

Feasibility Study on Moving Towards Electronic Prescription over Manual Prescription

Dharmendra Godhani¹, Prerna Singh², Deeksha Jangdekar³, Nikita Thadani⁴

¹²³⁴ B.E Scholar, Computer Science and Engineering, Jhulelal Institute of Technology, Nagpur, India

Abstract - *Think about the world without any manual work what if we reduce the work in which human has to put lots of efforts not in thinking but doing manual work. What if we make our world A SMART WORLD, So here is one such approach that we are taking to make our city smart. This paper is a small contribution towards making India digital and simplifying the work of doctors as well as patients. It allows the receptionist to enter patient's general information which includes name, age, address, gender, contact number of patient, etc. Doctor will be able to keep a track on patients who are in queue as well as how many patients he/she has to attend. Instead of prescribing medicines on paper Doctors will type the medicines and its dosage on the app itself. This will not only reduce the paper work but also helps developing the city being technology-oriented. The prescription can be provided via SMS or it will be linked to wired or wireless printer, so that print out of prescription can be provided to patients. The advantage of this system is that all information related to patients is saved digitally which will be stored on server hence the privacy is maintained, used paper which takes so much time to get recycled is saved.*

Key Words: *Electronic Prescription(EP), MediPic, Jini based,*

1. INTRODUCTION

As the concept of smart cities is being discussed since last year, the country is moving forward to an actual demonstration and presentation of smart city experience. The concept of Digitization plays a major role in moving towards smart cities. The concept of Digital India mainly focuses on transformation of the nation into digitally empowered society and a knowledge economy. This digitization will place technology at center of all efforts to foster change. This paper is also a small contribution

towards making India digital and simplifying the work of doctors as well as chemist.

This paper is about Prescription Writing app, for doctors, which saves time, avoids paperwork trouble and is a convenient tool to maintain patient's record and reduce the overhead of understanding manual documented prescription given by doctor's . It allows the receptionist to enter patient's general information which includes name, age, address, gender, contact no. of patient, etc and add them in a queue of patients waiting for the treatment. Doctor will be able to keep a watch on patients that are in queue as well as how many patients it has to attend. Instead of prescribing medicines on paper, doctor will type the medicines and its dosage on the app itself. Finally the print out of prescription can be provided to patients by linking it to printer.

Interactive design and following user friendly features makes prescription writing fast and useful for future use-

1.1 Prescribe medicines and tests with a single click:

With a single click, doctors can now prescribe medicines electronically, by entering the exact course instructions viz. dosage quantity, dosage frequency, time-duration and the dispense measure is auto-calculated. A facility of quick notes along with instructions for the prescribed medicines is also provided.

1.2 All patients in one place:

As all patient's data is digitally stored, so it will help to reduce the overhead of manual prescription given by doctors. The system generates a prescription which contains the patient's general information. It will also help in searching patient's data just with a single click.

1.3 Maintain patient's history:

Patient's medical history and previously prescribed medication courses can be quickly accessed by the doctors. In order to save time, previously prescribed

medicines by the doctor can easily be repeated from patient's history by adding them to the current prescription.

1.4 Print prescription PDFs wirelessly/wired:

In manual prescriptions patients are amenable for protecting the privacy of their prescription information while it is in passage from the prescriber to the dispenser. So this app provides the security to maintain the privacy of patient's data as well as their medical information.

1.5 Privacy of prescription information:

All prescriptions can be accessed in one place as they are stored typically in a single server. There is no need to write prescriptions manually as the PDF of prescription can be easily printed with wired/wireless printers.

2. RELATED WORK

The main idea behind making this paper comes from surveying various IEEE papers. All the surveyed papers had some common features related to our paper some in terms of technology and some in terms of usage. The main objective of our paper is to design an application which would provide an effective and easier way to maintain patient's record and reduce the overhead of manual documented prescription given by doctors. This paper has a small contribution towards making India digitally empowered country and also provides privacy to the patient's prescription information.

2.1 Ambulatory physical therapy clinic:

[1] The main objective of this hand held healthcare information system is to record medical processes and appointments of patient. During the App development, to compare the efficiency between traditional paper-based approach and App system, the medical system's environment characteristics were observed and a scenario simulation method was used which helped a lot.

2.2 Medicpic:

[2][3][4] A mobile application for medical prescriptions which partially scans handwritten medicine names by using optical character recognition and return readable digital text. As we know that misinterpretation of drug names in medical prescriptions can be very injurious to patients and can have very harmful effects on patients health. This is caused by either unreadable handwriting or inability of chemist to recognize medicine names in medical prescription. This mobile application uses Tesseract and Repres. It uses Tesseract as a library to

recognize optical character, and Repres in order to match the drug name with the partial string. So, with the help of medicpic it is possible to correctly interpret the medicine names given by doctors. This will also help chemist from selling the incorrect medicines to patients. This will also be helpful to the patients in some or the other way as patients would be able to read the prescription and know about the medicines.

2.3 Jini-based:

[5][6][7] Solution for electronic prescriptions which focuses on the issue of handwritten, paper based medical prescriptions which is a norm today in most of the countries. In order to move towards electronic dispensation of prescriptions, many efforts have been made, but these have generally omitted to incorporate omnipresent computing technology in their proposed solutions. This paper keeps track of the patients waiting and the allotted time for their appointments. This paper was found very useful, effective and ease of use according to feedback taken from clinics and users.

2.4 Electronic transfer of prescription:

[8][9][10][15] Electronic transfer of prescription Focuses on privacy of patients. Patients are themselves responsible for protecting the privacy of their paper prescription information. So to provide this privacy, a national electronic transfer of prescriptions (ETP) system has been made which is completely different from paper-based prescription. The system was basically designed keeping privacy of patient's prescription information in mind and it also discussed how others can use this system both inside and outside the healthcare sector for other applications.

2.5 Is electronic prescription essential for hospitals- A game theory model:

[5][11][12][13][14] In traditional hospitals, information technology progressing continuously by using Electronic prescription system. The main objective of this paper was to solve the following questions :

Why majority of the hospitals are moving towards electronic prescription system?

Why there is a need and is there actually a need of electronic prescription for hospitals?

Does the EP system have less disadvantages than advantages? Game theory model is presented in this paper to explore these questions and after analyzing the output that was generated from these questions came to the conclusion that electronic prescriptions had much advantages than traditional prescriptions.

We analysed the need of developing this DIGI-CLINIC app by surveying all of the above papers which was based on why electronic prescription important for hospitals. By surveying this paper we understood the advantages of electronic prescription (EP) system over traditional manual prescription.

3. PROPOSED SYSTEM

This paper presents a proposed system which is an application for the Android platform mobiles that has a small contribution towards making India digital. Android is Linux-based operating system designed primarily for touch screen mobile devices such as smart phone and tablet. The proposed system will be developed for Android mobiles only because the market share of Android is more than other operating systems.

The main objective behind this paper is to design an application which would provide an effective and easier way to maintain patient's record and reduce the overhead of manual documented prescription given by doctors. This application also has a major contribution towards maintaining privacy of patient's prescription information. This paper is designed keeping in mind the cost, ease of use, less overhead for target users like doctors. To reduce the cost, we are designing this application for tablet (phone), so that doctors could afford purchasing low cost tablets for receptionist as well as for himself.

This application is designed in such a way that it is easy to use, has less overhead of manual documented prescription and maintaining patient's record manually. The another advantage of using this application is that doctors can keep track of patients that are in queue waiting for the treatment from any place as the data would be stored on server and it could be accessed from anywhere. Also it can maintain patient's history that can be used in future.

Another advantage could be the privacy of prescription information. As we know that in paper based prescription, patients itself are responsible for protecting the privacy of their prescription information So our application is responsible for protecting the privacy of patient data while MEDIPIC app does not have the concept of privacy of data.

With MediPic which partially scans handwritten medicine names, cases of misinterpretation of medicine names can be decreased but it cannot be removed so there are some chances of misunderstanding which can have harmful side-effects on patient's health. But this paper produces an application where there are no chances of misunderstanding of medicine names as they are not handwritten and is easily understood.

Most of the papers which we have studied for electronic medical prescription are written for hospitals but this paper is written keeping a clinic in mind i.e it is basically designed for clinics.

4. CONCLUSIONS

In this paper we describe how manual prescription can be enhanced to electronic prescription. This will help to reduce the overhead of manual documented prescription given by doctors. Moreover it will help to maintain patient's record efficiently. It will also provide an intuitive form of understanding to patients such as knowledge of which medicines they have to take. The system described in this paper is basically designed keeping privacy of patient's prescription information in mind. This paper is designed keeping in mind the cost, ease of use, less overhead for target users like doctors. This paper produces an application where there are no chances of misunderstanding of medicine names as they are not handwritten and is easily understood.

5. FUTURE WORK

The proposed work may be grouped with several chemist's so that doctors can directly forward prescription to the chemist via fax or some other media. Up until now we have focused more on patients privacy and understanding of prescription. In future patients may also fix appointment with doctor from anywhere. Also a reminder system can be implemented that would remind patients about their appointment.

REFERENCES

- [1] Pei-Fang Tasi, I-Sheng chen, Pothoven K "Development of handheld healthcare information system in an outpatient physical therapy clinic" Proceedings of the 2014 IEEE 18th International Conference, 21-23 May 2014.
- [2] Alday, R.B Payagon, R.M "Medipic(2013):A mobile application for medical prescription" Piraeus, 2013. Publisher:IEEE 2013.
- [3] Berwick DM., and Winickoff DE. "The Truth about Doctors' Handwriting": A Prospective Study BMJ 313 (7072):1657-8." 1996 Dec 21-28.
- [4] Gupta AK., Cooper EA., Feldman SR., Fleischer AB Jr., and Balkrishnan R. "Analysis of factors associated with

- increased prescription illegibility": results from the National Ambulatory Medical Care Survey The American journal of managed care, 2003.
- [5] Ghinea, G Asgari, S Maradi, A Serif, T "A Jini-Based Solution For Electronic Prescription" Date of Publication :Oct. 2006 ,Date of Current Version :09 October 2006 ,Issue Date :Oct. 2006, Publisher:IEEE
- [6] M. C. Beuscart-Zephir , S. Pelayo , P. Degoulet , F. Anceaux and S. Guerlinger. "A usability study of CPOE\'s medication administration functions: Impact on physician-nurse cooperation", Proc. Medinfo, 2004.
- [7] D. Wang , M. Peleg , S. W. Tu , A. A. Boxwala , O. Ogunyemi , Q. Zeng , R. A. Greenes , V. L. Patel and E. H. Shortliffe "Design and implementation of the GLIF3 guideline execution engine", J. Biomed. Inform., vol. 37, 2004
- [8] C. Siva Ram Murthy and B. S. Manoj " Ad Hoc Wireless Networks Architectures and Protocols 2004" :Prentice-Hall R. Foot and L. Taylor "Electronic prescribing and patient records—Getting the balance right", Pharm. J., 2005
- [9] Ball E,Chandwick D.W, Mundy D "Patient Privacy In Electronic Prescription Transfer" Date of Publication :Mar-Apr 2003 Date of Current Version :08 April 2003 ,Issue Date :Mar-Apr 2003 ,Sponsored by :IEEE Computer , Publisher:IEEE
- [10] B. Struif German Ministry of Health. "German Health Professional Card and Security Module Card Part 2": HPC Applications and Functions, vol. 2.1.
- [11] Nan-Nan-Du, Mui-Yang chen, Qian-jin Zong, Qin-jian Yuan "Is Electronic Prescription Essential For Hospitals: A Gam Theory Model" ,Date of Conference:23-25 Oct. 2012 ,Conference Location :Taipei ,Publisher:IEEE
- [12] M. F. Collen, "A brief historical overview of hospital information system (HIS) evolution in the United States," International Journal of Bio-Medical Computing, 1991.
- [13] N. Jaakko, F. Jari, "Approaches for certification of electronic prescription software," International Journal of Medical Informatics, Dec 1997.
- [14] R. Shawahna, N. U. Rahman, M. Ahmad, M. Debray, M. Yliperttula, and X. Decleves, "Electronic prescribing reduces prescribing error in public hospitals," Journal of Clinical Nursing, Vol. 20, no. 21-22, Nov 2011.
- [15] S. Sharples and A. Woodhead, "Improving Security: Electronic Transfer of Prescription Data in Primary Care", British J. Healthcare Computing and Information Management, vol. 13, no. 1, 1996.