Challenges Faced by The Health Care Professionals in Implementing Wearable Technology

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ABSTRACT - The growing use of wearable technologies increases the ability to have more information from the patient including clinical, behavioral and self-monitored data. The availability and large amounts of data that did not exist before brings an opportunity to develop new tools with intelligent analyses and decision support tools for use in clinical practice. It also opens new possibilities for the patients by providing them with more information and decision support tools specially designed for them, and empower them in managing their own health conditions, keeping their autonomy. These new developments drive a change in healthcare delivery models and the relationship between patients and healthcare providers. It raises challenges for the healthcare systems in how to implement these new technologies and the growing amount of information in clinical practice, integrate it into the clinical workflows of the various healthcare providers. The future challenge for healthcare will be how to use the developing knowledge in a way that will bring added value to healthcare professionals, healthcare organizations and patients without increasing the workload and cost of the healthcare services. For wearable technology developers, the challenge is to develop solutions that can be easily integrated and used by healthcare professionals considering the existing constraints

Keywords: Wearable technology for healthcare, Implantable devices, Health information technology, Challenges for wearable technology future Wearable technology

I. INTRODUCTION

Information and communications technologies are transforming our social Interactions, our lifestyles and our workplaces. One of the most promising applications of information technology are healthcare and wellness management. Healthcare is moving from reactive responses to acute conditions to a proactive approach characterized by early detection, prevention and long-term healthcare Management. In this framework, health condition monitoring and wellness management are seen as significant contributors to individual healthcare and Wellbeing. This is particularly important in developing countries with a significant Aging population, where information technology can be employed to significantly Improve the management of chronic conditions and, thereby, overall quality of Life.

The medical applications can be of two types: Wearable and implanted. Wearable devices are those that can be used on body surface of a human or just at close proximity of the user. Some of the wearable medical devices and applications are:

- Temperature measurement,
- Respiration monitor,
- Heart rate monitor,
- Pulse oximeter SpO2,
- Blood pressure monitor,
- pH monitor,
- Glucose sensor etc.

OBJECTIVE

- To study about application of wearable technology in health care sector.
- To analyze the impact of wearable's on health care sector in India
- To highlight the challenges faced by the health care professional
- To analyze the future prospects of wearable in medicine field

II. WEARABLE TECHNOLOGY

Wearable technology, wearable's, fashionable technology, wearable devices, tech togs, or fashion electronics are smart electronic devices (electronic device with micro-controllers) that can be worn on the body as implants or accessories.

Wearable devices such as activity trackers are a good example of the Internet of Things, since "things" such as electronics, software, sensors, and connectivity are effectors that enable objects to exchange data (including data quality through the internet with a manufacturer, operator, and/or other connected devices, without requiring human intervention.

Wearable technology has a variety of applications which grows as the field itself expands. It appears prominently in consumer electronics with the popularization of the smart watch and activity tracker. Apart from commercial uses,

 DOI : 10.18231/2454-9150.2019.0439

wearable technology is being incorporated into navigation systems, advanced textiles, and healthcare

Statement of the problem, objective and research

The wished outcome of this research is to conduct a liter view on health care professionals about wear-able technologies in healthcare, and to consider the possibilities and problems it will face before becoming the next big thing in technology. The purpose of this study is to cultivate the interest about wearable technology and to emphasize the potential in healthcare developments it could bring. Before starting to go into details of wearable technology in healthcare, we start by introducing the basics of wearable technology in general

What is wearable technology?

After discoursing the basics of wearable technology, we move onto the main re-search question which focuses on the potential of wearable healthcare technology as well as its main development and problem areas. The primary research question of this thesis is as follows:

What are the main challenges and possibilities for wearable technology in healthcare?

By providing thorough answers for these two research questions in layman's terms, this thesis hopes to explore the potential that lays in wearable technology including its present applications as well as its future forecasts.

Research method and data acquisition

The key words to be used when conducting this research are: wearable technology, healthcare, health-IT, telemedicine, smart technologies, wearable sensors. Since there is lot of very detailed studies published about the subject, the bibliography for this research will be about the matter in general, and not about elaborate research. The sources used will be focused on wearable technology adaptation in healthcare and its main problems/possibilities; the focus will be given on researches with most references and preferably not from Google Scholar, but given its vast coverage it will not be ignored completely.

III. RESEARCH STRUCTURE

This research is divided to four main chapters. First chapter is Introduction, where the main concepts of wearable technology in general and wearable technology in healthcare are explained in brief, followed by research problems, questions, methods and structure with data acquisition. The following chapter, "What is Wearable Technology?" will explain the main concepts of wearable technology, whilst also providing a short summary about the history of wearable technology. Different hyponyms of wearable technology and its progression speed are also taken into account in this chapter. The chapter will end with a short conclusion and a brief introduction about the next chapter to ease the transition. The third chapter focuses on the main problems and possibilities that wearable technology in healthcare is likely to face. The main problems will be divided into two different sections, and the possibilities and potential of wearable's technology in healthcare will be discussed in the following section.

Last chapter is the Conclusion chapter, where main points of this dissertation are repeated and emphasized and the core content of this thesis is presented. Possible future studies about wearable technology in healthcare are also debated

IV. RESEARCH METHODOLOGY

This is study is a descriptive and explanatory: First ,a literature review on

(1) Wearable devices in health care

(2) In-depth interview with healthcare professionals in Thanjavur district

Tamil Nadu

Quantitative research approach

This study is a descriptive and explanatory, research to field out the factors affecting the acceptance of wearable devices for health care the research question is : what are the challenges in implementing the wearable devices in health care? quantitative research design was selected for answering the research question.

Descriptive research

This study is going to describe what are the Challenges faced by the health care professionals in implementing of wearable technology for personal healthcare in thanjavur? Through questionnaire, this study answers the following sub-questions:

1) what are applications of wearable technology in medicine?

2)What are the advantages of using implementing wearable in health care services?

3)What are the types of wearable's using health care services?

4)In which are the places the wearable's are used

5)What are challenges faced by the doctors while implementing the wearable's?

6)How the wearable's could are used in health care sector?

7)What could be the future of wearable technology?

Questionnaire development

To collect data for answering the research questions for both the descriptive and explanatory research goals, we developed a questionnaire based on the proposed research model and literature reviewed.

 DOI : 10.18231/2454-9150.2019.0439

The questionnaire has three parts:

1) technological personality questions,

2) factors affecting the usage pattern(descriptive research),

3) research model constructs (explanatory research).

Applications of wearable technology in health care

This section provides about a review of applications of wearable and ambient sensors and systems that are relevant to the field of rehabilitation. The material is organized in five sub-sections devoted to summarizing applications focused on:

1) Health and wellness monitoring,

2) Safety monitoring,

3) Home rehabilitation,

4) Assessment of treatment efficacy, and

5) Early detection of disorders.

Table Measurement items of model in survey

Construct	Items	Measurement Items
Applications of medicine	AM1	Glucose watch
	AM2	Bp/pulse monitoring device
	AM3	ECG/Telemedicine
	AM4	Patient controlled analgesia
Implementing Wearable in Health care	IWH1	Patient can monitor himself without help of a doctor
	IWH2	Patient can get opinion from the doctor with the telemedicine technology using wearable devices
Type of Wearable's	TW1	Watch
	TW2	Stitching patch
	TW3	Implantable devices
Place of Wearables	PW1	Over the Wrist
	PW2	Chest
	PW3	Abdomen
Challenges Face	CF1	Cost
	CF2	Patient education
Used in Health Care	UHC1	The wearables can be used to monitor patient vital
	UHC2	Collect basic data about his health parameters
	UHC3	Alarm(or)Warning Can be issued to the patient
Future of Wearables	FW1	Alarm device
	FW2	Patient /Doctor can modify the patient's physiology by converting wearable devices to deliver medicines also

V. RESULT AND CONCLUSION

Discussion

In this chapter the results of the study will be discussed. First implications will be discussed when compared to other studies. In addition, based on the research results, suggestions will be presented according to researcher, professionals, developers of smart bands, and also marketing strategy mangers. Next the limitations of the research will be evaluated. Finally some suggestions for future work will be presented in the end of this chapter.

Implications of results

This study investigated technology challenges in accepting of wearable devices focused on Wearable devices. The goal of the study was to provide a state-of-the-art of challenges in the adoption and acceptance of Wearable devices for personal healthcare. The main research question of this study is: What is the state of challenges in acceptance of wearable technology for personal healthcare ? Among the thirty doctors twenty eight were not aware of

 DOI : 10.18231/2454-9150.2019.0439

this technology. Rest of the two doctors gave information about this technology.

Doctors were explained the benefit of this type of technology. They said that none of the hospitals are using this technology why because the doctors are not satisfied with that result and the patients are not aware of this type of technology. Another reason is it is very costly.

In other countries this type of health care is given as common treatment but in India is not at all they are aware of this kind of treatments. Very rare cases can be found. In Thanjauvr district this type of treatment lacks.

Doctors told that it has many positive side but the people are not interested and also not believing in this type of treatments. While using this type of wearable technology many chances are there for as a side effect.

In future wearable technology may reach it highest peak . Like alarm device ,patient/doctor can modify the patient's physiology by converting wearable device to deliver medicines etc. At the end of this interview the collected information are prepared as a project and submitted .

VI. CONCLUSION

The aim of this study is to examine the factors that affecting acceptance of wearable devices focused on , in order to find the state of acceptance of wearable technology for personal healthcare Based on previous research, literature reviewed on wearable devices, especially in the fields of healthcare, and draw the concepts related to user evaluation. Then this study mainly conducted technology challenges acceptance model related theories and technological personality to put forward a research model. The research model had been tested through an in depth interview with healthcare professionals and 30 completed responses were received. Findings showed that 66.2% of respondents not aware of wearable devices in daily life, and 34.3% of respondents have not used, but are interested in using wearable devices while 12.03% abandoned to use..

The factors affecting user' behavioral intention to using wearable devices directly are: perceived usefulness, social influence, affinity, and compatibility. Trust and perceived ease of use affect behavioral intention indirectly through perceived usefulness. However, contrary to expectations, the influence from mobile technology skills and innovativeness are not significant.

The study is significant because it provides information on challenges in usage patterns of the emerging wearable technology for personal healthcare. Moreover, the determining factors of acceptance among potential customers can give developers a feedback for the future improvement of wearable devices. Based on the research of users 'challenges in adoption towards wearable device sin healthcare can help related companies have its needs-based positioning and make special marking strategies to reach their marketing target..

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