

Interface Aesthetic, Perceived Value, Perceived Ease of Use, and Perceived Usefulness on Purchase Intention of Smartwatch Consumers

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ABSTRACT

Many testimonies stated smartwatches ability to increase people's well-being and save people's lives in emergencies. Smartwatches encourage a healthy lifestyle and strengthening the way of life of users through intelligent coaching. By exceeding the technology and fashion barriers, smartwatches gain traction with definite growth predictions. This research explores a theoretical model focused on technology acceptance and visibility by interface aesthetics that influence smartwatch users adoption behaviour. SEM-AMOS evaluates the conceptual model and related theories from 110 survey samples. The empirical findings indicates perceived value and perceived ease of use are key factors that drive consumer's purchase intention. This result is different from the previous research in Europe and the United States market, which states that the design factor (fashion) affects consumer purchasing decisions. Indonesian consumers prefer functional design to interface aesthetics and consider a smartwatch as more about technology than a fashion accessory. This research provides managerial implication about how to set smartwatch value proposition by knowing the consumer technology adoption toward smartwatch technology.

Keywords: interface aesthetics, perceived value, perceived ease of use, perceived usefulness, purchase intention, smartwatches.

1. INTRODUCTION

Smartwatches are beginning to develop into a prominent part of the consumer electronics industry and take over the health care and fashion industries [1]. In addition to timekeeping and fitness monitoring, smartwatches can also stream music, receive message notifications, chat with friends, and track exercise objectives [2]. Despite their limited functionality, smartwatches can utilize their pedometer to monitor heart rate and blood pressure [3]. With these various uses, more and more consumer reviews show the benefits of a smartwatch to support a healthy lifestyle and medical tools for emergencies with its health monitor feature [4].

By combining technology, fashion, and health, smartwatches demonstrate strength, with forecasts of continued growth. For example, Richter [5] indicated that smartwatches, sports watches, and wristbands dominate 60% of global consumer spending on wearables, as presented in Figure 1.

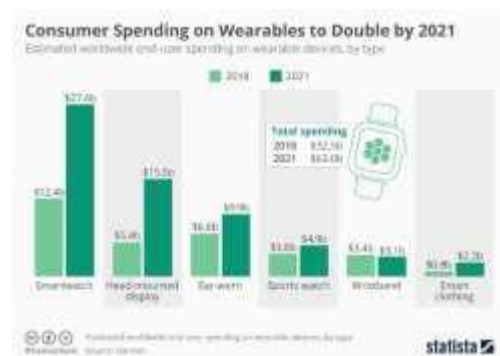


Figure 1. Consumer Spending on Wearables
Source: Richter (2019)

Meanwhile, Apple becomes the top global wearables brand with \$ 106.5 million in sales. It was followed by Xiaomi, Samsung, Huawei, and Fitbit [6], as presented in Figure 2.

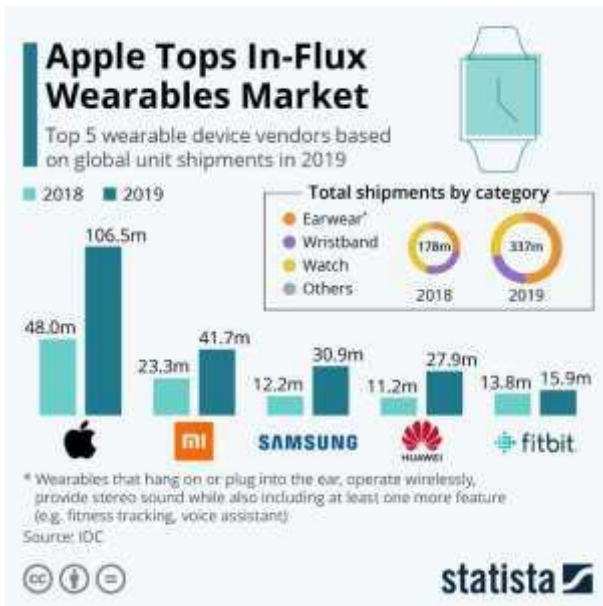


Figure 2 Top Global Wearables Brand
Source: Richter (2020)

Furthermore, Indonesia is the third-largest country that uses mobile health-app with China, India, and the United States. Hence, Indonesia can be a promising potential market for smartwatches producer. It also shows consumer preferences regarding features that should develop in each wearable product [7].

There have been studies incorporating TAM into the adoption theory, the model of planned behaviour, the diffusion theory of innovation, and technological readiness [4]. Kim and Shin [8] use an extended TAM model to explain smartwatch user's acceptance. Purchasing decisions differ broadly based on attractiveness and cost. About 83% of participants considered smartwatches as 'fashion'. According to subsequent research in 2016, fashion is an objective, much more pertinent expression of people's behaviour. This is a critical aspect when smartwatch design is concerned [9]. In research conducted by Chuah et al. [9], consumers who viewed smartwatches as fashion accessories emphasized their watches' visual design. In contrast, consumers who viewed smartwatches as technologies insisted on the usability feature in their purchase decisions.

Choi and Kim [10] compared extrinsic and intrinsic motives in high-end smartwatches adoption. This research claims that the degree of perceived uniqueness of a product affects the usage of smartwatches. In this way, product visibility can reflect one's identity [2]. Many companies claim that aesthetic appearance influence peoples' purchase decisions. There is not any comprehensive framework so far that includes trade-offs between the advantages and disadvantages of smartwatches, perception, and the mechanism of users' response toward smartwatches [11], [12] [13]. Also, the

mechanisms underlying consumer perceptions and responses to smartwatches are not well-known.

Therefore, this study intends to answer this question by investigating whether perceived value, the perceived ease of use, perceived usefulness, and interface aesthetics (as a representation of consumer fashion orientation) influence smartwatches products' purchase intention.

2. LITERATURE REVIEW

2.1. Smartwatches Definition

There is no clear definition of a smartwatch and its distinguishing characteristics from technology by previous research and the academic literature. For example, the Fitbit Flex and the Samsung Galaxy Gear called as "smart wristbands" and "fitness trackers," respectively, but what distinguished them from "smart bracelets" and "fitness trackers" are not detailed [8]. A smartwatch can operate quite independently of the device (mobile phone) but also able to connect with it for sync or data transfer and track the user when they are walking, biking, or running [8].

With its operating system, smartwatch enable users to install many applications. For example, Apple Watch allows its user to install more than 10,000 applications while Android Wear allows its user to install 4,000 applications [14]. What makes smart bracelets so distinct from watches is their capability to communicate securely (through Wifi, Bluetooth, or Mobile Network) with the synced device [14]. Although smartwatches can act like a swatch, it is safe to say that a smartwatch is a "mini-device that functions as a swatch, but can install and use applications with certain uses that can work independently or sync to other devices."

2.1.1. Technology Acceptance Model

Several theoretical models have been proposed for studying the adoption of new technologies by users. There are technology acceptance models (TAM) [15] [16]; planned behaviour theory [17]; integrated theory of acceptance and use of technology [18] [19].

TAM is one of the most frequently used models for considering how individuals adapt to new technologies, [8],[20]. Moreover, TAM also uses psychological approach through its subjective norm and perceived value aspects that differs it from the other theories such as Theory of Planned Actions and Rational Action [21] [22] [23]–[25].

TAM aims to identify the factors that influence the acceptance and use of information technology which are often influenced by demographic factors [15]. TAM construction was evaluated in terms of usefulness, ease of use, attitude, behavioural intention, actual use and a perspective of added complexity [15]. TAM suggests that

technologies that are perceived as being approachable or straightforward are more likely to be adopted [15].

Perceived usefulness is defined as the level at which an individual believes that using a certain system will be able to help improve the individual's performance and job performance [15]. For example, in the context of smartwatches, perceived usefulness is often linked to various smartwatch features that offer easy information, communication, time management as well as a health monitor. Meanwhile, perceived ease of use is a level where someone believes that the use of a certain system is able to reduce one's effort in doing something [15]. For example, synchronizing a smartwatch with a mobile phone reduces the complexity and improve efficiency for users who previously use more than one communication device.

In this research, not all TAM aspects are used in predicting consumer adoption, for example, *attitude (the consumer's pro or contra attitudes towards the application of a product), experience, and complexity*. Smartwatch users are the research respondent, so it is assumed that consumers are pro towards using this product (neglect adoption from prospective new users) [8]. Meanwhile, the value perceived by consumers represents the value of the product. The value of consumer perceptions is the factor that triggers the purchase intention of a smartwatch [11], [27], [28]. Because the purpose of this study is to prove whether smart watches are adopted because they are considered a fashion product or not, the perceived attributes embodied in the aesthetic design of the product interface are also variables tested for their correlation with the user's purchasing decisions. [11].

2.1.2. Perceived Product Attribute (Interface Aesthetic)

Interface aesthetics refers to the attractive colours, the characteristics, and the screen structure of smartwatches [29]. Previous studies shows that *design* and *feel* have significantly ties consumers' emotional reactions and perceptions of a product utility in the context of mobile phone and smartphone adoption. Visual perceptions may play a key role in consumer adoption of IT products because it correlates with consumer sentiments [29]–[31]. Hence, some watchmakers and mobile phone designers differentiate their product from competitors by paying more attention to their product style [29]–[31]. If smartwatches are more similar to modern watches and aesthetically appealing, consumers will be more likely to adopt them.

3. RELATED WORK

Although wearables have a vast number of applications, research on the use of wearables is limited. Kim and Shin [8] applied TAM to the intention of continuous use among smartwatch users. The study was

able to replicate basic TAM patterns, identify subcultural appeal, and found costs were additional antecedents to intention [9]. All these factors result in perceived ease of use and perceived usefulness. The research makes use of the knowledge of non-user groups, but also faces issues such as that it only emphasizes users.

Moreover, Kim and Shin [8] have applied TAM to explain the continuous usage intention of smartwatches users. The authors identify various antecedents for the perception of ease of use and perceived usefulness. Although the report provides insightful ideas on wearable technologies, it has some shortcomings. It appears that people who viewed their smartwatch as an expensive possession will discontinue the use of the product. Jung, Kim, and Choi [12] address how consumers react to smartwatches. The experiment results show that standalone communication and display are the decisive features of influencing respondents' smartwatch choice. Nevertheless, wearable technology seems to be less critical than other luxury brands' ideas [32], [33].

Furthermore, Hein and Rauschnabel [34] study the effects of wearable technology in the workplace. There will be the influence of some technology, environment, company qualities on the implementation of smart glasses. The Technical Assistance Management (TAM) factors were used to determine employees' usage behaviour. There are two aspects of smartphone use regarding aesthetic and functional-analyzed in this experimental study. Attractiveness, practicality, wearability, novelty, interactivity, usefulness, technology, beauty, expressiveness, and usability are technological usefulness dimensions. Wearables are seen as applying fashion and technology. Fashion items are now regarded as wearable technology, but technologies are also something that could be considered as fashion too. A scientific categorization is based on design features and the degree of exposure to a device category. Meanwhile, consumers can be classified as "technologists" or "fashionists". The fashion-related factors do play an essential role in smartwatch appreciation and reaction.

4. THEORETICAL FRAMEWORK AND HYPOTHESIS DEVELOPMENT

The research about the TAM framework and behaviour intention related to mobile and wearable technology has conducted by Kim & Shin, Park & Kim, and Rauschnabel & Ro [8], [33], [35]. Thus, we propose the following hypotheses:

H1. The perceived value positively influences the purchase intention of smartwatches.

H2. The perceived ease of use positively influences the purchase intention of smartwatches.

H3. The perceived ease of use mediated by perceived usefulness positively influences the perceived usefulness of smartwatches.

H4. Perceived usefulness positively influences the purchase intention of smartwatches.

Meanwhile, design aesthetics has been an influential factor in consumers' adoption of new technology [30], [31]. Since humans are visual perceivers, design aesthetics may significantly impact cognitive processes and emotions [31]. Thus, we hypothesize:

H5. Interface aesthetics positively influence the consumer's purchase intention.

Hence, Figure 3 is presented the research model:

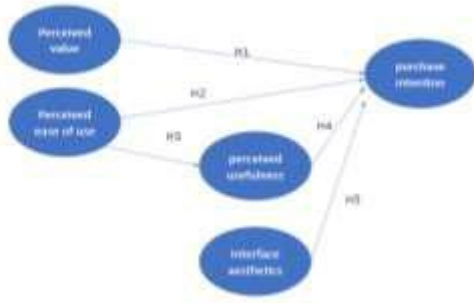


Figure 3. Research Model

Method

This study uses a quantitative approach. The survey instruments were inspired from the established scales from the previous studies with few modifications. Later, 110 smartwatch users were asked to answer the questionnaire items provided in Google forms and distributed through the *Publikasi Ilmiah Instagram* announcement page. This study uses a 7-point Likert scale (1=strongly disagree, 7=strongly agree) for all items. Furthermore, the respondent profile of this study is presented in Table 1.

Based on Table 1, most respondents are male with age above 32 years old, earn at least a Bachelor's degree, and prefer the Amazfit Bip and Mi Band smartwatch brand. This result reflects that male consumers with more vigorous outdoor activities and prone to do more sport activities are potential smartwatches' potential consumers. The consumer has better digital literacy who assumed earned at least higher education also becomes prospective users of this wearable. Meanwhile, Xiaomi produces the Amazfit Bit and Mi Band that segmented to mid-upper segmentation with the product price above \$100 Consumers believe that the brands bring the maximum smartwatch values for them.

Table 1 Profile of Respondents

Demographic Characteristic	Frequency	Percentage
Age		
19-25	27	27%
26-32	30	30%
>32	43	43%
Gender		
Male	55	55%
Female	45	45%
Education		
Undergraduate student	48	48%
Bachelor	29	29%
Master	21	21%
Doctoral	2	2 %
Smartwatch brand		
Xiaomi (Mi Band)	21	21%
Amazfit	19	19%
Apple	15	15%
Samsung	14	14%
Realme	5	5%
Fitbit	4	4%
Huawei	5	5%
Imoo	4	4%
Others	9	9%

Source: Data processed (2021)

Moreover, the research model was tested using SEM-AMOS. SEM-AMOS can maximize the latent variables' variance to predict target constructs [36]. Since this study's objective is to predict factors that influence the continued use of smartwatches, SEM-AMOS is appropriate.

5. RESULTS

Measures and Model Inspection

As illustrated in Table 2, the composite reliability (CR) values of all constructs are more significant than the benchmark value of 0.60, indicating that all constructs are internally consistent. Meanwhile, the convergent validity was met, as factor loadings exceed the 0.50 cutoff [37], and the average variance extracted was above the 0.50 benchmark [38].

Table 2 Reflective Measurement Result

Latent variables	Observed variables of items (Chuah et al., 2016)	Loadings	AVE	CR			
Interface Aesthetics	"The layout of the smartwatch interface is easy to grasp."	0.749	0.77382 8996	0.883 552			
	"The layout of the smartwatch's interface looks well structured."	0.654					
	"The layout of the smartwatch's interface looks dynamic."	0.53					
	"The smartwatch's interface layout is inventive."	0.528					
	"The colour composition of the smartwatch's interface is attractive."	0.577					
	"The colour selection of the smartwatch's interface is various."	0.531					
	"The colour of my smartwatch means a lot to me."	0.581					
	"The feel of the surface of my smartwatch (smoothness) is essential to me."	0.715					
	"The senses conveyed by my smartwatch, such as coolness to touch, are essential to me."	0.702					
	"I like the shape (square, round, smooth edge) of my smartwatch."	0.75					
	"The shape of a smartwatch should be pleasing to the eye."	0.657					
	"The design of my smartwatch is not like that of a traditional watch."	0.462					
	Perceived usefulness	"I am more concerned with the capability of my smartwatch such as health-related applications to measure workouts, track different activity programs at the same time rather than its looks."			0.618	0.57504 2617	0.738 043
		"I am often on the lookout for new products or brands that will add to my uniqueness."			0.477		
"Smartwatches could help me organize my life better."		0.475					
"I want a smartwatch with many different software applications for different purposes."		0.642					
"I want a smartwatch that is durable in terms of damage protection or battery life."		0.771					

Perceived ease of use	"I want a smartwatch that is easy to use"	0.704	0.78511 9483	0.847 666
	"My smartwatch makes me want to use it more often."	0.843		
	"I am happy when I am using my desired smartwatch."	0.865		
Perceived value	"I seek the approval of my smartwatch from my family, friends, or co-workers/peers."	0.842	0.84814 2834	0.877 037
	"I seek to impress my family, friends, or co-workers/peers through the purchase of my desired smartwatch."	0.924		
Purchase intention	"I intend to buy a smartwatch soon."	0.671	0.38178 062	0.627 452
	"I intend to buy a smartwatch because it is one of the important fashion accessories."	0.512		
	"I expect to purchase a smartwatch in the future because of its functional performance."	0.612		

Source: Data processed (2021)

The SEM-AMOS measurement models perform validation and reliabilities of the research instrument. A total of 25 out of 30 items met this norm for five constructs. Proxies that did not have a loading of 0.50 were: "A smartwatch should have contrasting colours that accent its presence," "A smartwatch should come in bright colours such as red, orange, and yellow," "The look of a smartwatch product can become outdated quickly (the shape, weight, and screen)," and "Smartwatches with more environmental benefits can improve what others think of me."

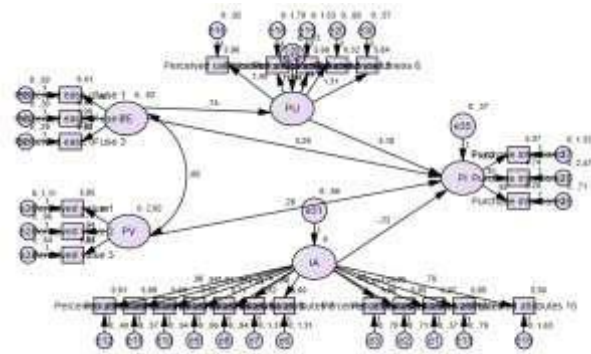


Figure 4 Casual Model Analysis
Source: Data processed by Amos

As presented in Figure 4, the second step in measuring the model is examining the hypotheses. Perceived value and perceived ease of use (H1 and H2) significantly affected smartwatch purchase intention, but the result cannot prove H3, H4, and H5. It means the perceived usefulness, perceived ease of use mediated by perceived usefulness, interface aesthetic has no significant influence on purchase intention.

Hypothesis Testing

Table 3 Hypothesis Testing Result

Hypotheses Path	Estimate	S.E.	C.R.	P
PU <--- PE	0.744	0.114	6.524	***
PI <--- PV	0.282	0.064	4.384	***
PI <--- PE	3.287	3.335	0.985	0.324
PI <--- PU	-3.183	4.586	-0.694	0.488
PI <--- IA	-0.222	0.121	-1.829	0.067

Source: Data processed (2021)

Discussion

This study indicates a significant relationship between perceived values and ease of use on smartwatch users' purchasing decisions. These results support the research of Hong et al., Hsiao & Chen, and Ramkumar & Liang [11], [27], [28], who researched the same product. This study results strengthen Davis [39] that stated smartwatch with technologies that are perceived as approachable or straightforward (ease of use) than fashionable are more likely to be adopted. However, this study does not support previous studies by Choi & Kim, Krey et al. [2], [10], which mentions respondents' preferences for interface aesthetics or design as a determinant of consumer purchasing decisions and emphasizes that smartwatches are both technology and fashion products

The results indicate more preferences for smartwatch consumers to functionality of smartwatch. For example, hardware quality, durability, battery life and large memory capacity, and easy synchronization with mobile devices. For consumers, product functionality factors that can help them organize activities and increase their well-being are determinants of their purchasing decisions (utilitarian value). These results support Lin and Windasari [40] research that consumers will abandon their smartwatches if they do not have well-being improvement. Meanwhile, the research results indicate that the ease of operating the smartwatch; for example, the smartwatch features are well-structured, intuitive for users and easy to navigate. This study supports Ghazali et al. [41] that a smartwatch must have an easy-to-use interface and intuitive use. Besides, smartwatches require consumers to operate the technology themselves; consumers need to believe that they can do it quickly.

However, the study results did not show a significant impact of interface aesthetic design on purchasing decisions. This indicates that although Indonesian consumers like smartwatch interface products that are aesthetically pleasing, this does not affect their decision to buy.

Consumer's perceived value for the smartwatch product represented in this study shows that *social value* is more

dominant in influencing purchase decisions. This shows how consumers need approval from their family, colleagues, or community before they buy a smartwatch. The smartwatch is a symbol that determines their identity, and they consider it essential in social interaction. These results indicate the consistency of lifestyle to adopt this product [10]. Nevertheless, this consideration of perceived social value doesn't lead to consumers' understanding of how much benefit the smartwatch provides. Hence, perceived usefulness in this study has no significant effect on their purchasing decisions. Indonesian consumers tend to do *imitative buying* recommended by their social environment. For example, consumers do not feel that the product's ability to install as many applications as possible, applications that can carry out health monitoring and tracking exercises, product durability and damage protection affect their purchasing decisions. The composition of millennials who tend to be *trend followers*, *new experience seekers*, and *brand switchers* who dominated the respondent profile may have contributed to their buying decisions [42].

Conclusion

Fashion and technology-related factors are sometimes responsible for the lower use of smartwatches, which is why they lack 'life-changing experience.' Smartwatches are also educational and productive. Developers need to create inspirational apps that can change the lives of users for the better. As smartwatches make lifestyle changes easier, marketers should adjust their marketing strategies to this positive news item.

This research's managerial implication suggests smartwatch producer be sensible with the differences of perceived value (functional, emotional or social value) of consumers in different countries that might influence their purchase intention. Therefore, they could provide the product with a value proposition that emphasizes functionality and operability to win the Indonesian market. The existence of a distribution centre or physical store and skilled salespeople to approach the target market also necessary to enable the process of education and socialization of product features and benefits to the consumer.

This study is subject to several limitations. First, a small sample of a single country may limit the generalizability of the findings. Second, while this study examined positive evaluation factors for adopting smartwatches, barriers to adoption were outside this research scope. Therefore, further study may include demographic factors as control variables to ensure that unobserved external factors do not interrupt the independent variable's influence on the dependent variable. Future research could also use finite-mixed partial least squares to uncover unobserved heterogeneity.

Future research can also explore how Indonesian consumers buy technology products, the things that underlie them, and how the evaluation process is carried out before technology products are purchased. It is also interesting that further research focuses on certain smartwatches depending on the features offered, for example, for health, children's safety, and education.

AUTHORS' CONTRIBUTIONS

Ika Diyah Candra Arifah created the conceptual research framework, and Rosa Prafitri Juniarti did the data statistic and analysis. Both authors collected the data, write and proofread the final manuscript.

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