

SCHOOL OF INNOVATIVE TECHNOLOGIES AND ENGINEERING

BEAUTY SALON BOOKING SYSTEM

This dissertation is submitted in partial fulfilment of the requirements for the degree of
Bachelor of Science with Honours in Software Engineering

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Chapter 1. Initial Study

1.1 Background Study

Beauty has been always considered to be an important attribute for females. The hair and beauty industry has evolved very rapidly. Long time ago, female or males would only care about a haircut, but now along with beauty services addons, the concept of beauty and being beautiful has changed a lot. Even, men also are doing this business and are also more frequently seen in salon for haircut and hairstyles.

A fact is that the percentage of women going in a salon is always higher than men. Now women tend to spend more time, money and energy on beautification by visiting beauty salon and parlors. In Mauritius, there are many beauty salons with sophisticated beauty machines which help the businesses to improve and provide a higher standard customer service.

In the past, people were not interested in this business, but now it has become a profession where especially, women get to become “entrepreneuse” and they help in contributing to the economy as well. Women get to be independent and knows how to live and how to survive in this business. There are also many startup salons which need to follow certain steps of big salons to become well known in this industry. Those hair and beauty services are done by professional and certified persons and its prices are also varied.

1.2 Introduction

Beauty salons are also like a temple but sometimes with many customers calling for appointments, has become difficult to manage. The problem is that the private salon is not being able to keep up with two works at the same time that taking appointments and taking care of clients. The owner cannot respond to calls and also lost some clients due to lack of time management. The actual status is the owner is taking notes or appointments in a diary where it becomes difficult to manage clients' calls and messages are not even replied as there are too many. If this goes on like that, a decrease in clients might be significant. The private salon includes only the owner and one staff where they work together to improve the services.

The proposed system is a web-based application, Beauty Salon Booking System which is designed to computerize the beauty salon management. It boosts up the performance in retrieving information with less or no paper work.

Beauty Salon Booking System helps the stakeholders using the system to take reasonable decisions for customers' booking and administration. It is very user-friendly, paperless and time saving in such a way the owner and customers relationship are well bonded. This software helps in improving the quality of services and if that works, it is very beneficial to the salon using this software.

Chapter 2. Project Management

2.1 Project Plan

2.1.1 Aims of the project

The goal of the project is to create a web-based application to support the gap between owner and clients. The main purpose of the system is to provide real-time information and allows the customers to schedule their appointments at any time by removing the “wait for your chance” concept. The system will allow the stakeholders in retrieving quick and systematic information.

Storing large amount of information will be solved in the system that is there is no need to compile information in files or documents. No data redundancy is assured in the system.

2.1.2 Scope of the project

The primary objective for the administration in this automated system is to keep track of the client bookings. Secondly, the Beauty Salon Booking System will provide a better way of monitoring the clients' booking status and payment. Customers can browse the details of the salon that services you provide, working hours and offers & packages that come.

Discounts and offers will be mentioned because these are the ideas generally attracting the attention of customers. Allowing people to choose their stylists and beauticians through the salon website is a good option.

2.1.3 Major Stakeholders

- Administrator/Owner
- Customer

2.1.4 General Timeframe

- 7th November 2020 - Project Proposal Form
- 16th November 2020 – Initial Study Submission
- 22nd February 2021 – Project Status Checkpoint
- 7th June 2021 – Final Project Report Submission
- As from 14th June 2021 – Project Presentation and Demonstration

Refer to Gantt chart for more details about timeframe.

2.2 Work Breakdown Structure

Below is the table of the organizational chart of Beauty Salon Booking System:

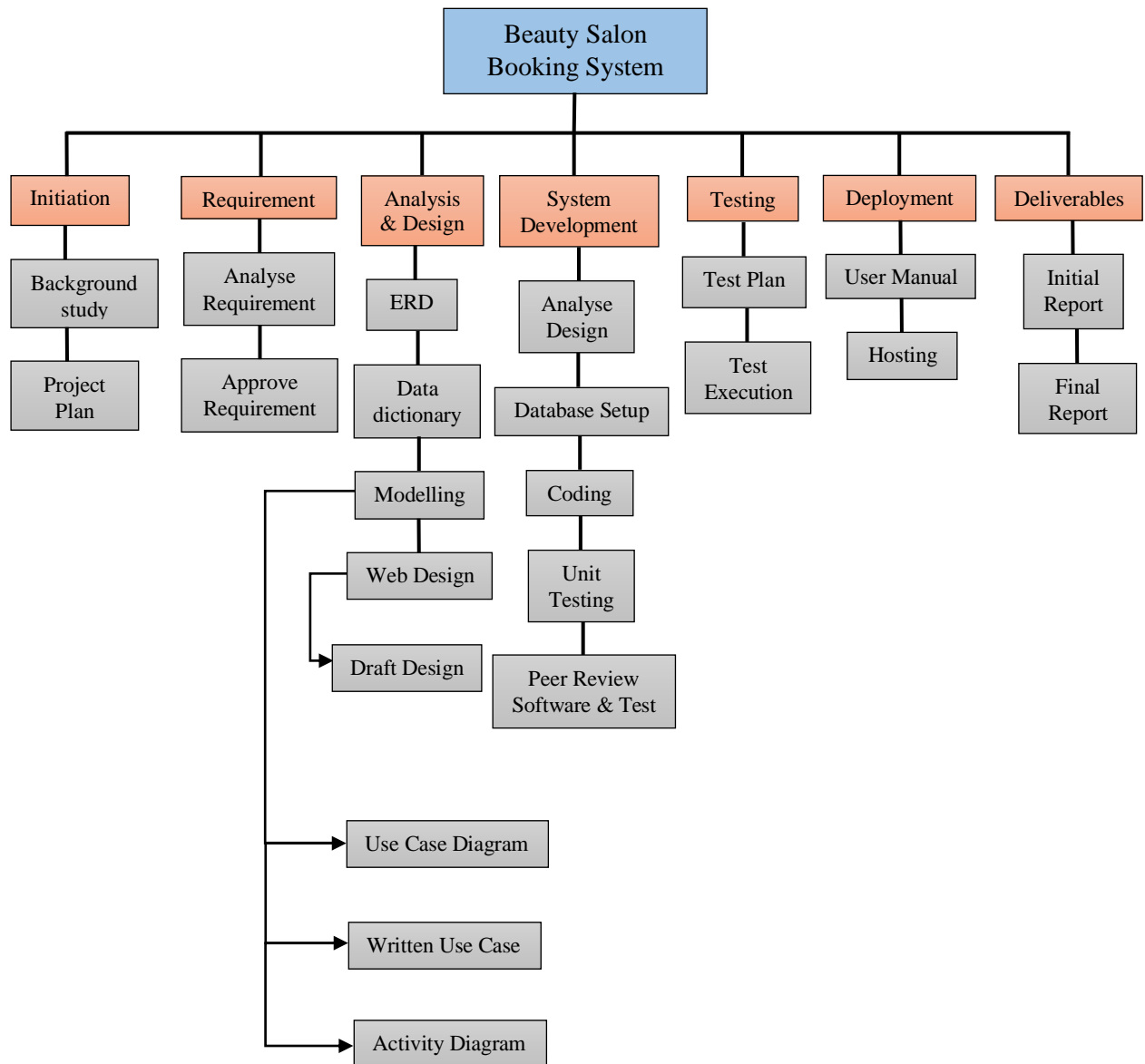


Figure 1: WBS of Beauty Salon Booking System.

2.3 WBS Dictionary

The **time** from start to finish date is not real. The time may vary.

		Name	Duration	Start	Finish	Predecessors	Work
1		Requirement	14 days?	11/11/20 8:00 AM	11/30/20 5:00 PM		136 hours
2		Background Study	1.25 days?	11/11/20 3:00 PM	11/12/20 5:00 PM		10 hours
3		Introduction - Problem Statement	1 day?	11/13/20 8:00 AM	11/13/20 5:00 PM	2	8 hours
4		Project Charter	1 day?	11/16/20 8:00 AM	11/16/20 5:00 PM	3	8 hours
5		Work Breakdown Structure	1 day?	11/11/20 8:00 AM	11/11/20 5:00 PM		8 hours
6		Gantt Chart	1 day?	11/12/20 8:00 AM	11/12/20 5:00 PM	5	8 hours
7		Risk Management	0 days?	11/15/20 8:00 AM	11/16/20 5:00 PM		8 hours
8		Feasibility Study	1 day?	11/16/20 8:00 AM	11/16/20 5:00 PM	3	8 hours
9		Methodology	10 days?	11/16/20 5:00 PM	11/30/20 5:00 PM	2;8	78 hours
12		1st Deliverable - Initial Study	1 day?	11/16/20 8:00 AM	11/16/20 5:00 PM		8 hours
13		Analysis & Design	22 days?	12/1/20 8:00 AM	12/30/20 5:00 PM	9;12	256 hours
14		Data Model	6 days?	12/1/20 8:00 AM	12/8/20 5:00 PM		48 hours
17		Modelling	22 days?	12/1/20 8:00 AM	12/30/20 5:00 PM		208 hours
23		Implementation	86 days?	1/1/21 8:00 AM	4/30/21 5:00 PM	13;22	744 hours
24		Architectural Design	1 day?	1/1/21 8:00 AM	1/1/21 5:00 PM		8 hours
25		Login/Forgot Password Module	1 day?	1/1/21 8:00 AM	1/1/21 5:00 PM		8 hours
26		Registration Module	1 day?	1/4/21 8:00 AM	1/4/21 5:00 PM	25	8 hours
27		Administrator/Owner Module	1 day?	1/1/21 8:00 AM	1/1/21 5:00 PM		8 hours
28		Client Module	1 day?	1/4/21 8:00 AM	1/4/21 5:00 PM	27	8 hours
29		Mail Module	1 day?	1/4/21 8:00 AM	1/4/21 5:00 PM	27	8 hours
30		Payment Module	1 day?	1/4/21 8:00 AM	1/4/21 5:00 PM	27	8 hours
31		System Testing	86 days?	1/1/21 8:00 AM	4/30/21 5:00 PM		688 hours
32		Project Status Checkpoint	1 day?	2/22/21 8:00 AM	2/22/21 5:00 PM		8 hours
33		Testing	21 days?	5/3/21 8:00 AM	5/31/21 5:00 PM	23;31	168 hours
34		Software Review	1 day?	5/3/21 8:00 AM	5/3/21 5:00 PM		8 hours
35		Software Test Plan	1 day?	5/4/21 8:00 AM	5/4/21 5:00 PM	34	8 hours
36		Test Execution	19 days?	5/5/21 8:00 AM	5/31/21 5:00 PM	35	152 hours
37		Implementation	4 days?	6/1/21 8:00 AM	6/4/21 5:00 PM	34;36	32 hours
38		Free Hosting	4 days?	6/1/21 8:00 AM	6/4/21 5:00 PM		32 hours
39		User Manual / Final Report	148 days?	11/11/20 8:00 AM	6/4/21 5:00 PM		1,184 hours
40		Report Review	1 day?	6/7/21 8:00 AM	6/7/21 5:00 PM	39	8 hours
41		Final Deliverable - Final Report & User Manual	1 day?	6/7/21 8:00 AM	6/7/21 5:00 PM		8 hours

Figure 2: Beauty Salon Booking System WBS Dictionary.

2.4 Gantt Chart

According to the Work Breakdown Structure, A Gantt Chart must be represented to show scheduling of the entire project. Below is the Gantt Chart showing Project Schedule:

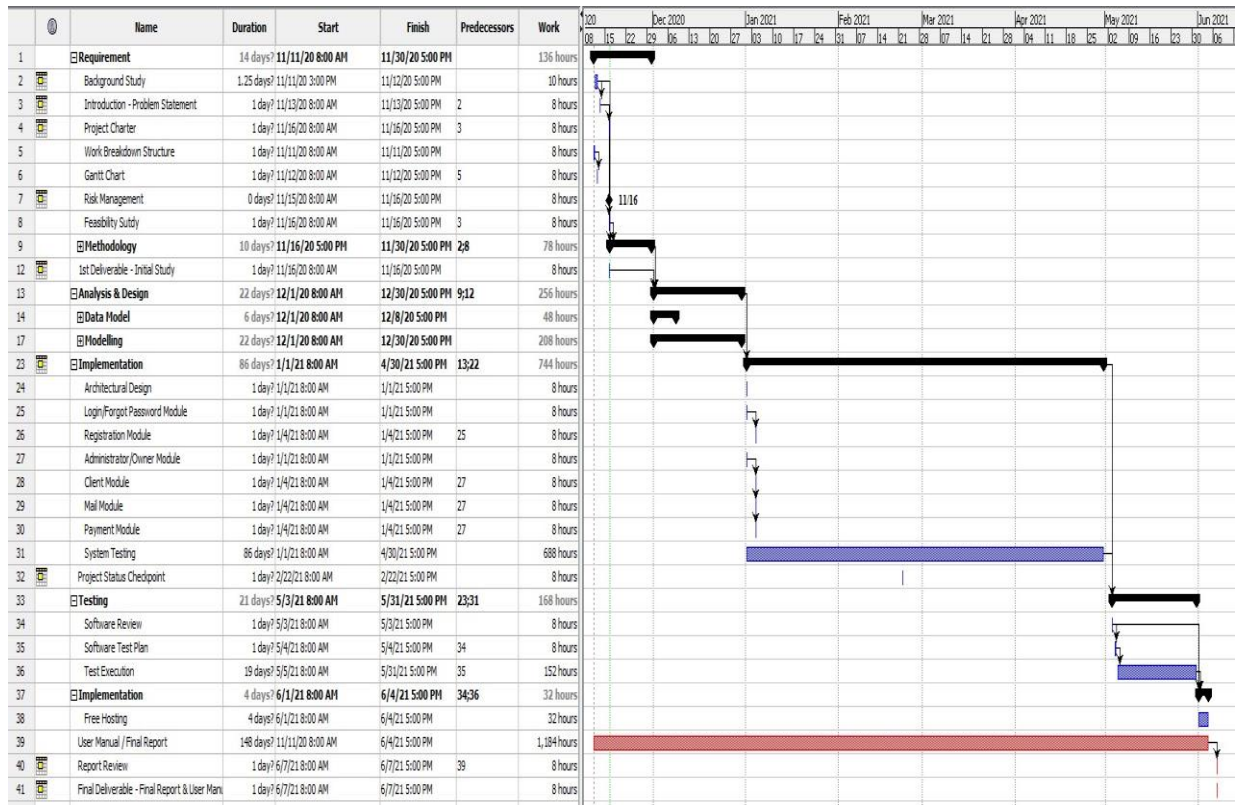


Figure 3: Gantt Chart/WBS dictionary for BSBS.

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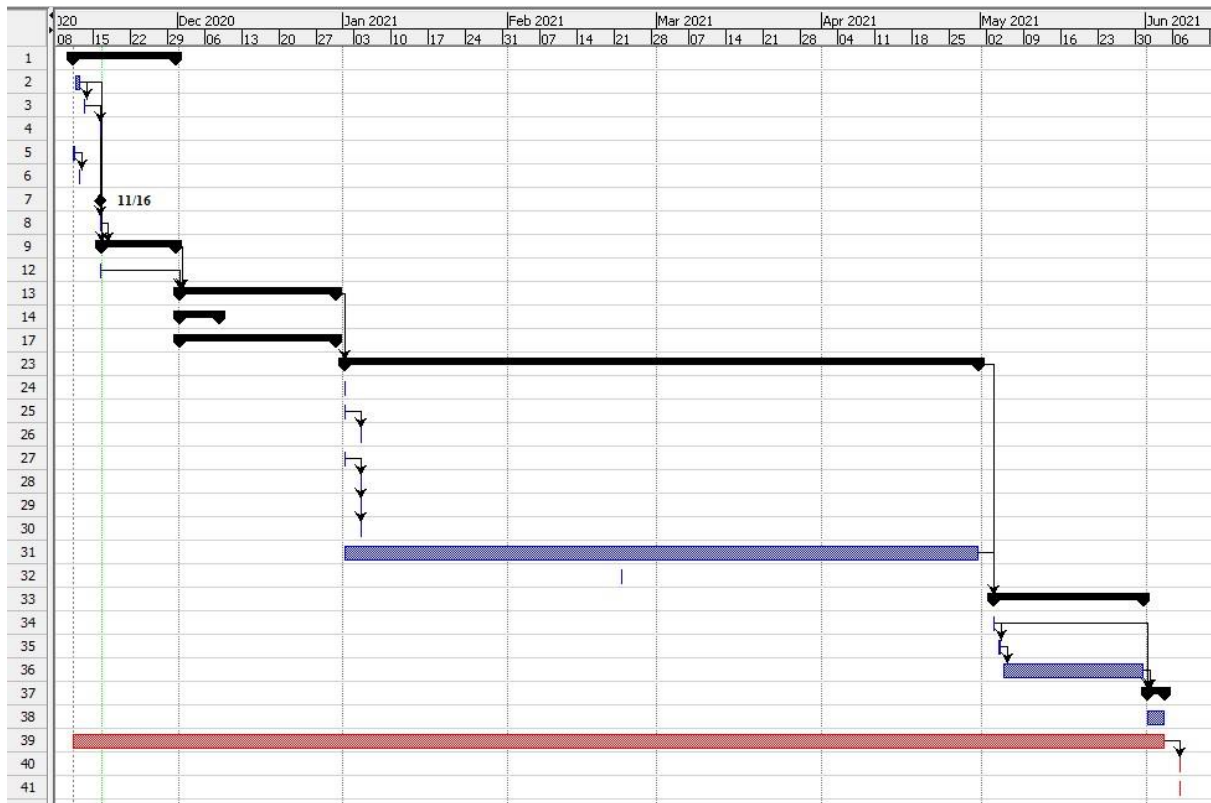


Figure 4: Gantt Chart showing project schedule for BSBS (Projet Libre).

2.5 Risk Management Plan

Risk management is done so that we are prepared to foreseen risks and to be able to estimate impacts but also create plan to mitigate them.

1. **Identify Risk** - identification of threats or potential risks that can occur in the project.
2. **Cause of Risk** – Once the risks are identified, they are then traced to find out the sources of risk and the impact they could have on the project.
3. **Measure the Risk** - “If you can’t measure risk, you can’t manage it”. Some examples of risk measurement are risk ratings or scoring, risk probability, value at risk and sensitivity analysis.
4. **Evaluate Risk** – When all risks have been identified, assessed and measured, decision must be taken to respond to those risks. There are four categories of risk responses – avoid, accept, reduce and share.
5. **Mitigate Risk** - Selected risk responses are then reviewed by management and decides to implement those risk responses.
6. **Monitor Risk** - It is an important key of project monitoring – Gradually, the practicality of risk mitigation actions should be monitored.

Below is a table showing the risks that can occurred in the project and also mitigation strategies for each risk:

- Probability from low-high (Low, Medium, High)
- Consequences from tolerable-catastrophic (Tolerable, Serious, Catastrophic)

Risks	Probability	Consequences	Mitigation
Network Failure.	Medium	Catastrophic	
Power Cut.	Medium	Catastrophic	Use of UPS.
Security Risks.	High	Serious	Use of Encrypted Passwords and Session Functions.
Database Crash.	Medium	Catastrophic	Do regular backups.
Functionalities and Forms may not work due to outdated version of PHP.	Low	Serious	Do regular updates if there is any change in the evolution of PHP.
Hardware Problem.	Low	Serious	Upgrade the hardware.
Hard Disk Crash.	Low	Catastrophic	Do regular backups on external drive.
Wrong time estimation for project completion.	Medium	Serious	Will use buffers.
Manual Communication Problems.	Low	Tolerable	Proper personal planning.
Deployment.	Medium	Serious	Try to learn about deployment earlier.
Availability of Stakeholders. (administrator, customers)	Medium	Tolerable	Fix a proper schedule.
Failure to identify core complex functionalities and time required to develop those functionalities.	Low	Serious	Take the time of low priorities tasks in doing the high priorities ones.

Table 1: Risks Identification and its Mitigation Strategies.

2.6 Functional requirements.

Key:

- Highest: critical functional component.
- High: functional component with high importance in the system.
- Medium: functional component with importance regarding the working of the system.
- Low: non-critical component

No.	Requirements	Status
1.	Login to the system	Highest
2.	Admin, and Clients must be redirected to respective account.	High
3.	The system must validate Email and Password.	High
4.	Forget password.	Medium
5.	Password Recovery mail.	Medium
6.	Account Opening mail.	Medium
7.	Admin updates clients' profile.	High
8.	Admin adds staff	High
9.	Admin generates clients' receipt.	High
10.	Admin confirms booking payment.	High
11.	Admin sets services/duration/price.	Medium
12.	Admin blocks\unfreeze clients' account	Medium
13.	Client signup via Email\Pass or Social Login	High
14.	Client updates his/her own profile.	High
15.	Client manages bookings.	High
16.	Client generates payment receipts.	High
17.	Admin views his/her Clients' profile.	High
18.	Client views payment.	High
19.	Client views appointments	High
20.	Notification system.	High
21.	Stakeholders can change their passwords.	Highest
22.	Logout.	Highest

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23.	System back-up.	High

Table 2: Functional Requirements for Beauty Salon Booking System

2.7 Non-Functional requirements.

Performance requirements:

- The Response time of the system must be very quick after checking information.
- The system must support and handle a very large amount of data at a time.
- The system must be very user-friendly with small amount of click.

Accuracy:

- The system should be able to provide real time information taking into consideration various concurrency issues.

Safety requirements:

- The system must have the capability to back-up data in case there is a database crash.

Operational requirements:

- The system shall be compatible with different type of browser (Chrome, Firefox, Safari, IE).

Security requirements:

- The admin and the operational staff must have a unique login id, so that the system can know who is logging in and not letting any non-authorized person to enter the system to change sensible data.
- The system should handle errors with error handling mechanism.
- The system will be using password encryption to prevent hackers from entering the system.
- Admin must be able to view and modify information in the Beauty Salon Booking System.

Software quality attributes:

- Availability – The system should be available every single time.
- Usability – The web interface is very simple with a well structure layout. These make the platform easy to understand and to use.
- Accessibility – Admin and operational staff have a limited access to the system according to their corresponding work scope.
- Reliability – The system must facilitate data integrity.
- Portability – The system shall be easily executed on a different software/ hardware platform to the one it has been developed for.
- Robustness - The application must have proper error handling and proper message should be display for optimal user experiences.

2.8 Feasibility Study

Feasibility Study is an analysis carried out to gather enough information for a decision making whether to proceed with the Beauty Salon Booking System or not. A plan for the project is showed and it has to make sure that the system has no negative impact to the salon. This study is done also with internal or with external consultants which is administrator, the clients and as well as the one staff member.

The feasibility analysis consists of 3 major keys:

2.8.1 Technical Feasibility

It is a study on all technical resources available to achieve the proposed system. This assessment will decide there is any technology available or not for the proposed system.

- Can existing technology be used to build the project?
- If any changes or upgrades are demanded, then can the system cope with those changes?
- Will it be feasible to develop new technology if required?
- Is the project feasible within the limits of current technology?

In order to develop the Beauty Salon Booking System does need enough money to be developed but it depends how many men need to work on the system. The system can be judged to be economically feasible if planned judiciously, a list of software, hardware and tools can be used which is described below:

❖ Software

- Windows 10/ Mac OS X
- Web Browsers (IE11, Chrome, Firefox, Safari)

❖ Hardware

- PC/ Monitor/ Laptop

❖ Tools

- Sublime Text Editor/ PhpStorm IDE/ Brackets Text Editor
- Xampp/ Wamp/ Mamp servers
- Case Tool – Select SSADM
- CodeIgniter Framework (best)

❖ Internet

- To have the best internet connection access, a 20 M my.t Fibre is sufficient.

❖ Security

- The PC must be password protected and give permission access to the right person only.
- The computer system needs to be equipped with antivirus software which is free online. Avast would be the best software to detect any virus, worm, Trojan horse and spyware and prevent any malware attempting to attack the system.

Front-End layer

An interface which is user friendly and interactive and also which is simple for non-IT users. It must have the ability to be easily modified when there is any impact of changes. It should be able to work under large workload with a better level of performance.

For developing our project, we selected CodeIgniter Framework and programming language, PHP7 and HTML5 to work with. PHP runs on various platforms and is compatible with almost all servers used today. One important aspect is PHP is open source and free. It provides powerful built in functions.

Why CodeIgniter?

- Free.
- No Setup (2mb download, including user guides).
- Easy to understand and use compared to other frameworks (Laravel).
- Nearly zero configuration.
- CodeIgniter encourages MVC, but does not force it on you.
- Built-in security tools.
- Built-in libraries.
- An excellent documentation.

Back-End layer

Since we selected PHP7, it is obviously to use the new version **MySQL** (phpMyAdmin) as the backend services. It is easy to install and work with. Data retrieval is much easier with PHP and more accessible. There will be no problem in connection with PHP7 as it is installed on the localhost of the computer itself.

2.8.2 Operational Feasibility

Operational Study is related to human society and government decision making. The user must be inclined in using the system. Users must be at ease with the system and training must be given for those non-IT users. It is the users who will decide whether the system is efficient or not. The level of acceptance of the system is an important one to move forward.

Feedbacks are important from End users to know what they want, how they use the system, how they find the system, do they find it difficult, do they need training and what new can be bring into it.

❖ **Technologies Availability**

The proposed system needs a computer system and different software which are available online. A computer system is accessible in every corner in any Computer Hardware shops and is affordable to buy.

❖ **Users Ability**

The system will be used by the owner and clients only. Nowadays, every Mauritian has a computer connected to the Internet and mobiles and tablets connected to Wi-Fi and Cyber Café all around the island. So, access to technology is easy. End-users do not need to be trained as professionals to use the system.

❖ **Willingness**

The Beauty Salon Booking System will be designed in a way so that users can use it without any difficulty. A survey will be conducted to have an overall study on the usage and likelihood of the system.

❖ **Legal Requirements**

Principles relating to processing of personal data:

- Data must be processed lawfully, fairly and in a transparency.
- Data need to be collected for explicit, specified and legitimate purposes.
- Adequate, relevant and limited data need to be processed for necessary purposes.
- Ensure that any accurate personal data are not erased, rectified and updated.
- Personal data must be kept in a form which permits identification of data subjects.
- Data need to be processed in accordance with the rights of data subjects.

2.8.3 Economic Feasibility

It is a study on the economy change that will reflect on the system and on the organization, itself. A budget must be planned for the system to be within it and what are benefits of the system to the company. It is way to know whether the system will be a burden or not on the company.

There are various steps to plan and estimate the budget of the project:

- To estimate a price for carrying out a study on the system.
- Hardware and Software cost.
- Opportunity cost is a benefit.
- Performance improvement increases profits.

This study checks that whether the proposed system can be built with sum of money available.

The project costs can be divided into 4 costs, Intangible Cost, Tangible Cost, One-Time Cost and Recurrent Cost. Below are tables showing costs associated with project start-up and development and costs for hardware and software needed:

One-Time Cost (Rs)	Year 0	Year 1	Year 2
Software Cost	7000.00		
Manpower	30,000.00		
<u>Sub Total</u>	<u>37,000.00</u>		
Recurrent Cost (Rs)			
Hardware maintenance		40,000	40,000
Software maintenance		20,000	20,000
<u>Sub Total</u>		<u>60,000</u>	<u>60,000</u>

Table 3: One-Time & Recurrent Costs.

Software needed for the system development:

Software Type	Software used	Cost (Rs)
Server	Apache	Free because of open source
Database	MySQL	Free
Framework	Code Igniter	Free
Web Browser	Firefox, Chrome, IE11	Free
PHP IDE	PhpStorm	7000

Table 4: Software Requirements.

The salon will be equipped with the following hardware:

Num	Hardware Description	Quantity	Unit Price (Rs)	Total Price (Rs)
1	Desktop PC: <ul style="list-style-type: none"> • Intel Core i7 – 10700 • Motherboard – ASRock B550 Pro 4 • RAM – 16GB DDR4 • Hard disk Barracuda 2TB • Keyboard • Windows 10 Pro (64-bit) 	1	45 000	45 000
2	Mouse Wireless Rechargeable	2	500	1 000
3	HP Officejet Pro 7740 Wide Format All-in-One Printer	1	9 000	9 000

Table 5: Hardware Requirements.

2.9 Methodology

It is technique used to develop a project and with this technique, one will determine the progress of the development of the software. For a software to be successful, a well-planned, an orderly and a conceptual study procedure is important. Methodologies were established to stimulate an orderly manner to planning, analysis, design, testing and implementation. One most important aspect is to complete a project in time and used planned budget within the scope of the project. It reflects the methodologies we use.

- **Spiral methodology:** It has an iterative approach to the notion of software development that helps risk management. One advantage is that users can give feedback early and more frequently on the system.

Unfortunately, spiral work best for large projects only, where costs involved are much higher. The model needs extensive skill in evaluating uncertainties or risks associated with the project. The time spend in planning, doing risk analysis and prototyping may be excessive. The spiral model is complex.

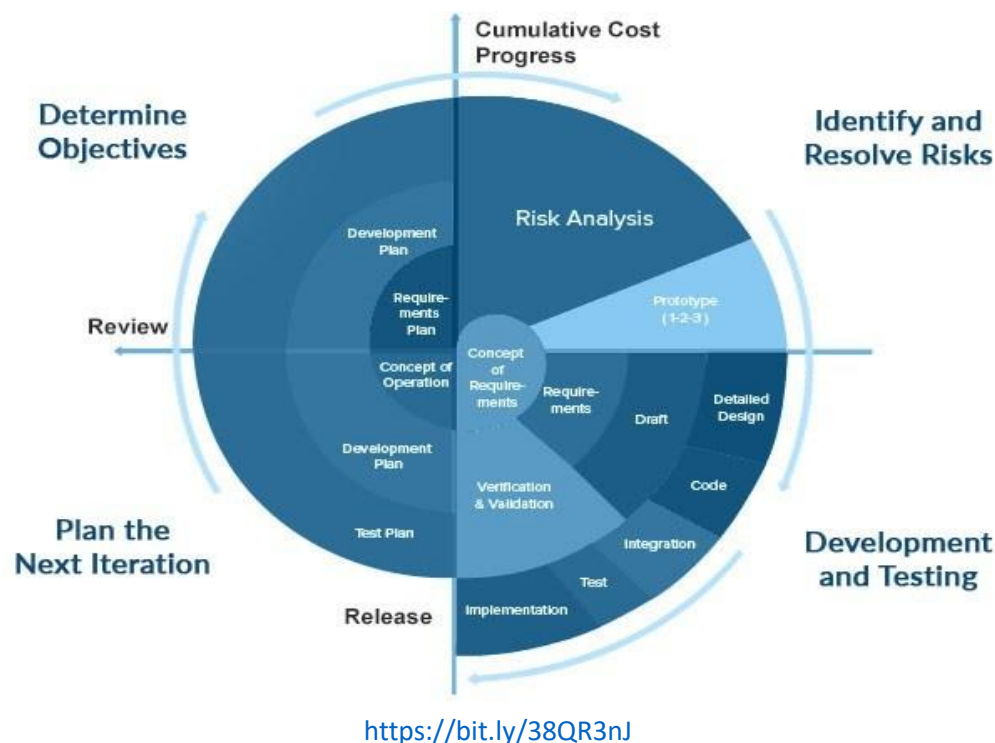


Figure 5: Spiral Methodology.

- **Rational Unified Process methodology, RUP:** It a repetitive process in Software Engineering. It enhances team productivity and acts as a guide to use UML effectively. Based on UML, RUP organizes the development of software into four different phases, each consisting of one or more executable iterations of the software at that stage of development. The four phases are:

1. **Inception**

- Problem Statement for hospitals.
- Scope of project.
- Technical Feasibility

2. **Elaboration**

- Operational Feasibility.
- Economic Feasibility.
- Risk Management.

3. **Construction**

- Application Design.
- Coding.
- Testing

4. **Transition**

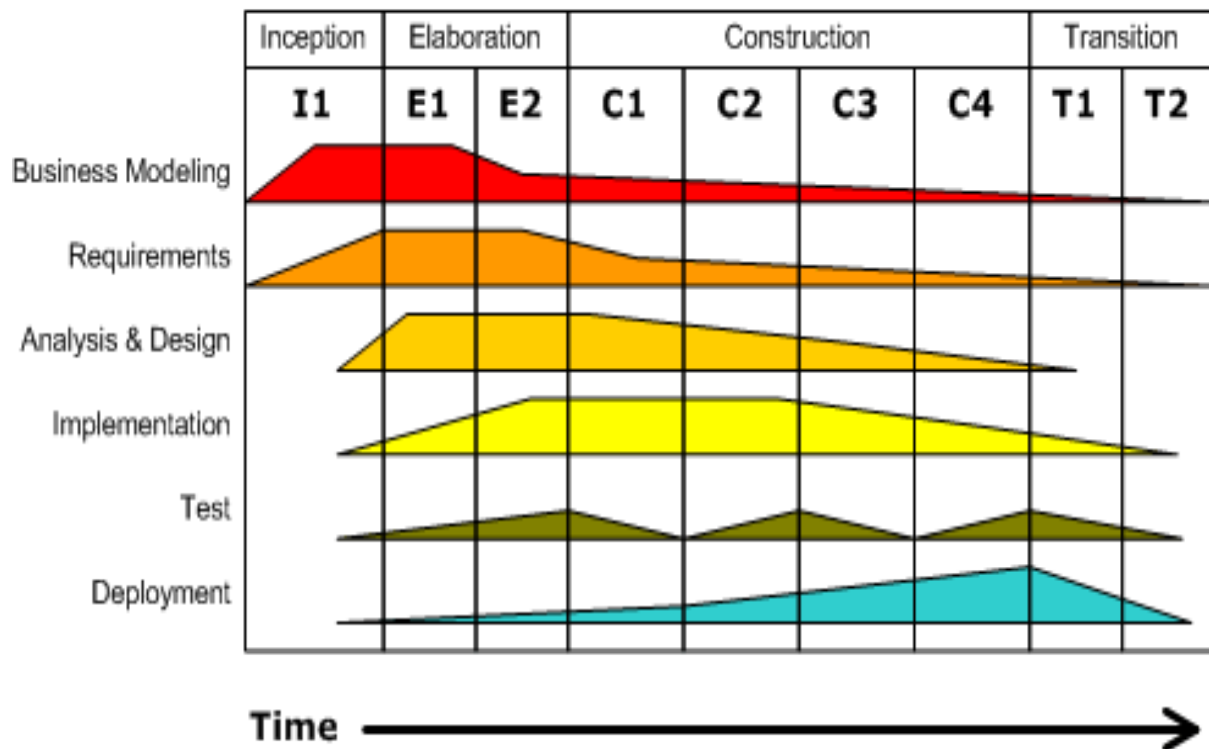
- Delivery of system to end-users.
- Feedbacks from end-users.
- Final adjustments and updates.

RUP ensures that the goals and objectives set for producing good software are achieved and meets the users' requirements. RUP do not take too much time for integration as the process of integration goes on throughout the software development life cycle. Other benefits of RUP are changes are more manageable, risks are diminished earlier, efficient use of resources and there is better overall quality.

Unfortunately, with RUP methodology there are possibilities that the development goes out of control. It is also a heavyweight process. After knowing the benefits and drawbacks of those methodologies, we will consider RUP as our project approach till the completion of the system.

Iterative Development

Business value is delivered incrementally in time-boxed cross-discipline iterations.



<https://bit.ly/2QxADoE>

Figure 6: RUP phases and disciplines.