PHARMACY MANAGEMENT SYSTEM

Software Requirement Specification

Group 2

BSSE 08th Batch

Institute of Information Technology

University Of Dhaka

PHARMACY MANAGEMENT SYSTEM

SUBMITTED TO

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LETTER OF TRANSMITTAL

00th December 2017
Dr. Kazi Muheymin-Us-Sakib
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Subject: Submission of term report on "Pharmacy Management System".

Sir,

With due respect, we are submitting the report on the above topic you assigned to us. In this report, we have given our best effort albeit some shortcomings. We earnestly hope that you would excuse our errors and oblige thereby.

Yours sincerely
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ABSTRACT

The study is made for Pharmacy Management System. The scope of the study is to analyse the existing pharmacy management system and to know its functions and drawbacks, and design the SRS of this system. The object of this study is to develop an SRS (software requirements and specification) of Pharmacy Management System.

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CHAPTER 1: INTRODUCTION

This chapter is a part of our software requirement specification for the project "Pharmacy 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 Pharmacy Management System. It contains functional, non-functional and supporting requirements and establishes a requirements baseline for the developing the system. The SRS holds the requirements are independent, uniquely numbered and organized by topic. The SRS serves as a platform to forward 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 the customer finds acceptable.
- ➢ 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 the right track when developing 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 demands.
- ➢ 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 document will help each and every person related to this project to perceive the subject matter of the project.

CHAPTER 2: INCEPTION OF PMS

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

2.1 INTRODUCTION

The renowned genius Albert Einstein has said, "If I had an hour to solve a problem I'd spend 55 minutes thinking about the problem and 5 minutes thinking about the solution." This means, it is more necessary to dig deep into the problem rather than jumping to a solution. Developing efficient software falls under the same jurisdiction.

Inception is the first phase of requirements engineering. It defines the scope and nature of the problem. The principle target of this stage is to create a basic understanding of the problem, identify the people involved and comprehend the nature of the solution via communication.

For a clear perception of the software requirements, a groundwork is established involving the following steps:

- ➢ Listing down the stakeholders
- ➢ Recognizing multiple viewpoints
- ➢ Working towards collaboration
- ➢ Breaking the ice and initiating communication

2.1.1 LISTING DOWN THE STAKEHOLDER

According to Sommerville and Sawyer [Som97], "Anyone who benefits in a direct or indirect way from the system which is being developed is a stakeholder." This implies that stakeholders include end users of the developed software as well as people whose activities might be influenced by the tool. Towards the end of inception, the list of stakeholders is usually larger as every stakeholder is allowed to suggest one or more individuals who might be probable stakeholders for the given problem.

To identify stakeholders we consulted a number of pharmacies in Dhaka, Bangladesh and asked them the following questions:
- ➢ Who will be using the product?
- ➢ Whose work will this project affect?

We identified the following stakeholders for our project.
- Pharmacy owner
- Employee
- Shareholder
- Supplier
- Developer

2.1.2 RECOGNIZING MULTIPLE VIEWPOINTS

The list of stakeholders will contribute to the input when requirements are elicited. Every stakeholder has different views of the system and achieves different benefits when the system is developed.

PHARMACY OWNER'S AND SHAREHOLDER'S VIEWPOINTS

- User friendly
- Computer based system
- Minimum maintenance expenditure
- Multiple login system: admin and standard
- Strong authentication
- Error free system
- Salespersons database
- Salespersons working hours recorder
- Notification per sale (to admin only)
- Report of daily transaction history (admin only)
- Cash-memo system
- Expiry date tracker and notification (before 4 months of expiry date)
- Low stock alert
- Recommendation list for medicines having same component
- Search option
- Supplier's database
- Sorting drugs (and other products) with respect to companies and components
- Future support from developers

SALESPERSON'S VIEWPOINTS

- User friendly
- Smartphone based system
- Easy access
- Offline guidance
- Expiry date tracker and notification

- Cash memo system
- Recommendation list for medicines having same component
- Search option for drugs
- Sorting drugs (and other products) with respect to companies and components
- Internet browsing option

DEVELOPER'S VIEWPOINTS

- Easy to develop
- No ambiguous requirement
- Keeping it simple and user friendly
- Light weight

SUPPLIER'S VIEWPOINTS

- Get notification via SMS or email
- Low complicated system

2.1.3 WORKING TOWARDS COLLABORATION

Each of the stakeholder constituencies (and non-stakeholder constituency) contributes to the requirement engineering process. The greater the numbers of interactions with multiple stakeholders, the higher is the probability of inconsistency, conflicts and clashes of viewpoints. In such circumstances, requirement engineers finalize the requirements following some steps, which are listed below.
- Finding out the commonality and the conflicting points of stakeholders
- Categorizing stakeholders
- Listing down the requirements based on the stakeholder's priority points

COMMON POINTS

- User friendly
- Expiry date tracker and notification
- Low stock alert
- Cash memo system
- Recommendation list for medicines having same component
- Search option for drugs
- Sorting drugs (and other products) with respect to companies and components

- ➢ Supplier's database

CONFLICTING POINTS

- ➢ Device
- ➢ High security
- ➢ Budget
- ➢ Easy access

FINAL REQUIREMENTS

- ➢ User friendly system
- ➢ Strong authentication
- ➢ Offline guidance
- ➢ Expiry date tracker and notification
- ➢ Cash memo system
- ➢ Recommendation list for medicines having same component
- ➢ Search option for drug
- ➢ Sorting drugs (and other products) with respect to companies and components
- ➢ Multiple login system: admin and standard
- ➢ Salesperson working hours recorder
- ➢ Notification per sale (to admin only)
- ➢ Report of daily transaction history (to admin only)
- ➢ Low stock alert
- ➢ Restrict access to functionality of the system based upon user roles

2.1.4 COMMUNICATION INITIATION

In requirements engineering, the involved individuals can be broadly divided into two clusters: the developers and the stakeholders. Coming from different backgrounds, it will be obvious that these two parties will have different points of views regarding the problem. The stakeholders have more knowledge on facing the problem. Meanwhile, the developers are experienced with providing computerized solutions. Thus, in order to obtain an efficient solution to the problem, it is important to 'loosen up' or 'break the ice' between the two groups.

Following the ideal guidelines of requirement engineering, some context free questions were asked. The context free questions help throwing light on the stakeholders of the project. The next set of questions includes the context itself so that a better understanding of the problem is obtained. The stakeholder is encouraged to voice out his/her opinions about an alternate solution and also provide recommendations to the developer's suggestions. The final set of questions focuses on the communication activity itself.

2.2 CONCLUSION

The intense hours of developing a software is fruitful only if the users are benefitted and satisfied. Jumping into coding, right after signing up for a project throws both the clients and the developers into the risks of failure. A successful project demands a better perception of the problem. The best and easiest way to sketch out the hints of a solution is to interact with those encountering the problem itself. This is where inception phase comes.

Inception phase has given us the opportunity to create a basic understanding of the problem and perceive an abstract idea of the nature of the solution. Direct interaction with the stakeholders made us come across core points of a solution and realize the effectiveness of communication between two parties. We believe that our groundwork will help us implement an efficient solution to the problem.

CHAPTER 3: ELICITATION OF PMS

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

3.1 INTRODUCTION

The second phase of requirements engineering is elicitation. The main task of elicitation is to combine elements of problem solving, elaboration, negotiation and specification. Gathering information from stakeholders regarding the problem was not sufficient to design the software. The problems that arose, were encountered following the principles of elicitation.

3.2 ELICITING REQUIREMENTS

Stakeholders works together to identify the problems, propose elements of solutions, negotiate different approaches and specify an initial set of solution requirements. This approach is sometimes called Facilitated Application Specification Technique (FAST). Elicitation has some sub-phases which are:

- ➢ Collaborative Requirements Gathering
- ➢ Quality Function Deployment
- ➢ Usage Scenario
- ➢ Elicitation Work Products

3.2.1 COLLABORATIVE REQUIREMENTS GATHERING

During inception, basic questions and answers established the scope of the problem and overall protection of a solution. However, some problems persisted about scope as the boundary of the system was ill defined and the customers have stated some unnecessary confusing detail. Also, customers/stakeholders don't have a proper understanding about the abilities of the computing environment which results in further discussion regarding the problem domain and product requirements. The requirements were put under revolution by doing following task:

> ➢ Meetings were conducted with stakeholders (owners and salespersons) and we went into further investigation about their requirements and expectations.
> ➢ They were inquired about the problems with existing workflow.
> ➢ The final requirement list was derived at the end of the meeting.

3.2.2 QUALITY FUNCTION DEPLOYMENT

Quality Function Deployment (QFD) is a quality management technique that translate the need of the clients into technical requirements for software. The prime concern of the QFD is customer's satisfactions maximization. In order to ensure this, QFD enforces in understanding of what customer describe as 'valuable' and then deploy these values throughout the engineering process.

QFD defines three types of requirements:

> ➢ Normal Requirements
> ➢ Expected Requirements
> ➢ Exciting Requirements

3.2.2.1 NORMAL REQUIREMENTS

Normal requirements refer the objectives and the goals that are stated for the product during the meeting with stakeholders. The presence of these requirements ensures the satisfaction of the customers. The normal requirements for the project are stated below:

> ➢ Low storage alert
> ➢ Expire date alert
> ➢ Cash memo
> ➢ Recommendation list
> ➢ Daily transaction history
> ➢ Internet searching
> ➢ Login system

3.2.2.2 EXPECTED REQUIREMENTS

Requirements that are implicit to the system might not be brought up during the meeting because of their fundamental nature. Despite being not explicitly mentioned, their presence must be ensured. Otherwise, the product will leave customers dissatisfied. These requirements are called expected requirements and these are stated below:

- ➢ Database
- ➢ Login type (Administrator/Standard)
- ➢ Email validity check
- ➢ Internet connection

3.2.2.2 EXCITING REQUIREMENTS

Factors that go beyond the customer's expectations and prove to be satisfying when present exciting requirements, exciting requirements are the so called 'wow factor' for our project:

- ➢ Notification message/email
- ➢ Recommendation list
- ➢ Graph generation based on monthly profit/loss
- ➢ Monthly transaction graph

3.2.3 USAGE SCENARIO

Pharmacy Management System (PMS) is an automated system for the following purposes:

- ➢ Authentication
- ➢ Stock Management
- ➢ Financial Management
- ➢ Information System
- ➢ Human Resources Management

3.2.3.1 AUTHENTICATON

When the user opens the software options for sign up/registration, sign in and account recovery is be displayed. These activities related to accessing the system fall under the category of authentication.

REGISTRATION/SIGN UP: DATA ENTRY

The owner registers himself/herself as the administrator of the system. The information he/she has to enter at the time of registration includes: full name, username, contact number, email, present address, password, backup questions and their corresponding answers. The administrator has the sole authority to register salespersons and shareholders in the system. To enlist a salesperson to the system, the following data must be provided: full name, username, password, address, contact number, email, date of recruitment, salary, National ID number, date of birth, present and permanent addresses. The following information must be given when registering a shareholder: full name, username, contact number, email, National ID number, investment/share amount. It must be noted that the administrator himself/herself assigns the username and password for a shareholder/salesperson at the time of registration.

REGISTRATION/SIGN UP: VALIDITY CHECKING AND STORING INFORMATION

At the time of data entry, there would be a validity check. The password must contain minimum 8 characters including at least one number. The format of e-mail, password and contact number is verified at the time of input. Confirmation code of four digits is sent to valid phone number and email address. Before confirming registration, the system asks for the codes. Correct entry of code results in account creation. The registration information of the individual is stored in Database.

SIGN IN

When the user chooses the "sign-in" option he/she is directed to the login page. He/she enters his/her respective username and password. The entered data is matched with the corresponding data stored in Database. If entered data matches the stored data, the user gains access to the system. The first login time of a salesperson is recorded on a daily basis.

ACCOUNT RECOVERY

If the user fails to recall his/her password and/or username, he/she can directly choose the "account recovery" option. Otherwise, he/she can try five times. If the entered password is incorrect on the 5th attempt, the user will be directed to the account recovery. In case of

owner, the system presents him/her of previously saved backup questions. If the answers to the backup questions match with the answers stored in Database, a confirmation code is sent to the administrator's phone and email address. On the other hand, salespersons and shareholders are asked to enter their contact number and email address. If contact number and email address match with the contact number and email address stored in database, the system sends the confirmation code to that number. Then, the system prompts the user to enter the confirmation code. The confirmation code is valid for 3 hours upon delivery. If the victim enter the valid confirmation code within the given period, he/she then will be able reset his/her password and/or username.

SIGN OUT

When a user attempts to sign out, the system prompts user for unsaved data, if there remains some unsaved data. If the user is salesperson, the last logout time will be recorded every day.

3.2.3.2 STOCK MANAGEMENT

The stock of a pharmacy includes drugs, first aid products, hygiene products and minimal medical tools. The following attributes of products will be stored in Database: product name, product ID or PID, product type, component, company name, cost price, manufactured date, expiry date, discount, sale frequency. Products can be searched by the product name, company name and customer name by salesperson and administrator. One of the most important issues in pharmacy management is to keep record of expiry dates of products. A carton of products whose expiry date will come in four months and another carton of the same product whose expiry date comes in a year can be in the stock. In order to reduce wastage, the pharmacy tries to sell the products whose expiry dates are nearer. For this reason, products are displayed by their expiry date.

STOCK RESERVE AND TRANSACTION UPDATE

At the beginning, the admin performs the task of updating the stock reserve. After salespersons are added to the system, they will update the stock upon receiving the products delivered by the supplier. The salesperson also updates the stock information after every sale. After every update, system will show pop-up for successful update.

PRODUCT RENEWAL AND EXCEPTION

Products can also go missing (due to accidents, political conflicts, extortion, theft, natural disasters). The drop in stock will also be recorded in database by salesperson. Again due to

less demands and sales, expiry dates of the products in the stock may pass. In these circumstances, the salesperson will update the decrement and send a notification to the admin. Sometimes, supplier allows the return of expired products and provides fresh products in return or even may give products for free.

3.2.3.3 FINANCIAL MANAGEMENT

The business of a pharmacy starts with an initial investment or principal which will be stored in the system. The daily transactions are handled by the salesperson. When a customer pays for a product, the salesperson updates the cash. The transaction information for product sale is stored by the following attributes: transaction ID or TID, product name, product ID or PID, quantity, date, username (of salesperson). The salesperson also notifies the administrator for paying the supplier. Administrator clears the dues with the cash in the shop and performs the update in the system.

An administrator will give the salespersons their salaries. Besides salaries, there are maintenance expenditures, for example, shop rent, electric bill. All these expenditures are treated as transaction which contain the following attributes: transaction id or TID, transaction type or T-type, transaction amount, username (salesperson when paying him/her), date and remarks.

The administrator or shareholders may desire to increment/decrement their shares in the business or withdraw their profits. The administrator can withdraw cash and update the system anytime. However, the shareholder notifies the administrator for cash withdrawal. During profit withdrawal, share increment/decrement, the sum of money to be deducted/added is entered as transaction.

Sometimes, loss is incurred from political clashes, extortions, accidents, natural disaster. The salesperson sends notification to the administrator regarding the loss. The administrator keeps record of the amount of the losses in Database with the date of the incident.

3.2.3.4 INFORMATION SYSTEM

The salesperson cannot remember all the products that need to be delivered, which products have their expiry dates nearby, which supplier to contact for which product, how many products have gone missing due to unavoidable circumstances. Also, a salesperson lacks the authority to help a customer by selling a product with due and purchasing a product from a person who is not a supplier who has a deal/contract with the owner. The information

management system assists and aids the salesperson in overcoming the problem of recalling everything.

The number of products in the stock decreases naturally after every sale. The salesperson updates the stock regularly after the purchase. When the products reach a certain number (determined by the administrator), the database generates a low stock alert and notify the salesperson. The salesperson sends request to supplier for products. The system shows whether the request has been sent successfully or not.

As stated before, Database keeps record of the expiry date of products. The administrator sets a time period before the expiry date for each product. When a product reaches that date, Database sends "expiry date alert" notifications to the salesperson and administrator.

Sometimes customers are unable to give full payment of purchased products. In these circumstances, a salesperson will enter customer data including: customer name, phone no, National ID number, address and send a notification to owner for the product sold with pending due. Database stores the customer details.

At times, individuals/customers want to sell products purchased from another pharmacy. The salesperson will seek the owner's permission by sending a request. If owner grants the permission, pharmacy purchases the product checking the expiry date and updates the stock.

There are cases when a customer may be in need of a product that is unavailable at the respective pharmacy and neighbouring ones as well. For such incidents, the salesperson sends message to the owner over the software about the customer and the product in need. The admin grants/denies the request for future purchase.

The pharmacy can also fall victim to extortion or accidents. The salesperson sends messages of the products lost in these cases to the admin.

The information system also contains the daily transaction history, product sale frequency, graph based on monthly profit/loss and monthly transaction graph. The administrator can see all the all these information and the shareholder can only see the monthly profit/loss graph and monthly transaction report if he/she wants.

3.2.3.5 HUMAN RESOURCES MANAGEMENT

The system supports 3 kind of users: Owner, Salesperson and Shareholder. Besides these individuals, every pharmacy has suppliers who provide products on demand. The administrator exercises the power to include or exclude individuals involved. He/she also has the ability to edit the individual's information. When adding salespersons, shareholders and

suppliers to the system, the details of the individuals will be stored. These details include full name, address, email, contact number, Joining data, investment (for shareholder only). All these data are entered by the owner. When owner removes anyone, information will be removed from database and their access to the system will be denied onwards.

3.2.4 ELICITATION WORK PRODUCT

At first we have to know whether the output of the Elicitation task may vary because of the dependency on the size of the system or the product to be built. Here, the Elicitation work product includes:

➢ Making a statement of our requirements for the Pharmacy Management System.

➢ Making a bounded statement of scope for our system.

➢ Making a list of users and other stakeholders who participated in the requirements elicitation.

➢ A set of usage scenarios that provide insight into the use of the system.

➢ Description of the system's technical environment.