



# Meeting Scheduler System

CS 6361 – Advanced Requirement Engineering, Section 101

Fall 2008

## Process and Production Specification



**Version 2.0**

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### Revision History

<b>Date</b>	<b>Version</b>	<b>Description</b>	<b>Author</b>
10 Nov 2008	0.1	Formulating outline and preliminary articulation.	Kavan, Srikrishna
11 Nov 2008	0.2	Detailed Introduction articulation	Shivdas
12 Nov 2008	0.3	Issues and Solution	Arvind, Varshada
15 Nov 2008	1.0	Final version	Varshada
02 Dec 2008	2.0	Final version for Phase 2 deliverable	Varshada Shivdas Animesh Arvind

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## 1. Introduction

SynergySoft Inc. aims to develop a meeting scheduling system that provides featured product to schedule and maintain meetings. The product primarily targets an enterprise as its market. The meeting scheduling system lets users to schedule a meeting effectively with less effort. The product is intended to ease the process of scheduling a meeting for increasing effectiveness of collaborative activities. Such a scheduling system is purported to increase awareness of relevant information of a meeting among concerned persons.

During initial phase, team of requirement analyst gathered initial requirements from the SynergySoft Inc. and relevant stakeholders to establish preliminary requirement specification. SynergySoft constitutes expectation to accumulate precise user requirement for the statement and profound analysis of the requirements. As SynergySoft Inc. strongly bolsters idea of holding precise and accurate requirements contributes to quality production. SynergySoft also has proposed few modifications to their initial requirements.

### 1.1 Purpose

This document entails the requirement changes and the refinement of the requirement analysis delivered in previous phase of the requirement accumulation and analysis. This document articulates detailed description of the product intended for SynergySoft Inc. This report also includes semi-formal illustration and articulation of the process for requirement gathering that shall be sourced from stakeholders, for refinement and description for enterprise and system functional and non-functional requirements. This document reports issues concerned to previous deliverable and requirements gathered, and also relevant to the new requirements rendered by SynergySoft. The report encloses mockups for the validation of product requirement understandability from stakeholder.

### 1.2 Scope

This document is consequence of deliverable of initial phase of requirement accumulation and analysis, initial requirement gathering and analysis process for second phase, feedback from stakeholder and further requirement analysis. This document projects abstract overview of the Meeting Scheduler covering product and process specification, enterprise and system requirements, issues and prototype. This document might be of best interest to stakeholders and validation team.

### 1.3 Definitions and Glossary

**MSS:** Meeting Scheduler System

**Meeting proposal:** An invitation to a meeting including the meeting agenda, date range, and duration that is sent to a list of potential meeting participants.

**Potential meeting participant:** A person who has been invited to a proposed meeting, but who has neither accepted (“will attend”) nor refused (“will not attend”).

**Active meeting participant:** A meeting participant who will be presiding over the meeting. This type of participant is one whose presence is essential for the meeting to be conducted.

**Exclusion set:** A set of dates on which participants cannot attend the meeting.

**Preference set:** A set of dates on which participants would prefer the meeting to take place.

**Date range:** a time interval established by the meeting initiator during which he/she would like the meeting to occur.

**Freeze time:** A period of 1 hour before the earliest of the dates specified in the date range.

**Virtual meeting:** A meeting held via teleconferencing.

### 1.4 References

- Portion of this document refers to documents sighted at:  
<http://www.utdallas.edu/~chung/RE/Presentations06F/index.htm> -  
 Team 1 and Team 4

### 1.5 Task Division

A seven-member project team will be developing and implementing this software system. Each member will contribute equally to each phase of the project development so that both members can experience all stages of the software process. Each phase, task description, and allocation of tasks to the individual team member is indicated in the table below.

Task	Team Member	Activity carried out
<b>Phase 1</b>		
Requirement gathering	Varun, Varshada, Shivdas, Kavan	Interacting with Synergysoft and listing out their requirements to understand the problems they face in scheduling meetings.
Requirement analysis and negotiation	Varun, Arvind, Kavan, Srikrishna	Understanding the requirements to identify all possible issues and ensure that they are clarified
Specification and prototype design	Arvind, Srikrishna, Animesh	Build a mock-up to represent the requirements and address the ‘Yes-But’ Syndrome.
Validation	Shivdas, Animesh, Varshada, Arvind	Ensure that the requirements as understood by the requirement engineers are consistent with the actual requirements of the customer and the prototype matches user expectations.



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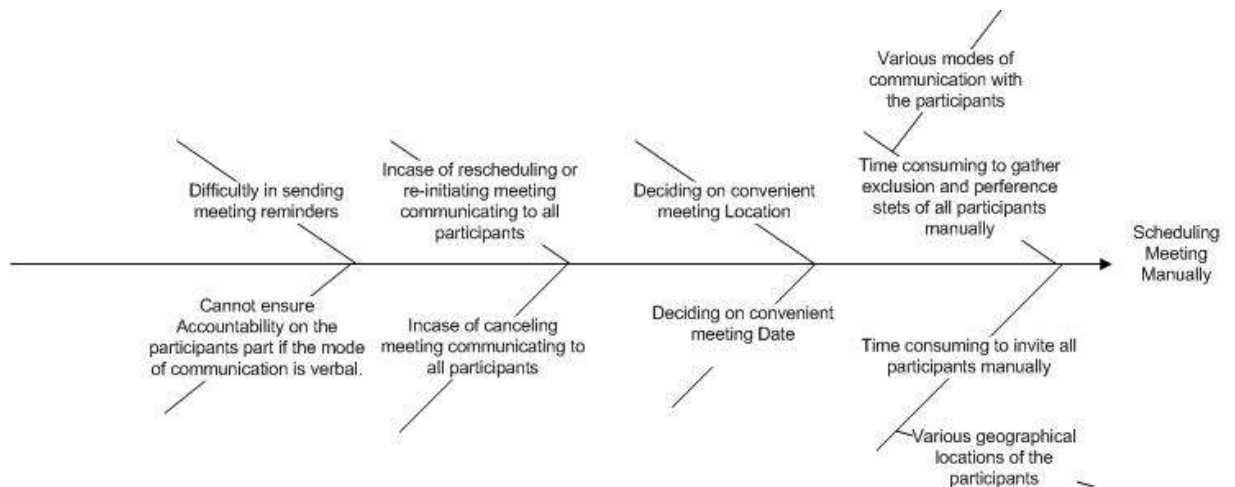
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<b>Phase 2</b>		
Analyze the changed requirements	Varshada, Shivdas, Kavan	Identify issues and remove the ambiguities from the new requirements.  Assessing the impact of change.  Analyze whether it is feasible to incorporate those in the already built prototype.
System Design	Arvind, Kavan Srikrishna,	Decide on usage environment (standalone /web based), servers to use, database design, system framework, etc
Implementation	Srikrishna, Animesh, Arvind	Convert the above design in to a working model
Testing	Shivdas, Varshada, Animesh	Test whether the end-to-end scenarios of sys usage are consistent with user expectations like a successful meeting invitation, unsuccessful invitation etc. This also covers requirement validation.

## 2. Process Specification

### 2.1 Causal Analysis – Fish Bone Method

Synergyssoft-supplied requirements document basically mentions that scheduling meetings manually is the main problem. Before coming up with a process for developing the Meeting Scheduler system, our team started with the analyzing the root causes of the problem. The fishbone will help to visually display the many potential causes for a specific problem or effect.



## 2.2 Overall Process Model used for the project

The process model used for the development of the system is the Spiral model. Barry Boehm's pivotal study (1988a) recommended this framework for guiding the software development process. His "spiral model" of software development is an ideal model for those who believe that success follows a more risk-driven and incremental development path.

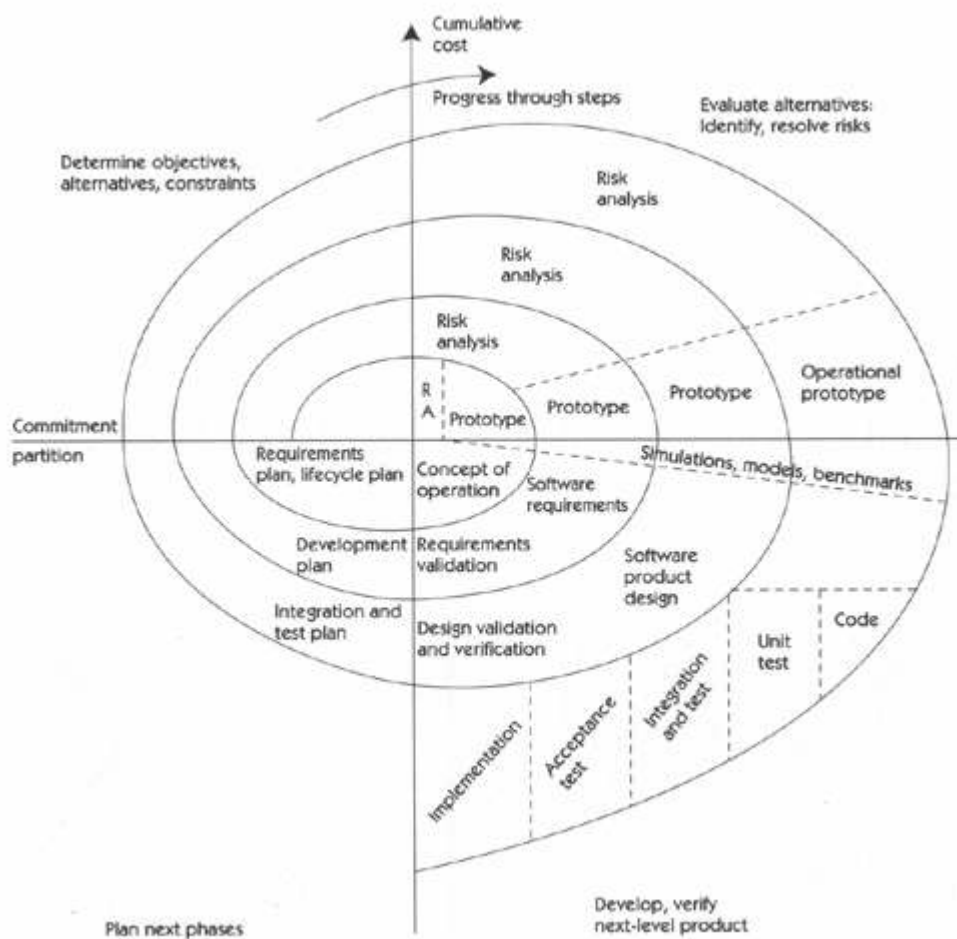
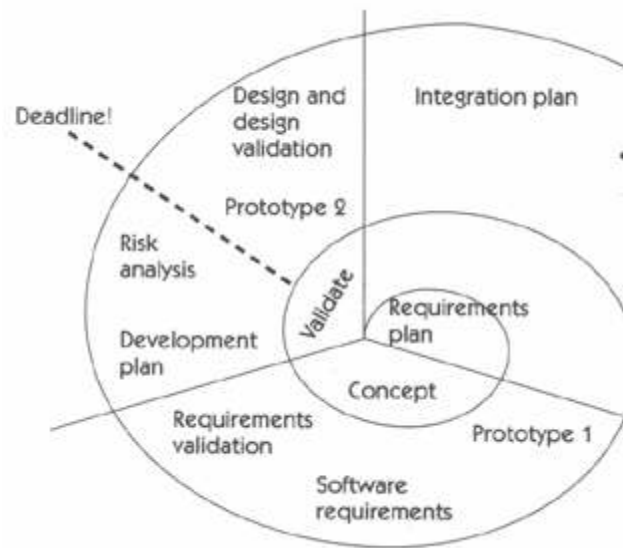


Fig 1: Spiral Model





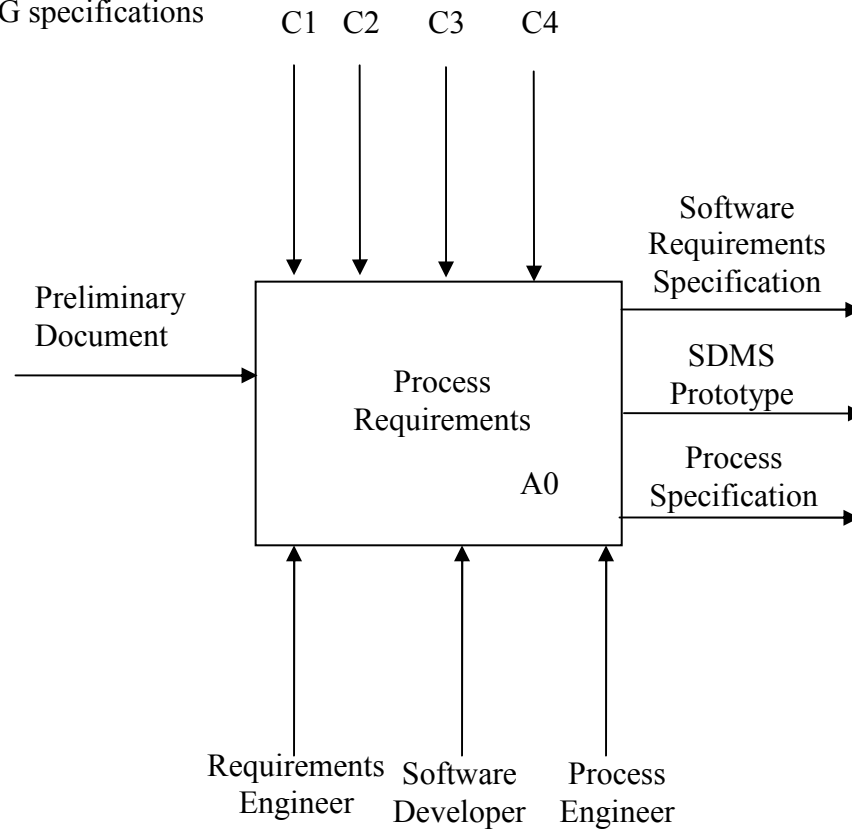
The spiral model starts with requirements planning and concept validation, followed by one or more prototypes to assist in early confirmation of our understanding of the requirements for the system.

Advantages:

- 1.** The availability of multiple feedback opportunities with the users and customers, which is intended to get the "Yes, Buts" out early.
- 2.** If the first iteration misses some requirements, that's an indicator that the project may be badly scoped, and adjustments can be made. Even if scope is not well managed, multiple executable iterations have been developed by the time the deadline is reached, and the last may even be deployed. Even though it lacks some functionality, the release will deliver value to the user, if the features have been picked and prioritized carefully, allowing your customer to meet objectives, at least in part, as you continue with further development iterations. And, if the architecture is robust and addresses the key technical issues, your team will have a solid platform on which to base the additional functionality.

## 2.3 Top Level IDEF0 for Process

- C1: Requirements Validation
- C2: UML specifications
- C3: IDEF specifications
- C4: SIG specifications



Context Level IDEF0 specifying the Process

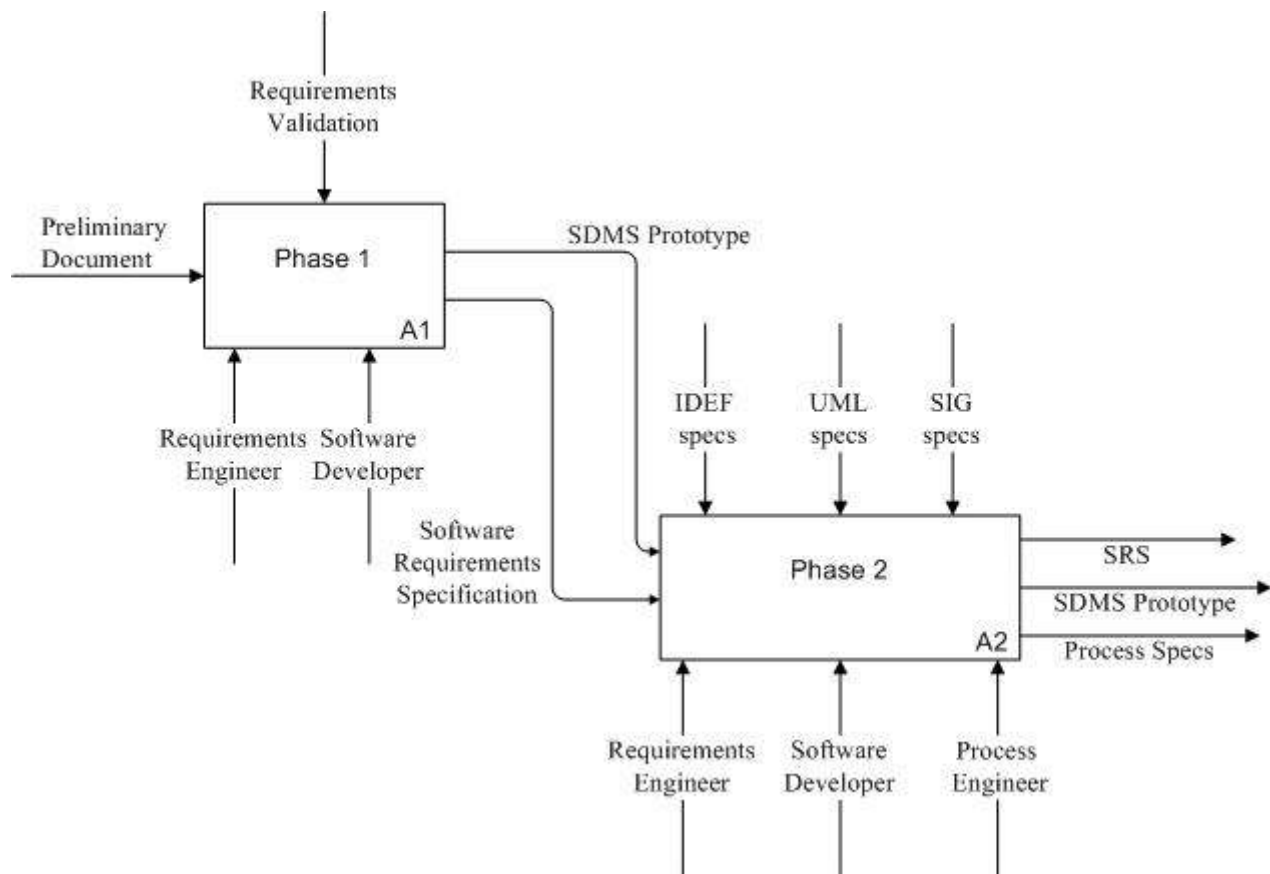
The figure above is a context level IDEF0 of the process we followed for our project.

Purpose: To obtain a better understanding of the various task involved in developing an efficient Meeting Scheduler System.

Context: We will assume that requirements document and resources for developing software system are available.

Viewpoint: that of a Requirement Engineer who has the Preliminary Document describing the domain, functional and non-functional requirements and who has a background in designing/building software systems.

## 2.4 Level 1 IDEF0 for Process



Level 1 IDEF0 diagram

The entire project process was divided into two phases.

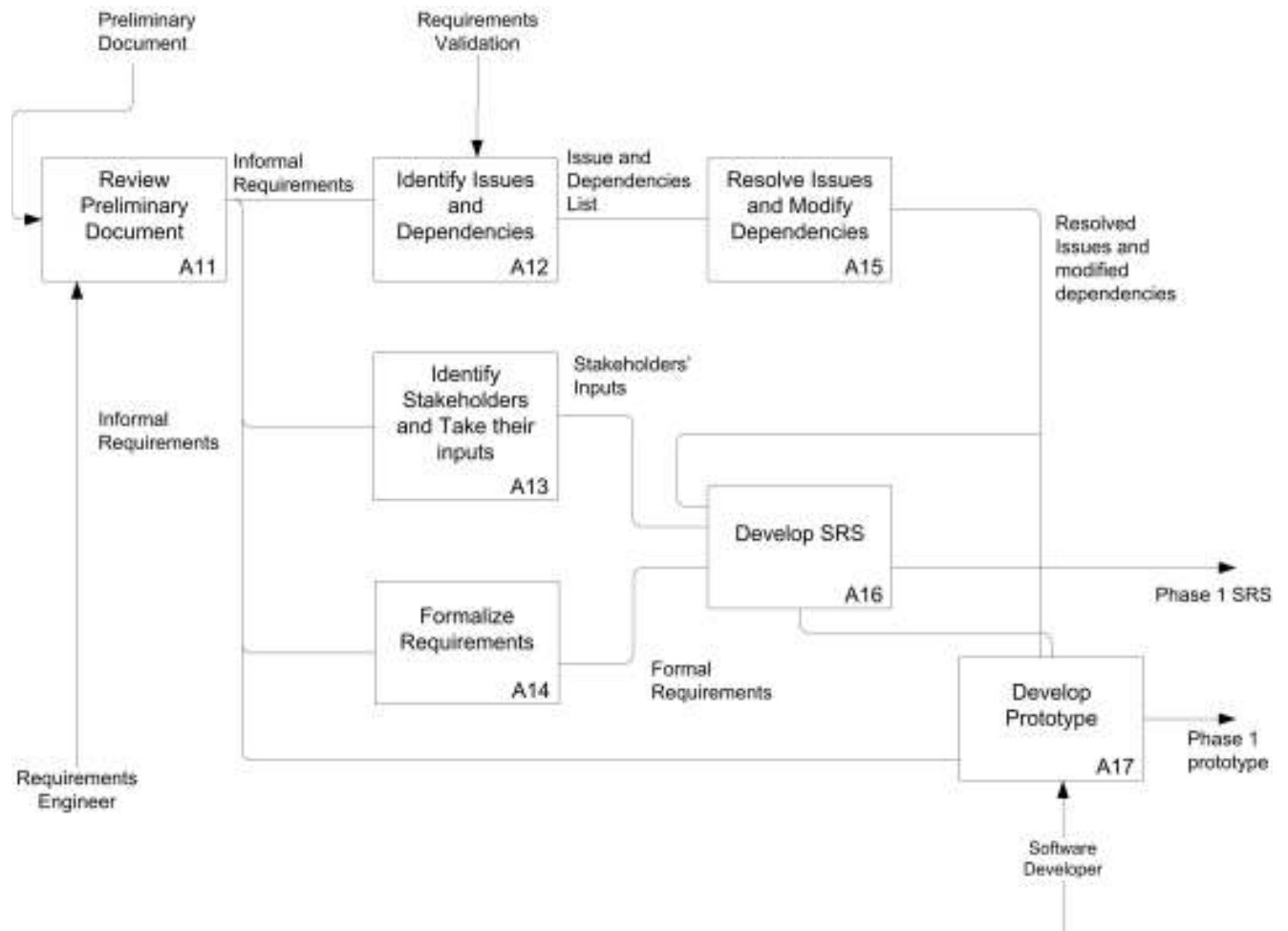
**Input:** Preliminary Document (provided by SynergySoft™) and the interview results of the potential users of our product (SDMS).

**Mechanisms:** Requirements Engineers, Process Engineers and Software Developers.

**Controls:** Requirements Validation, UML specifications, IDEF0 specifications, SIG specifications, Relevant Features of Similar Software and Process Constraints are used.

**Output:** SRS Document, a prototype for SDMS and the Process Specification.

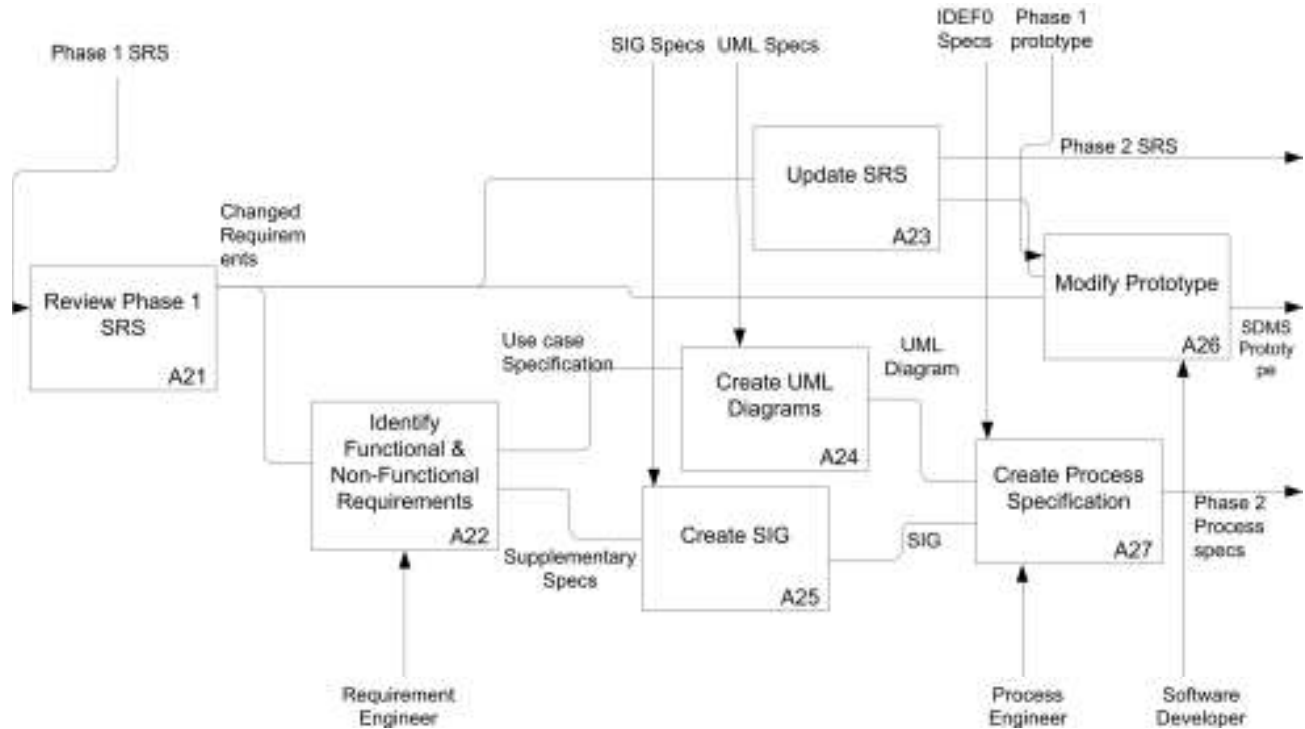
## 2.5 Detailed Diagram for Process using IDEF0 – Phase 1



IDEF0 diagram for Process - Phase 1

This is the Level 1 IDEF0 diagram for phase-1. The preliminary document is the input and the outputs are Phase-1 SRS and Phase-1 prototype.

## 2.6 Detailed Diagram for Process using IDEF0 – Phase 2



This is the Level 1 IDEF0 diagram for phase-2. The preliminary document is the input and the outputs are Phase-1 SRS and Phase-1 prototype.

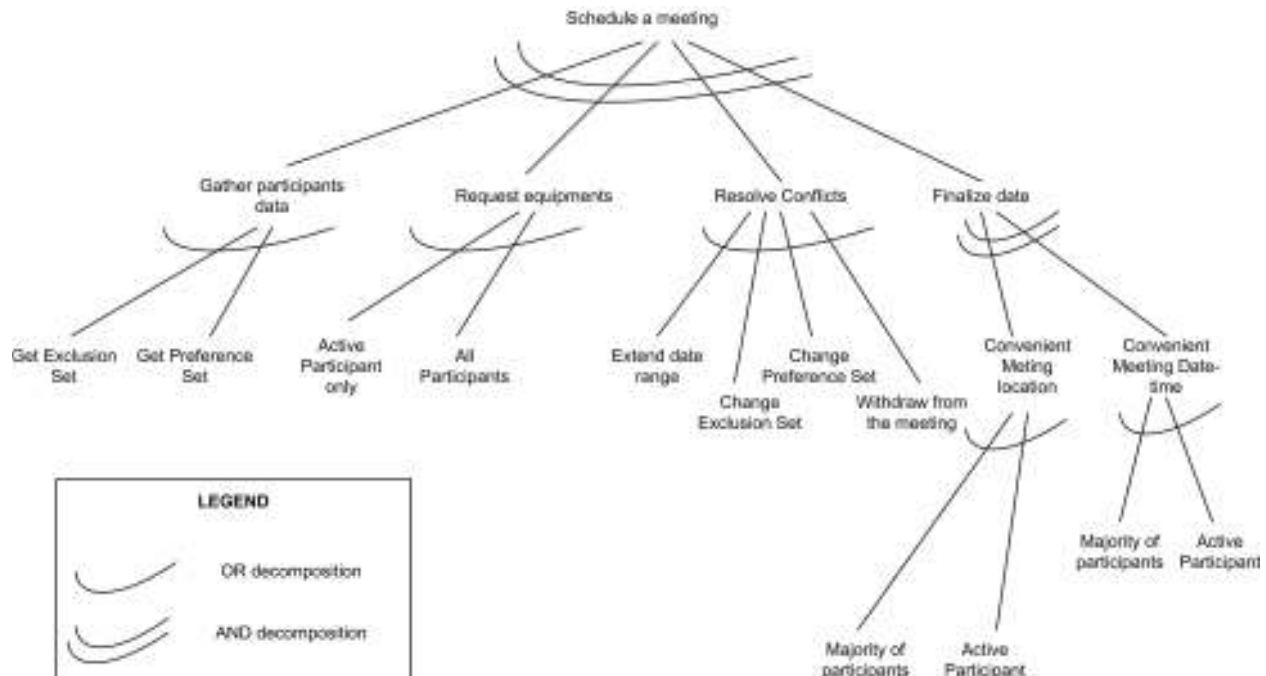
### 3. Product Specification

#### 3.1 System Specification

1. Any user is allowed to initiate a request for a new meeting using the MSS (*ref. EFR-12*), provided he/she is registered with the system. A user who initiates a meeting is referred to as the Initiator. To initiate a new meeting, the initiator shall provide the following as input to the MSS:
  - Agenda of the meeting.
  - Date-range, consisting of three 'date and time' pairs (*ref. EFR-1, EFR-2*)
  - Participant list
  - Active participant (if any).
  - Room (one for each date) for the meeting to be conducted in. (*ref. EFR-5*)
  - Duration of the meeting.
2. The meeting scheduler system shall be able to support several meeting requests in parallel, but ensures that multiple meetings are not scheduled in the same time-slot in the same room. (*ref. EFR-16*)
3. The system shall categorize the meeting rooms into auditoriums, conference rooms; board-rooms etc and also assume that each meeting room has all the necessary equipments in it for a meeting. (*ref. EFR-4, EFR-10*)
4. The system shall ensure that the initiator only selects rooms that are available on the selected dates. (*ref. EFR-9*)
5. The system shall allow the Initiator to schedule virtual meeting by selecting the meeting room as "Virtual". The system shall then prompt Initiator to enter Teleconference Number and Pin.
6. When the Initiator confirms the date-range, participant list and the rooms, the system shall send an email to all the participants informing them of the new meeting request. (*ref. EFR-15.5.2, EFR15.5.3*) This email shall inform the participants that a new meeting request has been made. The participant shall then have to log in to MSS to take further action regarding the meeting request.
7. Each participant (after he/she logs in to MSS) shall be shown the meeting request, along with the date-range specified by the initiator.
  - The participant shall be allowed to select from one or more dates from the date range to confirm his/her intention of attending the meeting. This set of dates forms the participant's Preference set. (*ref. EFR-1*).
  - The participant shall be allowed to decline the invite for the meeting in case he/she is not able to attend the meeting on any of the dates in the date-range specified by the initiator; the participant shall be allowed to specify 2 new dates as his/her Preference Set. (*ref. EFR-1, EFR-8.4*)
8. Each active participant shall be shown the meeting request, along with the date-range specified by the initiator.

- The active participant shall be allowed to select from one or more dates from the date range to confirm his intention of attending the meeting. This set of dates forms the participant's Preference set. (*ref. EFR-1*).
  - The active participant shall be allowed to request any specific equipments required for the meeting.
  - The active participant shall be allowed to decline the invite of the meeting in case he/she is not able to attend the meeting on any of the dates in the date-range specified by the initiator; the active participant shall be allowed to specify 2 new dates as his/her Preference Set. (*ref. EFR-1, EFR-8.4*).
9. The freeze time shall be one hour before the earliest of the 3 date-time pairs specified by the initiator. The system shall allow the Initiator to confirm or reject the meeting; failing to do so, the meeting request would stand cancelled and the initiator shall have to create new meeting request.
  10. The system shall allow the Initiator to view the response of every participant.
  11. The system shall allow the Initiator to decide whether to confirm the meeting schedule, re-negotiate, re-initiate or cancel the meeting. This decision shall depend solely upon the initiator's wish; the system shall not make a decision. (*ref. EFR-6, EFR-7, EFR-13, EFR-14, EFR-15.5.2, EFR-15.5.3*)
  12. The system shall send a notification mail to the participants when the Initiator confirms the meeting schedule. This email shall inform the users about the meeting agenda, the starting date and time, the duration and the participant list.
  13. The system shall allow the Initiator to re-negotiate on the date-range only once.
  14. The system shall allow the Initiator to re-negotiate till 3 hours before the earliest of the 3 date-time pairs specified by the initiator
  15. The system shall allow the Initiator to re-negotiate on date range and room with participants by sending 3 dates selected from the Preference sets of all the participants.
  16. The system shall allow the participants to view the re-negotiated date range and select one or more dates from the date range to confirm his intention of attending the meeting. This set of dates forms the participant's new Preference set.
  17. The system shall allow the participants to accept or withdraw from a meeting any number of times prior to the freeze date. (*ref. EFR-15.3.1, EFR-8.3*)
  18. The administrator of the system shall be able to manage accounts of the users. This task shall include authorizing access to the system, adding / deleting user accounts and meeting requests, adding / deleting meeting rooms, view data relevant to all meetings, view data related to availability of rooms (booked / free) and add / delete equipments to / from meeting rooms.

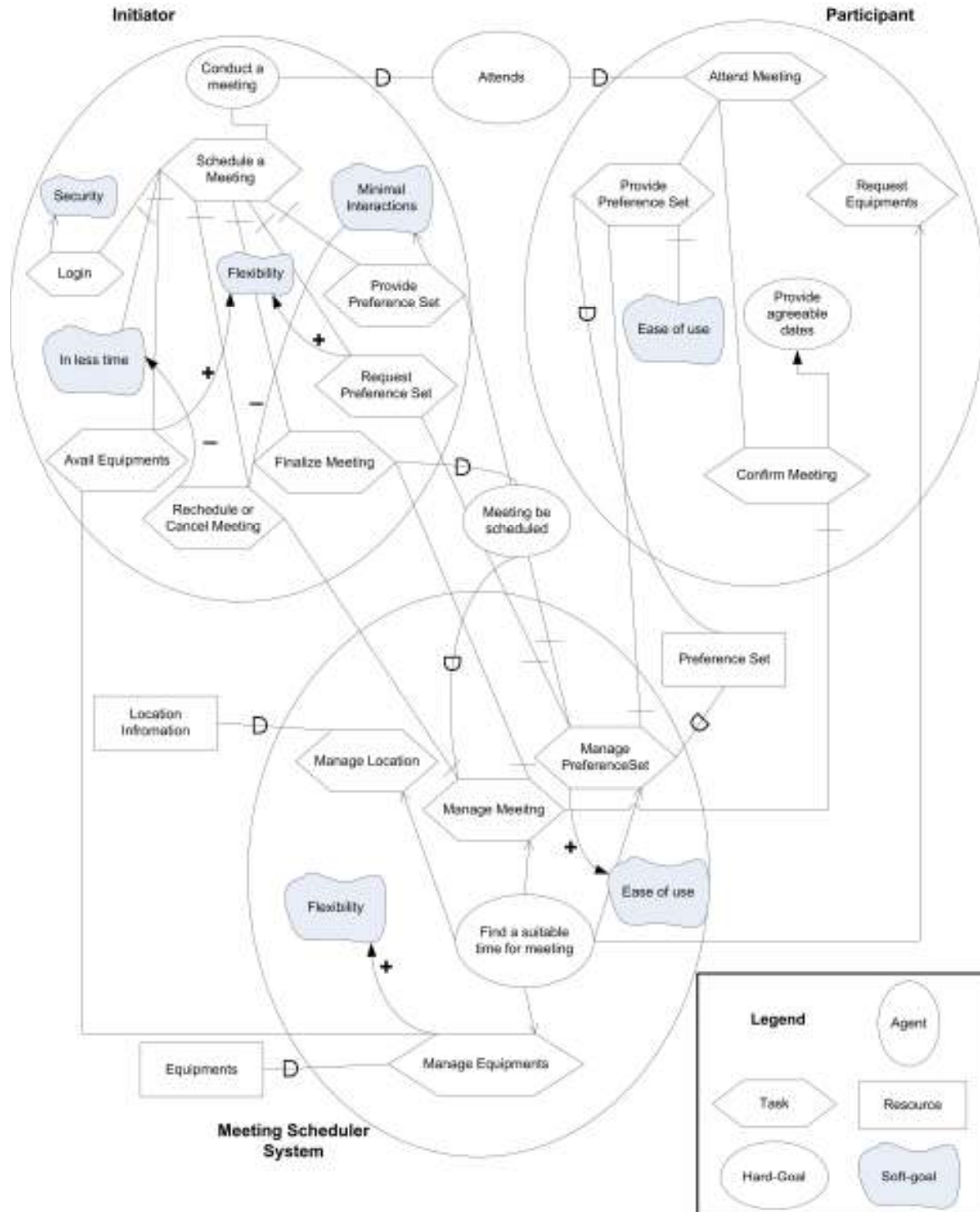
## 3.2 Goal Decomposition Diagram



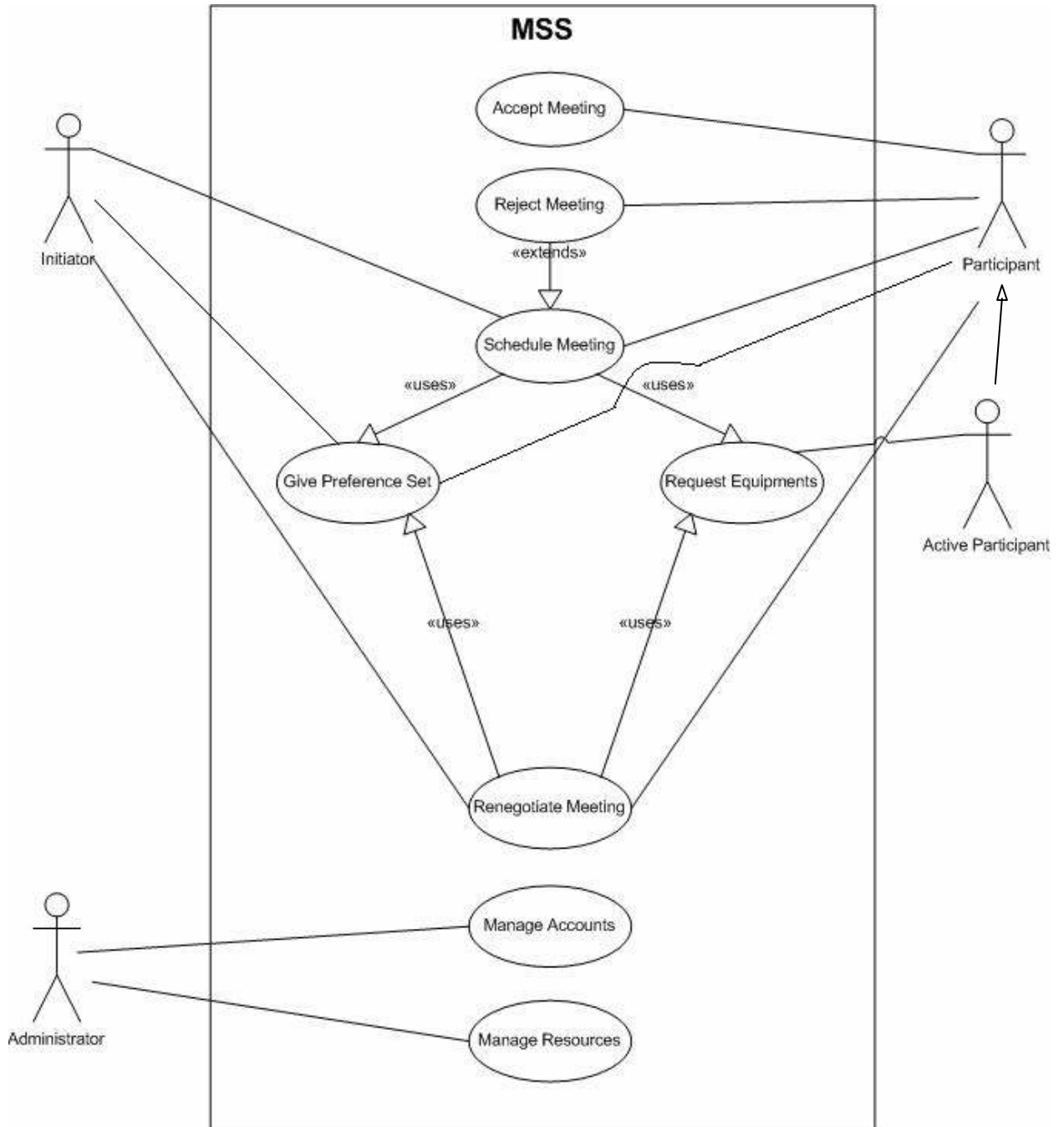
1. The primary goal of the system is Schedule a meeting. This goal is further composed of goals: Gathering participant data AND Request equipment AND Resolve conflict AND Finalize data.
2. Gathering of participant data can include getting preference sets OR getting exclusion sets.
3. Equipment requests could be given by all participants OR the active participants only.
4. Conflict resolution could be needed due to extension of date range by the initiator/participant OR change of exclusion set of initiator/participant OR change of preference set of initiator/participant OR withdrawal of initiator/participant from the meeting.
5. Data to be finalized is the date/time AND location of the meeting.
6. Either can be finalized either by majority selection OR preference selection for active participants.



## 3.3 Agent Oriented modeling – i\* diagram



## 3.4 Software System Use Case





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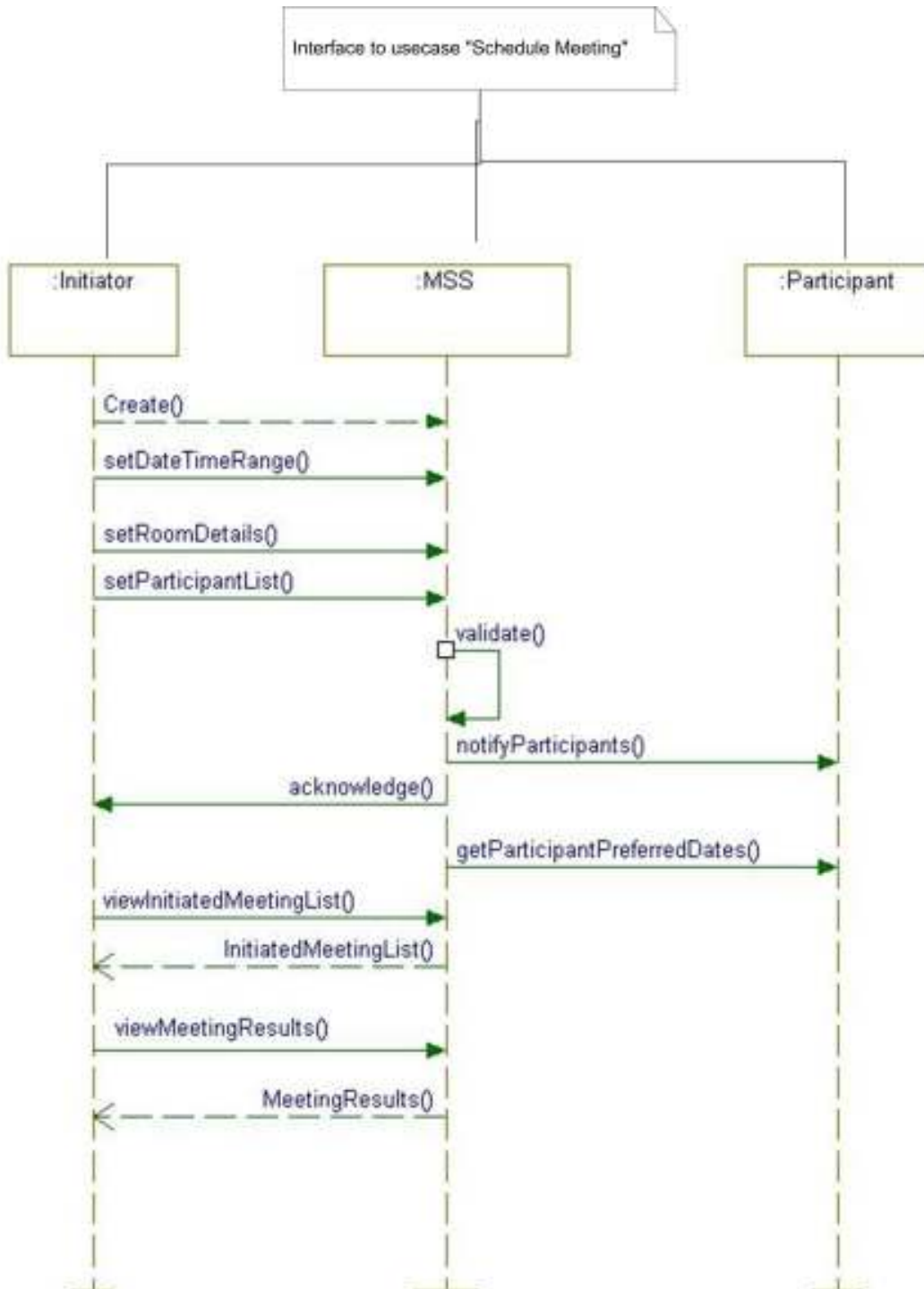
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Actors	Related interaction system in MSS
Initiator	Schedule Meeting, Renegotiate Meeting
Participant	Schedule Meeting, Accept Meeting, Reject Meeting, Renegotiate Meeting
Active Participant	Schedule Meeting, Accept Meeting, Reject Meeting, Renegotiate Meeting, Request Equipment
Administrator	Manage Accounts, Manage Resources

**Note:** The Active Participant is a special type of participation. This is depicted by the specialization arrow between these two actors in the Usecase diagram.

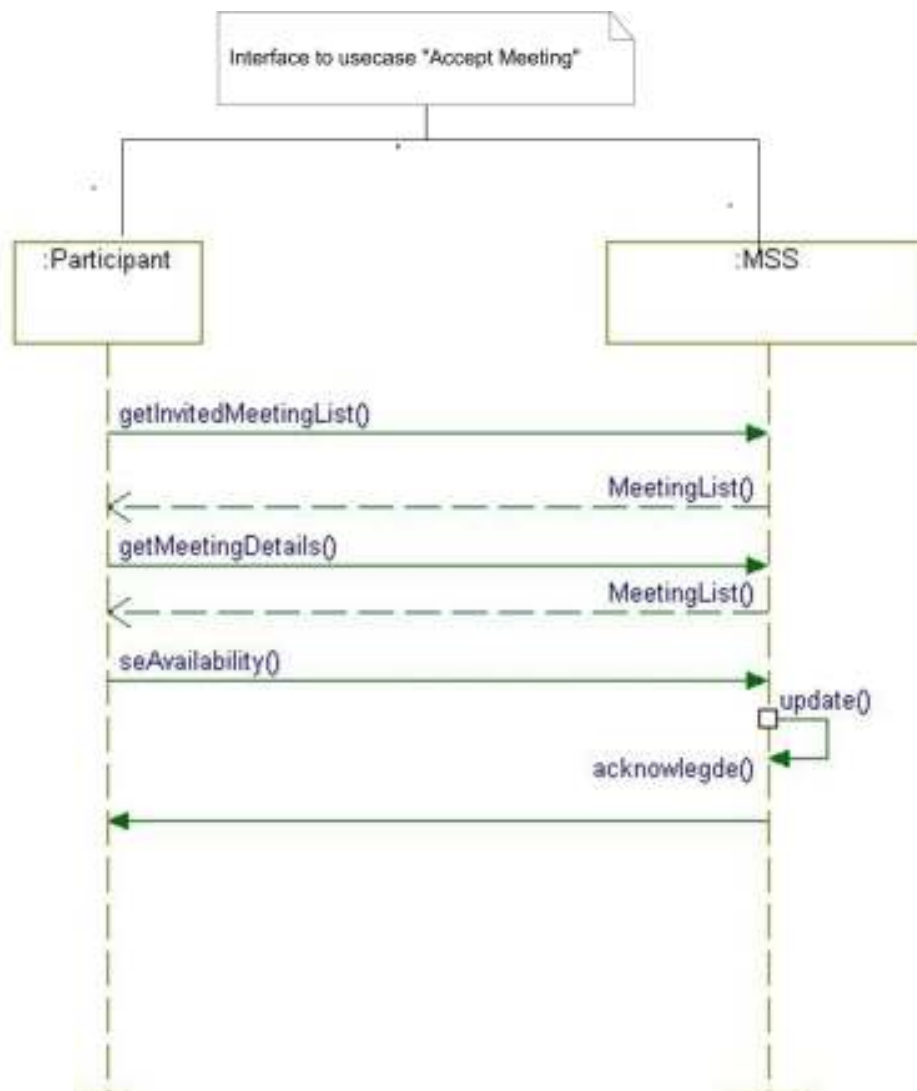
## 3.5 Sequence Diagrams

### a. Schedule Meeting



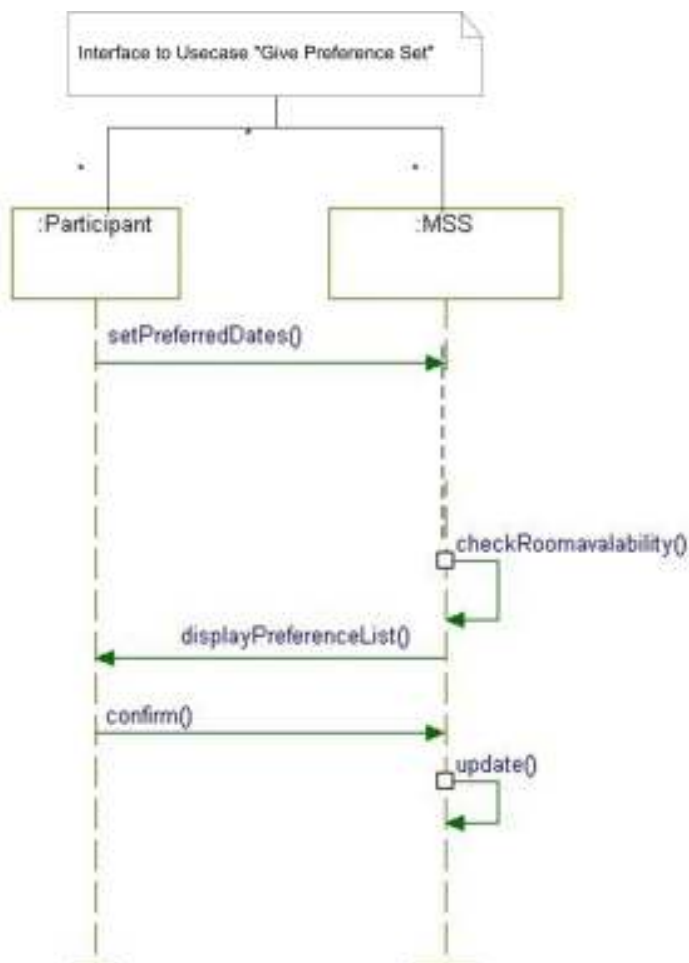
1. The initiator creates a new meeting request and sends his preferences sets, participant list and room requirements to the MSS.
2. The MSS validates the participant list and room availability, notifies the participants and sends an acknowledgement to the initiator.
3. On the participant side, MSS prompts the participant to enter their preference sets.
4. The initiator can view the details and responses to his initiated meeting through the MSS.

## b. Accept/Reject Meeting

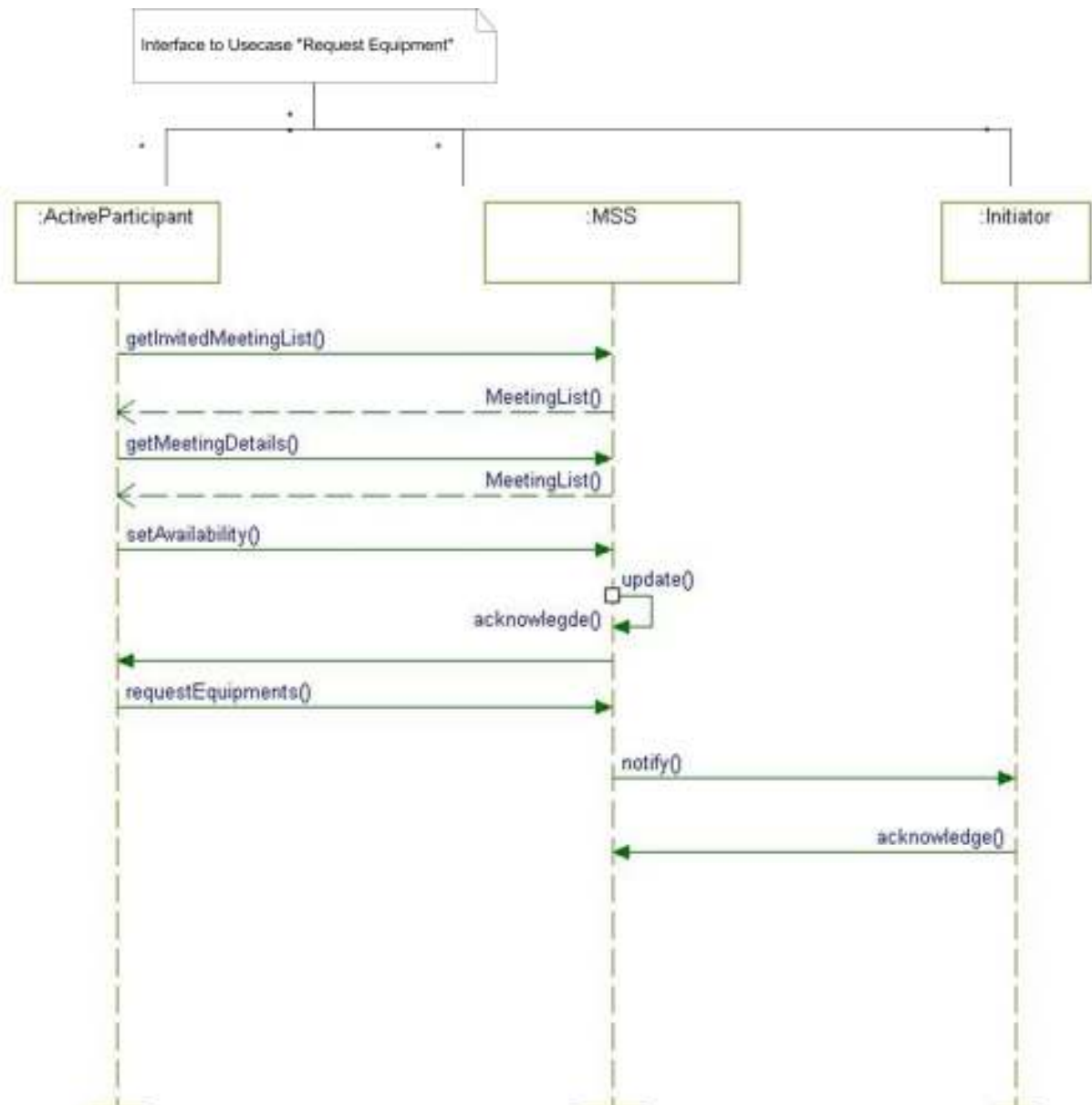


1. The participants can view the meeting invites through MSS. MSS displays the list of meetings to which the participant is invited.
2. The participant then either accepts an invite or rejects it with or without specifying his preference sets.
3. The MSS then updates its database according to the decision made by the participant and acknowledges the changes to the participant.

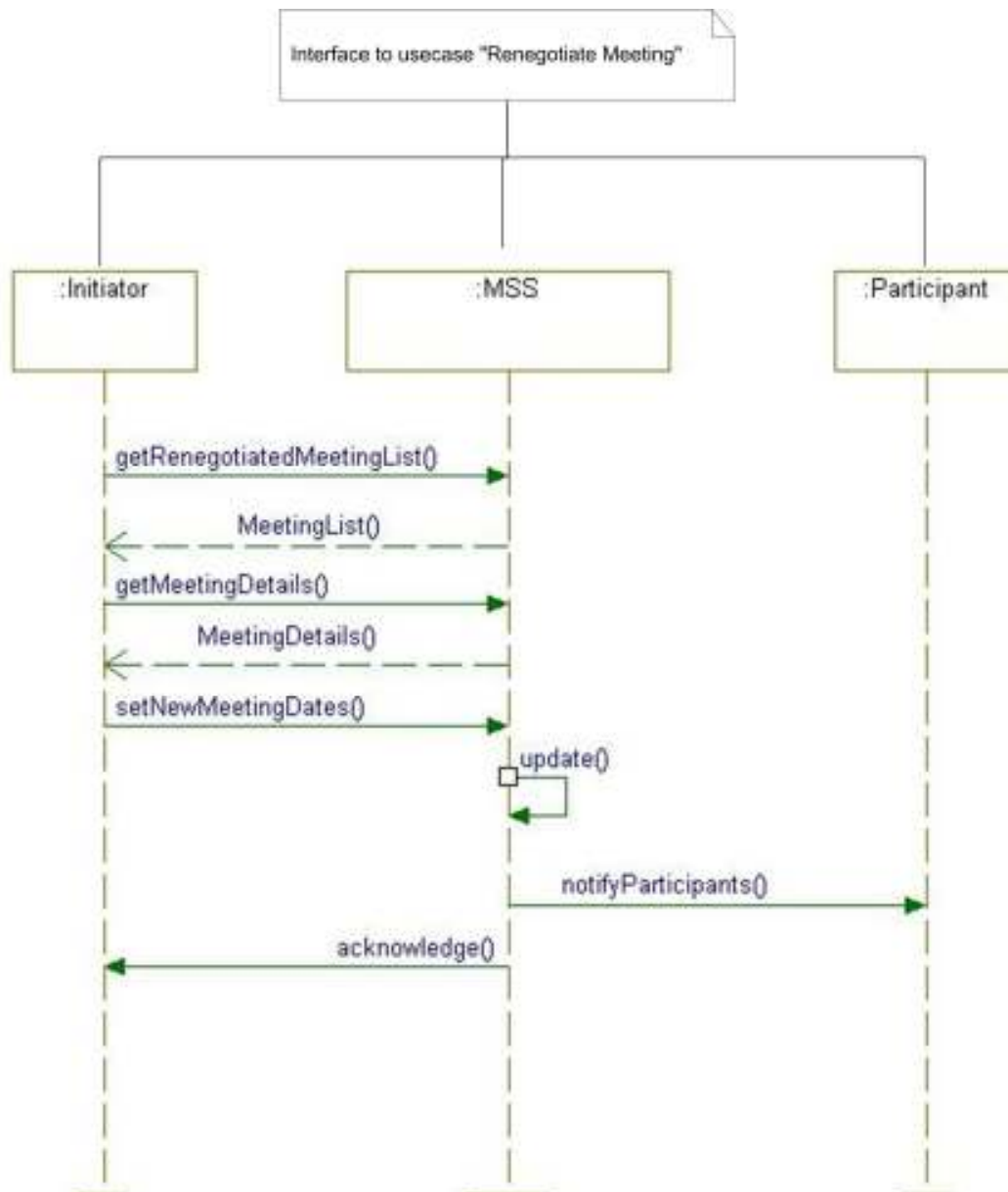
### c. Add Preference Set



1. The participant, on receiving a meeting invite can suggest his own preference set.
2. MSS validates the specified dates against the availability of rooms displays the results to the participant.
3. The participant confirms the desired dates and rooms.
4. MSS updates the related database entries of the meeting.

**d. Active Participants – Request Equipments**

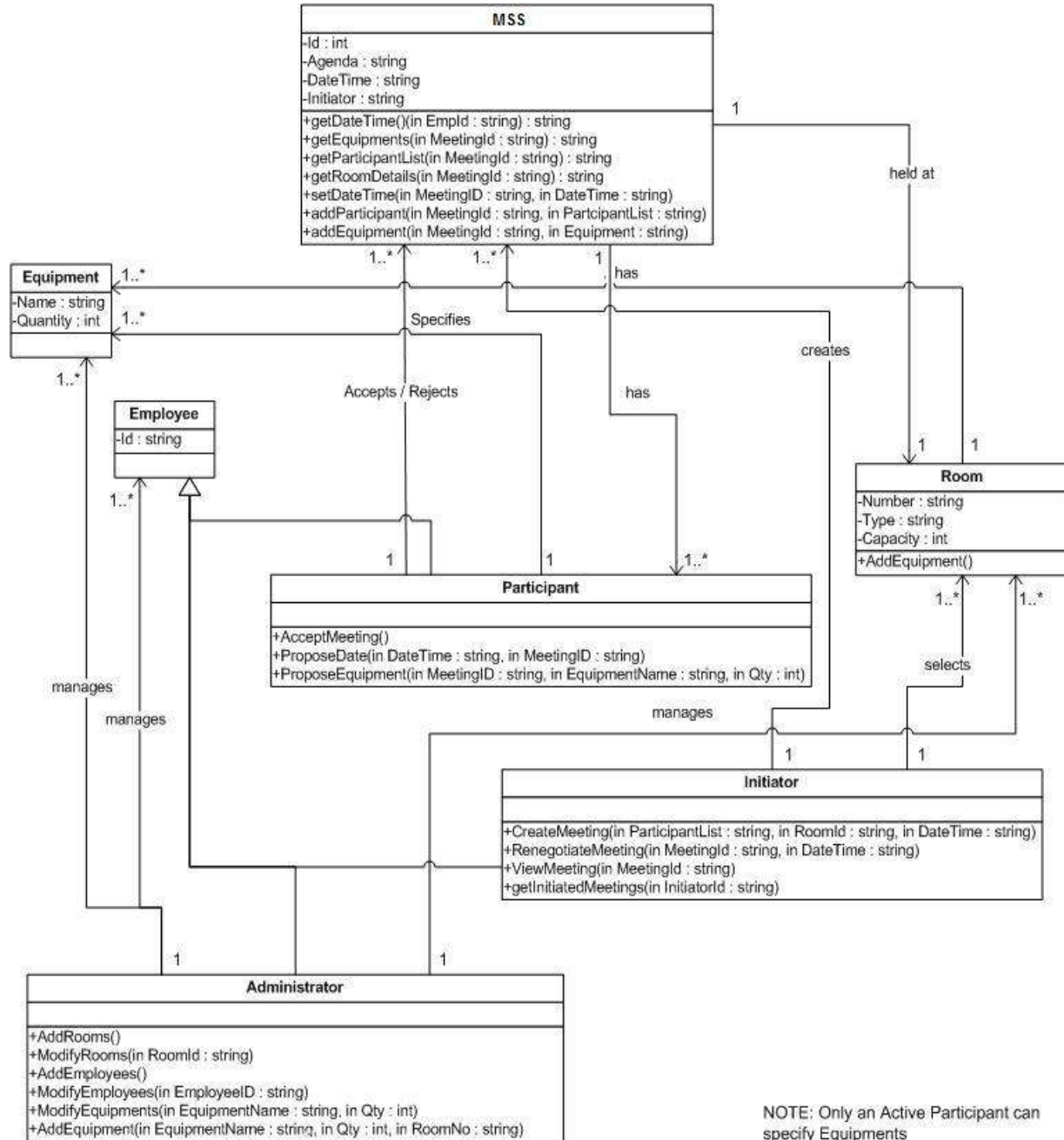
1. The participant (active) can view the list of meetings he is invited to through the MSS.
2. The participant selects a particular meeting and the MSS responds with the complete details of the meeting.
3. The participant accepts the meeting request and selects the rooms that he wishes to suggest.
4. The MSS send the response to the initiator and acknowledge the same to the participant.

**e. Renegotiate Meeting**

1. The initiator views the participant responses in the MSS and decides to either renegotiate or confirm a meeting.
2. To renegotiate a meeting, the initiator views the dates suggested by the participants, selects a date and updates the MSS.
3. The MSS notifies the participants of the renegotiation of the meeting.
4. MSS send the related acknowledgement to the initiator.



## 3.6 Class Diagram



#### 4. Product Issues and Solution

Following issues were identified from the requirements changed by SynergySoft Inc. as part of requirement refinement.

**Issue I:**

Meeting location should be 'convenient'.

- During requirement negotiation SynergySoft Inc. proposed a requirement that meeting location should be 'convenient'. However, the term 'convenient' demands further description. A location can be convenient to initiator, participants or active participant.

Further analysis suggests that decision maker for meeting location should be considered. This issue can be referred from first phase final deliverable under section '3.3 Issues and solution', subsection titled 'Unrealistic Requirements', issue number **ISU-13-EFR-5**.

Moreover, another possible interpretation can be in terms of preference negotiation with participant regarding meeting location. This issue was covered in first phase final deliverable and can be located under section '3.3 Issues and solution' sub section, issue number **ISA-2-EFR-5**.

Solution:

- This requirement was considered as a part of first phase final deliverable and can be located at '3.4 Enterprise Non-Functional Requirements (Initial Understanding)', ENFR-6.

**Issue II:**

Some meetings are organized and scheduled at the same time where partial attendance can be allowed.

Solution:

- Meeting scheduler system avails facility to schedule a meeting, it does not manage time schedule of the user. Hence, the system does not keep any restriction over the timing of the meetings. The user can schedule meetings with over-lapping timings.

**Issue III:**

Information about meeting should be secure.

1. Information about meeting should not be accessible by the user outside an organization.
2. Meeting data should not be visible to an employee who is not a participant of a meeting.
3. Meeting data implies preference set, location, resources, and timing of a meeting.

**Solution:**

1. Meeting Scheduler System can only be used by authenticated users. The system requires each user to login, hence user that is not part of organization or not authorized to access system cannot view data of the meeting.

2. A participant can only view data of a meeting that is relevant to him. Participant can only view preferred data provided by initiator. A participant does not know the preference set provided by other participants or active participant. Hence, meeting data is not accessible by other participant. However, initiator and administrator has are potential user to access meeting data. This information can be located in first phase final deliverable 4.1 Function Requirement, topics 9, 17 and 18.

3. SynergySoft Inc. is required to validate inference of meeting information that should be secured and is limited by preference set, location, resources and timing of a meeting.

**Issue IV:**

End users of MSS are not clearly defined. The system may come to interest of various users. Following were the possible solutions with trade off of system considerations.

1. System can be availed to General Public for open use

Advantages:

- System compounds large number of users.

Disadvantages:

- SynergySoft has to bear cost for data storage and services for scheduling.
- Unique identification becomes difficult.
- System is exposed to everyone causing security vulnerability to the system.
- System requirements might extensively vary.
- Each user has to be communicated independently.

2. The system can propose enterprise-wide usage.

Advantages:

- The system is used by employees of the enterprise.
- Cost of hardware and storage can be endured by the organization.
- Contractual purchasing is possible.
- Maintenance support can be offered.

Disadvantages:

- Users are limited by organization body capacity.

**Solution:**

Considering above tradeoffs, organization wide product development is to the best benefit to SynergySoft Inc.

Moreover, following is a brief memo received from General Manager during negotiation with SynergySoft Inc.

“As executives in organization confront major difficulty in scheduling meetings, considerable market revenue is beheld in business with an organization. It is very difficult to establish patronage in general public and maintaining their information is not scope and consideration of SynergySoft Inc.”

Considering trade off the product shall be developed with the perspective of organizational usage.

**Issue V:**

The goal to build a maintainable system can be defined using various attributes that make software easier to maintain. These include modularity, self (internal) documentation, code readability, and structured coding techniques. These same attributes also improve sustainability, the ability to make improvements to the software making the system more testable, modifiable and understandable.

The team has to prioritize the attributes to be achieved while developing the system.

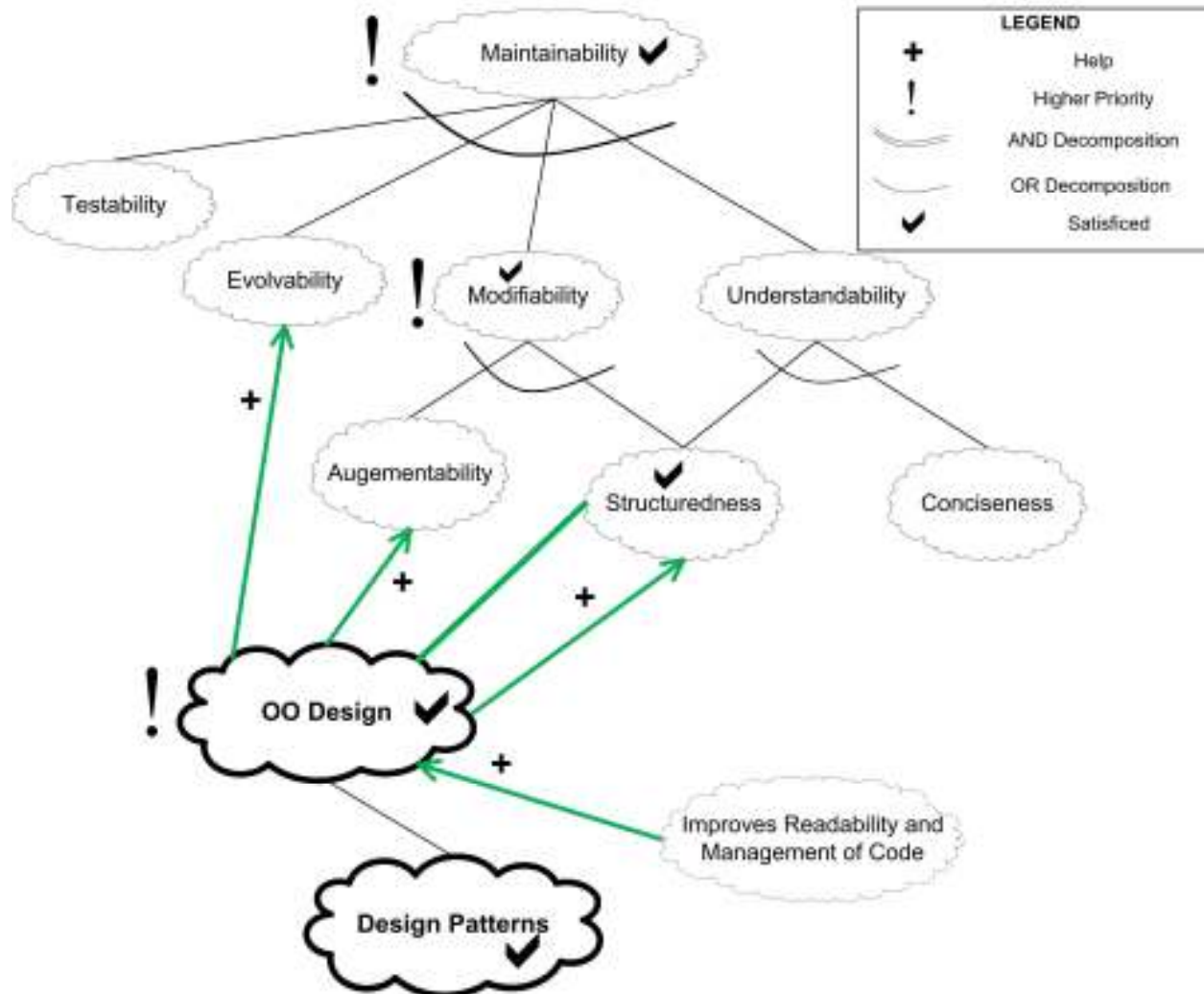
**Solution:**

Considering the time constraints the team shall develop the MSS with a user-friendly Graphical User Interface. The team shall use structured coding techniques thus making the code modular, modifiable and more readable.

## 5. NFR Formal Specifications

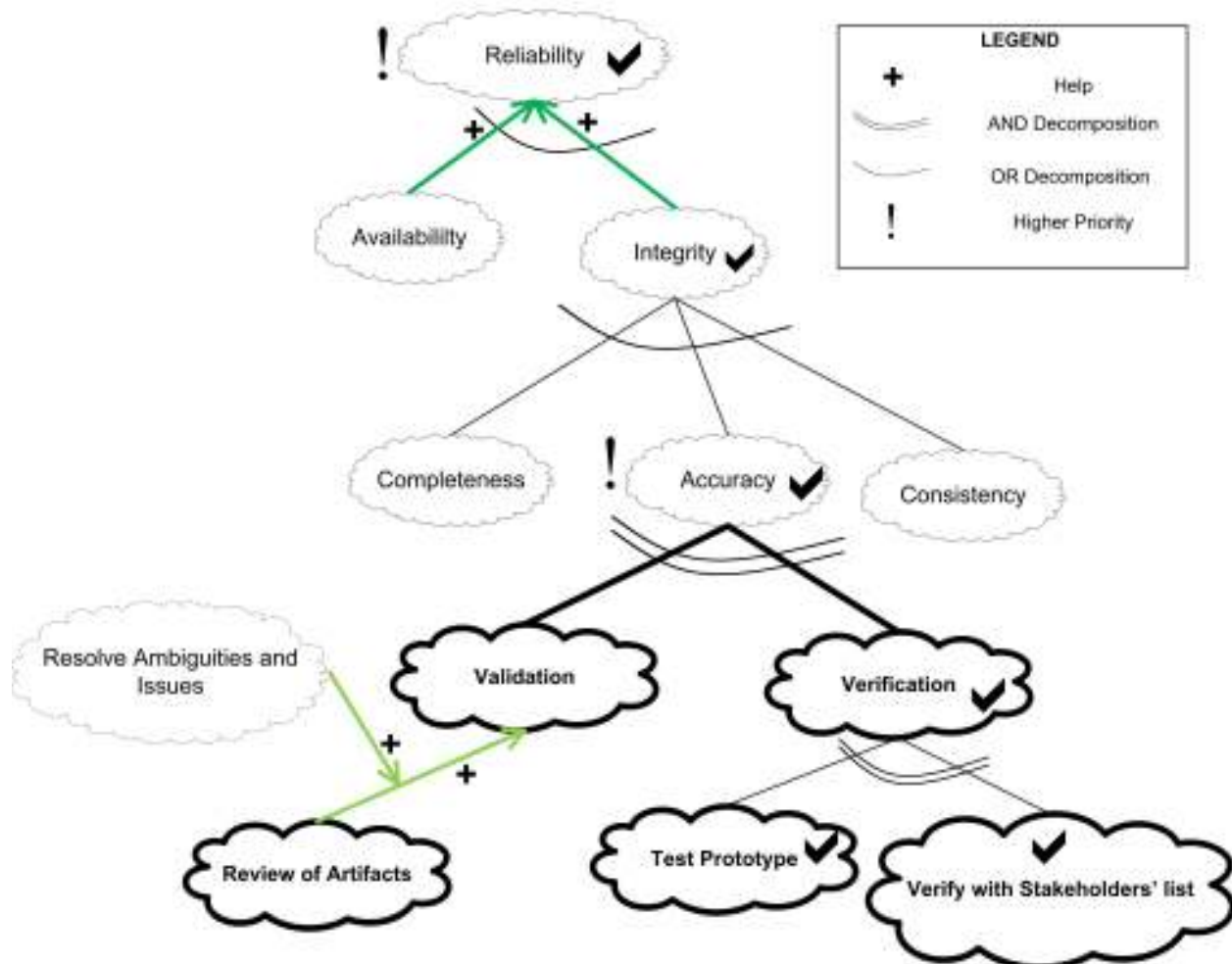
### 5.1 SIG for Process NFRs

#### Maintainability



1. The NFR of maintainability is decomposed into testability, evolvability, modifiability and understandability of which modifiability deserves higher priority due to the nascent nature of the application.
2. Modifiability is in turn decomposed into augmentability and structuredness. Structuredness is also a part of decomposition of understandability, the other decomposition being conciseness.
3. We prioritize structuredness as it helps achieve both modifiability and understandability.
4. We prioritize an Object Oriented design as it achieves code readability and management along with structuredness, augmentability and evolvability.

## Reliability

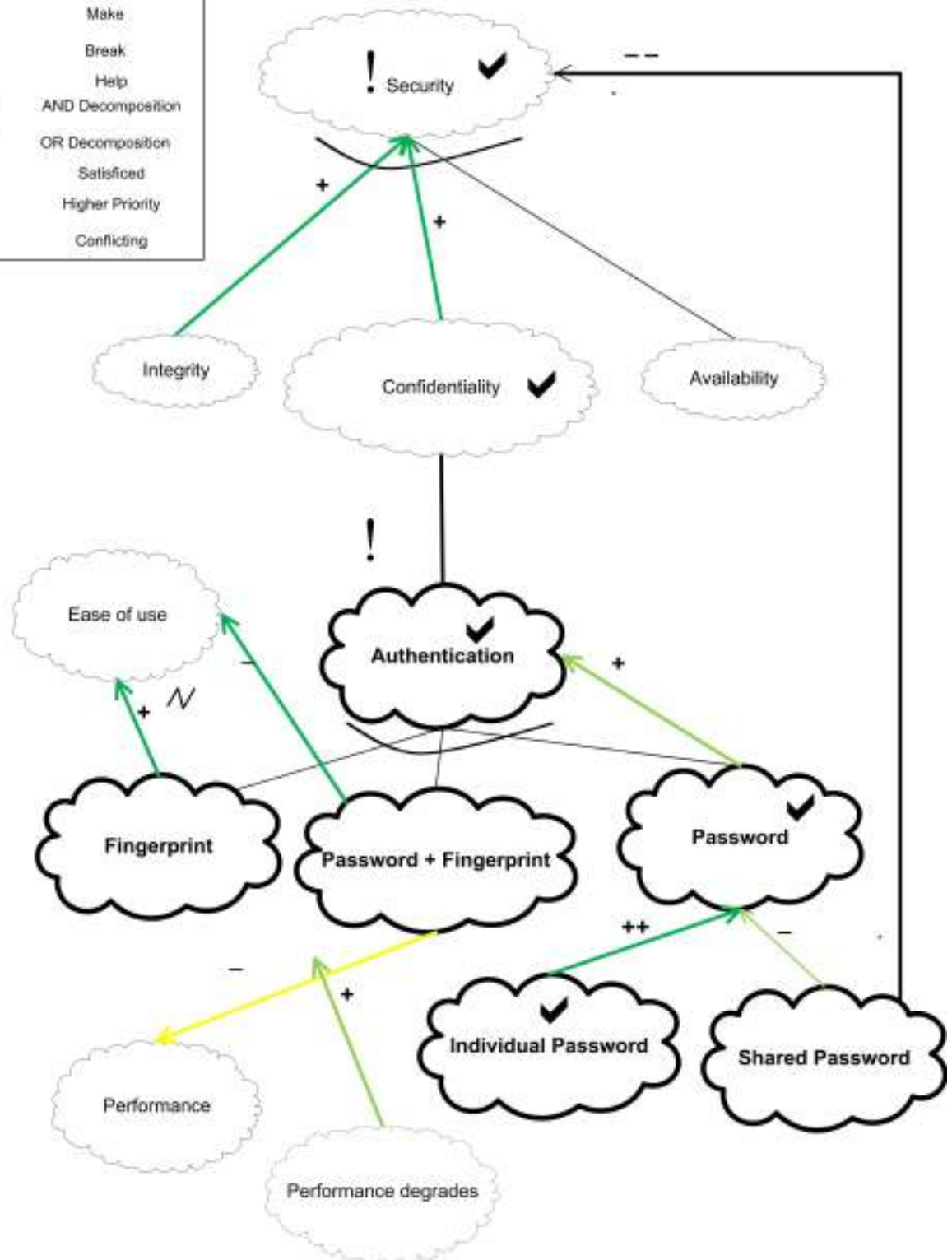
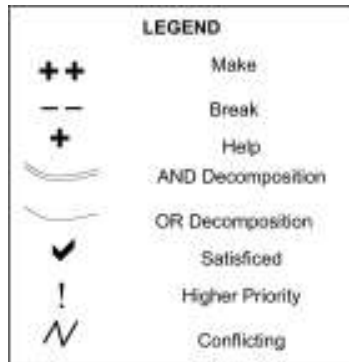


1. The NFR of reliability is decomposed into availability and integrity. It deserves a high priority as the application deals with schedules.
2. We prioritize integrity and decompose it into completeness, accuracy and consistency.
3. Accuracy of the results being of high priority, we aim to achieve it through validation and verification.
4. Validation includes review of all project related artifacts thus removing any chances of ambiguities and issues.
5. Verification includes development of test prototype and stakeholder verification.

## 5.2 SIG for Product NFRs

### Security

1. The highest priority NFR for a company internal application is security.
2. We decompose security into integrity, confidentiality and availability.
3. Under security we prioritize confidentiality and interpret it as authentication.
4. Authentication can be achieved through a fingerprint authentication OR a fingerprint + password authentication or simple password authentication.
5. Using a fingerprint authentication degrades the performance of the system and conflicts with the ease of use of the application. Using a combination of fingerprint and password is also an additional overhead. So, we choose a simple password authentication for MSS.
6. This password authentication is in turn achieved through individual password access not shared password access.





### 6. Traceability Matrix

Functional Req.	Issue	Options	Solution	System Specification	Implementation *ScreenShot
EFR-1	ISR-6-EFR-1		ISR-6-SOLF	IU-F-1 IU-F-7 IU-F-8	SS4 SS6 SS6
EFR-2				IU-F-1	SS4
EFR-3				IU-F-7	SS6
EFR-4	ISA-1-EFR-4 ISI-9-EFR-4	ISA-1-OP-1F ISA-1-FOP-2F ISI-9-OP-1F ISI-9-OP-2F ISI-9-OP-3F ISI-9-OP-4F ISI-9-OP-5F ISI-9-OP-6F	ISA-1-SOLF ISI-9-SOLF	IU-F-8	SS6
EFR-5	ISA-2-EFR-5 ISU-13-EFR-5	ISA-2-OP-1F ISU-13-OP-1F ISU-13-OP-2F ISU-13-OP-2.1F ISU-13-OP-2.2F ISU-13-OP-2.3F	ISA-2-SOLF ISU-13-SOLF	IU-F-7, IU-F-8	SS6
EFR-6				IU-F-7, IU-F-8, IU-F-11	SS6
EFR-7	ISA-3-EFR-7	ISA-3-OP-1F ISA-3-OP-2F	ISA-3-SOLF	IU-F-11	SS14
EFR-8	ISU-15-EFR-8 ISU-14-EFR-8.1	ISU-14-OP-1F ISU-14-OP-2F	ISU-14-SOLF ISU-15-SOLF	IU-F-7, IU-F-8, IU-F-11, IU-F-13, IU-F-16, IU-F-17	SS6, SS8, SS9, SS10



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Functional Req.	Issue	Options	Solution	Improved understanding	Implementation
EFR-9				IU-F-4	SS4
EFR-10				IU-F-3, IU-F-8	SS6
EFR-11	ISI-10-EFR-11		ISI-10-SOLF	IU-F-5	SS4, SS13
EFR-12	ISA-4-EFR-12	ISA-4-OP-1F ISA-4-OP-2F ISA-4-OP-3F	ISA-4-SOLF	IU-F-1	SS4
EFR-14					SS8
EFR-15	ISA-5-EFR-15.1 ISA-5-OP-2F	ISA-5-OP-1F	ISA-5-SOLF	IU-F-11, IU-F-6	SS8, SS9
EFR-16				IU-F-2	SS4
EFR-17				IU-F-1	SS1
Issue I	ISU-13-EFR-5 ISA-2-EFR-5		Isu-I-Soln	Issue I	NA
Issue II	ENFR-6	ISU-I-op-1	Isu-II-Soln	Issue II	SS6
Issue III	EFR-9 EFR-17 EFR-18	ISU-I-op-1	Isu-III-Soln	Issue III	SS1
Issue IV	Issue IV	ISU-I-op-1 ISU-I-op-2	Isu-IV-Soln	Issue IV	NA
Issue IV	Issue IV	ISU-I-op-1	Isu-V-Soln	Issue IV	NA

**\*\* Refer to Appendix for EFRs**

## 7. Scenarios

Two scenarios are discussed here:

1. **Success scenario** – no conflict and meeting scheduled successfully.

In this scenario the initiator sends initial preference set and meeting details to all the participants including active participants. The participants receive notification mail. The participant logs into the system and either accepts or rejects the meeting invite and gives his own preference set.

The initiator receives the response of all the participants. As there exist no conflict in the preference sets initiator schedules the meeting.

2. **Conflict scenario** – conflict occurs in preference set and thus meeting re-scheduled or renegotiated.

In this scenario the initiator sends initial preference set and meeting details to all the participants including active participants. The participants receive notification mail. The participant logs into the system and either accepts or rejects the meeting invite and gives his own preference set.

The initiator receives the response of all the participants. Preference sets of all the participants are different and thus no consensus can be derived and thus initiator has to Re-Negotiate the meeting.

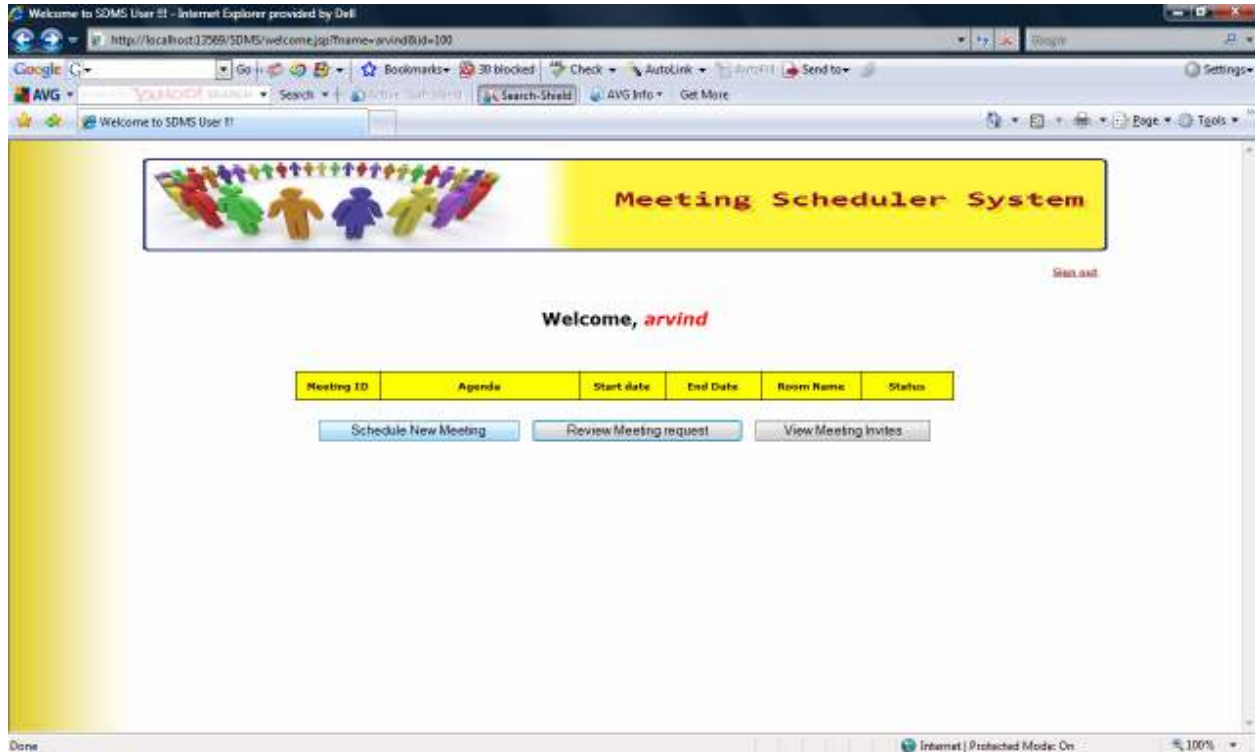
### Success Scenario



The initiator enters his Employee ID and Password to enter into the system.

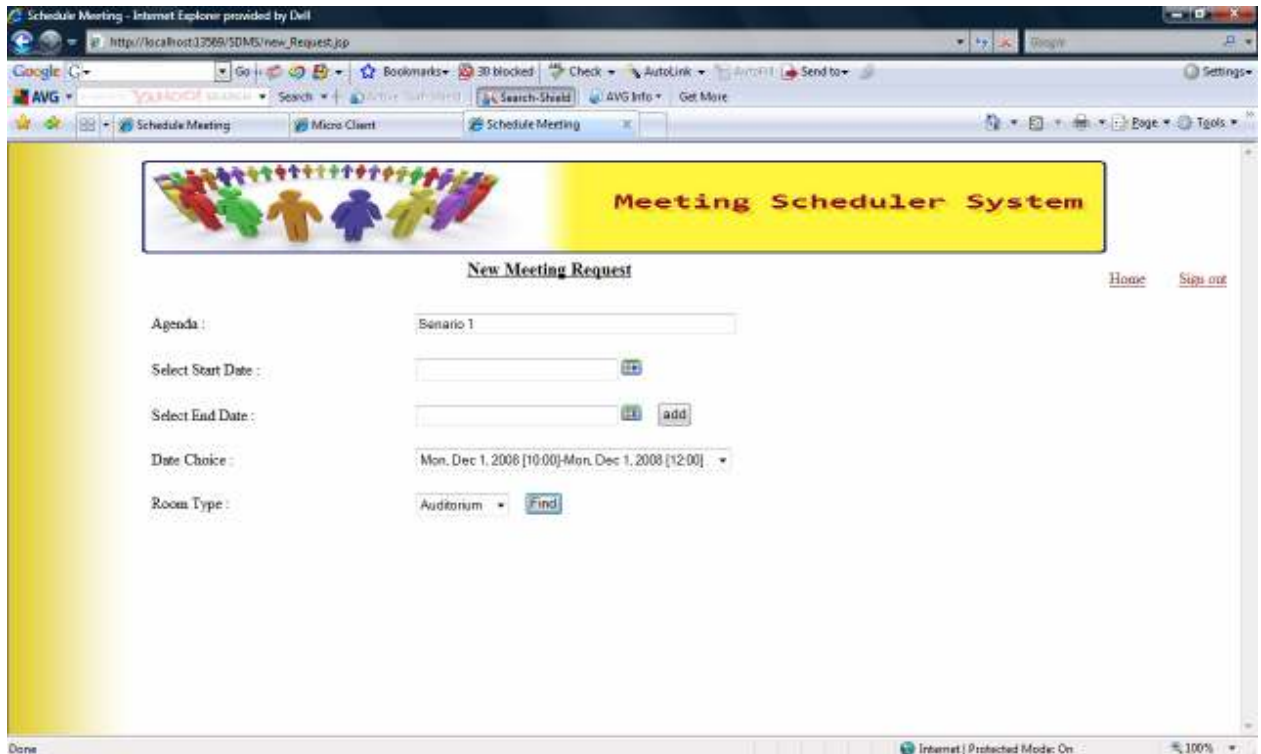
The system validates the Employee ID and Password, "Welcome page" is displayed to the user.

The initiator wants to schedule a meeting so he clicks on the schedule meeting button in the welcome page.



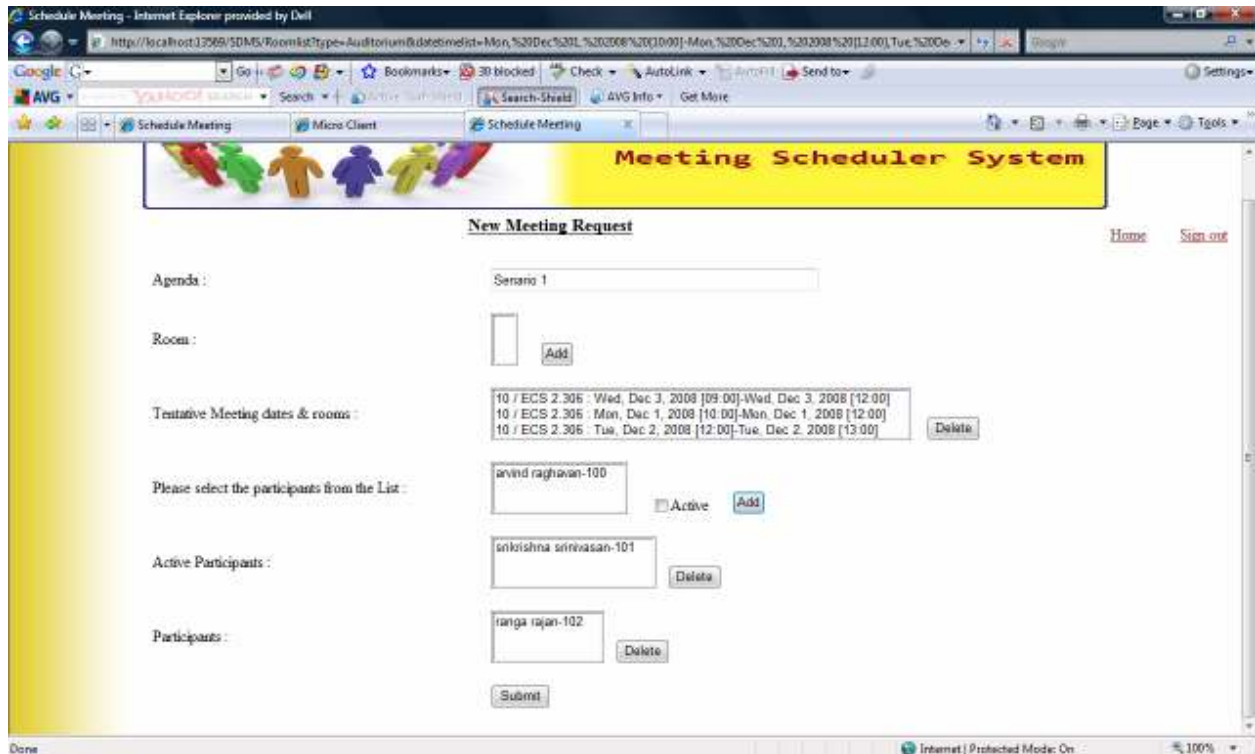
The New Meeting Request page gets displayed.

The user selects the agenda, Start Date, End Date and adds them into a list and selects the room type and searches for the available rooms on the particular date.

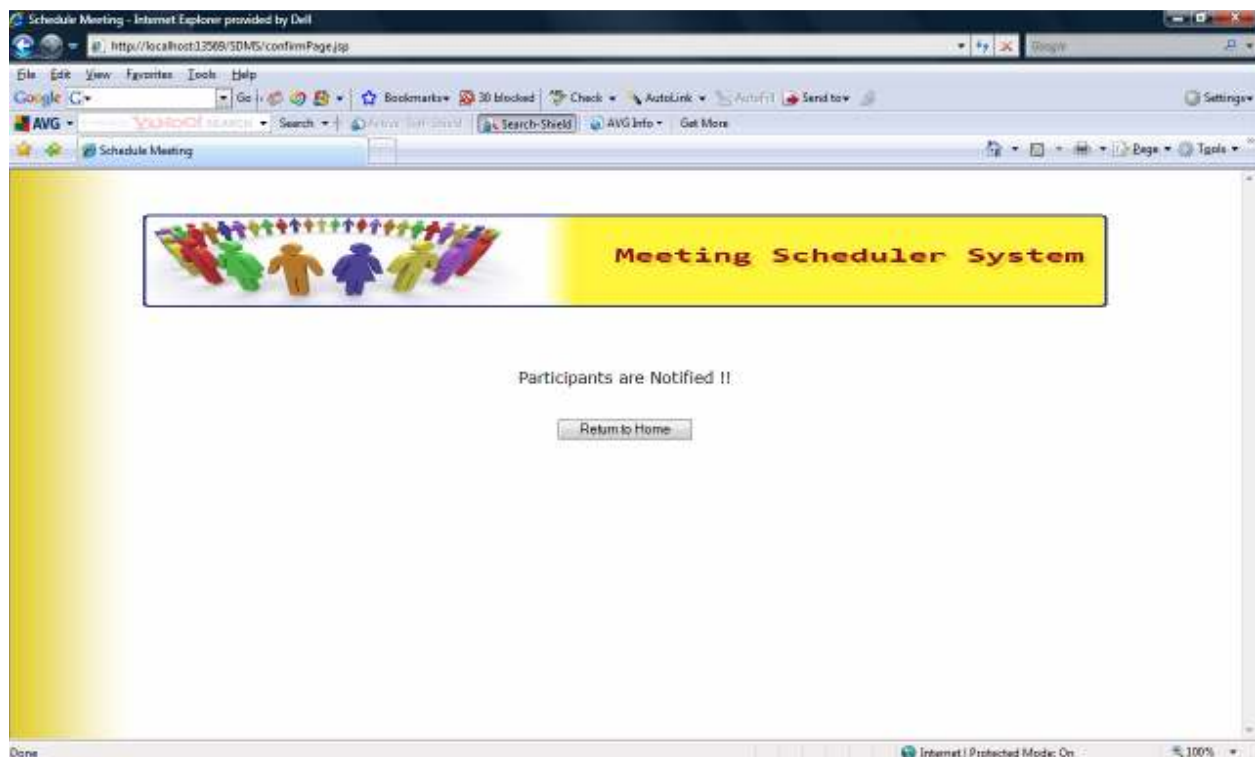


The system finds the rooms that are available for the particular dates and displays them in the next page.

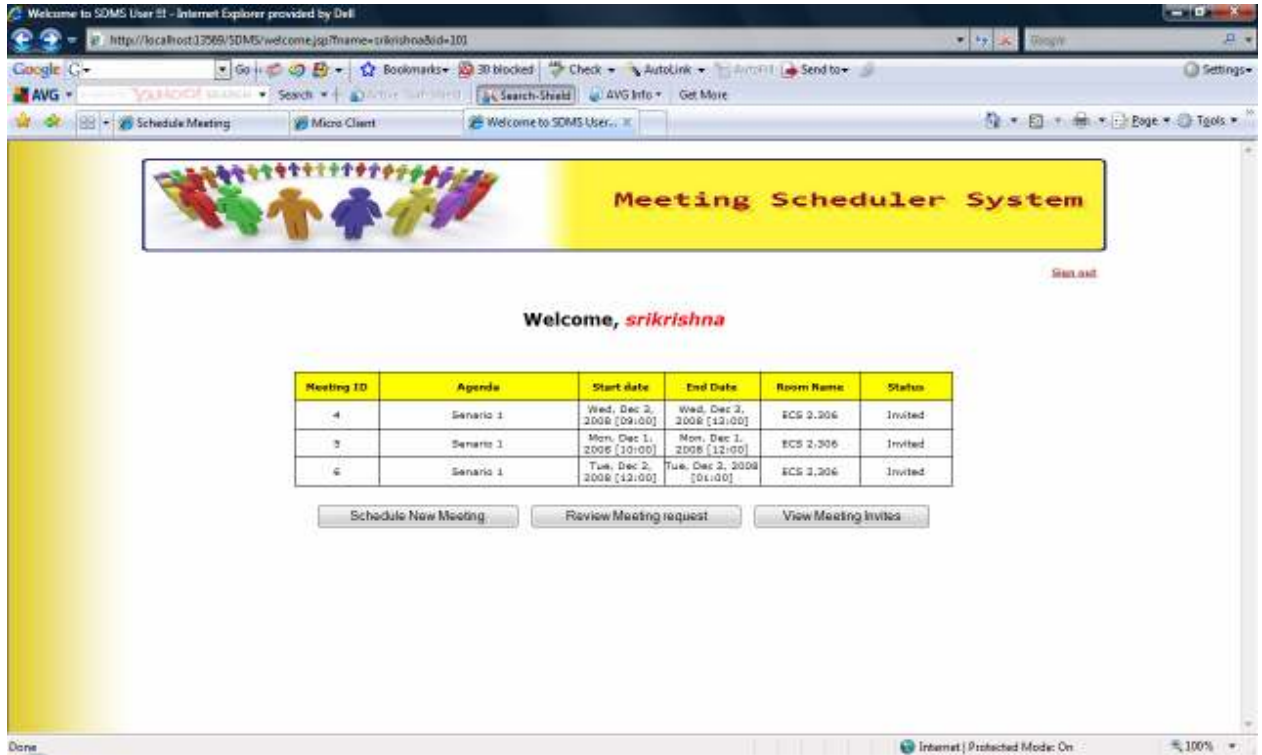
Now the initiator can select a maximum of three dates from the room list and add it to the tentative meeting dates and room list and enters the participants and the active participants and Submits.

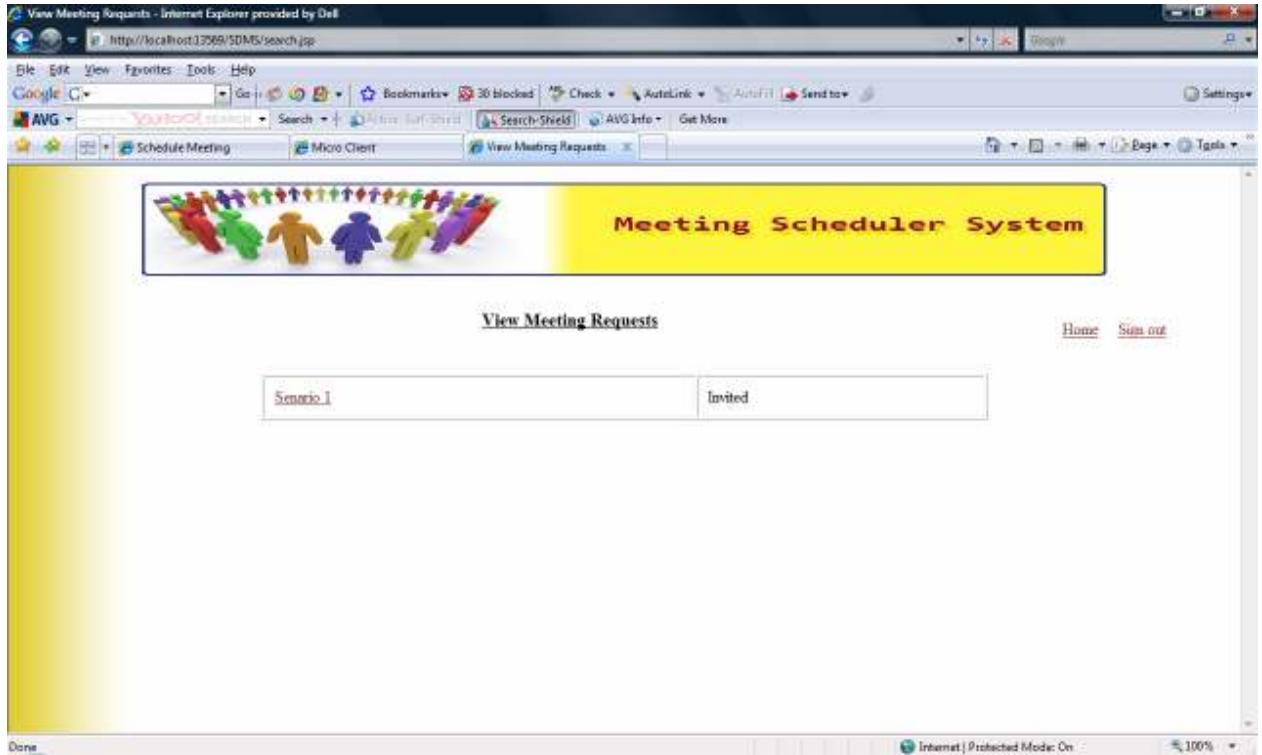


The System records all the information and creates the meeting Id and sends a mail to all the participants and active participants regarding the meeting details.

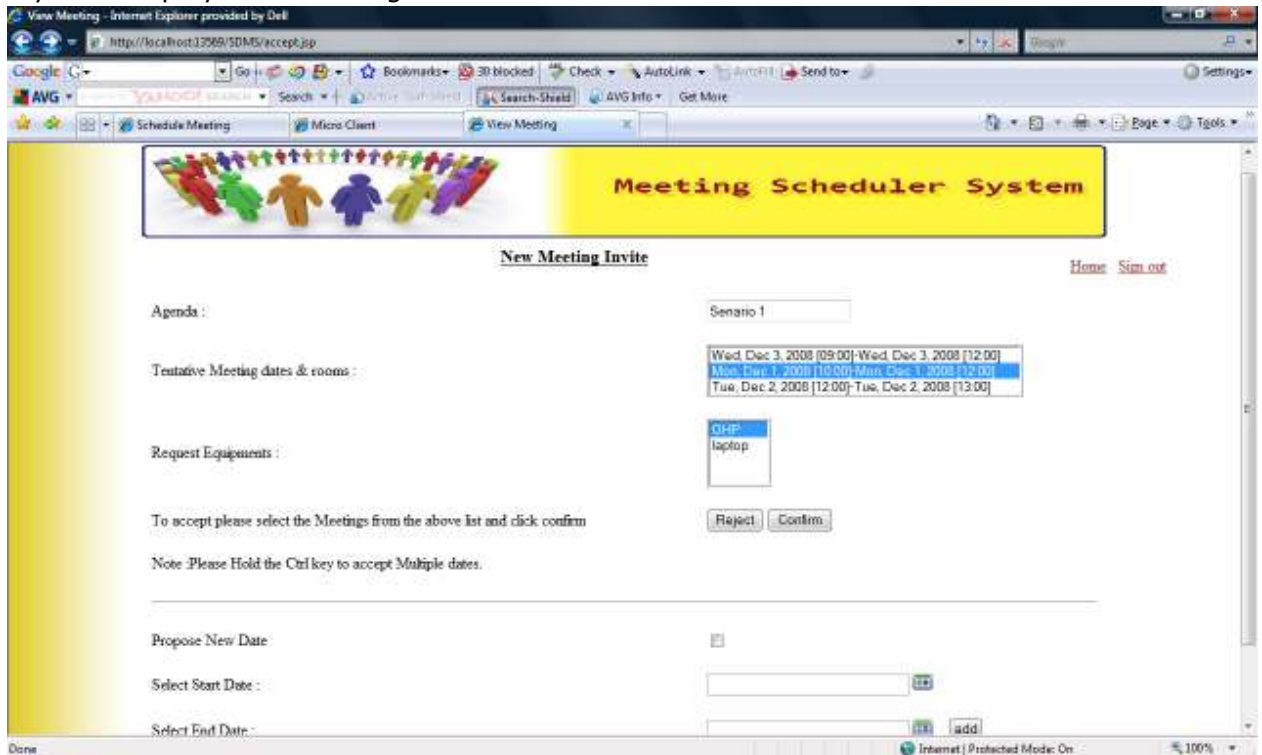


The participant enters into the system using his credentials and clicks on the “view meeting Invites” into order to view all the meeting requests pending for his approval.



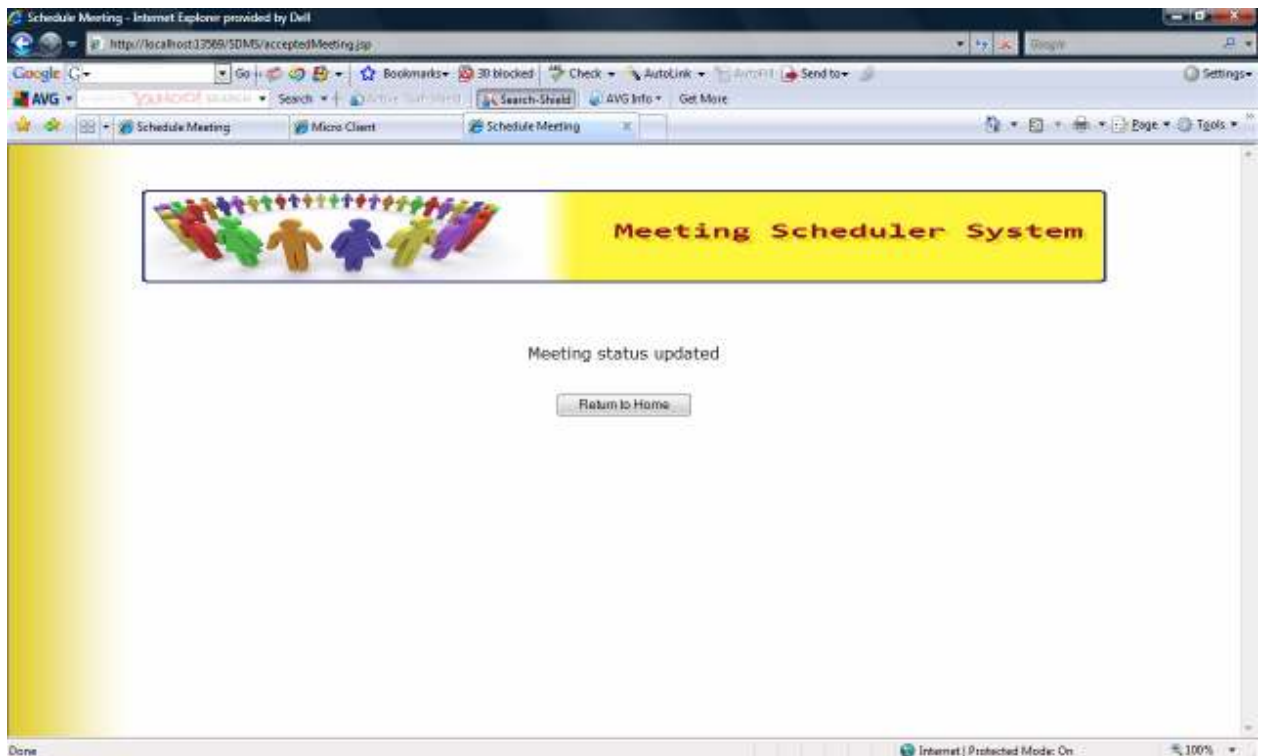


The participant clicks on the meeting id in order to view the meeting details.  
The system displays the meeting information.

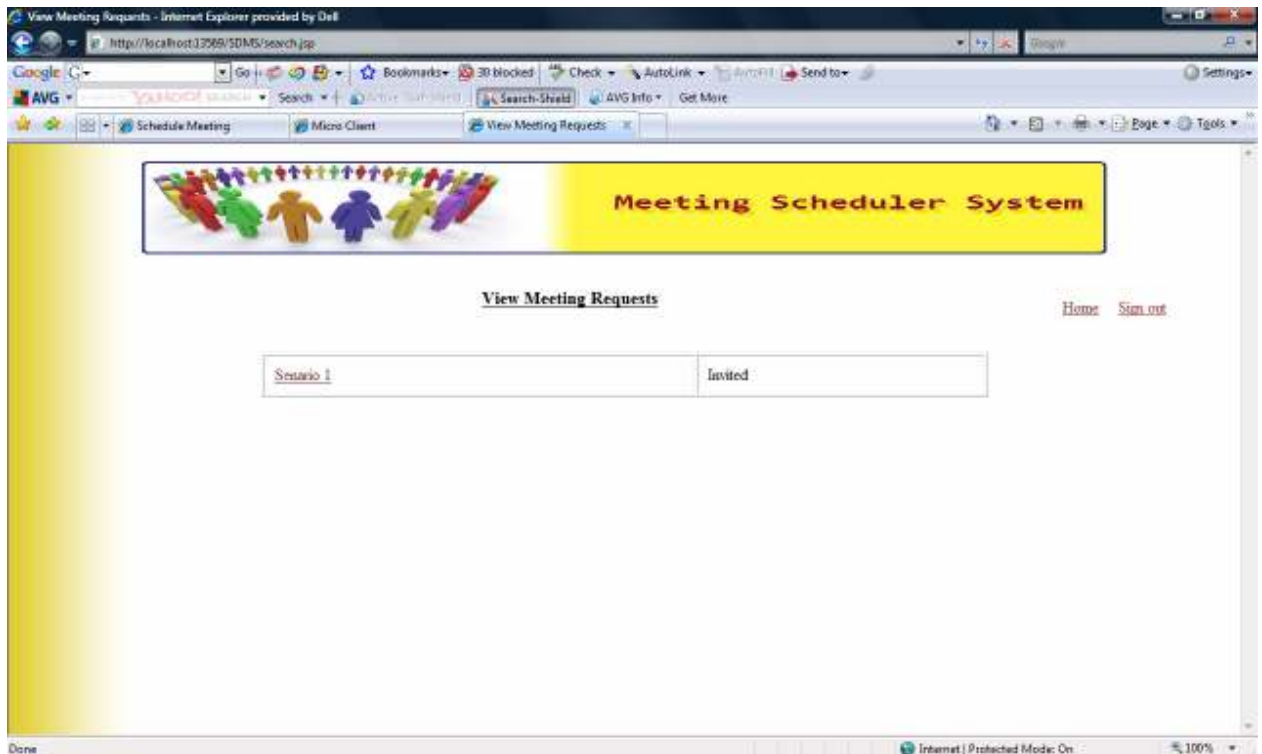
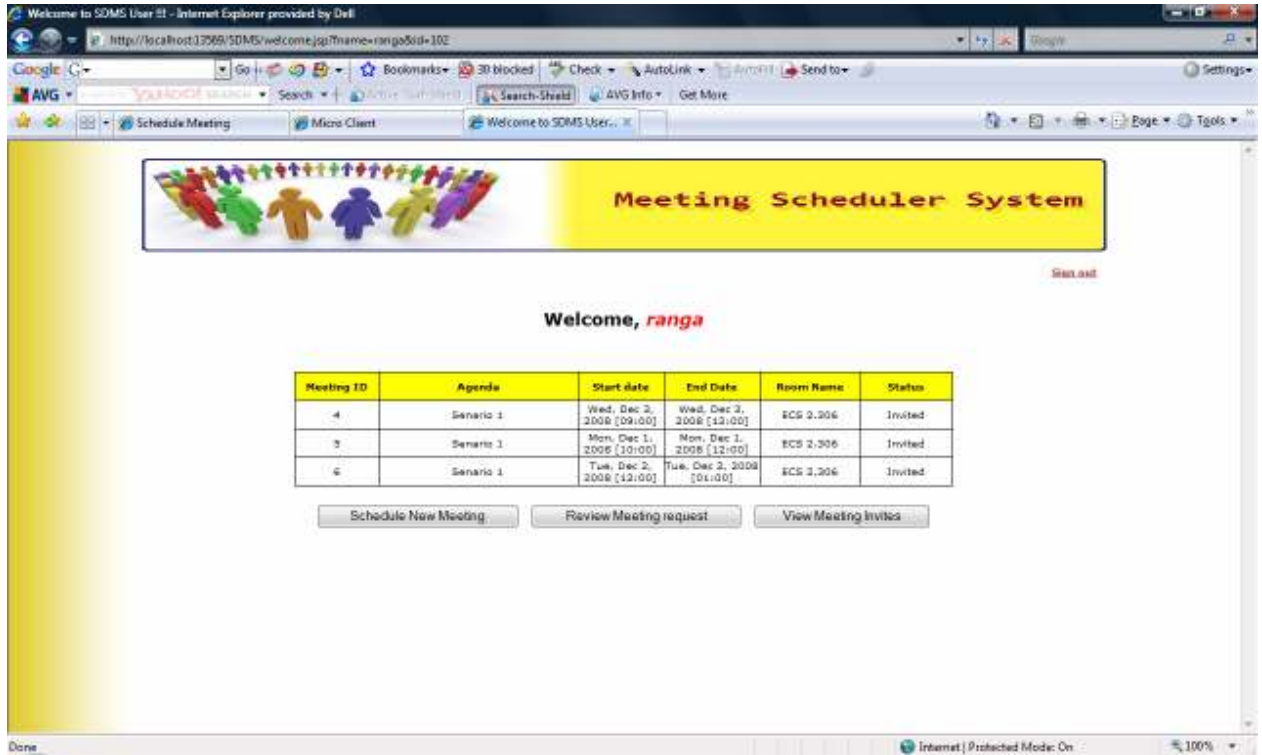


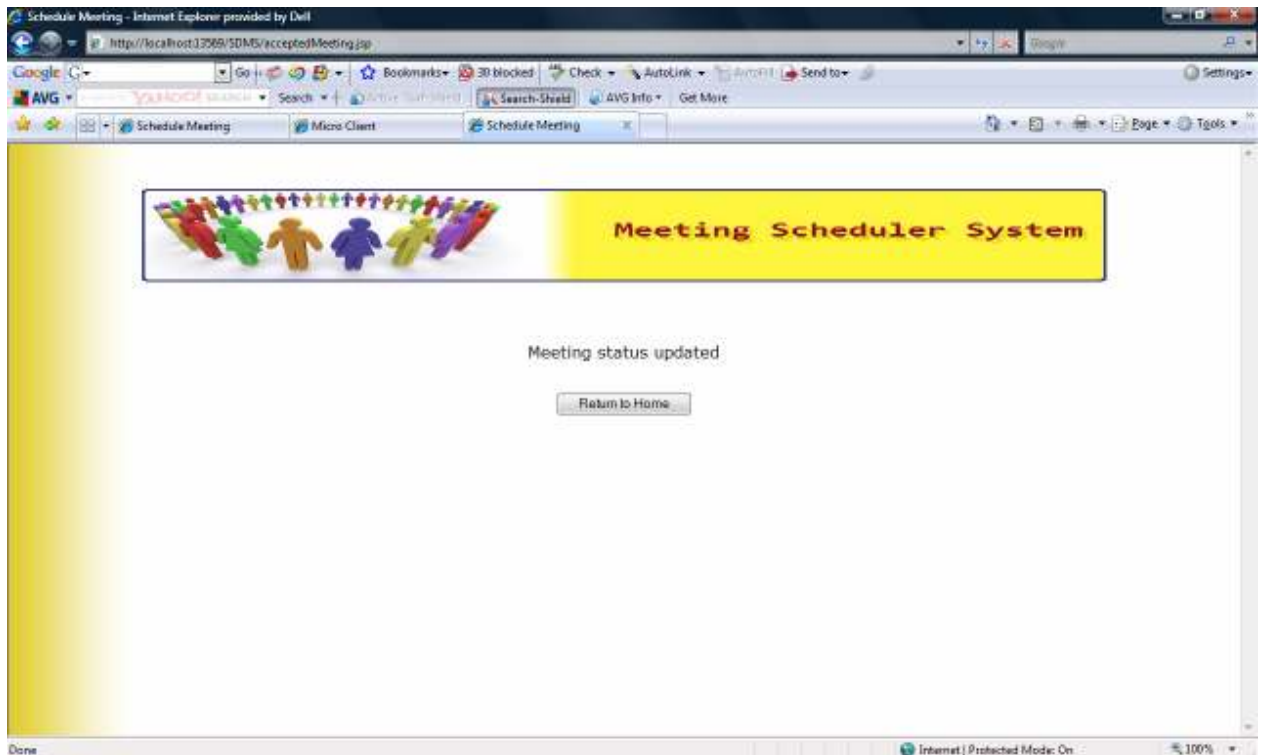
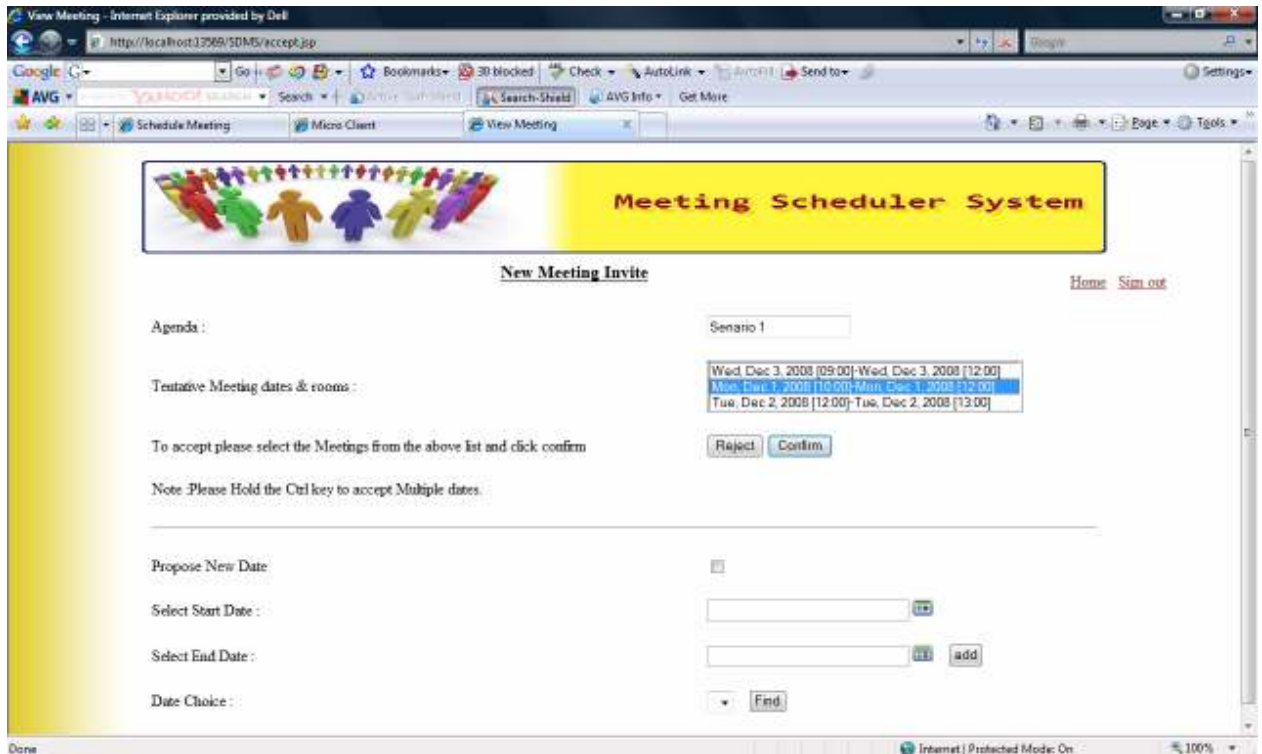


The user selects the dates in which he will be available and click on confirm button.



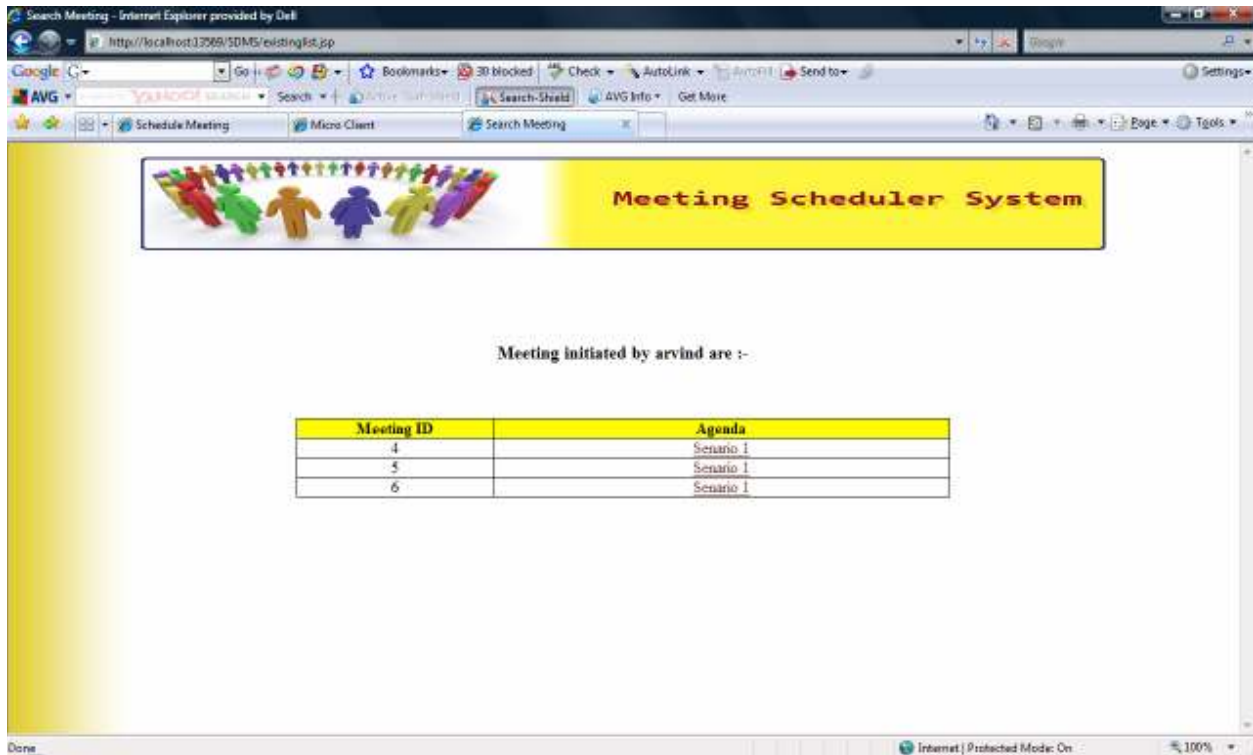
The system updates the users response and changes the status of the meeting. By doing the similar procedure from steps 9 – 13 the other users confirms the meeting requests.



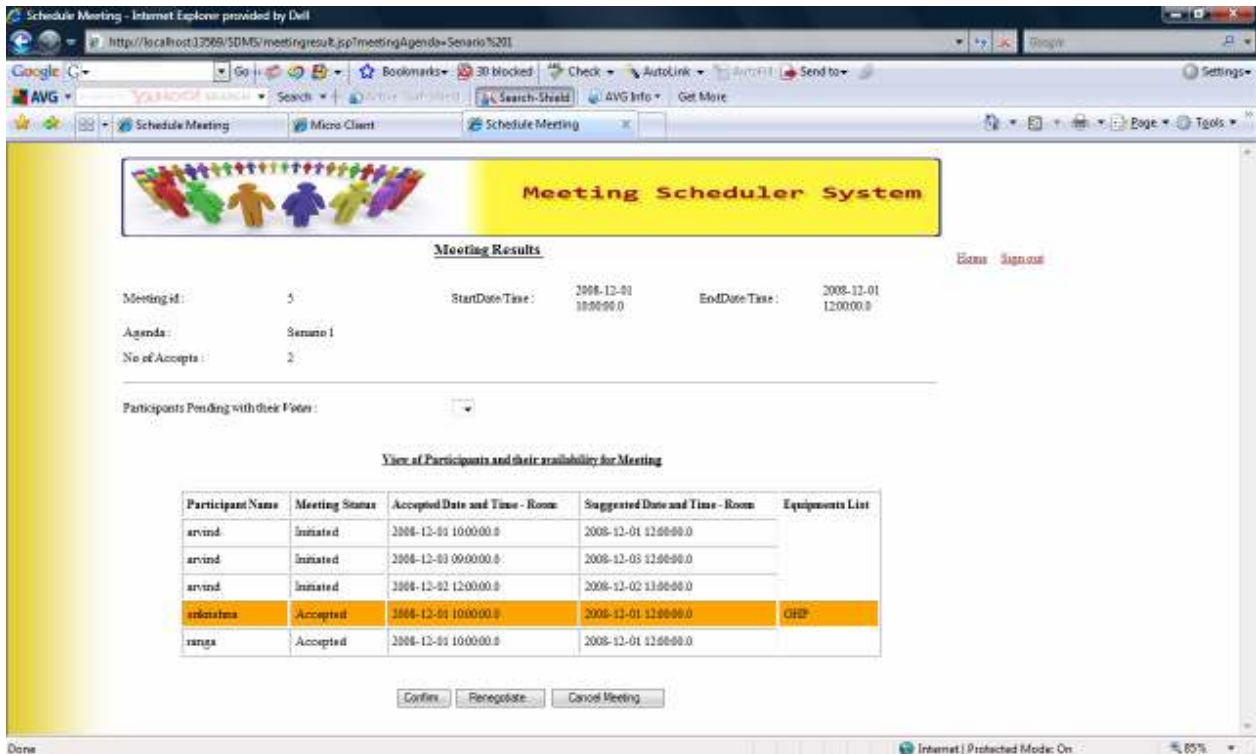


Now the initiator enters into the system and clicks on “review meeting request” button in order to view all the meetings statuses.

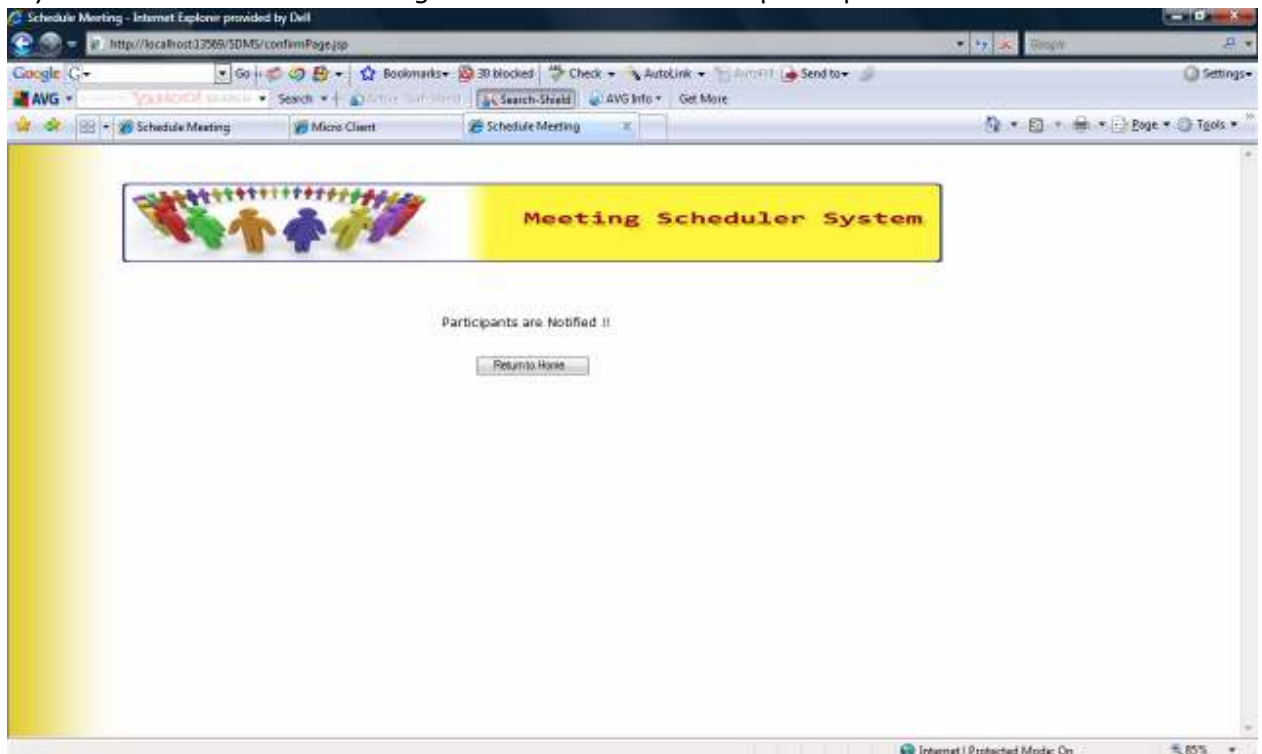
The system displays all the meeting information that the user has initiated.



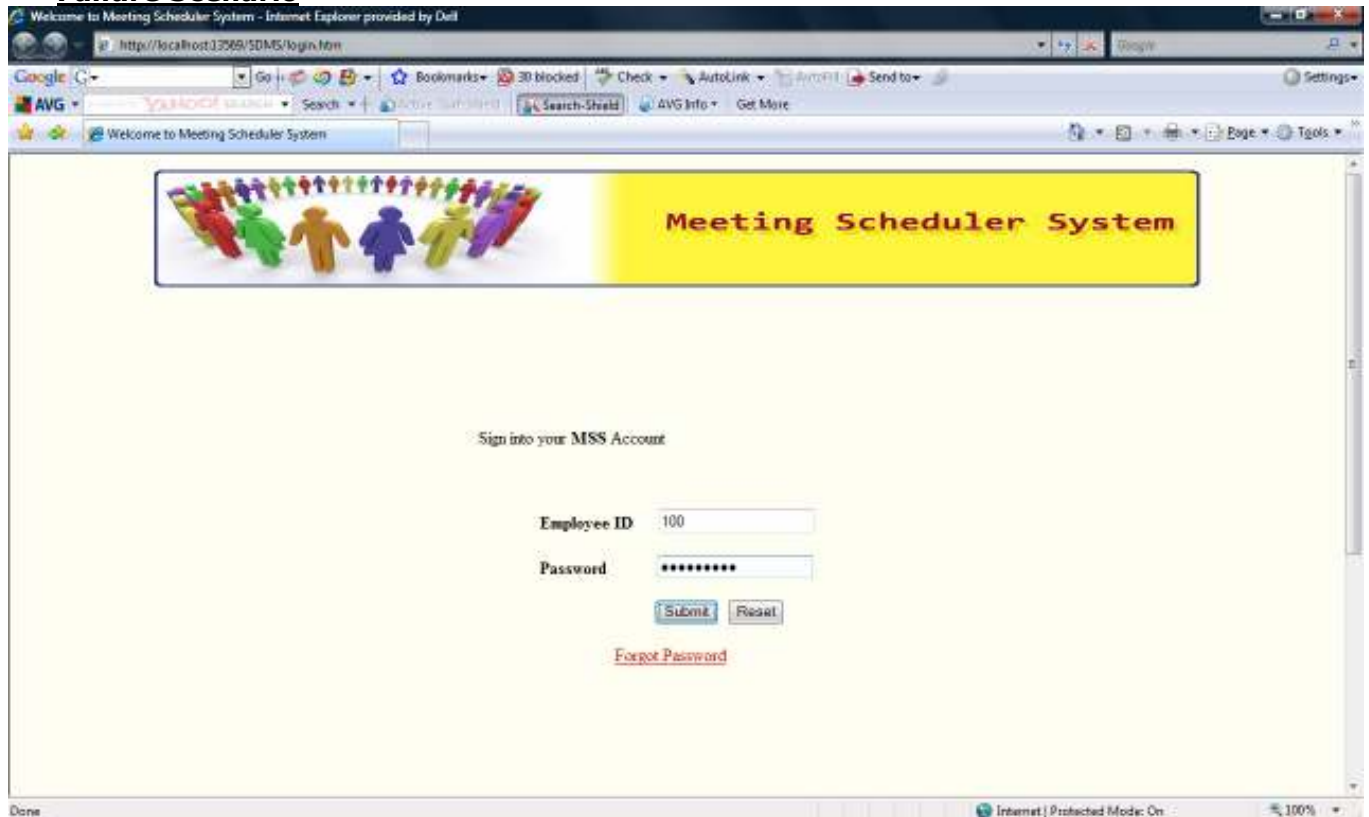
The user clicks on the agenda of the meeting in order to view the meeting status. The system displays the meeting results as shown below.



The initiator clicks on the "Confirm" button in order to confirm the meeting. The system displays dates of the maximum accept and the user confirms the meeting. The system sends confirm meeting mail to all the intended participants.



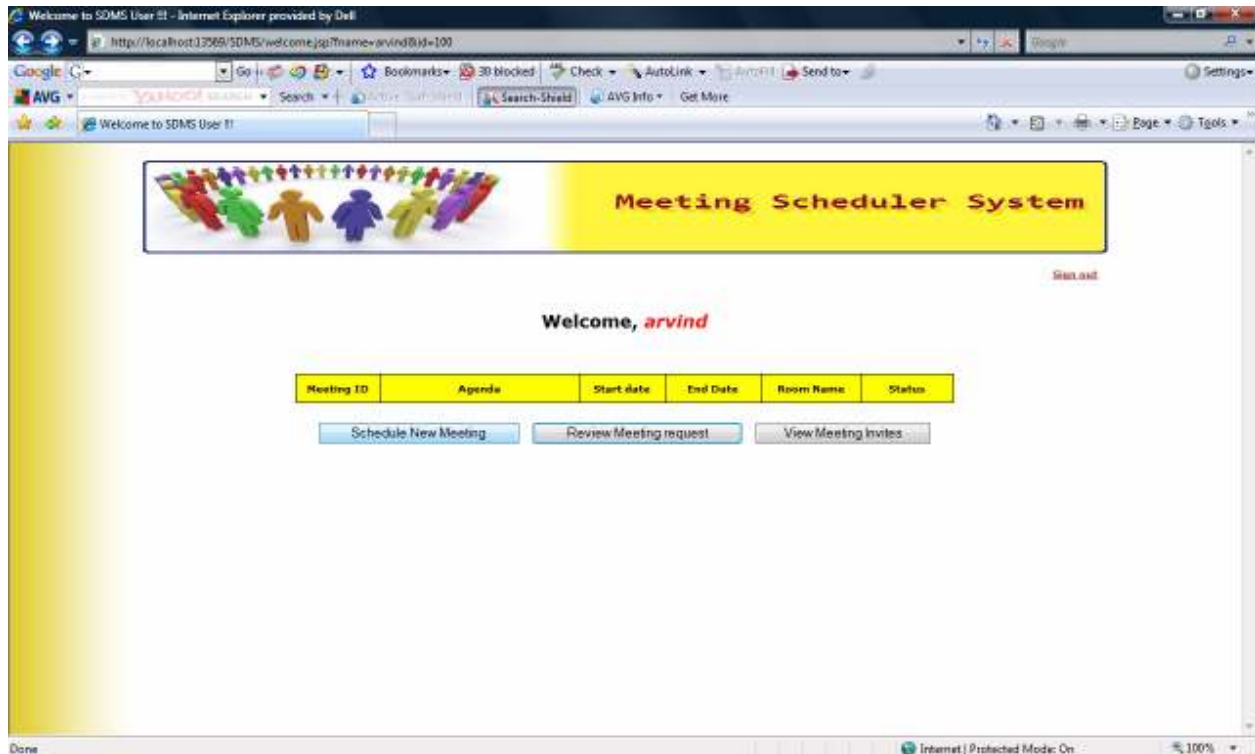
### Failure Scenario



The initiator enters his Employee ID and Password to enter into the system.

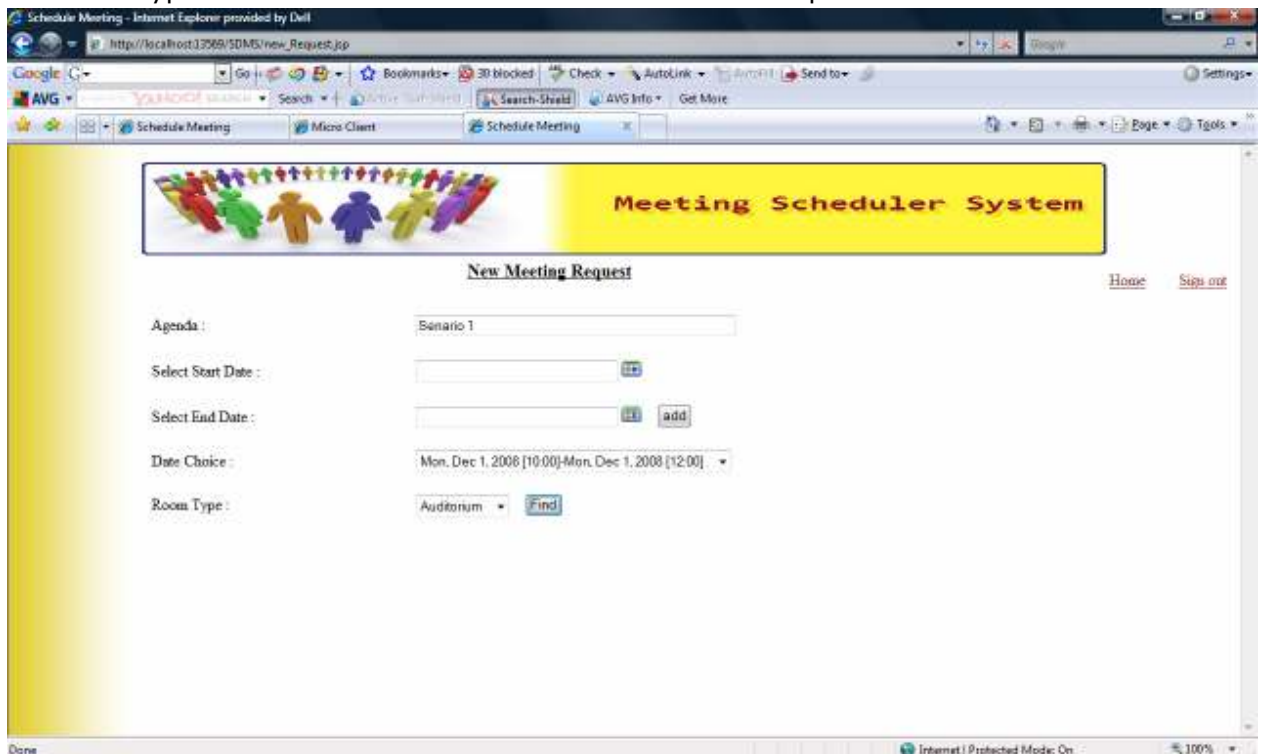
The system validates the Employee ID and Password, "Welcome page" is displayed to the user.

The initiator wants to schedule a meeting so he clicks on the schedule meeting button in the welcome page.



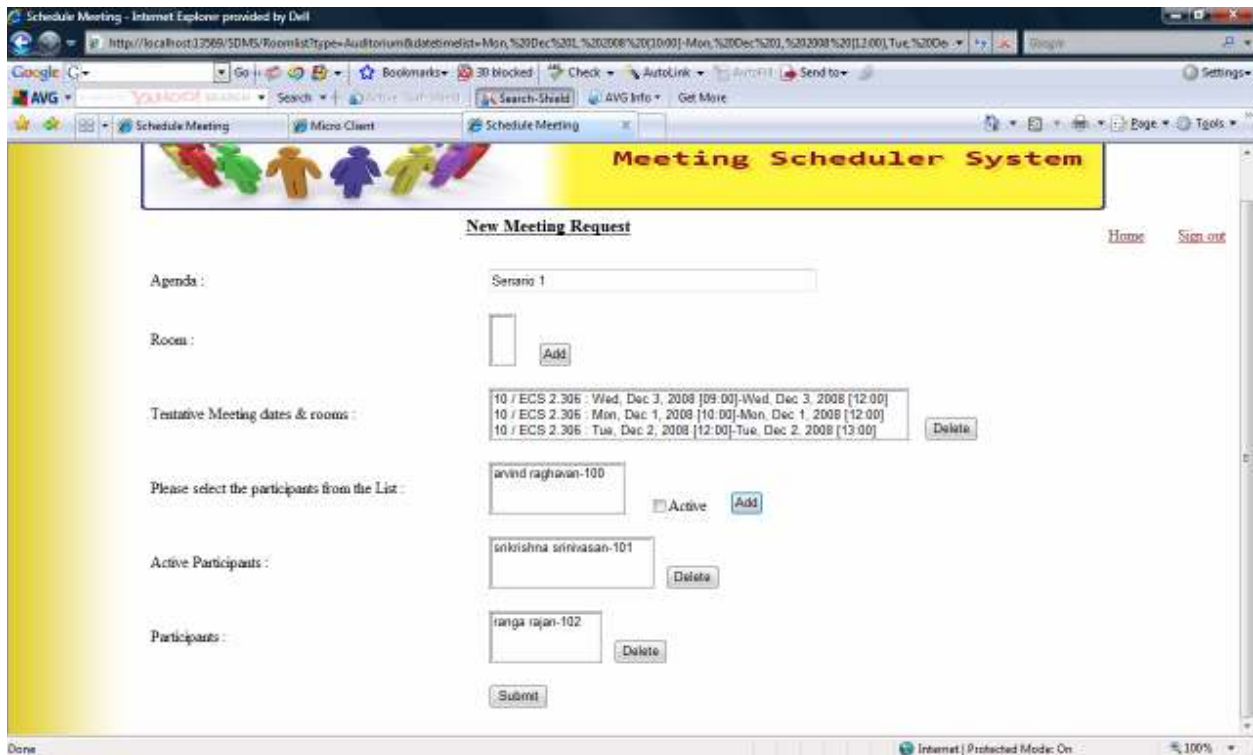
The New Meeting Request page gets displayed.

The user selects the agenda, Start Date, End Date and adds them into a list and selects the room type and searches for the available rooms on the particular date.



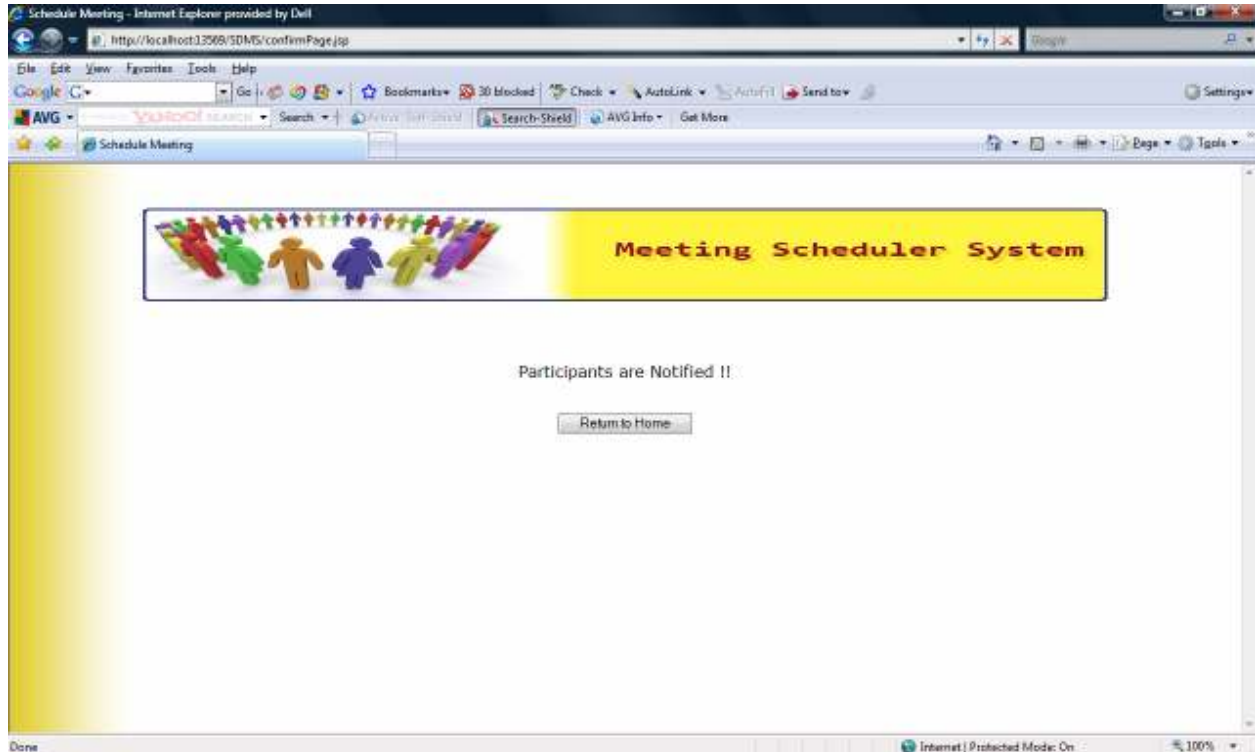
The system finds the rooms that are available for the particular dates and displays them in the next page.

Now the initiator can select a maximum of three dates from the room list and add it to the tentative meeting dates and room list and enters the participants and the active participants and Submits.

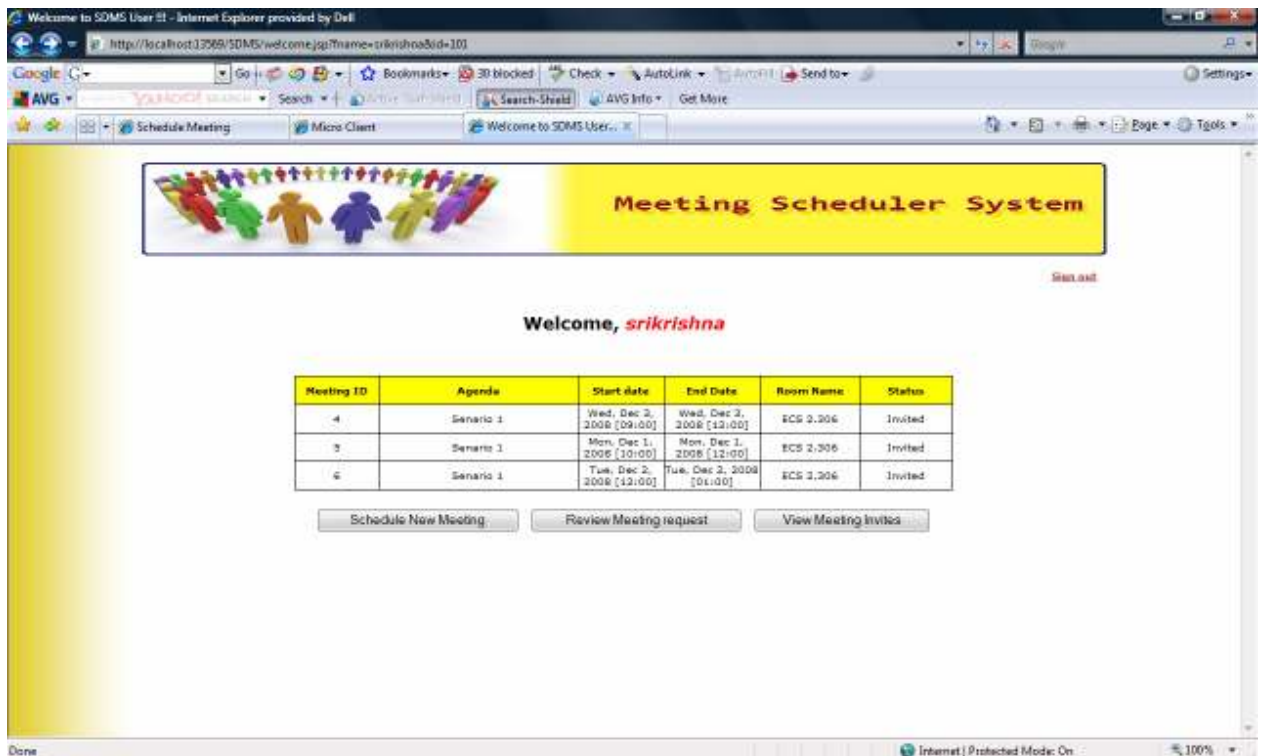


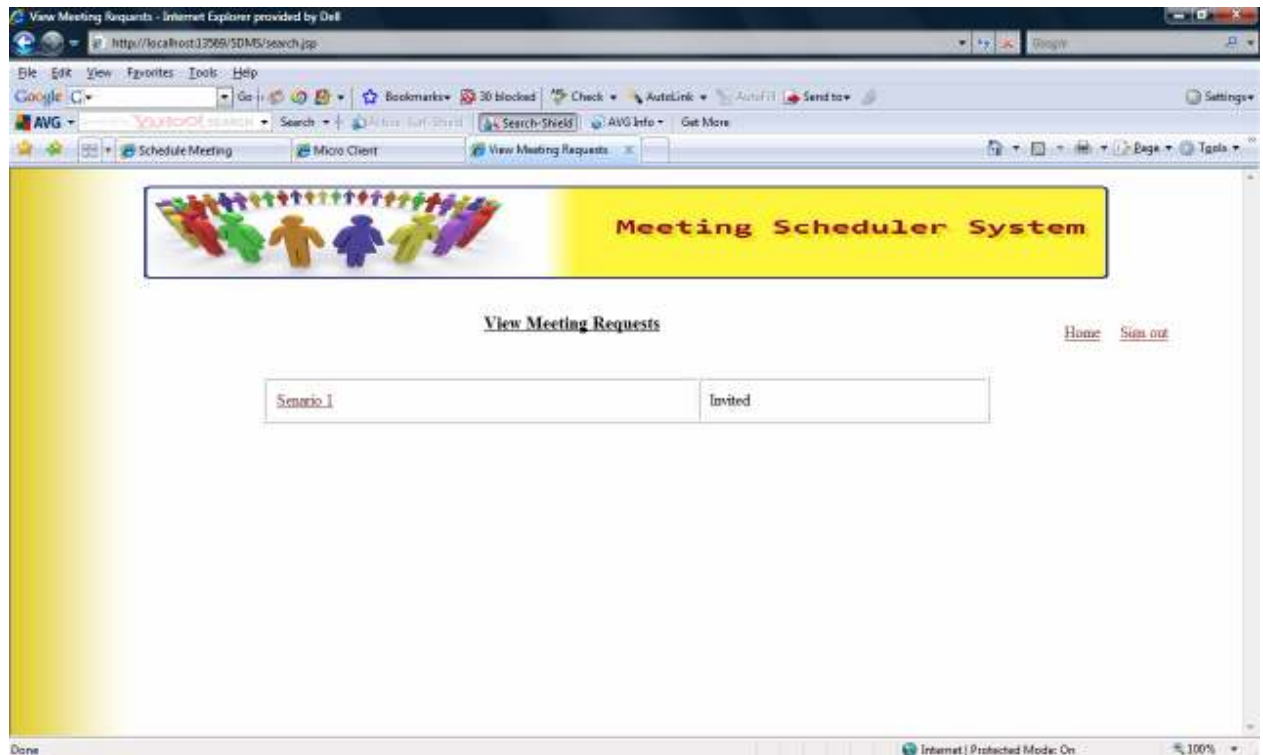
The System records all the information and creates the meeting Id and sends a mail to all the participants and active participants regarding the meeting details.



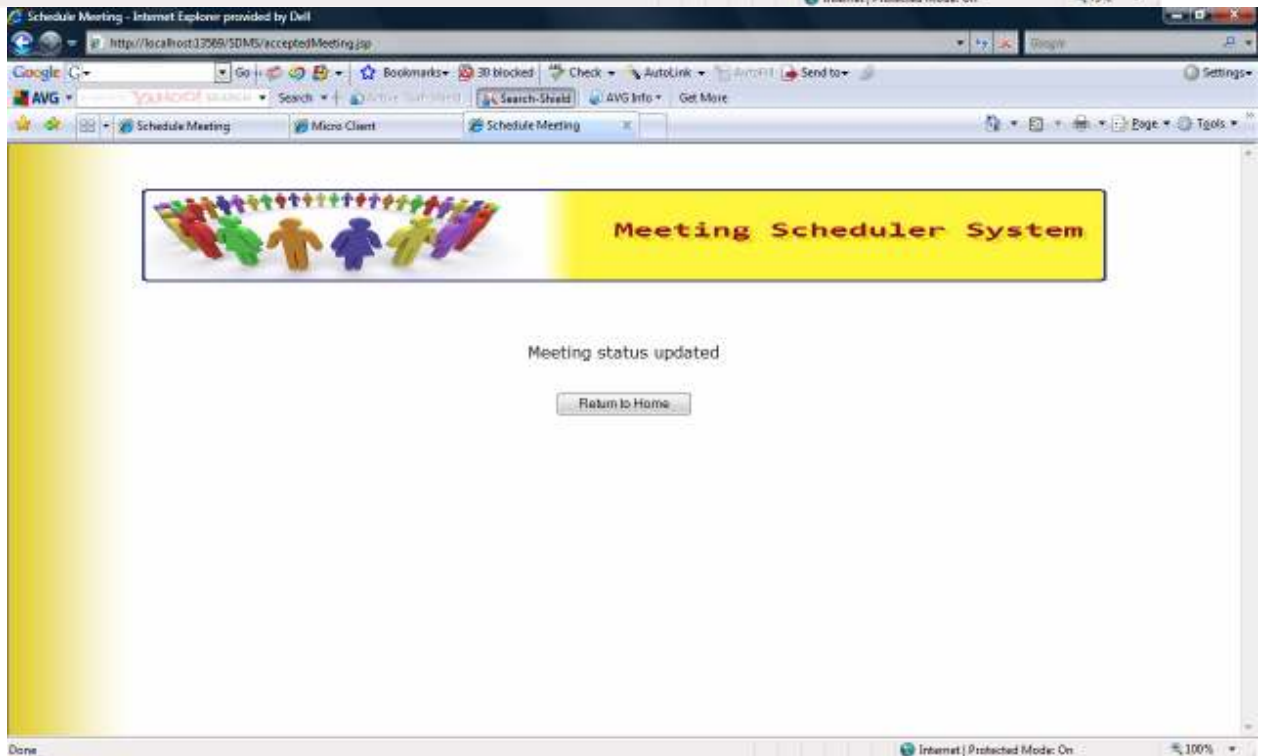
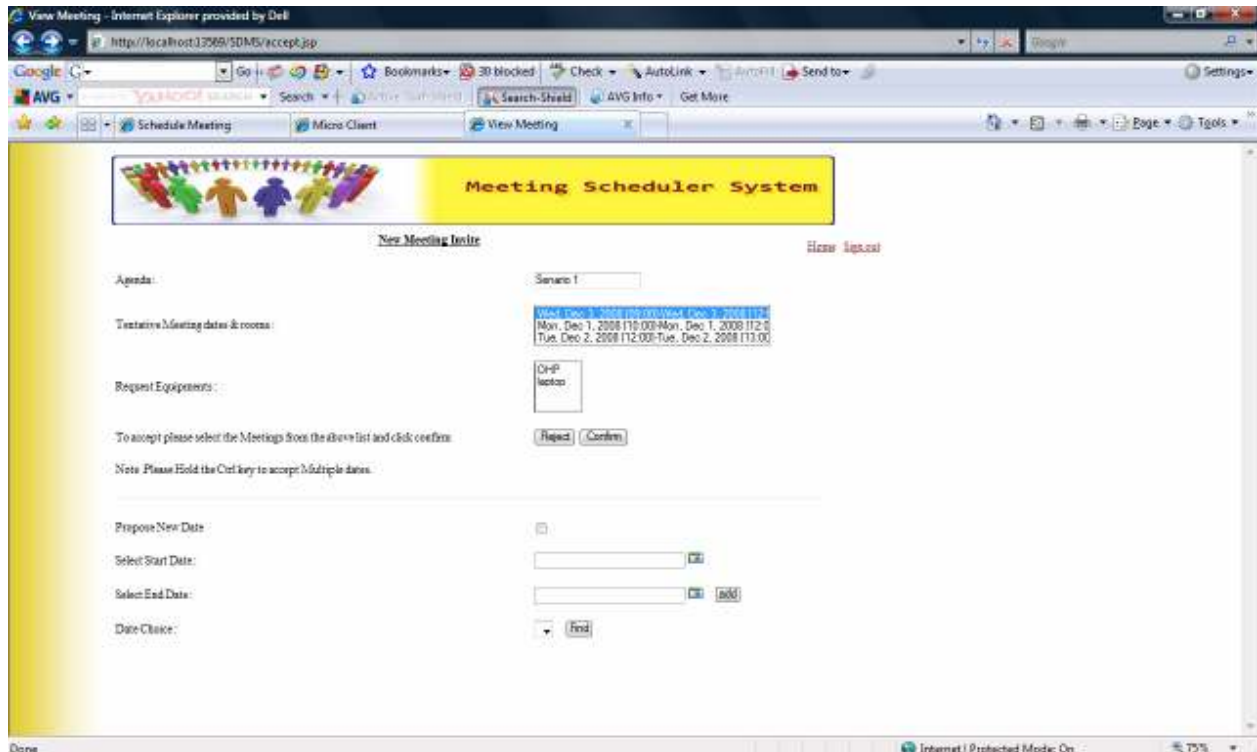


The participant enters into the system using his credentials and clicks on the “view meeting Invites” into order to view all the meeting requests pending for his approval.

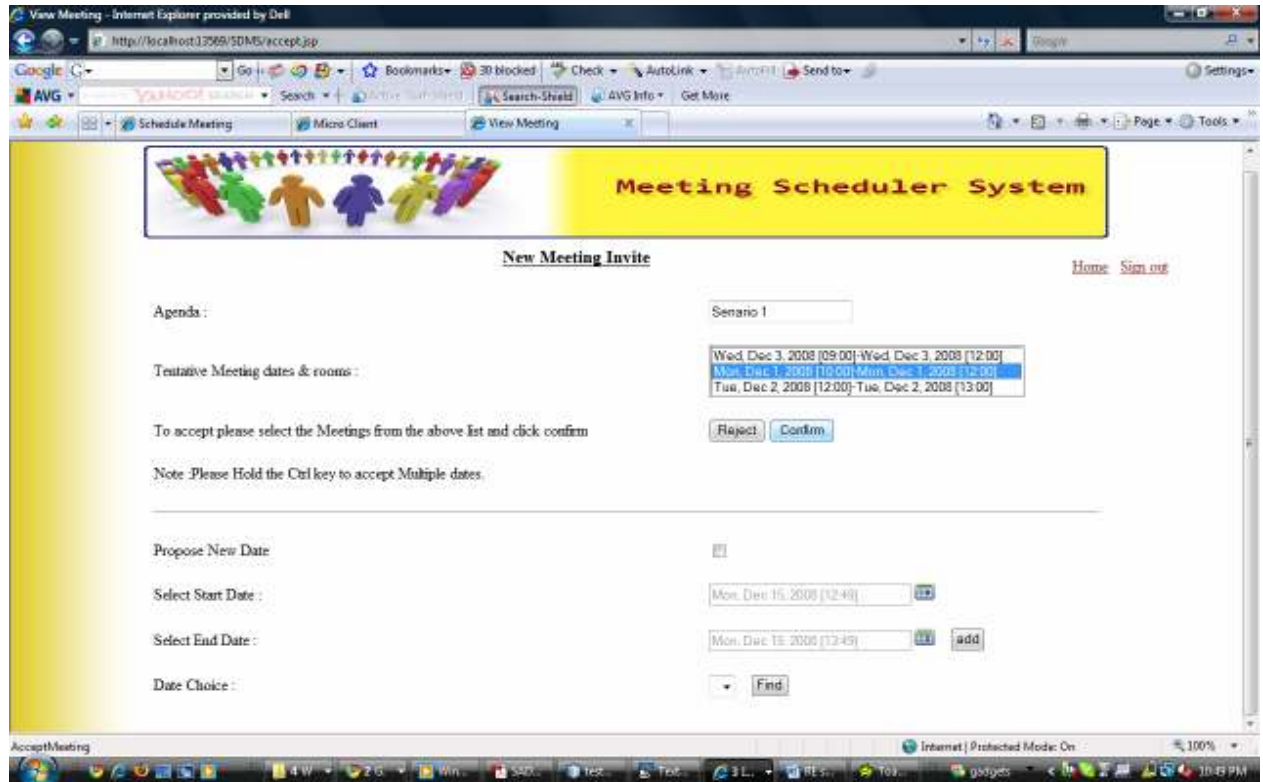




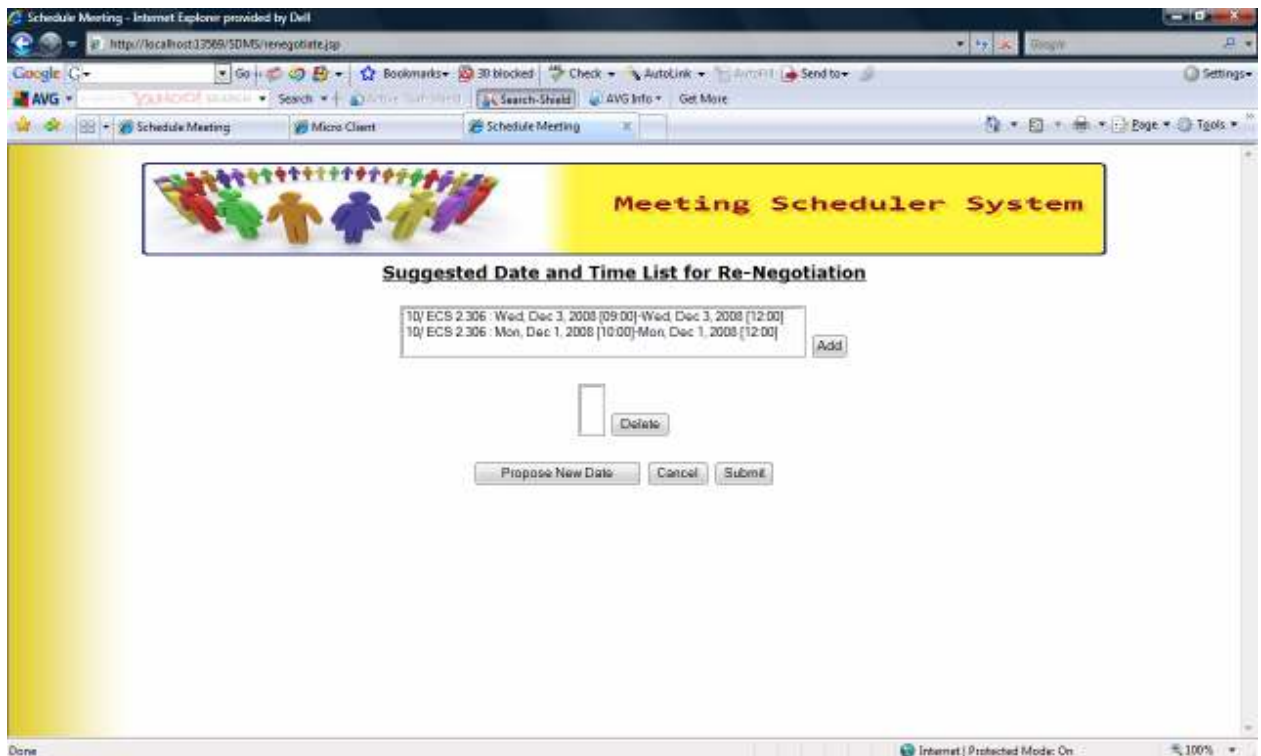
The participant clicks on the meeting id in order to view the meeting details.  
The user selects the dates in which he will be available and click on confirm button.  
The system updates the user's response and changes the status of the meeting.



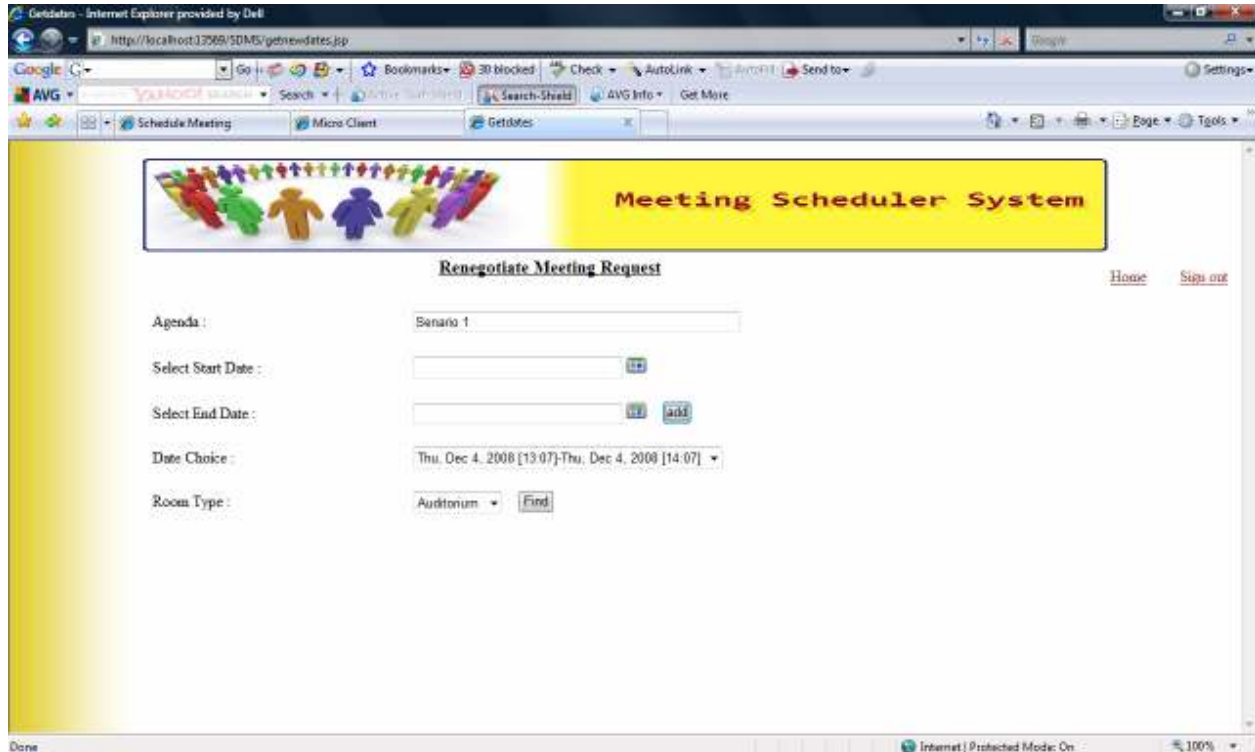
The second participant confirms another date.



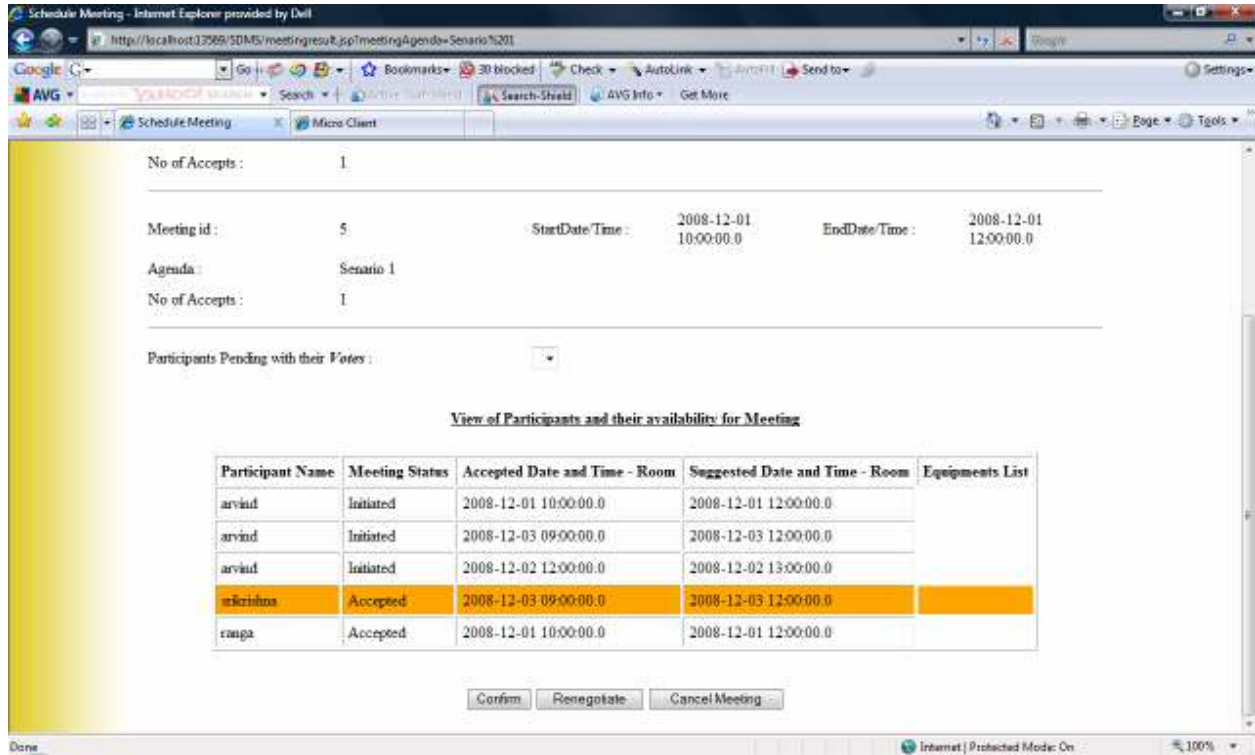
The initiator logs into the system and reviews the meeting and finds that the meeting dates are not appropriate and so renegotiates the meeting.



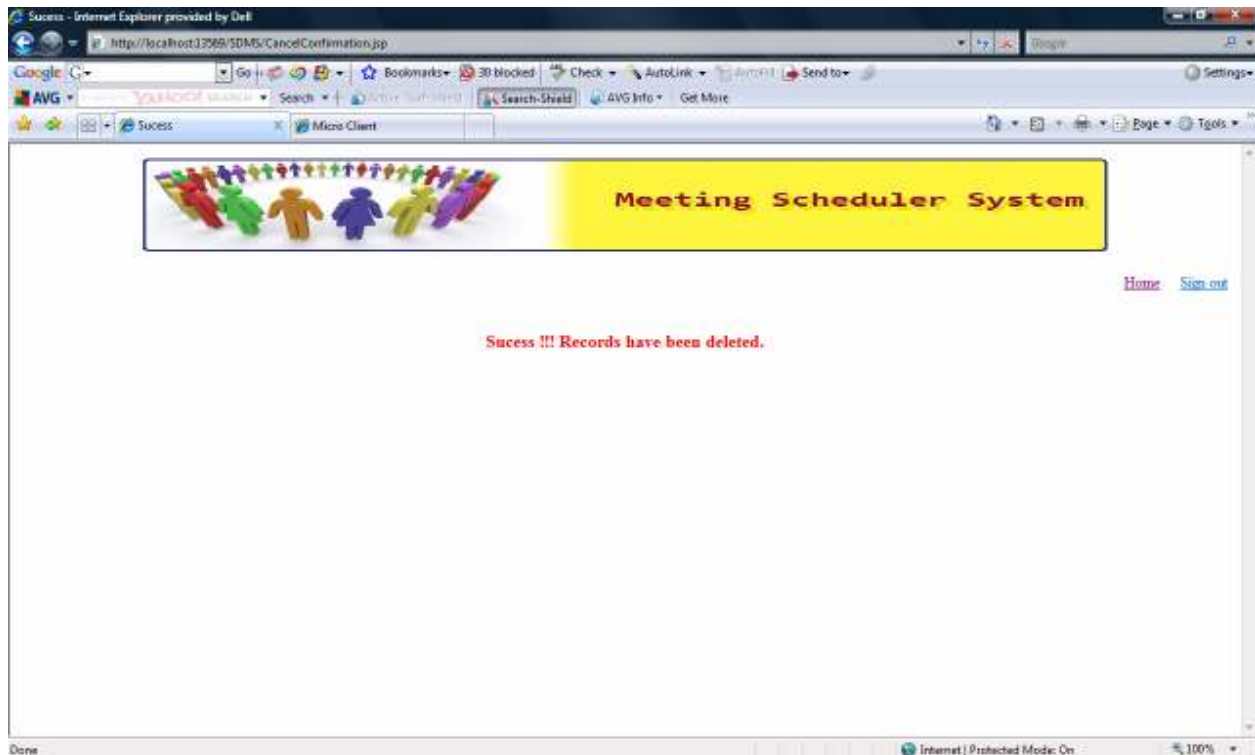
The initiator selects the dates from the participants confirmed date or proposes a new date or performs both. Here the initiator performs both and so clicks the Propose new date button.



The initiator enters the new dates and restarts the meeting request process. If after one round of renegotiation by the initiator participants are still not comfortable with the proposed dates the meeting scheduled is a failure. So the initiator cancels the meeting by clicking on the cancel meeting button.



All the records pertaining to the particular meeting gets deleted.



## Appendix

### 1.1 Functional Requirements: (Preliminary Document)

The Functional Requirements of the proposed system as given by SynergySoft are as follows:

**EFR-1:** The Meeting initiator will ask all potential meeting attendees for set of dates they cannot attend the meeting (exclusion sets) and the set of dates they can attend the meeting (preference sets)

**EFR-2:** A meeting date shall be defined by a (Date, Time) pair.

**EFR-3:** The exclusion and preference set should be contained in some time interval described by the initiator.

**EFR-4:** The Meeting Initiator could ask the active participants to provide any special equipment requirements on the meeting location.

**EFR-5:** The Initiator may also ask important participants to state preferences about the meeting location.

**EFR-6:** The proposed meeting date should belong to the stated date range and to none of the exclusion sets.

**EFR-7:** The proposed meeting date should belong to as many preference sets as possible.

**EFR-8:** Conflicts can be resolved in many ways inclusive of the following options:

EFR-8.1: The initiator extends the date range.

EFR-8.2: Some participants remove some dates from their exclusion set.

EFR-8.3: Some participants withdraw from meeting

EFR-8.4: Some participants add new dates to their preference set.

**EFR-9:** Meeting room should be available at the selected meeting date.

**EFR-10:** Meeting room should meet the equipment requirements.

**EFR-11:** It is absolutely necessary to allow the meeting to take place in a virtual place (e.g.: teleconferencing)

**EFR-12:** The meeting initiator can be one of the participants or some representative (e.g. a secretary)

**EFR-13:** The purpose of SDMS is to determine, for each meeting request, a meeting date and location so that most of the intended participants will effectively participate.

**EFR-14:** The Meeting room should ideally belong to one of the locations preferred by as many important participants as possible.



**EFR-15:** The system shall:

**EFR-15.1:** Monitor meetings

**EFR-15.2:** Plan meetings under the constraints expressed by participants

**EFR-15.3:** Re-plan a meeting to support the changing user constraints

**EFR-15.3.1:** to modify the exclusion set, preference set and/or preferred location before a meeting date/location is proposed; and

**EFR-15.3.2:** to take some external constraints into account after a date and location have been proposed - e.g., due to the need to accommodate a more important meeting.

**EFR-15.4:** Support conflict resolution according to resolution policies stated by the client

**EFR-15.5:** Manage all the interactions among participants required during the organization of the meeting, like

**EFR-15.5.1:** to support the negotiation and conflict resolution processes;

**EFR-15.5.2:** to make participants aware of what's going on during the planning process

**EFR-15.5.3:** to keep participants informed about schedules and their changes.

**EFR-16:** The meeting scheduler system must in general handle several meeting requests in parallel I.e. even when these requests overlap in time or space.

## **1.2 Non-Functional Requirements (Preliminary Document)**

The Non-Functional requirements of the proposed system as given by SynergySoft are as follows:

**ENFR-1.** A meeting should be accurately monitored, especially when it is held in a virtual place. Here, nomadicity will then be important to consider;

**ENFR-2.** Replanning of a meeting should be done as dynamically and with as much flexibility as possible;

**ENFR-3.** The amount of interaction among participants(e.g., number and length of messages, amount of negotiation required) should be kept minimal;

**ENFR-4.** The intended system should considerably reduce the amount of overhead usually incurred in organizing meetings where potential attendees are distributed over many different places and communicate with each other, for example, via Internet;

**ENFR-5.** The system should reflect as closely as possible the way meetings are typically managed (see the domain theory above);

**ENFR-6.** The meeting date and location should be as convenient as possible, and available as early as possible, to all (potential) participants;

**ENFR-7.** The system should accommodate as much decentralized requests as possible; any authorized user should be able to request a meeting independently of her whereabouts;



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- ENFR-8.** Physical constraints should not be broken --- e.g., a person may not be at two different places at the same time; a meeting room may not be allocated to more than one meeting at the same time; etc.;
- ENFR-9.** The system should provide an appropriate level of performance:
- ENFR-9.1.** the elapsed time between the submission of a meeting request and the determination of the corresponding date/location should be minimal; or ...; or
  - ENFR-9.2.** a lower bound should be fixed between the time at which the meeting date is determined and the time at which the meeting is actually taking place; ...;
- ENFR-10.** The system should be usable by non-experts;
- ENFR-11.** The system should be customizable to professional as well as private meetings;
- ENFR-12.** The system should be flexible enough to accommodate evolving data e.g., the sets of concerned participants may be varying, the address at which a participant can be reached may be varying, etc.;
- ENFR-13.** The system should be easily extensible to accommodate the following typical variations:
- ENFR-13.1.** handling of explicit priorities among dates in preference sets; ...;
  - ENFR-13.2.** variations in date formats, address formats, interface language, etc.;
  - and
  - ENFR-13.3.** Partial reuse in other contexts - e.g., to help establish course schedule.