



# User acceptance of wearable devices: An extended perspective of perceived value



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## ABSTRACT

This study develops a research model for analyzing customers' perceived value of wearable devices. It investigates the impact of each component of perceived benefit and risk on the perceived value of wearable devices, and explores how their attributes affect customers' perceived benefit. Partial least squares was employed to test the proposed model and corresponding hypotheses on data collected from 375 survey samples (273 potential and 102 actual users). The results show that perceived value is a clear antecedent of adoption intention. Perceived benefit—including perceived usefulness, enjoyment, and social image—seems to have a greater impact on perceived value than perceived risk. Specifically, a significant difference was observed between potential users and actual users. This study discusses a number of implications and contributes useful insights for researchers as well as practitioners.

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## 1. Introduction

As information technology (IT) continues to develop, mobile devices are getting smarter and have become essential tools for communication (Wang et al., 2014). Mobile device types are diversifying into classes such as smartphones, tablet PCs, and wearable devices. Wearable devices are attracting much attention as the next generation of portable electronics. Nine out of ten smartphone vendors have already entered the wearable device market or are about to ship their first product, whereas, two years ago, only two vendors were at that stage (Gartner, 2014). The global wearable device market is expected to grow by 78% each year, from 19 million units in 2014 to 112 million in 2018 (IDC, 2014).

Wearable devices are used external to the body, either attached as an accessory or embedded in clothes (Raskovic et al., 2004). They can be used in various applications equipped with sensors, internet connections, processors, and operating systems as well as user-friendly interfaces with touch pads/screens. Watch-type wearable device users can receive e-mail, text messages, and phone notifications on their wrists without having to pull out their cellphones. Wristband or necklace-type wearable devices are mainly used to track the user's health and fitness status in real time. Head-mount display-type wearable devices are suitable for virtual reality content and 3D games.

Despite the positive prospects and functionality of wearable devices, little research has been done on user acceptance and behaviors concerning them because they are still in the very early stage of commercialization. This study focuses on customers' perceived value of wearable devices as well as its determinants. Its research model is developed based upon previous

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research that has studied perceived value by incorporating perceived usefulness, perceived enjoyment, and social image. This study examines users' perceived value of wearable devices to investigate the impact of each component of perceived benefit and risk on perceived value and to explore how the attributes of wearable devices affect customers' perceived benefit. This study divides users into potential users and actual users to compare the significant factors influencing perceived value.

## 2. Literature review

### 2.1. Perceived value

Schechter (1984) explained that perceived value is composed of qualitative and quantitative as well as objective and subjective factors that jointly form a buyer's experience. Dodds et al. (1991) defined perceived value as the ratio of perceived benefit relative to perceived sacrifice. Woodruff and Gardial (1996) described perceived value as a trade-off between desirable attributes and sacrifice attributes. The most widely accepted definition of perceived value is that in Zeithaml (1988), who found that consumers defined value in four terms: value is (1) "low price," (2) "whatever I want in a product," (3) "the quality I get for the price I pay," and (4) "what I get for what I give." Zeithaml (1988) thus synthetically defined perceived value as the consumer's overall assessment of the utility of a product based on the perception of what is received and what is given. Thus, this study refers to the perceived value of wearable devices as a potential customer's overall perception of wearable devices based on their benefits and sacrifices.

### 2.2. Perceived benefit

Extrinsic benefits are functional and utilitarian, while intrinsic benefit perceptions result from fun and playfulness for their own sake (Holbrook, 1999). Rogers (1995) found that both extrinsic and intrinsic factors influenced perceived value and behavioral intention. Several studies have also shown that perceived usefulness and perceived enjoyment are main components of extrinsic and intrinsic benefits, respectively (Davis et al., 1992; Kim et al., 2007). Park and Chen (2007) found that perceived usefulness and enjoyment are representative benefits by adopting innovative IT products. Social image, the extent to which peers in a user's social network respect and admire the user because of IT usage (Lin and Bhattacharjee, 2010), is another important component of perceived benefit because people want to improve their social status or differentiate it from those of others in their social system.

### 2.3. Perceived risk

Dowling and Staelin (1994) conceptualized perceived risk as the consumer's perception of the uncertainty and adverse consequences of purchasing a product or service. While a number of risk dimensions have been suggested, performance and financial risk are the most commonly used to estimate risk (Chen and Dubinsky, 2003; Grewal et al., 1994; Sweeney et al., 1999). Financial risk is defined as the possibility of monetary loss due to a customer, including product repair or replacement and refunds (Horton, 1976). This risk also includes possible future costs as well as the perceived price at the point of purchase. Performance risk is the potential for loss incurred when a brand or product fails to meet a consumer's expectations. Thus, a conceptual distinction between financial and performance risk is that the price of the product is an intrinsic component of financial risk, whereas price is not directly related to performance risk. Snoj et al., 2004 used perceived risk as the concept of sacrifice for mobile phone purchases. Kim et al. (2007) regarded perceived fee (monetary) and technicality (non-monetary) as components of perceived sacrifice; these constructs are similar to financial risk and performance risk, respectively.

## 3. Research model and hypotheses development

This study develops the research model shown in Fig. 1. It proposes a comprehensive framework for examining the factors of perceived value for wearable devices. In particular, the proposed model includes four antecedents (i.e., functionality, compatibility, visual attractiveness, and brand name) that reflect the characteristics of wearable devices as high-tech electronic devices and fashion items. This study defined each construct and developed a theoretical rationale for the model's causal relationships.

### 3.1. Perceived value and intention to use

Intention to use is the "degree of the psychological state of the people's general minds to use specific services and systems" (Davis et al., 1989). Perceived value is an indicator of a consumer's adoption intention, as it reflects utility by comparing benefits and sacrifices (Kim et al., 2007). Many IT studies have found that the perceived value of using mobile internet services on portable devices positively affects adoption intention. Chen and Lin (2015) confirmed a significantly positive relationship between the perceived value of blogs and continuance intention. Yu et al. (2013) have examined the perceived value dimension (i.e., hedonic, utilitarian, and social value) and its effect on behavioral intention to use location-based social

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