

Chapter 38

Internet of Things in E-Health: An Application of Wearables in Prevention and Well-Being

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ABSTRACT

The main task of Internet of Things in eHealth solutions is to collect data, connect people, things and processes. This provides a wealth of information that can be useful in decision-making, improving health and well-being. The aim of this study is to identify framework of sensors and application health services to detect sources of stress and stressors and make them visible to users. Also, we aim at extracting relationship between event and sensor data in order to improve health behavior. Evaluation of the proposed framework model will be performed. Model is based on Internet of Things in eHealth and is going to aim to improve health behavior. Following the established pattern of behavior realized through wearable system users will be proposed a preventive actions model. Further, it will examine the impact of changing health behavior on habits, condition and attitudes in relation to well-being and prevention.

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INTRODUCTION

Despite numerous definitions of Health (Eysenbach, 2001; Dzenowagis, 2005; WHO, 2006; European Commission, 2015) all of them have in common that eHealth means not only technical development but also the change of the way of thinking, positive habits, networking in order to improve healthcare on local, regional and global level.

IoT is rapid innovation that leads to radical change of information delivery to users who often have limited time and energy to collect data and make them useful.

The market of mobile devices, smart phones and wearable devices has experienced astonishing growth. That is the main reason why they should be represented in the new technological solutions for the provision of health services. Distribution and availability of mobile and wearable computers to gather and monitor relevant vital health parameters during the everyday activities.

Some predictions says that the health care system of the future will be directed to the individual, personalization, participatory and precise (Raga Lavima & Subhramanya Sarma, 2015). The idea to perform constant monitoring of well-being is becoming increasingly popular. Measurements of human behavior and external factors that influence that behavior and condition of the body can be of valuable assistance in identifying stressors.

The subjects of this paper are concepts of Internet of Things in eHealth, wearable computing in different areas of well-being and technical and technological settings that are needed for IoT solution implementation. In this paper we present a model which consists of multidimensional framework of sensors and application of health services for stress detection and monitor sources that affect changes in health behavior and occurrence of stress.

BACKGROUND

Subjective well-being is the emotional and cognitive assessment of a person about his/her life, including happiness, contentment, peace, and life satisfaction.

The occurrence of stress in any population is a common predictor of other diseases and health disorders, including mental illnesses that are often difficult to detect and treat. The most common sources of the stress are changes in habits, short deadlines, separation from home, the social environment, long queues, etc. All of that can significantly affects the reduction of academic or work performance (Sohail, 2013).

Quality of life is not just the standard of living, material wealth, and income, employment. It is constant improving of mental and physical health, build a healthy environment, learning with recreation and rest. Promoting wellness, healthy lifestyles and their impact on health, encouraged people to participate in managing their health.

Vital signs, like heart rate, blood pressure, respiration, blood oxygen, GSR can be used to detect the presence of stress. These vital parameters can be measured and monitored with different type of wearable devices, sensors or accessories that are already included in mobile devices (such as compass, accelerometer, microphone, GPS, gyroscope, front and rear cameras, etc.). All the potentials of these devices gives them important feature, inherent to people - to feel. It is the feature that permits following the patterns of behavior of an individual in order to recognize the early signs of stress.

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