**Chapter 1**

**Introduction**

* 1. **Purpose**

This document is the software Requirement Specification (SRS) for “Expenditure Management System”. In this document, there contains functional, non-functional and supported requirements that establishes a requirements baseline for developing our proposed project. The requirements having this document are independent, uniquely numbered and embodied by topic. The SRS serves as specifying user requirements to the developer by means of communication and provides a common reference point for both the developer team and stakeholder community. The SRS will evolve enough time as users and developers work together to validate, clarify and expand its contents.

* 1. **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 will produce a product which will meet all the requirements specified and approved by the customer.

This SRS document helps the project manager to plan milestones and a delivery date, and ensuring that the developing team is on the right track during developing the system.

The designers will use this SRS as a basis for designing the system. The designers will continually roll back to this SRS to ensure that the system they are designing, will fulfill the customer’s requirements

The necessity of using this SRS documentation for the developer is in order to provide a basic for developing the system’s functionality. The developers will link the requirements defined in this SRS so that they ensure that they are producing a software which meets all the requirements defined in SRS as satisfying the customer requirements.

SRS document provides an easy way for the tester to perform their task with more flexibility because in SRS document requirements must be clear and specific with no uncertainty, requirements should be measurable in terms of specific values, requirements should be testable having some evaluation criteria for each requirement, and requirements should be complete, without any contradiction.

**Chapter 2**

**Inception**

**2.1 Introduction**

The goal of the inception phase is to achieve concurrence among all stakeholders on the lifecycle objectives for the project. The inception phase is of significance primarily for new development efforts, in which there are significant business and requirements risks which must be addressed before the project can proceed.

Inception is the beginning phase of requirements engineering. It defines how does a software project get started and what is the scope and nature of the problem to be solved. To establish the groundwork, we have worked with the following factors related to the inception phases:

1. Identifying Stakeholders
2. Recognizing multiple viewpoints
3. Working towards collaboration
4. Asking the First Questions

**2.1.1 Identifying stakeholders**

Stakeholders refer an individual, group, or organization, who may affect, be affected by, or perceive itself to be affected by a decision, activity, or outcome of a project. Stakeholders include end-users who interact with the system and everyone else in an organization that may be affected by its installation. To identify the stakeholders, we consulted with an employee and asked her 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).

By analyzing the requirements, we select two stakeholders for our proposed “Expenditure Management System” project. These stakeholders are teachers and the director.

1. Director: The director will add specific sectors of expense along with field names of expense. He also assigns each teacher as the sub admin of the system.
2. Teacher: Each teacher proposes an amount of expense corresponding to the assigned fields of the assigned sectors.
   * 1. **Asking the first question**

We predefine a set of context-free questions focuses on the customer and other stakeholders, overall project goals and benefits. The questions are mentioned above. These questions have helped us to identify all stakeholders, measurable benefit of the successful implementation and possible alternatives to custom software development. Next set of questions are helped us to gain a better understanding of problem and allows the customer to voice his or her perception about the solution. The final set of question focused on the effectiveness of the communication activity itself.

* + 1. **Recognizing multiple viewpoints**

We gather these view points by discussing with our selected stakeholders including Course Teacher and student.

1. Director
   * 1. Accessing system from any device that has internet access
     2. Restricting access to functionality of the system
     3. Approving or rejecting the proposal of the sub-admins
     4. Generating annual report
     5. Controlling the budget
2. Teacher
   * 1. Proposing an amount of expense
     2. Easy access to the system
     3. **Working towards collaboration**

Every stakeholder has their own requirements. We followed following steps to merge these requirements:

1. Identify the common and conflicting requirements
2. Categorize the requirements
3. Take priority points for each requirement from stakeholders and on the basis of this voting prioritize the requirements
4. Make final decision about the requirements

**Common Requirements:**

* Web-Based Interfaces.
* The application can be accessed from any computer that has Internet access.
* Easy Access.
* Maintain a database of all information.

**Conflicting Requirements:**

* Easy access and Strong Authentication.
* Don’t allow access to any authenticated user.

**Final Requirements:**

We finalized following requirements for the system by categorizing and prioritizing the requirements:

* Error free system (Level of tolerance 5% that means maximum 5% error may be considerable).
* Web-based interfaces.
* Allow valid users to login and logout.
* Restrict access to functionality of the system based upon user roles.
* Allow administrators of the system to change users and configure parameters of the system.
* Maintain a database of all information.
  1. **Conclusion**

Inception phase helped us to establish basic understanding about our proposed “Expenditure Management System” project; identify the people who will be benefited if the expenditure management process becomes automated, define the nature of the “Expenditure Management System” software and establish a preliminary communication with our stakeholders.

**Chapter 3**

**Elicitation**

**3.1 Introduction**

Requirement elicitation is the process of discovering, reviewing, documenting, and understanding the user's needs and constraints for the system. Elicitation is a step of requirement engineering that helps the customer to define what is required. To complete the elicitation step we face many problems like problems of scope, problems of volatility and problems of understanding. However, this is not an easy task. To overcome these problems, we have worked with the Eliciting requirements activity in an organized and systematic manner.

**3.2 Eliciting requirements**

Unlike inception where Q&A (Question and Answer) approach is used, elicitation makes use of a requirements elicitation format that combines the elements of problem solving, elaboration, negotiation, and specification. It requires the cooperation of a group of end-users and developers to elicit requirements. To elicit requirements, we completed following four works.

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

**3.3 Collaborative requirements gathering**

Many different approaches to collaborative requirements gathering have been proposed. Each makes use of a slightly different scenario. We completed following steps to accomplish this task.

* The meetings were conducted with Teachers. He was questioned about the requirements and expectations from the automated “Expenditure Management system”.
* He was asked about the problems he is facing with the current manual system. At last we selected our final requirement list from covering the meetings.

**3.4 Quality function deployment**

Quality Function Deployment (QFD) is a technique that translates the needs of the customer into technical requirements for software. It concentrates on maximizing customer satisfaction from the Software engineering process. With respect to our project the following requirements are identified by a QFD**.**

**3.4.1 Normal requirements**

Normal requirements consist of objectives and goals that are stated during the meeting with the customers. Normal requirements of our project are: -

* Allow valid user to log in and log out to the system.
* Restrict access to functionality of the system based upon user roles
* Allow valid users that log in to renew items, reserve items, and view the items
* The application is accessible from any computer via internet.

**3.4.2 Expected Requirements**

* Selectable fields wherever possible instead of fields that require the user to type in data.
* Easy operation of the system

**3.4.3 Exciting requirements**

These requirements go beyond the customer's expectations and prove to be very satisfying when present.

* The user interface should provide appropriate error messages for invalid input as well as tool-tips and online help.
* The user interface should follow standard web practices such that the web interface is consistent with typical internet applications.
* Offer log in with smart phone and tablets.
* The system’s configuration shall be documented and updated as changes to the system are made due to patches, new releases, new Changes etc.

**3.5 Usage Scenario**

**Expenditure Management System (EMS)**

Expenditure Management System is a system for IIT, University of Dhaka to manage and record each transaction related to the expense in various sectors. The system is administrated by the Director of IIT, University of Dhaka. The system is also driven by a set of teachers who is assigned by the Director in one or many sectors of expense.

First, the Director needs to add specific sectors of expense. Then, he/she adds various field names of expense under each sector with a unique field access key and estimated amount collected from the annual budget report. At the beginning of the year, the Director, super admin of the system assigns each teacher as the sub admin of the system with a unique username, password, one or many sector names. The director also needs to add one or many field access keys under each sector name.

After successful addition of the sub admins, each sub admin proposes an amount of expense corresponding to the assigned fields of the assigned sectors. Then their proposal is sent to the Director for approval. If the Director approves it then, the amount will be added to the proposed field of the proposed sector. If he/she rejects the proposal, then the proposal will be discarded and a notification is sent to the sub admin about the rejected proposal.

At the end of the year, the system will produce an annual report to the director mentioning the spent amount of each fields of each sector. If the total spent amount is below 75% or over 100% of the total estimated amount then, a special report is generated to the Director by the system mentioning the over spent fields of each sectors. The director can remove the sub admins in order to prepare the system again.

[The Director must be authenticated too]

**3.6 Elicitation work product**

The output of the elicitation task can vary depending on size of the system or product to be built. Our elicitation work product includes:

* A statement of our requirements for automated Online Student Registration and Exam system.
* A bounded statement of scope for our proposed system.
* A list of customers, users and other stakeholders who participated in requirement specification.
* Set of usage scenarios.
* Description of the system’s technical environment.