ABC HOSPITAL MANAGEMENT

Architecture Notebook

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# Purpose

This document describes the philosophy, decisions, constraints, justifications, significant elements, and any other overarching aspects of the ABC Hospital System that shape the design and implementation.

# Architectural goals and philosophy

The primary objectives of this computer system are to be developed and implemented with usability and availability, not just for patients, but also for physicians and nurses, which could include those who are not technologically comfortable.

In order to achieve this high degree of usability and availability, there are not only specific hardware devices to be used but also variants of the standard user interface to fulfil the device's intended purpose.

For example, the self-service kiosk station is only required to allow patient to fill details like name, age, address, birthdate etc. Therefore, a touchscreen with minimal selection options should be adopted.

however, the administrator counter system must have full access allowing for the count the details about the Staff members including the nurses, details of the wards, details of the rooms, Handling of appointments, Handling all the schedules of the operating rooms, Payment details, medical reports and lastly the system would handle all the invoices.

Adding to user interface optimization, the performance of each device often depends on its features. The online catalogue should be accessible on a website 24/7, for example, and Hospital staff should be able to access the program easily during or after working hours.

This computer system also needs to concentrate on data traceability through the incorporation of audit features. It will ensure that the position of the valuable objects in the Hospital is still known, including who took part in particular transactions i.e. Assign doctor to one patient

In addition, the management of member's fines will also be traceable, which in turn will reduce the Hospital s costs and liability. To further support the system's auditing capabilities, security / user authentication must be included as a feature.

To reduce the effect on device usability, only user management should be the priority of the security features. This means that unique device functionality is made accessible only to approved users (Hospital staff).

Furthermore, as personal information of member is being collected and stored, adequate protection must be in place to secure this information. Finally, the program must be effective, with the goal of ensuring availability to all users during working hours.

This will ensure Library's enhanced performance is preserved and will impact on system accessibility and availability.

# Assumptions and dependencies

* The system is extremely dependent on the intended hardware devices (barcode scanners, swipe card readers, etc.) and a database for data management.
* Additionally, internet access is also essential to the website's publication (online catalogue).
* The library system is assumed to have access to a database for data management criteria (patient’s details, details of the wards, details of the rooms, Handling of appointments).
* It is also assumed that the council permits the publishing of a website.

# Architecturally significant requirements

* Interfaces have to customized for the specific purpose and system must be easy to members. Self-serving kiosk station allows for creating or checking Handling of appointments, handling all the schedules of the operating rooms the system design primarily designed for schedule work with staff.
* The system must be available at the Hospital during business hours. An unscheduled downtime frequency of 2 - 3 times are year is acceptable and the system should be back up within 5 - 10 mins.
* Maintenance of 1 - 2 hours a week is acceptable, after business hours.
* An online catalogue must be available to users 24/7. In event of a system crash out of hours, it is acceptable for a “fix during working hours” response to be displayed to users.
* The system must be able to manage the data relating to count the details about the Staff members including the nurses, details of the wards, details of the rooms, Handling of appointments, Handling all the schedules of the operating rooms, Payment details, medical reports and lastly the system would handle all the invoices.
* The transactions / changes to the data relating to appointments, patients and payment must be tracked to ensure the maintain the schedule of patients is known at all times.
* Authentication of the users is required so that only authorized personnel can access restricted data and perform restricted transactions (discharge patient, take payment of outstanding fines). All staff members personnel are required to have a login and password to allow unrestricted access.
* The personnel information regarding member’s must be protected as per the governing privacy policy.
* An inactive user time-out (30 secs) should be implemented to provide security to the previous user and system data.
* During data entry, it must be ensured that all the required data is entered, no duplicate data entries are made and that the format of the data is correct.
* Any electronic interface failures, or user cancellations, must be handled so that the system reverts to the previous valid state
* The system, including all staff details, member and appointments, must be able to be restored from backups. The transactional, staff members and appointments is to be backed up daily, while the system code is only required to be backed-up upon changes.
* Receipts of transactions for members must be printed, along with barcodes and stickers for patients and general paper-based reports.

# Decisions, constraints, and justifications

* Optimize usability of the system and customized user interface for each of the intended devices.
* Using an application server independently from the rest of the applications to manage these personalized user interfaces.
* Constraint - Members data are to be obtained by using a swipe card reader, but a search can be conducted at the librarian's station in the event of missing membership card.
* Receipts are to be printed for patient transactions, Optional search at the kiosk station can be performed in case of missing barcode or member card.
* A touch screen interface is to be used for the kiosk station to increase usability
* The devices must be linked to a central server location in the hospital through local networking ports.
* Online catalogue searches and 24/7 item bookings for improved accessibility and availability shall be available on the website.
* The patient, staff member and appointments information must be handled by a relational database server as it provides perseverance, availability, integrity and security for the system. It's to stay separate from other software.
* All transactions are to be tracked and recorded using the relational database to ensure auditability of the system.
* A Domain server shall be used to authenticate / authorize users and to perform other system functions.
* The domain server shall enforce and preserve the protection of the members 'personal information in compliance with the applicable privacy policy / legislation.
* Network server shall limit maximum network access only to hospital / council employees.

# Architectural Mechanisms

# Relational Database Server

# A relational database is expected to be used to achieve consistency and automate the management of patients, staff members and appointments. Relational databases enable structured data storage which avoids undesirable complexity and increases system usability. Furthermore, relational databases not only guarantee the validity of the stored data but also allow the data to be stored.

# Domain Server (Authentication / Authorization)

# A domain server authenticates and permits computers and users to reach Logical Domain (Hospital) services. A username and password are required for all users with full system access (patients and hospital staff). It ensures that only approved individuals are able to conduct restricted tasks such as adding / removing hospital objects from the list, discharging patients.

# For remote access, the same login specifications will be required. In addition, the transactions performed by each authorized user can be monitored using the relational database by logging in to the program. User authentication shall be achieved using the swipe cards.

# Back Up

The generated data and the device software have to be stored on a backup. Though the cheapest and easiest alternative is to connect to another external server to back up to a removal hard drive. In the event of a disaster (fire, flood, etc.) in the Hospital, such as the council server provides the added security of off-site backups.

# Key abstractions

# Patient - Register patient, Update patient details, Search patient details, and Delete patient

# Room - Register room, Update room details, Search room details, and Delete room

# Ward - Register ward, Update ward details, Search ward details, and Delete ward

# Operating room - Register operating room, Update operating room details, Search operating

# room details, and Delete operating room

# Payment – make a payment, Update payment details, Search payment details, and Delete

# payment

# Appointment - place an appointment, Update appointment details, Search appointment

# details, and Delete appointment

# Admission - Register admission, Update admission details, Search admission details, and

# Delete admission

# Medical reports - add medical report, update medical report details, Search medical report

# Layers or architectural framework

The ABC Hosptial Management system design is to reflect that of a three-tier architecture

• presentation tier (module) - which is responsible for the displaying the various user interfaces for the self-service kiosk station, the website and the Hospital station. This tier sends the results / inputs from the user to the application tier

• application tier - That is responsible for the programme logic, and ultimately governs the functionality of the application

• data tier - That is responsible for database storage and retrieval. This data is kept independent of the application servers.