



DHAKA UNIVERSITY CLUB MANAGEMENT SYSTEM

Software Requirement Specification

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CHAPTER 1: INTRODUCTION

This chapter is a part of our software requirement specification for the project “Dhaka University Club Management System”. In this chapter we focus on the intended audience for this project.

1.1 PURPOSE

This document briefly describes the Software Requirement Analysis of Dhaka University Club Management System. It contains functional, non-functional and supporting requirements and establishes a requirements baseline for the development of the system. The requirements contained in the SRS are independent, uniquely numbered and organized by topic. The SRS serves as an official means of communicating user requirements to the developer and provides a common reference point for both the developer team and the stakeholder community. The SRS will evolve over time as users and developers work together to validate, clarify and expand its contents.

1.2 INTENDED AUDIENCE

This SRS is intended for several audiences including the customers as well as the project managers, designers, developers, and testers.

- ✚ The customer will use this SRS to verify that the developer team has created a product that is acceptable to the customer.
- ✚ The project managers of the developer team will use this SRS to plan milestones and a delivery date, and ensure that the developing team is on track during development of the system.
- ✚ The designers will use this SRS as a basis for creating the system’s design. The designers will continually refer back to this SRS to ensure that the system they are designing will fulfill the customer’s needs.

- ✚ The developers will use this SRS as a basis for developing the system's functionality. The developers will link the requirements defined in this SRS to the software they create to ensure that they have created a software that will fulfill all of the customer's documented requirements.
- ✚ The testers will use this SRS to derive test plans and test cases for each documented requirement. When portions of the software are complete, the testers will run their tests on that software to ensure that the software fulfills the requirements documented in this SRS. The testers will again run their tests on the entire system when it is complete and ensure that all requirements documented in this SRS have been fulfilled.

1.3 CONCLUSION

This analysis of the audience helped us to focus on the users who will be using our analysis. This overall document will help each and every person related to this project to have a better idea about the project.

CHAPTER 2: INCEPTION OF DUCMS

In this chapter, the Inception part of the SRS will be discussed briefly.

2.1 INTRODUCTION

Inception is the beginning phase of requirements engineering. It defines how a software project gets started and what the scope and nature of the problem to be solved is. The goal of the inception phase is to identify concurrent needs and conflicting requirements among the stakeholders of a software project. At project inception, we establish a basic understanding of the problem, the people who want a solution, the nature of the solution that is desired and the effectiveness of preliminary communication and collaborations between the other stakeholders and the software team.

To establish the groundwork we have worked with the following factors related to the inception phases:

- List of stakeholders
- Recognizing multiple viewpoints
- Working towards collaboration
- Requirements questionnaire

2.1.1 List of Stakeholders

Stakeholder refers to any person or group who will be affected by the system directly or indirectly. Stakeholders include end-users who interact with the system and everyone else in an organization that may be affected by its installation. At inception, a list of people who will contribute input as requirements are elicited. The initial list will grow as stakeholders are contacted because every stakeholder will be asked: “Whom else do you think I should talk to?”

To identify the stakeholders we consulted with Club Manager and asked him following questions:

- Who is paying for the project?
- Who will be using the project outcomes?
- Who gets to make the decisions about the project (if this is different from the money source)?
- Who has resources I need to get the project done?
- Whose work will my project affect? (During the project and also once the project is completed).

We identified the following stakeholders for our automated club management system of Dhaka University.

Club Manager: A manager is selected for the Dhaka University Club. He has the administrative power over the system. Almost all decisions are taken by the club manager.

Executive Committee: A committee is formed with 15 members. There are one president, two vice-presidents, one treasurer, one secretary, two additional secretaries and eight general members. Associate members are selected based on their application by the executive committee in a meeting. This committee is elected in the annual meeting.

General Member: General members are the faculty members or the officers of the University of Dhaka. They can also be the recommender for outsiders who want to join the club.

Associate Member: Associate members are the outsiders who want to join the club. There can be a maximum of 50 associate members in a certain period of time. They need a recommendation from a member of the club. Their application is finally approved by the executive committee.








Developers: Developers are one of the stakeholder because they are also affected by this system. They develop this system and work for further development. If there occurs any system interruption, they will find the problem and try to solve it.

University: University of Dhaka will finance the project and it has some rules and regulation to maintain this system. We have to follow them strictly. It will also be affected by this system so we consider it as one of our stakeholders.






2.1.2 Recognizing Multiple Viewpoints

Different stakeholders achieve different benefits from the system. Consequently, each of them has a different view of the system. So we have to recognize the requirements from multiple points of view, as well as multiple views of requirements. Assumptions are given below:


Club Manager's viewpoint:

-  User friendly and efficient system
-  Error free system
-  Easy to operate
-  Minimum maintenance cost
-  Availability of expected requirements within budget
-  Store member related information
-  Generate annual report for expenses and incomes.

General Member's viewpoint:

-  Easy to access
-  Strong authentication
-  User friendly
-  Notification for expenses
-  High security of member's information

Associate Member's viewpoint:

-  Easy to access

- ✚ Strong authentication
- ✚ User friendly
- ✚ Online guidance

Developer's viewpoint:

- ✚ Easy to develop
- ✚ No ambiguous requirement

University's viewpoint:

- ✚ User friendly
- ✚ Efficient system
- ✚ Error free system
- ✚ Cost within budget
- ✚ Less maintenance cost
- ✚ No disruption of rules and regulations

2.1.3 Working towards Collaboration

Every stakeholder has their own requirements. There are some common and conflicting requirements of our stakeholder. That's why we followed the following steps to merge these requirements-

- ✓ Find the common and conflicting requirements
- ✓ Categorize them
- ✓ List the requirements based on stakeholder's priority points
- ✓ Make final decision about requirements

Common requirements:

- ✓ User friendly
- ✓ Efficient system
- ✓ Error free system
- ✓ Strong authentication

Conflicting requirements:

- ✓ Limited budget
- ✓ Cost within budget.
- ✓ High security of the system
- ✓ Easy access (Different stakeholder wants different type of access)

Final requirements: We finalize the following requirements based on stakeholder's priority point:

- User friendly system
- Strong authentication
- Maximum error free system. (5%-10% error is considerable)
- Restrict access to functionality of the system based upon user roles
- High security of member's information
- Automated submission of application

2.1.4 Requirements Questionnaire

We first ask the stakeholder some context free questions to understand the project's overall performance and goals. These questions are mentioned in section 2.1.1. These questions help us to identify the stakeholders of the project. Then we ask our next set of questions to better understand the problem and take stakeholder's opinion about the solution. The final set of question focused on the effectiveness of the communication activity itself.

2.2 CONCLUSION

The Inception phase helped us to establish basic understanding about the club management system of University of Dhaka, identify the stakeholders who will be benefited if this system becomes automated, define the nature of the system and the tasks done by the system, and establish a preliminary communication with our stakeholders.

In our project, we have established a basic understanding of the problem, the nature of the solution that is desired and the effectiveness of preliminary communication and collaboration between the stakeholders and the software team. More studies and communication will help both sides (developer and client) to understand the future prospect of the project. Our team believes that the full functioning document will help us to define that future prospect.

CHAPTER 3: ELICITATION OF DUCMS

After discussing on the Inception phase, we need to focus on the Elicitation phase. So this chapter specifies the Elicitation phase.

3.1 INTRODUCTION

Requirements Elicitation is a part of requirements engineering that is the practice of gathering requirements from the users, customers and other stakeholders. We have faced many difficulties, like understanding the problems, making questions for the stakeholders, limited communication with the stakeholders due to a short amount of time and volatility. Though it is not easy to gather requirements within a very short time, we have surpassed these problems in an organized and systematic manner.

3.2 ELICITING REQUIREMENTS

We have seen Question and Answer (Q&A) approach in the previous chapter, where the inception phase of requirement engineering has been described. The main task of this phase is to combine the elements of problem solving, elaboration, negotiation and specification. The collaborative working approach of the stakeholders is required to elicit the requirements. We have finished the following tasks for eliciting requirements-

- Collaborative Requirements Gathering
- Quality Function Deployment
- Usage Scenarios
- Elicitation work products

3.2.1 Collaborative Requirements Gathering

We have met with many stakeholders in the Inception phase such as the club manager, general members, our classmates and teachers. These meetings created an indecisive state for us to elicit the requirements. To solve this problem we have met with the stakeholders (who are acting a vital rule in the whole process) again to elicit the requirements. A slightly different scenario from these approaches has been found.

Following activities have been completed to accomplish this task.

- ✚ The meetings were conducted with the club manager and general members; they were questioned about their requirements and expectations from the Dhaka University Club Management System.
- ✚ They were asked about the problems they were facing with the current manual system.
- ✚ Lastly we selected our final requirement list from the meetings.

3.2.2 Quality Function Deployment

Quality Function Deployment (QFD) is a technique that translates the needs of the customer into technical requirements for software. Ultimately the goal of QFD is to translate subjective quality criteria into objective ones that can be quantified and measured and which can then be used to design and manufacture the product. It is a methodology that concentrates on maximizing customer satisfaction from the software engineering process. So we have followed this methodology to identify the requirements for the project. The requirements, which are given below, are identified successfully by the QFD.

3.2.2.1 Normal Requirements

Normal requirements are generally the objectives and goals that are stated for a product or system during meetings with the customer. The presence of these requirements fulfills customers' satisfaction. These are the normal requirements for our project.

1. User-friendly design.
2. Allow new members to register for the club.
3. Interactive menu for each day's catering services is provided alongside appropriate images for ordering food.
4. Allow members/nonmembers to book community space for events.
5. A database is maintained for accounting purposes so that an annual report can easily be generated and stored.
6. Allow manager to add new revenue or expense item, alter list of food items served, and approve new associate members and club space booking.
7. Allow manager access to any previous annual or monthly financial report.

8. Prevent the issue with “Ghost billing”.
9. Notify members about their total monthly bill via SMS.
10. Allow existing members to access their monthly expense reports.

3.2.2.2 Expected Requirements

These requirements are intrinsic to the product or system and may be so elementary that the customer does not explicitly state them. Their absence will be a cause for significant dissatisfaction. Below the expected requirements for our project are briefly described.

1. IDs is provided so that only valid users can safely login to the system and see notification.
2. Restrict access to system functionalities based upon user roles.
3. The user interface is to make use of selectable fields wherever possible instead of fields that require the user to type in data.
4. The system’s configuration is to be documented and updated as changes to the system are made due to patches, new releases, etc.
5. The online interface provides photos and interactive calendars in the section of renting space for events.
6. Provide two factor authentication, where session PINs will be sent via SMS.
7. Members are able to set alerts for expense limits during a month.
8. A member can keep track of her monthly expenses as she can get access to her previous orders.
9. The user interface is to follow standard web practices such that the web interface is consistent with typical internet applications.

3.2.2.3 Exciting Requirements

These requirements are for features that go beyond the customer's expectations and prove to be very satisfying when present. Following are some exciting requirements of our project.

1. A member can ask questions and submit complaints to a dedicated employee via a virtual helpline.
2. All the necessary aspects on the user interface contain tooltip information alongside a virtual manual so that even users who are not familiar with automated systems can use this with ease.
3. Offer access to DUCMS through a mobile app.
4. Display nutrition facts (carbohydrate, protein, fat, calorie count) about the food items offered.

3.2.3 Usage Scenario

Dhaka University Club Management System (DUCMS) is an automated system for the following purposes:

1. Member registration
2. Ordering food
3. Booking community space
4. Management activities
5. Member activities

New Member Registration

The club has two types of members: General Members (GM) and Associate Members (AM). General members are either university faculty members or officers. Faculties and officers of University of Dhaka (DU) are eligible to join Dhaka University Club (DUC) as GM. AMs are outsiders who can join the club upon approval from the executive committee. At any time there can be a maximum of fifty AMs. Non-member DU faculties and officers can register as a GM of DUC by using their Dhaka University Employee Identification Number (DUEIN) to fill out the new member registration form.

The new member registration form for GM contains the following information:

1. Name
2. Department
3. Designation
4. Contact Number
5. Present Address
6. Permanent Address
7. DUEIN
8. Photo
9. Username
10. Password (must be at least eight digits long and include one uppercase letter and number)

Outsiders who want to become AM of DUC can apply by filling out the new member registration form for AM, along with their recommender's DUEIN, subject to a vacant position. After being approved by the recommender, applications are then scrutinized and approved by the executive committee manually. A list of successful candidates is published by the club manager. Eligible applicants are notified to pay DUC AM membership fees which is verified by the bank, by cross-referencing Bank A/C number, Application Reference number and amount.

The new member registration form for AM will contain the following information:

1. Name
2. Occupation
3. Contact Number
4. Present Address
5. Permanent Address
6. Photo
7. Bank A/C No.
8. Recommender's DUEIN
9. Username
10. Password (must be at least eight digits long and include one uppercase letter and number)

Upon registration AMs will be sent a temporary ad hoc DUEIN to login into DUCMS via SMS and email. Users can either use their DUEIN or username and password to login to DUCMS.

The rest of the Member's information will be generated from the Member Registration Application and the information will be stored in the Database.

Ordering Food

Each table in the club premises (porch, lounge, reading room, ordering counter) will have a dedicated electronic device for ordering food. Each electronic device will be identified with a table number (identified by MAC address), and will be connected to the DUCMS web interface, through which members of the DUCMS will be able to login with their credentials and order food.

This panel will display an interactive list of food items or menu, currently available for ordering. Each food item will have:

1. Food name
2. Multiple pictures of the food item (up to five pictures)
3. User daily rating
4. Nutritional Facts (carbohydrate, protein, fat and calorie count per serving)
5. Price
6. Amount in the cart

Through this panel they will be able to order the food item, mention the quantity of the item they want to order. After selecting all the items and specifying the quantity, users will be able to add to, cancel or submit cart. Before placing the order the user will be prompted to verify the correctness of her order. Upon confirmation the user will be prompted to complete her order by logging in with her credentials. If two factor authentication is enabled a session PIN, a four-digit number, will be generated for each attempted login with correct credentials and sent via SMS to the user's mobile phone. A virtual receipt will be generated with every completed order.

All club members will also be able to use their own devices to login into the DUCMS web interface for ordering food; in which case she will need to login with valid credentials in order to gain access to the food ordering panel and identify their table using an interactive map which displays ID and position of all the tables within the club premises.

Booking Community Space for Events

Members and non-members can also apply to book community space for events from DUC, based on availability. Club space is rented out for community events only on Friday of every week between 10:00 am to 4:30 pm. Every application made by a non-member is first approved by the recommender (existing member of DUC) and then by the Club Manager.

Members can apply for booking community space by logging in. Every application made by a member is approved by CM only.

Upon approval, the applicant is notified to pay booking fees within three working days and the space is allocated at desired date, and applicant is notified, after payment has been verified by the bank. If payment is not received within three working days, the application is automatically nullified and the community space becomes available for booking again.

Application by non-member will contain the following information:

1. Name of Applicant
2. Present Address
3. Permanent Address
4. Contact Number
5. Booking Purpose
6. Booking Date and Time
7. Name of Recommender
8. Contact Number of Recommender
9. DUEIN of Recommender

Notification SMS/Email will contain:

1. Applicant's Name
2. Booking Date and Time
3. Amount

4. Application ID

Manager's Dashboard

- Club manager will be able to add revenue sources such as:
 1. University Grants
 2. Donation
 3. Club Space Rent
 4. Interest on Savings Bank Account
 5. Raffle Draw
 6. Club Rent Received in Advance
 7. Souvenir Contribution (Advertisement)
 8. Club Premises Rent
 9. Security Deposit (Club Shop)
 10. Miscellaneous Receipts

- In addition, the following sources of revenue will be automatically generated and maintained within the DUCMS:
 1. Subscription from GM
 2. Subscription from AM
 3. Security Deposit from AM
 4. Catering Sales

- The CM will also be able to add expenses incurred during the financial period such as:
 1. Staff Salaries and Benefits
 2. Catering Expenses
 3. Repairing and Maintenance
 4. Cleaning Supplies

5. Stationary
6. Newspaper
7. Recreational Expenses
8. Bank Charge
9. Audit fees
10. Club Booking Return
11. Miscellaneous Expenses

Other than the categories of items listed above, the CM will also be able to create new revenue or expense categories.

- CM will be able to record transactions of any given or newly created category. Each transaction will have a category and an amount.
- At any given time the CM will be able to generate a managerial report listing the following:
 1. Receipts
 2. Payments
 3. Current Surplus/Deficit
 4. Summary of members (Number of GM and AM)
 5. Food items served along with number of items sold

Reports will also be automatically generated and stored, monthly and annually.

- At the end of each month a Reimbursement Report will be generated and sent solely for the purpose of Dhaka University's Accounting Department (DUAD), listing:
 1. Total Catering Sales of the month
 2. Total Subscription fees for the month
 3. Individual Member's Monthly Bill (Subscription fees and Catering Sales)
- The CM will also have the responsibility of approving:
 1. New AMs through her dashboard
 2. Application for booking club space
- Publish list of approved AMs
- View list of all the club members and their details, provided during registration.
- CM will also be able to update the following information provided during registration:
 1. DUEIN

2. Name
 3. Photo
 4. Password
 5. Contact Number
 6. Present Address
 7. Permanent Address
- CM can change name, picture, nutritional fact, price and available days of the week for existing food items served. She will also be able to add new food items to the list or remove existing ones.
 - The CM will also be able to check the current status of payments (Unpaid/Paid) :
 1. AM's monthly subscription
 2. AM's security deposit
 3. Club Space booking fees

All payments will be automatically verified by the bank, by cross-referencing Bank A/C number, Application Reference number and amount.

Members' Dashboard

Members will be able to view a graphical list of food items served for every day of the week. Each food item will have:

1. Food Name
2. Multiple Pictures of the food item (up to five pictures)
3. User daily rating
4. Nutritional Facts (carbohydrate, protein, fat and calorie count per serving)
5. Price
6. Quantity added to cart

Members can also rate their food out of 5 from their dashboard. The rating feature will be available for the member after the first food she purchases. She can also change her rating for a food later on. After a member rates a food item, average food rating is updated.

The member will be prompted to rate purchased but unrated food items each month. She can choose to ignore it for the time being and rate it later.

The following components will be present for the rating:

1. List of Food
2. Rating (out of 5) from other users
3. The member's rating

Members can book community space from their dashboard based on availability. Application for booking community space can then be verified and approved by CM, after which the member will be requested to complete her payment within three working days; the space is allocated at desired date after payment has been verified by the bank. If payment is not received within three working days, the application is automatically nullified and the community space becomes available for booking again.

Members will be able to access their real-time expense reports at any given time through the web interface. Here they will be able to find details for their every transaction:

1. Date
2. List of Items ordered
3. Quantity of each item ordered
4. Bill amount

Members will also be able check their total expense for the current month and past twelve months at any given time. At the end of each month members will be notified by SMS of the total bill incurred during the month.

Members can also set alerts for expense limits during a month, where a member will be notified by SMS if and when they exceed their aforementioned expense limits.

Club members will also be able to enable two factor authentication. If two factor authentication is enabled, a session PIN, a four-digit number, will be generated, for each attempted login with correct credentials, and sent via SMS to the user's mobile phone.

A member will also receive automated request if she is considered as a recommender by non-member applying to rent community space or registering as an AM. The message will have the following information:

1. Recommendation Purpose
2. Booking purpose (if renting out community space)
3. Applicant Name

4. Present Address
5. Contact Number

The member will have the option to approve or decline the request.

Members will also be able to update the following information they provided during registration:

1. Photo
2. Password
3. Contact Number
4. Present Address
5. Permanent Address
6. Department (only for GMs)
7. Designation (only for GMs)
8. Occupation (only for AMs)
9. Bank A/C number (only for AMs)
10. Expense limit