

SOEN 6471: ADVANCED SOFTWARE ARCHITECTURES

iCare

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1 VISION

1.1 Business Goal

Business goals describe what a company/project expects to accomplish over a specific period of time. Businesses usually outline their goals and objective at the beginning of the project. Goals might pertain to the project as a whole, Feature addition, Security implementation or any other aspect of the project.

1.2 Goal Question Metric

GQM approach helps us to specify the goals for the project, and to provide a framework in respect to the given goals. Thus it is important to have clear idea of, what is the information available, So that this information can be quantified and analysed to whether or not the goals are achieved.

- Conceptual Level(Goal): A goal is defined as set of desired results that have to be achieved by the given project. The goals of our project include:
 - iCare must available to very person having a mobiles device in Canada.
 - iCare must be reliable by avoiding misinformation.
 - Approved personnel can retrieve and update patience information.
 - Patients can access various doctors information
 - iCare should be maintainable, extensible as it keeps on evolving.
- Operational Level (Question): A set of questions is used to characterize the achievement of specific goal based on some characterizing model. Questions generally try to evaluate, how the specific goal can be achieved, what are the steps, process, resources and other objects that are involved and to determine its quality from a selected view point.
 - What can be the best way so that everyone can view our information?
 - What are the technologies could be considered before the start of the project?(So that 1st goal can be meet)
 - How can we differentiate between reliable and unreliable information?
 - How to map various doctors to patients?
 - What are the best practices to make a less maintenance and highly extensible system?
- Quantitative level (Metric): A set of data can be gathered for every question in order to answer it in a measureable manner. The data can be.
 - Answers for the above questions can be as followed:
 - * We are providing a web interface so that everyone could access it from any device.
 - * We are considering HTML, CSS, and backend database to store, retrieve and update the information.
 - * Authenticate users prior, provide access to authenticated users.
 - * Provide an interactive way to map users to doctors.
 - * Provide a distributed system to distribute the work load among systems.

2 STAKEHOLDERS

The stakeholders are the main players and entities that play an important role in the HIS organization's environment. The table and diagram below list the most important stakeholders for the system.

2.1 List of Stakeholders:

1. Doctors
2. Patients
3. Pharmaceuticals & Pharmacies
4. Hospital Staff & Management
5. System Technical Team

The table below provides a brief summary to each of the stakeholders with a short description and responsibility.

Attribute	Content	Content
Doctors	This consists of groups of doctors and nurses who are engaged in the Orthopedics healthcare to provide the necessary care needed to their patients.	<ul style="list-style-type: none"> • This stakeholder is a key stakeholder of the iCare Healthcare Information System. This includes the chief doctor and nurse specialists. • The physicians provide insight to the different system requirements. There could be one member of each different physicians' team to provide the System Technical Team information how they would need the HIS to be.
Patients	The patients are the main target group that are interested in the iCare System. Patient records will be populated in the system after they register themselves.	<ul style="list-style-type: none"> • This stakeholder is the main consumer of the iCare System. Patients creates the request for Physicians to perform health checks (a file opened can be done by a guardian/parent).
Pharmaceuticals and Pharmacies	A number of pharmacies and pharmaceutical companies will be dealing with the HIS to monitor and supply the hospital with the drugs and vaccines required for patients.	<ul style="list-style-type: none"> • These will have an access to the inventory system to find out quantities of drugs, treatments and vaccines that are available
Hospital Staff and Management	This includes the CEO, CTO and all other non-medical staff that make up the hospital organization	<ul style="list-style-type: none"> • This entity is responsible for managing the hospital from a business aspect. Responsibilities for this team includes the hospital revenues and how iCare System will generate more income to the hospital. In addition to that, their main mission is to operate the hospital and keep it running while providing high healthcare.
System Technical Team	Understands the users (patients' and physicians' needs) and related system-to-be features. This group would include: Software Engineers	<p>This entity is responsible to handle the following:</p> <ul style="list-style-type: none"> • Implementation of the system functionalities. • Handling the HIS deployment

2.2 Stakeholders Profiles

2.2.1 Stakeholder Profile 1: Doctors

Attribute	Content
Title	Doctors
Goals	Check patients records to log in
Tasks	General Practitioners Specialist Orthopedics Perform Health checks
Concepts	Healthcare
Concerns	How do I verify the state of patients ?How do I know the severity of each patient ? When is it needed to meet the patient physically ?

2.2.2 Stakeholder Profile 2: Patients

Attribute	Content
Title	Patients
Goals	Remedy and recovery from a sickness
Tasks	Registration into the systemReporting sickness symptoms
Concepts	Sickness Recovery and treatment
Concerns	How do I get the best and most precise treatment?

2.2.3 Stakeholder Profile 3: Pharmaceuticals and Pharmacies

Attribute	Content
Title	Pharmaceuticals and Pharmacies
Goals	Provide Drugs and Vaccines on time
Tasks	Verify inventory and check quantities of drugs and vaccines
Concepts	Drug treatment supply
Concerns	How do I provide the necessary drugs and vaccines without having a shortage?

2.2.4 Stakeholder Profile 4: Hospital Staff Management

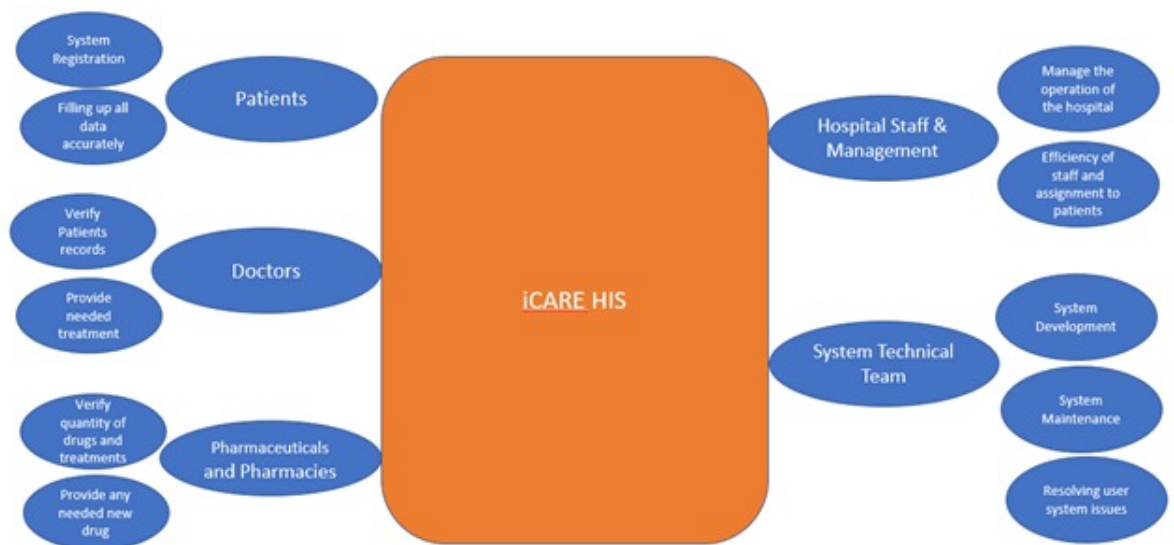
Attribute	Content
Title Management	Hospital Staff
Goals	Make sure the hospital is operational
Tasks	Verify that all patients are being taken care of and assigned a physician and a nurse.
Concepts	Day to day operations of Hospital
Concerns	How do I ensure that all patients are being taken care of ?How do I ensure we are not short staffed ?

2.2.5 Stakeholder Profile 5: System Technical Team

Attribute	Content
Title	System Technical Team
Goals	Development, engineering and maintenance of HIS system
Tasks	Verify that the HIS System is up to date. Maintain the system to be error free. Continuous update and upgrade of the current system.
Concepts	System administration of the HIS
Concerns	How do I ensure the system is well maintained? How do I ensure users system issues are resolved ?

2.3 Quality Attribute Diagram

Quality is usually a judgment made by an individual. The below diagram shows the quality attribute:



3 INTRODUCTION

3.1 Purpose

Developing a healthcare information system that is scalable and reliable, which can be accessed across Canada and available 24*7, thereby increasing the ease of access.

3.2 Scope

The application is specific to a children's hospital in Montreal.

3.3 Product perspective

3.3.1 *System interfaces*

The application runs in the latest version of Chrome or Firefox browser on Windows, Linux, and Mac.

3.3.2 *User interfaces*

The application GUI provides menus, toolbars, buttons, panes, containers, grids allowing for easy control by a keyboard and a mouse.

3.4 User Characteristics

Each User in the application has its own characteristics:

- Doctors: They can register themselves and get information about their upcoming appointments, Patient medical history with the hospital.
- Patients: They can view their own medical history and upcoming appointments with doctors.
- Hospital Staff and Management: They are responsible for maintaining revenue, updating patient and Doctor records, booking appointments for patients.
- Pharmacy: They have access to an inventory system to find out the quantities of drugs.
- Technical Team: They are responsible for developing and maintaining the site and updating the databases accordingly.

3.5 Limitations

This application is designed with security and reliability in mind, so it is limited to a single hospital thereby securing patient details.

4 REQUIREMENTS

4.1 Functional Requirements

A Functional Requirement is a description of the service that the software must offer. It describes a software system or its component. The following services are offered by the iCare software:

Requirements:**ID : FR₁****Description :**As a Doctor, I want to register myself into the iCare site, so that I can view patient health records and my upcoming appointments.**Type :** Functional**Difficulty :** Nominal**ID : FR₂****Description :**As a Patient, I want to register myself into the iCare site, so that I can view my health records and my upcoming appointments with the Doctors.**Type :** Functional**Difficulty :** Nominal**ID : FR₃****Description :**As a Patient, I want to book an appointment with Doctors, so that I can have myself checked.**Type :** Functional**Difficulty :** Nominal**ID : FR₄****Description :**As a part of the Hospital Management team, I want to have access to the doctor and patient profiles, so that I can update their appointment schedules and patient health records.**Type :** Functional**Difficulty :** Nominal**ID : FR₅****Description :**As a pharmacy team, I want access to the inventory team, so that I can update the quantities of drugs and vaccines.**Type :** Functional**Difficulty :** Nominal**ID : FR₆****Description :**As a new user, I want to register myself to the iCare site, So that I can see the available doctors and appointments.**Difficulty :** Nominal**Type :** Functional**ID : FR₇****Description :**As a Doctor, I want to update my availability, so that I can have appointments.**Type :** Functional**Difficulty :** Nominal**4.2 Non-Functional Requirements:**

A Non-functional requirement is a requirement that specifies criteria that can be used to judge the operation of a system, rather than specific behaviors. They are contrasted with functional requirements that define specific behavior or functions.

Requirements: Security and Privacy

ID : NFR₁

Description :As a part of the Technical Team, I want to secure the patient information, so that patients' private information can't be accessed by other patients and hackers.

Type : Non-Functional

Difficulty : Critical

ID : NFR₂

Description :As a part of the Technical Team, I want to secure the Doctor's profile information, so that users can't alter doctor's availability and appointments.

Type : Non-Functional

Difficulty : Critical

ID : NFR₃

Description :As a part of the Technical Team, I want to safeguard the transactions, so that hackers can't disrupt/steal money.

Type : Non-Functional

Difficulty : Critical

Requirements: Maintainability

ID : NFR₄

Description :As a part of the Technical Team, I want to document every change made to the system, so that it won't create any ambiguity in the future.

Type : Non-Functional

Difficulty : Critical

ID : NFR₅

Description :As a part of the Technical Team, I want to maintain proper coding standards, so that the readability is clear for other developers.

Type : Non-Functional

Difficulty : Critical

5 PRODUCT REQUIREMENTS

A product requirements document defines the product you are about to build, It outlines the product's purpose, its features, functionalities, and behavior.

View	Description
Registration/ Signup	Allows Doctors and patient to register themselves
Login	Allows registered users to log in
Home Screen of Patient	It contains health records and appointments scheduled
Appointment Booking	Allow patient users to book appointments with doctors
Home Screen of Doctors	It allows doctors to update their availability.
Management	Allows changes across the platform including doctors and patients