Central Medical Appointment Booking and Information Tracking System

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- AHS - Alberta Health Services

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Healthcare apps are built to provide quick access to lifesaving services. However, software development is not always easy, and many systems in the healthcare industry have systems that are out-of-date, obsolete, broken, or even vulnerable to cyber-crime. These cases may render it difficult to obtain medical services. The proposal below aims to combat some missing features that may aid patients in obtaining healthcare.

1.3 Summary of the solution

The project proposed aims to provide easy management and access to users' health care. This is accomplished through designing and implementing an access system for use by both patients and healthcare workers. This is based off of the AHS app currently available to the public. The project will provide patients and healthcare workers with easy access to patient records, and will facilitate appointment bookings.

1.4 Motivation

One of the members of the team behind the proposal has a close family member who worked for AHS. They and many other health care workers, have often expressed their frustrations with the problems of the current app and scheduling systems.

2: Problem Definition

Healthcare systems around the world have long been plagued by poor data tracking. It is often up to the individual to track health history - a task that is made especially difficult by uncommon maladies and doctors who don't share all observations. Compounding this is a lack of clear information about wait times, no central scheduling systems, and the general incompatibility of digital healthcare systems integration between cities and provinces.

2.1 History of the Problem

Before the advent of computers, healthcare records were stored in massive paper filing systems at health care facilities. While this system worked, it had a single point of failure. If a patient moved to a new city or a natural disaster destroyed the records, the data was irrecoverable. Even if they could remember their complete medical history, doctors notes, scan results, and such were lost.

Computerized data input systems were adopted as early as the 1970s, when the world's first computerized health record input systems was put into use in El Camino Hospital in Mountain View, California.[1] Though many of the developed world's health care

systems have since adopted digital technology, it is rare indeed that two health systems can communicate with any ease. Here in Canada, most provinces have province-wide systems to store medical records, but they are currently incompatible with each other, and are designed only for record storage.[2, 3] Currently, there does not exist a centralized health portal across the country that can act as a "one stop shop" for any individual's interactions with the healthcare system.

2.2 Why you should care

There are thousands of individuals in Canada alone whose lives depend on good healthcare systems. For such individuals, the layer of unnecessary complexity added by records that are difficult to access or multiple portals for different services only serves to exacerbate what is already an extremely difficult period of their lives. It is not an overstatement to say that a fast, accurate, easy to use, interface for healthcare interaction would, in the long term, meaningfully improve the life of every Canadian.

2.3 When and why the problem occurs

To illustrate how the current systems could be improved, consider the case of an individual living in Moose Jaw, SK an allergy to penicillin. One day, they have an allergic reaction and needed to go to the hospital. Little do they know, the hospital in Regina, 45 minutes away, has a wait time two hours shorter than the one in Moose Jaw. They end up waiting three hours, and during treatment it is discovered they have diabetes. They begin monthly or yearly checkups with their family doctor, whose record keeping system may or may not sync with the data collected at the hospital. Now, say the individual moves to Alberta, where doctors have no access to the records collected in Saskatchewan. Before they can rectify this by requesting a data exchange, an accident occurs in which the individual is brought, unconscious, to an Alberta hospital. The Albertan paramedics now have no medical history for a person who has been a frequent user of the Canadian healthcare system, and who has a well-documented medical history, just out of reach. The proposed centralized system would give every health care worker involved in this person's health care access to all medical records ever collected, and enable them to provide substantially better care.

2.4 Existing solutions

Currently, a hodgepodge of different services exist, which largely fall into two categories. Firstly, there are systems that offer information about the healthcare system in general, such as the Alberta Health Services app. Then, there are systems that track health data for an individual, such as Apple's Health app and Samsung Health. The Alberta Health Services app is perhaps the closest to the proposed system, with the app allowing patients to see hospital wait times, physician locations, and the medications they are taking. It does not, however, give patients access to their healthcare history or records. Apple's Health app can track patient history and medical issues, but very few healthcare providers take advantage of the services it offers to store the data there. A system where a patient can see data entered directly by their doctors, and also access information about the healthcare system in their area (wait times, locations, specialists, etc), does not exist.

2.5 Similar systems or solutions to related problems

An excellent example of a solution to a similar problem is the Cineplex website and app.[4] Here, users can see movies playing in their area, ratings and reviews for these movies, and book tickets. Users can also see their movie watching history, and rate movies they've seen.

Another example of a similar system where facility and service information is paired with personal information is the Calgary Public Library website[5]. Users can see information about events, services, locations, and book suggestions offered by the library system. They can also see personal reading history, their checked-out books, and recommendations for titles they may enjoy based on past reading history.

2.6 Improvements that could be made to existing or related solutions

The primary advantage the proposed healthcare data system has over existing systems is compatibility and transparency. Users will have access to their healthcare data, and doctors will be able to access important information collected about their patients in any province. This system will have much greater access control than the Cineplex system, to ensure that the correct doctors can see all relevant information, and it will be easier to navigate than the Calgary Public Library system, so patients with limited knowledge or limited access to technology don't have an impossible barrier of entry for using the system.

3: Proposed Solution

3.1 What the project will achieve

This project aims to provide users with convenient access to managing their health care. The most important aspect is user-friendliness, so users do not need advanced knowledge of technology in order to use the app effectively. Having one app that connects multiple hospitals/clinics would allow users to easily transfer between institutions, and reduce the amount of registration required. This is especially useful for those users who are unable to or have difficulties leaving their home, as this project strives for greater accessibility. It will also reduce the amount of patients waiting at a clinic, since users will be notified how long the wait time is for the clinic they want to go to. Although keeping physical copies of medical records is still a protection against lost files, most record-keeping can be tracked through the proposed project, reducing the amount of paper used.

3.2 What the project will produce

This project will produce a website/app that is similar to the Alberta Health Services app, but with added features such as being able to see a user's own medical history. Patients are also able to check their doctor's orders, e.g.the frequency of their prescription intake. In addition, the project will allow doctors to see a patient's medical history , as well as keep track of what medicine has been prescribed to them.

3.3 Features of the project's products

This project will provide patients and professionals with two different perspectives, though both parties will require an account to access the product. Users will be able to view emergency contacts, as well as which vaccinations are currently being offered.

On the patient side, users will be able to upload their medical information, such as their family history and current illnesses (if applicable). They can also view which institutions would have openings at their desired time, and book or cancel appointments. Users who have booked appointments will be notified one day in advance about their appointment, and be reminded to check-in 15 minutes prior to their scheduled time.

Medical professionals can view their patient's medical history, as well as keep a record of their examinations. They can submit referrals, which would be approved by their selected institutions. If a particular patient is moving, doctors are able to send their records to any institution close to the patient.

4: Motivation

4.1 Why this solution is needed

Right now, there is no system Albertans can use to achieve all the features proposed in this project. There are many health care clinics who still choose to use paper records, despite their fragile nature. If the proposed project was introduced, the ease-of-access may incentivize a switch to digital records. In addition, many patients would have their minds set at ease from readily available access to their personal health care records.

4.2 What makes this project unique

On public platforms, it is easy to find apps related to health care. However, none offer the critical features demanded by patients and health care workers alike. The proposed project would harmonize both features present in some apps and features absent from any app in wide use.

5: Conclusion

Digital health care systems are cumbersome, incomplete, and incompatible with each other. These shortcomings affect the lives of every citizen in our country, causing unneeded stress and confusion in already difficult times. There needs to be a single, simple to navigate, country-wide system that both tracks healthcare history and provides information about healthcare services.

6: Timeline

October 10th - Detailed EERD of the system
October 17th - Initial (logical) relational model
November 7th - Functional skeleton providing basic look/feel and simple functionality
November 26th - Fully functional system, open for extension and scaling

References

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