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Research on Smart Healthcare: Based on the Website / Health Services Platform

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Abstract

With the development of information technology, the concept of smart healthcare has gradually come to the fore. Smart healthcare uses a new generation of information technologies, such as the internet of things (loT), big data, cloud computing, and artificial intelligence, to transform the traditional medical system in an all-round way, making healthcare more efficient, more convenient, and more personalized. With the aim of introducing the concept of smart healthcare, in this paper we first list the key technologies that support smart healthcare and introduce the current status of smart healthcare in several important fields. Then we are trying to analyze the existing problems with smart healthcare and try to propose solutions to them. Finally, we look ahead and evaluate the future prospects of smart healthcare. After analyzing the problems of an existing systems, in this paper, we came with the purpose of identifying the key motivation elements that shall be present in Smart Healthcare solutions that will integrate the data of medical history on the safe and well managed platform.

Keywords – Smart Healthcare, big data, CVD prevention, machine learning algorithm

1. Introduction

What is Smart Healthcare?

Smart healthcare is a health service that uses technology such as wearable devices, IoT, and mobile internet to dynamically access information, connect people, materials and institutions related to healthcare, and then actively manages and responds to medical ecosystem needs in an intelligent manner. Management of the data related to all departments of healthcare such as Clinical, Financial, Inpatient, Outpatient ,Operation Theatre, Pharmaceutical, Pathology.Smart Healthcare is a computer-based system will be used to the manage the different functions of the hospital administration that will integrate all the detail information regarding patients, doctors & hospital employees.Smart Healthcare system will help to maintain hospital administration and will minimize efforts of maintaining the paper work for the history of medicines

2. LITERATURE SURVEY

1. **N. Mohammadzadeh and R. Safdari, :** "Patient monitoring in mobile health: opportunities and challenges," Medical Archives, vol. 68, no. 1, pp. 57–60, 2014.

   In this system, some challenges are in patient monitoring in general and specific aspects like threats to confidentiality and privacy, technology acceptance in general and lack of system interoperability with electronic health records and other IT tools, decrease in face-to-face communication between doctor and patient, sudden interruptions of telecommunication networks, and device and sensor type in specific aspect.

2. **E. Sezgin, S. Ozkan-Yildirim, and S. Yildirim, :** "Investigation ¨ of physicians' awareness and use of health apps: a mixed method study," Health Policy & Technology, vol. 17, no. 4, pp. 133–142, 2017.

In this system , the field of research is highly multi-disciplinary; most of documents belong to the medical field, with only a few interconnections with the technology and health policy spheres. Although the involvement of patients is recognized as fundamental for CVD prevention through PASA, co-design schemes are still lacking at the public management level.

3. **B. K. Ahmedani, N. Crotty, M. M. Abdulhak, and S. J. Ondersma, :** "Pilot feasibility study of a brief, tailored mobile health intervention for depression among patients with chronic pain," Behavioral Medicine, vol. 41, no. 1, pp. 25–32, 2014.

In the survey of mood detection, there was no indication that mood improvements from pre- to post-micro-intervention differed between techniques or across the 13 micro-intervention days; hence there was no evidence for habituation of potential microintervention effects.

4. **S. A. Stoner, P. B. Arenella, and C. S. Hendershot, :** "Randomized controlled trial of a mobile phone intervention for improving adherence to naltrexone for alcohol use disorders," PloS One, vol. 10, no. 4, Article ID e0124613, 2015.

The results suggest that in the context of daily monitoring and assessment via cell phone, additional text message reminders do not further improve medication adherence.

The primary outcome, proportion of participants with adequate adherence (defined as ≥80% of prescribed doses taken through Week 8), did not differ between groups in intent-to-treat analyses (p = .34).

5. **K. E. Muessig, E. C. Pike, S. Legrand, and L. B HightowWeidman, :** "Mobile phone applications for the care and prevention of HIV and other sexually transmitted diseases: a review," Journal of Medical Internet Research, vol. 15, no. 1, Article ID e1, 2013.

Most available HIV/STD apps have failed to attract user attention and positive reviews. Public health practitioners should work with app developers to incorporate elements of evidence-based interventions for risk reduction and improve app inclusiveness and interactivity.

6. **J. Y. Breland, V. M. Yeh, and J. Yu, :** "Adherence to evidencebased guidelines among diabetes self-management apps," Journal of Healthcare Engineering 7 Translational Behavioral Medicine, vol. 3, no. 3, pp. 277–286, 2013.

This study suggests current DSM apps do not provide meaningful features for self-management and may not fulfill the needs of older people with diabetes. There is a need to conduct a systematic features analysis of current diabetes apps for older people with diabetes against evidence-based guidelines.

7. **W. H. S. D. Gunarathne, K. D. M. Perera, and K. A. Kahandawaarachchi, :** "Performance evaluation on machine learning classification techniques for disease classification and forecasting through data analytics for chronic

kidney disease (CKD),” in Proceedings of the 2017 IEEE 17th international conference on bioinformatics and bioengineering (BIBE), pp. 291–296, Washington, DC, USA, October 2017.

We have analyzed 14 different attributes related to CKD patients and predicted accuracy for different machine learning algorithms like Decision tree and Support Vector Machine.

8. **J. M. Hahne, F. Biebmann, N. Jiang et al., :** “Linear and nonlinear regression techniques for simultaneous and proportional myoelectric control,” IEEE Transactions on Neural Systems and Rehabilitation Engineering, vol. 22, no. 2, pp. 269–279, 2014.

The approach is based on adapting a trained Classifier using a small calibration set only, which incorporates the relevant aspects of the non stationarities, but requires only less than 1 min of data recording.

9. **S. D. Desai, S. Giraddi, P. Narayankar, N. R. Pudakalakatti, and S. Sulegaon, :** “Back-propagation neural network versus logistic regression in heart disease classification,” in Advanced Computing and Communication Technologies, pp. 133–144, Springer, Singapore, 2019.

Two objectives of this paper are identifying the best classification model among parametric and nonparametric for effective heart disease prediction and optimizing the number input attributes for classification model which were achieved by various systematic and engineering approaches. The output variable is categorical in nature and the para-metric based algorithms outputs are found to be more effective.

10. **S. K. Dey, A. Hossain, and M. M. Rahman, :** “Implementation of a web application to predict diabetes disease: an approach using machine learning algorithm,” in Proceedings of the 2018 21st international conference of computer and information technology (ICCIT), pp. 1–5, Dhaka, Bangladesh, December 2018.

Diabetes is one of the prolonged diseases triggered by the unbalanced release of insulin, which becomes apparent when blood glucose levels are above average levels. In this study, five different models, such as CNN, DNN, CNN-LSTM, Bi-LSTM, and CNN-Bi-LSTM, are used to identify diabetic patients over static PIDD. The CNN-Bi-LSTM is used for the first time in this study to perform well in the multiple classification and prediction problems, which makes it unique.

3. PROPOSED WORK

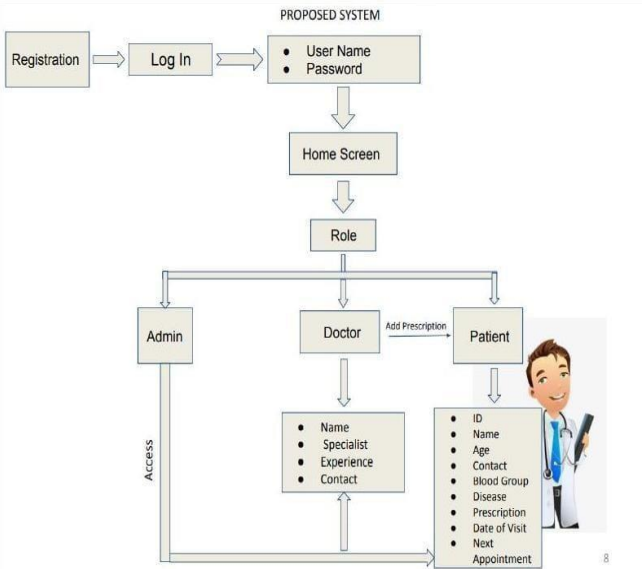

Fig 3.1. Proposed Architecture of Smart Healthcare

As per the proposed architecture, first we have to Register on the provided website of Smart Healthcare. After registration, the user will Log in with the User name and password. After registration, home screen will be displayed according to the role of the user i.e. Admin, Doctor, Patient

Admin Module – Admin will have all the access of maintaining medical history of an administration . Like the admin can create, delete , update & read the information of doctor as well as patient. In Doctor's module the admin can add Doctor's detail e.g Name, Specialist, Experience, Contact Details . And in the patient's module , the admin will update the patient's name, id, age, contact, blood group, disease, date of visit, next appointment (optional).

Doctor Module – The doctor will only have the access to check patients' medical history and add the prescription in the particular patient's column.

Patient Module - The patient will only have the access to check the medical history.

4. CONCLUSIONS & FUTURE SCOPE

4.1 CONCLUSION

Smart healthcare is a health service that uses technology such as wearable devices, IoT, and mobile internet to dynamically access information, connect people, materials and institutions related to healthcare, and then actively manages and responds to medical ecosystem needs in an intelligent manner. This project will enhance the patients and the hospital to serve more quickly and efficiently.This software is developed in order to computerize the activities which take more time , if done manually. Hospital billing system will enable the patient and hospital staff to make things faster and can get information quickly. If we want any information about patient , we can access it quickly. The system introduced smart healthcare to monitor the basic important signs of patients. Authentic medical staff can view and track the data in real-time even though the patients perform the tests outside of the hospital. The system can also benefit doctors in situations of epidemics or crises as raw medical data can be analyzed in a short time. The developed system will improve the current healthcare system that may protect lots of lives from current situation. Some more measures which are very significant to determine a patient's condition like the level of diabetes, respiration monitoring, etc. can be addressed as future work.

4.2 FUTURE SCOPE

The system will be used as the application that serves hospitals, clinic, dispensaries or other health institutions. The intention of the system is to increase the number of patients that can be treated and managed properly. If the hospital management system is file based, management of the hospital has to put much effort on securing the files. They can be easily damaged by fire, insects and natural disasters. Also could be misplaced by losing data and information. It has challenges and limitations it will not stop the technology from growing. The need for smart health care is huge and it can help the system immensely. It can reach every patient from all over the world and connect doctors with patient. There is no denying that system has already made a huge impact and is only set to grow further. This approach would save huge costs and introduce efficiencies.

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