Impact Of Mobile Computing On Rural Community For Health Care

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Abstract

Paper explains about n use of mobile computing middleware in context of health-care. Mobile technologies are increasingly growing in developing countries like India and other also. Nowadays mobile is becoming an important Computer and Information Technology tool which is not only in used city areas but also used in remote and rural areas. The rapid advancement in the technologies, easily of use and the falling costs of devices, make the mobile an appropriate and adaptable tool to bridge the digital divide. Many of these new "mobile citizens" live in poorer and more rural areas with scarce infrastructure and facilities, high illiteracy levels, low PC and internet penetration. The availability of low-cost mobile phones and the already broad coverage of Global System for Mobile networks in India is a huge opportunity to provide services that would trigger development and improve people's lives. This paper explores the present status of health care systems and its shortfalls in Primary Health Care Management in rural area, and as a potential solution to fill it with the application of Mobile Web technologies for Primary Health care management.

1. INTRODUCTION

Mobile services are quickly emerging as the new frontier in transforming government and making it even more accessible and citizen-centric by extending the benefits of remote delivery of government services and information to those who are unable or unwilling to access public services through the Internet or who simply prefer to use mobile devices. In theory, many government services can be now made available on a 24x7x365 basis at any place in the world covered by mobile networks, which today means almost everywhere. Approximately 50%–60% of government services including Primary Health Management can be delivered via mobile channel. With the recent outburst of smartphones technologies and worldwide deployment of mobile and wireless networks, it has become quite obvious that wireless infrastructure can support many current and emerging healthcare applications. For an example, consider a clinician who has just provided an inpatient service to a patient. The clinician could enter a description of the service on a paper record at the patient's bedside. Alternatively, the clinician can simply enter specific parameters of the service in a mobile device. This data entered are automatically sent to the billing systems via wireless networks. How cool would be that? Another interesting application would be writing a prescription using a mobile device that transmits the order via the Internet to the appropriate pharmacist

Using Mobile Devices ensures improved access to primary healthcare and its gate-keeping function leads to less hospitalization, and less chance of patients being subjected to inappropriate health interventions.

2. LITERATURE REVIEW

Heng-Shun Chen. [2007], in his Ph. D work titled **"From Ruraltelemedicine to ubiquitous healthcare",**stated three dimensions of e-health systemsdevelopmentButhis work is only limited to telemedicine which has many drawbacks.**MihaiJalobeauni**, a professor of Western University, Romania stated in his research paper titled "**Internet –A Virtual Laboratory for DistributedComputing**", that how does the distributed computing can be done by using the internet as a virtual laboratory for database management tasks. This gives the idea of the Distributed System as web based model for healthcare development.

B T Jadhav& P PPatil [2009] mentioned in his Ph. D thesis Designing and development of distributed web based (DWB) model by using wireless technology and its performance evaluation about certain limitations which motivates us to make use of the Mobile.

The internet downloaded article by **Obi Igbokwe**titled **"WirelessTechnology and Healthcare"** explained major issues for building effectivehealthcare system by using wireless technology and different methodologies have been identified and used in medicalcomputing research.

3. PROPOSED MODEL : MOBILE COMPUTING TECHNOLOGY FOR HEALTH CARE

Amongst the many ICT options available to government to improve the efficiency& effectiveness of its delivery process of primary health care, mobile & wireless technologies offer some exciting opportunities for a low cost, high reach service. It is found that that mobile technologies could be instrumental in addressing slow response rates of government to citizen requests,poor access to services, particularly for low-income and marginalized populations in underserviced rural areas. In addition, mobile technologies offer significant opportunities for improving the back-office operations of government. In addition, many primary healthcare centers located in the rural areas do not have any electronic systems at all & continue to operate paper- based systems, resulting in patient records being kept by patients themselves. The impact of the use of multiple systems is that it is difficult& costly to develop a national overview of patient statistics. On a more basic level, it is extremely difficult for individual institutions within the healthcare sector to share information between each other. One of the clearest examples of this is to be found in the sharing of patient laboratory results. Currently in most instances, this only takes place through manual exchange. Many vendors of Cellular phones started to embed a variety of health services in Mobiles.

4. OBJECTIVES

In the view above of the above limitations, we propose one of the solution in the healthcare development is mobile computing model for the healthcare development of rural community.

The objective of this paper is to bring out status of mobile devices based Health care management systems in the world particularly in India of rural areas and present the details of Mobile based Primary Health Care Management System.

- The quality of primary healthcare will increase.
- Increased efficiency of service care with an adequate referral and remote consultation system.
- Better pregnancy case registration case management.
- Improved epidemiological surveillance and control.
- Reduction of maternal and perinatal mortality and morbidity.
- Raising awareness and vaccination of corona virus.

4.1 Patient Communication and Support Application

Along with supporting remote monitoring, mobile phones and wireless devices provide a wide horizon for communication between patient and healthcare providers. Such applications not only allow providers to communicate with the patients anytime anywhere, but they also deliver-health related information at a time and place where they have utmost influence. The outcome is lower-health related costs. Some of these kinds of applications include:

A. Mobile EHRs (Electronic Health Record) could allow physician to access the patient's information that further allow physicians to communicate to the patients anywhere at anytime. Also, as consumers get more engaged to in tracking their health records, Public Health Records (PHRs) will gain acceptance. There are couples of PHR's that are available for smart phones. For example, Child and Women health Department works for iPhone. It stores and analyses the him personal health data, and offers health reminders. In addition to this app, there are several other emergency apps available.

B. Health Education Health educators generally face difficulty in reaching out young people to educate regarding health information. cellphones can be used as a promising tool to reach out young people. Several health campaigns that deliver messages to cell phone can be an assuring alternative. Other potential applications could be to provide warnings of dangerous levels of pollution or notifying upcoming tsunami and explaining the growing of influence of the corona.

C. Communication between doctor and patient is very important to as in to convey important information to patient or to update patient's health status to doctor so that doctor can act instantly. Live, two-way video conferencing app between doctor and patient would be a direct way of communication between doctor and patient. While these technologies can help physicians provide more timely diagnoses and treatment, it makes health care more convenient and pleasing for patients.

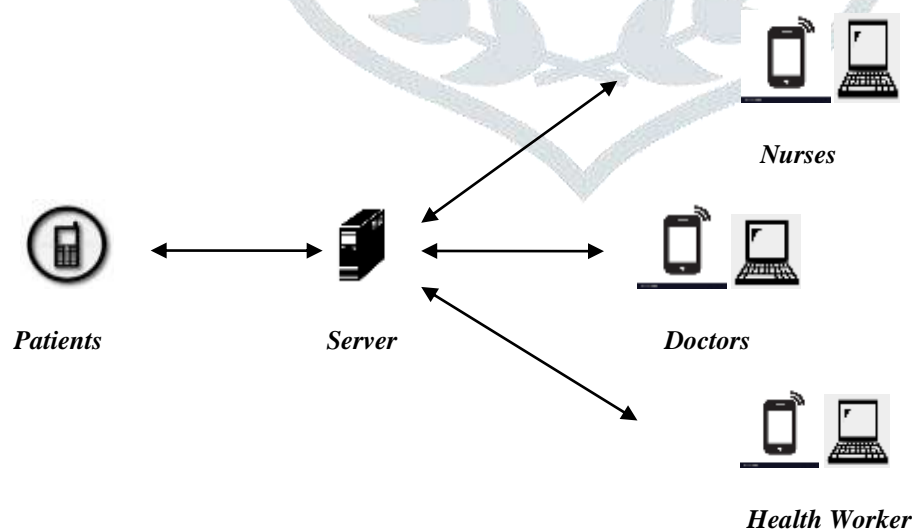*The diagrammatic representation is shown as below*

Fig. 1 :Representation of rural healthcare management system using   Mobile Computing.

The systems are :

(a) A central information with database of the patient information and other resources/services. So that patient can convey his health information to the rural hospital on mobile basis.

(b) Web server. SMS interface for receiving/sending SMS to 2G Mobile systems, which receives the SMS, converts the SMS into a query and executes the query. The results are then sent as an SMS reply.WAP Gateway for linkage with a GPRS/3G mobile. The gateway server translates mobile phone requests (WAP) into HTTP requests and sends them to Web server. The Web server processes the request, and sends WML(Wireless markup language) to gateway server, which in turn sends the WML to phone in the binary compressed WMLformat. In briefly, the server accept requests from patients and send a reply to the patient from healthcare.

(c) Localization Module for providing interface for translation. Means that healthcare operators accept the request and send answer to the patients using server. such as SMS, video conferencing or calling.

5. ADVANTAGES

In health Information system in which each family has an up-to-date family folder is a valuable tool for maintaining, analyzing and interpreting the enormous data. The Mobile based Primary health Care Management System will seek to achieve:

(a) Give patients quick access to providers and care.
(b) Direct patient management.
(c) Improve medication adherence.
(d) Makes it possible and easy to monitor remote patients.
(e) Medication enhances the accuracy of reconciliation, which improves patients safely.
(f) Improves provider communication and coordination.

6. LIMITATIONS

Smartphones have been widely promoted as game-changer of health. As we have highlighted before, there are many mobile health care and smartphones are the most popular form of mobile device.

We think this proportion is higher than seekers in healthcare smartphones but we can admit that there are some shortcoming that organization and doctors should consider when developing and enhancing mobile health policy. Mobile computing technology, like all technologies, faces limitations and challenges including:

(a) Every phone needs network, be it a simple mobile phone or a smartphone. Therefore limited network coverage and low bandwidth in rural areas, can lead to neglect of some people and other groups.

(b) Smartphones are expensive. Not everyone has a smartphone. So they can't use the smart apps in healthcare.

(c) Low awareness of the potential benefits of technology.

(d) limited capacity of rural people to use the technology.

(e) Apps often require internet access. But in some places, the problem of internet is more prevalent in rural areas. Healthcare services are not readily available in such places.

(f) Apps are not always available for all smartphones.

7. CONCLUSION

Mobile computing is an effective tool in terms of society. We can use mobile everywhere. Rural healthcare seems to be right intervention in terms of basic prevention but it is important to support it with other strategies as well. Rural healthcare is based on socially acceptable, practical and scientifically sound method and technologies. And we can use this service with the help of mobile computing technology. A patient convey information about his illness to the doctors only with the help of mobile and take care of himself at home. It saves the time and money. Mobile computing is an effective tool in terms of rural community, implementing "Mobile based rural healthcare management system" can make village health services transparent and easily available. And this service can benefit all the people of the village. This introductory system has been introduced in this paper.

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