.1.2.4
Estimated duration	2 days
Predecessor activity	-
Successor activity	-
Description	Writing a software module using the Java programming language, according to the design specifications described as the work product of the activity number 11.1.3.2.4. The module shall evaluate the authentication information sent by the client software and shall produce a reply to the client software accordingly.

Name	Coding of the chat group deletion function for server software
WBS #	13.1.2.5
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Writing a software module using the Java programming language, according to the design specifications described as the work product of the activity number 11.1.3.2.5. The module shall evaluate the authentication information sent by

	the client software and shall produce a reply to the client software accordingly.

Name	Coding of the chat group update function for server software
WBS #	13.1.2.6
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Writing a software module using the Java programming language, according to the design specifications described as the work product of the activity number 11.1.3.2.6. The module shall evaluate the authentication information sent by the client software and shall produce a reply to the client software accordingly.

Name	Design of the room addition function for server software
WBS #	13.1.2.7
Estimated duration	2 days
Predecessor activity	-
Successor activity	-
Description	Writing a software module using the Java programming language, according to the design specifications described as the work product of the activity number 11.1.3.2.7. The module shall evaluate the authentication information sent by the client software and shall produce a reply to the client software accordingly.

Name	Coding of the room deletion function for server software
WBS #	13.1.2.8
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Writing a software module using the Java programming language, according to the design specifications described as the work product of the activity number 11.1.3.2.8. The module shall evaluate the authentication information sent by the client software and shall produce a reply to the client software accordingly.

Name	Coding of the room update function for server software
WBS #	13.1.2.9
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Writing a software module using the Java programming language, according to the design specifications described as the work product of the activity number 11.1.3.2.9. The module shall evaluate the authentication information sent by the client software and shall produce a reply to the client

	software accordingly.

Name	Coding of the functions for instructor, students & customers
WBS #	13.1.3
Estimated duration	2 days
Predecessor activity	-
Successor activity	119
Description	Symbolizing the coding process for instructor, students & customers that lies below this work activity.

Name	Coding of the chat function for server software
WBS #	13.1.3.1
Estimated duration	2 days
Predecessor activity	-
Successor activity	-
Description	Writing a software module using the Java programming language, according to the design specifications described as the work product of the activity number 11.1.3.3.1. The module shall evaluate the authentication information sent by the client software and shall produce a reply to the client software accordingly.

Name	Coding of the client software
WBS #	13.2
Estimated duration	15 days
Predecessor activity	-
Successor activity	104
Description	Symbolizing all of the coding processes for client software that lies below this work activity.

Name	Coding of the common functions of all users
WBS #	13.2.1
Estimated duration	1 day
Predecessor activity	-
Successor activity	107
Description	Symbolizing the coding process for all users that lies below this work activity.

Name	Coding of the user authentication function for client software
WBS #	13.2.1.1
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Writing a software module using the Java programming language, according to the design specifications described as the work product of the activity number 11.1.4.1.1. The module shall send the authentication information entered by the user to the server software and shall produce a reply to the user according to the reply from the server software.

Name	Coding of the functions for root
WBS #	13.2.2
Estimated duration	12 days
Predecessor activity	-
Successor activity	109
Description	Symbolizing all of the coding processes for root that lies below this work activity.

Name	Coding of the user addition function for client software
WBS #	13.2.2.1
Estimated duration	2 days
Predecessor activity	-
Successor activity	-
Description	Writing a software module using the Java programming language, according to the design specifications described as the work product of the activity number 11.1.4.2.1. The module shall send the authentication information entered by the user to the server software and shall produce a reply to the user according to the reply from the server software.

Name	Coding of the user deletion function for client software
WBS #	13.2.2.2
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Writing a software module using the Java programming language, according to the design specifications described as the work product of the activity number 11.1.4.2.2. The module shall send the authentication information entered by the user to the server software and shall produce a reply to the user according to the reply from the server software.

Name	Coding of the user update function for client software
WBS #	13.2.2.3
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Writing a software module using the Java programming language, according to the design specifications described as the work product of the activity number 11.1.4.2.3. The module shall send the authentication information entered by the user to the server software and shall produce a reply to the user according to the reply from the server software.

Name	Coding of the chat group addition function for client software
WBS #	13.2.2.4
Estimated duration	2 days
Predecessor activity	-
Successor activity	-

Description	Writing a software module using the Java programming language, according to the design specifications described as the work product of the activity number 11.1.4.2.4. The module shall send the authentication information entered by the user to the server software and shall produce a reply to the user according to the reply from the server software.

Name	Coding of the chat group deletion function for client software
WBS #	13.2.2.5
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Writing software module using the Java programming language, according to the design specifications described as the work product of the activity number 11.1.4.2.5. The module shall send the authentication information entered by the user to the server software and shall produce a reply to the user according to the reply from the server software.

Name	Coding of the chat group update function for client software
WBS #	13.2.2.6
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Writing a software module using the Java programming language, according to the design specifications described as the work product of the activity number 11.1.4.2.6. The module shall send the authentication information entered by the user to the server software and shall produce a reply to the user according to the reply from the server software.

Name	Coding of the room addition function for client software
WBS #	13.2.2.7
Estimated duration	2 days
Predecessor activity	-
Successor activity	-
Description	Writing a software module using the Java programming language, according to the design specifications described as the work product of the activity number 11.1.4.2.7. The module shall send the authentication information entered by the user to the server software and shall produce a reply to the user according to the reply from the server software.

Name	Coding of the room deletion function for client software
WBS #	13.2.2.8
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Writing a software module using the Java programming

	language, according to the design specifications described as the work product of the activity number 11.1.4.2.8. The module shall send the authentication information entered by the user to the server software and shall produce a reply to the user according to the reply from the server software.

Name	Coding of the room update function for client software
WBS #	13.2.2.9
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Writing a software module using the Java programming language, according to the design specifications described as the work product of the activity number 11.1.4.2.9. The module shall send the authentication information entered by the user to the server software and shall produce a reply to the user according to the reply from the server software.

Name	Coding of the functions for instructor, students & customers
WBS #	13.2.3
Estimated duration	2 days
Predecessor activity	-
Successor activity	119
Description	Symbolizing the coding process for instructor, students & customers that lies below this work activity.

Name	Coding of the chat function for client software
WBS #	13.2.3.1
Estimated duration	2 days
Predecessor activity	-
Successor activity	-
Description	Writing a software module using the Java programming language, according to the design specifications described as the work product of the activity number 11.1.4.3.1. The module shall send the authentication information entered by the user to the server software and shall produce a reply to the user according to the reply from the server software.

Name	Control of the project schedule
WBS #	13.3
Estimated duration	2 days
Predecessor activity	-
Successor activity	102
Description	Comparing actual progress to planned progress and to implement corrective action when actual progress does not conform to planned progress.

Name	Control of the budget requirement
WBS #	13.4
Estimated duration	2 days
Predecessor activity	101
Successor activity	103
Description	Comparing the planned cost to budgeted cost and implement corrective action when actual cost does not conform to budgeted cost.

Name	Review of the project risk factors
WBS #	13.5
Estimated duration	1 day
Predecessor activity	102
Successor activity	-
Description	Specifying ,analyzing and identifying the ION-CHAT SYSTEM risk factors

Name	Control of the quality of the code generated
WBS #	13.6
Estimated duration	1 day
Predecessor activity	86, 71
Successor activity	-
Description	Comparing the actual quality level to the planned quality level and implement corrective action when actual quality level does not conform to planned quality level.

Name	Training for testing processes
WBS #	14
Estimated duration	4 days
Predecessor activity	-
Successor activity	-
Description	Giving training Seda Barış & Erkin Baykal by lectures and discussions to make a background about testing techniques.

Name	Testing of the ION-CHAT SYSTEM
WBS #	15
Estimated duration	15 days
Predecessor activity	-
Successor activity	-
Description	Symbolizing all of the testing processes that lies below this work activity.

Name	Testing of the common functions of all users
WBS #	15.1
Estimated duration	1 day
Predecessor activity	72, 87
Successor activity	109, 119
Description	Symbolizing the testing process for all users that lies below this work activity.

Name	Testing of the user authentication function
WBS #	15.1.1
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Finding out the bugs in this function and to test whether the links of this function are working correctly with other functions.

Name	Testing of the functions for root
WBS #	15.2
Estimated duration	2 days
Predecessor activity	74,89,107
Successor activity	-
Description	Symbolizing all of the testing processes for root that lies below this work activity.

Name	Testing of the user addition function
WBS #	15.2.1
Estimated duration	2 days
Predecessor activity	-
Successor activity	-
Description	Finding out the bugs in this function and to test whether the links of this function are working correctly with other functions.

Name	Testing of the user deletion function
WBS #	15.2.2
Estimated duration	2 days
Predecessor activity	-
Successor activity	-
Description	Finding out the bugs in this function and to test whether the links of this function are working correctly with other functions.

Name	Testing of the user update function
WBS #	15.2.3
Estimated duration	2 days
Predecessor activity	-
Successor activity	-
Description	Finding out the bugs in this function and to test whether the links of this function are working correctly with other functions.

Name	Testing of the chat group addition function
WBS #	15.2.4
Estimated duration	2 days
Predecessor activity	-
Successor activity	-

Description	Finding out the bugs in this function and to test whether the links of this function are working correctly with other functions.

Name	Testing of the chat group deletion function
WBS #	15.2.5
Estimated duration	2 days
Predecessor activity	-
Successor activity	-
Description	Finding out the bugs in this function and to test whether the links of this function are working correctly with other functions.

Name	Testing of the chat group update function
WBS #	15.2.6
Estimated duration	2 days
Predecessor activity	-
Successor activity	-
Description	Finding out the bugs in this function and to test whether the links of this function are working correctly with other functions.

Name	Testing of the room addition function
WBS #	15.2.7
Estimated duration	2 days
Predecessor activity	-
Successor activity	-
Description	Finding out the bugs in this function and to test whether the links of this function are working correctly with other functions.

Name	Testing of the room deletion function
WBS #	15.2.8
Estimated duration	2 days
Predecessor activity	-
Successor activity	-
Description	Finding out the bugs in this function and to test whether the links of this function are working correctly with other functions.

Name	Testing of the room update function
WBS #	15.2.9
Estimated duration	2 days
Predecessor activity	-
Successor activity	-
Description	Finding out the bugs in this function and to test whether the links of this function are working correctly with other functions.

Name	Testing of the functions for instructor, students & customers
WBS #	15.3
Estimated duration	1 day
Predecessor activity	84, 99, 107
Successor activity	-
Description	Symbolizing the testing process for instructor, students & customers that lies below this work activity.

Name	Testing of the chat function
WBS #	15.3.1
Estimated duration	1 day
Predecessor activity	-
Successor activity	-
Description	Finding out the bugs in this function and to test whether the links of this function are working correctly with other functions.

Name	Control of the project schedule
WBS #	15.4
Estimated duration	1 day
Predecessor activity	-
Successor activity	122
Description	Comparing actual progress to planned progress and to implement corrective action when actual progress does not conform to planned progress.

Name	Control of the budget requirements
WBS #	15.5
Estimated duration	1 day
Predecessor activity	121
Successor activity	123
Description	Comparing the planned cost to budgeted cost and implement corrective action when actual cost does not conform to budgeted cost.

Name	Review of the project risk factors
WBS #	15.6
Estimated duration	1 day
Predecessor activity	122
Successor activity	-
Description	Specifying ,analyzing and identifying the ION-CHAT SYSTEM risk factors

Name	Delivery of initial product
WBS #	16
Estimated duration	1 day
Predecessor activity	-
Successor activity	125, 126, 129, 131
Description	Submitting the initial product to the customer.

Name	Review meeting for the initial product with the customer
WBS #	17
Estimated duration	1 day
Predecessor activity	124
Successor activity	-
Description	Reviewing the initial product of the ION-CHAT SYSTEM to determine that if there is anything that the customer wants to add.

Name	Control of the project schedule
WBS #	18
Estimated duration	1 day
Predecessor activity	124
Successor activity	127
Description	Comparing actual progress to planned progress and to implement corrective action when actual progress does not conform to planned progress.

Name	Control of the budget requirements
WBS #	19
Estimated duration	1 day
Predecessor activity	126
Successor activity	128
Description	Comparing the planned cost to budgeted cost and implement corrective action when actual cost does not conform to budgeted cost.

Name	Review of the project risk factors
WBS #	20
Estimated duration	1 day
Predecessor activity	127
Successor activity	-
Description	Specifying ,analyzing and identifying the ION-CHAT SYSTEM risk factors

Name	Control of the quality of the initial product
WBS #	21
Estimated duration	1 day
Predecessor activity	124
Successor activity	132, 133
Description	Comparing the actual quality level to the planned quality level and implement corrective action when actual quality level does not conform to planned quality level.

Name	Training for IEEE Std. 1063-1987
WBS #	22
Estimated duration	2 days
Predecessor activity	-
Successor activity	131

Description	Giving training to Ahmet Kara & Erkin Baykal by lectures and discussions to make a background about IEEE Std. 1063-1987 **[4]**.

Name	Preparation of the User Manual
WBS #	23
Estimated duration	19 days
Predecessor activity	124, 130
Successor activity	-
Description	Describing how the ION-CHAT SYSTEM is working and at the end to bring out a report about it.

Name	Product Demonstration
WBS #	24
Estimated duration	1 day
Predecessor activity	129
Successor activity	-
Description	Showing the final product to the customer.

Name	Delivery of the final product
WBS #	25
Estimated duration	1 day
Predecessor activity	129
Successor activity	-
Description	Submitting the final product to the customer.

5.2.2 Schedule Allocation (Subclause 5.2.2 of the SPMP)

The ION-CHAT SYSTEM schedule allocation is given in Table 13. The gray backgrounded work activities (WBS #: 22, 23, 24 and 25) are the critical path activities of the ION-CHAT SYSTEM schedule. The GANTT chart for the schedule can be viewed in Appendix A.

The milestones of the ION-CHAT SYSTEM are the activites with WBS #: 1, 3, 5, 8.10, 8.12, 11.4, 11.6, 16, 23, 24, 25 in Table 13.

The time–sequencing of the ION-CHAT SYSTEM is given in Table 13 with the concurrent work activities given in the predecessor colounm of Table 13.

No	WBS #	Work Activity	Duration (d=day)	Start Date	End Date	Predecessor
1	1	Stating the problem statement	6d	Wed 2/13/02	Mon 2/18/02	
2	2	Training for IEEE Std.	1d	Tue 2/19/02	Tue 2/19/02	

		1058-1998				
3	3	Preparation of the Initial Plan	10d	Wed 2/20/02	Fri 3/1/02	"2,1"
4	4	Training for IEEE Std. 830-1998	4d	Sat 3/2/02	Tue 3/5/02	
5	5	Preparation of the SRS	17d	Wed 3/6/02	Fri 3/22/02	"4,3"
6	6	Review meeting for the changes of software requirements with the customer	1d	Mon 3/25/02	Mon 3/25/02	5
7	7	Training for IEEE Std. 1058-1998	3d	Sun 3/24/02	Tue 3/26/02	
8	8	Preparation of the SPMP	11d	Tue 3/26/02	Fri 4/5/02	
9	8.1	Update of the Initial Plan	1d	Tue 3/26/02	Tue 3/26/02	6
10	8.2	Preparation of managerial process plans	1d	Wed 3/27/02	Wed 3/27/02	"9,7"
11	8.2.1	Work plan	1d	Wed 3/27/02	Wed 3/27/02	
12	8.2.2	Control Plan	1d	Wed 3/27/02	Wed 3/27/02	
13	8.2.3	Risk management plan	1d	Wed 3/27/02	Wed 3/27/02	
14	8.2.4	Project closeout plan	1d	Wed 3/27/02	Wed 3/27/02	
15	8.3	Control of the project schedule	0.5d	Thu 3/28/02	Thu 3/28/02	10
16	8.4	Control of the budget requirements	0.5d	Thu 3/28/02	Thu 3/28/02	15
17	8.5	Review of the project risk factors	0.5d	Fri 3/29/02	Fri 3/29/02	16
18	8.6	Review meeting for the content of the SPMP with the customer	1d	Fri 3/29/02	Fri 3/29/02	10
19	8.7	Preparation of technical process plans	1d	Fri 3/29/02	Fri 3/29/02	16
20	8.8	Preparation of supporting process plans	1d	Sat 3/30/02	Sat 3/30/02	19
21	8.9	Control of the quality of the SPMP	1d	Sun 3/31/02	Sun 3/31/02	20
22	8.10	Writing of the SPMP documentation	1d	Mon 4/1/02	Mon 4/1/02	21
23	8.11	Review meeting for SPMP documentation	0.25d	Wed 4/3/02	Wed 4/3/02	22
24	8.12	Update of the SPMP documentation	2d	Thu 4/4/02	Fri 4/5/02	23
25	9	Training for IEEE Std. 1016-1998	2d	Sat 4/6/02	Sun 4/7/02	
26	10	Review meeting for the changes of software requirements with the customer	1d	Mon 4/8/02	Mon 4/8/02	8
27	11	Preparation of the SDD	25d	Tue 4/9/02	Fri 5/3/02	26
28	11.1	Design of the ION-	13d	Tue 4/9/02	Sun 4/21/02	

		CHAT SYSTEM				
29	11.1.1	Design of the communication protocol between client & server softwares	2d	Tue 4/9/02	Wed 4/10/02	
30	11.1.2	Design of the user and room information files	1d	Wed 4/10/02	Wed 4/10/02	
31	11.1.3	Design of the server software	11d	Thu 4/11/02	Sun 4/21/02	"29,30"
32	11.1.3.1	Design of the common functions of all users	1d	Thu 4/11/02	Thu 4/11/02	
33	11.1.3.1.1	Design of the user authentication function for server software	1d	Thu 4/11/02	Thu 4/11/02	
34	11.1.3.2	Design of the functions for root	9d	Fri 4/12/02	Sat 4/20/02	
35	11.1.3.2.1	Design of the user addition function for server software	1d	Fri 4/12/02	Fri 4/12/02	
36	11.1.3.2.2	Design of the user deletion function for server software	1d	Sat 4/13/02	Sat 4/13/02	
37	11.1.3.2.3	Design of the user update function for server software	1d	Sun 4/14/02	Sun 4/14/02	
38	11.1.3.2.4	Design of the chat group addition function for server software	1d	Mon 4/15/02	Mon 4/15/02	
39	11.1.3.2.5	Design of the chat group deletion function for server software	1d	Tue 4/16/02	Tue 4/16/02	
40	11.1.3.2.6	Design of the chat group update function for server software	1d	Wed 4/17/02	Wed 4/17/02	
41	11.1.3.2.7	Design of the room addition function for server software	1d	Thu 4/18/02	Thu 4/18/02	
42	11.1.3.2.8	Design of the room deletion function for server software	1d	Fri 4/19/02	Fri 4/19/02	
43	11.1.3.2.9	Design of the room update function for server software	1d	Sat 4/20/02	Sat 4/20/02	
44	11.1.3.3	"Design of the functions for instructor, students & customers"	1d	Sun 4/21/02	Sun 4/21/02	
45	11.1.3.3.1	Design of the chat function for server software	1d	Sun 4/21/02	Sun 4/21/02	

46	11.1.4	Design of the client software	11d	Thu 4/11/02	Sun 4/21/02	29
47	11.1.4.1	Design of the common functions of all users	1d	Thu 4/11/02	Thu 4/11/02	
48	11.1.4.1.1	Design of the user authentication function for client software	1d	Thu 4/11/02	Thu 4/11/02	
49	11.1.4.2	Design of the functions for root	9d	Fri 4/12/02	Sat 4/20/02	
50	11.1.4.2.1	Design of the user addition function for client software	1d	Fri 4/12/02	Fri 4/12/02	
51	11.1.4.2.2	Design of the user deletion function for client software	1d	Sat 4/13/02	Sat 4/13/02	
52	11.1.4.2.3	Design of the user update function for client software	1d	Sun 4/14/02	Sun 4/14/02	
53	11.1.4.2.4	Design of the chat group addition function for client software	1d	Mon 4/15/02	Mon 4/15/02	
54	11.1.4.2.5	Design of the chat group deletion function for client software	1d	Tue 4/16/02	Tue 4/16/02	
55	11.1.4.2.6	Design of the chat group update function for client software	1d	Wed 4/17/02	Wed 4/17/02	
56	11.1.4.2.7	Design of the room addition function for client software	1d	Thu 4/18/02	Thu 4/18/02	
57	11.1.4.2.8	Design of the room deletion function for client software	1d	Fri 4/19/02	Fri 4/19/02	
58	11.1.4.2.9	Design of the room update function for client software	1d	Sat 4/20/02	Sat 4/20/02	
59	11.1.4.3	"Design of the functions for instructor, students & customers"	1d	Sun 4/21/02	Sun 4/21/02	
60	11.1.4.3.1	Design of the chat function for client software	1d	Sun 4/21/02	Sun 4/21/02	
61	11.1.5	Control of the project schedule	2d	Sun 4/14/02	Mon 4/15/02	
62	11.1.6	Control of the budget requirements	2d	Tue 4/16/02	Wed 4/17/02	61
63	11.1.7	Review of the project risk factors	1d	Thu 4/18/02	Thu 4/18/02	62
64	11.2	Review meeting for the	1d	Mon 4/22/02	Mon 4/22/02	

		content of the SDD with the customer				
65	11.3	Control of the quality of the SDD	2d	Tue 4/23/02	Wed 4/24/02	28
66	11.4	Writing of the SDD documentation	5d	Thu 4/25/02	Mon 4/29/02	"25,65"
67	11.5	Review meeting for SDD documentation	0.25d	Wed 5/1/02	Wed 5/1/02	66
68	11.6	Update of the SDD documentation	2d	Thu 5/2/02	Fri 5/3/02	67
69	12	Training for Java programming language	31d	Mon 4/1/02	Wed 5/1/02	
70	13	Coding of the ION-CHAT SYSTEM	16d	Sat 5/4/02	Sun 5/19/02	27
71	13.1	Coding of the server software	15d	Sat 5/4/02	Sat 5/18/02	
72	13.1.1	Coding of the common functions of all users	1d	Sat 5/4/02	Sat 5/4/02	
73	13.1.1.1	Coding of the user authentication function for server software	1d	Sat 5/4/02	Sat 5/4/02	
74	13.1.2	Coding of the functions for root	12d	Sun 5/5/02	Thu 5/16/02	
75	13.1.2.1	Coding of the user addition function for server software	2d	Sun 5/5/02	Mon 5/6/02	
76	13.1.2.2	Coding of the user deletion function for server software	1d	Tue 5/7/02	Tue 5/7/02	
77	13.1.2.3	Coding of the user update function for server software	1d	Wed 5/8/02	Wed 5/8/02	
78	13.1.2.4	Coding of the chat group addition function for server software	2d	Thu 5/9/02	Fri 5/10/02	
79	13.1.2.5	Coding of the chat group deletion function for server software	1d	Sat 5/11/02	Sat 5/11/02	
80	13.1.2.6	Coding of the chat group update function for server software	1d	Sun 5/12/02	Sun 5/12/02	
81	13.1.2.7	Coding of the room addition function for server software	2d	Mon 5/13/02	Tue 5/14/02	
82	13.1.2.8	Coding of the room deletion function for server software	1d	Wed 5/15/02	Wed 5/15/02	
83	13.1.2.9	Coding of the room update function for	1d	Thu 5/16/02	Thu 5/16/02	

		server software				
84	13.1.3	"Coding of the functions for instructor, students & customers"	2d	Fri 5/17/02	Sat 5/18/02	
85	13.1.3.1	Coding of the chat function for server software	2d	Fri 5/17/02	Sat 5/18/02	
86	13.2	Coding of the client software	15d	Sat 5/4/02	Sat 5/18/02	
87	13.2.1	Coding of the common functions of all users	1d	Sat 5/4/02	Sat 5/4/02	
88	13.2.1.1	Coding of the user authentication function for client software	1d	Sat 5/4/02	Sat 5/4/02	
89	13.2.2	Coding of the functions for root	12d	Sun 5/5/02	Thu 5/16/02	
90	13.2.2.1	Coding of the user addition function for client software	2d	Sun 5/5/02	Mon 5/6/02	
91	13.2.2.2	Coding of the user deletion function for client software	1d	Tue 5/7/02	Tue 5/7/02	
92	13.2.2.3	Coding of the user update function for client software	1d	Wed 5/8/02	Wed 5/8/02	
93	13.2.2.4	Coding of the chat group addition function for client software	2d	Thu 5/9/02	Fri 5/10/02	
94	13.2.2.5	Coding of the chat group deletion function for client software	1d	Sat 5/11/02	Sat 5/11/02	
95	13.2.2.6	Coding of the chat group update function for client software	1d	Sun 5/12/02	Sun 5/12/02	
96	13.2.2.7	Coding of the room addition function for client software	2d	Mon 5/13/02	Tue 5/14/02	
97	13.2.2.8	Coding of the room deletion function for client software	1d	Wed 5/15/02	Wed 5/15/02	
98	13.2.2.9	Coding of the room update function for client software	1d	Thu 5/16/02	Thu 5/16/02	
99	13.2.3	"Coding of the functions for instructor, students & customers"	2d	Fri 5/17/02	Sat 5/18/02	
100	13.2.3.1	Coding of the chat function for client software	2d	Fri 5/17/02	Sat 5/18/02	

101	13.3	Control of the project schedule	2d	Sat 5/11/02	Sun 5/12/02	
102	13.4	Control of the budget requirements	2d	Mon 5/13/02	Tue 5/14/02	101
103	13.5	Review of the project risk factors	1d	Wed 5/15/02	Wed 5/15/02	102
104	13.6	Control of the quality of the code generated	1d	Sun 5/19/02	Sun 5/19/02	"86,71"
105	14	Training for testing processes	4d	Thu 5/2/02	Sun 5/5/02	
106	15	Testing of the ION-CHAT SYSTEM	15d	Sun 5/5/02	Sun 5/19/02	
107	15.1	Testing of the common functions of all users	1d	Sun 5/5/02	Sun 5/5/02	"72,87"
108	15.1.1	Testing of the user authentication function	1d	Sun 5/5/02	Sun 5/5/02	
109	15.2	Testing of the functions for root	2d	Fri 5/17/02	Sat 5/18/02	"107,74,89"
110	15.2.1	Testing of the user addition function	2d	Fri 5/17/02	Sat 5/18/02	
111	15.2.2	Testing of the user deletion function	2d	Fri 5/17/02	Sat 5/18/02	
112	15.2.3	Testing of the user update function	2d	Fri 5/17/02	Sat 5/18/02	
113	15.2.4	Testing of the chat group addition function	2d	Fri 5/17/02	Sat 5/18/02	
114	15.2.5	Testing of the chat group deletion function	2d	Fri 5/17/02	Sat 5/18/02	
115	15.2.6	Testing of the chat group update function	2d	Fri 5/17/02	Sat 5/18/02	
116	15.2.7	Testing of the room addition function	2d	Fri 5/17/02	Sat 5/18/02	
117	15.2.8	Testing of the room deletion function	2d	Fri 5/17/02	Sat 5/18/02	
118	15.2.9	Testing of the room update function	2d	Fri 5/17/02	Sat 5/18/02	
119	15.3	"Testing of the functions for instructor, students & customers"	1d	Sun 5/19/02	Sun 5/19/02	"107,84,99"
120	15.3.1	Testing of the chat function	1d	Sun 5/19/02	Sun 5/19/02	
121	15.4	Control of the project schedule	1d	Fri 5/17/02	Fri 5/17/02	
122	15.5	Control of the budget requirements	1d	Sat 5/18/02	Sat 5/18/02	121
123	15.6	Review of the project risk factors	1d	Sun 5/19/02	Sun 5/19/02	122
124	16	Delivery of initial product	1d	Mon 5/20/02	Mon 5/20/02	

125	17	Review meeting for the initial product with the customer	1d	Tue 5/21/02	Tue 5/21/02	124
126	18	Control of the project schedule	1d	Tue 5/21/02	Tue 5/21/02	124
127	19	Control of the budget requirements	1d	Wed 5/22/02	Wed 5/22/02	126
128	20	Review of the project risk factors	1d	Thu 5/23/02	Thu 5/23/02	127
129	21	Control of the quality of the initial product	1d	Thu 5/23/02	Thu 5/23/02	124
130	22	Training for IEEE Std. 1063-1987	2d	Mon 5/20/02	Tue 5/21/02	
131	23	Preparation of the User Manual	19d	Wed 5/22/02	Sun 6/9/02	"130,124"
132	24	Product Demonstration	1d	Sun 6/9/02	Sun 6/9/02	129
133	25	Delivery of the final product	1d	Sun 6/9/02	Sun 6/9/02	129

Table 13: Schedule of the ION-CHAT SYSTEM

5.2.3 Resource Allocation (Subclause 5.2.3 of the SPMP)

The detailed itemization of the resources allocated to each individual work activity in the work breakdown structure is given below.

The only resource that wroth planning, allocating and tracking for every work activity in the work breakdown structure is the personnel. Since planning, allocating and tracking other resources to the work activities shall result in high overhead for the project when compared with the benefits of providing such an allocation, they shall simply be neglected.

Name	Stating the problem statement
WBS #	1
Personnel responsible	All of the DeepBlue members

Name	Training for IEEE Std. 1058-1998
WBS #	2
Personnel responsible	Seda Barış

Name	Preparation of the Initial Plan
WBS #	3
Personnel responsible	All of the DeepBlue members

Name	Training for IEEE Std. 830-1998

WBS #	4
Personnel responsible	Seda Barış
Name	Preparation of the SRS
WBS #	5
Personnel responsible	All of the DeepBlue members

Name	Review meeting for the changes of software requirements with the customer
WBS #	6
Personnel responsible	Ahmet Kara, Erkin Baykal

Name	Training for IEEE Std. 1058-1998
WBS #	7
Personnel responsible	Seda Barış

Name	Preparation of the SPMP
WBS #	8
Personnel responsible	All of the DeepBlue members

Name	Update of the Initial Plan
WBS #	8.1
Personnel responsible	Seda Barış

Name	Preparation of managerial process plans
WBS #	8.2
Personnel responsible	All of the DeepBlue members

Name	Work plan
WBS #	8.2.1
Personnel responsible	Erkin Baykal

Name	Control plan
WBS #	8.2.2
Personnel responsible	Ahmet Kara

Name	Risk management plan
WBS #	8.2.3
Personnel responsible	Seda Barış

Name	Project closeout plan
WBS #	8.2.4
Personnel responsible	Erkin Baykal

Name	Control of the project schedule
WBS #	8.3
Personnel responsible	Ahmet Kara

Name	Control of the budget requirements

WBS #	8.4
Personnel responsible	Seda Barış
Name	Review of the project risk factors
WBS #	8.5
Personnel responsible	Erkin Baykal

Name	Review meeting for the content of the SPMP with the customer
WBS #	8.6
Personnel responsible	Ahmet Kara, Erkin Baykal

Name	Preparation of technical process plans
WBS #	8.7
Personnel responsible	Erkin Baykal

Name	Preparation of supporting process plans
WBS #	8.8
Personnel responsible	Ahmet Kara

Name	Control of the quality of the SPMP
WBS #	8.9
Personnel responsible	All of the DeepBlue members & Assoc. Prof. Onur Demirörs

Name	Writing of the SPMP documentation
WBS #	8.10
Personnel responsible	All of the DeepBlue members

Name	Review meeting for SPMP documentation
WBS #	8.11
Personnel responsible	MobileSoft members

Name	Update of the SPMP documantation
WBS #	8.12
Personnel responsible	All of the DeepBlue members

Name	Training for IEEE Std. 1016-1998
WBS #	9
Personnel responsible	Seda Barış

Name	Review meeting for the changes of software requirements with the customer
WBS #	10
Personnel responsible	Ahmet Kara, Erkin Baykal

Name	Preparation of the SDD
WBS #	11
Personnel responsible	All of the DeepBlue members

Name	Design of the ION-CHAT SYSTEM

WBS #	11.1
Personnel responsible	All of the DeepBlue members

Name	Design of the communication protocol between client & server software
WBS #	11.1.1
Personnel responsible	All of the DeepBlue members

Name	Design of the user and room information files
WBS #	11.1.2
Personnel responsible	Erkin Baykal

Name	Design of the server software
WBS #	11.1.3
Personnel responsible	Erkin Baykal

Name	Design of the common functions of all users
WBS #	11.1.3.1
Personnel responsible	Erkin Baykal

Name	Design of the user authentication function for server software
WBS #	11.1.3.1.1
Personnel responsible	Erkin Baykal

Name	Design of the functions for root
WBS #	11.1.3.2
Personnel responsible	Erkin Baykal

Name	Design of the user addition function for server software
WBS #	11.1.3.2.1
Personnel responsible	Erkin Baykal

Name	Design of the user deletion function for server software
WBS #	11.1.3.2.2
Personnel responsible	Erkin Baykal

Name	Design of the user update function for server software
WBS #	11.1.3.2.3
Personnel responsible	Erkin Baykal

Name	Design of the chat group addition function for server software
WBS #	11.1.3.2.4
Personnel responsible	Erkin Baykal

Name	Design of the chat group deletion function for server software
WBS #	11.1.3.2.5
Personnel responsible	Erkin Baykal

Name	Design of the chat group update function for server software
WBS #	11.1.3.2.6
Personnel responsible	Erkin Baykal

Name	Design of the room addition function for server software
WBS #	11.1.3.2.7
Personnel responsible	Erkin Baykal

Name	Design of the room deletion function for server software
WBS #	11.1.3.2.8
Personnel responsible	Erkin Baykal

Name	Design of the room update function for server software
WBS #	11.1.3.2.9
Personnel responsible	Erkin Baykal

Name	Design of the functions for instructor, students & customers
WBS #	11.1.3.3
Personnel responsible	Erkin Baykal

Name	Design of the chat function for server software
WBS #	11.1.3.3.1
Personnel responsible	Erkin Baykal

Name	Design of the client software
WBS #	11.1.4
Personnel responsible	Seda Barış, Ahmet Kara

Name	Design of the common functions of all users
WBS #	11.1.4.1
Personnel responsible	Seda Barış, Ahmet Kara

Name	Design of the user authentication function for client software
WBS #	11.1.4.1.1
Personnel responsible	Seda Barış, Ahmet Kara

Name	Design of the functions for root
WBS #	11.1.4.2
Personnel responsible	Seda Barış, Ahmet Kara

Name	Design of the user addition function for client software
WBS #	11.1.4.2.1
Personnel responsible	Seda Barış

Name	Design of the user deletion function for client software
WBS #	11.1.4.2.2
Personnel responsible	Seda Barış

Name	Design of the user update function for client software
WBS #	11.1.4.2.3
Personnel responsible	Seda Barış

Name	Design of the chat group addition function for client software
WBS #	11.1.4.2.4
Personnel responsible	Ahmet Kara

Name	Design of the chat group deletion function for client software
WBS #	11.1.4.2.5
Personnel responsible	Ahmet Kara

Name	Design of the chat group update function for client software
WBS #	11.1.4.2.6
Personnel responsible	Ahmet Kara

Name	Design of the room addition function for client software
WBS #	11.1.4.2.7
Personnel responsible	Seda Barış

Name	Design of the room deletion function for client software
WBS #	11.1.4.2.8
Personnel responsible	Seda Barış

Name	Design of the room update function for client software
WBS #	11.1.4.2.9
Personnel responsible	Seda Barış

Name	Design of the functions for instructor, students & customers
WBS #	11.1.4.3
Personnel responsible	Seda Barış, Ahmet Kara

Name	Design of the chat function for client software
WBS #	11.1.4.3.1
Personnel responsible	Seda Barış, Ahmet Kara

Name	Control of the project schedule
WBS #	11.1.5
Personnel responsible	Ahmet Kara

Name	Control of the budget requirements
WBS #	11.1.6
Personnel responsible	Seda Barış

Name	Review of the project risk factors
WBS #	11.1.7
Personnel responsible	Erkin Baykal

Name	Review meeting for the content of the SDD with the customer
WBS #	11.2
Personnel responsible	Ahmet Kara, Erkin Baykal

Name	Control of the quality of the SDD
WBS #	11.3
Personnel responsible	All of the DeepBlue members & Assoc. Prof. Onur Demirörs

Name	Writing of the SDD documentation
WBS #	11.4
Personnel responsible	All of the DeepBlue members

Name	Review meeting for SDD documentation
WBS #	11.5
Personnel responsible	MobileSoft members

Name	Update of the SDD documentation
WBS #	11.6
Personnel responsible	All of the DeepBlue members

Name	Training for Java programming language and networking
WBS #	12
Personnel responsible	Erkin Baykal

Name	Coding of the ION-CHAT SYSTEM
WBS #	13
Personnel responsible	All of the DeepBlue members

Name	Coding of the server software
WBS #	13.1
Personnel responsible	All of the DeepBlue members

Name	Coding of the common functions of all users
WBS #	13.1.1
Personnel responsible	Erkin Baykal

Name	Coding of the user authentication function for server software
WBS #	13.1.1.1
Personnel responsible	Erkin Baykal

Name	Coding of the functions for root
WBS #	13.1.2
Personnel responsible	Erkin Baykal

Name	Coding of the user addition function for server software
WBS #	13.1.2.1
Personnel responsible	Erkin Baykal

Name	Coding of the user deletion function for server software
WBS #	13.1.2.2
Personnel responsible	Erkin Baykal

Name	Coding of the user update function for server software
WBS #	13.1.2.3
Personnel responsible	Erkin Baykal

Name	Coding of the chat group addition function for server software
WBS #	13.1.2.4
Personnel responsible	Erkin Baykal

Name	Coding of the chat group deletion function for server software
WBS #	13.1.2.5
Personnel responsible	Erkin Baykal

Name	Coding of the chat group update function for server software
WBS #	13.1.2.6
Personnel responsible	Erkin Baykal

Name	Design of the room addition function for server software
WBS #	13.1.2.7
Personnel responsible	Erkin Baykal

Name	Coding of the room deletion function for server software
WBS #	13.1.2.8
Personnel responsible	Erkin Baykal

Name	Coding of the room update function for server software
WBS #	13.1.2.9
Personnel responsible	Erkin Baykal

Name	Coding of the functions for instructor, students & customers
WBS #	13.1.3
Personnel responsible	Erkin Baykal

Name	Coding of the chat function for server software
WBS #	13.1.3.1
Personnel responsible	Erkin Baykal

Name	Coding of the client software
WBS #	13.2
Personnel responsible	Seda Barış, Ahmet Kara

Name	Coding of the common functions of all users
WBS #	13.2.1
Personnel responsible	Seda Barış, Ahmet Kara

Name	Coding of the user authentication function for client software
WBS #	13.2.1.1
Personnel responsible	Seda Barış, Ahmet Kara

Name	Coding of the functions for root
WBS #	13.2.2
Personnel responsible	Seda Barış, Ahmet Kara

Name	Coding of the user addition function for client software
WBS #	13.2.2.1
Personnel responsible	Seda Barış

Name	Coding of the user deletion function for client software
WBS #	13.2.2.2
Personnel responsible	Seda Barış

Name	Coding of the user update function for client software
WBS #	13.2.2.3
Personnel responsible	Seda Barış

Name	Coding of the chat group addition function for client software
WBS #	13.2.2.4
Personnel responsible	Ahmet Kara

Name	Coding of the chat group deletion function for client software
WBS #	13.2.2.5
Personnel responsible	Ahmet Kara

Name	Coding of the chat group update function for client software
WBS #	13.2.2.6
Personnel responsible	Ahmet Kara

Name	Coding of the room addition function for client software
WBS #	13.2.2.7
Personnel responsible	Seda Barış

Name	Coding of the room deletion function for client software
WBS #	13.2.2.8
Personnel responsible	Seda Barış

Name	Coding of the room update function for client software
WBS #	13.2.2.9
Personnel responsible	Seda Barış

Name	Coding of the functions for instructor, students & customers
WBS #	13.2.3
Personnel responsible	Seda Barış, Ahmet Kara

Name	Coding of the chat function for client software
WBS #	13.2.3.1
Personnel responsible	Seda Barış, Ahmet Kara

Name	Control of the project schedule
WBS #	13.3
Personnel responsible	Ahmet Kara

Name	Control of the budget requirement
WBS #	13.4
Personnel responsible	Seda Barış

Name	Review of the project risk factors
WBS #	13.5
Personnel responsible	Erkin Baykal

Name	Control of the quality of the code generated
WBS #	13.6
Personnel responsible	All of the DeepBlue members

Name	Training for testing processes
WBS #	14
Personnel responsible	Ahmet Kara

Name	Testing of the ION-CHAT SYSTEM
WBS #	15
Personnel responsible	All of the DeepBlue members

Name	Testing of the common functions of all users
WBS #	15.1
Personnel responsible	Seda Barış

Name	Testing of the user authentication function
WBS #	15.1.1
Personnel responsible	All of the DeepBlue members

Name	Testing of the functions for root
WBS #	15.2
Personnel responsible	All of the DeepBlue members

Name	Testing of the user addition function
WBS #	15.2.1
Personnel responsible	All of the DeepBlue members

Name	Testing of the user deletion function
WBS #	15.2.2
Personnel responsible	All of the DeepBlue members

Name	Testing of the user update function
WBS #	15.2.3
Personnel responsible	All of the DeepBlue members

Name	Testing of the chat group addition function
WBS #	15.2.4
Personnel responsible	All of the DeepBlue members

Name	Testing of the chat group deletion function
WBS #	15.2.5
Personnel responsible	All of the DeepBlue members

Name	Testing of the chat group update function
WBS #	15.2.6
Personnel responsible	All of the DeepBlue members

Name	Testing of the room addition function
WBS #	15.2.7
Personnel responsible	All of the DeepBlue members

Name	Testing of the room deletion function
WBS #	15.2.8
Personnel responsible	All of the DeepBlue members

Name	Testing of the room update function
WBS #	15.2.9
Personnel responsible	All of the DeepBlue members

Name	Testing of the functions for instructor, students & customers
WBS #	15.3
Personnel responsible	All of the DeepBlue members

Name	Testing of the chat function
WBS #	15.3.1
Personnel responsible	All of the DeepBlue members

Name	Control of the project schedule
WBS #	15.4
Personnel responsible	Ahmet Kara

Name	Control of the budget requirements
WBS #	15.5
Personnel responsible	Seda Barış

Name	Review of the project risk factors
WBS #	15.6
Personnel responsible	Erkin Baykal

Name	Delivery of initial product
WBS #	16
Personnel responsible	All of the DeepBlue members

Name	Review meeting for the initial product with the customer
WBS #	17
Personnel responsible	Ahmet Kara & Erkin Baykal

Name	Control of the project schedule
WBS #	18
Personnel responsible	Ahmet Kara

Name	Control of the budget requirements
WBS #	19
Personnel responsible	Seda Barış

Name	Review of the project risk factors
WBS #	20
Personnel responsible	Erkin Baykal

Name	Control of the quality of the initial product
WBS #	21
Personnel responsible	All of the DeepBlue members & Assoc. Prof. Onur Demirörs

Name	Training for IEEE Std. 1063-1987
WBS #	22
Personnel responsible	Seda Barış

Name	Preparation of the User Manual
WBS #	23
Personnel responsible	All of the DeepBlue members

Name	Product Demonstration
WBS #	24
Personnel responsible	All of the DeepBlue members

Name	Delivery of the final product
WBS #	25
Personnel responsible	All of the DeepBlue members

5.2.4 Budget Allocation (Subclause 5.2.4 of the SPMP)

The detailed breakdown of the budget allocation provided for each of the major work activity in the work breakdown structure is given below.

Since the only resource allocated to individual work activities is personnel as mentioned in section 5.2.3, the allocated budget for every individual work activity shall be increased by 5%.

Since planning, allocating and tracking an individual budget to each one of the work activities shall result in high overhead for the project when compared with the benefits of providing such an allocation, budget allocation shall be done in only the detail necessary.

As calculated in section 5.1.1 Estimation Plan in order for the project to finish at time 6 people are needed and the payment given for each person is estimated to be 1500$. Since DeepBlue can allocate 3 people for the ION-CHAT SYSTEM the monthly payment to be given for each person shall be 3000$. Which makes 100$ per day. Also payment for the MobileSoft members is 10$ as indicated in section 5.1.1 Estimation Plan.

The calculations done in Table 14 depends on the above payment criterias.

Major Work Activity Name	**Total Cost ($)**
Review meeting for the changes of software requirements with the customer	(2*100)+ (200*0.05) = 210
Training for IEEE Std. 1058-1998	(3*100)+ (300*0.05) = 315
Preparation of the SPMP	((19.5*100)+ (1*10))+(1960*0.05) = 2048
Training for IEEE Std. 1016-1998	(2*100)+ (200*0.05) = 210
Review meeting for the changes of software requirements with the customer	(2*100)+ (200*0.05) = 210
Preparation of the SDD	((62*100)+ (1*10))+(6210*0.05) = 6520.5
Training for Java programming language and networking	(15*100)+(1500*0.05)=1575
Coding of the ION-CHAT SYSTEM	(36*100)+(3600*0.05)=3780
Training for testing processes	(4*100)+(400*0.05)=420
Testing of the ION-CHAT SYSTEM	(10*100)+(1000*0.05)=1050
Review meeting for the initial product with the customer	(2*100)+ (200*0.05) = 210
Control of the project schedule & Control of	(2*100)+ (200*0.05) = 210

the budget requirements	
Review of the project risk factors	(1*100)+(100*0.05)=105
Control of the quality of the initial product	(3*100)+ (300*0.05) = 315
Training for IEEE Std. 1063-1987	(2*100)+ (200*0.05) = 210
Preparation of the User Manual	(57*100)+(5700*0.05)=5985
TOTAL COST for the major work activities	**23373.5**

Table 14: Budget allocation table

5.3 Control Plan (Subclause 5.3 of the SPMP)

In all over the document duration is 1 day means the activity will be finished in that particular day.

5.3.1 Requirements Control Plan (Subclause 5.3.1 of the SPMP)

The schedule for the activities related to the requirements change management process and the names of the personnel, responsible from the requirements change management activities specified are given below.

Name	Review meeting for the changes of software requirements with the customer
WBS #	6
Estimated duration	1 day
Personnel responsible	Ahmet Kara, Erkin Baykal
Predecessor activity	5
Successor activity	9
Description	Reviewing the software requirements of the ION-CHAT SYSTEM to determine that if there is anything that the customer wants to add.

Name	Review meeting for the changes of software requirements with the customer
WBS #	10
Estimated duration	1 day
Personnel responsible	Ahmet Kara, Erkin Baykal
Predecessor activity	8
Successor activity	27
Description	Reviewing the software requirements of the ION-CHAT SYSTEM to determine that if there is anything that the customer wants to add.

The requirements change management process shall be done in the way described below, in order to treat all the change proposals in a consistent manner:

The customer shall specify the proposed requirements changes in a written way. The change proposal supplied shall be analyzed by the DeepBlue to check the validity, consistency and accuracy of the proposal. If needed, a more specific requirements change proposal shall be requested.

The effect of every individual change on other requirements shall be assessed. The cost of making the change in terms of schedule, labor and monetary cost shall be estimated. In the estimation calculations, strictly the methods followed in the software project management plan shall be followed.

Once this analysis is completed, the customer shall be informed from the results of the analysis in a written manner by the DeepBlue Customer Relations Department.

5.3.2 Schedule Control Plan (Subclause 5.3.2 of the SPMP)

The goal of the schedule control process is to compare the actual progress to the planned progress and to implement corrective action, when actual progress does not conform to planned progress.

The schedule for the activities related to the schedule control plan and the names of the personnel, responsible from the schedule control activities specified are given below.

Name	Control of the project schedule
WBS #	8.3
Estimated duration	0.5 day
Personnel responsible	Ahmet Kara
Predecessor activity	10
Successor activity	16
Description	Comparing actual progress to planned progress and to implement corrective action when actual progress does not conform to planned progress.

Name	Control of the project schedule
WBS #	11.1.5
Estimated duration	2 days

Personnel responsible	Ahmet Kara
Predecessor activity	-
Successor activity	62
Description	Comparing actual progress to planned progress and to implement corrective action when actual progress does not conform to planned progress.

Name	Control of the project schedule
WBS #	13.3
Estimated duration	2 days
Personnel responsible	Ahmet Kara
Predecessor activity	-
Successor activity	102
Description	Comparing actual progress to planned progress and to implement corrective action when actual progress does not conform to planned progress.

Name	Control of the project schedule
WBS #	15.4
Estimated duration	1 day
Personnel responsible	Ahmet Kara
Predecessor activity	-
Successor activity	122
Description	Comparing actual progress to planned progress and to implement corrective action when actual progress does not conform to planned progress.

Name	Control of the project schedule
WBS #	18
Estimated duration	1 day
Personnel responsible	Ahmet Kara
Predecessor activity	124
Successor activity	127
Description	Comparing actual progress to planned progress and to implement corrective action when actual progress does not conform to planned progress.

By taking into consideration the individual work activities that are delayed and the dependencies between the project work activities, the project schedule shall be revised. The new estimations shall be compared with the planned values. If the total deviation from the planned project schedule is less or equal to 5%, than the personnel working hours shall be adjusted in a way to eliminate the deviation. If the total deviation from the planned project schedule is greater than 5%, than the Project Management Department of the DeepBlue shall directly inform the board of directors in a written manner.

In schedule calculations, strictly the methods followed in the software project management plan shall be followed during the schedule control process.

5.3.3 Budget Control Plan (Subclause 5.3.3 of the SPMP)

The goal of the budget control process is to compare the budgeted cost to the actual cost and to implement corrective action, when actual cost does not conform to budgeted cost.

The schedule for the activities related to the budget control plan and the names of the personnel, responsible from the budget control activities specified are given below.

Name	Control of the budget requirements
WBS #	8.4
Estimated duration	0.5 day
Personnel responsible	Seda Barış
Predecessor activity	15
Successor activity	17, 19
Description	Comparing the planned cost to budgeted cost and implement corrective action when actual cost does not conform to budgeted cost.

Name	Control of the budget requirements
WBS #	11.1.6
Estimated duration	2 days
Personnel responsible	Seda Barış
Predecessor activity	61
Successor activity	63
Description	Comparing the planned cost to budgeted cost and implement corrective action when actual cost does not conform to budgeted cost.

Name	Control of the budget requirement
WBS #	13.4
Estimated duration	2 days
Personnel responsible	Seda Barış
Predecessor activity	101
Successor activity	103
Description	Comparing the planned cost to budgeted cost and implement corrective action when actual cost does not conform to budgeted cost.

Name	Control of the budget requirements
WBS #	15.5
Estimated duration	1 day

Personnel responsible	Seda Barış
Predecessor activity	121
Successor activity	123
Description	Comparing the planned cost to budgeted cost and implement corrective action when actual cost does not conform to budgeted cost.

Name	Control of the budget requirements
WBS #	19
Estimated duration	1 day
Personnel responsible	Seda Barış
Predecessor activity	126
Successor activity	128
Description	Comparing the planned cost to budgeted cost and implement corrective action when actual cost does not conform to budgeted cost.

By taking into consideration the revised project schedule generated as a result of the schedule control plan, the budget calculations shall be revised. The new estimations shall be compared with the planned values. The budget deviation from the planned project budget up to 5% is allowed. However, if the total deviation from the planned project budget is greater than 5%, than the Project Management Department of the DeepBlue shall directly inform the board of directors in a written manner. The final decision shall be made by the board of directors. This document shall not specify neither the way the board shall follow nor the criteira that the board shall use.

In budget calculations, strictly the methods followed in the software project management plan shall be followed during the budget control process.

5.3.4 Quality Control Plan (Subclause 5.3.4 of the SPMP)

1. Both DeepBlue and customer shall do the quality control of Initial Plan of the ION-CHAT SYSTEM with respect to the content.
2. Both DeepBlue and customer shall do the quality control of the ION-CHAT SYSTEM work processes and the resulting work products.
3. Both DeepBlue and customer shall do the quality control of Software Requirements Specification of the ION-CHAT SYSTEM with respect to the content.
4. Both DeepBlue and customer shall do the quality control of Software Project Management Plan of the ION-CHAT SYSTEM with respect to the content.

5. Both DeepBlue and customer shall do the quality control of Software Design Descriptions of the ION-CHAT SYSTEM with respect to the content.
6. The quality control of the Initial Plan with respect to the IEEE std 1058-1998 **[1]** done by MobileSoft, customer and DeepBlue.
7. The quality control of the Software Requirements Specification with respect to the IEEE std 830-1998 **[2]** done by MobileSoft, customer and DeepBlue.
8. The quality control of the Software Project Management Plan with respect to the IEEE std 1058-1998 **[1]** done by MobileSoft, customer and DeepBlue.
9. The quality control of the Software Design Descriptions with respect to the IEEE std 1016-1998 **[3]** done by MobileSoft, customer and DeepBlue.
10. After the quality control of the Initial Plan done by both MobileSoft and customer, DeepBlue shall update the Initial Plan of the ION-CHAT SYSTEM.
11. After the quality control of the Software Requirements Specification done by both MobileSoft and customer, DeepBlue shall update the Software Requirements Specification of the ION-CHAT SYSTEM.
12. After the quality control of the Software Project Management Plan done by both MobileSoft and customer, DeepBlue shall update the Software Project Management Plan of the ION-CHAT SYSTEM.
13. After the quality control of the Software Design Descriptions done by both MobileSoft and customer, DeepBlue shall update Software Design Descriptions of the ION-CHAT SYSTEM.
14. Deepblue shall do the quality control of the generated code.
15. Customer and DeepBlue shall do the quality control of the Initial Product.

The quality control of documentation done by MobileSoft is only review the metarial by using IEEE standars **[1]**, **[2]** and **[3]**. it is not related with the metrics. However for the qaulity control done by customer, customer shall specify the percentage of completion for each product submitted by reviewing and comparing the desired requirements and reached one.

The schedule for the activities related to the quality control plan and the names of the personnel, responsible from the quality control activities specified are given below.

Name	Review meeting for the content of the SPMP with the customer
WBS #	8.6
Estimated duration	1 day
Personnel responsible	Ahmet Kara, Erkin Baykal
Predecessor activity	10
Successor activity	-
Description	Reviewing the SPMP's content to determine that if there is anything that the customer wants to add.
Name	Control of the quality of the SPMP
WBS #	8.9
Estimated duration	1 day
Personnel responsible	All of the DeepBlue members & Assoc. Prof. Onur Demirörs
Predecessor activity	20
Successor activity	22
Description	Comparing the actual quality level to the planned quality level and implement corrective action when actual quality level does not conform to planned quality level.

Name	Review meeting for SPMP documentation
WBS #	8.11
Estimated duration	0.25 day
Personnel responsible	MobileSoft members
Predecessor activity	22
Successor activity	24
Description	Reviewing the SPMP documentation of the ION-CHAT SYSTEM by MobileSoft to determine quality of the SPMP documentation using IEEE std. 1058-1998 **[1]**.

Name	Review meeting for the content of the SDD with the customer
WBS #	11.2
Estimated duration	1 day
Personnel responsible	Ahmet Kara, Erkin Baykal
Predecessor activity	-
Successor activity	-
Description	Reviewing the SDD's content to determine that if there is anything that the customer wants to add.

Name	Control of the quality of the SDD
WBS #	11.3
Estimated duration	2 days
Personnel responsible	All of the DeepBlue members & Assoc. Prof. Onur Demirörs
Predecessor activity	28
Successor activity	66
Description	Comparing the actual quality level to the planned quality level and implement corrective action when actual quality level

	does not conform to planned quality level.

Name	Review meeting for SDD documentation
WBS #	11.5
Estimated duration	0.25 days
Personnel responsible	MobileSoft members
Predecessor activity	66
Successor activity	68
Description	Reviewing the SDD documentation of the ION-CHAT SYSTEM by MobileSoft to determine quality of the SDD documentation using IEEE std. 1016-1998 **[3]**.

Name	Control of the quality of the code generated
WBS #	13.6
Estimated duration	1 day
Personnel responsible	All of the DeepBlue members
Predecessor activity	86, 71
Successor activity	-
Description	Comparing the actual quality level to the planned quality level and implement corrective action when actual quality level does not conform to planned quality level.

Name	Review meeting for the initial product with the customer
WBS #	17
Estimated duration	1 day
Personnel responsible	Ahmet Kara & Erkin Baykal
Predecessor activity	124
Successor activity	-
Description	Reviewing the initial product of the ION-CHAT SYSTEM to determine that if there is anything that the customer wants to add.

Name	Control of the quality of the initial product
WBS #	21
Estimated duration	1 day
Personnel responsible	All of the DeepBlue members & Assoc. Prof. Onur Demirörs
Predecessor activity	124
Successor activity	132, 133
Description	Comparing the actual quality level to the planned quality level and implement corrective action when actual quality level does not conform to planned quality level.

5.3.5 Reporting Plan (Subclause 5.3.5 of the SPMP)

The reporting mechanisms of the ION-CHAT SYSTEM shall be done as shown in the Table 15.

Reports	Submitted by	Submitted To[1]		Submission Date
Problem Statement	DeepBlue	Customer	is502@ii.metu.edu.tr	Feb 18th, 02
Initial Plan	DeepBlue	Customer	is502@ii.metu.edu.tr	Feb 26th, 02
		MobileSoft	MobileSoft e-mail account	
Review of Initial Plan	MobileSoft	Customer	is502@ii.metu.edu.tr	Feb 27th, 02
		DeepBlue	MobileSoft e-mail account	
Updated Initial Plan	DeepBlue	Customer	is502@ii.metu.edu.tr	March 1st, 02
SRS	DeepBlue	Customer	http://infoant.ii.metu.edu.tr/	March 17th, 02
		MobileSoft		
Review of SRS	MobileSoft	Customer	http://infoant.ii.metu.edu.tr/	March 20th, 02
		DeepBlue		
Updated SRS	DeepBlue	Customer	http://infoant.ii.metu.edu.tr/	March 22nd, 02
SPMP	DeepBlue	Customer	http://infoant.ii.metu.edu.tr/	April 1st, 02
		MobileSoft		
Review of SPMP	MobileSoft	Customer	http://infoant.ii.metu.edu.tr/	April 3rd, 02
		DeepBlue		
Updated SPMP	DeepBlue	Customer	http://infoant.ii.metu.edu.tr/	April 5th, 02
SDD	DeepBlue	Customer	http://infoant.ii.metu.edu.tr/	April29th, 02
		MobileSoft		
Review of SDD	MobileSoft	Customer	http://infoant.ii.metu.edu.tr/	May 1st, 02
		DeepBlue		
Updated SDD	DeepBlue	Customer	http://infoant.ii.metu.edu.tr/	May 3rd, 02
User Manual	DeepBlue	Customer	http://infoant.ii.metu.edu.tr/	June 10th, 02

Table 15: Reporting Mechanisms of the ION-CHAT SYSTEM

The ION-CHAT SYSTEM report format shall be as follows:

1. Any kind of documentation prepared for ION-CHAT SYSTEM shall be in content compliance with IEEE standards **[7, 8, 9, 10]**.
2. Any kind of documentation prepared for ION-CHAT SYSTEM shall be written in Times New Roman, 12 point with 1.5 line spacing except for title page, table of contents, list of figures, list of tables and figures.
3. Any kind of documentation prepared for ION-CHAT SYSTEM shall include the page numbers at the footer on the right hand side.
4. Any kind of documentation prepared for ION-CHAT SYSTEM shall include the document name and version number at the footer on the left hand side.

[1] The Submission Method for is502@ii.metu.edu.tr is e-mail and for http://infoant.ii.metu.edu.tr/ is uploading the document.

5. Heading 1 of any kind of documentation prepared for ION-CHAT SYSTEM shall be uppercase and bold. Other headings shall be title case and bold.

5.3.6 Metrics Collection Plan (Subclause 5.3.6 of the SPMP)

- In order to provide a basis for control activities regarding schedule and budget control processes, each DeepBlue member shall specify the percentage of completion for each individual work activity under his/her responsibility.
- The percentage calculation shall be based on the difference between total time required to complete the work activity and the time elapsed for the completed portion of the work activity.
- The percentage calculation shall be based on the subjective judgement of the DeepBlue members according to their historical experience.
- The specifications mentioned in the first bullet shall be submitted to the project manager at the end of each working day of the week via e-mail.

5.4 Risk Management Plan (Subclause 5.4 of the SPMP)

The risk factors that are initially identified, the strategies developed in order to manage the risks specified and the category of the strategy proposed for every individual risk factor are depicted in Table 16. The proposed strategies are grouped into three categories:

1. *Avoidance Strategies*: These are the strategies that shall reduce the probability that the risk will arise.
2. *Minimization Strategies:* These are the strategies that shall reduce the impact of the risk on the project.
3. *Contingency Plans:* These are the strategies that are in place to deal with the risk.

Risk	Strategy Type	Strategy
Changes to software requirements	Avoidance strategy	There shall be scheduled meetings with the customer as scheduled in section 5.3.1
Underestimated development time	Minimization strategy	The schedule of the project shall be revised as scheduled in section 5.3.2
Underestimated development time	Contingency plan	In case of deviation from the planned schedule up to 5% occurs, the working hours of the employees shall be adjusted as specified in section 5.3.2
Underestimated project cost	Contingency plan	As specified in section 5.3.3, a budget overflow of 5% shall be allowed

Staff illness	Contingency plan	The personnel allocation to the work activities shall be done in such a manner that there shall be more overlap of work and people, where possible. Therefore, the people's understanding of each other's jobs shall improve.
Inexperienced coding team	Minimization strategy	Before the coding stage of the project, the coding team members shall be intensively trained on the Java programming language with a special emphasis on project related aspects, namely, applets and console application development
Unfamiliar application domain	Minimization strategy	Before the design phase of the project, the design team members shall be intensively trained on computer networking.
Incorrect judgment about the probability or seriousness of risk factors	Minimization strategy	The project manager shall have at least 5 years of experience both on the application domain and on the Java programming language

Table 16: Initially identified risk factors

The schedule for the activities related to the risk management plan and the names of the personnel, responsible from the risk management activities specified are given as below.

Name	Review of the project risk factors
WBS #	8.5
Estimated duration	0.5 day
Personnel responsible	Erkin Baykal
Predecessor activity	16
Successor activity	-
Description	Specifying, analyzing and identifying the ION-CHAT SYSTEM risk factors

Name	Review of the project risk factors
WBS #	11.1.7
Estimated duration	1 day
Personnel responsible	Erkin Baykal
Predecessor activity	62
Successor activity	-
Description	Specifying, analyzing and identifying the ION-CHAT SYSTEM risk factors

Name	Review of the project risk factors
WBS #	13.5

Estimated duration	1 day
Personnel responsible	Erkin Baykal
Predecessor activity	102
Successor activity	-
Description	Specifying, analyzing and identifying the ION-CHAT SYSTEM risk factors

Name	Review of the project risk factors
WBS #	15.6
Estimated duration	1 day
Personnel responsible	Erkin Baykal
Predecessor activity	122
Successor activity	-
Description	Specifying, analyzing and identifying the ION-CHAT SYSTEM risk factors

Name	Review of the project risk factors
WBS #	20
Estimated duration	1 day
Personnel responsible	Erkin Baykal
Predecessor activity	127
Successor activity	-
Description	Specifying, analyzing and identifying the ION-CHAT SYSTEM risk factors

The risk management process is comprised four parts:

1. Risk identification is concerned with discovering new risk factors to the project. Risk identification shall be carried out using brainstorming approach among the DeepBlue members.
2. During the risk analysis part, each of the identified risks shall be considered in turn and a judgment shall be made about the probability and seriousness of the risk. The project manager shall judge about the probability and seriousness of the risk. The probability of the risk indicates the chance of occurance of the risk The seriousness of the risk indicates the importance of the risk for the project. The probability of a risk factor shall be indicated with a scale 0.1-1, 1 showing the most probable. The seriousness of a risk factor shall be indicated with a scale 1-10, 10 showing the most serious. Each risk factor, for which the (probability*seriousness) value is less than 0.25, shall be neglected.
3. During the risk planning part, an avoidance strategy, a minimization strategy or a contingency plan shall be developed for each of the risk factors in consideration.

4. Risk monitoring shall involve, regular assessment of each of the identified risks in order to decide whether or not that risk is becoming more or less probable and whether the effect of the risk has changed.

5.5 Project Closeout Plan (Subclause 5.5 of the SPMP)

The ION-CHAT SYSTEM closeout plan shall include three kinds of plan. First plan is the archiving project materials plan. Second plan is the staff reassignment plan and third plan is the final report which shall include the lessons learned.

The archiving of the metarials of the ION-CHAT SYSTEM shall be done by storing the documents in the personel computers of all members of the DeepBlue. The archiving of the metarials of the ION-CHAT SYSTEM shall be also stored in the account of Ahmet Kara.

Except the above mentined archiving methods, all the documentions of the ION-CHAT SYSTEM shall be uploaded to http://infoant.ii.metu.edu.tr address.

The staff reassignment plan of the ION-CHAT SYSTEM shall depend on the control activities if there exists inconsistency with the budget or schedule plan, then the DeepBlue members shall be reassigned to the work activities in order to finalize the project milestones.

6 Technical Process Plan (Clause 6 of the SPMP)

6.1 Process Model (Subclause 6.1 of the SPMP)

The software life cycle of the ION-CHAT SYSTEM shall be the waterfall model. The detail of the software process is depicted in Table 17.

No	Activity Name	Deliverable	Due Date	Predecessor Activity No
1	Problem Statement	Problem Statement Documentation	18 February 2002	-
2	Initial Plan	Initial Plan Documentation	26 February 2002	1
3	Initial Plan Review	Updated Initial Plan Documetation	01 March 2002	2
4	SRS	SRS Documentation	17 March 2002	3
5	SRS Review	Updated SRS Documentation	22 March 2002	4
6	SPMP	SPMP Documentation	1 April 2002	5
7	SPMP Review	Updated SPMP Documentation	05 April 2002	6
8	SDD	SDD Documentation	29 April 2002	7
9	SDD Review	Updated SDD Documentation	03 May 2002	8
10	Delivery of Product	Initial Product	20 May 2002	9
11	User Manual	User Manual Docuentation	09 June 2002	10
12	Demonstration of Product		09 June 2002	11

14	Delivery of Final Product	Final Product	09 June 2002	12

Table 17: Details of software process

6.2 Methods, Tools and Techniques (Subclause 6.2 of the SPMP)

The methods, tools and techniques that shall be used for the ION-CHAT SYSTEM project are depicted below.

Software process model: Waterfall model
Software programming language: Java2
Software design methodology: Object-oriented analysis & design technique
Standard for software requirements specification documentation: IEEE Std. 1830-1998 **[2]**
Standard for software project management plan documentation: IEEE Std. 1058-1998 **[1]**
Standard for software design description documentation: IEEE Std. 1016-1998 **[3]**
Standard for user manual development: IEEE Std. 1063-1997 **[4]**

6.3 Infrastructure Plan (Subclause 6.3 of the SPMP)

As specified in section 3.1.2 of the Software Requirements Specification for the ION-CHAT SYSTEM **[10]**, there is no interface between the ION-CHAT SYSTEM and the hardware on which it shall operate. So, the hardware configuration specified below shall not be taken either as a hardware interface of the ION_CHAT SYSTEM or as a minimum required configuration. The hardware configuration specified below indicates resources, which are already available to DeepBlue and which shall be allocated to the ION-CHAT SYSTEM project.

As specified in section 3.1.3 of the Software Requirements Specification for the ION-CHAT SYSTEM **[10]**, there is no interface between the ION-CHAT SYSTEM and the operating system on which it shall operate. So, the operating system specified below shall not be taken either as a software interface of the ION-CHAT SYSTEM or as a minimum required configuration. The software specified below indicates resources, which are already available to DeepBlue and which shall be allocated to the ION-CHAT SYSTEM project.

The development environment for the ION-CHAT SYSTEM is depicted below. The specified infrastructure is already available and shall be provided to each individual, who is allocated to the ION-CHAT SYSTEM project in the DeepBlue.

Hardware configuration	A microprocessor having 866 MHz clock speed 128 MB RAM 10 GB total harddisk space 8 MB graphics card memory A network interface card supporting 100 Mbps connections
Operating system	Microsoft Windows 98
Network connection	100 Mbps network connection
Software	Java2 Standard Edition v.1.3.1_02 from Sun Microsystems Apache Web Server v.1.3.23 Microsoft Internet Explorer v.5.5 Netscape Navigator v.4.79 Microsoft Word 2000 Microsoft Project 98

6.4 Product Acceptance Plan (Subclause 6.4 of the SPMP)

The acquirer acceptance of the delivered work products generated shall be as follows:

1. Any deliverable work product shall satisfy 100% of the requirements specified in the software requirements specification, where each requirement specification shall be weighted equally.

2. If it is proven that a work product delivered to the customer within its scheduled time period satisfies more than 90% of the requirements, DeepBlue shall be given an additional one week time to modify the work product.

3. If it is proven that a work product delivered to the customer within its scheduled time period satisfies less than 90% of the requirements, DeepBlue shall pay $100 for each working day passed to the delivery of the modified version, satisfying 100% of the requirements specified in the software requirements specification.

7 Supporting Process Plans (Clause 7 of the SPMP)

7.1 Verification and Validation Plan (Subclause 7.2 of the SPMP)

The details of the verfication and validation plan shall be done by testing activites and they are depicted in Table 18. Testing of the ION-CHAT SYSTEM shall be done by the DeepBlue testing team. However the programmer and the testing engineer shall not be the same person.

The testing activities shall be composed of the verification of the correctness of the requirements specified in the software requirement specification of the ION-CHAT SYSTEM **[10]** for the corresponding work activity in the coding phase of the ION-CHAT SYSTEM. No special method will be used by DeepBlue members while doing testing activities since there is not enough time to do so.

WBS #:	Work Activity	Duration (d=day)	Start Date	End Date
15	Testing of the ION-CHAT SYSTEM	15d	Sun 5/5/02	Sun 5/19/02
15.1	Testing of the common functions of all users	1d	Sun 5/5/02	Sun 5/5/02
15.1.1	Testing of the user authentication function	1d	Sun 5/5/02	Sun 5/5/02
15.2	Testing of the functions for root	2d	Fri 5/17/02	Sat 5/18/02
15.2.1	Testing of the user addition function	2d	Fri 5/17/02	Sat 5/18/02
15.2.2	Testing of the user deletion function	2d	Fri 5/17/02	Sat 5/18/02
15.2.3	Testing of the user update function	2d	Fri 5/17/02	Sat 5/18/02
15.2.4	Testing of the chat group addition function	2d	Fri 5/17/02	Sat 5/18/02
15.2.5	Testing of the chat group deletion function	2d	Fri 5/17/02	Sat 5/18/02
15.2.6	Testing of the chat group update function	2d	Fri 5/17/02	Sat 5/18/02
15.2.7	Testing of the room addition function	2d	Fri 5/17/02	Sat 5/18/02
15.2.8	Testing of the room deletion function	2d	Fri 5/17/02	Sat 5/18/02
15.2.9	Testing of the room update function	2d	Fri 5/17/02	Sat 5/18/02
15.3	"Testing of the functions for instructor, students & customers"	1d	Sun 5/19/02	Sun 5/19/02
15.3.1	Testing of the chat function	1d	Sun 5/19/02	Sun 5/19/02

Table 18: Details of Verification and Validation Plan

7.2 Documentation Plan (Subclause 7.3 of the SPMP)

Deliverable work products of the ION-CHAT SYTEM shall be done as shown in the Table 19.

Deliverable work products	Submitted by	Submitted to	Meeting Time	Meeting Date	Submission Date
Problem Statement	DeepBlue	Customer	-	-	Feb 18th, 02
Review of the IEEE std. 1058-1998 **[1]**	DeepBlue	Customer	12:40	Feb 20th, 02	-
Initial Plan	DeepBlue	Customer MobileSoft	-	-	Feb 26th, 02
Review of Initial Plan	MobileSoft	Customer DeepBlue	14:40	Feb 27th, 02	Feb 27th, 02
Updated Initial Plan	DeepBlue	Customer	-	-	March 1st, 02
Review of the IEEE std. 830-1998 **[2]**	DeepBlue	Customer	12:40	March 6th, 02	-
SRS	DeepBlue	Customer MobileSoft	-	-	March 17th, 02
Review of SRS	MobileSoft	Customer DeepBlue	14:40	March 20th, 02	March 20th, 02
Updated SRS	DeepBlue	Customer	-	-	March 22nd, 02
Review of the IEEE std. 1058-1998 **[1]**	DeepBlue	Customer	12:40	March 27th, 02	-
SPMP	DeepBlue	Customer MobileSoft	-	-	April 1st, 02
Review of SPMP	MobileSoft	Customer DeepBlue	14:40	April 3rd, 02	April 3rd, 02
Updated SPMP	DeepBlue	Customer	-	-	April 5th, 02
Review of the IEEE std. 1016-1998 **[3]**	DeepBlue	Customer	12:40	April 10th, 02	-
SDD	DeepBlue	Customer MobileSoft	-	-	April29th, 02
Review of SDD	MobileSoft	Customer DeepBlue	14:40	May 1st, 02	May 1st, 02
Updated SDD	DeepBlue	Customer	-	-	May 3rd, 02
Review of the IEEE std. 1063-1987 **[4]**	DeepBlue	Customer	12:40	May 22nd, 02	-
User Manual	DeepBlue	Customer	-	-	June 10th, 02

Table 19: Reporting Mechanisms of the ION-CHAT SYSTEM

7.3 Quality Assurance Plan (Subclause 7.4 of the SPMP)

There is no additional detail that shall be specified under this subclause other than the specifications given in the whole SPMP document.

7.4 Review Plan (Subclause 7.5 of the SPMP)

The details of the review plan is depicted in Table 20. The method that is used for reviews shall be discussions hold on meetings.

WBS #	Work Activity	Duration (d=day)	Start Date	End Date
6	Review meeting for the changes of software requirements with the customer	1d	Mon 3/25/02	Mon 3/25/02
8.6	Review meeting for the content of the SPMP with the customer	1d	Fri 3/29/02	Fri 3/29/02
8.11	Review meeting for SPMP documentation	0.25d	Wed 4/3/02	Wed 4/3/02
10	Review meeting for the changes of software requirements with the customer	1d	Mon 4/8/02	Mon 4/8/02
11.2	Review meeting for the content of the SDD with the customer	1d	Mon 4/22/02	Mon 4/22/02
11.5	Review meeting for SDD documentation	0.25d	Wed 5/1/02	Wed 5/1/02
17	Review meeting for the initial product with the customer	1d	Tue 5/21/02	Tue 5/21/02

Table 20: Details of review plan

APPENDİX A

ID	WBS Number	Task Name
1	1	Stating the problem statement
2	2	Training for IEEE Std. 1058-1998
3	3	Preparation of the Initial Plan
4	4	Training for IEEE Std. 830-1998
5	5	Preparation of the SRS
6	6	Review meeting for the changes of software requirements with the customer
7	7	Training for IEEE Std. 1058-1998
8	**8**	**Preparation of the SPMP**
25	9	Training for IEEE Std. 1016-1998
26	10	Review meeting for the changes of software requirements with the customer
27	**11**	**Preparation of the SDD**
69	12	Training for Java programming language
70	**13**	**Coding of the ION-CHAT SYSTEM**
105	14	Training for testing processes
106	**15**	**Testing of the ION-CHAT SYSTEM**
124	16	Delivery of initial product
125	17	Review meeting for the initial product with the customer
126	18	Control of the project schedule
127	19	Control of the budget requirements
128	20	Review of the project risk factors
129	21	Control of the quality of the initial product
130	22	Training for IEEE Std. 1063-1987
131	23	Preparation of the User Manual
132	24	Product Demonstration
133	25	Delivery of the final product