



NEW YORK UNIVERSITY

CS-UH 2012: SOFTWARE ENGINEERING

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System Request

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Project Name

Qalb+

Business Need

The fallout from the ongoing global pandemic of COVID-19 clearly demonstrated a gap in the medical system. At present, remote technologies and services are not fully in place to meet patient demands when physical appointment is not an option, either due to lockdown measures, an individual's COVID-19 status, and other pandemic restrictions. Even as the number of vaccinated people go up, cases go down, and there is a gradual return to pre-pandemic reality, the demand for complimentary remote technologies and services facilitating visits, appointments, and other functions will remain purely on the basis of ease of access and convenience.

For example elderly people with limited mobility due to their seniority will find appointments online convenient to determine if their circumstances and health warrant a visit to the doctor's office. Others yet may be new to an area and rely on word of mouth to locate good health care providers. And, even once having located a place, they may have questions on whether that health center accepts their health insurance.

Thus, we strongly believe a platform that can help its users readily book Zoom appointments with a physician, locate nearby treatment providers, determine health insurance compatibility, sharing medical records and other salient information will be met with good demands.

It goes without saying, rather than reinventing the wheel, the platform we have in mind will be integrated with preexisting technologies and services such as Zoom, Google Maps, Uber, What's App etc if and when possible.

Functionality

Our platform will be an online web based application. The application will have two different types of users: patients and treatment providers. Patients will be defined as people seeking medical services whereas treatment providers are defined as people licensed

under a jurisdiction to provide medical services. On the server side, there will be a database that hosts some necessary information such as the following:

- Doctors, physicians, psychologists, and other people affiliated with health care facilities who are licensed to provide treatment.
- Health insurance and their compatibility with different treatment providers. For example, if GeoBlue health insurance is accepted by a physician affiliated with Cleveland Clinic in Abu Dhabi.
- Patient reviews detailing and rating their experiences with different treatment providers they had sessions with.

The database has to be integrated with other preexisting services. Thus, once a patient creates an individual account they should be able to do the following:

- Locate nearest treatment provider. Therefore, integration with Google Maps or similar application is necessary.
- Schedule online appointments through means of their choice: Zoom, Skype, What's App, phone call etc.
- Users by uploading information of their health insurance plan should be able to determine if a given treatment provider can accept their plan.
- Provide safe and secure means to upload medical documentation that they would be able to seamlessly share with others.

On the other hand, licensed treatment providers can create their own account. They will have access to the following functionalities:

- Upload their license and other necessary credentials needed to register as physicians, doctors, or a professional person who is permitted to provide treatment.
- View patient details when a patient requests to meet them.
- Share their working hours, the health centers they are affiliated with, and addresses of their chambers.
- Provide medical documentation when a patient recommends them.

Expected Value

Tangible

The business model we have is based on registration and subscription fees. Treatment providers will need to pay a registration fees 500 AED to be featured on our system, and moreover, make a monthly subscription fee of 300 AED to use our system to access patients.

Patients will not have to make any direct payment to us. In terms of the business value of the project we expect to have 200 treatment providers (spread across different fields) and 1000 users (as potential patients) in the first 3 months.

Intangible

If successful, our platform will expand healthcare coverage and access during the trying times of a global pandemic.

Moreover, this platform may contribute to the greater safety and well being of the community. As COVID-19 is a contagious virus, the option to have access to a physician from the comfort and safety of one's home is certainly welcome. Once there is return to normalcy, patients who have compromised mobility, either due to age or disability, will still appreciate online access to health care resources if and when applicable.

Treatment providers will benefit from having yet another channel to find prospective patients. Once again, depending on the popularity of the system, they can enjoy greater visibility. This visibility can come from good reviews patients leave behind, and thus, contribute to the prestige and renown of a specific treatment provider. This in term will make our web based application more popular with treatment providers and bring it greater credibility.

Users in terms of patients will be free to register at any time a day where ever they are. When it comes to the other parties, health care providers and physicians, same logic shall be applied yet taking into consideration that some data authentication would be required along the process of registering.

Special Issues and Constraints

Insofar we can discern, special issues and constraints pertain to time constraints, security, and legalities.

Time Constraints:

The system requires implementation the next three months. This time constraint will influence all aspects of the process, from conceiving the original ideas to engineering the final implementation.

Once engineered, time will still be a matter. The system must always reflect the correct schedule of different physicians, and other relevant information.

It is also of paramount importance to avoid time conflicts. For example if a patient wishes to book an appointment with two different physicians, then there should not be any time clash. They cannot book the same time slot for two different physicians!

Moreover, the given the nature of the domain, the system we have in mind be operational 24/7. Maintenance work should not interfere with the system functioning. At no given point should the system display a message or error that it is down for maintenance.

Security:

Health information are very sensitive. Thus, we need to ensure secure access and data retrieval. There are two different classes of users: treatment providers, treatment centers, and patients.

Each class of user should have access to information that is appropriate to context and position. As a concrete example, a treatment provider should not be able to access nor share health information without the consent of a patient.

Likewise, there is a need to build safeguards from malignant actors. An example for instance can be hackers. Such malignant actors should be actively barred from any access to sensitive medical information.

Legal:

The system we build must be in compliance with local healthcare rules and regulations.

Some jurisdictions have stringent laws protecting patient privacy, enforcing doctor-patient confidentiality, and other measures in place to prevent abuse of medical information. A concrete example of such rules would be Health Insurance Portability and Accountability Act (HIPAA) in the United States of America. HIPAA, broadly speaking, prevents health care providers and health care businesses from sharing protected information without the consent of a patient.

Analogous rules and regulations, policies and legislation may be in place in the jurisdiction we have in mind, Abu Dhabi, which is an Emirate of United Arab Emirates.

Other rules and regulations will pertain to authorities who are licensed to provide health care services and treatments. It will, therefore, be crucial to ensure the system accurately checks doctors, physicians, and any other parties for holding valid license and credentials.