Understanding User Preferences of Smart Watch Users in Interface Navigation

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1. Introduction

Using the watches as a wearable device originated in the late 19th century, and has become the very commonly used accessory of people (Darmwal, 2015). Since the invention of wearable watches different designs and approaches have been tried including the invention of digital watches. Recent advances in technology have enabled the development of smartphones and smartwatches as an implementation of this concept. Since people were already accustomed to wearing wristwatches, it was not difficult for smartwatches to enter their lives quickly. Wearable technologies have become a growing trend these days and it's expected to grow even more(Al-Sharrah et al., 2018). According to the data of IDM about the worldwide shipments of wearable devices, smartwatches have the second highest volume in wearable device product categories. (*Worldwide Wearables Market Is Forecast to Rebound in 2023 with Continued Growth Thereafter, According to IDC,* n.d.) With a significant share of the smart wearables market, smartwatches have become the epitome of wearables and can provide a variety of services in many aspects such as health, entertainment, and life management (Tan et al., 2022). The influence of personal factors such as age, occupation, economic situation, lifestyle, and personality significantly shapes user`s purchasing decisions too (Darmwal, 2015).
The results of the research conducted by Lin et al., 2023 show that smartwatches have a significant advantage in terms of fulfilling psychological needs and pleasure, because of the inherited functions of wristwatches. Another distinctive advantage of smartwatches is their ability to access countless apps without the need for a smartphone (Darmwal, 2015). The characterization of these smartwatch apps reveals a gap in understanding app types through the users and sometimes it leads to the not taking advantage of all the features of smartwatches (Chauhan et al., 2016). The higher mobility and significantly smaller screens make the smartwatches the most popular mobile device both for the people who do the regular exercises and the professional athletes. However, the fact that many features are adapted from smartphones, and only minimally so, makes it lacking in some aspects of the user experience and lets users down (Mo et al., 2017). For example, it should be thought about where and how to display information on the small screen during sports time. User experience with smartphones significantly influences the perceived ease of use and usefulness of smartwatches (S. C. Jeong et al., 2016). The usability of smartwatch interfaces, evaluated through eye-tracking, highlights the importance of effective information display and layout (Y. Wu et al., 2016). Problems with battery life, device durability, and trade-offs between costs and benefits have also been raised under the reviews of users of smartwatches (Motti & Caine, 2016). Wearing behaviors of smartwatches are closely tied to daily routines and locations, with discomfort and concerns of breakage being major reasons for take-off events (H. Jeong et al., 2017). The lowest is wearing at home compared to other places which include the workplace and cafeteria. Users

often face challenges with device setup and express concerns about the usefulness of the device in their daily lives. While running when users want to use, smartwatch they have a drop in performance and lack of subjective feedback as well as an increased cognitive load compared to sitting or walking conditions (Mo et al., 2017). Users find it more challenging to interact with visually rich content, and feedback on the device status is lacking. The portability of smartwatches allows users to stay connected and receive notifications potentially enhancing productivity and social interactions (Cecchinato et al., 2017). It can be said that in a variety of different features, notification screening is the simplest but most desirable feature of the device.

There are some difficulties in terms of describing the role of these devices by consumers. If smartwatches are more likely described as technological devices then smartwatches ought to be viewed as more beneficial, since technologies are tools for improving productivity. Against this, if smartwatches are to be perceived by customers as fashion accessories, then features of conventional fashion items, such as being noticeable to others have to be emulated (Chuah et al., 2016). Wearable technologies, when perceived as both a technology and a fashion accessory, must fulfill the functional, hedonic, and social needs of their target groups. In today's connected world, the primary means of the users is to be able to express their individuality and way of life. Therefore personalized expression is essential for the individual's accessories and the technological products that are also defined in that way (Tan et al., 2022). Different design qualities affect the preference of young potential smartwatch users. For instance, the design of the idle screen of the smartwatch is commonly associated with the feeling of premium. Some of the users preferred a typical round physical form to resemble it with classic watches (Raptis et al., 2022). For people aged between 35 and 54 enjoyment plays a significant role. Since the people between these ages are the ones that often occupy higher social positions and have higher incomes. Enjoyable designs with high function-oriented features attract their attention more easily. Factors such as pleasure, personal style preferences, and lifestyle choices become crucial elements to these potential smartwatch users (L.-H. Wu et al., 2016a). Pleasurability emerges as a key factor for smartwatches, emphasizing the importance of extending battery life and reducing charging frequency (Lin et al., 2023). Even for some smartwatch users, brand and prices significantly influence perceptions, with less attention given to usability (Anggraini et al., 2019). Reviews and references become less crucial once customers have a brand in mind.

In summary, the contribution of smartwatches goes beyond fast and convenient information access; it includes aspects of fashion, technology, identity, and personal voice as well as application in specific niches such as medical environments and adjusting to a wide variety of use scenarios. These results highlight the complex nature of smartwatches and require taking into account various user needs and difficulties in the development process.

1.1 Aim and Scope

This study aims to understand the current preferences of the potential smartwatch users when they are choosing their product. Understanding the user`s contentment and their interaction with these smart wearable devices are other important aspects that this study intensified. In light of all this, the main purpose of the study is to find the answers for designing optimum interface navigation for smartwatches. In the research`s scope defining the different users plays a pivotal role. By delving into the diverse user personas, this study seeks to uncover patterns of preferences, behaviors, and expectations that users exhibit when selecting and utilizing

smartwatch personas to understand their personalized needs and their approaches to using their devices. The research utilizes a multifaceted approach, which involves a combination of qualitative and quantitative methods for data collection. Explicit and implicit user preferences are captured through surveys, interviews, and observational studies.

The research questions are designed to understand these issues.

1. How do the priorities and preferences in interface navigation impact the overall satisfaction and continued usage patterns of smartwatches across the three different user profiles?

2. How do the preferences for smartwatch interface navigation vary among users with different motivations—hedonistic (emphasis on aesthetics/pleasure), usability/functionality-focused, and price-performance-oriented buyers?

2. Literature Review

In terms of conducting a comprehensive understanding of the user`s preferences literature review was conducted. ACM digital library, Taylor and Francis, Wiley Online library databases searched with the smartwatch UX, smartwatch interface, smartwatch navigation, and user preferences in smartwatch keywords. Overall 51 scientific research papers have been viewed. Twelve of these papers were eliminated because they contained engineering solutions. The remaining 39 papers were excluded because they addressed non-relevant features including software development for smartwatches and market trends. The last choice included 22 papers, which were considered to be highly relevant for the study of preferences among smartwatch users. The included papers are categorized into two categories: Usability and User Experience of Smartwatches, and User Preferences in Smartwatches.

Usability and User Experience of Smartwatches

The study by Park et al., 2020 concentrates on the usability of menu interfaces for smartwatches. With their experiments, they focused on the productivity and satisfaction of various layouts by focusing specifically on two aspects: how grid view influences overall satisfaction while list view affects efficiency and time spent to complete a task.

Dong, 2023's research is focused on the usability of wrist-worn smartwatches in a clinical study, evaluating data collection efficiency under home conditions.

In an academic setting, a study on smartwatches for cheating performed by researchers shows that these devices are far from efficient or highly usable to be used in cases of pretenses. However, the study offers some information regarding the perceived usability and appropriateness of smartwatches in an academic environment (Wong et al., 2017).

The study conducted by a group of researchers on age-specific usability issues in smartwatches reveals problems associated with varying groups. The issues that older adults have include voice commands, menu structure, user interface, and touchscreen gestures (Zotz et al., 2018).

The research by L.-H. Wu et al., 2016 The situational effects of smartwatch use are investigated by looking at the presence of others, activity, location, and time. It exposes differences in the way people use their watches depending on context, thus undermining assumptions about usage patterns at home and work.

Al-Sharrah et al., 2018 contribute to the forensic aspect of smartwatches, developing a framework for forensic analysis stages: physical, backup, and wireless communication. The research highlights smartwatches as a potential value for forensic investigators.

Moreover, the usability study on Indonesian customers conducted by surveying smartwatch users (116 people) shows how brand and price affect consumer perceptions. It also mentions the impact of smartphone brands on respondents' choice of a particular type or manufacturer for their use (Anggraini et al., 2019).

User Preferences in Smartwatches

Dong, 2023's study also goes into users' preferences, analyzing preferred heart rate data types and smartwatch visualizations among participants. It implies that interpretative data is preferred to raw data.

The research on gamification elements in smartwatch fitness applications highlights the need to classify users of a given type based on their preferences for designing effective and efficient gamified apps. Users prefer features such as reviews, objectives, challenges, and rewards (Song & Yao, 2023).

L.-H. Wu et al., 2016b exploring consumers' intention to accept smartwatches based on innovation diffusion theory and acceptance models unveil interesting results that challenge previous studies. It defines attitude as important, not ease of use; and shows the need for enjoyment by 35–54-year olds.

In the study carried out by Raptis et al., 2022 participants are placed in groups with homogenous preferences to determine smartwatch design elements and people's choices. The research gives insights into different design characteristics that participants highlight, providing implications for practice and future studies.

Tan et al., 2022 develop an intelligent wearable devices user experience model for defining the critical factors influencing users' experiences; usability is one of these significant elements alongside interface effectiveness and brand value.

2.1 Preliminary User Insights

This qualitative study was conducted with mini-survey, survey, interview, and task-based observation methods to understand the usage preferences of smartwatch users in interface navigation. First, a mini-survey was conducted to understand the purpose and expectations of smartwatch users.

In addition to personal information such as age, gender, and occupation, questions were asked about the brand model of their smartwatches, the applications they use the most, and the features they like/dislike about their smartwatches. The questions asked for this research, which reached 21 participants in total, are as follows.

- Your age/gender/brand of the watch?
- What is the brand/model of your smartwatch? What is the application you use the most on your smartwatch?
- What is your least favorite/ most annoying app to use on your smartwatch?
- What is the most difficult operation/action to do/implement on your smartwatch?
- Why is it difficult to do this action?

With the answers collected from the participants, a table was created and the preferred smartwatches were grouped. In this framework, it was seen that the most used watch among the participants was the Apple Watch. Afterward, the following additional questions were sent to the participants who use products other than Apple Watch to observe the purpose of choosing these products.

- What is your purpose for choosing this watch?
- Did its price or features attract your attention? If features, which features?
- Which of the watch's buttons do you use the most?
- Do you use all buttons actively?
- For watches with rotating bezels, how do you find the use of this bezel? Do you use it actively?

Among these answers, the most used applications were marked and the questions to be asked and the tasks to be prepared for the survey and interview planned to be conducted with volunteer participants in the following stages were determined.

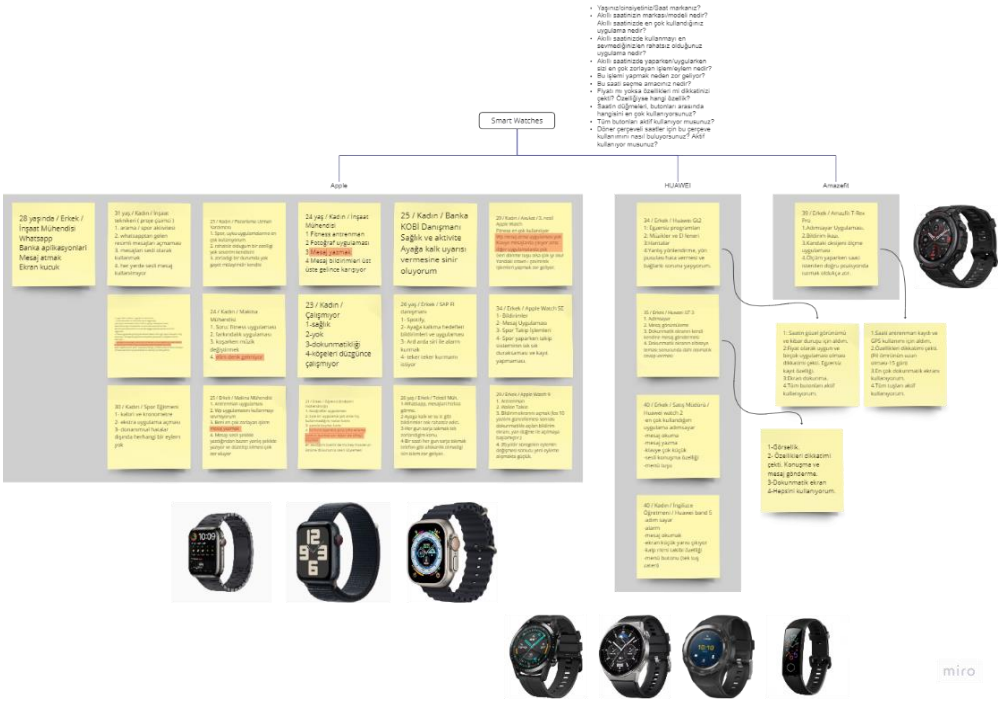

Table 1

3. Methodology

This research uses a multi-method approach involving surveys, interviews, and task observations to study how participants use the interface of smartwatches. A heterogeneous sample of 30 participants representing prerequisite criteria for variety was chosen to cover a wide span of user experiences. Data collection was comprised of a structured questionnaire, with different types of questions such as open-ended, multiple choice, and Likert scale to obtain comprehensive insights into factors affecting smartwatch selection and overall contentment in terms of interface elements. Also, detailed interviews were carried out among some participants to explore in detail the individual experiences and preferences. To observe participants during real-time interactions while performing specific tasks with their smartwatches, task-based observations were used. Smartwatch interface navigation preferences will be obtained through the application of thematic analysis to survey data, interview transcripts, and observational notes to reveal recurring patterns and divergent viewpoints. In the entirety of our study, ethical considerations were put first to ensure that participants' confidentiality, informed consent and privacy protection were maintained. The study seeks to glean important information about the intricate terrain of user preferences and interface interaction for smartwatches.

3.1 Questionaire

3.1.1 Process

A Questionnaire was created with the google forms and shared with the participants to obtain more detailed information with the criteria determined. In this questionnaire, unlike the preresearch phase, questions about the factors affecting the selection of the smartwatch and general satisfaction with the watch and its interface elements were added. The questions of this questionnaire, which reached 30 people in total, were prepared as open-ended, multiple choice, and Likert scale (1-5) as follows.

- Age?
- Gender?
- What is the brand and model of the smartwatch you use?
- Which features did you consider when choosing your smartwatch? Please indicate the influential features.
- Which of the following influenced your choice of watch?
- Were its aesthetic features (color, appearance, etc.) influential in your choice?
- How important is it for your watch to receive software updates?
- When choosing your smartwatch, did its physical characteristics (shape: rectangle or circle, size) influence your choice?
- How satisfied are you with your smartwatch?
- How well do the features of your watch meet your expectations?
- How satisfied are you with the layout of the buttons and switches on your watch?
- How often do you wear/use your smartwatch?
- Which of the following was more influential in your choice of smartwatch than the others?

- Rate the battery life of your smartwatch on the scale below.
- What is your opinion about the ease of use of the applications on your smartwatch?
- Which application do you use most often on your smartwatch?
- Are there any apps on your smartwatch that you dislike or are uncomfortable using? If so, which one and why?
- Have you ever considered switching to a different smartwatch because you are not satisfied with your smartwatch for any reason, and if so, why?

3.1.2 Outcomes

In this survey of 30 people, 18 questions were asked to determine the participant's satisfaction with their smartwatches and their usage habits.

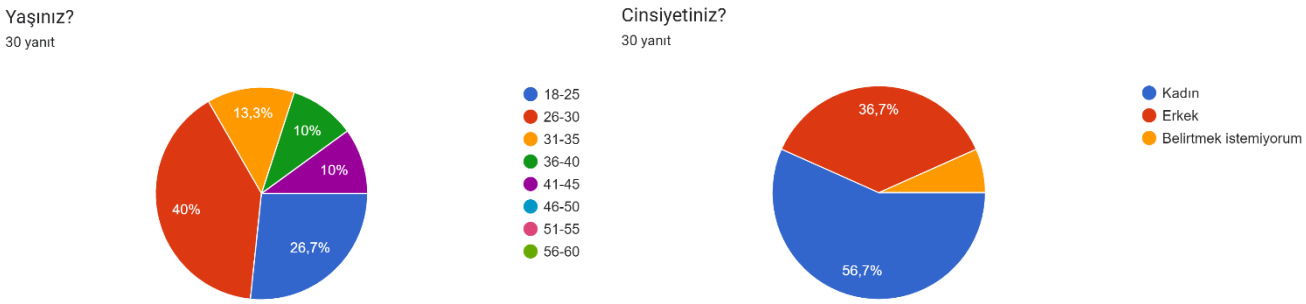

Figure 1

According to the responses, it was seen that smartwatches are distributed among a wide age group (Figure 1). At the same time, 19 people preferred Apple products, 7 people preferred Huawei, 1 person preferred Amazefit, 1 person preferred Samsung and 1 person preferred Xiaomi brand products (Figure 2).

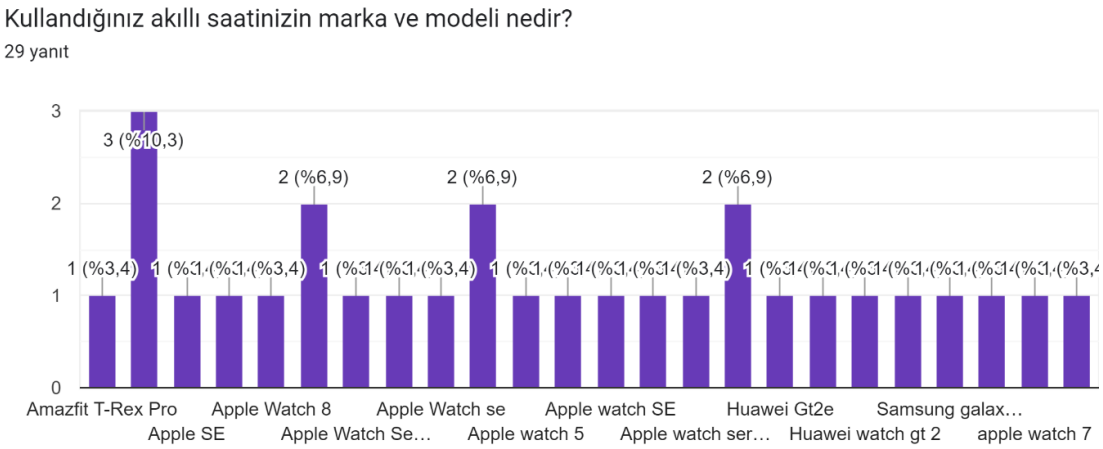

Figure 2

According to the open-ended answers, health tracking in 12 answers, compatibility with other devices in 9 answers, performance and functionality in 7 devices, and brand and design factors in 6 answers were seen among the features considered when choosing a smartwatch. However, 59% of the participants stated that they are not only brand-oriented but also look for more than one feature in their smartwatches. In addition, since it is a wearable technology product, the appearance, size, and color of the product are important for the participants (Figure 3).

Figure 3

Although smartwatch satisfaction varies according to brand, model, and personal wishes, the participants stated that they bought the smartwatch after researching and said that they were generally satisfied. Positive responses were given by 76.6% for satisfaction, 76.7% for meeting expectations, and 86.7% for interface satisfaction.

The watch usage habits of the users also affect their expectations of the watch and their choice of watch. In the answers given, it was seen that users wore their watches for more than 18 hours every day, except for 4 people (Figure 4).

Figure 4

When participants were asked about the most frequently used applications, it was seen that they overlapped with their wishes for buying the watch. Among the participants, 19 responded to health and exercise programs, 10 responded to notification and call tracking, 3 responded to music apps, and 1 responded to GPS (Figure 5).

Figure 5

Finally, participants were asked about the features of their watches that they were dissatisfied with and the likelihood of choosing a different watch. While 70% of the respondents indicated that they had never thought of switching to a new watch, 30% indicated that they would change their watches because they did not support certain applications, were incompatible with their phones, and demanded different features (Figure 6).

Figure 6

3.2 Semi-Structured Interviews

3.2.1 Process

At this stage of the research study, one-to-one interviews were conducted with volunteer participants. Interviews with 8 participants were conducted by video recording (with the

permission of the participant) on an online platform. Before the questions, the participant was asked to wear his/her smartwatch and position the camera so that his/her watch and face were visible. The aim here was to examine the physical interaction with the smartwatch during the interview (when he touched it, when he looked at it, and how much he examined the notifications)..

At this stage, questions similar to the survey were asked to the participants in more detail and grouped under the headings of general questions, decision-making process, purchase process, and post-purchase, and questions deemed necessary during the comments of the participants were added to the basis of the interview. The questions asked are included in Appendix 1.

3.2.2 Outcomes

When the users, whose smartwatch usage habits wanted to be understood with the answers given to the general questions, were asked to define their smartwatches, they used the expressions "it is my everything, useful (2), convenience, functional, helpful, aesthetic, stylish". The answers in Figure 1 were seen as the first descriptor of the bond that the participants established with their watches, and the usage motivation of each participant was determined by the answers received in the following process.

	Saat Markası	Kullanım Yılı	Saat Sayısı	Takma Sıklığı	Akıllı Saat Tanımlama	Kullanım Öğrenilebilirliği	Bildirim Yönetimi	Arayüz Ögesi Tercihi	Arayüz Ögesi Puanı (1-5)	Geri bildirim
Büşra (Tasarım Mühendisi)	Apple Watch SE	7 ay	2	Şarj ve duş hariç her zaman	o benim her şeyim	Çok kolay	titreşim	dokunmatik ekran	3	ekran titremesi dokunma hissi
Gürhan (Satış Müdürü)	Huawei GT2	2 yıl	2	Şarj ve duş hariç her zaman	faydalı	Çok kolay	titreşim	dokunmatik ekran	3	tuş tıklaması
Sibel (İngilizce Öğretmeni)	Huawei GT3	1.5 yıl	2	Şarj ve duş hariç her zaman	faydalı	Kolay	titreşim	dokunmatik ekran	1	titreşim ve tuş tıklaması
Aykut (Askeri Personel)	Huawei GT2	1 yıl	1	Uyandıktan sonra yatana kadar	kolaylık	Kolay	titreşim	1. düğme 2. dokunmatik ekran	düğme: 4 ekran: 2	titreşim
Zeynep (Pazarlama Uzmanı)	Apple Watch SE	5 yıl	1	Şarj ve duş hariç her zaman	fonksiyonel	Kolay	titreşim	dokunmatik ekran	1	tuş tıklaması
Enes (İnşaat Mühendisi)	Apple Watch SE	2 yıl	1	Uyandıktan sonra yatana kadar	estetik, tamamlayıcı, yardımcı	Kolay	titreşim	1. dokunmatik ekran 2. scroll	2	titreşim
Ezgi (Ürün Yöneticisi)	Apple Watch SE	8 ay	1	Uyandıktan sonra yatana kadar	şık, faydalı	Kolay	titreşim	dokunmatik ekran	2	titreşim
Ali Can (Bilgisayar Öğretmeni)	Samsung Gear S3 Classic	3 yıl	2	Uyandıktan sonra yatana kadar		Kolay	titreşim	1. bezel ve tuşlar 2. dokunmatik ekran	1	bezel dönüş tıklaması

Figure 7

The usage motivations determined as a result of the data were categorized under three headings: hedonistic, usability/functionality-oriented, and price/performance-oriented. However, it was observed that the participants who were placed under these headings based on the information they provided about their smartwatches did not give answers that fit only one heading. Participants acted with at least 2 motivations while buying and using their products. However, it can be said that one of these motivations is more dominant.

At the same time, it was observed that different usage motivations were effective in the selection of watch brands and models. Watch brand choices play an important role in interface interaction and usage habits. When the participants were asked to explain the methods they preferred in interface interaction, they used the following statements.

"Ben önce bir ekrana dokunuyorum sonra düğmeye geçiyorum genelinde düğmeyle dolaşıyorum ama parmağım ekrana da gidiyor scroll yerine elimle kaydırıyorum." (Enes – Apple Watch SE)

"Daha çok kullandığın ihtiyaca göre kadran üzerindeki değişikliği dokunmatik yapıyorsun ve dokunmatik hassasiyeti başarılı ama menü için tuşa basmak gerekiyor. Ama çoğunluk dokunmatikte oluyor her zaman." (Gürhan – Huawei GT2)

"Tuşlar 2 tane. Aktivite başlatma ve durdurma için onlara basıyorum çünkü fiziksel olduğu için daha kolay yönettim. Koşarken ekranı nişan alamıyorsun. Tuşa basıyorsun çok kolay oluyor." (Can – Samsung Gear S3)

Although the usage scenario of the smartwatches purchased according to the habits and expectations of the users varied, reading/replying to notifications, health tracking, and exercise recording were seen as common points. Participants who use their watches synchronized with their phones stated that they mostly use their watches to view notifications.

"Egzersiz programlarını aktif kullanıyorum onları çok iyi tanımlayıp belirtmişler. Açık alan, kapalı alan yüzme vs her şekilde belirtmişler egzersiz kayıtları çok kolay saati almamdaki en büyük etken bu zaten." (Aykut – Huawei GT2)

"Bildirimler geliyor mesela telefonu elime almam gerekiyorsa alıyorum almamam gereke bir şeyse kapatıp önüme dönüyorum mesela. Her gelen bildirime dönmüyorum banka smsleri instagram bildirimlerini kapattım sadece whatsapp ve önemli bulduğum birkaç uygulamadan gelen bildirimi saate yollattırıyorum." (Büşra – Apple Watch SE)

While notification display is an application that can be performed on any smartwatch, message replying is not supported on certain models. Participants identified this as a shortcoming.

"Ben gelen mesajlara cevap verememeyi sevmiyorum ama bu benim saatimin özelliği diğer saatlerde bu var mesajları sadece okuyabiliyorum. Resim geldiyse mesajda açamıyorum sadece bildirim olarak görüyorum" (Gürhan – Huawei GT2)

In the next stage of the study, two features that were seen to be used the most from these comments and one application that was not preferred as much were selected to monitor the interface usage habits of the participants. For this reason, the participants were given 3 tasks in the next stage and asked to perform these tasks.

3.3 Task-Based Observations

3.3.1 Process

In the last stage of the one-on-one interview, the participants were given the following tasks according to the features of their smartwatch. This observation process's main aim is to conduct a usability test of the device that affects users. A usability test is a process that denotes a product or service on a representative user base to evaluate it (Affairs, 2013). While the observation process is designed it is aimed to find the most common features of the most preferred devices in the market and the most used features by the users. But even with this approach the first message screening and the responding task are redefined according to the interview. Because in some smart wearable devices, there are no responding features to the message. Also for some

models, the music playing feature is only available when the music first starts from the smartphone.

1. Displaying notifications and responding to messages
2. Health monitoring (heartbeat measurement)
3. Music Playback

Before each task, the stages required to be done were explained to the participant and then the participant was asked to fulfill the task.

While the participant was performing the tasks, the participant was timed and the time it took for the participant to perform the desired action was monitored. After the completion of the task, the participant was asked to rate the task as "Very Easy (1)" and "Very Difficult (5)". Finally, for each task, the features that the user would like to change/improve in the interface were asked and the current user satisfaction was observed.

3.3.2 Outcomes

Displaying and Responding to Notifications

Viewing notifications, the feature that participants said they used most frequently, was also listed as one of the purposes for purchasing the watch. Although notifications were displayed regardless of brand, the message reply task could only be performed by Apple users. For this reason, during the execution of the task, separate time was kept for displaying notifications and separate time for replying to messages. This task demonstrated how users' interactions with their smartwatches differed by the feature they used most frequently.

Health Monitoring (Heartbeat Measurement)

Health and exercise tracking are actions that can be performed on all smartwatches in this study. In the interviews, it was observed that measuring heart rate was a common priority for all participants. The measurement, which works with a different process for each brand, is usually performed easily by clicking on the icon on the main screen, which users organize according to their priorities. It was also observed that the continuous measurement feature was turned on for many participants. This task showed the interface relationship of an application that is used less frequently during the day despite being constantly monitored.

Music Playback

Listening to music, which is not included in the smartwatch usage goals of most of the participants, is an application that is not used much, and it was observed that many participants did not have these applications on their watches. Since it is synchronized with the phone, only volume up, stop/play, and switching to the next song can be done from the watches that show the song being played instantly. With this task, it was observed how the interface interactions differed with a feature that users rarely use.

	Saat Markası	Bildirim Takibi	Mesaj Yanıtlama	Kalp Atışı Ölçme	Şarkı Açma	Şarkı Değiştirme
Büşra (Tasarım Mühendisi)	Apple Watch SE	4 saniye	16 saniye (sesli komut)	13 saniye	8 saniye	6 saniye
Gürhan (Satış Müdürü)	Huawei GT2	3 saniye	-	3 saniye (ana ekran ikonu)	6 saniye	-
Sibel (İngilizce Öğretmeni)	Huawei GT3	3 saniye	-	6 saniye	6 saniye	-
Aykut (Askeri Personel)	Huawei GT2	2 saniye	-	72 sn (menüde bulamadı)	-	-
Zeynep (Pazarlama Uzmanı)	Apple Watch SE	3 saniye	19 saniye (el ile yazma)	15 saniye	10 saniye (telefondan açtı)	3 saniye
Enes (İnşaat Mühendisi)	Apple Watch SE	8 saniye (birden çok bildirim)	16 saniye (sesli komut)	22 saniye	30 saniye	20 saniye
Ezgi (Ürün Yöneticisi)	Apple Watch SE	3 saniye	5 saniye (hızlı cevap)	20 saniye	4 saniye	8 saniye
Ali Can (Bilgisayar Öğretmeni)	Samsung Gear S3 Classic	3 saniye	-	21 saniye	6 saniye (telefondan açtı)	6 saniye

Figure 8

Figure 8 is organized by the time it took users to perform the given tasks. The gray areas in the message reply task are since the technical specifications of the watches do not allow this action. Three of the users said that they were not satisfied with this feature of their watches and that they wanted this feature in the new watch they would buy.

Participants who did not prefer music applications on smartwatches used opened songs on their phones and then switched to the next song on the watch. However, the lack of a music application caused the song lists to be inaccessible at certain hours, and this task could not be accomplished by the participants.

4. Findings

In this research study, one-on-one interviews were conducted with 8 participants of different professions and ages to understand the usage preferences of smartwatch users in interface navigation. These interviews, which were divided into two parts, first enabled us to determine the participants' motivations for choosing/buying a smartwatch and their usage habits. For the rest of the study, at least 2 volunteer participants were selected for these motivations. These topics are now the personas of this study. Afterward, the tasks given to the participants and the interface interactions they realized depending on their usage habits were examined and their expectations were asked to improve their experience in these applications.

The personas, which act according to the motivations for smartwatch use determined by the pre-interview questionnaires, are divided into three categories.

- Hedonistic
- Usability/Functionality focused
- Price/Performance focused

User preferences in smartwatch choosing process

The participants were grouped according to their motivations for using smartwatches based on their answers to the questions asked during the interview, such as "defining a smartwatch, the features they found user-friendly, how the purchasing process progressed, and how model research was conducted". However, it was observed that the participants did not act with only one motivation in their watch choices. For this reason, the frequency of use of words to describe these motivations and the physical contact with the watch were taken into consideration in the recorded interviews.

Smartwatche`s hedonic qualities that derived from the classical wearable watches are the main source of the pleasurable UXs ((Lin et al., 2023). In the interviews, users who bought their smartwatches with hedonistic feelings used expressions such as aesthetic, stylish, and very beautiful while describing their watches in the general questions section. For them, the smartwatch provides a pleasant and beautiful experience.

“Estetik olarak bakıyorum bir de tamamlayıcı bir aksesuar benim için. (saatinin kıyafetine uyumlu olduğunu göstererek)” (Zeynep – Apple Watch SE)

Respondents that more likely to describe smartwatches as a fashion accessory tend to see visibility more valuable speciality (Chuah et al., 2016). At the same time, it was also observed that these people make product choices based on the brand.

“Apple ürünlerinden oluşmuş bir hayatım olmasını istiyorum. Modelleri tasarımları çok hoşuma gidiyor. Akıllı saate ihtiyacım olmadığını biliyordum arkadaşlarımla da konuştum bu konuda ama gerçekten benim için bir zorunluluk değildi yani. O yüzden de almak istememiştim ama hep de aklımdaydı. Ta ki en yakın arkadaşım hediye edene kadar artık tüm Apple’ lara sahibim ve bu beni çok mutlu ediyor.” (Ezgi – Apple Watch SE)

The usability/functionality focus, which is effective in the decision-making process, was evaluated according to the way the participants researched the product. Participants acting with this motivation conducted market research and paid attention to technical specifications, operating system compatibility, and product size before deciding on the product they would buy.

“Aktif çalıştığımız yoğun olduğumuzdan dolayı telefon hep cebimde. Helikopter faaliyeti oluyor normal faaliyet oluyor üstümüzde yelek oluyor o yüzden telefonu elime alma zorluğu oluyor elimde eldiven oluyor. Ondan dolayı akıllı saat kolumda olduktan sonra gelen bildirimler aramalar önemli şeylere daha kolaylık sağlayacağı için zaman sıkıntısından dolayı da saat almaya karar verdim.” (Aykut – Huawei GT2)

“Bu arada benimki 46 mm. Büyük olan modeli. Bunun bir de küçüğü var. Aynı tasarımda 42. Yanlış hatırlamıyorsam, 41 ya da 42 milimetrelik bir modeli var. Ben bir de büyüğünü tercih ettim. (…) Hani teknik özelliklerine vesaire hakimdim ama kolumda nasıl duracağına mağazada karar verdim. Her şey yolunda gidince de aldım.” (Can – Samsung Gear S3)

Considering the first two motivations, the use, posture, and value of the watch are important for the participants. Most users prefer to define smartwatches as technology and fashion-like (Wearable technologies: The role of usefulness and visibility in smartwatch adoption). Price/performance-oriented users, on the other hand, made comparisons between different

watches during the purchasing process and preferred the product they found most suitable according to the product price as well as technical features.

“Ya ben liseden beri istiyordum ama param yoktu ondan sonra üniversiteye geçtim KYK falan biraz baktım ama Apple Watch olmayınca salmıştım sonra üniversite 3’te bir Huawei aldım. (yüz ifadesi pek memnun değil) Motivasyonum şeydi biraz daha çok param olmasını bekledim. Akıllı saati gereksiz buluyordum ben yürüdüğümde saatin 4 adım atması gereksiz buluyordum. Buna ayırabilecek bir paramın olmasını bekledim bu saati almak için.” (Büşra – Apple Watch SE)

“Bunu alırken bir üst modeli vardı ama telefon fiyatındaydı farklı özellikleri vardı ama ben bütçeme bağlı olarak seçtim.” (Enes – Apple Watch SE)

Choosing a Smartwatch

The participants, who saw the smartwatch as a need, a whim, a helper, and an accessory, went through many stages during the selection of their smartwatches. Although the process of choosing the brand and model of the smartwatch progressed differently for each motivation topic, there were common stages that the participants went through. All of the interviewed participants stated that they conducted internet research, watched usage videos, and asked their friends.

“Önce ben zaten araştırıyordum ama hangi modeli alacağıma karar veremiyordum kesin Apple alıcam diyodum akıllı saatte zaten. (…) youtubedan izledim bir de takip ettiğim birkaç influencerda vardı SE modeli daha kibar duruyordu bence bilekte bir de aman aman bir farklılık yoktu aralarında (…) Satış danışmanıyla bu konuda çok konuşmak istemiyorum çünkü zaten onlar satmak için konuşuyor ama youtubeda gerçek kullanıcı deneyimleri var iş yerimdeki insanlar çok kullanıyordu bir de onlara sordum hep ya ama youtube u daha çok referans alıyorum bu konularda.” (Büşra – Apple Watch SE)

“Genelde teknolojik bir ürün alacağım zaman internetteki videoları izliyorum youtubedan onlar baya yardımcı oluyor benim için. Kendi sitelerinde de yayınlanıyor onlar teknik özelliklerine bakıyorum ama inceleme videoları karşılaştırma videoları daha iyi oluyor benim için. Onlar daha başarılı.” (Enes – Apple Watch SE)

There were 2 different results in the answers given for the purchase of the products. In the first scenario, users tried on the watches in the store, decided on the size and model, and purchased them through online platforms.

“Online satın aldım önce apple mağazasına gittim konuştum sonra onlinedan aldım zaten 1-2 gün içerisinde hemen mağazadan teslim edildi.” (Zeynep – Apple Watch SE)

İkinci senaryoda ise mağazada deneyip karar veren kullanıcılar mağazadan satın alım yapmıştır.

“Kesinlikle mağaza. Çünkü bu çok kişisel bir ürün. (…) Oradaki görevlilerle konuştum. En sonunda. Baktım. Her şey uy uygun. İnternette araştırmamı zaten yapmıştım. Hani teknik özelliklerine vesaire hakimdim ama kolumda nasıl duracağına mağazada karar verdim. Her şey yolunda gidince de aldım.” (Can – Samsung Gear S3)

In addition to the motivation of the users, the most important criterion for choosing the brand and model of the watches was the synchronization with the devices to be used with them.

Buying a watch that is compatible with phones, computers, and tablets is an important criterion for all participants.

“Benim kendi bilgisayarım da iş bilgisayarım da Apple. Artı bir de tabletim telefonum var. Hepsinde ortak mailleri kullanıyorum hepsinde farklı notlar alıyorum ve birbirine aktarıyor. Saatimin de bunlarla aynı işletim sisteminde olmasını isterim tabii ki. İhtiyacım olduğunda diğer cihazlardaki bilgileri onda otomatik görmem lazım.” (Ezgi – Apple Watch SE)

Smartwatch Usage Habits

Smartwatches have gained an important place in the lives of users with their exercise tracking and notification monitoring features during the day. With these and similar features, smartwatches manage to increase the one-to-one interaction with the user. In addition to being actively used during the day, they also motivate users to wear them during sleep. During the interviews, it was observed that the participants constantly wore their smartwatches except for being uncomfortable during sleep, the possibility of water penetration, and the charging process.

In addition, although they were regularly monitored during the day, due to being in a school/work environment, the notifications of the watches were set to show only messages and reminders, and only the vibration mode was activated for notification alerts.

“Bildirimler genelde titreşimli geliyor bana güncelleme bildirimleri ve mesaj bildirimleri geliyor titreşim olarak. Saati hiç sesli modda kullanmıyorum. Saatin güncelleme bildirimi çok fazla peşpeşe gönderiyor. Mecbur bu sefer telefonla saat bağlantısını kesiyorum çünkü titreşimde mesaj geldi sanıyorum bakıp güncelleme görünce rahatsız oluyorum.” (Aykut – Huawei GT2)

“Ben sürekli okulda oluyorum veya özel derslere giriyorum telefonumda da gereksiz uygulamaları kapatmıştım zaten ama saatimin sadece arama ve mesaj bildirimlerini açık tutuyorum. Mutlaka titreşimde ama hatta derse girerken rahatsız etme moduna alıyorum derste devamlı ses gelmesi beni çok sinir eder.” (Sibel – Huawei GT3)

4.1 Analysis of Interface Navigation Preferences Across User Motivations

Smartwatches, the most widely used example of wearable technologies today, are the products that spend the most time with their users compared to other technological products. Satisfying the user is possible by ensuring that they perform the actions they want to perform in the easiest and shortest time. Although there are users who pay attention to user comments and interface usage and interface elements in their purchases, it has also been observed that there are users who buy smartwatches without paying attention to them or who do not find these features sufficient after use.

Interface elements differ according to each brand. In addition to the touch screen, which is common to all of them, there are buttons and bezels used for different functions. Although the difficulty of use or prioritization of these elements varies from person to person, the majority of the participants use the touch screen as the primary one.

“Dokunmatik ekranı kullanmayı tercih ediyorum ona daha çok güvendiğimi söyleyebilirim.” (Zeynep – Apple Watch SE)

“Daha çok kullandığın ihtiyaca göre kadran üzerindeki değişikliği dokunmatik yapıyorsun ve dokunmatik hassasiyeti başarılı ama menü için tuşa basmak gerekiyor. Ama çoğunluk dokunmatikte oluyor her zaman.” (Sibel – Huawei GT3)

While users who purchased with hedonic and price/performance-oriented motivations adopted the use of existing interface elements, users who purchased with usability/functionality-oriented motivations commented more on interface satisfaction. In addition, screen interfaces that differed with the models attracted the attention of the participants and they said that they would pay attention to this in their future purchases.

“… saatlerin markası aynı ama menüler farklı muhtemelen yazılımdan benim menümde her şey alt alta bu şekilde dikey hareketle seçmem gerekiyor benim görmek için aşağı kaydırmam gerekiyor diğer saatte menüyü açınca tek ekranda 9 tane ikon görebiliyorsun o yüzden o daha rahat erişim sağlıyor.” (Gürhan – Huawei GT2)

“GT3 te uygulamaların hepsini çok daha net görebiliyorsun bende de o şekilde olmasını isterdim (...) Burada hava durumunu ekledim, kalp atımı, şarj göstergesi var programlar içerisinde onları bulmam zor. Uygulamalar ekranında çok küçükler gözden kaçıyor maalesef.” (Aykut – Huawei GT2)

The participants were given tasks to observe the impact of frequently used, occasionally used, and rarely used applications on the use of the interface. During and after these activities, the participants were asked to evaluate the interface and interface elements of their watches and to suggest the features they considered necessary to improve the interface usage.

For the tasks to be fulfilled,

Participants who bought smartwatches with hedonistic motivation: "It was easy for me to do this task", "No, I'm fine", "I didn't feel any deficiency for the moment", and "I think it's nice".

Participants who bought smartwatches with a focus on usability/functionality: "If it can send the sentences we speak as a message with the software add-on, all the current shortcomings will be eliminated", "I think they could assign a key to health events, I think it would be nice if they could assign a key to health events, I think it would be nice if they could press the key 2 times, measure, etc. It is tedious to enter here, choose an application, and search for heartbeat, or if the current increase is too high, it would be nice to give a notification.", "It does not say things like "Sit calmly without talking or we will measure incorrectly. It would be a little better if there were such guidance.", "It would be nice if there was a notification if the increase is too much.", "Sit calmly without talking or it will be wrong.

Participants who bought smartwatches with a focus on price/performance: "It is already easy", "I am satisfied", "It would be very nice if we could reply for the message application, that is the only shortcoming of the watch", "It meets my expectations. I mean, other people's expectations may be different. It may be insufficient, but it has what I want and what I expect from a smartwatch." They made relatively shorter sentences and accepted the features of the watch.

5. Conclusion

Smartwatches have taken root in people’s lives, providing a broad range of services such as health monitoring, entertainment, and life management. But issues related to the app understanding, interface optimization as well as battery life and durability remain. The duality of smartwatches as technological tools and fashion accessories reflects the importance of meeting functional, hedonic, and social needs. Personalization turns out to be an important factor affecting user preferences, as design features target various age segments and lifestyles.

This study began by trying to understand the nature of smartwatches and the role they play in people's lives by examining previous academic research on user preferences. The qualitative research conducted in light of these studies firstly aimed to understand the profile of smartwatch users and categorized them under 3 different personas: hedonists, price-performance users, and functionalists. Subsequently, task-based observations were conducted to understand how users navigate through the interface navigation and their satisfaction during this process. The survey and the semi-structured interview results show that people who buy the smartwatch for pleasurability reasons are most likely to prefer the Apple Watch series. Generally, hedonist users are satisfied with their devices and do not want to change their devices in upcoming years. Even though the functionalists are satisfied with their device too, they are still looking for more software updates that aim to improve user experience and new technological updates that give smartwatches more features. Price-performance users are commonly chosen by Chinese companies. They are mostly aware of the lack of advancements in their devices and even if they want to change their devices, they would prefer to upgrade to a higher model of their current watch.

When asked for users' opinions on interface navigation in interviews, 5 out of 8 people said they didn't like the buttons. It was noteworthy that the people who thought the number of buttons was sufficient or wanted more were older than 30. Younger people tend to use touchscreens and believe if the button number decreases watch will be more waterproof too. Regarding the touchscreens and their usability 80% of female participants did not face any challenges while all of the male participants complained about how small is the screen size and sometimes it is hard to touch the right app icon. Probably it is because the male participants' hands are physically bigger than the female participants. Also, questionnaire results show that male participants are more sensitive about the physical form of their watch. 90 percent of male participants either use circle-shaped smartwatches that look more like classical watches or state that they wish their Apple watch to be circle-shaped. None of the participants decide to utilize voice-controlled operations with their smartwatches in social environments.

In conclusion, the study highlights the critical role of interface design in smartwatches. A widespread preference for touchscreens, perceived as intuitive, coexists with a universal need for improved navigation. Users, regardless of age, express dissatisfaction with traditional buttons. Addressing this concern is paramount for enhancing overall usability. Ongoing efforts in refining touchscreen navigation will be pivotal in ensuring a more user-friendly and satisfying smartwatch experience for all.

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