

USABILITY AND USER EXPERIENCE IN THE DESIGN OF
BIKE RENTAL SYSTEMSCASE OF ISBIKE
BIKE RENTING SYSTEM



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YEDITEPE UNIVERSITY
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PLAGIARISM

I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

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ABSTRACT

From past to present, human beings have always produced a service or a product. One of the most important indicators emphasizing the quality of these products or services is the concept of usability. The concept of user experience is concerned with what the user feels from this service or product.

In this study, in order to examine the effects of usability and user experience concepts on product development, it is aimed to examine the roles of usability and user experience in product design through the Isbike bicycle rental system. For this purpose, determinations have been made through the product developers who have worked in Isbike bicycle rental systems and the participants who have experienced the Isbike bicycle rental system, and in this way, it is aimed to determine a road map for future studies.

In the introduction section, the subject, purpose, scope, main questions, hypothesis and methodology of the study are explained. In the following sections of the study, the concepts of usability and user experience, which are the focus of the research, are discussed, and the concept of user experience design is explained by determining the definitions of these concepts, their components and inquiry methods. In the third part of the study, the concept of design is defined and the relationship between the concepts of design and usability is examined. In the following part of the study, the concept of bicycle is defined and the evolution of the use of bicycles in the city is discussed, bicycle rental systems and the Isbike bicycle rental system in Turkey are emphasized.

In the fourth part of the study, data was collected from the participants and product developers using the interview technique in order to classify, evaluate, make sense of and develop the findings related to the whole process of the research. After the evaluation of these data, new data was obtained and as a result, the effects of usability and user experience on the Isbike bicycle rental system were revealed and suggestions for the design of the Isbike bicycle rental system were put forward.

Keywords: Usability, User, Experience

ÖZET

Geçmişten günümüze insanoğlu her zaman bir hizmet veya bir ürün üretmiştir. Bu ürün veya hizmetlerin kalitesini vurgulayan en önemli göstergelerden biri kullanılabilirlik kavramıdır. Alınan bu hizmet veya üründen kullanıcının ne hissettiği ile ise Kullanıcı deneyimi kavramı ilgilenir.

Bu çalışmada kullanılabilirlik ve kullanıcı deneyimi kavramlarının ürün geliştirmedeki etkilerinin incelenmesi amacıyla İsbike bisiklet kiralama sistemi oda üzerinden kullanılabilirlik ve kullanıcı deneyiminin ürün tasarımındaki rollerinin irdelenmesi hedeflenmektedir. Bu amaç doğrultusunda İsbike bisiklet kiralama Sistemleri'nde görev almış o ürün geliştirici kişiler ve İsbike bisiklet kiralama sistemini deneyimlemiş olan katılımcılar üzerinden tespitler yapılmış ve bu yolla gelecek çalışmalar adına bir yol haritası belirlenmesi hedeflenmiştir.

Giriş bölümünde çalışmanın konusu, amacı, kapsamı, başlıca soruları, hipotezi ve çalışmanın yöntemi anlatılmıştır. Çalışmanın devamında araştırmanın odağında bulunan kullanılabilirlik ve kullanıcı deneyimi kavramları ele alınmış bu kavramların tanımlarıyla birlikte bileşenleri ve sorgulama yöntemleri tespit edilerek kullanıcı deneyimi tasarımı kavramının açıklanması sağlanmıştır. İlerleyen bölümde tasarım kavramı Tanımlanmış ve tasarım ile kullanılabilirlik kavramları arasındaki ilişki irdelenmiştir. Çalışmanın devamında ise bisiklet kavramı tanımlanmış ve bisikletin kent içindeki kullanımının evrimi yerdelenmiştir bisiklet kiralama sistemleri ve Türkiye'deki İsbike bisiklet kiralama sistemi üzerinde durulmuştur.

Çalışmanın dördüncü bölümünde ise araştırmanın tüm süreci ile ilgili bulguların sınıflandırılması, değerlendirilmesi, anlaşılması ve geliştirilebilmesi için görüşme tekniği kullanılarak katılımcılardan ve ürün geliştiricilerden veriler toplanmış bu verilerin değerlendirmesi sonradında yeni veriler elde edilmiş sonucunda kullanılabilirlik ve kullanıcı deneyiminin İsbike bisiklet kiralama sistemi üzerindeki etkileri ortaya konmuş ve İsbike bisiklet kiralama sisteminin tasarımına öneriler ortaya konmuştur.

Anahtar Kelimeler: Kullanılabilirlik, Kullanıcı, Deneyim

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I. INTRODUCTION

A city, which is a settlement area, is a settlement where industry, trade, services, culture, education, health and other social services coexist. These features that make up its own definition are also the reasons for the increase in population density in cities. Especially due to the intensity of industry and trade in cities, people migrate to cities in search of new jobs.

With the rapid increase in global growth and population, information technologies have come to the fore in urban life in order to increase the quality of life in large cities, both in terms of time and efficiency. As a result of rapid population growth, transportation, energy, water, health, environment and security problems arise especially in large cities, and solutions to these problems are developed with smart applications using various technologies for these areas. Technology has started to be used to improve the quality of life of the population living in large cities and smart applications are being developed to produce practical solutions in different areas.

The adaptability of information technologies to living spaces leads to a change in the traditional understanding of space and leads to the emergence of interactive spaces that can change with their mechanical and digital infrastructures according to the wishes, needs and demands of users (Özdemir, 2023).

According to Pektekin (2019), all systems are evolving towards smart technologies and smart cities are becoming a part of these systems. The design and sustainability of smart cities will be a problem for municipalities and local governments today and in the near future. Smart cities are not only technologically advanced, but also defined by the joint action of all stakeholders to solve livability, access, traffic and environmental problems (Pektekin, 2019).

Nowadays, mobile applications have become very popular and contain many elements that will facilitate human life in daily life. All over the world, mobile applications are generally used in many areas such as communication, health, shopping and entertainment. With smartphones, which have been used in many different countries of the world since the 2000s, it has been possible to access these

applications and the services offered from anywhere. Mobile applications have made life easier for people in various ways. They have simplified communication, made shopping easier and more convenient, and provided access to entertainment and information. As the mobile app market continues to grow, it is likely that these apps will continue to play an increasingly important role in people's lives (Papagari & Riedl, 2017).

If the population density in cities cannot be controlled or if the systems within the city continue to be developed, new problems arise and many systems become inadequate. Especially in big cities, transportation problems lead to disruptions in public transportation systems. Although the densifying population makes public transportation systems inadequate, due to the pandemic, people have preferred to use individual vehicles instead of using trains, buses, subways or public transportation vehicles. Therefore, due to the traffic density in big cities, people have turned to using alternative means of transportation such as motorcycles, scooters and bicycles. The widespread use of such individual vehicles in certain countries around the world has brought about different applications and bicycle rental systems have emerged with various initiatives for renting, creating a new branch of need.

In order for bicycle and bicycle rental systems to develop, they must have all the characteristics of certain concepts. The concept of usability is one of the main elements of this system that interacts with people one-to-one. The concept of usability measures the effectiveness, efficiency, learnability, satisfaction and memorability of the system. In order for bicycle rental systems to make designs that have these qualities, they benefit from user experience. In this context, usability and user experiences in bicycle rental systems are discussed in this study. In this case study, Isbike, one of the bicycle rental systems in Istanbul, and the factors that play a role in user experiences will be examined.

1.1. Purpose and Scope of The Study

The aim of this thesis is to reveal the factors that play an effective role in bicycle rental systems within the framework of usability and user experience concepts and the effects of these factors on product development. The focus of this research is the Isbike bicycle rental system affiliated to Isparka in Istanbul. In this study, the

interface and rental units of the system will be examined in terms of digital and physical dimensions. The rental systems of Isbike on the Anatolian side of Istanbul, which are determined within the scope of the research, will be handled within the user group between the ages of 18-65 who use the rental system.

1.2. Hypothesis and Research Questions

User experience and usability play an important role in bicycle rental system design and product development. In this context, the main question of this research is; *“How do usability and user experience contribute to the design of bicycle rental system in Istanbul?”* Since it is aimed to examine the user experiences of bicycle culture and bicycle users in Isbike and to determine the contribution of user experiences, answers to the following research questions and sub-problems are sought

-What are the problems experienced by people using the Isbike bicycle rental service?

From the point of view of usability, how do Isbike's in-house/consulting designers carry out the product development process?

1.3. Structure of The Study

In the first chapter, in order to better understand the concepts of usability and user experience, which constitute the focus of the thesis, these concepts are defined in detail. The effects of the components of the usability concept on usability such as usability, productivity, satisfaction, learnability and memorability are explained and the interview method, survey method, focus groups and think aloud method, which are inquiry-based methods in usability, are defined. In the rest of the chapter, the concept of User Experience is defined and the concepts of user and experience are explained separately and the history of user experience is mentioned. At the end of the chapter, the concept of User Experience Design is explained in detail. In the next chapter, the concept of Design is defined and the design process criteria are determined. In the rest of the chapter, the use of the concept of usability in the design process is explained and finally the definition and historical development of interaction design is mentioned. The role of usability in interaction design is defined. In the last section, the concept of bicycle is defined and the countries with the highest

number of bicycles in the world are mentioned; Netherlands, Denmark, Germany. Afterwards, the evolution of bicycle use in the city was mentioned and bicycle rental systems were explained. At the end of the chapter, bicycle rental systems in Turkey were mentioned; Isbike, Bizim Bisiklet, Bisiklet izmir. Finally, the Isbike bicycle rental system is explained in detail. In the following sections, a situation analysis is made on the examples on the Anatolian side of Istanbul within the scope of the Isbike bicycle rental system, and the data obtained from the interviews are analyzed according to the usability and the findings on what should be done in order to improve the Isbike bicycle rental systems are revealed.

1.4. Methodology of The Study

Qualitative research method is used within the scope of the study. Qualitative research method is a research method in which the researcher collects and analyzes qualitative data to describe and make sense of phenomena, events and situations (Yıldırım & Şimşek, 2016). Within the framework of Isbike, which is considered as a case study within the scope of the study, Isbike user experience and thoughts are examined in interviews with users and product developers. In this context, Yıldırım and Şimşek's (2016) statement "Qualitative research is used in research where the researcher usually asks open-ended questions, collects data through in-depth interviews, observations or document analysis to understand the thoughts, feelings, experiences and beliefs of the participants." also includes the scope of the research. The collected data will be analyzed and will contribute to the hypothesis of the study.

In this context, a case study was preferred as a research method because it deals with a current phenomenon within its own life framework. Case study is a qualitative research method that involves a detailed analysis of a situation or phenomenon. This method is used for a comprehensive examination of social or behavioral phenomena. Case study allows researchers to understand the characteristics, dynamics and relationships of a phenomenon. Through a case study, researchers can understand how a phenomenon behaves or is affected in a particular situation.

Isbike, which is considered within the scope of the study, provides a service that is used in many different districts throughout Istanbul. In order to create a relatively small sample to define the research population and to reflect the diversity of

individuals to the maximum extent, Isbike users in Kadıköy district of Istanbul were considered. The aim of maximum diversity sampling is not to generalize to the universe by ensuring diversity, but to find out what kind of commonalities or similarities exist between situations that show diversity (Yıldırım & Şimşek, 2008).

Within the scope of qualitative research, interview technique will be used as a data collection tool. The aim of the interview technique is to enter the inner world of the individual and understand his/her point of view (Patton, 1987). Interview is a qualitative research method in which a researcher collects detailed information by directly interacting with a subject. The interview method allows researchers to understand and explore in depth the perspective of the subjects they are researching. Interviews are usually conducted face-to-face, over the phone or via video conferencing. For this purpose, the study aims to obtain data by analyzing the experiences of Isbike users and product developers with open-ended questions through the interview technique.

Since open-ended questions are not prepared in advance, there is no restriction on the answers (Rubin, 1983).

Unstructured interviewing is an interview method that allows researchers to talk to participants using open-ended questions. This method allows the researcher to collect information from the participants on unexpected or non-obvious issues. In this context, an interview form was prepared and a test interview was conducted after informing the individual about the purpose of the interview and the interview process. Interviews were conducted within the framework of the sample selected within the scope of the case study.

Qualitative data are usually analyzed with qualitative data analysis methods. Qualitative data analysis is used to categorize data, identify patterns and relationships, and draw meaningful conclusions.

The infrastructure of the thesis study, which was created to answer these questions, is described in the diagram below (See Figure 1).

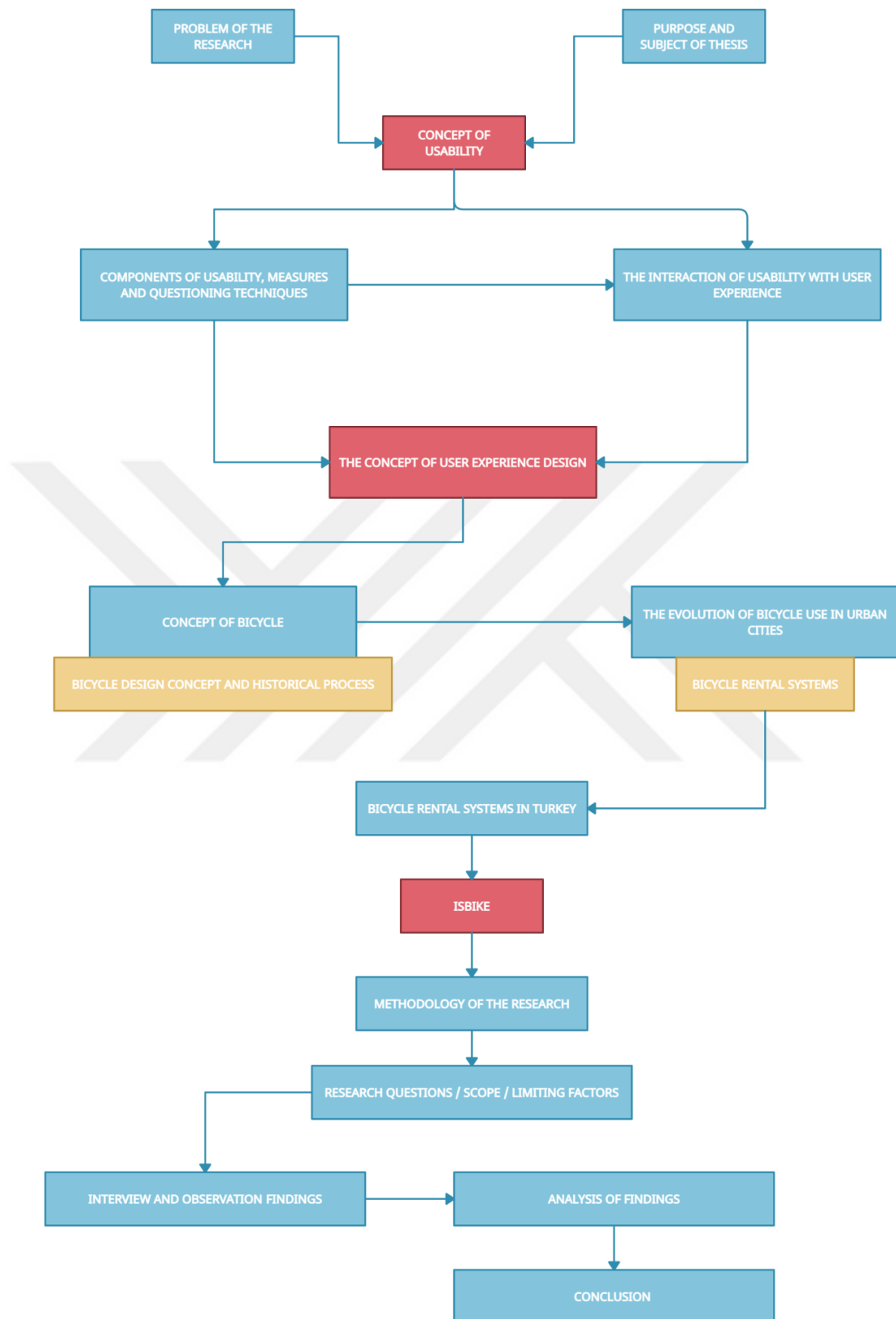


Figure 1. Thesis structure.

1.5. Possible Contributions of The Study

The information obtained at the end of the study will serve as a bibliography showing the applications and functioning of the concept of usability in the field of bicycle rental systems design for Turkey, and will reveal the latest situation regarding the perspective of companies and designers in the sector on this concept.

In addition, the data will provide a basis for further studies to be carried out to expand and improve the concept of usability in the design of bicycle rental systems in Turkey.

In addition, as a result of the study, the data on the dominance of the concept of usability in the design of bicycle rental systems will serve as an important resource for students in the process of industrial product design education.

2. LITERATURE REVIEW

2.1. The Concept Of Usability

Today, a lot of work has been done and continues to be done on the concept of usability. As a definition of usability in this research, ISO states the following; Usability is the extent to which a product, system or service can be used by specific users to achieve specific objectives with effectiveness, efficiency and satisfaction in a given context of use (ISO 9241-11, 2018). In other words, usability is a measure of how easily and effectively users can accomplish their desired tasks using a particular product or service. This can include things like the design of a website, the layout of a software interface or the ergonomics of a physical device. In addition to these, Nielsen also said the following for support ; usability is refers to the ease of use and learnability of a product, system or service. It is the extent to which users can perform certain tasks, such as filling out a form or finding information, with effectiveness, efficiency and satisfaction. (Nielsen J. ,1994)

2.1.1. The concept of usability in design

Usability in design refers to the practice of designing products, systems or services to be easy and intuitive for users to use. This can include elements such as layout, navigation and overall user experience. Good usability design is characterized by a user-centered approach, which means that the design process focuses on understanding the needs and goals of users and designing the product to meet those needs. (Nielsen, J. 1994). In addition to what Nielsen said, ISO has also said the following about usability in design; Usability design also involves testing and iterating the design to ensure that it is effective and efficient for users. This can include usability testing, where actual users are brought in to use the product and provide feedback, and user research, which involves studying and understanding the needs of target users. (ISO 9241-210:2010)

2.2. Usability Components

There have been many studies on usability components in the world. The study that these studies have referred to the present day belongs to Lewis (1995) According to Lewis, the components of usability are as follows;

Learnability: The ease with which users learn to navigate and use the product, system or service.

Efficiency: How quickly and easily users can complete their desired tasks.

Memorability: The ease with which users can remember how to use the product, system or service after not using it for some time.

Error frequency and severity: The frequency and severity of errors that users make when using the product, system or service.

Satisfaction: Users' overall level of satisfaction with the product, system or service.

These components are often used to assess the usability of a product or service and can be measured through methods such as usability testing and user surveys. (Lewis, 1995).



Figure 2. Components of usability (URL 1).

2.2.1. Efficiency

Usability efficiency is a measure of how quickly and easily users can complete their desired tasks using a product, system or service. It is one of the usability components used to evaluate the overall usability of a design (ISO 9241-11:2018).

Efficiency can be influenced by factors such as the layout of the interface, the number of steps required to complete a task, and the speed with which the system responds to user input. To measure efficiency, researchers often use metrics such as task completion time, the number of clicks required to complete a task, and the number of errors made.

Efficiency is an important aspect of usability as it directly affects user productivity and satisfaction with the product. A product that is efficient to use allows users to complete their tasks quickly and with minimal effort, which can lead to increased productivity, satisfaction and loyalty. (Lewis,1995). In addition to what Lewis said, Nielsen also said the following about productivity; Efficiency in usability refers to how well a product or system, such as a website, software application or device, uses resources (e.g. time, effort, memory) to achieve a goal. It is a measure of how effectively a person can complete a task or achieve a goal with minimal resources. High levels of efficiency in usability can lead to increased productivity, satisfaction and overall success of the product. Efficiency in usability is closely related to other aspects of usability such as learnability, effectiveness and satisfaction. (Nielsen,1994).

2.2.2. Productivity

Productivity refers to the efficiency with which resources (typically time and labor) are converted into goods or services. It is a measure of the output of a system or process relative to the input. (Salvendy, G., & Koubek, R. J. 2000). In addition to this brief summary, to explain productivity in more detail, Shneiderman's words on this subject are as follows, to explain productivity in more detail Usability efficiency refers to the efficiency with which a person can complete tasks or achieve goals using a product or system, such as a website, software application or device. It is a measure of how quickly and effectively a person can complete a task or achieve a goal with the

product and can be influenced by factors such as ease of use, learnability and satisfaction. High levels of efficiency in usability can lead to increased productivity, effectiveness and overall success of the product. (Shneiderman, B. 1998).

2.2.3. Satisfaction

Satisfaction in usability is one of the most important concepts for users according to the Journal of Service Science; Satisfaction refers to a positive emotional state that occurs when a person's needs or wants are fulfilled or exceeded. It is a psychological construct that reflects the degree to which a person's expectations are met or exceeded. (Journal of Service Science. 2020) Satisfaction with usability is also expressed by Oliver as follows ; Usability satisfaction refers to a person's overall emotional response to using a product or system, such as a website, software application or device. It is a measure of how positive or negative a person feels about the experience of using the product and can be influenced by factors such as ease of use, effectiveness and efficiency. High levels of satisfaction with usability are associated with increased likelihood of continued use, positive word-of-mouth and overall success of the product. (Oliver, R. L. 1997)

2.2.4. Learnability

Learnability, one of the components of usability, is defined by Reimann and Klobas as follows ; Learnability refers to the ease with which a person can acquire new knowledge, skills or abilities through training or experience. It is a measure of how quickly and effectively a person can acquire new knowledge and apply it to new situations. Learnability is an important aspect of human performance and is often considered in the design of training programs, training materials and technology. (Reimann, P., & Klobas, J. E. 2015) However, according to Van Merriënboer and Kester; In usability, learnability refers to the ease with which a person can learn to use a product or system, such as a website, software application or device. It is a measure of how quickly and easily a person can understand and navigate the interface, learn the features and functions, and become proficient in using the product. Learnability is an important aspect of usability because it directly affects a person's ability to use the product effectively and efficiently. (Van Merriënboer, J. J. G., & Kester, L. 2003)

2.2.5. Memorability

Usability Memorability represents the continuity of an application or system. According to Nielsen In usability, recall refers to a person's ability to retain or remember information about a product or system, such as a website, software application or device, after a certain period of time has passed since their last interaction with it. It is a measure of how well a person can remember how to use the product or how well they can navigate the interface after a period of inactivity. High levels of memorability in usability are associated with increased ease of use, increased effectiveness and increased likelihood of continued use. Retention is an important aspect of usability because it directly affects a person's ability to use the product effectively and efficiently after a period of non-use. (Nielsen, J. 1994)

2.3. Measures Of Usability

Usability is a multidimensional structure that can be measured in various ways, we can see this structure in many studies, but the founder of this structure is Nielsen and according to Nielsen, the criteria of usability are as follows;

- Effectiveness: This measure assesses the degree to which a product or system accomplishes a task or achieves a goal.
- Efficiency: This measure assesses the resources (e.g. time, effort, memory) required to complete a task or achieve a goal.
- Learnability: This measure assesses how easily a person can learn to use a product or system.
- Memorability: This measure assesses a person's ability to retain information about a product or system or to recall it after a period of inactivity.
- Satisfaction: This measure assesses a person's overall emotional response to using a product or system.
- Error rate: This measure assesses the rate of errors a person makes when using a product or system. (Nielsen, J. 1994)

2.3.1. Questioning-based methods of usability

Usability inquiry-based methods refer to a set of techniques and approaches used to collect information and feedback about the usability of a product or system, such as a website, software application or device. These methods typically involve asking users questions, observing their interactions with the product and collecting feedback about their experiences. Some common inquiry-based methods in usability are:

- Interviews: This method involves one-on-one interviews with users to gather information about their experience using a product or system.
- Surveys: This method involves administering a set of standardized questions to a group of users to gather information about their experiences using a product or system.
- Focus groups: This method involves bringing a group of users together to discuss their experiences using a product or system.
- Think-aloud protocols: This method involves asking users to verbalize their thoughts and actions while using a product or system.
- Contextualized questioning: This method involves observing users using a product or system in their natural work or home environment. (Shneiderman, B. 1998)

2.3.1.1. Interviews in usability inquiry-based methods

In usability inquiry-based methods, interviews refer to one-on-one conversations with users to gather information about their experience of using a product or system. These interviews are usually conducted by a researcher or designer and ask a series of open-ended questions about the user's experience with the product, their views on its functionality, and any problems or challenges they may have encountered. Interviews are conducted in person, over the phone or via video conference and can be structured, semi-structured or unstructured. (Nielsen, J. 1994)

Interviews are considered a qualitative research method, provide a deeper understanding of users' experiences, feelings and thoughts, and provide a rich source

of feedback and suggestions for improving the usability of the product. (Bevan, N., & Cairns, P. 2006)

2.3.1.2. Questionnaires in usability inquiry-based methods

In usability inquiry-based methods, surveys refer to a set of standardized questions administered to a group of users to gather information about their experience using a product or system. Surveys can be conducted online, by mail or in person and can include both closed-ended (e.g. multiple choice) and open-ended questions. They are typically used to collect quantitative data about a large number of users and their perceptions of a product or system. Surveys are a common way to collect feedback about a product or system and provide a broad view of users' satisfaction, usability and overall experience. (Lewis, J. R. 1994)

One of the advantages of surveys is that they can be administered to a large number of users, allowing researchers to identify patterns and trends in user behavior and feedback. However, it is important to note that surveys do not provide as much depth and context as other methods such as interviews or observations, and the results need to be combined with other methods for a more comprehensive understanding. (Lewis, J., & Sauro, J. 2009)

2.3.1.3. Focus groups in inquiry-based methods in usability

In usability inquiry-based methods, focus groups refer to a method of gathering feedback and information about a product or system by bringing together a group of users in a moderated discussion. A focus group is typically led by a moderator who asks open-ended questions and guides the discussion. The purpose of focus groups is to collect qualitative data about users' perceptions, attitudes and experiences with a product or system. The group discussion format allows participants to share their views, ideas and experiences and also to react to each other's observations. (Ducoffe, R. H. 1996)

Focus groups are often used in the early stages of product development to gather feedback on concept ideas and in later stages to evaluate the final product before launch. They are also useful to get feedback on the design, layout and content of a website or to understand user preferences and needs. However, it is important to keep

in mind that focus groups are a form of self-reported data and are subject to social influences and biases. (Stewart, D. W., & Shamdasani, P. N. 1990)

2.3.1.4. Think aloud protocols in usability inquiry-based methods

The think-aloud protocol is a form of verbal analysis. On this topic, Ericson and Simon state the following; Think-aloud protocol is a method used in inquiry-based usability testing to understand users' cognitive processes when interacting with a product, website or application. According to (Ericsson & Simon, 1984), think-aloud protocol is a form of verbal protocol analysis in which participants are asked to verbalize their thoughts while performing a task or navigating a system. This allows researchers to understand the participant's mental model and identify any areas of confusion or difficulty.

During a think-aloud protocol, participants are given specific task instructions and asked to verbalize their thoughts and actions as they complete the task (Kirakowski, 1996). This verbalization process can be done in real time or recorded for later analysis. The think-aloud protocol can be used as a form of qualitative data collection that provides rich insight into the user experience (Nielsen, 1993). The think-aloud protocol has several advantages, such as providing valuable information about user behavior, mental models, and problem-solving strategies (Kirakowski, 1996). However, it also has some limitations, such as the potential for participants to not fully reflect their actual thoughts and actions due to social desirability bias (Holtzblatt & Beyer, 1998).

2.3.1.5. Contextual inquiry in usability inquiry-based methods

Contextual inquiry is a user-centered design method used in inquiry-based usability testing. It is a form of fieldwork that combines ethnographic techniques to understand users' tasks, goals and work environments (Holtzblatt & Beyer, 1998). The method is based on the idea that users' work contexts and activities are essential for understanding their needs and requirements for a product, website or application.

The contextual inquiry process consists of several steps:

- Data collection: Researchers observe and interview users in their natural working environment, often taking notes and recording the session.
- Data analysis: Researchers analyze the collected data, identifying patterns and themes related to users' tasks, goals and work environments.
- Synthesis: Researchers use the information collected to create a representation of users' work context and the tasks they perform.
- Design: Researchers use the information collected to design a solution that meets users' needs.

In addition to these points, Holtzblatt made the following argument Contextual inquiry enables researchers to understand the user's work environment, tasks and goals, and how they use the product, website or application in their work context. It can provide valuable information about users' behaviors, mental models and problem-solving strategies (Holtzblatt, 1998).

2.3.2. Usability exploratory methods

Usability review-based methods are a group of techniques that involve the evaluation of a product, website or application by a group of experts or trained evaluators. These methods include heuristic evaluation, cognitive review and expert review.

Heuristic evaluation, first introduced by Nielsen and Molich (1990), is a method in which a group of evaluators examine a product, website or application using a predefined set of usability principles or heuristics to identify usability problems. The evaluators use their expertise to identify areas of difficulty, confusion or inconsistency in interface design. Cognitive review, proposed by Lewis, Polson, Wharton, and Rieman (1992), is a method in which a group of evaluators review a set of tasks that a user can perform to identify usability issues. The evaluators consider the user's goals, actions and feedback and assess the interface's ability to support them. Expert review, also known as usability review, is a method where a group of experts independently evaluate a product, website or application for usability issues. The experts use their knowledge and experience to identify areas of difficulty, confusion or inconsistency in interface design. In addition to these articles, Nielsen makes the following

argument Usability review-based methods have the advantage of identifying usability issues early in the design process before they become expensive to fix. However, they also have limitations, such as being time-consuming and dependent on the expertise of the evaluators. Furthermore, review-based methods may not identify all usability issues that may arise during real-world use. (Nielsen, J. 1993)

2.3.3. User testing in usability

User testing is a method used in usability to evaluate a product, website or application by having real users perform tasks and provide feedback. The method aims to identify usability issues by observing users as they interact with the interface and measuring their performance, satisfaction and overall experience.

User testing can be conducted in a lab or remotely and can be moderated or unmoderated. Moderated user testing is when a researcher is present during the testing session to guide the user and ask follow-up questions. Unmoderated user testing is when the user interacts with the interface independently, usually through a recorded session. (Dumas, J. S., & Loring, B. 2008) During a user testing session, participants are given specific task instructions and asked to carry them out while the researcher observes and takes notes. The researcher also asks the participant to provide feedback about the interface, their overall experience and satisfaction. Performance metrics such as task completion time, error rate and success rate are also recorded.

In addition to these articles, Nielsen makes the following argument User testing is considered one of the most valuable methods for understanding the usability of a product, website or app as it provides a direct measure of how real users interact with the interface and their experience. However, it also has some limitations, such as the cost and time required to recruit and test a representative sample of users. (Nielsen, J. 1993)

The relationship between user testing and user experience in usability;

User testing and user experience are closely related concepts in usability. User testing is a method used to evaluate the usability of a product, website or application through real users performing tasks and providing feedback. User experience, on the other hand, is a broad concept that encompasses the overall feelings and perceptions a

user has when interacting with a product, website or application. User testing allows researchers to observe users as they interact with the interface and measure their performance, satisfaction and overall experience. This information can be used to identify usability issues and improve interface design. However, user testing only provides a snapshot of the user's experience and may not capture all the emotions and perceptions users may have when using a product, website or application over time (Nielsen, J. 1994). In contrast to Nielsen's remarks, Norman argued in 2013 ; User experience, on the other hand, is a holistic concept that takes into account not only the usability of the interface, but also the emotional and aesthetic aspects of the user's interaction with the product, website or application. It encompasses the user's overall satisfaction, enjoyment and interaction with the product, website or application (Norman, D. A. 2013). Nicolle supported Norman in his argument for user testing and put forward the following argument; User testing and user experience are complementary concepts. User testing provides valuable information about the usability of a product, website or application and allows researchers to identify specific issues that need to be addressed. User experience, on the other hand, provides a broader understanding of the user's overall feelings and perceptions when interacting with the product, website or application. (Nicolle, C. 2019)

2.4. User Experience

From past to present, user experience has always been a part of life. Today, with the increase in awareness, the subject of user experience continues to exist in a popular way. Among the definitions made about user experience, Norman's statements about user experience are as follows ; User experience (UX) is a broad concept that encompasses a user's overall feelings and perceptions when interacting with a product, website or application. It encompasses the user's overall satisfaction, enjoyment and engagement with the product, website or application. This includes elements such as usability, accessibility, aesthetics and emotional engagement. User experience is a multidisciplinary field that draws on concepts from psychology, human-computer interaction, design and other disciplines. (Norman, D. A. 2013)

In contrast to Norman's words, Nicolle defines user experience as follows; User experience is a holistic concept that considers not only the usability of the interface,

but also the emotional and aesthetic aspects of the user's interaction with the product, website or application. The goal of UX design is to create products that are easy to use, efficient and satisfying for the user. It also aims to create a sense of engagement and enjoyment for the user. (Nicolle, C. 2019)

According to Hassenzahl and Tractinsky, many methods are used in data collection of user experience ;User experience can be evaluated through various methods such as user testing, surveys and interviews. These methods allow researchers to gather information about the user experience and identify areas for improvement. (Hassenzahl, M., & Tractinsky, N. 2006)

2.4.1. User concept

In usability, user refers to the person or group of people who interact with a product, website or application. The term “user” covers a wide range of individuals, including customers, clients, patients, students, employees and more. The user's characteristics, such as background, knowledge, skills and goals, play a critical role in the design and evaluation of a product, website or application. (Nielsen, J. 1994) According to Norman, the definition of the concept of user is as follows; Usability research and evaluation methods are conducted with the user in mind and aim to identify and address issues that may arise during the user's interaction with the product, website or application. The aim is to design interfaces that are easy to use, efficient and satisfying for the user and that meet their needs and goals. (Norman, D. A. 2013).

2.4.2. Experience concept

The knowledge that a person acquires over a certain period of time or throughout his/her life, the knowledge he/she gains from the situations and events he/she has seen and experienced can all be called experience. Nicolle explained the concept of experience in usability as follows; In user experience (UX), experience refers to the overall perception and feeling a person has when interacting with a product, website or application. It encompasses the user's overall satisfaction, enjoyment and engagement with the product, website or application. This includes elements such as usability, accessibility, aesthetics and emotional engagement.

(Nicolle, C. 2019). User experience design is defined by Hassenzahl and Tractinsky as follows; UX experience is a multidisciplinary concept that draws on concepts from psychology, human-computer interaction, design and other disciplines. The goal of UX design is to create products, websites or applications that are easy to use, efficient and satisfying for the user and meet their needs and goals. This also includes creating a sense of engagement and enjoyment for the user when interacting with the product, website or application. (Hassenzahl, M., & Tractinsky, N. 2006). Another statement about user experience design is expressed by Norman. UX researchers and designers use a variety of methods such as user testing, surveys, interviews and other methods to evaluate and understand the user experience. These methods allow researchers to gather information about the user's experience, identify areas for improvement, and design solutions that meet the user's needs and goals. (Norman, D. A. 2013)

2.5. History Of User Experience

The history of user experience (UX) dates back to the early days of human-computer interaction (HCI) in the 1960s and 1970s. The field of HCI emerged as a response to the increasing complexity of computer systems and the need to make them more usable for humans. Early HCI researchers such as Ivan Sutherland and Douglas Engelbart focused on technical aspects of interaction, such as input and output devices and the design of graphical user interfaces (GUIs).

In the 1980s and 1990s, the field of HCI shifted its focus towards usability and user experience. Researchers such as Jakob Nielsen and Donald Norman began to emphasize the importance of understanding the user's needs, goals and mental models in the design of computer systems. This led to the development of user-centered design (UCD) methods that emphasized the importance of involving users in the design process.

In the 2000s, the field of UX emerged as a separate discipline from HCI. The term "user experience" became more widely used to describe the overall perception and feeling a person has when interacting with a product, service or environment. The field of user experience encompasses a wide range of factors such as usability, accessibility, aesthetics and emotional engagement.

In recent years, the field of UX has continued to evolve and expand, with increasing emphasis on the importance of user research, user-centered design and the use of user experience metrics. The field has become increasingly important in the design of digital products and services and is now a critical aspect of product development and design in a variety of sectors such as healthcare, transportation and education. (Norman, D. A. 2013)

2.6. User Experience Design

User experience design (UXD) is the process of designing and developing products, websites or applications with the user's needs, goals and overall experience in mind. The goal of UXD is to create interfaces that are easy to use, efficient and satisfying for the user and meet their needs and goals. (Nicolle, C. 2019) Nielsen has also mentioned the following about this issue UXD is a multidisciplinary field that draws on concepts from psychology, human-computer interaction, design and other disciplines. It involves a combination of user research, design and evaluation to understand the user's needs, goals and mental models and create interfaces that meet those needs. UXD typically follows a user-centered design process that involves involving users throughout the design process to ensure that the final product meets their needs. (Nielsen, J. 1994)

The UXD process typically includes various steps such as research, design, prototyping, testing and implementation. The research phase is where user researchers conduct research about users, their needs and goals, and their mental models. The design phase is when designers create wireframes, mock-ups and prototypes of the product, website or app. The prototype is then tested with users to gather feedback and then the final product is brought to life. (Holtzblatt, K., & Beyer, H. R. 1998)

3. DESIGN

3.1. Design Concept

Design is the process of creating a plan or solution for a problem or need. In the context of product development, design refers to the process of creating a plan or solution for a product, website or application. The goal of design is to create solutions that are functional, efficient and aesthetically pleasing. (Nicolle, C. 2019)

Design is a multidisciplinary field that draws on concepts from engineering, art, psychology and other disciplines. It involves a combination of research, problem solving and creativity to create solutions that meet the needs of users. There are different types of design, such as industrial design, graphic design, user experience design, architectural design and fashion design. (Norman, D. A. 2013)

The design process typically involves various steps such as research, conceptualization, prototyping, testing and implementation. The research phase is when designers conduct research about users, their needs and goals, and the context of use. The conceptualization phase is where designers generate ideas, sketch, and create wireframes, mock-ups and prototypes. The prototype is then tested with users to gather feedback and then the final product is realized. (Cross, N. 2011)

3.2. Design Process

The design process refers to the steps taken to plan and create a product, system or service. The specific steps and methods used in the design process may vary depending on the field and project, but generally follow a structured and iterative process that includes the following phases

- Problem definition: Understanding the problem or opportunity that the design project is addressing and defining the goals and objectives of the project.
- Research: Conduct research to gather information about the problem or opportunity, the users or stakeholders, and the current state of the site.

- Concept development: Generate ideas and concepts for the design and evaluate them against the goals and objectives defined in the problem definition phase.
- Design development: Develop detailed design specifications and plans and build prototypes or models to test and evaluate the concepts.
- Testing and evaluation: Test and evaluate the design using methods such as user testing, usability testing and field testing, and make adjustments as needed.
- Implementation: Implement the final design and monitor and evaluate its performance in the real world. (Pahl, G., & Beitz, W. 2018)

3.2.1. Use of the concept of usability in design processes

Usability is a concept that refers to the ease of use and effectiveness of a product, system or service for its intended users. It is an important aspect of design that is considered throughout the design process to ensure that the end product is user-friendly and meets the needs of the intended users.

In the design process, usability is typically addressed in the following phases:

- Problem definition: Usability is usually considered in the problem definition phase to ensure that the goals and objectives of the design project are aligned with the needs and expectations of users (Nielsen, 1994).
- Research: Usability research is conducted to gather information about users, their needs and expectations, and the current state of the space (Shackel, 2016).
- Concept development: Usability is considered in the concept development phase to evaluate the usability of different design concepts and select the most promising one (Nielsen, 1994).
- Design development: Usability is considered during the design development phase to create detailed design specifications that take into account users' needs and expectations (Shackel, 2016).

- Testing and evaluation: Usability testing is done to evaluate the usability of the design, identify any problems and make adjustments accordingly (Nielsen, 1994).
- Implementation: Usability is considered during the implementation phase to ensure that the final design is user-friendly and meets the needs of the intended users (Shackel, 2016).

It is worth noting that different methods and tools can be used to evaluate usability, such as usability testing, heuristic evaluation, expert reviews and user satisfaction surveys (Nielsen, 1994).

3.3. Interaction Design

Interaction design is a field of design that focuses on creating products, systems and services that facilitate meaningful interactions between people and technology. Interaction designers use a user-centered approach to design, which means they focus on understanding users' needs, behaviors and goals and use this information to design interactions that are intuitive, efficient and fun.

The interaction design process typically includes the following phases:

- Research: Conducting research to understand users, their needs and goals, and the context in which the product, system or service will be used (Sharp, Rogers & Preece, 2015).
- Concept development: Generate ideas and concepts for interaction design and evaluate them against research findings (Blythe, Hassenzahl & Wright, 2011).
- Design development: Develop detailed design specifications and plans and build prototypes or models to test and evaluate concepts (Sharp, Rogers & Preece, 2015).
- Testing and evaluation: Test and evaluate the interaction design using methods such as user testing, usability testing and field testing, and make adjustments as needed (Blythe, Hassenzahl & Wright, 2011).

- **Implementation:** Implement the final interaction design and monitor and evaluate its performance in the real world (Sharp, Rogers & Preece, 2015).

Interaction design can be applied to a wide range of products, systems and services, including websites, mobile applications, consumer electronics and transportation systems.

3.3.1. Interaction design past and present

Interaction design is a field of design that focuses on creating products, systems and services that facilitate meaningful interactions between people and technology. The field of interaction design has evolved significantly over the past few decades as technology has advanced and our understanding of human behavior and cognition has improved. In the past, interaction design primarily focused on the design of desktop computer interfaces, such as graphical user interfaces (GUIs) for personal computers. The focus was on providing effective and intuitive ways for users to interact with the computer, such as through the use of icons, menus, and other graphical elements (Norman, 1988).

As technology advances and mobile devices such as smartphones and tablets become more ubiquitous, interaction design has begun to focus on designing interactions for smaller screens and touch-based interfaces. This shift in focus has led to the development of new interaction design principles and guidelines, such as the concept of “finger-friendly” design, which refers to the design of interfaces that are easy to use with fingers instead of a mouse (Rubin, 2014). In recent years, with the widespread adoption of the internet, social media and the Internet of Things (IoT), interaction design has expanded to include interaction design across multiple devices and platforms. This has led to the development of new design principles and guidelines, such as the concept of “responsive design”, which refers to the design of interfaces that adapt to different screen sizes and resolutions (Flynn, 2017).

As technology continues to evolve, the field of interaction design will continue to evolve and adapt to the changing landscape.

3.3.2. The role of usability in interaction design

Usability is a critical aspect of interaction design as it refers to the ease of use and effectiveness of a product, system or service for its intended users. By considering usability in the interaction design process, designers can ensure that the final product is user-friendly and meets the needs of the intended users.

Usability in interaction design is typically considered in the following ways:

- User-centered design: Usability is a core tenet of user-centered design, an approach that focuses on understanding users' needs, behaviors, and goals to inform the design process (Sharp, Rogers & Preece, 2015).
- Usability testing: Usability testing is a method used to evaluate the usability of an interaction design by observing users as they interact with a prototype or functional product (Nielsen, 1994).
- Heuristic evaluation: Heuristic evaluation is a method used to evaluate the usability of an interaction design by applying a set of usability principles or guidelines (known as heuristics) to identify potential usability problems (Nielsen & Molich, 1990).
- User feedback: User feedback is collected throughout the design process to gather information about the usability of the design and make adjustments as needed (Shackel, 2016).

By considering usability throughout the interaction design process, designers can create products, systems and services that are easy, efficient and enjoyable for users to use.

3.3.3. Interactivity

Interactivity is a concept that refers to the degree to which a product, system or service allows users to actively interact with it and influence its behavior or output. In other words, interactivity refers to the degree to which users can control or influence the behavior of a product, system or service through their actions and inputs. (O'Brien, J., & Toms, E. G. 2008)

Interactivity can take many forms, such as touch, sound, gestures or other types of input. Some examples of interactive products, systems and services are:

- Websites and mobile applications that allow users to interact with content and navigate through different pages
- Video games that allow users to control characters and influence the outcome of the game
- Virtual reality and augmented reality experiences that allow users to interact with virtual environments
- Smart home devices that allow users to control various aspects of their home through voice commands or mobile apps

Interactive museum exhibits allow visitors to interact with exhibits and learn interactively, and interactivity can enhance the user experience by making it more engaging, immersive and personalized. However, it is important to consider the user's goals and tasks when designing for interactivity, as well as the usability of interactive elements, to ensure that interactivity serves a purpose and enhances the overall experience and not just for the sake of it (Wensveen, S. A. 2018).

3.3.3.1. Interactivity in design

Interactivity in design refers to the ability of users to actively participate in and manipulate the content or interface of a digital product, such as a website or app. This can include features such as hover states, clickable buttons and drop-down menus. Interactivity allows users to have a more personalized and dynamic experience with the product and can also provide valuable data and feedback for the designer. (Norman, D. A. 1988)

4. BIKE RENTAL SYSTEMS AND E-BIKE

4.1. Evolution of Cycling in The City

As cities have become more urbanized, cycling has undergone a significant evolution. Increased cycling in urban areas can be attributed to a number of factors, including air pollution, traffic congestion and the desire for more sustainable transportation options. An important development in the evolution of cycling in urbanization is the increasing use of dedicated bicycle lanes and other infrastructure improvements. For example, a study by Pucher and Buehler (2008) found that cycling is higher in cities with more bicycle infrastructure. They also found that cities with more bicycle lanes had a lower death rate per cyclist. Another important development is the increase in bike sharing programs. According to a study by Shaheen et al. (2016), bike sharing programs have become increasingly popular in urban areas and many cities now offer these services. These programs have been found to increase bicycle use, reduce traffic congestion and encourage more active transportation options. In addition, the development of electric bicycles (e-bikes) has also helped to promote cycling in urban areas. A study by Cervero and Kockelman (1997) found that e-bikes have the potential to increase the number of people cycling for transportation, especially among older adults and those with mobility problems.

Overall, the development of cycling in urban areas has been driven by a combination of factors, including infrastructure improvements, bike sharing schemes and the development of e-bikes. These developments have helped to make cycling a more viable transportation option in urban areas.

4.2. E-Bike

The main difference between electric bicycles and standard bicycles is the electric motor assistance. In addition to the pedal force, the electric support helps the rider when needed. In fact, the electric bicycle is not a newly developed idea. First, in 1881, Gustave Trouve invented the electric bicycle in France and conducted his first experiments. However, the technological conditions of the time did not allow the

rapid development of e-bikes. E-bikes have gained significant popularity as a sustainable mode of transportation, combining the benefits of traditional bicycles with the assistance of electric power. The electric motor in e-bikes provides pedal-assist, meaning it amplifies the power applied by the rider, enabling them to travel at higher speeds and tackle challenging terrains with less physical effort. Wardman and Page stated the following about this issue; E-bikes typically have various levels of assistance that can be adjusted based on the rider's preference and the terrain they are traversing (Wardman, Tight, & Page, 2021). E-bikes offer several advantages over conventional bicycles. They provide an accessible and efficient means of transportation, especially for longer distances and hilly terrains. And also Buehler and Pucher stated the following about this issue; E-bikes can also extend the cycling range for individuals who may have physical limitations or lack the stamina required for traditional cycling (Buehler & Pucher, 2020). Furthermore, e-bikes contribute to reducing carbon emissions and traffic congestion, making them a sustainable alternative to private car usage for short to medium trips. Also on this issue, Cherry and Yang said; Studies have shown that e-bike users tend to replace car trips with e-bike trips, resulting in environmental and health benefits (Cherry, Weinert, & Yang, 2019).

E-bikes have gained popularity globally, and their adoption is influenced by factors such as infrastructure, regulations, and cultural preferences. Governments and transportation planners are recognizing the potential of e-bikes as a viable mode of transportation and are implementing policies to support their integration into urban mobility systems . In conclusion, e-bikes provide an efficient and sustainable transportation option, combining the benefits of traditional bicycles with electric assistance. They offer increased accessibility, extended cycling range, and reduced environmental impact compared to conventional vehicles (Fishman et al., 2016; Buehler & Pucher, 2020).

4.3. Bicycle Rental Systems

Over time, motor vehicle ownership increases with the population; environmental, cultural, etc. problems are encountered, and this has resulted in the development of an economic system that encourages the use of bicycles. and

environmentally friendly bike sharing programs interest in studies aimed at mainstreaming increased. Bicycle rental systems, also known as bike sharing systems, are programs that allow individuals to rent bicycles for short periods of time, usually on an hourly or daily basis. These systems have become increasingly popular in urban areas as a way to encourage active transportation and reduce traffic congestion and air pollution.



Figure 3. Bicycle rental kiosk design example drawing (URL 5).

A key feature of bicycle rental systems is the use of automated kiosks or docks where bicycles can be rented and returned. According to a study by Shaheen et al. (2016), these kiosks or docks are often located in high-density, central areas such as city centers or near public transport hubs. This allows users to easily access bicycles and return them when they are done. Another important feature of bike rental systems is the use of smart card technology or mobile apps that allow users to rent and return bikes quickly and easily. According to a study by Guzman et al. (2017), this technology has made bike rental systems more convenient and user-friendly, increasing usage and making it easier for people to integrate cycling into their daily travel habits. Bicycle rental systems also have some benefits for cities and communities. For example, a study by Dill and McNeil (2017) found that bike rental systems can reduce traffic congestion and air pollution and encourage more active transportation options. They can also support local businesses by increasing foot traffic and providing additional transportation options for customers. Overall, bike

rental systems are a popular and effective way to promote cycling in urban areas. They provide a convenient and user-friendly way for individuals to rent bicycles for short periods of time and can also have positive impacts on cities and communities.

4.3.1. Most bicycle rental countries in the world

Firstly, in the 1960s, the interest in bicycling the concept of "bicycle sharing" has emerged and this development, bike-sharing programs in Europe are rapidly has caused it to spread. Generation 1 bike sharing programs were introduced for public use in Amsterdam in 1965. as dedicated "White Bicycles", but This system soon came to an end as bicycles were thrown into canals, etc. The 2nd generation bike sharing program "Nakskov" was born in Denmark in 1993. With 4 stations-26 bicycle ownership, "Nakskov" was a small, non-profit bicycle sharing program that ended due to bicycle theft. During this period, it was seen that the main problem with bike sharing programs was the lack of bike tracking and this idea led to the development of 3rd Generation bike sharing programs. Generation 3 bike sharing programs were supported by bike locks, telecommunication systems and mobile phone access, smart cards, kiosks, computer-aided systems. Generation 3 bike sharing programs such as "Call a Bike" in Munich in 2000 and "Velo'v" in France have been growing in number over the decade, and have expanded beyond Europe.

Bike sharing in countries like Brazil, China and the U.S. programs have started to be created. 4th Generation bicycle sharing programs increase sustainability, efficiency and quality-targeted, smart systems that include are bicycle sharing programs and today these systems development is essential for a more livable world is considered

Bicycle rental usage is high in many countries around the world, with many people renting bicycles as a convenient and sustainable transportation option. Some of the countries with the most bicycle rentals in the world are as follows:

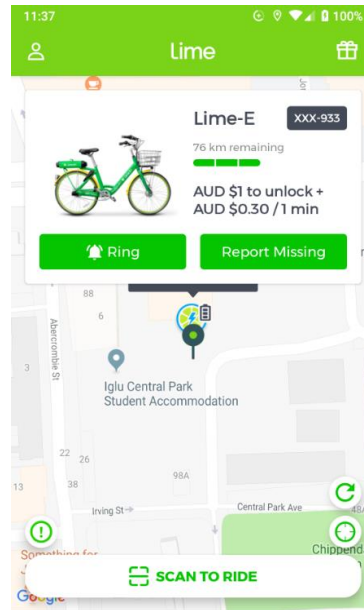


Figure 4. Interface of the Lime bicycle rental system, the world's largest bicycle rental system (URL 6).



Figure 5. Ofo bicycle rental application in China (URL 7).

4.3.1.1. China

According to a study by Shaheen et al. (2016), China has the world's largest bike sharing market with more than 50 million rental bicycles. The authors attribute this to the country's large population, high level of urbanization and widespread use

of bicycles as a primary means of transportation. The most widely used bicycle rental system in China is Ofo.

The Ofo bike renting app was a mobile application developed by the Chinese bike-sharing company, Ofo. It aimed to provide users with a convenient and accessible mode of transportation by allowing them to rent bicycles for short trips. With the Ofo app, users could locate nearby available Ofo bicycles through a map interface within the app. The app provided information on the locations of the bicycles, allowing users to easily find the nearest one. Once a suitable bicycle was located, users could unlock it by scanning a QR code on the bike using their smartphone. This process eliminated the need for physical keys or cards, making the rental process quick and hassle-free. Ofo implemented a dockless bike-sharing system, which meant that users were not required to return the bicycles to specific docking stations. Instead, they could park the bicycles in designated parking areas or any suitable location within the service area. This flexibility allowed users to conveniently start and end their rides without being limited by docking station availability. The Ofo bike renting app provided features for tracking the duration of the rental and calculating the cost based on usage. Users could view their ride history and monitor their usage patterns through the app. Ofo gained significant popularity in China and expanded its operations globally, becoming one of the leading bike-sharing companies in the world. However, it faced financial challenges in subsequent years, leading to operational difficulties and a reduction in its global presence. Please note that the information provided here is based on my knowledge up until September 2021. For the most up-to-date information about the Ofo bike renting app, it is recommended to consult reputable sources such as news articles, industry reports, or official statements from Ofo. (Shaheen, 2016)

4.3.1.2. France

According to a study by Schwanen et al. (2019), France has one of the highest levels of bikeshare usage in Europe, with high levels of bike rental in large urban areas such as Paris. The authors attribute this to the country's well-established bike sharing systems and the presence of bike sharing programs in many cities. There are many bicycle rental apps in France. The most popular of these is Vélip' Métropole;

Vélib' Métropole is a bike-sharing program that operates in Paris and its surrounding metropolitan area in France. It provides residents and visitors with a convenient and sustainable transportation option for short trips within the city. Launched in 2007, Vélib' Métropole is one of the largest bike-sharing initiatives in the world. The program is managed by the Metropolitan Transport Authority of Paris (Métropole du Grand Paris) and operated by Smovengo, a consortium responsible for the maintenance and management of the bike-sharing system. Vélib' Métropole offers a network of bicycles that are available for rent at numerous docking stations throughout the city. Users can access the bicycles by purchasing a short-term or long-term subscription or by making one-time rentals through the Vélib' Métropole mobile app, website, or at the self-service kiosks located at the docking stations. The program features both traditional bicycles and electric bicycles (e-bikes), allowing users to choose their preferred mode of transportation. The bikes are equipped with features such as adjustable seats, lights, and baskets for added convenience. Users can easily locate and unlock available bicycles using the Vélib' Métropole mobile app or by entering their subscription details at the docking station. The rental fees are calculated based on the duration of usage, encouraging short trips and frequent turnover of bicycles. Vélib' Métropole has been successful in promoting sustainable and eco-friendly transportation in Paris. It has contributed to reducing traffic congestion, improving air quality, and providing an affordable and efficient means of transportation for residents and visitors alike. (Schwanen, 2019)

4.3.1.3. Italy

According to the same study by Schwanen et al. (2019), Italy also has a high level of bikeshare usage and many cities in Italy offer bike rental programs. The authors attribute this to the country's long history of cycling culture and the popularity of cycling as a means of transportation

In general, these countries have high levels of bicycle rental use due to a combination of factors such as high levels of urbanization, efforts to promote active transport and reduce traffic congestion, and a strong bicycle culture. There are many bicycle rental apps in Italy. The most popular bicycle rental application is Mobike.

Mobike was a global bike-sharing platform that offered rental bicycles in various cities worldwide. The company was founded in 2015 in China and expanded its operations to numerous countries, including the United Kingdom, Germany, Italy, and more. Mobike operated through a dockless bike-sharing system, allowing users to find and rent bicycles using a mobile app. Users could locate available Mobike bicycles nearby, unlock them using the app's QR code scanning feature, and start their rides. Once their journey was completed, users could park the bicycles at a convenient location within the designated service area, without the need for specific docking stations. The bicycles provided by Mobike were designed with durability and user convenience in mind. They often featured solid construction, airless tires, and smart locks. The app also provided real-time information on bike availability, riding history, and payment options. Mobike aimed to promote sustainable urban transportation, reduce traffic congestion, and provide an eco-friendly alternative for short trips within cities. It was a popular option for locals and tourists seeking a flexible and cost-effective means of transportation. However, it's important to note that Mobike underwent changes and faced operational challenges in recent years. As of my knowledge cutoff in September 2021, Mobike had scaled back its operations in some countries, and its services may have evolved or adapted in response to market conditions.

4.4. Bicycle Rental Systems In Turkey

Bicycle rental services have become widespread in Turkey in recent years and are available in many cities. These services have been developed to meet the cycling and transportation needs of local and foreign tourists and locals. Bicycle rental services are available in touristic and big cities such as Istanbul, Ankara, Izmir, Antalya, Bodrum. Several bicycle rental systems are available in Turkey, Some of these bike rental systems including the following:

Velibike This is one of the first bicycle rental systems in Turkey and was introduced in Istanbul in 2009. According to a study by Özkan et al. (2019), the Velibike program now has more than 4,000 rental bicycles and has been successful in

increasing cycling and reducing traffic congestion and air pollution in the city. As these bicycle rental systems are old, not much information is available.



Figure 6. Isbike bicycle rental station (URL 8).

IsBike A dockless bicycle rental system launched in Istanbul in 2016. According to a study by Özkan et al. (2019), the IsBike program currently has more than 2,000 rental bikes and has been successful in increasing cycling and promoting active transportation in the city. In order to encourage the use of bicycles as a means of transportation as well as for recreational and sports purposes, Istanbul Metropolitan Municipality company İSPARK has extended the ISBİKE "Smart Bicycle Sharing System" throughout Istanbul and offered a healthy and environmentally friendly transportation to the service of all bicycle lovers. With the Smart Bicycle Sharing System, bicycle lovers do not have to carry their bicycles with them, they can rent bicycles from ISBİKE stations of their choice and leave them at any ISBİKE station.



Figure 7. Ankara bicycle rental station (URL 9).

Altınbis A bicycle rental system in the Turkish capital Ankara. According to a study by Gunes and Koc (2018), the program now has over 1,000 rental bicycles and has been successful in increasing cycling and promoting active transportation in the city. In ANTBIS bicycle sharing system, it is possible to rent a bicycle with a subscription card, credit card and mobile application. Only people over the age of 18 can get a subscription card. In order to rent a bicycle with a subscription card, the card must first be scanned at the parking unit and the membership password must be entered. In addition, there is a blockage application for bicycle rentals to be made from the kiosk screen with a credit card. After the short-term payment to be made with the credit card, the bicycle rental process can be completed by entering the password in the sms sent to the mobile phone into the parking unit of the ready-to-use bicycle.



Figure 8. Izmir Bicycle Rental Station (URL 10).

Taking innovative steps towards becoming a bicycle city, Izmir local authorities launched the BISIM bicycle sharing program on January 18, 2014. To date, BISIM has rented approximately 1.3 million bicycles and has a total fleet of 34 stations and 500 bicycles. The station map of BISIM is shown. In the BISIM bicycle sharing program, bicycle rental service can be obtained in three ways: 1) Member Card, 2) Credit Card, 3) İZMİRİMKART. If you want to rent a ready-to-use bicycle at the rental station, any bicycle with a green light on the parking unit can be rented. People with a member card first scan the member card into the parking unit and enter the password into the system. When the system accepts the password, the bicycle is unlocked and ready for use. There is no blockage application on the member card. Bicycle lovers who want to rent a bicycle without requiring any membership can make their rental transactions with a credit card or İZMİRİMKART. In the same way, blockage is applied in the rental made with a credit card, people who want to rent with İZMİRİMKART must be over the age of 18 and have a minimum balance on their cards. BISIM, bicycle rental program is not in service between 23:00 and 06:00

In general, there are several bicycle rental systems in Turkey, such as Velibike, BikeIstanbul, IstBike, Bizim Bisiklet and BisikletIzmir. These systems have been successful in increasing cycling and promoting active transportation in their respective cities. However, the authors of the studies suggest that more extensive infrastructure improvements are needed to support cycling in these cities.

4.4.1. IstBike

Istbike is a bicycle rental system and bike sharing service operated by Istanbul Metropolitan Municipality. The system offers people living in or visiting Istanbul the opportunity to rent bicycles for transportation and sightseeing. The main purpose of Istbike is to reduce urban traffic, provide an environmentally friendly transportation alternative and promote healthy living. In areas of Istanbul with heavy traffic, bicycles offer people a faster, more environmentally friendly and economical transportation option. Istbike serves to facilitate and popularize this option. The Istbike system works through bicycle stations located throughout Istanbul and a user interface for renting bicycles from these stations. Istbike stations, which are located at various points in the city, are places where bicycles are stored and users can perform rental transactions.

Those who want to use Isbike must first register with the system or purchase a subscription. This can usually be done through online platforms or mobile applications. After the registration or subscription process is completed, users can start renting bicycles from Isbike stations. To rent a bike from Isbike stations, users use a user interface that can read the QR code on the bikes at the station or enter the bike number. This is usually done through a mobile app or a kiosk-like device. Users start the rental process by selecting the bicycle they want. Once the rental is complete, the user can use the bicycle to go wherever they want. Isbike bicycles are designed in such a way that you can travel around the city using specific bicycle paths and bicycle-friendly roads. Bicycles must be returned to the stations, which are usually concentrated in the central areas of the city and in popular spots. The duration of use of the bicycle is usually set in hours or days. Users can use the bicycle for a certain period of time for renting it. When the rental period ends, the bicycle needs to be brought back to a designated Isbike station. Once the bicycle is safely returned to the station, the rental is complete. The Isbike system usually requires a membership or subscription. Subscriptions usually have different options and offer the right to rent a bicycle for a certain period of time. In addition to subscriptions, in some cases there may be different pricing options for one-time use. The Isbike system is used in conjunction with similar bike sharing systems in many cities to encourage cycling and provide a sustainable transportation alternative. Isbike provides an easily accessible transportation option for residents and visitors to Istanbul, while at the same time trying to reduce the city's traffic and promote a more environmentally friendly transportation culture.

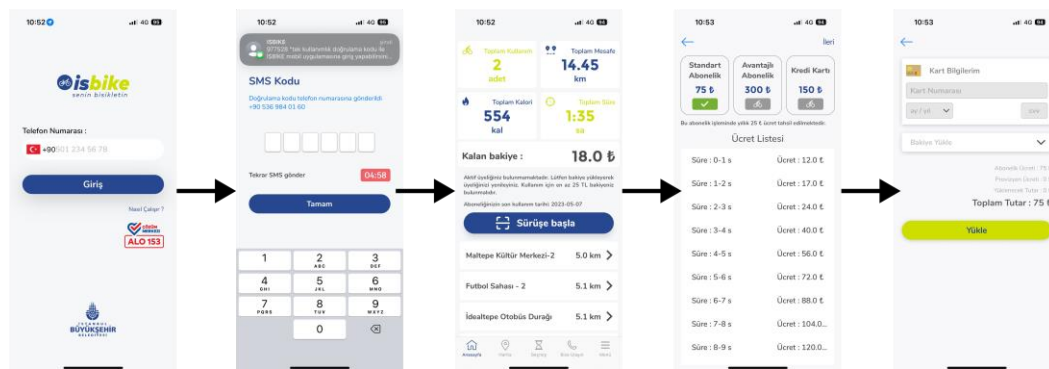


Figure 9. Isbike mobile application usage flow

IstBike is a bicycle rental system that started operating in Istanbul in 2016. It operates on a dockless bike sharing model, meaning users can rent and return bikes anywhere within the service area. Bikes can be rented through a mobile app that also allows users to find, reserve and unlock the bike.



Figure 10. Isbike Bicycle rental kiosk (URL 11).

According to a study by Özkan et al. (2019), the IstBike program currently has more than 2,000 rental bikes and is primarily focused on the city center, including tourist and commercial areas. This makes it easily accessible for both tourists and city residents. The program is also integrated with other transport options such as public transport, making it easier for users to switch between different modes of transport.

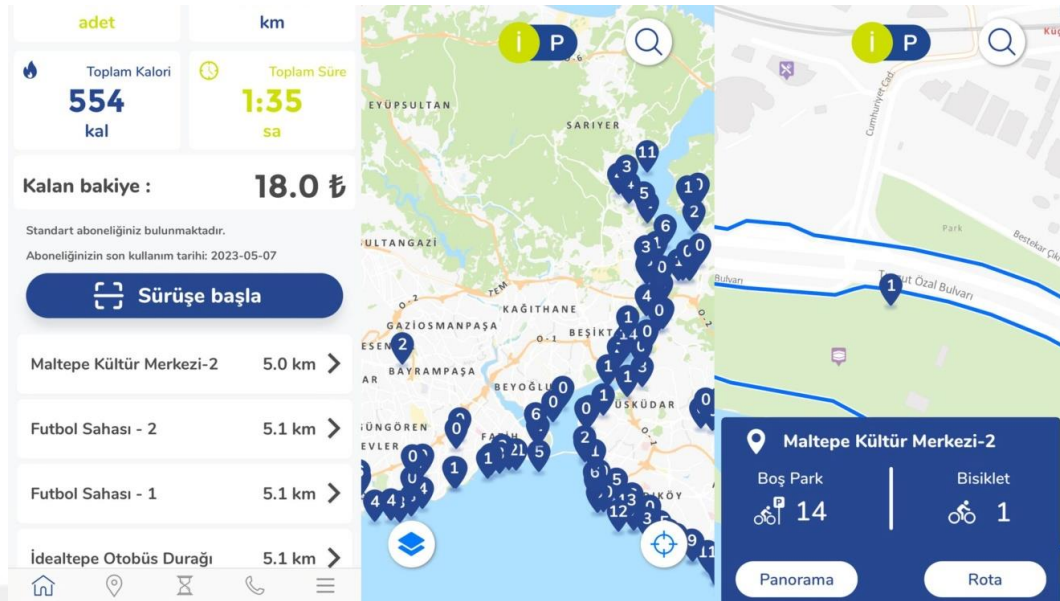


Figure 11. Istbike mobile application interfaces.

The study by Özkan et al. (2019) found that the IstBike program was successful in increasing cycling and promoting active transportation in Istanbul. The authors attribute this success to the convenience and flexibility offered by the dockless bike sharing model. However, the authors also argue that more extensive infrastructure improvements are needed to support cycling in Istanbul, such as building more bike lanes and increasing the number of bicycle parking spaces.

Overall, IstBike is a dockless bike rental system that has been successful in increasing cycling and promoting active transportation in Istanbul. However, more extensive infrastructure improvements are needed to support cycling in the city.

5. METHODOLOGY OF THE RESEARCH

5.1. Methodology of The Study

Methodology is an important factor in classifying, evaluating, interpreting and developing the necessary findings related to the whole process of the research. Within the scope of this study, qualitative research method was used to reveal the underlying causes of phenomena and to reach findings on how phenomena occur.

Qualitative research methods are widely used in dissertations as they provide a range of benefits in exploring complex phenomena, experiences and social processes. Qualitative research involves collecting and analyzing non-numerical data through various techniques such as interviews, observations and document analysis. One reason why qualitative research is useful in theses is that it provides a detailed understanding of the phenomenon under study by focusing on the experiences and perspectives of individuals or groups involved in the situation (Creswell, 2014). Qualitative research methods also allow researchers to explore complex issues in their natural settings, providing an in-depth understanding of social phenomena and contexts (Patton, 2015).

Case studies can be used in theses to provide a detailed and in-depth analysis of a particular phenomenon, event or situation. A case study involves the examination of a specific case or cases, which may involve individuals, groups, organizations, communities or even countries, using a variety of research methods such as interviews, observations and document analysis. One reason why case studies are useful in theses is that they allow researchers to explore complex phenomena in a real-life context and provide a more comprehensive understanding of the topic under study (Baxter & Jack, 2008). Case studies can also be used to test and refine existing theories or generate new theories, especially in under-researched areas (Yin, 2018). Furthermore, case studies can be used to examine a specific problem or issue and develop practical solutions or recommendations (Baxter & Jack, 2008). By examining a particular case in detail, researchers can identify the key factors contributing to the problem and develop strategies to address it.

5.2. Research Questions

As discussed in the previous sections of the study, the aim of this study is to reveal the effects of usability and user experience on the product development of the Isbike bicycle rental system operating in Istanbul, Turkey. With this aim in mind, the study seeks answers to the following questions;

- How do usability and user experience contribute to the design of a bicycle rental system in Istanbul?
- What are the problems experienced by people using the Isbike bicycle rental service?
- From the point of view of usability concept, how do the designers working in/consulting with Isbike realize the product development process?

5.3. Scope of The Study

As revealed in the literature research conducted in the previous sections, previous research in this field has not specifically addressed Isbike and the usability of Isbike has not been mentioned. The rental systems of Isbike in the Anatolian side of Istanbul, which is determined within the scope of the research, will be handled within the user group between the ages of 18-65 who use the rental system.

5.4. Determination of The Sample

In this research, it was divided into two groups to examine the issue. In-depth interviews were conducted with a total of 12 participants, including 1 pilot. The first of these groups is the product developers consisting of 2 people. The second group is 10 users of the Isbike bicycle rental system. Snowball sampling, one of the purposive sampling methods, was used to select the interviewed ISBIKE users.

The people selected to answer the problems in the research are the people living on the Anatolian side of Istanbul. In this research, people who have experienced the Isbike bicycle rental system before were selected. The participants in this study are required to have a credit card in order to use the Isbike bicycle rental system. Therefore, the selected participants must be over 18 years of age. In this research,

university students were selected as the lowest level according to their education level, and it was paid attention that the participants had the ability to use mobile applications. Among the users, 12 people were contacted but 10 people could be interviewed. The product developer participants in the study are people who have worked or are working in the Isbike bicycle rental system. In this research, product developer participants were selected from senior positions. In total, 6 product developers were contacted, but 2 of them could be interviewed. The table below shows the number of participants contacted and how many of these participants could be interviewed (see Table 1).

Table 1
Numbers of Participants

	Contact Person Number of	Number of People Participating in the Interview
Number of Product Developer	6	2
Number of Users	12	10

5.5. Data Collection

In this part of the study, interview questions were prepared to examine the usability and design visions of the employees who are actively involved in the Isbike bicycle rental system within Ispark, which is affiliated to Istanbul Municipality in Turkey.

In these interviews, information was obtained about how Isbike emerged, what the design criteria are, which usability principles are followed, whether user experience is utilized, and finally how Isbike will be in the past, present and future.

In the continuation of the study, Isbike users on the Anatolian side of Istanbul in Turkey were asked what they think about Isbike, what they use it for, what kind of experiences they have had and what they think about the Isbike mobile application.

Finally, observations were made and the behavior of Isbike users was analyzed. In these observations, it was observed how users use the Isbike bicycle rental system.

The overall result of these two interview groups and observations is that usability and user experience have an impact on the design of bicycle rental systems.

5.6. Research Constraints

Some limitations have been established in this study with the aim of developing usability and user experience of Isbike bicycle rental systems in terms of usability and user experience and to create possible strategies in the next research.

Within the scope of this study, interviews were conducted with the officials working within the Isbike bicycle rental systems belonging to Ispark, which is affiliated to Istanbul Metropolitan Municipality. In addition, interviews were conducted with users who use the isbike bicycle rental system on the Anatolian side of Istanbul. The results of the interviews were analyzed and a case study was conducted. However, the results obtained in this study should not be seen as the common approach of all Isbike officials and users.

5.7. Data Analysis

In this study, descriptive analysis was preferred as a qualitative data analysis approach. Descriptive analysis is the summarization and interpretation of the data obtained according to predetermined themes and categories (Yıldırım & Şimşek, 2013). The aim of descriptive analysis is to present the information obtained in an organized and interpreted form (Kıncal, 2017).

In this study, a framework for data analysis was created based on the research questions and the dimensions of the interviews and observations. The data obtained according to this framework were read and organized. In this study, the audio recordings of the interviews with 10 participants and 2 product developers were transcribed and the data were read and defined. An example for transcription and data reading/identification is shared in the appendix.

6. FINDINGS AND RESULTS

6.1. Interview Findings

In the first phase of this study, interviews were conducted with 10 users. In these interviews, 4 questions were asked to the users. A summary of the answers of the interviews is shown in the table below (see Table 2).

Table 2

Summary of The Answers of The Interviews From Users

Interviewed Participants	Job	General opinion about Isbike	Purpose of Use	Experience after use	Opinion about the mobile app
A	Architect	Should be improved	*Sport *Entertainment	*Negative * Positive	Not used
B	Fashion Designer	Advantageous for non-bicycle owners	Entertainment	Negative	Synchronization problem
C	Industrial Designer	Should be improved	Trip	* Negative * Positive	Synchronization problem
D	Research Assistant	Should be improved	Trip	* Negative * Positive	*Simple *Easy
E	Architect	*Should be improved *Advantageous for non-bicycle owners	Trip	Positive	Easy
F	Sales Consultant	Should be improved	*Trip *Entertainment	Positive	Not used
G	Student	Advantageous for non-bicycle owners	*Transportation *Entertainment	Positive	Easy
H	Unemployed	Should be improved	*Sport *Entertainment *Transportation	Positive	*Simple *Easy
I	Student	Should be improved	Trip	* Negative * Positive	Basit/Motive edici
J	Unemployed	Successful	Sport	Positive	Difficulty

As seen in Table 2, participant A stated that Isbike bicycle rental systems are a successful system for people who do not own a bicycle, but this system needs to be

improved. In the second question, when asked for what purpose he uses this system, he said that he uses it for sports and activities. In the third question, Participant A mentioned that he had both positive and negative experiences. The negative experiences included broken bicycles and long distances between two kiosks. In the fourth question, Participant A was asked whether he used the isbike mobile application and it was determined that he did not.

The second participant was a 28-year-old fashion designer with a university degree. His answers to the questions in the interview are shown in Table 2.

As seen in Table 2, user B said that Isbike bicycle rental systems are efficient and a successful system for people who do not have a bicycle. User B said *“I think it is a good tool for events and activities and also for doing sports”*. It is clear from what this user said that user B used this system for recreation. In the third question, user B said *“It was a big challenge for us because there were not areas where we could leave the bicycle at every point”*, indicating that user B had bad experiences. In the fourth question, it was understood that user B had a synchronization problem between the isbike mobile application and the kiosk.

The third participant is a 43-year-old industrial designer with a university degree. His answers to the questions in the interview are shown in Table 2.

As seen in Table 2, user C stated that Isbike bicycle rental systems should be developed. In the second question, when asked for what purpose it was used, he said that he used it for sightseeing. When asked what kind of experience he had with Isbike, he answered “bad”. In the fourth question, he said, *“I think there is a lack of coordination, I think there is miscommunication between the kioks and the mobile application”*. This statement suggests that there is a synchronization problem in Isbike bicycle rental systems.

Some participants used the expression *“it should be improved”* about Isbike. Participants’ thoughts on this issue are shared below.

“I think it needs to be developed more. I wonder why ISPARK didn’t do the Seagull project, for example. For example, I don’t like the scattering of seagulls and their derivatives in some places in the city. I think it would be more organized if the municipality itself had an activity instead of these. That’s why I

think it could be better. Isbike It's not enough. I honestly don't find it enough" (Participant C, 43, Male).

The fourth participant was a 26-year-old research assistant with a Master's degree. His answers to the questions in the interview are shown in Table 2.

As seen in Table 2, Participant D stated that Isbike bicycle rental systems should be improved. Participant D used the isbike bicycle rental system for sightseeing and hobby purposes and said in the third question "*The wheels of the bicycle were spinning empty, but otherwise it was nice*". It is understood that she had both good and bad experiences. In the fourth question, he said, "It is very easy, simple, I mean simple for my age group." From these statements, it was determined that the interface of the mobile application of the Isbike bicycle rental system is easy only for a certain age group range.

Some participants used the expression "*for navigation purposes*" about Isbike. The thoughts of the participants on this issue are shared below.

"When I went to the street, I used it for recreational cycling, that is, not as a transportation, but just as a hobby. I mean for recreational purposes" (Participant D, 26, Female).

The fifth participant is a 30-year-old architect with a university degree. His answers to the questions in the interview are shown in Table 2.

As seen in Table 2, participant E said that Isbike bicycle rental systems are a successful system for people who do not own a bicycle, but that this system needs to be developed. Participant E answered the question "For what purpose did you use it?" by saying "*To ride a bicycle on the beach, in other words, it is a kind of sightseeing*". To the third question, he said that he had good experiences and finally, to the question of how do you think the Isbike mobile application is, he said, "*It is easy to use but very plain, I think it could be colored a little*".

The sixth participant is a 30-year-old sales consultant with a university degree. His answers to the questions in the interview are shown in Table 2.

As seen in Table 2, participant F stated that Isbike bicycle rental systems should be improved. Participant F used the Isbike bicycle rental system for sightseeing and entertainment purposes. When asked what kind of experience he had with Isbike, he said, *“I had a pleasant experience on the bike path”*. Finally, he was asked about his thoughts on the Isbike mobile application. Participant F said that he used this system through the kiosk, not through the mobile application.

The seventh participant was a 20-year-old university student. His answers to the questions in the interview are shown in Table 2.

As seen in Table 2, participant G said that Isbike bicycle rental systems are a successful system for people who do not own a bicycle. Participant G used Isbike bicycle rental systems for entertainment and sports purposes. He said that he had positive and negative experiences with Isbike and that the kiosk capacity was insufficient. It was concluded that he used the mobile application easily.

Some participants stated that Isbike is *“advantageous for those who do not own a bicycle”*. The thoughts of the participants on this issue are shared below.

“I can say that it is a service that enables people without bicycles to use bicycles” (Participant G, 20, Male).

The eighth participant is a 27-year-old university graduate. His answers to the questions in the interview are shown in Table 2.

As seen in Table 2, participant H stated that Isbike bicycle rental systems should be developed. Participant H used the isbike bicycle rental system for entertainment, sports and transportation. Participant H gave a positive answer to the question of what kind of experience it was. Participant H said that the mobile application was a very simple application except for the synchronization problem.

The ninth participant is a 22-year-old university student. His answers to the questions in the interview are shown in Table 2.

As seen in Table 2 participant I stated that Isbike bicycle rental systems should be improved. Participant I used the Isbike system for sightseeing and had both good and bad experiences. When asked how do you think Isbike mobile application is, he said *“There are information such as how many kilometers you have traveled, how*

many calories you have burned, I think these are very motivating”. From these words, we can say that the interface of the Isbike mobile application increases people’s use of bicycles.

The tenth participant is a 54-year-old housewife. Her answers to the questions in the interview are shown in Table 2.

Participant J, whose opinions were asked in the first question, said that he found Isbike bicycle rental systems successful. Participant J said that he used Isbike bicycle rental systems for sports purposes and had pleasant experiences. When asked about the Isbike mobile application, participant J said, “When there is a problem, I ask my daughter for help, for example, I ask my daughter to load money”. It was determined that the Isbike mobile application was easier to use in certain age ranges and that the upper age groups experienced difficulties.

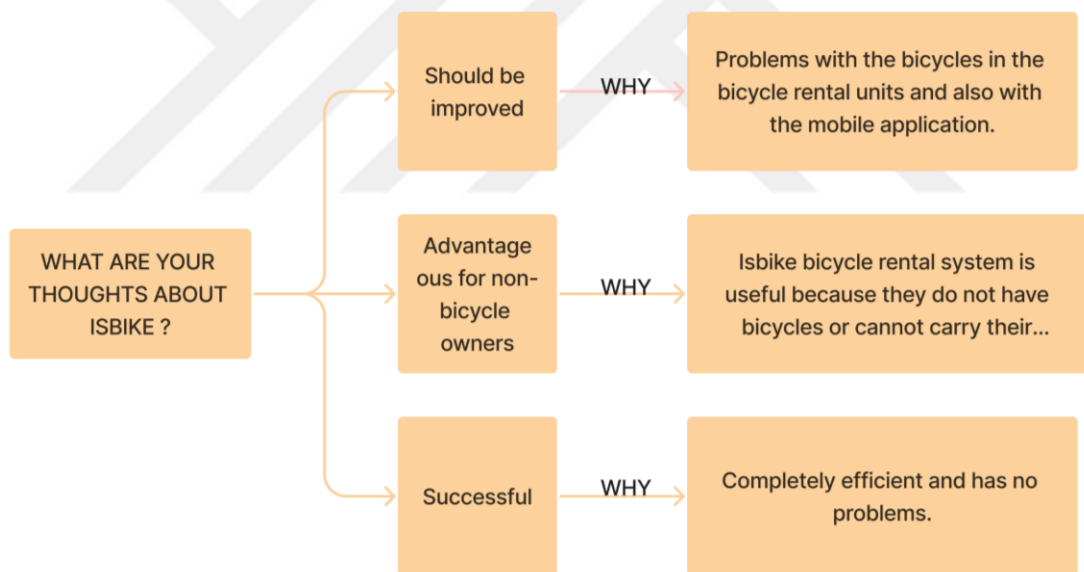


Figure 12. The answer analysis of the first interview question.

In these interviews with 10 participants, the answers to the questions asked were analyzed. The answer analysis of the first question is shown in the pie chart below (see Figure 14).

Out of the 10 participants who were asked about their opinions on Isbike, 6 of them argued that the Isbike bicycle rental system should be improved. These 6 participants said that they had problems with the bicycles in the bicycle rental units

and also with the mobile application. Of the remaining 4 participants, 3 of them said that it is a good and successful system for people without bicycles, but that it still needs to be improved. These 3 participants argue that this system is a necessary system. The last participant claimed that the system is completely efficient and has no problems.

In line with these outputs, it is thought that the Isbike bicycle rental system should be improved. Because a high proportion of participants advocate that this system should be developed.

In the second question of the interview, the participants were asked for what purposes they use the Isbike bicycle rental system. 5 out of 10 participants used it for sightseeing, 3 used it for sports, 2 used it for transportation, 5 used it for entertainment. Of these 10, 4 used it for several purposes. These intersections can be seen in the cluster below (see Figure 15).

PARTICIPANTS	TRIP	SPORT	TRANSPORTATION	ENTERTAINMENT
A		X		X
B				X
C	X			
D	X			
E	X			
F	X			X
G			X	X
H		X	X	X
I	X			
J		X		

Figure 13. Table of user intentions.

Among the 10 participants who used Isbike bicycle rental system, 1 of them used this system for both sports and entertainment purposes. One of the participants used Isbike for recreational purposes at the same time. Another participant used it for both transportation and entertainment. Finally, one of the participants used the Isbike bicycle rental system for sports, transportation and entertainment purposes. We can see this data from the cluster above (see Figure 15).

In line with these outputs, it has been revealed that the Isbike bicycle rental system can be used for many purposes. As a result of this conclusion, it is concluded that Isbike bicycle rental systems comply with the principle of efficiency among the principles of usability.

In the third question of the interview, 5 of the participants said that they had both bad and good experiences. Of the remaining 5 participants, 4 said they had good experiences, while the last participant said they had bad experiences. We can see these ratios in the graph below (see Figure 16).

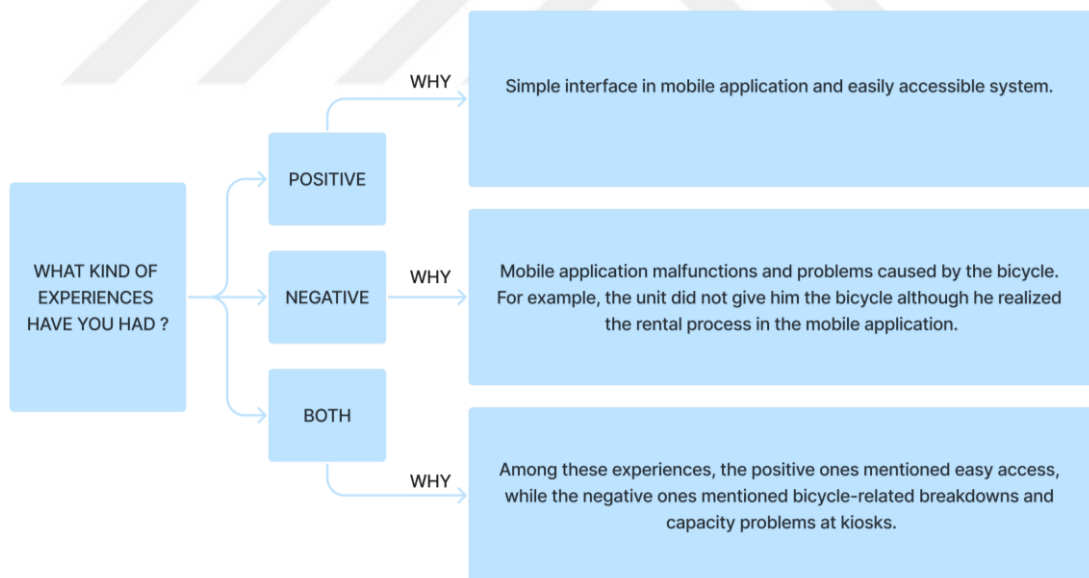


Figure 14. User experience satisfaction graph.

In the light of this information, we can conclude that the participants of Isbike bicycle rental systems are satisfied with this service and that this system is an efficient system, since the rate of good experiences of the participants of Isbike bicycle rental systems is higher than the bad experiences.

Finally, the results of the question about how the users found the mobile application of the isbike bicycle rental system can be seen in the pie chart below (see Figure 17).

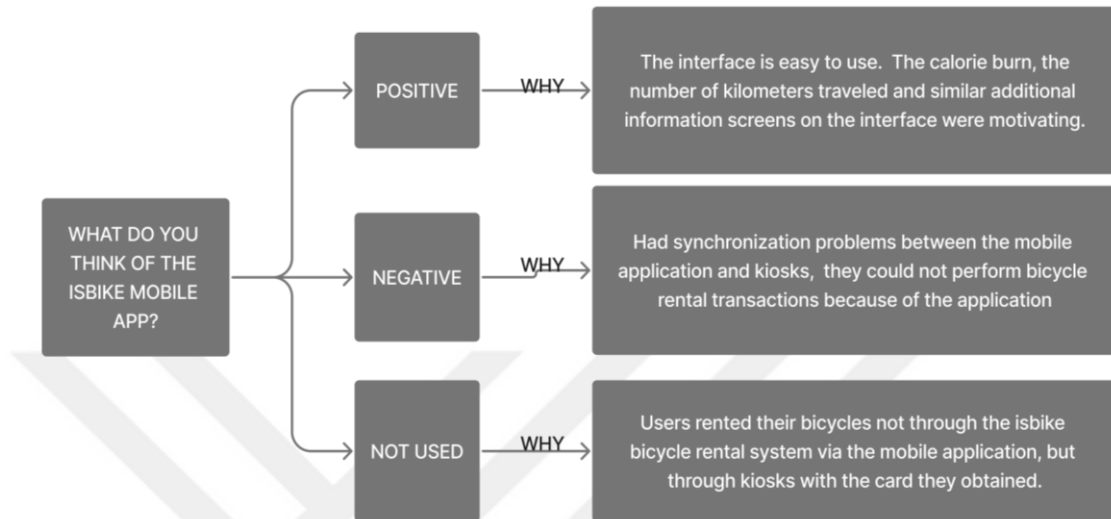


Figure 15. Mobile application usage graph.

As can be seen from the graph above, 5 out of 10 participants stated that this application is easy to use. 2 of the participants did not use the mobile application because they used the isbike bicycle rental system in the past. Participant J said that this mobile application is difficult. Due to his age, he cannot use the mobile application with full efficiency. 27% of the participants said that they had problems with this mobile application.

In this part of the study, the responses of 2 product developers who have worked and are working within Isbike Bicycle Rental Systems are shown in the table below (see Table 3).

Table 3

Summary of The Answers of The Interviews From Product Developer

	X	Y
How did the idea of Isbike come about?	-It emerged with the need for micro mobility and serves as a means of navigation	-The aim is an individual alternative means of transportation, but the current point is a means of navigation.
What did you consider when designing the Isbike App?	-Because it is made for industrial use rather than personal use, it is heavier and more robust.	-Easy interface to appeal to the general public.
Did you benefit from user experience while designing Isbike?	-We went for renewal and took into account the feedback of Istanbulites.	-Synchronization between mobile application and kiosks
Did you follow usability principles in Isbike design?	-More people use it for sports	
What were your ideas when Isbike was founded? Where do you see Isbike now? How do you envision Isbike will be in the future?	-Credit card collection	We examine the complaints and suggestions from 153.

As a result of these interviews, both product developers who worked in Isbike bicycle rental systems said in the first question that the purpose of Isbike's establishment was a means of transportation. However, in today's conditions, they said that the bicycles of the Isbike bicycle rental system have turned into a means of transportation. In the second question, different answers were received because both product developers worked for Isbike in different time periods. When asked what they took into consideration when designing Isbike, they gave a common answer again. 153 It was said that they received complaints and suggestions from the White Desk line, analyzed them and tried to select and implement the applicable ones. To the question of whether the usability principles were followed in the design of the Isbike, participant Y stated that they partially complied, but that they generally took the cost factor into consideration. The user X expressed the idea that he thought it could be more useful. In the last question, both participants stated that isbike was established for transportation purposes as they said at the beginning, but today it is used as a means of transportation and they hope that isbike will switch to e-bike system in the future.

6.2. Results Of Findings

When the opinions of the people involved in the development of the isbike bicycle rental system and the users of the isbike bicycle rental system and the observations made, it can be said that usability and user experience have a positive impact on the product development of isbike bicycle rental systems. When the findings obtained from the interviews and face-to-face interviews with the people involved in the product development of the isbike bicycle rental system and the users who have used the isbike bicycle rental system are examined, it is seen that many similar statements are encountered. By discussing the concepts mentioned in the framework of usability and user experience concepts, it may be useful to answer the questions in the introduction of the research.

The findings obtained as a result of the examinations conducted in the research are evaluated in this part of the study. In order to evaluate this data, the hypothesis should be remembered first;

User experience and usability have positive implications for users, manufacturers and municipalities in bicycle rental systems, both physically and digitally.

In order to evaluate this thesis, inferences are drawn from the findings and answers are provided to the following research questions from the introduction;

- 1) How do usability and user experience contribute to the design of the bicycle rental system in Istanbul?
- 2) What are the problems or issues experienced by people using the Isbike bicycle rental service?
- 3) In terms of usability concept, how is the product development process carried out by the designers consulting within isbike?

6.2.1. The effects of usability and user experience on the isbike

As a result of the findings of the research and the information obtained from the literature review, it can be said that usability plays a positive role in the product development of Isbike bicycle rental systems. In the light of the data obtained from the interviews with the users of Isbike bicycle rental system, we can say that the effect of usability has increased in the development of Isbike from past to present. We can see from the findings of the interviews with the users that it incorporates the concepts of learnability, memorability and satisfaction from the usability criteria. 70% of the users said that the Isbike mobile application is easy. Of the remaining thirty percent, 20% did not use the mobile application and the last ten percent of the users could not use the mobile application due to their advanced age. Based on the satisfaction criterion of usability from the data obtained from the interviews, it can be said that 90% of the users responded positively from their experiences. These evaluations can be supported by the following words of Nielsen; A good usable design is characterized by a user-centered approach (Nielsen, 1994). On the other hand, Isbike bicycle rental system has not developed in terms of the concept of efficiency, one of the usability criteria of Isbike bicycle rental systems. As a result of the interviews, it was stated in the interviews with the product developers that the initial purpose of Isbike was transportation, but it was concluded that today Isbike is used as a recreational vehicle.

6.2.2. The role of product developers in the usability of isbike

As a result of the literature research, interviews and observations during the study period, it is seen that the product developers who have worked or are working at Isbike take usability and user experience issues seriously.

However, a result of the interviews with users shows the opposite. It is seen that the Isbike bicycle rental system is not sufficient in terms of efficiency, one of the usability criteria. The reason why Isbike has not made these improvements is that the product developers have put forward the cost problem. In this sense, Isbike employees are expected to make more accurate planning, more accurate designs and better market research with lower costs in order to produce products that meet the usability criteria.

It has been determined that the people involved in the product development process within Isbike use 153 white tables as a method based on data collection in usability. The useful data from these data banks they created were compared with the interviews with the users they applied and positive information was recorded.

It has been determined that people working at Isbike use data collection, data analysis and data synthesis techniques as inquiry-based methods in usability. This method is the Think-aloud technique, that is, taking data from a portal where users can verbalize their complaints and suggestions.

6.2.3. Eliminating the problems experienced by isbike users

In the researches conducted, it was determined that Isbike has several problems in the findings that emerged as a result of the interviews with the users.

One of these problems is the synchronization problem between the Isbike mobile application and the kiosk. In order to overcome this problem, we can say that the transmitter and receiver hardware in the kiosks should be renewed and the mobile application version should be updated accordingly.

One of the problems experienced by users is the capacity of kiosks and the long distances between kiosks. The suggestion for this issue is to get rid of the outdated kiosk system. In addition, we can suggest a system where bicycles are renewed and GPS is installed and finally, certain gathering areas can be determined on maps with a geofence system and bicycles can be left at certain points.

With the geofence system, it is expected that it will also contribute to the purpose of the Isbike bicycle rental system, that is, isbike can also be used as a means of transportation.

8. CONCLUSION

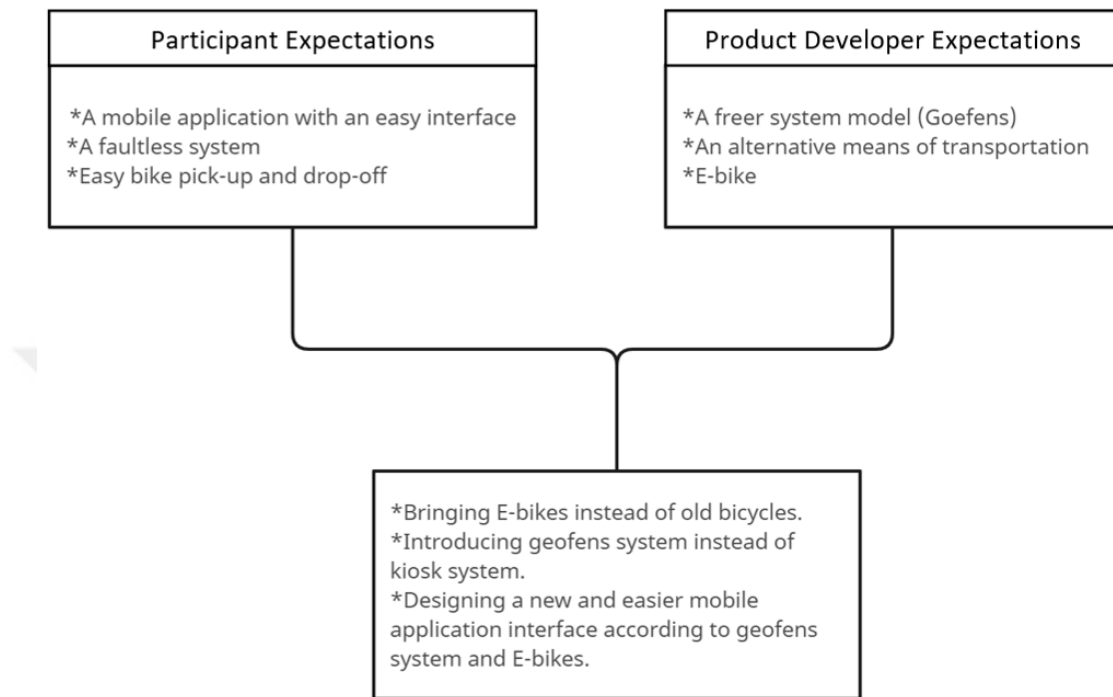


Figure 16. Synthesis of expectations of participants and product developers.

The chart above shows the expectation data of the participants and product developers from the research conducted. In the synthesis of this data, new design ideas have been proposed for the isbike bicycle rental system.

The first of these suggestions is the replacement of old bicycles with e-bikes. E-bikes are lighter than the current Isbike bicycles and they are equipped with GPSs and electric motors. With the GPS devices on the e-bikes, a geofence system can be installed and the bikes can be dropped off in areas shown on maps. With this system, the kiosk system can be removed and more bike pick-up and drop-off points can be created. In this way, it is not expected that there will be a capacity problem in a certain location. Finally, in order for this system to work, the design of the mobile application needs to be renewed according to a system with this feature.

The concepts of usability and user experience are included in all products or services that interact with human beings from past to present. Usability is the measure

of how effectively and easily people can perform the tasks they want using a particular product or service.

In order to examine the effects of usability and user experience in the product development process, this research was conducted with a focus on Isbike bicycle rental systems.

When Isbike bicycle rental systems are examined, it is seen that usability and user experience is a positive factor affecting the design in the product development process. It has been concluded that usability criteria provide various advantages in the design process of isbike bicycle rental systems.

As a result of the researches, it was determined that the Isbike bicycle rental system has two main problems. One of them is the synchronization problem. It can be said that this synchronization problem can be solved by changing the hardware and upgrading the mobile application version. The second problem is the capacity of the kiosks where the bicycles are located and the long distances between these kiosks. As a solution to this problem, it is concluded that the kiosk system should be removed and replaced with a geofence system and a more apologetic system model without capacity problems will eliminate the problems.

In the light of the research, answers to three research questions were sought. Firstly

“How do usability and user experience contribute to the design of a bicycle rental system in Istanbul? “ The answer to the first research question is that bicycle rental systems use usability criteria to improve their designs both digitally and physically in the light of the data obtained from the user experience. The second research question is *“What are the problems or issues experienced by people using the Isbike bicycle rental system?”* In response to this question, users who use Isbike are of the opinion that there is a capacity problem in the kiosks, the distances between these kiosks are long and there is a synchronization problem between the kiosks and the mobile application. The last question of the research is *“ In terms of the concept of usability, how do the designers consulting at Isbike carry out the product development process? “* As a result of the research, it is concluded that designers analyze the data obtained by using user experience in the product development process and present new design proposals or system models with the results obtained from these analyzes.

The hypothesis of the research is as follows “ *User experience and usability play an important role in bike rental system design and product development.* “ As a result of the data obtained in this study, we can say that this hypothesis is correct. Usability and user experience concepts are not expected to be present in this system that interacts with people.

Usability and user experience are concepts that exist in the infrastructure of all products and services that interact with people. This study is an important research area for many design disciplines. This study describes the effects of these concepts on bicycle rental units. The adaptation of the design data presented in this study to the design processes of different disciplines sets an example for future research.



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APPENDICES

Appendix A. Murat Çakır, 49 Yaşında, Yüksek Lisans Mezunu, Mali Müşavir, Eski İsbike Genel Müdürü

* İSBİKE FİKRİ NASIL ORTAYA ÇIKTI?

İspark fikri bildiğim kadarıyla 2015 te mikro mobilite ihtiyacı nedeniyle aslında bu toplu taşıma arterlerine ulaşma amaçlı olarak tasarlanarak ortaya çıktı. Fakat İstanbul'un topoğrafyası nedeniyle genelde sahil şeridinde yer aldığı için bir Trip aracına dönüştü. Elektrikli olmadığı için yani destekli olmadığı için yokuş yukarı çok çıkamıyor.

Kullanıcısının eforuna bağlı. O yüzden genelde sahil hattı boyunca kullanılıyor. Bu endüstriyel bir tasarım olduğu için Elektrikli veya işte ne bileyim destekli veya şarj destekli bir şey yapmadığımız sürece veya motorlu, zaten yokuş yukarı çıkmakta çok zorlanıyor.

Diğer yurt dışındaki örneklerle de baktığımız zaman genelde tasarımları üç aşağı beş yukarı bu model. Çünkü bu şey hani günlük kişisel kullanımdan ziyade yollarda endüstriyel kullanım yönünde yapıldığı için daha sağlam, biraz daha ağır olması gerekiyor. Bozulmaması bekleniyor.

* İSBİKE UYGULAMASINI TASARLARKEN NELERİ DİKKATE ALDINIZ?

İsbike uygulamasını iki sene evvel yenilemesini yapmıştık. Orada şimdi bir öncelikle daha önceki uygulamada müşterilerin, kullanıcıların İstanbulluların geri dönüşünü dikkat edildi. Burada en önemli şeylerden bir tanesi işte kullanım amacı çünkü sportif amaçlı kullanan da çok. Örneğin; kaç kilometre kullanmışım? hesabımın daha önceki bakiyelerini takip edebiliyor muyum? Bu ux tarafında testler de yapıldı mümkün olduğunca tabi ki, yurt örnekleri alındı orada başka mikro mobilite uygulamalarında Martı'nın ve yaş daha sık kullanılan hangileri varsa onlardaki Good özellikler de göz önüne alındı ve içeride yazıldı bu.

* BUNLAR NELERDİR PEKİ? BUNLARI BIRAZ AÇABILIR MISINIZ?

Kredi kartından tahsilat. İstanbul kartla ödeme yapılabilmesi. O şu anda o aktif mi? Onu bilmiyorum, işte boş istasyonların görülmesi, istasyonlarda kaç bisiklet olduğunun görülmesi. Buradaki en kritik şey de tabii ki yük dağıldı mı? Yani şöyle ki hani herkes Beşiktaş'ta bırakmak istiyor fakat Beşiktaş'taki istasyon sayısı kısıtlı. İstasyonda boş yer olup olmadığının da gösterilmesi gerekiyor mesela müşteriler tabii yani kullanıcıların en çok istediği konulardan bir tanesi de buydu.

* Evet ben de eski kullanıcılarla da görüşmüştüm. onlar kart basma döneminden beri hani kullanıyorlarmış ve mobil uygulamaya geçtiğimizde orada bisiklet var gözüküyor ama gittiğimizde göremiyoruz demişlerdi, böyle geri dönüşler almıştım.

O konular donanımdan kaynaklanıyor, bazen donanımın teknolojisi yazılıma yetişememesinden de kaynaklanıyor çünkü artık istasyonlu bir teknoloji de kalmadı, artık istasyonsuz ilerliyor. Kilit mekanizmalarıyla beraber aslında işlemin bitip başlaması gerekiyor malesef istasyonlu bir düzen kurulduğu için de o istasyondaki teknik yetersizlik deyip kullanıcı işte uygulamadaki eksik bilgiye yol açıyor.

* KULLANICI DENEYİMİNDEN YARARLANDIK DEDİNİZ, NE ŞEKİLDE YARARLANDINIZ KULLANICI DENEYİMİNDEN? NASIL TESTLER YAPTINIZ?

Geri bildirimleri sonuçta belediye hizmeti olduğu için 153 üzerinden çok sayıda geri bildirim alıyoruz ve bunları inceliyoruz. Uygulama içerde yazıldığı içinde taleplere göre şekillendirme esnekliğimiz vardı. Ama bir focus grup kurmadık ama zaten 153 ten çok data geldiği için gerek duymadık.

* SIZCE İSBIKE KULLANILABİLİR BİR TASARIMA MI SAHİP YANI KULLANILABİLİRLİK ESASLARINA UYULARAK MI TASARLANDI?

Şöyle bence İstasyon bazlı bir mikro mobilite sistemi yerine bu (geofens) ile yani coğrafi olarak işaretlenmiş yerlere bırakabileceğiniz daha özgür bir model daha Good olacaktır diye düşünüyorum. Yani sadece Trip amaçlı yapıcaksanız evet bu sistem Good. Ama Transportationa da katkısı olsun. İşte ne bileyim metrodur gidip bırakıyım dediğiniz zaman bu modelle öyle bir Transportationa katkısı olmaz ve Trip bisikletinden öteye de geçmez zaten. Her yere bırakılsın değil. Her yere bırakılmasına da karşıyım ben. Ama böyle işaretlenmiş yerlerde başlanılıp bitirilmesi bence gerekli.

İşaretlerseniz onların hani sonuçta GPS'leri üzerinden. Zaten bisikletin kitlenme yeri belli işaretleyebiliyorsunuz. İstiklal Caddesi üzerinde bitiremiyor olması lazım. İşaretlenmiş alanlarda bitirebilirse onları hep bir yerde toplanmış olur. Hem herkes acaba nerede var diye aramamış olur. Ama tabii bu da böyle çok uzak ayrı İsparkta olduğu gibi aralarında böyle beşer kilometre olan yerlerde değil de yani sık sık yerlerde olması lazım ki bir işe yarasın.

* İSBIKE I ILK KURARKEN KI FIKIRLERINIZ NELERDI? ŞUAN İSBIKE I NEREDE GÖRÜYORSUNUZ? VE İSBIKE IN GELECEKTE NASIL OLACAĞINI ÖNGÖRÜYORSUNUZ?

İsbike ın ilk planlamasında ben yoktum fakat gördüğüm kadarıyla planlaması Transportationa da katkısı olacak bir bisiklet sisteminin kurulmasıydı fakat geldiği noktada hala çok tutulan gerçekten hem turistler hem İstanbullular tarafından tercih edilen bir Transportation aracına dönüştü, hem Trip amaçlı hemde Transportation için de kullananlar var. Bundan sonra da dediğim gibi istasyondan bağımsız mümkünse Elektrik destekli bir e-bike sistemi olabilir ona dönüşecektir.

Appendix B. Cem Oflas, 41 Yaşında, Lisans Mezunu, Yapıdorm Teknoloji Firmasında Saha Uzmanı

*** İSBİKE FİKRİ NASIL ORTAYA ÇIKTI?**

İsbike 2012 de bireysel Transportation aracı olması amaçlanan fakat şartlar itibarı ile günümüzde bir Trip aracına dönüşmüş bir bisiklet kiralama sistemidir. Bu sistemin ilk çıkışı sürekli Transportation amaçlı düşünülse de genelde aynı sonuçlar gözlenmiştir. Bu durum avrupa ülkelerinde de aynı şekilde uygulandığını görebilirsiniz. Tabi bir hollanda gibi değil ama örneğin italya da bisiklet kiralama sistemleri en çok turistler tarafından kullanılıyor ve Trip amaçlı kullanılıyor. Yani sözün özüne gelirsek İstanbul Büyük Şehir Belediyesinin aslında alternatif Transportation için planlanmış olduğu düşünülse de halka bir Trip aracı olarak lanse edilmiş bir bisiklet kiralama sistemi olarak ortaya çıkmıştır.

*** ISBIKE UYGULAMASINI TASARLARKEN NELERİ DİKKATE ALDINIZ?**

Ben mobil uygulama kısmında görev almadım fakat bilgim dahilinde olanlar; bu uygulamanın herkes tarafından kullanılması istenmesi ve ona göre daha kolay bir arayüz tercih edilmesi gerektiğiyle alakalıydı. Mobil uygulamadan önce kartlı sistemi kullanılıyordu ve vatandaşlarımız kiosklardan işlemlerini halledebiliyorlardı. Fakat bu sistemde sorunlarla karşılaştık bunlar mekanik olsun dijital olsun bir çok şikayet aldık. Örneğin ekranda rakamlara basılamadığı veya kart okuyucunun çalışmadığıyla alakalı. Bununla birlikte isteklerde alıyorduk insanlar yoğun olan bölgelerde bisiklet bulamıyor ve onlara yakın alternatif nerelerde bisiklet bulabilceklerini merak ediyorlardı. Bunlara daha bir çok örnek verebilirim ama süremiz çok uzar, neticede bu tarz geri dönüşler sayesinde elimizde bir veri bankası oluşturduk ve tasarımıımızı bu verilere göre yaptık.

*** ISBIKE’I TASARLARKEN KULLANICI DENEYİMİNDEN YARARLANDINIZ MI?**

Biraz önce bahsettiğim gibi bir anda ortaya çıkmadık, tabi ki kullanıcı deneyiminden yararlandık bir veri bankası oluşturduk . Bu verileri 182 den şikayet ve öneriler sürekli geliyordu ve biz bu verileri ekibimizle analizlerini yapıp yani doğruyu

yanlışı birbirinden ayırıp, öyle diyorum çünkü saçma yorumlarda geliyordu karşımıza, evet bu verileri ayıklayıp içlerinden uygulanabilecek olanları sistemimizin içine entegre ediyoruz. Hayır kullanıcı testleri yapmıyoruz çünkü elimizdeki veriler bize yeterince yardımcı oluyor.

* ISBIKE TASARIMINDA SİZCE KULLANILABİLİRLİK ESASLARINA UYULDU MU?

Şöyle söyleyebilirim bire bir kullanıcıyla etkileşim halinde olan bir sistemden bahsediyoruz, kullanılabilirlik esaslarına uymamamız söz konusu olamaz fakat buna ek olarak farklı faktörler var örneğin bisikletlerin ağır olması birçok kullanıcı tarafından eleştiriliyor fakat maliyetlerin yükselmesi sebebiyle bazı durumları istismar etmek zorunda kalıyoruz bu konu da benimle alakalı değil ve elimden de analizleri göstermek ve önermek dışında bir seçenek kalmıyor.

* İSBIKE İLK KURARKEN Kİ FIKIRLERİNİZ NELERDİ? ŞUAN İSBIKE İ NEREDE GÖRÜYORSUNUZ? VE İSBIKE İN GELECEKTE NASIL OLACAĞINI ÖNGÖRÜYORSUNUZ?

Güzel bir soru düşünüyüm, isbike ilk kurulduğunda değil fakat benim ilk bu işte çalışmaya başladığım dönem bir Transportation aracı sistemi olması gerektiğini düşünenlerdendim fakat şuan günümüzde bunun İstanbul için biraz zor olduğunu düşünüyorum çünkü insanlarımız bu sistemi daha benimsemiş değiller, onlar için bisiklet hala bir Entertainment bir spor. İlerde teknolojinin gelişimi sayesinde bisikletlerin de daha Good olacağını varsayarsam ve bununla birlikte insanlarımız bisiklet kullanmaya devam edeceğini düşünürsek ileride bu sistemin daha yaygın bir halde daha verimli ve bir çok amaç için kullanılabilcek bir sistem olacağını düşünüyorum.

Appendix C. Gizem Sonay, 30 Yaşında, Üniversite Mezunu, Yataş Firmasında Mimar

*** İSBİKE HAKKINDA NE DÜŞÜNÜYORSUN?**

Genel bir yorum yapmam gerekirse ülkemizi geliştirilmesi gereken güzel bir alana parmak basılmış olduğunu düşünüyorum. Ben İsbike'nin eski kullanıcılarındanım. Yıllarını tam hatırlamıyorum ama üniversite yıllarımda arkadaşlarımla sosyalleşmek amaçlı hafta sonları çok kullandık. o zamanki deneyimlerimden daha çok bahsedebilirim. Son zamanlarda iş yoğunluğuyla yoğunluğu sebebiyle sadece yazın arada bir bisiklet sürmeye gidiyoruz. Ben e5 in üst kısmında yaşıyorum ve elimde bisikletim dahi olsa maalesef İstanbul'da bisiklet yolları olmadığı için sadece de sahilde bisiklet kullanabildiğimiz İçin evden bir bisiklet çıkarıp alıp götürme gibi bir imkanım yoktu. Onun için de isbike benim için gerçekten çok güzel bir uygulama oldu diyebilirim. Fakat İsbike ın kendi içinde geliştirilmesi gereken alanları vardı benim kullandığım dönemde. Bunda da yaklaşık beş altı sene önce olması gerekiyor diye düşünüyorum. O zamanki deneyimlerimde isbike da bir mobil uygulama yoktu. İsbike'nin belirli turnikeleri vardı ve turnikelere kart okutarak bisikleti kiralama işleminiz gerçekleşiyordu. Ama şöyle bir sıkıntı vardı. Duraklar çok azdı ilk etapta. durakların arasında çok büyük bir mesafe vardı ve işte bu duraklarda kaç adet bisiklet olduğunu asla göremiyorduk. Biraz şansa gidiyorduk açıkçası.

*** İSBİKE'İ NE AMAÇLA KULLANDINIZ?**

Ben İsbike'ı spor yapmayı sevdiğim ve hafta sonu spor aktivitesi olsun ve arkadaşlarımla da birlikte vakit geçirebileyim diye kullandım açıkçası.

*** İSBİKE İLE NASIL DENEYİMLER YAŞADINIZ?**

Yani olumlu ve olumsuz yanları vardı. Yorum yapacak olursam Bisikletler maalesef hasarlı oluyordu ve hasarlı olduğunu görebilecek bir application yoktu. Ya da aldıktan sonra hasarlanabiliyordu. Atıyorum zincire atabiliyordu. Lastiği patlayabiliyordu Bu sefer de duraklar arasında çok büyük mesafeler olduğu için bir sonraki durağa kadar bisikleti taşımak zorunda kalıyordunuz kendi elinizle. Ve

herhangi birine Transportation sağlayıp yardım isteyemiyordunuz. Bu büyük bir sıkıntıydı.

Daha sonra ya bunlar zamanla tabii ki de geliştirildi. Son zamanlarda application geldikten sonra kullanmaya başladığında çok büyük rahatlığa ulaştım. Şöyle söyleyebilirim. kaç adet bisiklet olduğunu, bisikletlerin nerede olduğunu, durakların mesafesini ve harita telefonu harita üzerinden o durağa nasıl ulaşabileceğimi görebiliyor hale geldiğim için benim için gerçekten kullanışlı bir hale geldi. fakat diğer ülkelere baktığımızda Transportation aracı olarak kullanılmasına rağmen bizim ülkemizde çok fazla Transportation aracı olarak kullanılmıyor.

Geliştirilmesi gereken bir alan olduğunu düşünüyorum. Maalesef coğrafi olarak çok düz bir zeminde yaşamıyoruz İstanbul'da. Fakat bisiklet yolları yapılabilir diye düşünüyorum. Maalesef işte bir metro aktarmasına biniyorsunuz. Belki çok kısa bir durak gideceksiniz. Ya da metrodan metrobüse geçeceksiniz. Kısa bir alan. fakat bisiklet yolu olmadığı için ya da oraya yakın indiğiniz metro durağına yakın bir bisiklet kiralama durağı olmadığı için bir Transportation aracı olarak kullanılmıyor. İnsanlar kendi kişisel bisikletleriyle bunu yapmaya çalışıyor. Bazı insanlarda görüyorum. fakat Transportation için çok fazla kullanıldığını düşünmüyorum. Ben de kendi adıma kullanmıyorum.

Appendix D. İrem Çakaloğlu, 28 Yaşında, Üniversite Mezunu, LC Waikiki Firmasında Moda Tasarımcısı

*** İSBIKE HAKKINDA NE DÜŞÜNÜYORSUN?**

İSPARK bence etkinlik ve aktivite için ve aynı zamanda spor yapabilmek için Good bir araç. Özellikle de bisikleti olmayan ve bisiklet alamayan gençler ve diğer orta yaşta insanlar için Good bir araç olduğunu düşünüyorum. Verimli bir araç çünkü hem arkadaşlarıyla hem tek başına. Good vakit geçirebilmek için veya spor yapabilmek için verimli bence. Transportation aracı olarak kullanmıyorum. Çünkü Transportation aracı olarak kullanımı verimli olmadığını düşünüyorum. Yani çünkü şehir içi bisikletleri farklı. İSBIKE Biraz daha etkinlik amaçlı, aktivite amaçlı Trip bisikletleri ve zaten şehir içinde kullanım olabilmesi için birincisi bisiklet yollarının olması gerek bence. Maalesef ki İstanbul'da öyle bir her noktada hem bisiklet yolu hem de bisikletini bırakabileceğin nokta olmadığı için bu bisikletleri Transportation için kullanmayı düşünmem.

*** İSBIKE'İ NE AMAÇLA KULLANDINIZ?**

Ben aktivite hem de Entertainment amaçlı arkadaşlarımla Good vakit geçirebilmek amaçlı kullandım. Bu yüzden hani çok Good deneyimler yaşayamadım açıkçası.

*** İSBIKE İLE NASIL DENEYİMLER YAŞADINIZ?**

Şöyle genellikle deneyimlerim Bad oldu. Ben ilk İsbike çıktığı zaman kullanmaya başlayanlardandım. biz bisikletleri kartla alıyorduk. Bazen kartın okumadığı durumlar oluyordu. Alamıyorduk bisiklet. Aldığımız bisikletler bozuk çıkabiliyordu. Lastiği patlak çıkabiliyordu ve her noktada bisikleti bırakabileceğin alanlar olmadığı için bu bizim için büyük bir zorluk oluyordu. Değiştiremiyorduk bisikleti atıyorum. Yolda giderken lastiğim patlıyordu ve hani belli noktalarda duraklar olmadığı için bisikleti bırakamadığından kaynaklı yürümek durumunda kaldığım noktalar oluyordu. Bu yüzden hani çok Good deneyimler yaşayamadım açıkçası.

*** İSBIKE MOBİL UYGULAMASI SİZCE NASIL?**

Mobil uygulamada sadece hani duraklarda kaç tane bisiklet olduğunu görebilmek amaçlı kullanıyordum. tek kullandığım özelliği hangi duraklarda kaç tane bisiklet var onu öğrenmek istiyordum. Tabi onlarda da şöyle bir sıkıntı oluyordu. Hani bakıyorsun beş tane bisiklet var gidene kadar azaldığında onu göster ya da gittiğinde o bisikletin hani bozuk veya işte normal olduğunu bilemiyorsun. Lastiği Good mi değil mi onu bilemiyorsun. O tip sıkıntılar yaşıyordu.



Appendix E. Türker İnan, 43 Yaşında, Lisans Mezunu, Polin Firmasında Endüstriyel Tasarımcı/Öğretim Görevlisi

*** İSBIKE HAKKINDA NE DÜŞÜNÜYORSUNUZ?**

Daha çok geliştirilmesi gerektiğini düşünüyorum. bir de geçen aklıma geldi. Martı projesini İSPARK'ın neden yapmadığını merak ediyorum mesela. neye takıldılar da yapmadılar. Mesela şu an martı ve türevlerinin şehirdeki bazı yerlerde dağınıklığı hoşuma gitmiyor. Bunların yerine yani belediyenin kendisinin bir faaliyeti olsaydı sanki daha düzenli olurdu. O yüzden daha Good olabileceğini düşünüyorum. İsbike Yeterli değil yani. Yeterli bulmuyorum açıkçası.

*** İSBIKE'İ NE AMAÇLA KULLANDINIZ?**

Oğlumun Maltepe Park'a götürmüştüm bisikletiyle. orada bisiklete binen ebeveynleri görünce senin de benimle binme şansın olur mu baba dedi. Annesiyle bana birer tane de bisiklet kiralamıştık o zaman. Trip amaçlı kullanmış olduk. Ve oğlumuzla eşlik ettik.

*** İSBIKE İLE NASIL DENEYİMLER YAŞADINIZ?**

Aslında ilk başlangıç çok Good olmadı. Şöyle oldu. kioskta bir sürü bisiklet vardı. biz o bir sürü bisikletin içerisinde kesin birini alabileceğimizi düşünerek kioska da problem yaşadığımız için mobil uygulamaya para yükleyip bisiklet kiralamaya çalıştık fakat hiçbirini vermedi. Meğer o gün o noktada bir internet problem varmış. Merkeze ulaşamadığı için anladığım kadarıyla hiçbir bisikleti vermiyormuş. Dolayısıyla biz de işte çağrı merkezini aradık. Çağrı merkezi hemen bir yandakine bizi yönlendirdi. Bir yandakine gittiğimizde tabii ki hiçbir bisiklet yoktu. Yani ilk deneyimim Bad başladı.

*** İSBIKE MOBİL UYGULAMASI SİZCE NASIL?**

İsbike mobil uygulamasıyla sorun yaşamadık. Asıl problem nokta ve iletişimsizliğiyle yani noktalardaydı. Kordinasyon sıkıntısı olduğunu düşünüyorum kiosk ve mobil uygulamalar arası iletişimsizlik var bence.

Appendix F. İrem Elal, 26 Yaşında, Yüksek Lisans Öğrencisi, Araştırma Görevlisi

*** İSBIKE HAKKINDA NE DÜŞÜNÜYORSUNUZ?**

Kullanışlı ama dört mevsimi olsa bence daha Good olur. Belki tasarım ve arayüzü değişebilir. Bununla birlikte güneşli zamanlardakiosklarda görüş engelleniyor güneş parlaması yüzünden.

*** ISBIKE’I NE AMAÇLA KULLANDINIZ?**

Caddeye gittiğimde keyif amaçlı bisikleti sürmek yani bir Transportation değil de sadece bir hobi olarak kullandım. Trip amaçlı yani.

*** ISBIKE İLE NASIL DENEYİMLER YAŞADINIZ?**

Aslında keyifliydi ama kullandığım bisikletin artık neyinde sıkıntı var bilmiyorum. Boş dönüyordu. Yani bir servis yapılması gerekiyordu bisikletin bakımı olarak. Ama onun dışında güzeldi.

*** ISBIKE MOBİL UYGULAMASI SİZCE NASIL?**

Gayet kolay, basit yani benim yaş grubum için basit. Ama daha yüksek için bence değil bence.

Appendix G. Tarık Aykaç, 30 Yaşında, Lisans Mezunu, Mimar*** İSBIKE HAKKINDA NE DÜŞÜNÜYORSUNUZ?**

İstanbul şartlarında depolaması zor olan dış ortam ürününe hizmet sayesinde ulaşmak keyif verici.Yani bisikleti olmayan insanlar için bence şahane bir proje. Fakat kilit noktalarındaki istasyonları arttırılmalı.

*** İSBIKE’I NE AMAÇLA KULLANDINIZ?**

Sahilde bisikletle turlamak için yani bir nevi gezi amaçlı oluyor.

*** İSBIKE İLE NASIL DENEYİMLER YAŞADINIZ?**

Keyifliydi açıkcası eşimle birlikte hem spor hem Entertainment amaçlı bindik, bisikletler biraz ağırdı fakat idare ederdi.

*** İSBIKE MOBİL UYGULAMASI SİZCE NASIL?**

Kullanımı kolay fakat çok sade bence biraz daha renklendirilebilirdi ve bence biraz yavaş bir arayüzü var geliştirilmesi gerekiyor bence.

Appendix H. Büşra Yılmaz, 30 Yaşında, Lisans Mezunu, Satış Danışmanı*** İSBIKE HAKKINDA NE DÜŞÜNÜYORSUNUZ?**

İsbike projesini beğeniyorum yaygınlaşması gerektiğini düşünüyorum ancak bunun için altyapı eksikliği bulunmaktadır bunun tamamlanması gerektiğini düşünüyorum. Bisiklet yolları çok fazla kesintiye uğramaktadır yolların sürekliliğinin sağlanması gerekmektedir.

*** İSBIKE’I NE AMAÇLA KULLANDINIZ?**

Kullanım amacım Entertainment amaçlı olmuştur. İstanbul’u bisiklet ile gezmeyi deneyimlemek istedim.

*** İSBIKE İLE NASIL DENEYİMLER YAŞADINIZ?**

Bisiklet yolunda keyifli bir deneyim yaşadım. Araç yollarında tedirginlik hissettim.

*** İSBIKE MOBİL UYGULAMASI SİZCE NASIL?**

Uygulama üzerinden değil direkt kiosk üzerinden kullandım. Bisiklet aktive olmadı müşteri hizmetlerini arayarak sorun için destek aldım.

Appendix I. Ediz Bayır, 20 Yaşında, Lisans Öğrencisi*** İSBIKE HAKKINDA NE DÜŞÜNÜYORSUNUZ?**

Bisikleti olmayan insanların bisiklet kullanabilmesini sağlayan bir hizmet olduğunu söyleyebilirim.

*** İSBIKE’I NE AMAÇLA KULLANDINIZ?**

Entertainment için de kiraladım işe gitmek için de. Evimin yanında da bir kiosk var oradan kiralayıp sabahları iş yerime yakın olan kioska park ediyorum.

*** İSBIKE İLE NASIL DENEYİMLER YAŞADINIZ?**

İyi bir deneyim için şunu söyleyebilirim, benim ve bazı arkadaşlarımdan bisikleti yok fakat isbike sayesinde birlikte bisiklete binip gezebiliyoruz. Bad bir deneyim olarak ise bir gün işe yakın olan kioska boş yer yoktu ve ben bir sonraki kioska park etmek zorunda kaldım ve ben o gün hem işe geç kaldım hemde fazladan yürümek zorunda kaldım.

*** İSBIKE MOBİL UYGULAMASI SİZCE NASIL?**

İsbike mobil uygulamasının kullanımı kolay, kimlik ve kart bilgilerinizi girip hemen kullanabiliyorsunuz. Arada sırada uygulamada bakımdadır yazıyor ve kapanıyor o zamanlarda kullanamadım ve bu üzücü oldu.

Appendix J. Alphan Taştan, 27 Yaşında, Lisans Mezunu, Çalışmıyor

* İSBIKE HAKKINDA NE DÜŞÜNÜYORSUNUZ?

İlk çıktığında çok heveslenmişim çünkü küçükken ancak ailemle birlikte nadiren sahile inip bisiklete binebiliyordum. Sevindirmişti beni açıkcası fakat ben yine kullanamadım ilk zamanlarda çünkü kart almamız gerekiyormuş ve ailemden tek başıma bisiklete binmek konusunda izin alamadığım için bana kart almadılar. Bende 18 yaşına geldiğim dönemde zaten mobil uygulama üzerinden herşeyi yapabiliyordunuz. İsbike genel olarak güzel bir başlangıç oldu ama devamını beklerdim bisikletler çok eski ve ağır bu beni aşırı yordu ve eskisi gibi bir isteğim kalmadı açıkcası.

* İSBIKE’I NE AMAÇLA KULLANDINIZ?

İsbike’ı bisiklete binmeyi sevdiğim için kullandım kimi zaman spor amaçlı kimi zaman caddebostana arkadaşlarımın yanına gitmek için. Neticede keyif aldığım için bisikletten vakit buldukça bindim bir kere trafikten kaçmak için bile kullandım.

* İSBIKE İLE NASIL DENEYİMLER YAŞADINIZ?

Ya başlarda hevesli olduğum için baya keyif alıyordum ki ozamanlar bisiklet bize ağır bile gelmiyor gibi hissediyorduk. Çok anım var isbike la yani örneğin biraz once kısa kestim anlatayım bir gün dalyan tarafında trafik aşırı kalabalıktı ve baya arabalar duruyordu bende bir süre sonra 16D den indim ve yürümeye başladım o sırada aklıma isbike geldi ve en yakın istasyonun konumuna baktım ve caddebostanda ki duraktan bisikleti alıp idealtepeye kadar gidip ordan evime geçtim bu benim için güzel bir deneyim di.

* İSBIKE MOBİL UYGULAMASI SİZCE NASIL?

İsbike mobil uygulaması bence güzel, sade kolay ve anlaşılır bir uygulama ama bir kaç eksiği var bence senkronizasyon sorunu mu denir yani mesela bisiklet var gözüküyor ama olmadığı oluyor yada insanlar lastiği patlak bisiklet bırakıyorlar, tamam patlayabilir ama bunu bence uygulamada işaretlense yada uygulama bize bir şekilde bisikletlerin de durumunu söyleyebilse bence çok daha güzel olur.

Appendix K. Janet Kazancıyan, 22 Yaşında, Lisans Öğrencisi

* İSBIKE HAKKINDA NE DÜŞÜNÜYORSUNUZ?

Bence isbike yetersiz, sanki yapıp bırakmışlar üzerine hiç birşey katmamışlar. Bisikletler eski ve ağır çoğu kiosk arızalı. Bence zaten kiosk olmamalı almanya da bisikletlerin kendi üzerlerinde kilit ve gpsler var bunun gibi yenilikler gelmeli bence

* İSBIKE'İ NE AMAÇLA KULLANDINIZ?

Ben üç kere kullandım zaten ki Trip yapmak amaçlıydı bunlar maltepe sahilde parkurda bindim.

* İSBIKE İLE NASIL DENEYİMLER YAŞADINIZ?

Ben hep maltepe sahilde kullanıyorum bisiklet yolları içerisinde. Bad olarak bir kere önüme bir aile yola çıkmıştı ve ben biraz panik yapıp direksiyonu sağa kırdım biraz fazla kırmışım galiba bisiklet dengesini kaybetti ve birlikte çimlere yuvarlandık, bisiklet üzerime düştü bacağım ezildi ve o kadar ağır ki yani bacağımın ağrısı bir hafta geçmedi cidden buyüzden diyorum bu bisikletleri yenilemeleri lazım.

* İSBIKE MOBİL UYGULAMASI SİZCE NASIL?

Yani basit bir uygulması var bence direk sürüşe başla dGoodp bisikletinizi kiralabiliyorsunuz birde üst kısımda kaç km yol aldınız kaç kalori yaktınız gibi bilgilendirmeler var bence bunlar çok motive edici fakat renkler konusunda biraz daha Entertainmentli olsalar da şu beyaz memur kafasından çıksalar daha Good olur.

Appendix L. Ruzan Kazancıyan, 54 Yaşında, Ev Hanımı*** İSBIKE HAKKINDA NE DÜŞÜNÜYORSUNUZ?**

Bence çok başarılı, ben hiç bisiklete binmemiş bir insan olarak isbike ile bisiklete binmeyi öğrendim kızım öğretti bana. Artık kendi başıma kiralayıp bisiklete binebiliyorum.

*** İSBIKE’I NE AMAÇLA KULLANDINIZ?**

Hobi amaçlı kullanıyorum sabahları spor olarakta sahilde yarım saat biniyorum buda biraz keseye zararlı ama keyif alıyorum biraz daha ucuz olsa keşke.

*** İSBIKE İLE NASIL DENEYİMLER YAŞADINIZ?**

İyi günlerim oldu fakat ilk başladığım zamanlarda ki korkularımı unutamam hem bisiklette ağır benim için kontrol etmesi başlarda zordu ve sürekli düşüyordum büyük düşmeler değil de işte bisikleti atıyordum bir tarafa ben fırlıyordum diğer tarafa. Genel olarak söylersek bana bisiklet kullanabilmemi sağladılar bunu yapanlara çok teşekkür ediyorum.

*** İSBIKE MOBİL UYGULAMASI SİZCE NASIL?**

Yani ben çok anlamam ben sürüşe başla diyorum ve kullanıyorum bir sorun olduğu zaman kızımdan yardım istiyorum mesela para yüklemelerini ondan istiyorum. Onun yanında tabi kalori yaktığını gösteriyor ve bu da beni daha çok binmeme teşvik ediyor.