

Wearable Devices in Healthcare using Telehealth Technology

Omkar Rajan Kambli

ASM's IMCOST, Thane

Student

Sharada Ravi Das

ASM's IMCOST, Thane

Student

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Abstract- There is a current trend of wearable sensing with regards to health. Wearable sensors and devices allow us to monitor various aspects of our lives. Through this monitoring, wearable systems can utilise data to positively influence an individual's overall health and wellbeing. In future this technology can effectively help us to become accomplishable and healthier. Telehealth care involves the remote delivery of medical care service to either out-of-hospital or admitted patients through wireless network and computer information technology. In this paper, we can describe an overview of current method used within wearable applications to track and support positive health and wellbeing of an individual. We then highlight drawbacks and solutions through previous studies and describe the future scope of work with the use of telehealth technology.

Keywords- (minimum 3): Telehealth, Wearable Sensors, Technology.

INTRODUCTION: The popularity of wearable technologies has increased rapidly day by day. In near future, wearable technologies are expected to become a dependable & necessary part of our daily life. Telehealth is a technology-based alternative solution to a traditional health care system. The delivery of health care services & clinical information is to improve, maintain, or assist patient's health care status tracked by means of information, devices or sensors. For each purposes, particular industry specifies various wearable devices according their own features, characteristics and applications. Grouping the wearable technologies based on their own applications and features plays an important role to analyze the wearable technologies specifically. Through this real-time monitoring, wearable systems can utilize data to positively influence an individual's overall health and wellbeing. Wearable sensors and devices allow us to monitor various aspects of our lives.

The most important contribution of wearable technologies in the health sector is enabling continuous monitoring of a patient's health status and gathering real-time information about the patient by the doctors in their demographic/geographical region. In addition, the treatment of heart failure, prevention conditions such as diabetes, seizure improved clinical such as Parkinson's disease, and the ability to promptly respond to emergency situations such as seizures in patients with cardiac arrest in subjects to wearable technologies can be used. **Telehealth/ Telemedicine** is a unique field that concerns with the development & applications of modern computing and telecommunication technologies in the healthcare to monitor people's well-being and provide remote medical care and treatment.

Related work/ Literature Survey: Many people have started using smartwatch's and fitness bands to check their activity and health, while patients are provided with monitoring devices to control & prevent diseases and take possible steps to avoid consequences. In current scenario, people have to make an appointment to visit the clinic or hospital which people find to be hectic and tedious process due to their tight schedule. So, to ease and fulfil the requirements of each and every patient's, the doctor can track patient's health conditions and can gather information anytime & anywhere within its demographic region rather than the patient going to the doctor himself which can lead to problems accidently/unintentionally. In fact, in Canada at a smaller scale this methodology is being implemented and some of them aren't even aware of this technology. 30% of the population in Canada have started initializing and implementing this technology which can be extended to further and wide scale.

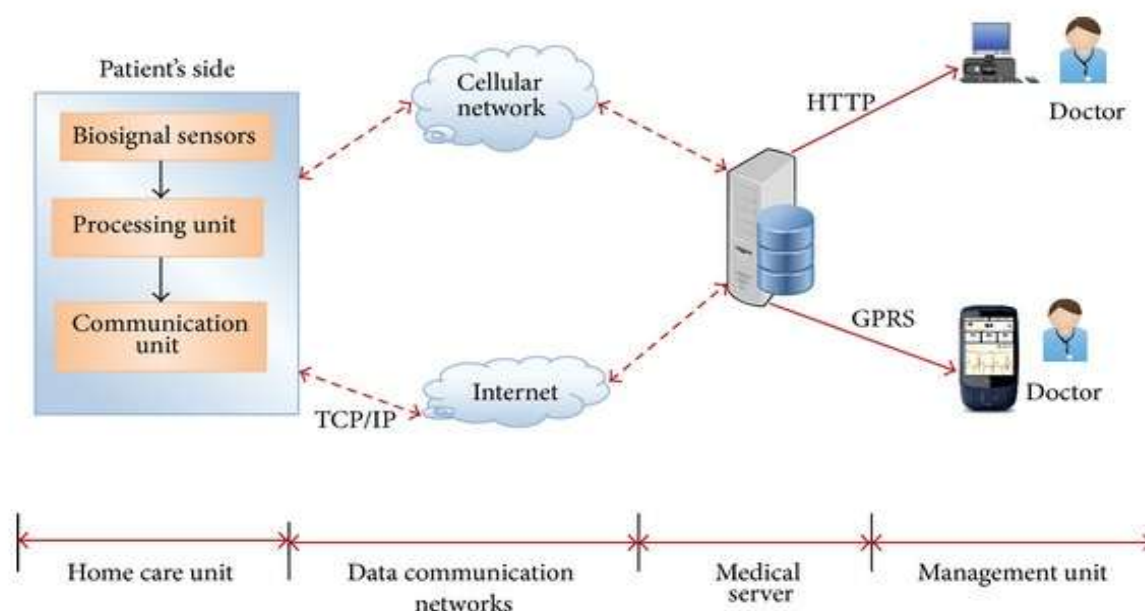
OBJECTIVES/PURPOSE OF THE STUDY: There is a current trend of wearable devices with regards to health. Wearable sensors and devices allow us to monitor various aspects of our lives. The purpose of the telehealth system is that the

information about patient health conditions can be gathered anytime & anywhere by the doctor which can save time & lives. The main advantage of wearable devices is to store data virtually so that the doctor can track the real time information of the patient can collect crucial and prioritize the data accordingly. It consists of data communication & sensors to interact with both internal & external states and objects in the environment. The Doctor can connect with the patient via Web Cams, calls, etc and can access live feedback from the patient and can depict the intensity of the issue according to the best and the worst case scenario.

DATA ANALYSE & INTERPRETION: This paper systematically reviews current trend in Tele-medical health care system with wearable sensors. One hundred and ten articles and Scopus indexed Journal were retrieved using relevant keyword search. Five magazine articles were also considered. The field of telemedicine, telehealth care system has attracted various number of researchers both from professional bodies and academics from various areas of specialization. The ability to detect and alert patients about ailments would result in a decrease in sudden death and outbreaks experienced around the globe, both in developing and developed nations where medical care is either too expensive or inaccessible at patients' current location. Professionals have researched monitoring Heart disease and diabetes using a network of wireless medical sensors connected to a mobile device (PDA). The PDA connects the sensors to a medical server where the measured parameters such as temperature, respiration rate, blood glucose and electrocardiograph are further processed and stored. However, their architecture is not a complete wireless system therefore compromising user's mobility.

Professionals have proposed a real-time Sensors monitoring system addressing the issues of integrating a wireless wearable sensor with mobile technology in extracting basic medical multiple parameters contrary to the single parameter as seen in the work of other researchers. This system is still deficient in having a special algorithm for early detection and constant monitoring of critical or abnormal physiological parameters that would help mitigate or manage cardiac related diseases effectively. With new generation smart-phones, the capability of running powerful applications is more popular with built-in sensors. A direct consequence is smart-phone-based health care applications rapidly being developed.

The fundamental parts to a telehealth system include the medical measuring devices (e.g., instruments or sensors), a processing device or subcomponent (e.g., mobile phone, computer) to process the readings obtained for transmission, a medical practitioner or intelligent server (neural fuzzy logic servers) to which the data is transmitted, a database for storing raw and analyzed data, and a device to display this data obtained from the server (Medical web portal) to the medical practitioner and/or the patient.



Researchers have also proposed complex algorithm in building a system that scans for symptoms prior to asthma attacks from biomedical data they obtain. This ensures patients take precautions from conditions that trigger critical response of their chronic case. This could be implemented for all other chronic cases.

SCOPE OF THE STUDY: Wearable technologies will play an important role in Telehealth System. Wearable devices may continuously monitor the health indicators of the people. If something goes wrong, the device can automatically send a signal to the emergency service and share current situation of the patients and share the exact location of the patient with the emergency service. In the future, some special wearable technologies can be integrated into the patient's body and in case of emergency these devices that may administer treatment to the patient. For example, when the insulin level decrease, the wearable device will inject insulin according to the amount that the body needs.

The power of these new technologies is that a wide spectrum of data can be made accessible to physicians and other health care providers regardless of the proximity of the patient.

CONCLUSION: In conclusion, wearable technologies have evolved gradually in parallel with technological advancements such as electronic chips, GPS systems, Wi-Fi systems, the internet, computers and sensors. We believe the future of telemedicine is extremely promising. On the physician's desktop, in small, rural clinics, in large, inner-city clinics, in the patient's home, or wherever medical information is needed, the technologies to connect patient with provider are rapidly becoming a reality. In this paper, it is proposed that wearable technologies will ease the life for the people that will enable the doctors to monitor the health indicators of the people continuously via Telehealth Technology.

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