DIGITAL HEALTH RECORDS SYSTEM

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ABSTRACT

The current landscape of patient information management in healthcare organisations is rife with inefficiencies and shortcomings that are undermining the quality of care delivered to patients. Despite a plethora of methods that have been developed to store and manage patient information, there remains a scarcity of objective evidence demonstrating their impact on healthcare quality and outcomes. This lack of evidence has made it difficult for healthcare organisations to adopt new information management technologies and methods, leaving many to rely on outdated and cumbersome pen-and-paper methods that waste valuable time and resources. To address these challenges, we propose a low-cost digital health records system that is designed to capture, securely store, and manage all patient-related information and activities. The proposed system leverages the power of digital technology to enable healthcare organisations to seamlessly manage patient information, streamline workflows, and provide more informed and efficient care. By incorporating advanced security features and strict privacy protocols, our system ensures that patient information always remains safe and secure, without compromising accessibility or ease of use. Perhaps most importantly, our system places a strong emphasis on patient engagement and empowerment, enabling patients to stay informed about their care and take an active role in their health management. Overall, the low-cost digital health records system represents a game-changing solution that has the potential to transform the healthcare industry. By improving the quality and efficiency of patient information management, the proposed system enables healthcare organisations to deliver better care, reduce costs, and improve overall health outcomes for patients.

Keywords

Digital health records system; Patient information management; Healthcare quality; Patient engagement; Security and privacy protocols

I. INTRODUCTION

Traditionally paper has been standardised and in use for so long in many countries as a way of recording patients' health information i.e., from birth up until death, their health records are on various papers. This was very successful at the time since it required less upfront setup costs i.e., all that was required was paper and file cabinets to store the papers. This also meant fewer costs for training personnel. Doing this on paper has led to many complications within the healthcare environment, for example, storing this information in file cabinets means there is a lack of security, and no data is backed up.

The emergence of electronic methods of storing information has resulted in significant advances in the ease and flexibility in which information can be stored, manipulated, backed up and analysed to quickly identify any patterns that would be of importance to stakeholders in the healthcare industry.

II. PROBLEM STATEMENT

In today's technologically advanced era, it is astonishing that many healthcare facilities still rely on a paper-based record-keeping system. This antiquated method of documenting patient information has a myriad of drawbacks that can lead to serious consequences. One of

the most prominent issues with paper records is that they can be easily misplaced or destroyed, leading to missing or distorted information. Inaccurate information can have severe implications for patient care, and in some cases, may even result in malpractice.

The lack of proper data to support medical decisions is another major issue with paper based record-keeping systems. This can lead to wrong diagnoses or incorrect treatment plans for patients, which can have serious consequences. Furthermore, the current system makes it challenging to have a seamless flow of information from one healthcare facility to another, which can create loopholes in how patients are handled and treated across different healthcare facilities.

Recording data on paper also poses a significant problem when it comes to analysing the information. The analysis of data is crucial in healthcare, and relying on paper records makes this process time-consuming and often results in false information due to human error. This, in turn, can lead to erroneous conclusions and flawed decisions.

In conclusion, the current paper-based record-keeping system in healthcare is plagued with a host of problems that can have significant consequences for patients. With the advancement of technology, it is essential for healthcare facilities to adopt modern record-keeping systems that are reliable, secure, and efficient. This will not only enhance patient care but also improve the overall efficiency and effectiveness of the healthcare system.

III. RELATED WORKS

Electronic health records in chiropractic practice

In his literature review, "A Literature Review of Electronic Health Records in Chiropractic Practice: Common Challenges and Solutions," David Taylor explores the benefits and challenges of using electronic health records (EHR) in chiropractic practice. Taylor highlights that EHR can improve efficiency and accuracy in patient care and treatment plans. However, the cost of implementing and maintaining the technology, difficulty of use, and regulatory compliance are some of the challenges associated with EHR in chiropractic practice.

Adopting EMRs and Information Technology in Primary Care

Authors Sarah Carbone, Allie Peckham, Dominika Bhatia, Sara Allin, and Gregory Marchildon conducted a rapid review on the impact of Electronic Medical Records (EMRs) and Information Technology (IT) adoption on primary care in their article "Adopting EMRs and Information Technology in Primary Care." The authors found that EMRs and IT can improve communication, coordination, and patient engagement, ultimately leading to improved quality of care. However, factors such as organisational culture, resource availability, technical expertise, and cost can influence successful adoption of EMRs and IT in primary care.

Electronic Health Record Implementation in Developing Countries

Tirenioluwa Adeyinka's article "Electronic Health Record Implementation in Developing Countries: A Systematic Review" explores the challenges and opportunities associated with Electronic Health Record (EHR) implementation in developing countries. The author found that limited resources, technical expertise, and infrastructure are some of the challenges facing EHR implementation in developing countries. On the other hand, EHRs have the potential to improve patient care quality and coordination. Cultural and organisational factors also play a crucial role in the success or failure of EHR implementation in developing countries.

Conclusion

Digital health record systems have the potential to enhance healthcare delivery by improving its quality, efficiency, and safety. However, the above-mentioned articles also underscore the challenges associated with implementing such systems, including:

- Lack of resources, technical expertise, and infrastructure
- Cultural and organisational barriers
- High cost of implementation

- Data security and privacy concerns

Fortunately, the highlighted challenges can be addressed to leverage the benefits of implementing digital health records while minimising obstacles. For example, implementing a low-cost system tailored to the needs of developing countries that requires little technical proficiency to operate could be a viable approach. Additionally, policymakers, healthcare providers, and patients can collaborate to address organisational and cultural barriers.

IV. SOLUTIONS

The goal of this project's design and development is to create an electronic health record for Zimbabwe that will make health related information easily accessible. To solve the issues described in the problem statement, a system with the following objectives was created:

To develop a desktop platform for health facilities to:

- securely collect, store and retrieve patient information (visits, tests, prescriptions, etc)
- generate analytical reports at any level for any specified period.
- Provide secure APIs for sharing of patient information with other health care providers.

To develop a mobile platform for patients to:

- Access their information.
- Receive notifications of anything related to their health (e.g., reminders to take medication as prescribed)

A. Solution Architecture

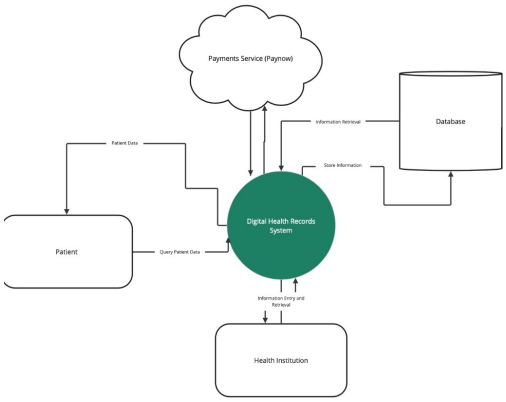

Fig. 1: Architecture Solution

B. Coding Strategy

To accomplish all the objectives of the project, a coding strategy comprising a series of actions was employed. Due to the project's vast scope, it was divided into several components. A comprehensive plan outlining the structure of the database was created prior to its construction. The structure and interrelationships between classes were also determined before their establishment. Certain features were developed through a trial-and-error process until the intended results were achieved.

C. Experimentation and Testing

Table 1: Experimentation and Testing

Function	*Expected Result*	*Comment*
Authentication (through email or phone number)	Success and redirect to dashboard for specific role	Passed
Authentication (through email or phone number)	Error: Invalid username or password error	Passed
Creation of accounts of all types (different roles)	Error and employee is not registered in the system	Passed
Database Connectivity	Health check with status 200	Passed

V. CONCLUSION

The Digital Health Records system satisfies the project's requirements for success by achieving the goals, features, and functionality listed while being extremely efficient and offering a wonderful user experience. Using FDD made it possible to produce a product in the lowest amount of time with the fewest defects possible because debugging was quite simple.

Obtaining the specifications for what the system must accomplish was one of the obstacles encountered throughout software development.

VI. FUTURE WORK

Secure messaging will be incorporated into system upgrades in the future to improve patient satisfaction and patient-provider communication. This can enhance patient participation and happiness, which can ultimately result in better health results.

Another area that may be incorporated in future improvements is predictive analysis, which can be used to identify patients who are at high risk for specific health disorders or complications, allowing healthcare providers to intervene early and prevent or lessen these risks.

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