A Study on the Continuing Usage of IoT-based Healthcare Wearable Devices

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Abstract:Along with the development of IoT technology, which is receiving global attention, various technologies and services such as IoT-based healthcare, smart city, and agriculture are being provided. In particular, the IoT-based healthcare industry is expected to dominate the future of information and telecommunication industries amid fierce global competition. Future research shows continued growth of IoT-based healthcare wearable devices. There is a need to pay attention to the spread and the spread. This study will explore the factors that influence continued use of healthcare wearable devices. Specifically, the user experience was considered to be a hamstring factor in the continued use of IoT-based healthcare wearable devices. This study selected community, perceived interactivity, perceived information availability, and personalisation services as the prior variables of the user experience.

Indexterms:IoT-based healthcare wearable devices, user experience, community, perceived interactivity, perceived information availability, personalisation services.

I. INTRODUCTION

The first study of wearable devices began in the 1860s at MIT Media Lab.The study of early attachment type wearable computing is the beginning. In 1961, Edward Thorp and Claude Shannon developed the first wearing computer used to predict roulette arrows at MIT. [1]

As it entered the 2010s after activation of Smartphones, attempts to expand wearable devices into connected devices began. In 2012, the "Pubble Watch," a smart watch that was funded through Kickstarter, a crowd-funding platform, was developed. "Pebble Watch" is linked to a mobile phone to receive messages, e-mails, incoming calls, SNS, etc. as well as to be used as a remote control of a mobile phone or camera.

Health care wearable devices adhere to a person's body over time and help him observe changes in his or her body 24 hours a day. The user's physical response can be continuously monitored, including what changes occur if he or she continues to perform certain actions, what changes will occur, when the most and least movement occurs in the body for a week, and when the heart rate changes greatly. With the help of healthcare wearable devices, we can see our body changes continuously and at a relatively low cost. The more data you have, the more effective you can exercise, prescribe, and diagnose your health accurately. As such, healthcare wearable devices have the superior competitiveness to help a healthier life by continuously monitoring and analyzing physical changes the most.

Wearable devices expand their use in a wide range of areas, including fitness and wellness, healthcare and medical, infotainment capabilities, and military/industrial and medical applications, based on the user's use area. According to Juniper Research (2013), fitness wearable devices are expected to have the highest market share in the wearable market, but expect to see a rapid increase in market share in infotainment and healthcare in the future. By 2018, sales of healthcare wearable devices are projected to reach 40 million units annually at 46 percent, with North America and Europe expected to reach 22 million units, more than 50 percent of global health care wearable devices.

However, because the success of the technology and the success of the market are at different levels, products that overlook consumer characteristics are likely to fail in the market (Veryzer, 1998). To meet the diverse needs of users, needs to identify how users perceive external stimuli, and the personal characteristics and external factors that affect the selection and purchase of products. In this paper, we will study various factors that affect the continued use of IOT-based healthcare devices from a user-centric perspective rather than a technology-centric perspective. Ultimately, the competitive edge in the wearable device market is intended to suggest that it can be stacked when it focuses on the services and user values or benefits offered by the device. [3]

II. THEORETICAL BACKGROUNDS

Intention of Continuous Use

Bhattacherjee(2001) research indicates that the use of a product or service is intended for users to continue using it after they first try it. In recent information technology-related studies, some argue that the success of a product or service stems from continued use, not from the initial acceptance of the user. Bhattacherjee(2001) has empirically analyzed the user's perceived usefulness and satisfaction with the information system affects the degree of continuous use.[4]

Perceived Interactivity

Several studies have explained that the various technology characteristic variables that cause interactions have a significant effect on dependent variables such as user attitudes and behaviors by perceived interaction.

NewhagenLight(1995) presented the concept of perceived interactivity as a foreword.

Accordingtothem,theperceptionofinteractivityisthepsychological perceptionthatindividualusersfeelaboutinteractivity,which includestwodimensions:theself-efficacythatusersfeelabouttheirabilitytointeractwiththeexternalenvironmentandthesystemeffectivenessthattheyfeelabouttheir ability to interactwiththeexternalenvironment

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Self-efficacy is the perception that users feel about their capabilities when interacting with a device environment. Users are clearly aware of where they are on the device and have control and control over what actions they will take and where they will go. [5]

Recognized Information Provision

Recognized information provision Information provision refers to the quality of information that users receive from the media or from interactions with other users. In this study, based on a study by Ducofffe (1996), the definition of information provision was recognized as an assessment by users of wearable devices that users could obtain quality information. [6]

Community Immersion

For those who participate in the community, immersion is a very important factor. A typical online community was voluntarily joined and established by users. Many online communities are successful because they are causing continued user immersion. [7] In the preceding study, the community created a higher level of user immersion and increased the number of participants in the community. [8] Health care wearable devices allow users to share their exercise or service experience with others, and to check their status through evaluations or advice shared by others. This will ensure continued use of health care wearable devices.

User Experience

For those the term of user experience has been more used increasingly, it refers to wide range of implications. User experience is the result of an experience based on a basic understanding of a person's feelings and perceptions. Existing researchers have defined user experience definitions as interactions with products, services and systems. User experience includes perceptual and emotional components under the usability of focusing on effectiveness measures and task efficiency. [9]

Personalization

Varadarajan and Yadav (2009) highlighted the importance of personalization as an interface to companies and customers, a way of marketing strategies that will lead the next decade.

Research on the positive effects of these personalization was conducted in marketing and customer contact studies. Consumers want accurate information to meet their needs. Therefore, it is important to collect and analyze data on preferences of consumers and to provide accurate information according to consumers' needs. [10]

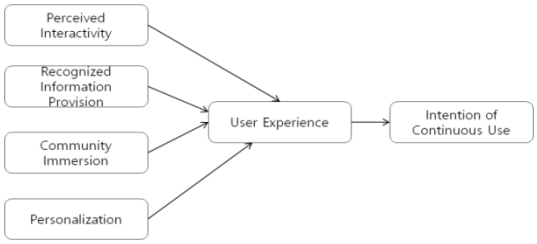

Figure 1: A Research Model on the Continuing Usage of IoT-based Healthcare wearable Devices

Table 1

Research Hypothesis

H1. Perceived Interactivity is positively related with Intention of Continuous Use.

H2. Recognized Information Provision is positively related with Intention of Continuous Use.

H3. Community Immersion is positively related with Intention of Continuous Use.

H4. Personalization is positively related with Intention of Continuous Use.

H5. User Experience mediates the relationship between Perceived Interactivity and Intention of Continuous Use.

H6. User Experience mediates the relationship between Recognized Information Provision and Intention of Continuous Use.

H7. User Experience mediates the relationship between Community Immersion and Intention of Continuous Use.

H8. User Experience mediates the relationship between Personalization and Intention of Continuous Use.

CONCLUSION

Recently, health care services and users based on wearable devices have steadily increased, and the paradigm has changed from being centered on diagnostic therapy to prevent pre-diagnosis through exercise participation and lifestyle correction. However, studies have shown that until now, there are limits to using these wearable device-based healthcare services and leading to steady participation in the movement. In this study, we conducted a study from the user's perspective to understand how wearable device-based healthcare services affect continuous use

The purpose of this study was to examine the factors that affect the continued use of IOT-based healthcare wearable devices. To this end, the research model of this study was constructed with independent, dependent variables.

Specifically,thisstudyseekstoexaminewhetherperceivedinteractions,perceivedinformationavailability,communityimmersion,andpersonalizationhaveapositiveeffectonthelevelofcontinuoususe.Inaddition,thestudyseekstodeterminewhetherthese relationshipsaremediatedbytheuserexperience.

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