A STUDY ON HEALTH PORTAL

Kajal Raghuwanshi, Dept. of Computer Science Engineering, Medi-Caps University, Indore, M.P. India raghuwanshikajal0@gmail.com

Dr. Hemlata Patel, Mr. Vivek Kumar Gupta Dept. of Computer Science Engineering, Medi-Caps University, Indore M.P. India

Abstract

Web-based e-Health portals give patients faster access to their healthcare information and services as an emerging type of enabling technology. We create and build a successful e-Health portal that can incorporate a variety of backend medical services. Meeting important security needs, such as the confidentiality of patient information, the integrity of diagnostic results, and the accessibility of healthcare services, is a significant problem in the design of such a system. In this thesis, I discuss the problem from the angle of access control. I first suggest a two-tier access control strategy for e-Health portals in more detail. The strategy adds a rule-based access control module based on the traditional Flexible Authorization Framework (FAF) concept to current Role Based Access Control (RBAC) capabilities. I research interpersonal communication and conflict.

Patients can only receive support from current e-Health portal platforms if they have already enrolled and received services from a medical establishment (such as a hospital, clinic, etc.). Typically, these portals are linked to a central EMR/EHR system that is connected to a central system. Additionally, these portals are limited in that only these   Mr. Vivek Kumar Gupta patients can access them. without the involvement of the patient's parents, family, or there carers. Added difficulties include the growing need for patients to receive more non-primary, in-home, specialized healthcare services (such therapy, nursing, personal assistance, etc.) from our healthcare systems.

Keywords: *e-Health, healthcare IT, online e-Health portal, appointment scheduling, patient care service, mobile health.*

I.   Introduction

There is more enthusiasm for the adoption of the fundamental shift in healthcare brought on by e-healthcare how communications between healthcare providers, patient records, and scheduling of appointments can be provided. By "tethered" to their integrated electronic health records, e-Health portals provide patients with convenient, round-the-clock access to their personal health information from anywhere they have an Internet connection. The patient saves time, is kept organized and current, and has a higher degree of convenience overall thanks to   e-Health portals; for example, they no longer need to go back to their doctor to get the results or make calls to schedule a follow-up visit. E-health portals have advantages not just for patients but also for staff and service providers. The general flow of patient treatment is disrupted, which can have a detrimental effect on clinic productivity and income, for instance, when patients must call to make appointments and the phone lines are busy. Thus, from the perspective of service providers, the electronic appointment booking system made possible by e-Health portals has a clear potential for advantages, such as lower appointment no-show rates, higher staff satisfaction, less time spent by staff on scheduling patient appointments, and higher patient convenience and satisfaction.

These portals assist users with

(i) scheduling appointments, obtaining test results, and sharing information with others

 (ii) providing access to patient information such as lab test results and imaging exam reports for thousands of healthcare providers;

(iii) connecting patients and practitioners with personal health information by keeping patient records in an accessible and shareable manner; (iv) extending the functionality of EMR systems for patients and healthcare providers through an online appointment booking interface.

The majority of the e-Health portals mentioned above (such as MyChart and myUHN.ca) only provide support to patients who are already registered with one or more of their affiliated partners that provide healthcare services (such as hospitals, healthcare centers, and clinics).

Patients who are not registered to receive such care have been limited by this To obtain effective and efficient eHealth portal services from related partners. The solutions that Health by providing a customizable portal, Myself Patient Portal seems to throw some light on how to handle this problem. However, in order to support public clinic workflows restricted to general practitioners.

Once more, a lot of these portals only provide support for in-person patients, meaning that they can only Patients who visit the facilities where healthcare is provided (i.e.hospitals or medical facilities).

II.   Literature Review

Numerous e-Health architectures, including the Telemedicine System Interoperability Architecture, the European Pre-standard Healthcare Information System Architecture (HISA), the SOA-based e-Health Services Architecture, and others, have been proposed globally due to the development of the modern community's online presence and the rising demand for e-Health services. We concentrated on the integration of various secondary healthcare services provided at the patient's location and an appointment scheduling system appropriate for the Canadian healthcare environment rather than pursuing such special-purpose architectures for primary healthcare services provided at the physician's location.

The efficacy and efficiency must be paramount.of these time management programmers, in terms of required time and patient satisfaction, may be influenced by a number of factors. elements including the front desk staff's accessibility to pick up the phone (or get assistance), and manually look for the required date, time, or service provider, as well as manually locating alternative timeslots when the requested time slot is unavailable.

The majority of current e-health portals concentrate on online appointment management systems to address the aforementioned problems. Patients are willing to book online at a time of convenience, control, and choice without having to wait for open phone lines when given 24/7 access and the option to self-schedule, which empowers them. highlights how the use of the e-booking procedure has sped up the clinic staff's process. Staff are still required to contact patients who make incorrect bookings, but they are free to focus on other tasks like helping patients who are already present in the clinic. In the end, it assists people in scheduling appointments with healthcare providers, utilizing their "choice of convenience," without having to rely on the phone.

III.   Design of Health Portal

Online portals are often hosted on a local or remote server and resemble web-based applications in that they include user interfaces that show and offer a number of services. With the development of technology and the accessibility of software and materials offered online as a service,
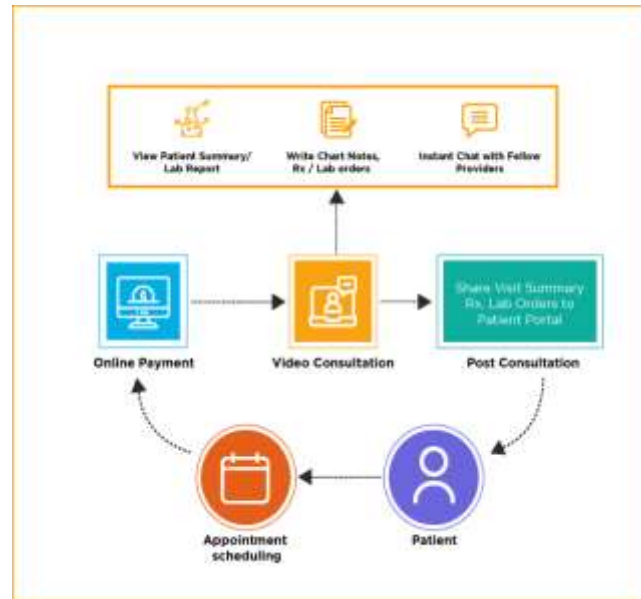
Figure 1 . Basic scheduling workflow.

portals are being hosted through clouds, as well. Most data the portals display is extracted from a data layer implemented internally or externally. A set of Application Programming Interface (APIs) provide low-level interaction between the portal and underlying hosting environment, personalization, presentation andmaintain privacy and security. Most online portals provide an appointment management environment along with other supporting features for patients such as obtaining lab reports, viewing, and managing overall health records, checking prescriptions, drugs refills/ requests, and communicating with health professionals.2,4 Some portals can also be configured to handle administrative and clinical functions for better workflow and decision making (e.g., inter-hospital health record transfers and coordination).

3.1 Functional Requirements

The design of the e-Health site intends to satisfy the following functional objectives. The last four requirements concern portal administrators or service providers, whereas the first three requirements are from the perspective of portal users.

• User Individualization. Users of an e-Health portal can design and store a customized page including only the content they would like to access. For instance, a patient might opt to view only the cardiology newsfeed.

• Aggregating content. No matter how many service providers are engaged or how differently those services are delivered, users of a portal can access connected services on a single page. Users should have access to navigation features that make it simple for them to go to another page when necessary. Easy to use. This need is especially important for e-Health systems because many of their users are elderly or have little experience with computer technology, making it difficult for them to even install client-side software.

• Customization of the backend. Using a content management system, portal administrators can alter the services the portal offers, and these changes should be obvious to regular users.

• Cooperativity. The portal must have the ability to smoothly connect diverse medical services that are developed using various platforms and technologies. Users of the portal should be informed of such implementation specifics.

• Support for Various Service Modalities. Real-time, automated, or store-and-forward medical services are all possible, and the gateway should enable all of them. Real-time mode services allow several participants to communicate with one another simultaneously. Typically, this type of service involves audio and video transmissions. The automation mode means that the medical data that users

contributed is automatically processed and analyzed using sophisticated algorithms, with the results being provided to users. When using the store-and-forward mode, medical information is sent to a station where it is stored and reviewed later by a medical team.

3.2 System Architecture Design
The Portal View module serves as a link between the portal system and its users (such as administrators, providers, and patients). Before being processed by the Functional module, all input received through this module is first validated, authenticated, and authorized by the Authentication module. Once more, only the authenticated end user has access to the outputs from the core functionality (sub)modules.
This View module solely communicates with the User Authentication module for the sake of this security feature.
3.2.1 Admin:
An admin module for a health portal is an essential component that allows administrators to manage the portal's content, user accounts, and other features. Here are some key features that an admin module for a health portal should include:
User Management, Content Management, Analytics and Reporting, Security and Privacy, Communications, Payments and Billing, Session Management, Password Reset
3.2.2 Doctor:
A doctor module for a health portal is a crucial component that allows healthcare providers to manage their patient's health records, appointments, and other related activities. Here are some key features that a doctor module for a health portal should include:
Patient Management, Appointment Management, Telemedicine, Prescription Management, Communication, Analytics and Reporting
3.3.3 Patient/User:
A patient/user module is a crucial component of a health portal that allows patients to access health services, manage their health records, and communicate with healthcare providers. Here are some key features that a patient/user module for a health portal should include:
User Registration and Profile Management, Appointment Booking and Reminder, Telemedicine, Medical Records Access, Health Tracking, Billing and Payments.
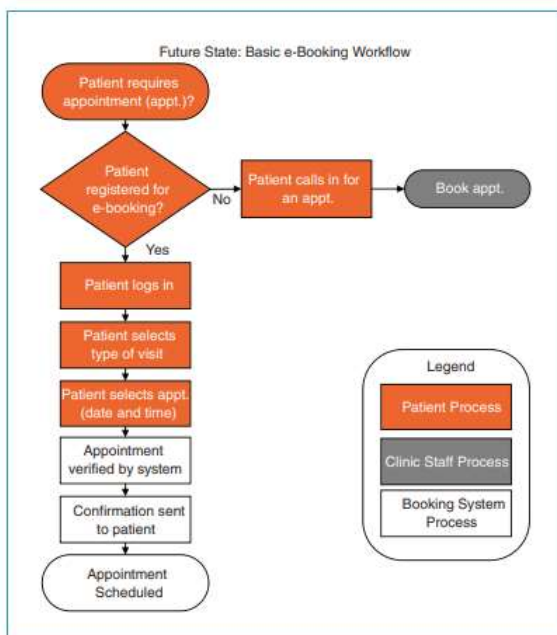

Figure 2 basic booking workflow

IV.   Evaluation of portal

The portal was evaluated in two distinct ways: 1) security vulnerability and penetration testing, and 2) the usability in real-world environments.

testing for security vulnerabilities and intrusions

- security vulnerability and penetration testing:

Health Portal must deal with and communicate patients' personal and medical information due to the nature of its functionalities and services (e.g., access to various upcoming medical appointments (nursing, physiotherapy, etc.), care provider team information, emergency contacts, etc.). This portal obtains a high degree of confidence by putting in place the necessary security precautions and conducting ongoing testing, such as regression tests, unit tests, server and network penetration tests, and application vulnerability tests.

- The usability in real-world environments:

The stakeholders involved with Closing the Gap are diverse, and their clientele is as diverse. We have selected Closing the Gap and its clientele as our test subjects in order to assess Health Portal's functions in various demographic settings. On the portal, we carried out a real-world user experience study. Our research was split into two sections. In the first section, we conducted a survey on users to learn more about them, gauge their comfort level with modern technologies, and learn about their experiences using our Health Portal. In the first section, we used open-ended and closed-ended questionnaires along with researcher observation.

V.   Future Scope

The Covid-19 pandemic provided the Indian healthcare system and industry with a significant number of obstacles during the past two years. It brought to light all of the systemic flaws and emphasized the need for a medical revolution. Nevertheless, despite the difficulties, there were chances. In a post-pandemic world, the Indian healthcare system has a golden opportunity to develop while reflecting on the past and get ready to take off into the future while keeping citizen welfare in mind.

India is already regarded as the pharmacy of the world. India launched the largest vaccination campaign in history during the pandemic, administering about 170 crore vaccines and shipping over 5 crore doses of vaccine to 70 nations, further establishing its position as a leader in the healthcare industry. Today, the nation is in the midst of a medical technology revolution with booming infrastructure and investments due to the nation's growing healthcare needs. India also shines because it is an excellent location for medical tourism. Make in India is becoming a reality, and numerous businesses have begun producing MRI machines, CT scanners, ventilators, and ultrasound devices. Due to Make in India, APMTZ has developed into a manufacturing hub and the import share has decreased. An expedited clearance procedure and the Production Linked Incentive (PLI) would increase the success of Make in India. Indian software companies are able to advance in the development of HIS, RIS, PACS, Teleradiology, and AI software for international use. There will be a National Digital Health Mission.

VI.   Conclusion

The report offers several recommendations for improving the portal. Having a calendar view in the portal and integrating it with other similar websites are a couple of examples. portals (such as a medication or record-keeping service portal) that the customers are using. In the In a future Health Portal expansion, we would aim to discuss these ideas and look into how the portal can interact with service providers automatically and patient, as well as the interactive scheduling, rescheduling, and cancellation capabilities for patients.

VII.   References

1. Gheorghiu B and Hagens S. Use and maturity of electronic patient portals. Stud Health Technol Inform 2017;234: 136–141.

2.   Permanente   K.   Annual   report   on   healthcare, https://healthy.kaiserpermanente.org/static/health/annual_reports/kp_annualreport_2018/   (2018, accessed 8 January

2021).

3. Thomas B. Exploring the benefits and common concerns of e-booking, www.infoway-inforoute.ca/en/component/edocman/1832-exploring-the-value-benefits-and commonconcerns-of-e-booking/view-document?Itemid=101 (2020,accessed 8 January 2021).

4. Reed ME. Use of patient portals by people with long-term health problems. Washington, DC: Patient-Centered Outcomes Research Institute, 2018.

5. Wildenbos GA, Maasri K, Jaspers M, et al. Older adults using a patient portal: registration and experiences, one year after implementation. Digital Health 2018; 4: 1–9.

6. Kohler S, Keil T, Reinhold T, et al. Usage of a German prevention and health promotion web portal and cost per pageview: a life-cycle assessment. Digital Health 2019;

7. Kline BR. University Health Network, www.uhn.ca(2020, accessed 8 January 2021).

8. Aaronson NK. My Chart, www.mychart.ca (2020,accessed 8 January 2021).

9. Zehumfry N. Health myself, https://healthmyself.ca/(2020, accessed 8 January 2021).

10. Craft S. OneHealth, www.onehealth.ca/ (2020, accessed8 January 2021).

11. Sadeh N. myUHN for patients, www.uhn.ca/ PatientsFamilies/myUHN (2020, accessed 8 January 2021).

12. Baeker S. e-HealthOntario: an e-Health portal, www.eHealthontario.on.ca/en/ (2020, accessed 8 January 2021).

13. Claudia L-P. Exploring the value benefits and common concerns of e-booking, www.infoway-inforoute.ca/en/component/edocman/1832-exploring-the-value-benefitsand-common-concerns-of-e-booking/view-document? Itemid=101 (2019, accessed 8 January 2021).

14. G. Eysenbach, "What Is e-Health?," Journal of Medical Internet Research, vol. 3, no. 2, p. e20, 2001.