CS 449 Human-Computer Interaction Term Paper

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Sabancı University, Faculty of Engineering and Natural Sciences,
Department of Computer Science

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Project Title:

Exploring the Impact of Visual Design and Brand Identity on the Efficiency and Usability of Hepsiburada and Trendyol Mobile Apps

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Abstract

This study aims to investigate the relationship between visual design and brand identity and their effect on the usability and efficiency of mobile e-commerce apps, specifically Trendyol and Hepsiburada. The research methodology includes an examination of the visual design and brand identity elements of both companies, data collection through usability testing, and analysis of the results to identify patterns and trends. Participants are divided into groups based on gender (male and female) and occupation (university students and employed individuals). During the usability testing, participants are asked to perform tasks such as searching for products, using filtering and sorting options, reading reviews, adding items to a cart, and completing a purchase. The duration of task completion for each participant is recorded for further analysis. Additionally, participants are asked to fill out a questionnaire about their perceptions of the visual design and brand identity of the apps based on their experiences during the usability testing. The study found that the average usage rate of Trendyol is higher than Hepsiburada, but both companies failed to create a strong brand identity that was effective for all demographic groups. Additionally, the study also found that task completion duration is an important measure of user experience, and that eCommerce companies should focus on creating a strong brand identity and visually appealing elements such as colors, images and layout to catch users' attention and encourage them to explore products. The final outcome of the study will be a report containing recommendations for improving the visual design and brand identity of the apps to enhance user experience and enhance the success of the businesses.

Background of the Study

Related Literature

As consumers increasingly turn to online shopping, the importance of visual design in the digital shopping experience has become a topic of interest for researchers. One study, conducted by authors Jeannot, F., Jongmans, E., and Dampérat, M., investigated the connection between visual design and consumer behavior in the context of online shopping (Jeannot et al., 2022). The authors argue that the appearance of a website can significantly influence consumer behavior, and following this information, the relationship between visual design and consumer behavior may be affected by the consumer's level of expertise.

To support their theory, the authors conducted a study in which 200 participants evaluated the attractiveness of various online shopping websites based on different design elements such as color, typography, layout, and images. The results showed that the level of consumer expertise had a significant effect on the connection between visual design and consumer behavior. Specifically, the study revealed that more experienced consumers were more likely to prioritize

the appearance of the website over other factors such as price or product availability. They also found that consumer expertise moderated the relationship between visual design and consumer behavior, meaning that the impact of visual design on consumer behavior was more significant for consumers with a higher level of expertise compared to those with less expertise. The authors suggest that website designers should take into account the level of expertise of their target audience when designing online shopping websites in order to effectively influence consumer behavior.

Another study, by author Perlman, delves into the importance of UI and UX in mobile e-commerce and how they affect customer satisfaction and loyalty (Perlman, 2021). The article emphasizes the significance of personalization in mobile e-commerce, which can lead to increased sales and customer loyalty. Personalization can be achieved by tailoring the user experience based on the user's browsing and purchase history, location, and other personal data. Additionally, the author also notes the role that social media and user-generated content can have in the success of a mobile e-commerce application, such as customer reviews, ratings and recommendations. The author also emphasizes the importance of incorporating these elements into the design and user experience. The article also discusses specific design elements, such as navigation, layout, and visual appeal, that can improve the user experience. Navigation should be intuitive and easy to understand, the layout should be consistent and easy to follow, and the visual appeal should be attractive and engaging. The author also notes the difficulties that mobile e-commerce applications face, such as finding a balance between aesthetics and functionality and ensuring a smooth user experience across different devices.

A third study, by authors Sohn, S., Seegebarth, B., and Moritz, M., investigated the impact of visual complexity on user satisfaction in the context of mobile online shopping (Sohn et al., 2017). Through an experiment in which participants shopped on a mobile online store and then rated their satisfaction, the authors found that perceived visual complexity had a negative impact on user satisfaction. The authors argue that excessive visual complexity can hinder users by making it difficult for them to locate the desired products and navigate the website. Additionally, this complexity may cause frustration and decrease user satisfaction. The study provides valuable insights into the effects of visual complexity on user satisfaction in the context of mobile online shopping and suggests that designers of mobile online stores should aim to create visually simple websites to enhance user satisfaction. The authors suggest that designers should avoid using too many colors, fonts, images, and animations, and should instead use a minimalistic approach to create a clean and easy-to-use interface.

Overall, these studies suggest that visual design plays a significant role in the online shopping experience and that consumer expertise, personalization, and visual simplicity are important factors to consider in the design of online shopping websites and mobile e-commerce applications. Additionally, it is important to balance aesthetics and functionality in mobile e-commerce applications. It is clear that designers should take into account the level of expertise of their target audience when designing online shopping websites and mobile e-commerce

applications in order to effectively influence consumer behavior and enhance user satisfaction. These findings highlight the importance of considering visual design in the overall shopping experience and the need for designers to carefully consider the impact of visual complexity on user satisfaction.

Statement of Purpose

The purpose of this study is to determine the relationship between visual design and brand identity and their impact on the usability and efficiency of mobile e-commerce apps, specifically Trendyol and Hepsiburada. The study aims to identify patterns and trends by examining the visual design and brand identity elements of both companies, collecting data through usability testing, and analyzing the results.

Significance of the Study

This study and its results are important because it aims to investigate the relationship between visual design and brand identity and their effect on the usability and efficiency of mobile e-commerce apps. Understanding how these elements impact user experience can inform the design and branding strategies of businesses in the e-commerce industry, ultimately leading to more successful and user-friendly apps. The research methodology used, including usability testing and analysis of data collected from participants, allows for a thorough examination of the topic. Additionally, the inclusion of participants from different genders and occupations provides a diverse perspective on the usability and perceptions of the apps studied. The final report containing recommendations for improving the visual design and brand identity of the apps can serve as a valuable resource for businesses and designers looking to enhance user experience and improve their mobile e-commerce offerings.

Methodology

This study aims to investigate the effect of visual design and brand identity on the efficiency and usability of Hepsiburada and Trendyol mobile apps. To further analyze this topic, the following research questions are proposed:

1. How do the visual design and brand identity of the Hepsiburada and Trendyol mobile apps affect their efficiency and usability?
2. What are the most common user frustrations with the Hepsiburada and Trendyol mobile apps, and how do these relate to visual design and brand identity?
3. How can the visual design and brand identity of the Hepsiburada and Trendyol mobile apps be improved to enhance efficiency and usability?
4. What impact would changes to the visual design and brand identity of the Hepsiburada and Trendyol mobile apps have on the overall success of the businesses?
5. What are the current trends, patterns, styles, and techniques in visual design and brand identity for e-commerce user interfaces, and how can these be leveraged to enhance the efficiency and usability of Hepsiburada and Trendyol?

To find an answer to these questions, a total of 14 participants were selected for this study. To inspect possible differences caused by occupational status and also gender, the participants were selected as a mix of 6 employed individuals and 8 university students and the gender distribution is 7 females and 7 males. They were all volunteers and were people that the researchers knew.

The participants were asked to perform predetermined tasks on the Hepsiburada and Trendyol mobile apps. A screen recording is taken while they are performing those tasks and their task completion times were calculated by going back to those recordings.

After completing the practical part, participants were asked to fill out a questionnaire for taking their feedback on the design, trustability, usability, and usefulness of both apps, and to share their suggestions for possible improvements. More specifically, the questions are prepared to get the personal thoughts of the participants on typography, color, spacing, interface elements, brand identity, and visual design of both applications.

The questionnaire was prepared on Google Forms, and to assist participants, screenshots of the application screens were provided for some questions. There were questions about the demographics of the participants such as age, gender, and occupation. Following that, there were several multiple-choice, rating, and open-ended questions. The survey questions can be found in the Results section.

The tasks on the practical part are based on a scenario of purchasing sunglasses. The tasks are as follows:

1. Search Bar → Type: Güneş Gözlüğü
2. Filters → Marka → “Rayban”, “Osse” → Uygula
3. Filters → Fiyat → Type: “2500 - 5000” → Uygula
4. Filters → Ürünleri Listele
5. Sırala → Çok Satanlar → Seç
6. İlk çıkan ürüne gir
7. Product Page → Ürün özelliklerine bak
8. Product Page → Ürün değerlendirmelerine bak → Tüm yorumları gör
9. Product Reviews Page → 4 yıldızlı yorumları gör
10. Sepete ekle
11. Purchasing Page → Ürün sayısını 2 yap
12. Purchasing Page → Sepeti Onayla
13. Purchasing Page → Başka Kartla öde
    1. 1111 2222 3333 4444
    2. 12/24
    3. 123
14. Purchasing Page → Ön Bilgilendirme
15. Purchasing Page → Onayla ve Bitir

After gathering the data, the analysis was conducted in two parts:

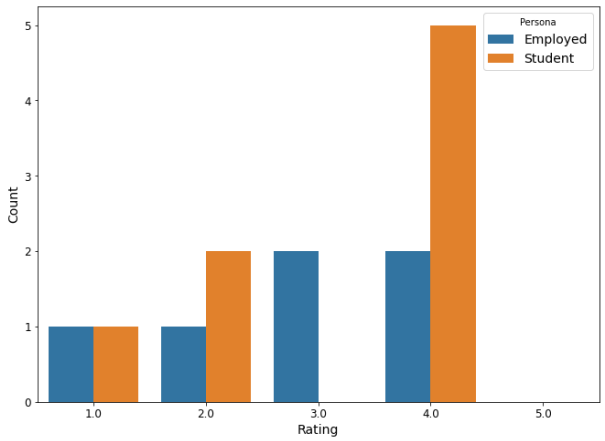
1. Quantitative analysis was done by using statistical tests to formally determine the trends, patterns, and relationships among the variables. T-test was used for comparing the mean task completion times on two applications and differences among gender and occupational status. The T-test was conducted by using the ttest_ind from scipy.stats. For each task, the mean task completion times and the standard deviation among the total completion times were calculated.
2. Qualitative analysis was done by interviewing participants after they used the system to gain insights about their overall experience, reactions, and feelings towards the application.

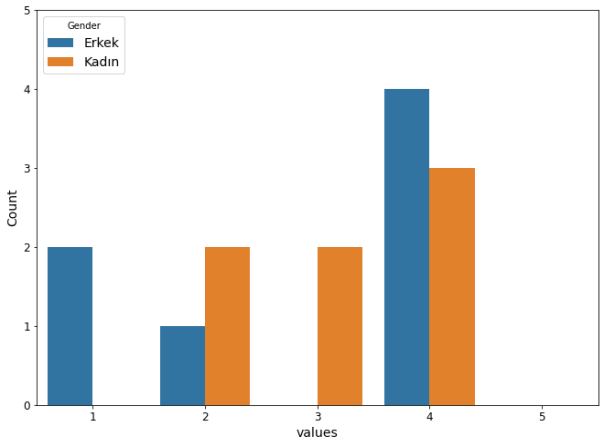
Results

In this research, specific tasks were designated for both e-commerce companies' mobile applications to perform user-based tests. These tasks were instructed to be completed to users and the screen recordings were taken during the tests. After the observations were concluded, each video was analyzed by the group members, and the time spent on each task was calculated and recorded. Using the task durations, Visualizations were made in order to observe the effects of gender and job status of the user on the duration of each task and also the total duration for the test.

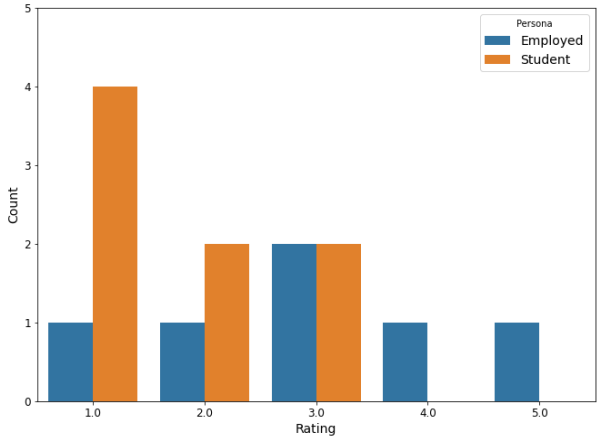
The graphs below show the distribution of the questionnaire results according to different genders and different persona groups.

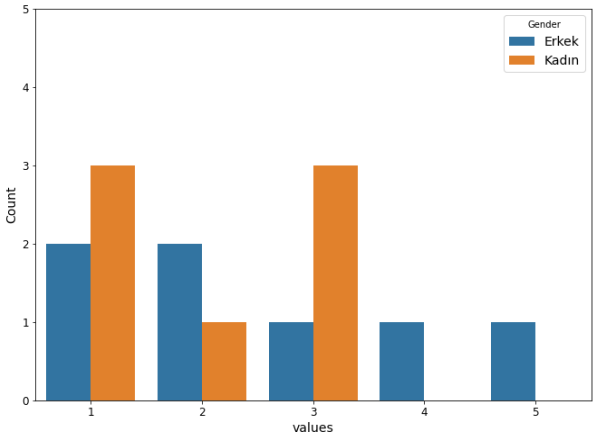
Q1: Trendyol mobil uygulamalarını ne sıklıkla kullanıyorsunuz?



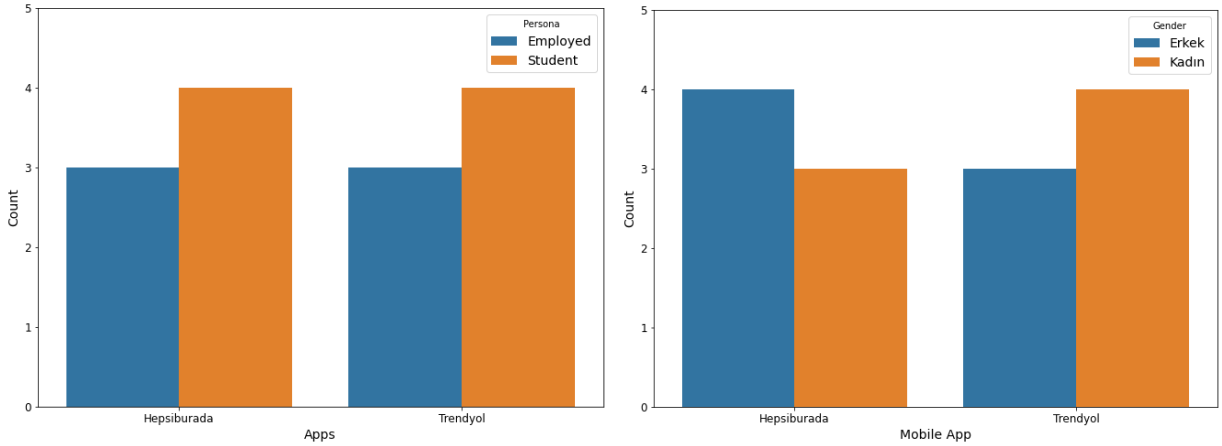


Q2: Hepsiburada mobil uygulamalarını ne sıklıkla kullanıyorsunuz?

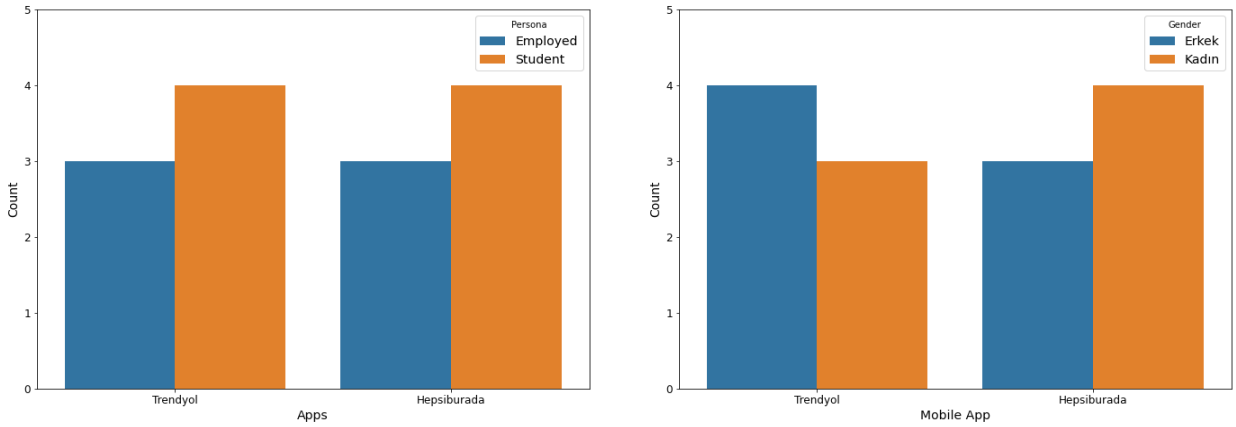




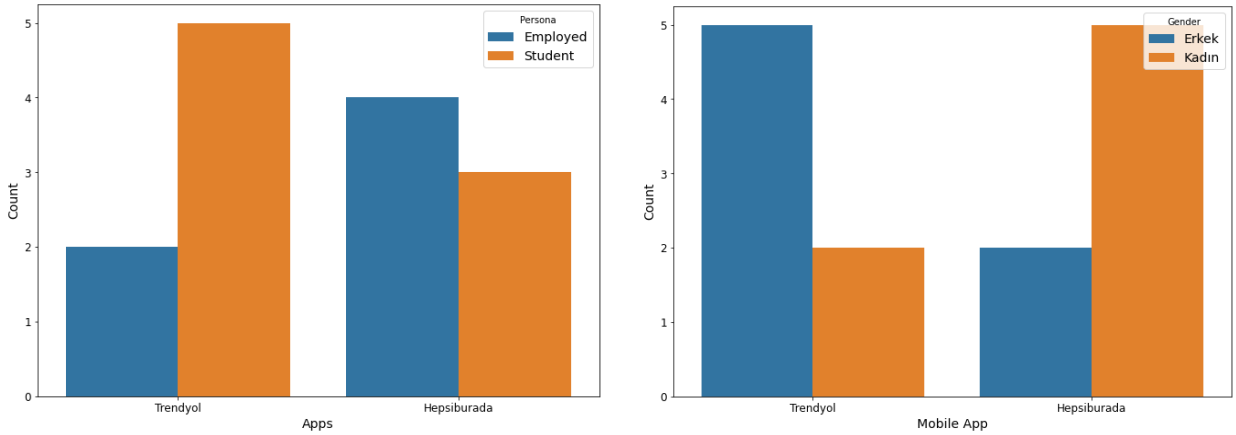
Q3: Aşağıdaki ekran görüntüsünün hangi uygulamaya ait olduğunu tahmin edebilir misiniz?



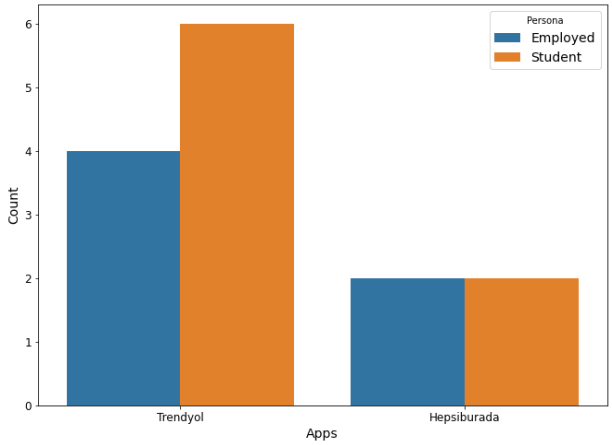
Q4: Hangi uygulamanın ana ekranının düzeni daha anlaşılır ve tutarlı?

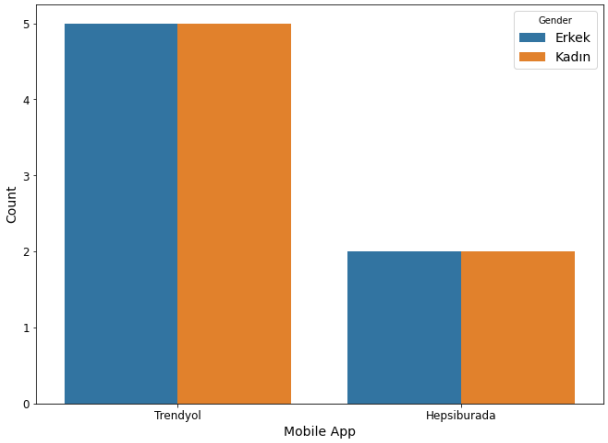


Q5: Hangi uygulama daha tutarlı ve okunaklı yazı tiplerine sahip?

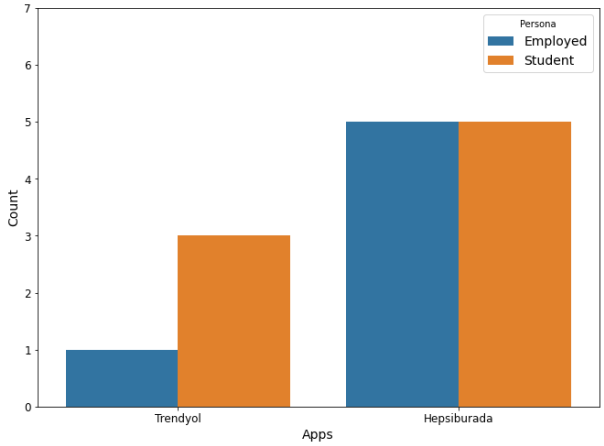


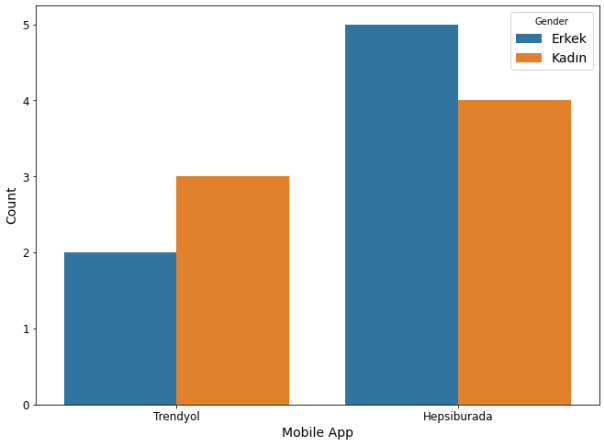
Q6: Hangi uygulama görsel olarak daha hoş ve tutarlı bir renk şemasına sahip?



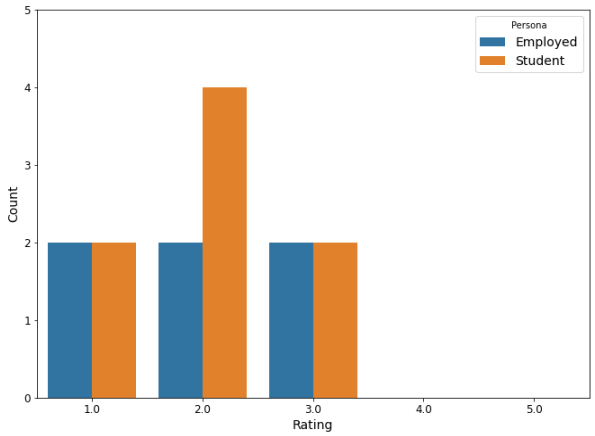


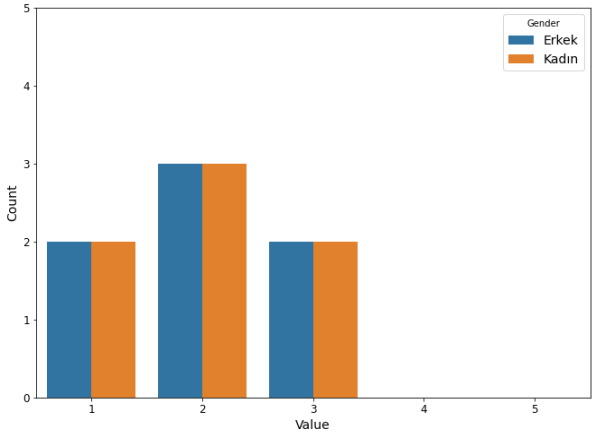
Q7: Hangi uygulamada görsel elemanlar arasındaki boş alanlar daha etkin bir şekilde kullanılmış? Yani hangi uygulama göze daha az kalabalık ve yorucu geliyor?



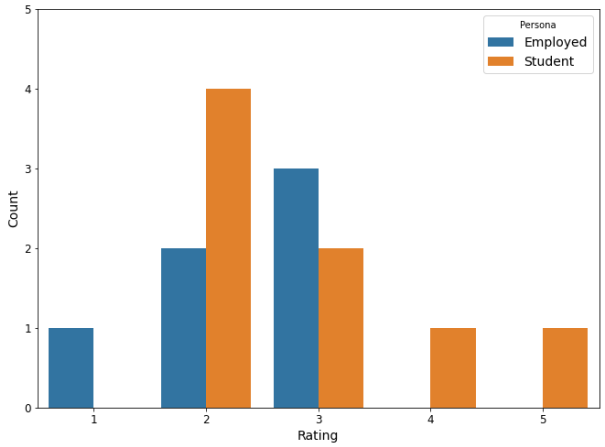


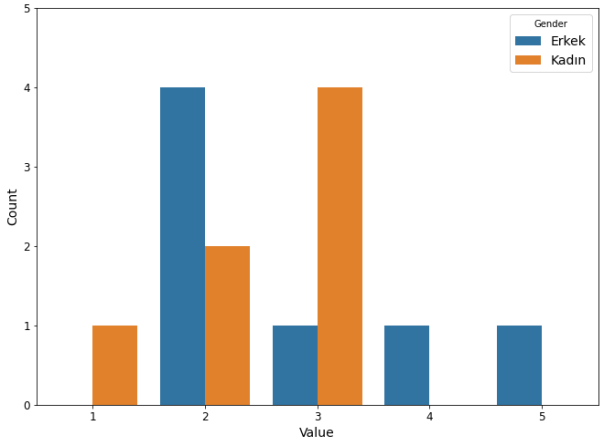
Q8: Trendyol uygulamasındaki belirli öğelerin (örneğin butonlar, menü öğeleri, ürün resimleri veya açıklamaların) yeri, boyutu ve tasarımı, uygulamayı kullanmayı zorlaştırdı mı?



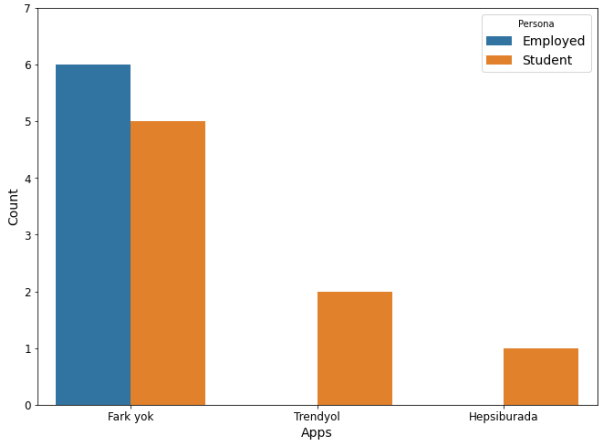


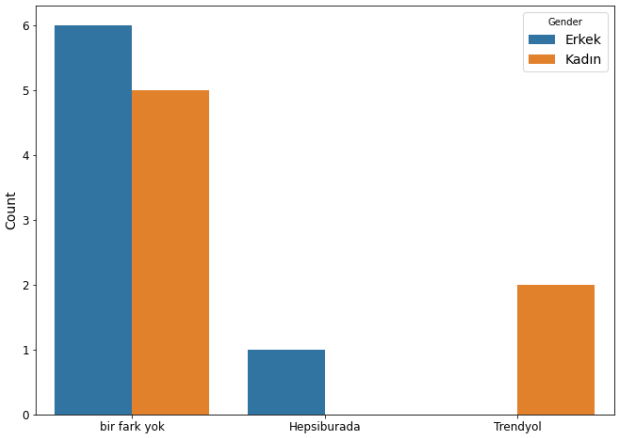
Q9: Hepsiburada uygulamasındaki belirli öğelerin (örneğin butonlar, menü öğeleri, ürün resimleri veya açıklamaların) yeri, boyutu ve tasarımı, uygulamayı kullanmayı zorlaştırdı mı?



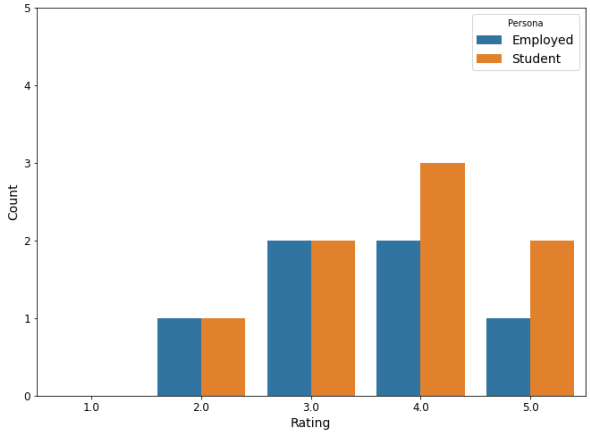


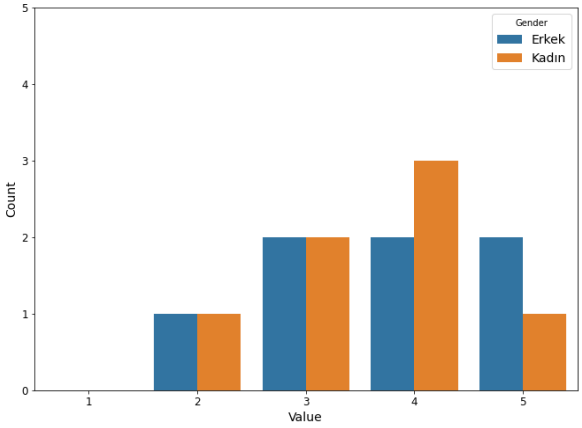
Q10: Uygulamalardaki öğelerin görsel tasarımı, uygulamalar arasında güvenilirlik açısından bir fark oluşturdu mu?



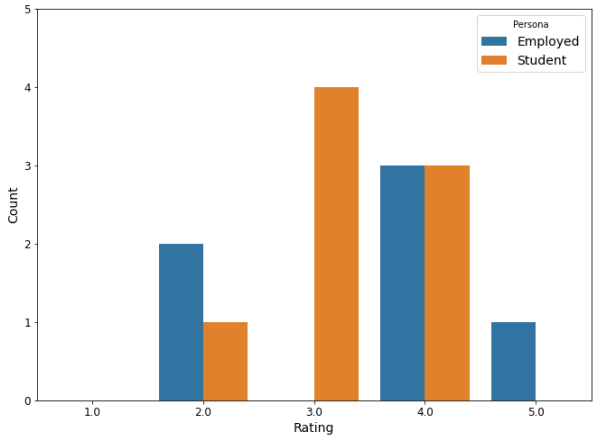


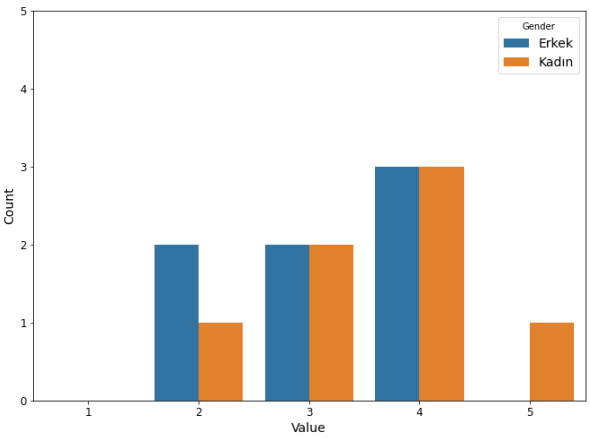
Q11: Trendyol uygulamasında farklı tasarım öğeleri arasındaki ilişkiyi ve hiyerarşiyi anlamak ne kadar kolay (örneğin başlıklar, alt başlıklar, resimler)?



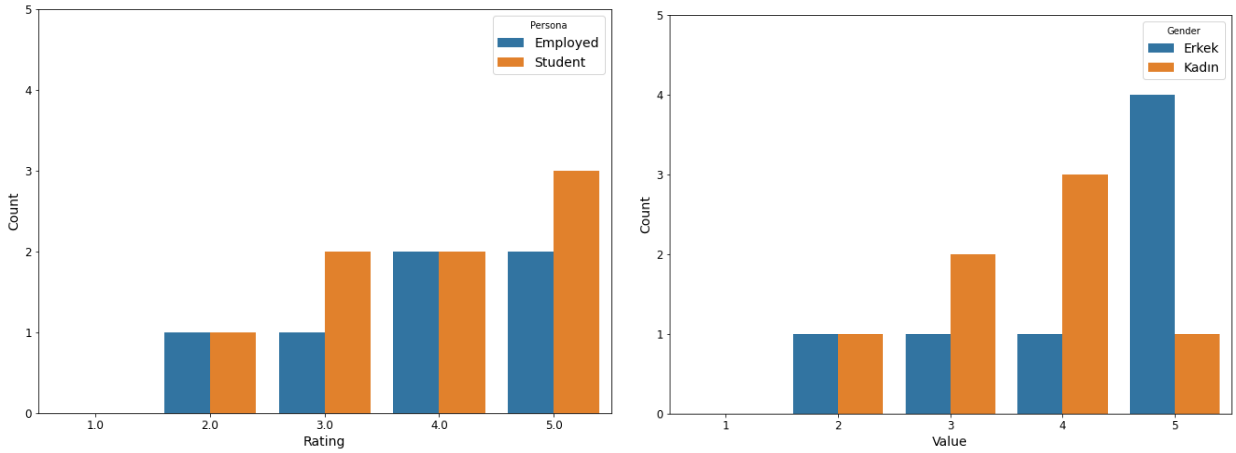


Q12: Hepsiburada uygulamasında farklı tasarım öğeleri arasındaki ilişkiyi ve hiyerarşiyi anlamak ne kadar kolay (örneğin başlıklar, alt başlıklar, resimler)?

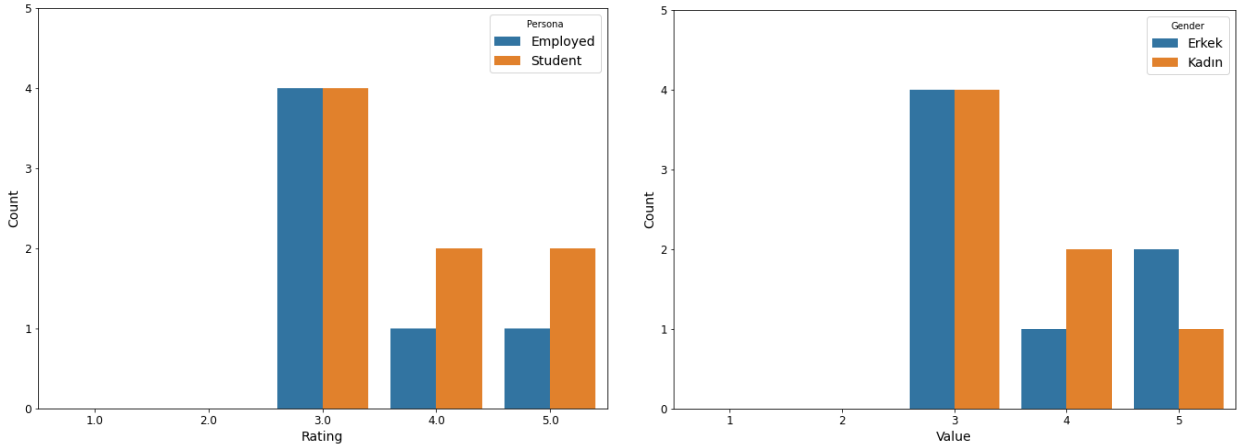




Q13: Trendyol uygulamasında aradığınız ekranı veya ürünü bulmak ne kadar kolay?

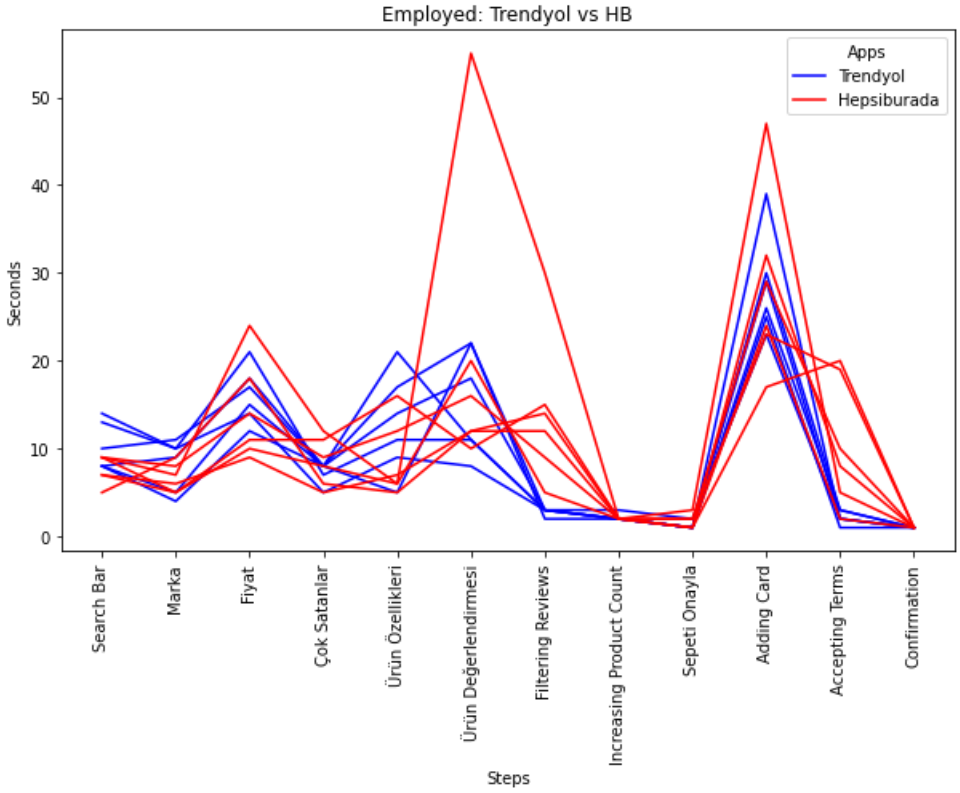


Q14: Hepsiburada uygulamasında aradığınız ekranı veya ürünü bulmak ne kadar kolay?

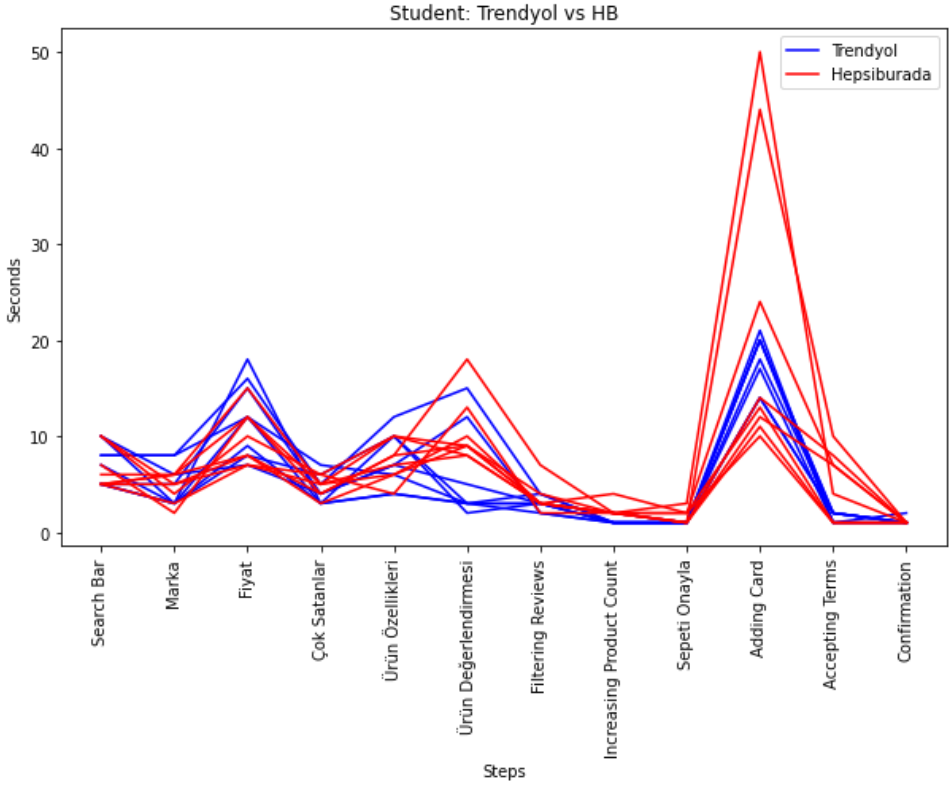


The graphs below show the task completion times of all participants for each task. The charts are split to show both personas' task completion times in both apps and both genders' task completion times in both apps.

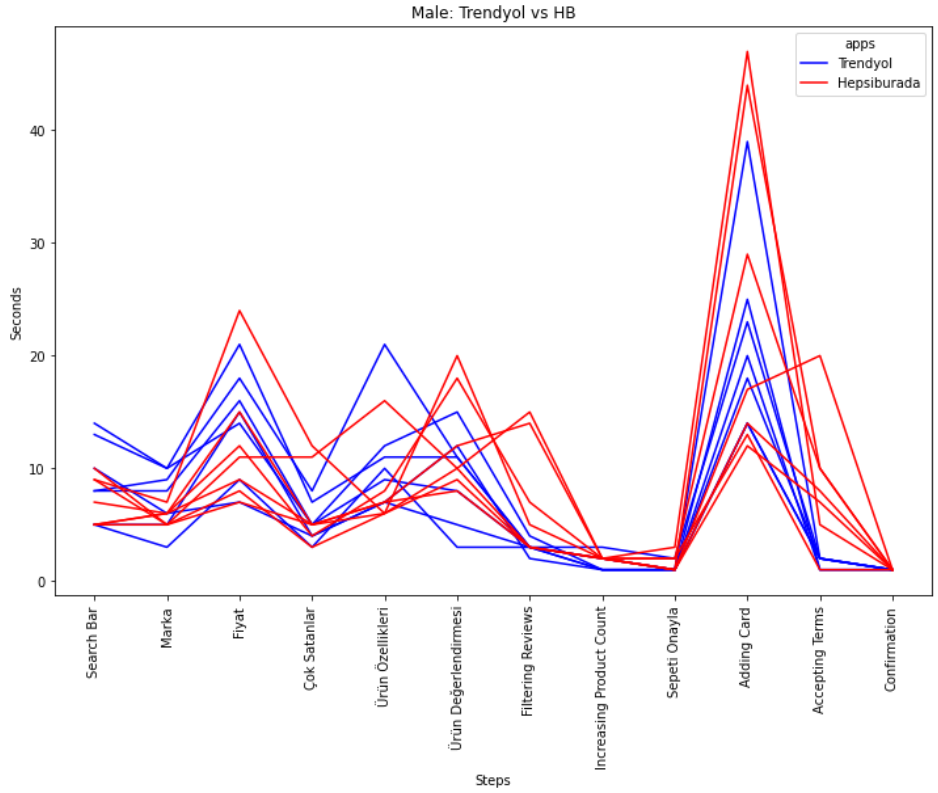
Employed: Trendyol vs. Hepsiburada



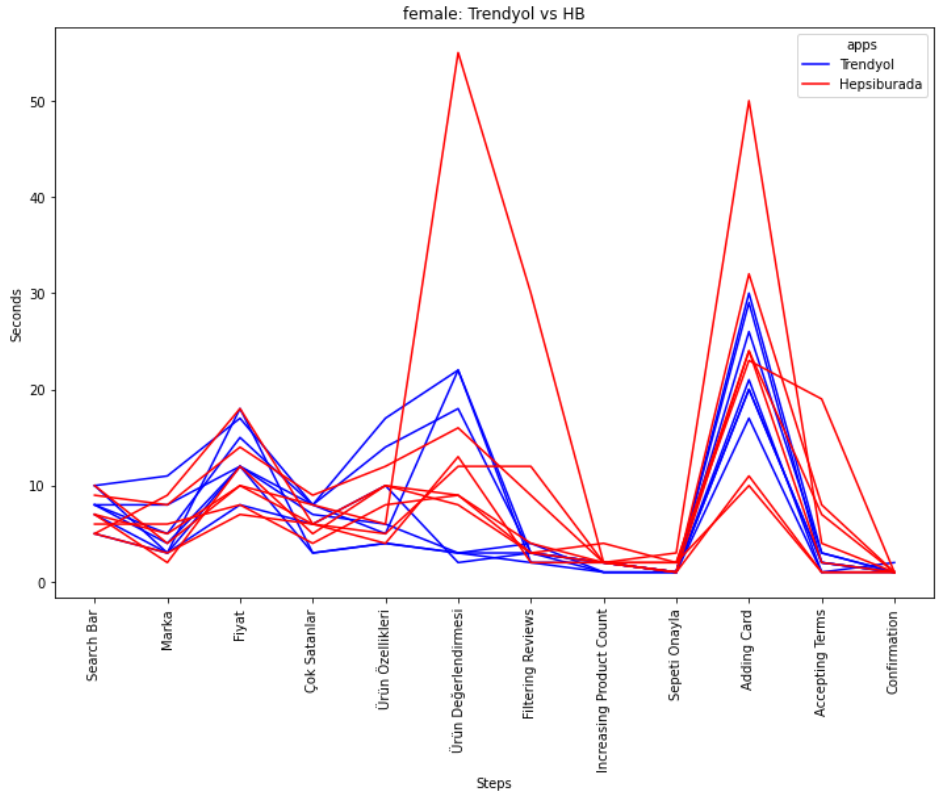
Student: Trendyol vs. Hepsiburada



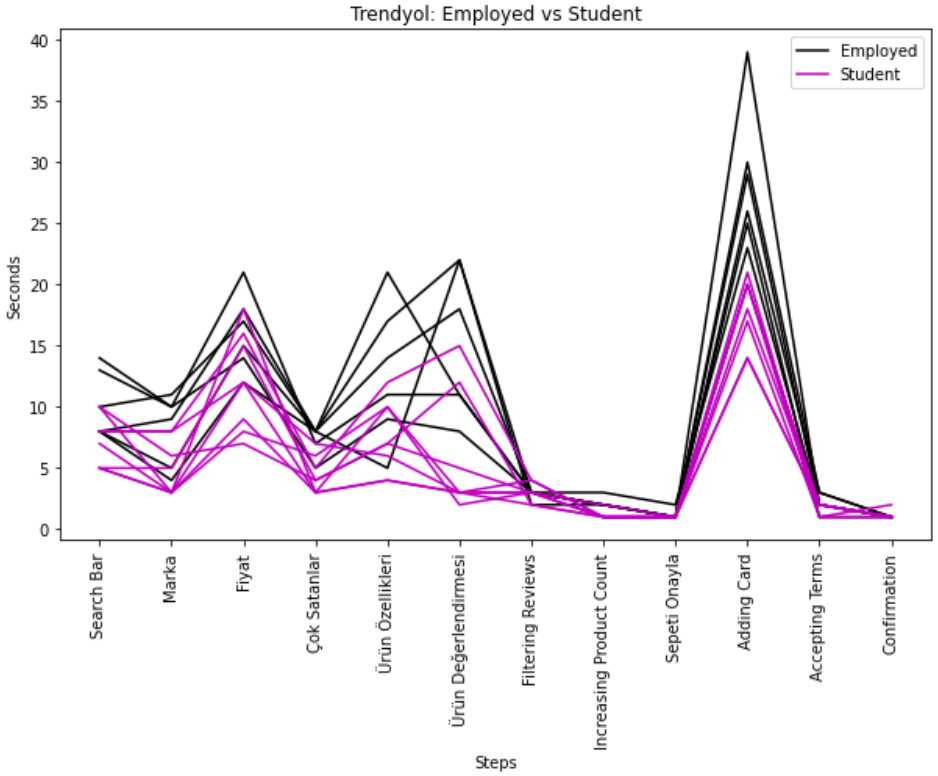
Male: Trendyol vs. Hepsiburada



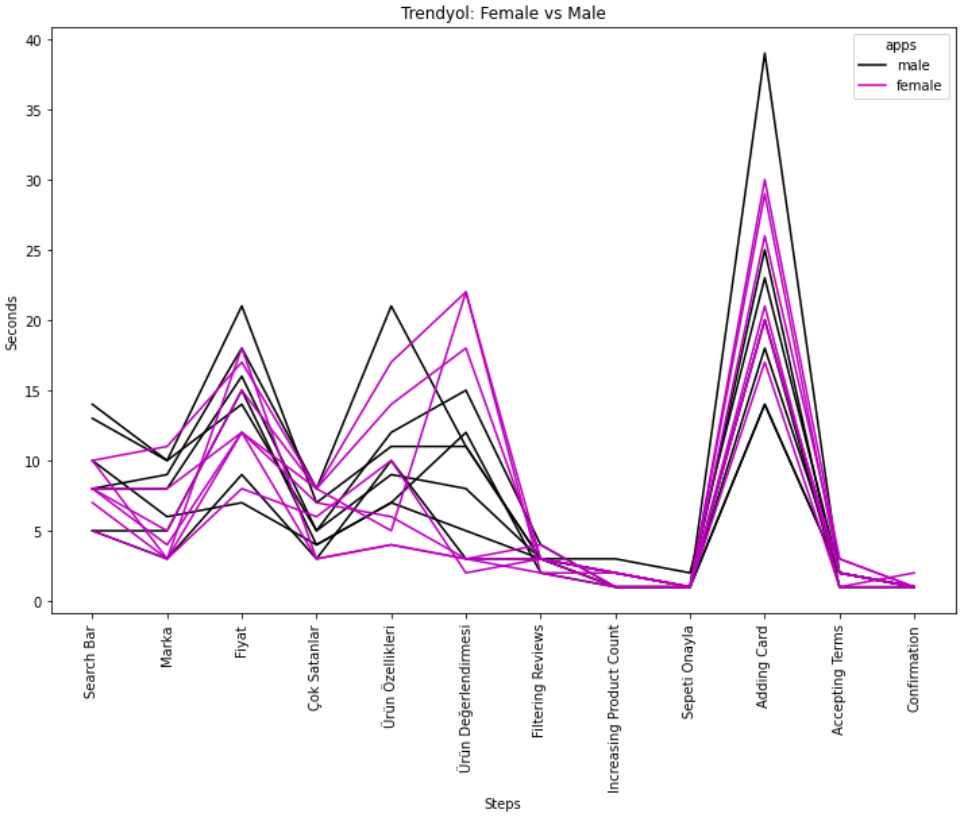
Female: Trendyol vs. Hepsiburada



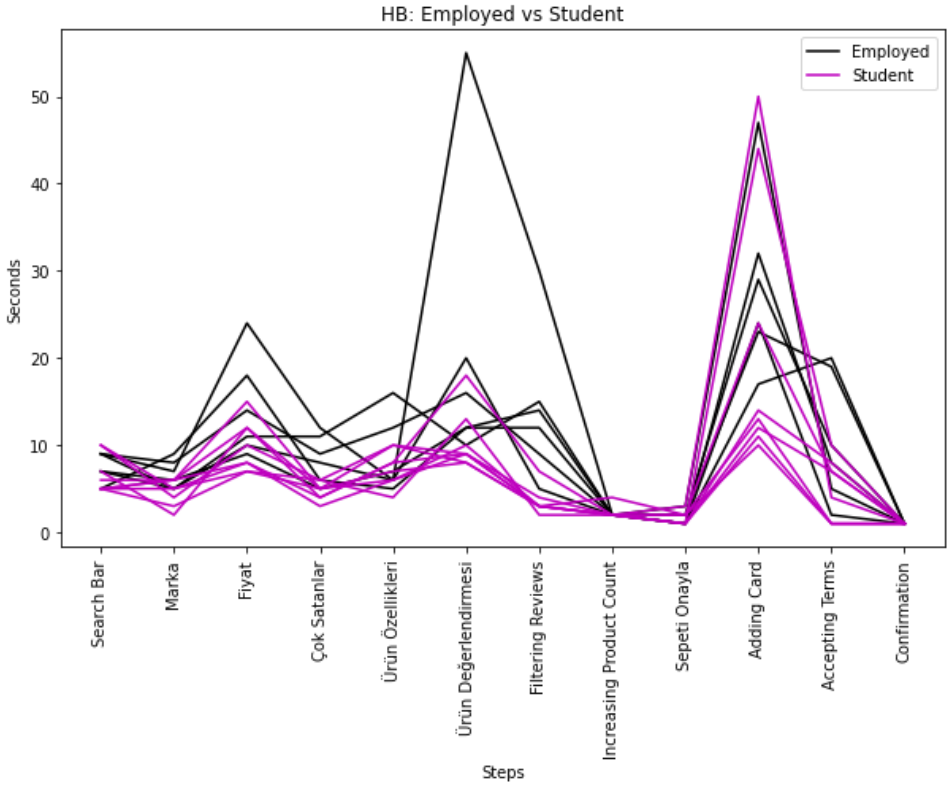
Trendyol: Student vs Employed



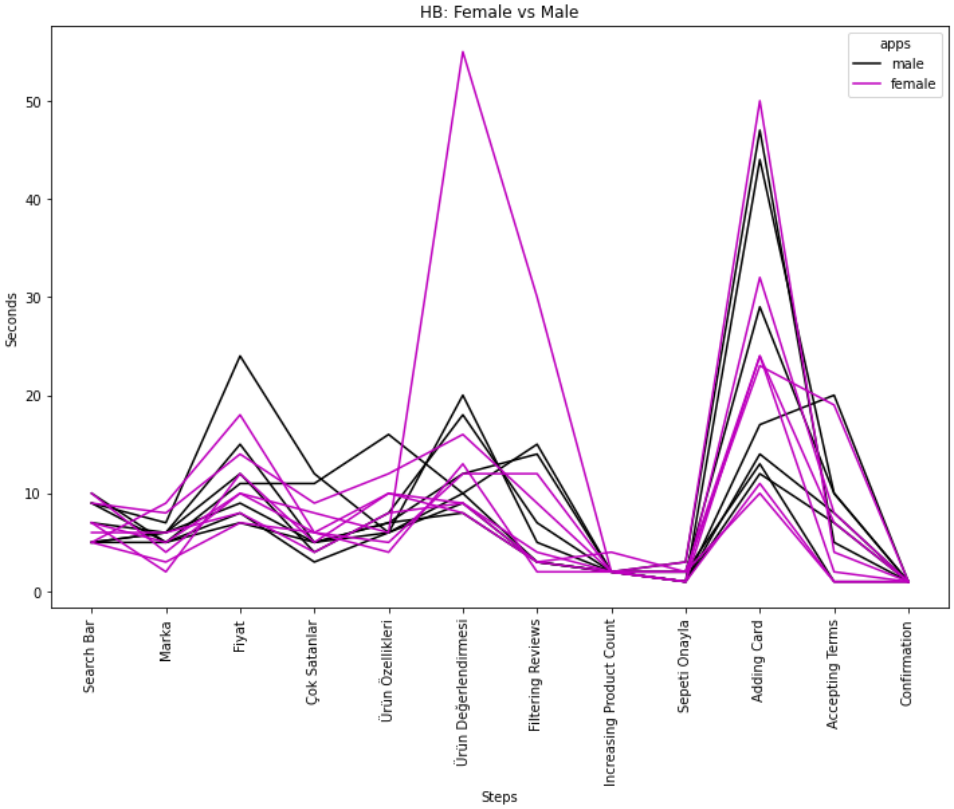
Trendyol: Male vs Female



Hepsiburada: Student vs Employed

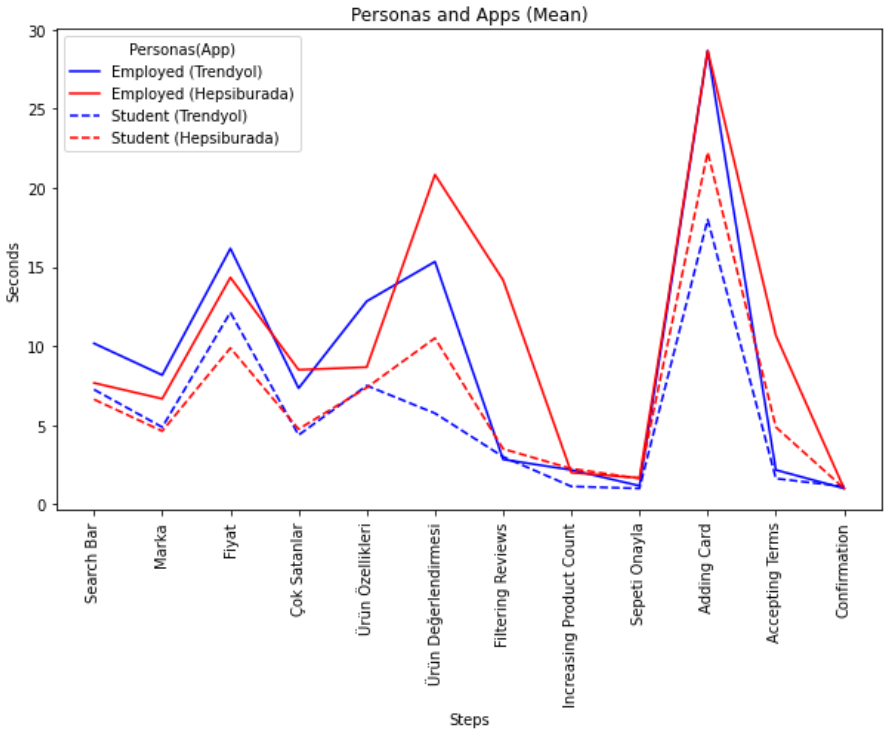


Hepsiburada: Male vs Female

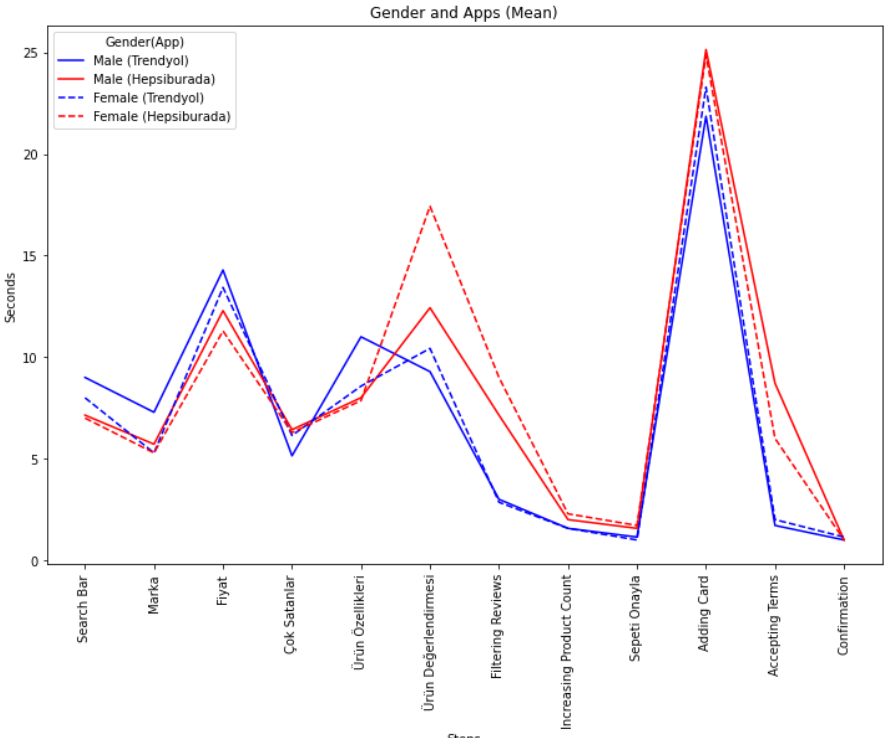


The graph below shows the means of task completion times of each persona group for each task on Trendyol and Hepsiburada.

Task Durations: employed vs student



Task Durations: Male vs Female



- For Trendyol, the mean of the total task completion time of employed participants was found to be 108 seconds and the standard deviation was 10.29563014. It was 67.75 and 9.498120115 for the students.
- For Hepsiburada the mean of the total task completion time of employed participants was found to be 124.8333333 seconds and the standard deviation was 18.2254401. It was 79.25 and 20.10508109 for the students.
- For Trendyol, the mean of the total task completion time of male participants was found to be 86.28571429 seconds and the standard deviation was 23.25019201. It was 83.71428571 and 23.97717168 for the female participants.
- For Hepsiburada the mean of the total task completion time of male participants was found to be 97.57142857 seconds and the standard deviation was 28.23034504. It was 100 and 33.69470779 for the female participants.

The results of the T-test done on different combinations of the selected persona groups and websites can be seen below:

- Comparison of Employed group on using Trendyol and Hepsiburada
    - t-statistic: -1.9698179050174527
    - p-value: 0.07716778302496737
- Comparison of Student group on using Trendyol and Hepsiburada
    - t-statistic: -1.462820554862953
    - p-value: 0.16560247949534265
- Comparison of Trendyol used by Employed and Student group
    - t-statistic: 7.575363926166279
    - p-value: 6.541908207011369e-06
- Comparison of Hepsiburada used by Employed and Student group
    - t-statistic: 4.363289344197168
    - p-value: 0.0009230103120119823
- Comparison of Trendyol and Hepsiburada used by male participants
    - t-statistic: -0.8164457081873503
    - p-value: 0.4301553002313607
- Comparison of Trendyol and Hepsiburada used by female participants
    - t-statistic: -1.0419036112713533
    - p-value: 0.31799326319654175
- Comparison of Trendyol among male and female participants
    - t-statistic: 0.20370108051450098
    - p-value: 0.8420006412392189
- Comparison of Hepsiburada among male and female participants

- t-statistic: -0.14617201366197966
- p-value: 0.8862124019185752

It was not possible to create a visualization of the data due to the lack of meaningful insights obtained from the answers given to open-ended questions asked to users. The answers to the questions can be found in the table provided below.

Q: Trendyol uygulamasında dikkat çeken tasarım öğeleri nelerdir (örneğin renkler, yazı tipi, resimler)?

Response number	Answers
1	yazı tipi ve boyutu daha anlaşılır ve dikkat çekiciydi
2	renkler
3	Kalabalık. Renk tonları daha basık hissettiriyor.
4	Daha duzgun duruyor
5	Turuncu renge ağırlık verilmiş, resimler içeriği yansıtıyor
6	Turuncu renk
7	Buyuk oge bloklari
8	Markaların kullandığı fotoğraflar markaya olan ilgimi arttırıyor. Bir şey almasam bile bakma isteği uyandırıyor.
9	Profil sayfası çok kalabalık görünüyor elementler arası fazla boşluk olmadığı için, renkler ve fontlar tutarlı ve iyi görünüyor. Değerlendirmeler ürünlerin hemen altında görülebiliyor resmin daha küçük olması sebebiyle.
10	Resimler
11	Elemanlar daha düzenli yerleştirilmiş
12	Resimler
13	turuncu rengi dikkatimi çekiyor
14	Resimler

Q: Hepsiburada uygulamasında dikkat çeken tasarım öğeleri nelerdir (örneğin renkler, yazı tipi, resimler)?

Response number	Answers
1	resimler, görsel canlılık
2	butonlar ve ekranların tasarımı
3	Daha renkli, hala kalabalık.
4	Ogeler birbirlerine daha uzak
5	Turuncu renge ağırlık verilmiş, yazı tipi daha farklı olabilirdi
6	Dikkat çekici bir şey yok
7	Tek basina duran yazilar (baslik, detay vs.)
8	Yok
9	Elementler arasında fazla boşluk bırakılmış, yazı fontları trendyola göre daha yuvarlak ve yumuşak, değerlendirmelerin ürün sayfasında görünmemesi bir dezavantaj.
10	Renkler daha sade
11	Biraz dağınıklık hissediliyor
12	Resimler
13	turuncu rengi dikkatimi çekiyor
14	Yazı tipi

Q: Gelecekte Trendyol uygulamasında görsellik açısından nelerin değişmesini önerirsiniz?

Response number	Answers
1	daha az dikkat dağıtan reklam olmalıydı
2	daha az karmaşık ekran düzeni, daha az ekrana gelen mesajlar (pop-up'lar)

3	Daha basitleşsin ve renkler. Daha canlı hale gelebilir
4	Onerim yok
5	-
6	Önerim yok
7	Sade bir arayuz gormek isterim
8	Yok
9	
10	
11	
12	Sadelik
13	biraz daha az karmaşık bir sayfa yaplabilir resimler çok dip dibe
14	Ana ekran daha az kalabalık olabilir

Q: Gelecekte Hepsiburada uygulamasında görsellik açısından nelerin değişmesini önerirsiniz?

Response number	Answers
1	daha az dikkat dağıtan reklam olmalıydı, sayfalar arası geçişlerde butonları bulmakta zorlandım
2	ürün kısmında ürün özelliklerini filtrelemede zorlandım o kısım geliştirilebilir
3	Daha az kalabalık daha düzenli olabilir
4	Daha sık bir duzen kullanmalarini
5	-
6	Yeni kart ekle yerine diğer kart ile öde yazmalarını öneririm

7	Sade bir arayuz gormek isterim
8	Uygulamaya ilk girdiğimizde ürünlerin direkt karşıma çıkması bende nedense bir güvensizlik hissi uyandırıyor. En başta direkt mağaza kutucukları çıkarsa nedense daha güvenilir bir alışveriş olacakmış gibi geliyor. En başta gördüğüm ürün mağaza kutucuklarına tıkladığımda karşıma çıkarsa, ürünü alma olasılığımın daha yüksek olacağını düşünüyorum .
9	
10	Ürün değerlendirmelerinde filtreleme kısmı daha görünür bir yere konulabilirdi.
11	
12	Sadelik
13	Hepsiburadanın sayfası görsellik açısından bir şey değiştirmesine gerek yok
14	

Discussion and Conclusion

Interpretation of the Results

To enhance the ease of navigation and organization, the section will be divided into three subcategories: Multiple Choice Questions, Durations, and Long Answers. The results will be analyzed and interpreted within each respective subcategory.

Multiple Choice Questions

Analysis of the Question 1 & 2:

First two questions ask the usage rates for the Trendyol and Hepsiburada in the scale of 1 to 5. These questions were included to determine if any significant bias existed among participants towards one platform that could potentially skew the data. Upon analysis of the data, it was determined that the average usage rate of Trendyol is higher than Hepsiburada. Further examination of the average usage rates within specific demographic groups was conducted:

Group	Trendyol	Hepsiburada
Students	3.12/5.0	1.75/5.0
Employed	2.83/5.0	3.0/5.0
Male	2.85/5.0	2.57/5.0
Female	3.14/5.0	2.0/5.0

Data suggests that the control group exhibits minimal bias towards Trendyol and their prior knowledge may have had minimal impact on the results. This knowledge of minimal risk of bias will be useful in interpreting subsequent questions.

Analysis of the Question 3:

The aim of the third question in the survey was to evaluate the brand identity creation capabilities of two companies. Assuming both companies had constructed a strong brand identity for themselves, users should have been able to identify from which platform the screenshots in the question were taken. The expected answer was Hepsiburada, however, an equality in terms of responses was observed.

A comparison of the results from the student group and the employed group revealed that both companies failed to create a brand identity that was effective for both groups, with "Trendyol"

and "Hepsiburada" responses being equal in both groups. In the gender-based analysis of the results, it is seen that 57.4% of the males (by 1 vote), and 42.85% of the females answered the question correctly. These results revealed that the companies also partially failed to build a brand identity that was effective for males (4 Hepsiburada & 3 Trendyol) and completely failed to build a brand identity that was effective for females (3 Hepsiburada & 4 Trendyol).

The reasons for these companies' failure in terms of brand identity may include the constant implementation of industry best practices and the constant copying of competitors. In the highly dynamic eCommerce environment, it is essential to keep platforms up to date and implement cutting-edge technologies that are popular among customers. This constant copying of competitors can lead to platforms converging into look-alikes, which can ultimately erode brand identity.

Analysis of the Question 4:

The reasoning presented in the analysis of the results for the third question is also relevant to the fourth question, which concerns the layout of home screens. In the occupation-based analysis, both students and employed participants demonstrated a 50% preference for both Trendyol and Hepsiburada. Similarly, the gender-based analysis revealed that 57.4% of male participants and 57.4% of female participants preferred the home screen layout of either Trendyol or Hepsiburada, respectively.

These results indicate a near tie for all subgroup comparisons. This phenomenon can likely be attributed to the similar layouts employed by both companies in their mobile app home screens, which may contribute to the blurring of their brand identities. It is essential for companies to understand that to differentiate themselves in the highly competitive eCommerce market, they must not only focus on the functional aspects of their platform but also on the visual elements, in order to establish a unique and recognizable brand identity.

Analysis of the Question 5:

The fifth question aims to identify the impact of typographic design choices of the Trendyol and Hepsiburada apps in terms of typographic consistency and readability of the texts. the results of the study indicate that there is a clear preference for either the Trendyol or Hepsiburada app when it comes to typographic consistency and readability of the text. However, the preference for each app varies significantly when looking at the results by occupation and gender.

When considering the occupation-based analysis, it is clear that students have a preference for Trendyol (62.5%) over Hepsiburada (37.5%) which could indicate that the design of Trendyol is more appealing to a younger demographic. On the other hand, employed participants have a preference for Hepsiburada (66.6%) over Trendyol (33.3%) this could indicate that the design of Hepsiburada is more appropriate for a working adult demographic.

Similarly, when considering the gender-based analysis, we see a similar pattern of preference. Male participants have a preference for Trendyol (71.42%) over Hepsiburada (28.57%) this could indicate that the design of Trendyol is more appealing to men. On the other hand, female participants have a preference for Hepsiburada (71.42%) over Trendyol (28.57%) this could indicate that the design of Hepsiburada is more appealing to women.

It is important to note that these are just some possible interpretations of the results and additional research would be needed to confirm these findings. However, based on the data provided in the results, it seems that the typographic design choices of the two apps may appeal differently to different groups of people, specifically based on their occupations and gender.

Analysis of the Question 6:

The results of the sixth question, which aimed to determine the app with the most visually pleasing and consistent color scheme, reveal a clear preference for Trendyol among all subgroups. Analysis of results based on occupation reveals that 75% of students and 66.6% of employed participants cast their vote for Trendyol. Furthermore, a gender-based analysis shows that 71.42% of both male and female participants chose Trendyol. This trend can be attributed to the underlying visions and branding strategies of the two companies. As an eCommerce website with roots in the fashion industry, Trendyol places a significant emphasis on visual aesthetics and consistency in its color scheme, in alignment with the fundamental principles of the fashion industry. It is also likely that the company's deep connection to fashion has led it to prioritize visual appeal and consistency in its color scheme, which in turn may have contributed to its popularity among the surveyed participants.

Analysis of the Question 7:

The analysis of the responses to the seventh question, which concerns the effective utilization of empty space between visual elements, indicates that Hepsiburada's user interface is perceived as less fatiguing to the eye. A closer examination of the results by occupation highlights that a significant proportion of participants, specifically 62.5% of students and 83% of employed individuals, favored Hepsiburada. Similarly, an analysis based on gender shows that a majority of male participants (71.42%) and female participants (57.14%) also voted in favor of Hepsiburada.

However, upon further examination of the results in the context of subsequent questions, it becomes evident that the generous use of empty space in Hepsiburada's user interface is not universally well-received, as it is sometimes viewed as unusual or atypical. This suggests that while the use of empty space in Hepsiburada's user interface may be beneficial in terms of reducing eye fatigue, it may not always be the most effective design strategy for improving the overall user experience.

Analysis of the Question 8 & 9:

The eighth and ninth questions explore the factors that contribute to the difficulty of using certain elements, such as buttons, menu items, product images, or descriptions, within the user interface of both applications. Participants were asked to rate the level of difficulty they experienced while using the app on a scale of 1 (very easy) to 5 (very hard). The results of these questions have provided valuable insights and have confirmed the observations made in the previous question, revealing that users find navigating Hepsiburada to be challenging. To further analyze the findings, the average difficulty rates within specific demographic groups are presented below for deeper examination.

Group	Trendyol	Hepsiburada
Students	2.0/5.0	2.87/5.0
Employed	2.0/5.0	2.33/5.0
Male	2.0/5.0	2.85/5.0
Female	2.0/5.0	2.42/5.0

When analyzing the results by demographic groups, there are some similarities and differences. For example, students, employed individuals, and both male and female participants all rated the difficulty level of using certain elements in the Hepsiburada app similarly. However, the ratings for both apps were quite low, with an average of 2 out of 5, indicating that users find both apps challenging to use.

These findings suggest that both apps may have room for improvement in terms of user interface design. The use of ample white space between components in the design may not necessarily lead to an increase in user satisfaction and ease of use. Further research may be needed to understand why users find both apps challenging to use and how they can be improved to increase user satisfaction.

Additionally, the present evidence appears to lend support to the assertion that the strategy of utilizing ample white space between components in an effort to create a visually pleasing design may not necessarily lead to an increase in user satisfaction.

Analysis of the Question 10:

The tenth research question aimed to investigate the relationship between the visual design of elements in mobile applications and their perceived reliability by users. The results of the study were unexpected, as a majority of participants across all subgroups reported that there was no difference in reliability between the two apps under examination.

An occupation-based analysis of the results revealed that 62.5% of student participants found no difference in reliability between the apps, while 25% found Trendyol to be more reliable and 12.5% found Hepsiburada to be more reliable. Among employed participants, 100% reported that there was no difference in reliability between the apps.

A gender-based analysis of the results showed that 85.71% of male participants found no difference in reliability between the apps, while 14.28% found Hepsiburada to be more reliable. Among female participants, 71.42% found no difference in reliability between the apps, while 28.57% found Trendyol to be more secure.

Overall, the results suggest that visual design of elements in mobile applications does not have a significant impact on users' perceptions of reliability. The majority of participants across all subgroups (students and employed, and male and female participants) reported that there was no difference in reliability between the two apps under examination. This suggests that other factors, such as the functionality and performance of the apps, may play a more significant role in determining users' perceptions of reliability.

It's also worth noting that the results of the study revealed some interesting insights when analyzing the data by occupation and gender. For example, among student participants, a higher percentage found Trendyol to be more reliable compared to Hepsiburada, while among employed participants, 100% reported that there was no difference in reliability between the apps. This could suggest that students may have different criteria for evaluating the reliability of mobile applications compared to employed individuals.

Additionally, when analyzing the data by gender, it appears that male participants were more likely to report that there was no difference in reliability between the apps, while female participants were more likely to find Trendyol to be more secure. This could indicate that men and women may have different preferences and priorities when evaluating the reliability of mobile applications.

Overall, these results suggest that visual design may not be a determining factor in users' perceptions of reliability, but it is important to note that this study has a small sample size and the results should be considered accordingly.

Analysis of the Question 11 & 12:

The eleventh and twelfth questions investigate whether it is easy is it to understand the relationship and hierarchy between different design elements such as titles, subheadings, and images in both app. Participants were asked to rate the level of difficulty they experienced while using the app on a scale of 1 (very easy) to 5 (very hard). Results indicated that the information hierarchy in the Hepsiburada app is rated as slightly easier to understand than the information hierarchy in the Trendyol app. To further analyze the findings, the average rates of

understandability of the information hierarchy within specific demographic groups are presented below for deeper examination.

Group	Trendyol	Hepsiburada
Students	3.75/5.0	3.25/5.0
Employed	3.50/5.0	3.50/5.0
Male	3.71/5.0	3.14/5.0
Female	3.57/5.0	3.57/5.0

When looking at the results for students and employed individuals, the average difficulty ratings for understanding the information hierarchy in both apps are very similar. This suggests that there is no significant difference in the understandability of the information hierarchy for these groups. When looking at the results for male and female participants, there is a slightly larger difference in the average ratings. Male participants rated the Hepsiburada app as having a slightly easier to understand information hierarchy compared to Trendyol. On the other hand, female participants did not find significant difference between the two apps regarding the information hierarchy's understandability. This suggests that there may be some differences in how male and female participants perceive the understandability of the information hierarchy in these apps.

It's worth noting that the differences in understandability of the information hierarchy between the two apps and among the demographic groups are not significant, and the average ratings are close to each other. However, these results suggest that further research may be needed to understand why there are differences in how certain demographic groups perceive the understandability of the information hierarchy in these apps and how these apps can improve their information hierarchy to make it more understandable for all user groups.

Analysis of the Question 13 & 14:

The thirteenth and fourteenth questions investigates the difficult level of finding a screen or product in both mobil apps. Participants were asked to rate the level of difficulty they experienced while using the app on a scale of 1 (very easy) to 5 (very hard). The results showed that users find it challenging to find a screen or product within both mobil apps. The average ratings for both apps were relatively high, with an average rating of around 3.87 out of 5 for Trendyol and around 3.75 out of 5 for Hepsiburada. To further analyze the findings, the average rates of difficulty for finding a screen or product within specific demographic groups are presented below for deeper examination.

Group	Trendyol	Hepsiburada
Students	3.87/5.0	3.75/5.0
Employed	3.83/5.0	3.50/5.0
Male	4.14/5.0	3.71/5.0
Female	3.57/5.0	3.57/5.0

When analyzing the results by demographic groups, there are some similarities and differences. For example, students and employed individuals have similar difficulty levels when it comes to finding screens or products in both apps, with average ratings of around 3.87 and 3.83 respectively for Trendyol and 3.75 and 3.50 respectively for Hepsiburada. However, when it comes to gender-based analysis, males found Trendyol more challenging than Hepsiburada with an average rating of 4.14 and 3.71 respectively, while females found both apps to be similarly challenging with an average rating of 3.57 for both apps.

These findings suggest that both apps may have room for improvement when it comes to the discoverability of screens and products within the app. The results also suggest that users may have different preferences when it comes to finding information within an app, and that these preferences may be influenced by demographic factors such as gender. Further research may be needed to understand why users find both apps challenging to use in this respect and how they can be improved to increase user satisfaction.

Task Completion Durations

From a Human-Computer Interaction (HCI) and User Experience (UX) perspective, the analysis of completion time statistics reveals decisive patterns among the employed participants and students in regards to the two e-commerce platforms, Trendyol and Hepsiburada. The results indicate that the student group have outperformed the employed group on both platforms, in parallel to expectations. This outperformance in durations can be reasoned with students being highly experienced with using mobile technologies since it is a technology of their era. Eventhough the employed group might have performed better with an application that they have been repeptitively using for their work, they could not compete against the students on platforms that they are not much familiar with.

Occupation-Based Analysis:

Based on the information provided, it appears that the mean total task completion time for employed participants was 108 seconds for Trendyol and 124.83 seconds for Hepsiburada. The

standard deviation for the employed participants was 10.29 for Trendyol and 18.22 for Hepsiburada.

For the students, the mean total task completion time for Trendyol was 67.75 seconds and for Hepsiburada it was 79.25 seconds. The standard deviation for the student participants was 9.49 for Trendyol and 20.10 for Hepsiburada.

Overall, it seems that the employed participants took longer to complete the task than the student participants for both Trendyol and Hepsiburada. Additionally, the standard deviation for the employed participants was higher than that of the students for both companies, which suggests that there was more variation in task completion time among the employed participants than the student participants.

Gender-Based Analysis:

Based on the given information, it appears that the mean total task completion time for male participants in the Trendyol study was 86.28 seconds, with a standard deviation of 23.25. For female participants, the mean total task completion time was slightly lower at 83.71 seconds, with a standard deviation of 23.97.

For the Hepsiburada study, the mean total task completion time for male participants was found to be 97.57 seconds, with a standard deviation of 28.23. For female participants, the mean total task completion time was slightly higher at 100 seconds, with a standard deviation of 33.69.

It can be concluded that the mean total task completion time for male participants in both studies is shorter than that of female participants, and the standard deviation is larger for female participants. This suggests that there may be a greater variability in task completion times among female participants compared to male participants.

It is important to note, however, that these results do not take into account other factors that could influence task completion times on both Trendyol and Hepsiburada. These factors may include, but are not limited to, the participants' prior familiarity and knowledge of the app, their level of experience with the app, and their interest in online shopping. Therefore further research is necessary to determine the specific factors that influence task completion times and to evaluate their relative impact on user experience.

Potential detailed explanations for the variations in task completion times among different participant groups may include, but are not limited to:

- **Participants' prior familiarity and knowledge:** The student participants may have possessed a higher level of prior knowledge and understanding of the mechanics of online shopping, which could have enabled them to navigate the e-commerce platforms, Trendyol and Hepsiburada, more efficiently and complete the task at a faster pace. Conversely, the employed participants may have had less prior knowledge and

understanding of online shopping, which may have resulted in slower task completion times and greater difficulty in navigating the platforms.

- **Participants' level of experience:** Aside from the familiarity with the platform, the student participants may have possessed an overall higher level of experience and familiarity with e-commerce platforms and mobile applications in general, which could have facilitated their task completion times. On the other hand, employed group may have had less exposure and experience with these platforms, which may have resulted in slower task completion times.
- **Participants' interest in online shopping:** The student participants may have had more interest in shopping than the students, which would have made them more motivated to complete the task quickly and fed their experience and familiarity.

T-Test on Duration Results

The t-test is a commonly utilized statistical method for determining the significance of the difference between the means of two groups. The t-test compares the means of the two groups and calculates a t-value and a p-value. The t-value measures the difference between the means of the two groups, and the p-value is the probability that the difference in means is due to chance.

In this case, the t-test is being used to compare the mean time to complete the steps for different groups: employed people using Trendyol, employed people using Hepsiburada, students using Trendyol, and students using Hepsiburada.

For the first comparison, employed people using Trendyol and employed people using Hepsiburada, the t-statistic is -1.9698 and the p-value is 0.07716. This means that there is not a significant difference between the mean time to complete the steps for these two groups. The p-value is greater than 0.05, which is the threshold for statistical significance. Therefore, it can be concluded that there is not enough evidence to reject the null hypothesis, which states that there is no difference between the means of the two groups.

For the second comparison, students using Trendyol and students using Hepsiburada, the t-statistic is -1.4628 and the p-value is 0.16560. This means that there is not a significant difference between the mean time to complete the steps for these two groups. The p-value is greater than 0.05, which is the threshold for statistical significance. Therefore, it can be concluded that there is not enough evidence to reject the null hypothesis, which states that there is no difference between the means of the two groups.

The third comparison is between employed (Trendyol) and student (Trendyol) groups. The t-statistic is 7.58 and the p-value is 6.54e-06. This indicates that there is a significant difference between the means of the two groups, and the null hypothesis (that there is no significant

difference between the means of the two groups) can be rejected. Specifically, it suggests that the employed group has significantly higher mean of the completion time than the student group.

The fourth comparison is between employed (Hepsiburada) and student (Hepsiburada) groups. The t-statistic is 4.36 and the p-value is 0.0009. This indicates that there is a significant difference between the means of the two groups, and the null hypothesis (that there is no significant difference between the means of the two groups) can be rejected. Specifically, it suggests that the employed group has significantly higher mean of the completion time than the student group.

Long Answer Questions

Analysis of the Long Answer Question 1:

In conducting research on the design elements of popular e-commerce platforms, the question "What are the design elements that stand out in Trendyol (for example, colors, fonts, images)?" was posed. The responses to this inquiry reveal the significant emphasis placed on visual elements, such as images and colors, rather than fonts. The visual elements play a crucial role in catching the users' attention and encouraging them to explore the available products. This is especially important when users access apps like Trendyol, as they are often in a mode of exploration and may not have a specific item in mind. In this scenario, a quick visual scan of the available products is more effective than reading the text descriptions individually. The use of visually appealing images, bright and contrasting colors, and a clear and easy to navigate layout are crucial elements that contribute to the success of e-commerce platforms like Trendyol.

A similar pattern was observed in responses to the same question about the e-commerce platform Hepsiburada. The use of blank spaces between components on the platform was noted as a unique aspect, but overall, the emphasis on visual elements was also prevalent in responses about Hepsiburada. The strategic use of blank spaces can create a sense of minimalism and sophistication, making the platform more visually appealing and easy to navigate. The use of consistent typography and color schemes also contribute to the platform's overall aesthetic.

In conclusion, the responses to the question about the design elements of e-commerce platforms like Trendyol and Hepsiburada indicate that visual elements play a crucial role in the success of these platforms. The use of visually appealing images, bright and contrasting colors, clear and easy to navigate layout, consistent typography and color schemes, and the strategic use of blank spaces all contribute to the overall aesthetic and user experience of these platforms.

Analysis of the Long Answer Question 2:

In the final inquiry, participants were asked to provide suggestions for enhancing the visuality of the Trendyol and Hepsiburada applications. Responses received for Trendyol were centered on the need for a simplification of the user interface (UI). Specifically, emphasis was placed on the importance of reducing complexity and creating a cleaner aesthetic that is less tiring to the eyes. This feedback aligns with comments received in response to a previous question regarding UI fatigue, indicating that a cluttered and complex UI can negatively impact user experience.

On the other hand, feedback received for Hepsiburada was more varied, with suggestions for improvements in three main areas:

1. **Better utilization of blank spaces within the UI:** It was suggested that blank spaces should be used more effectively to improve the overall visual appeal and to make the UI more organized and easy to navigate.
2. **Further simplification of the UI:** It was suggested that the UI should be made more simple and easy to use by reducing the number of elements and making the layout more straightforward.
3. **Increased visibility of features such as filters:** It was suggested that filters should be made more visible and easy to access to make it easier for users to find what they are looking for.

It is worth noting that the comments pertaining to blank spaces and complexity perception highlight the need for a balance between aesthetics and functionality in UI design. While ample blank space can improve visual appeal, it may not necessarily lead to improved navigation. Therefore, designers should strive to create a UI that not only looks good but also facilitates ease of use and functionality.

Practical Implications of the Study

The analysis of multiple choice questions in the survey aimed to determine the usage rates and brand identity of two eCommerce platforms, Trendyol and Hepsiburada. The data suggests that the average usage rate of Trendyol is higher than Hepsiburada, but both companies failed to create a strong brand identity that was effective for all demographic groups. The results also indicate that both companies have similar home screen layouts, which may contribute to the blurring of their brand identities. The fifth question of the survey aimed to identify the impact of typographic design choices in terms of consistency and readability of the text and the results indicate that there is a clear preference for either the Trendyol or Hepsiburada app, but the preference varies significantly among different demographic groups.

Besides the multiple choice questions, the task completion durations of the participants provided important insights about the time it takes for a user to complete a task on an e-commerce platform is an important measure of user experience. The study found that there were no significant differences in task completion duration between employed and student users for both Trendyol and Hepsiburada. However, there was a significant difference between the means of the completion time for the groups of employed people using Trendyol and students using Trendyol, suggesting that the employed group had a significantly higher mean of the completion time than the student group.

In addition to this, a T-Test on the duration results was conducted to compare the mean time to complete the steps for different groups: employed people using Trendyol, employed people using Hepsiburada, students using Trendyol, and students using Hepsiburada. The results of the T-Test showed that there was not a significant difference between the mean time to complete the steps for the groups of employed people using Trendyol and Hepsiburada, and students using Trendyol and Hepsiburada. However, there was a significant difference between the means of the completion time for the groups of employed people using Trendyol and students using Trendyol, suggesting that the employed group had a significantly higher mean of the completion time than the student group.

Furthermore, the analysis of the long answer questions also revealed that the design elements that stand out in Trendyol, such as colors, fonts, images, are visual elements and play a crucial role in catching the users' attention and encouraging them to explore the available products. The use of visually appealing images, bright and contrasting colors, and a clear and easy to navigate layout are crucial elements that contribute to the success of e-commerce platforms like Trendyol. A similar pattern was observed in responses to the question about the design elements that stand out in Hepsiburada.

Practical implications of this study are that eCommerce companies should focus on creating a strong brand identity that appeals to all demographic groups, rather than just relying on usage rates. Additionally, typographic design choices play a crucial role in user experience and should be considered carefully in order to ensure consistency and readability of the text. Furthermore, it is also important for eCommerce companies to take into account the duration time for completing the steps for different user groups, as it can affect user satisfaction and engagement. Additionally, the importance of visual elements like colors, images and layout in catching users' attention and encouraging them to explore the available products should be considered as well.

UX designers, researchers, and others can learn from this study that creating a strong brand identity is important for eCommerce companies, as it can help to differentiate them from their competitors. They can also learn that typographic design choices can have a significant impact on user experience and should be considered carefully in order to ensure consistency and

readability of the text. Additionally, it is also important for designers to consider the duration time for completing the steps for different user groups and optimize it for better user experience. The importance of visual elements like colors, images and layout in catching users' attention and encouraging them to explore the available products should also be considered as well. Overall, this study can benefit eCommerce companies, by providing them with insights on how to improve their brand identity, user experience and optimize the duration time, and visual elements which can lead to increased customer engagement and sales. Furthermore, the study also highlights the importance of considering task completion duration from a HCI perspective and how it can impact user experience.

Limitations of this Study and Recommended Improvements

Data availability:

It may be difficult to obtain sufficient data on the user interfaces of Hepsiburada and Trendyol, as well as data on how users interact with these interfaces. This may make it challenging to accurately assess the impact of visual design on brand identity, consumer trust, and user loyalty.

To address the limitation of data availability, consider using a variety of data sources such as user surveys, interviews, and website analytics to gather information on the user interfaces and interactions with Hepsiburada and Trendyol.

Subjectivity:

Visual design is a subjective area, and different people may have different opinions on what constitutes good design. This may make it difficult to reach a consensus on the effectiveness of the visual design of Hepsiburada and Trendyol in achieving the desired outcomes.

To address the subjectivity of visual design, consider using a combination of quantitative and qualitative research methods, such as user testing and surveys, to gather data on the effectiveness of the visual design in achieving desired outcomes.

Time and resource constraints:

Conducting a thorough and detailed analysis of the role of visual design in the user interfaces of Hepsiburada and Trendyol may require a significant amount of time and resources. This may be a limitation if there are constraints on the availability of these resources.

To address the time and resource constraints, consider using a more efficient research design, such as a smaller sample size or a shorter duration of data collection, to reduce the amount of time and resources required for the study.

The complexity of the topic:

The topic of the role of visual design in the user interfaces of Hepsiburada and Trendyol is complex, as it involves multiple factors and variables that may interact in complex ways. This may make it challenging to fully understand the impact of visual design on brand identity, consumer trust, and user loyalty.

To address the complexity of the topic, consider breaking down the research into smaller, more manageable parts and focusing on specific aspects of visual design and their impact on brand identity, consumer trust, and user loyalty.

The scope of the study:

The study is limited to the examination of only two mobile e-commerce apps, Trendyol and Hepsiburada, and may not be generalizable to other mobile e-commerce apps. Additionally, the study is limited to participants who are university students and employed individuals, and may not be generalizable to other groups such as older adults or non-professional individuals.

To address the scope of the study, consider conducting further research to examine other mobile e-commerce apps and other user groups such as older adults or non-professional individuals to increase the generalizability of the findings.

Methodological limitations: The study is limited to the examination of visual design and brand identity, and may not consider other factors that could impact the usability and efficiency of mobile e-commerce apps. Additionally, the study is limited to usability testing and questionnaire data collection method, which may not capture all aspects of user experience. Furthermore, the study is limited to the measurement of task completion time as a metric for usability and efficiency, which may not capture other important aspects such as user satisfaction or retention.

To address methodological limitations, consider using a variety of research methods such as eye-tracking, interviews, and website analytics to capture a more comprehensive view of user experience and usability. Additionally, consider using a variety of metrics such as user satisfaction and retention in addition to task completion time to measure usability and efficiency.

Suggestions for Further Research

The research presented in this study focuses on the relationship between visual design and brand identity in mobile e-commerce apps, specifically Trendyol and Hepsiburada. The participants were divided into groups based on gender (male and female) and occupation (university students and employed individuals). However, there are several opportunities for further research in this area.

One suggestion for further research is to expand the sample size and test the usability and efficiency of mobile e-commerce apps from different industries and countries. This would provide a more comprehensive understanding of the relationship between visual design and brand identity in mobile e-commerce apps in different contexts. For example, testing the usability of mobile e-commerce apps from popular e-commerce websites such as Amazon in the United States, Taobao in China, Flipkart in India, and Rakuten in Japan would give insight into how visual design and brand identity elements are used in different cultures and how they affect user experience and business success in those contexts. This would also give insight into how design elements that perform well in one market might not perform well in another market, this would help in understanding cultural nuances. This would provide valuable information for businesses looking to expand their mobile e-commerce operations globally.

Another suggestion is to investigate the impact of personalization on the usability and efficiency of mobile e-commerce apps. Personalization in UI/UX has become increasingly important in the mobile e-commerce industry, as it has been found to lead to increased sales and customer loyalty as highlighted by Perlman (2021) in their study. This highlights the need for further research in this area to understand how best to incorporate personalization elements such as user's location, purchase and browsing history, and other personal data, into the design and user experience of mobile e-commerce apps. Additionally, the role that user-generated content such as customer reviews, ratings, and recommendations can play in the success of a mobile e-commerce app must also be explored. As the mobile e-commerce industry continues to grow and evolve, it is vital that businesses understand how to effectively personalize the user experience to increase customer satisfaction and loyalty. Therefore, further research in this area is essential to stay competitive in the mobile e-commerce market.

Another suggestion for further research is to increase the participant count and diversity of the participant groups. The sample size in this study was limited to university students and employed individuals, and both male and female participants. However, in order to gain a more comprehensive understanding of how visual design and brand identity affect the usability and efficiency of mobile e-commerce apps, it would be beneficial to expand the sample size and include participants from different age groups, income levels, and education levels. Additionally, it would be beneficial to include participants from different cultural backgrounds, as cultural differences may impact the way users perceive and interact with visual design and brand identity

elements. Expanding the diversity of the participant groups would provide a more representative sample of the population and allow for more generalizable conclusions to be drawn. It would also help to identify potential barriers and opportunities for specific groups of users, which could inform the design and branding of mobile e-commerce apps for different target groups. This would ultimately lead to a more inclusive and user-centered design approach that could enhance the user experience and business success of mobile e-commerce apps.

Lastly, another suggestion for further research is to conduct long-term studies on the impact of visual design and brand identity on user engagement and conversion rates. While this study provides insight into the immediate effects of visual design and brand identity on usability and efficiency, it would be beneficial to conduct a longer-term study to understand how these effects evolve over time. This could be done by conducting follow-up usability testing with the same participants over a period of several months or even a year, to assess how changes in visual design and brand identity elements affect user engagement and conversion rates over time. Additionally, this could also include tracking participants' usage patterns and purchase behavior over time, to gain a better understanding of how visual design and brand identity elements influence customer retention and repeat purchases. This information would provide valuable insight into the effectiveness of visual design and brand identity changes in the long term, and the potential return on investment for businesses.

References

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