A Study on the Development Status and Type Classification of Global Smart Healthcare
Wearable Device

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In recent years, companies have started producing innovative products that combine Information and Communications Technology (ICT) with textiles, and consumer interest in the wearable industry is increasing. The development and diffusion of wearable devices is the fastest and broadest in the healthcare field (KHIDI, 2016). In addition, more people are starting to learn about their own health based on numerical data by continually putting on wearable devices and checking their statistics for exercise, calories, and heart rate. In a time when the development of an industrial society has led to a decrease in exercise in daily life, such preventive medical technologies have become vital.

Thus, this study aims to research the current development status of smart healthcare wearable devices released from 2013 to 2018 and to understand the types and characteristics of these items in accordance with the parts of popular wearable devices that are available at the present time. By searching Korean and English keywords in Google, NAVER, and wearable-related websites, this study examines smart healthcare wearable device products and outlines the types and characteristics of these products.

In the results of this study, there were a total of 51 device products from seven countries, including 24 products from the US, 14 from Korea, four from China, four from France, two from Japan, two from the UK, and one from Sweden. These 51 devices were analyzed by the usage of the products and the types of products. In the results of examining the usage of the products, depending on their functions, they were classified into healthcare-type and exercise-care-type products. The healthcare-type devices included a total of 37 products: 11 from Korea, 17 from the US, four from China, three from France, one from the UK, and one from Japan. Of these, there were three products (two from the US and one from the UK) measuring children and seven products (two from Korea and five from the US) with approval as rehabilitative/medical devices. Healthcare-type devices have functions that include measuring and monitoring bio-signals, such as heart rate, heart relaxation, blood sugar, blood pressure, and breath, and sending them to mobile devices to prevent diseases and to help the user cope with emergencies. The exercise-care-type devices included a total of 14 products: three from Korea, seven from the US, one from the UK, one from Sweden, one from France, and one from Japan. These devices function to replace the roles of a personal trainer through the correction of posture, prevention of injury, and the control of the exercise amount during exercise sessions. They are non-invasive, easy to carry, and feature automatic management functions that add convenience to daily life. Next, in the results from classifying the form of products, regarding wearables worn on the human body, products placed on the wrist in the form of a smart band or smart watch were the most common (17 products), followed by footwear and insole forms worn on the foot (nine products),

accessories such as necklaces and belts (six products), wearable smart clothes (eight products), products with a sensor attached (five products), a product with a wearable device attached (one product), a product using fabric equipped with micro sensors (one product), and a product attached to a wearable device (one product). There were also other forms, like skin attachment and body insertion type devices, such as pacifiers, sanitary products, hearing aids, and patches. These results suggest that consumers' preferences (Kim et al., 2015) for the wrist-based wearing position are reflected in product development and underline the importance of the portability and lightness of the product. According to the level of function, of the 51 products, there were 45 smart-type products that linked to applications based on a mobile operating system. There were two products that linked to computer software and four basic-type products that provided relatively simple functions and did not link to a mobile device or a personal computer. Smart healthcare wearable products mainly linked to mobile devices, and the relevant application development market was also vitalized.

In the results of this study, even though smart healthcare wearable device products have been developed into diverse forms and shapes of equipment, most of the products based on textiles were limited to products mainly focusing on of attaching or inserting devices into clothes, indicating that it would be necessary to develop products in diverse forms.

### Reference

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