



REPUBLIC OF TÜRKİYE

ALTINBAŞ UNIVERSITY

Institute of Graduate Studies

Data Analytics Department

**AN ANALYSIS OF CUSTOMER COMPLAINTS IN  
THE TELECOMMUNICATIONS SECTOR VIA BTK  
AND DIGITAL PLATFORMS**

**Kübra GÖKALP ERKAN**

Master's Thesis

Supervisor

Assoc. Prof. Dr. Doğu Çağdaş ATILLA

İstanbul, 2025

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The thesis titled ANALYSIS OF CUSTOMER COMPLAINTS IN THE TELECOMMUNICATIONS SECTOR VIA BTK AND DIGITAL PLATFORMS prepared by KÜBRA GÖKALP ERKAN and submitted on 30.06.2025 has been **accepted unanimously** for the degree of Master of Science in Data Analytics.

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I hereby declare that all information/data presented in this graduation project has been obtained in full accordance with academic rules and ethical conduct. I also declare all unoriginal materials and conclusions have been cited in the text and all references mentioned in the Reference List have been cited in the text, and vice versa as required by the abovementioned rules and conduct.

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Signature



## DEDICATION

I dedicate this thesis to my family, who have always supported me, to my beloved spouse, and to my esteemed manager *İpek Türker*, who passed away shortly after we decided on the thesis topic and began writing it together.



## PREFACE

I would like to extend my sincere gratitude to all the academic and administrative staff who contributed to the preparation of this thesis, especially to my advisor, Assoc. Prof. Dr. Doğu Çağdaş Atilla. The subject of this research focuses on digital transformation and customer complaint management in the telecommunications sector, aiming to provide significant contributions from both theoretical and practical perspectives.

During the preparation of this study, I conducted an extensive literature review in the field, analyzed customer complaints shared on digital platforms using natural language processing techniques, and carried out comparative evaluations with official data. Each challenge I encountered during this process strengthened my determination and deepened my academic knowledge.

I would especially like to express my gratitude through this work to my esteemed manager *İpek Türker*, with whom I decided on the topic of this thesis and who sadly passed away shortly after we began writing it, to my beloved family who have always guided me, and to my precious spouse.

I hope this thesis serves as a guide for developing strategies to reduce customer dissatisfaction in the telecommunications sector and inspires future research in this field.

## **ABSTRACT**

### **AN ANALYSIS OF CUSTOMER COMPLAINTS IN THE TELECOMMUNICATIONS SECTOR VIA BTK AND DIGITAL PLATFORMS**

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Date: 06/2025

Pages: 66

In this study, customer complaints shared on digital platforms were systematically analyzed. Data were collected from sources such as Şikayetvar, Google Play, and the App Store and processed using natural language processing (NLP) techniques. The primary objective was to identify the main problem areas in the telecommunications sector by applying sentiment analysis, topic modeling, and keyword extraction methods to the complaints.

The data preprocessing phase involved cleaning the text data, handling missing values, and removing irrelevant content to ensure reliable analysis. Sentiment analysis was used to assess customer satisfaction levels, while topic modeling techniques helped uncover the most frequently mentioned issues.

In addition to digital platforms, official complaint data obtained from the Information and Communication Technologies Authority (BTK) were also examined. A comparative analysis was conducted between digital complaints and official complaints submitted to BTK, focusing on factors such as complaint themes, resolution times, and customer satisfaction rates. The comparison revealed that complaints shared on digital platforms tend to spread more rapidly and are often less structured, whereas BTK complaints are more formal, detailed, and processed through standardized procedures.

These findings highlight the complementary roles of digital platforms and official regulatory channels in capturing customer feedback. The study demonstrates that integrating insights

from both sources can contribute to more effective customer service strategies and informed decision-making in the telecommunications sector.

**Keywords:** Telecommunication, Complaint Analysis, Natural Language Processing, Customer Satisfaction, Digital Transformation.



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## ABBREVIATIONS

|        |                                                        |
|--------|--------------------------------------------------------|
| AI     | : Artificial Intelligence                              |
| API    | : Application Programming Interface                    |
| BTK    | : Information and Communication Technologies Authority |
| CRM    | : Customer Relationship Management                     |
| GDPR   | : General Data Protection Regulation                   |
| IoT    | : Internet of Things NLTK (Natural Language Toolkit)   |
| ISS    | : Internet Service Provider                            |
| ITU    | : International Telecommunication Union                |
| LDA    | : Latent Dirichlet Allocation                          |
| NLP    | : Natural Language Processing                          |
| NLTK   | : NLTK (Natural Language Toolkit)                      |
| RAKE   | : Rapid Automatic Keyword Extraction                   |
| SMS    | : Short Message Service Latent Dirichlet Allocation    |
| TF-IDF | : Term Frequency-Inverse Document Frequency            |

# 1. INTRODUCTION

The telecommunications sector is one of the industries where digital transformation is most intensely experienced and where societal interaction is highly concentrated. Serving a wide range of areas from daily life to the business world, this sector plays a critical role in economic and social life by meeting the communication needs of individuals and institutions [1]. However, this broad service area and increasing demand expose telecommunications companies to various challenges. In particular, disruptions in areas such as service quality, customer experience, and technical issues lead to customer dissatisfaction, which is often expressed as complaints on digital platforms [2], [3].

Platforms such as the Bilgi Teknolojileri ve İletişim Kurumu (BTK), Google Play, App Store, and Şikayetvar have become primary channels where consumers voice the problems they encounter during service usage. The large volume of complaint data accumulated on these platforms provides a valuable source of information for the telecommunications sector and regulatory bodies [4]. However, effectively analyzing this data and transforming it into meaningful insights remains a significant challenge, as complaints are often in an unstructured format, text-based, and frequently include contextual information [5].

This thesis aims to systematically examine customer complaints shared on digital platforms such as Şikayetvar, the App Store, and Google Play using Natural Language Processing (NLP) techniques. The goal is to analyze customer complaints through methods such as sentiment analysis, topic modeling, and keyword extraction. Additionally, one of the key objectives of the study is to compare these complaints with those recorded on BTK and identify common problem areas in the sector.

Given that the telecommunications sector is highly competitive and customer loyalty is of critical importance, it is essential to analyze complaints accurately and integrate these analyses into strategic decision-making processes. Customer satisfaction emerges as a decisive factor in a company's market success [6]. This thesis aims to offer an innovative approach to address the current issues in the sector and to incorporate customer feedback into priority-setting processes.

## **1.1 PURPOSE AND SCOPE**

The primary aim of this thesis is to conduct an in-depth analysis of customer complaints shared on digital platforms related to the telecommunications sector, identify the underlying core problem areas behind these complaints, and provide recommendations for those conducting similar studies in the industry. To this end, a series of sub-objectives have been formulated to support the overall research framework.

### **1.1.1 Data Collection and Cleaning**

In this study, the systematic collection of customer complaints shared on digital platforms and their preparation for analysis have been identified as a critical phase. Data obtained from platforms such as Şikayetvar, the App Store, and Google Play were transformed into an analyzable format through data preprocessing procedures. During this process, tasks such as text cleaning, handling of missing data, and removal of irrelevant information were carried out.

### **1.1.2 Analysis Using NLP Techniques**

In this study, various Natural Language Processing (NLP) techniques were used to analyze customer complaints obtained from digital platforms. First, sentiment analysis was applied to determine the emotions and satisfaction levels expressed by customers in their complaints. Then, topic modeling techniques were used to identify the key problem areas highlighted in the complaints. Additionally, keyword extraction techniques enabled a more in-depth analysis of specific topics. This approach plays a significant role in identifying common issues in the sector and in developing potential solutions.

### **1.1.3 Comparison with BTK Complaints**

Customer complaints obtained from digital platforms were analyzed by comparing them with the data from the Information and Communication Technologies Authority (BTK), which maintains official complaint records in Turkey. This comparison was conducted to determine the extent to which the issues raised on digital platforms are reflected in official records and to identify which problems are more prominently highlighted. Furthermore, by examining the relationship between BTK data and complaints on digital platforms, the study

contributed to drawing important conclusions regarding regulatory processes and customer satisfaction in the sector.

#### **1.1.4 Sector-Oriented Solution Proposals**

Based on the analyses conducted, strategic solution proposals have been developed for companies in the telecommunications sector. These proposals include innovative approaches and strategies aimed at enhancing customer satisfaction and are designed to address the most critical issues in the industry, with the goal of increasing customer loyalty. The solutions were shaped by considering overall industry trends, customer expectations, and the analysis of complaints.

### **1.2 CONTRIBUTION OF THE THESIS**

This section aims to focus on the contributions it will make to the telecommunications sector, particularly regarding the analysis of digital complaints in the industry. The following are the key contributions that this study aims to achieve:

#### **1.2.1 Systematic and Automated Analysis of Customer Complaints Collected from Digital Platforms**

This study aims to make a significant contribution to the process of systematically collecting customer complaints from digital platforms and analyzing them using NLP techniques. The use of NLP techniques allows for the automatic processing of large-scale text data, enabling customer feedback to be evaluated more quickly and accurately. This approach will provide an opportunity to investigate the causes of customer dissatisfaction in greater depth and help identify recurring issues across the industry [7]. Furthermore, this study aims to fill the gap in the literature regarding the data-driven analysis of customer complaints and lay the foundation for future research.

#### **1.2.2 Identification of Recurring Problem Areas in the Telecommunications Sector**

This study presents a significant opportunity to identify recurring problem areas in the telecommunications sector. Sentiment analysis and topic modeling methods, conducted using NLP techniques, facilitate a deeper understanding of customer complaints in the industry and allow for an exploration of the root causes of these issues. The identified

problem areas will serve as a crucial data source for the improvement of the sector and contribute to the proposal of potential solutions.

### **1.2.3 Contribution to the Literature on the Application of NLP Techniques in Customer Feedback Analysis**

The study aims to address gaps in the literature regarding the use of NLP techniques in customer feedback analysis and provides significant contributions to this field. In particular, the potential of NLP techniques to efficiently and automatically analyze large-scale customer complaints enables customer satisfaction-focused studies to adopt a more scientific and systematic approach. In this context, methods such as sentiment analysis, topic modeling, and keyword extraction play a critical role in deriving meaningful insights from customer feedback [8].

## **1.3 CONTRIBUTION TO SCIENCE**

This study makes a multidimensional contribution to the literature by analyzing how customer complaints are expressed through digital platforms and official institutions in the telecommunications sector in Turkey. A comprehensive sentiment analysis, topic modeling (LDA), and keyword extraction have been performed using data from Şikayetvar, Google Play, the App Store, and the BTK, employing Natural Language Processing (NLP) techniques. In this regard, a deep content analysis has been carried out on a multi-faceted and rich dataset, rather than relying on social media tags or limited data sources.

Unlike similar studies [9], which focus solely on Twitter data or hashtag analysis, this research considers the reflections of customer feedback on both official (BTK) and digital (Şikayetvar, Google Play, and App Store) platforms together. Specifically, unlike studies that examine the three major operators in Turkey generally, this thesis provides a detailed analysis of a single operator and examines periodic trends through a time-series analysis. This focus on the micro-level of the sector has laid the groundwork for deeper and more strategic insights.

The scientific contributions of the study can be summarized under the following headings:

### **1.3.1 Adaptation of NLP Techniques to the Telecommunications Sector**

Processing customer complaints using NLP methods such as text mining and sentiment analysis makes significant contributions to academic studies on customer experience in the telecommunications sector. These methods allow for the systematic analysis of large-scale text data and provide an opportunity to investigate the causes of customer dissatisfaction in greater depth. For example, a study processing customer complaints through sentiment analysis allowed for the identification of widespread issues in the sector and facilitated the accurate and efficient evaluation of customer feedback [10]. The adaptation of such methods to the telecommunications sector offers a powerful tool for understanding customer dissatisfaction and developing solutions.

### **1.3.2 Comparison of Digital and Official Complaints**

Comparing customer complaints collected from digital platforms with official complaint data recorded by regulatory institutions helps identify the differences between these two data sources and provides a deeper understanding of customer complaint processes. Liu and Zhang demonstrated that comparing consumer complaints from digital platforms with official regulatory data significantly contributes to understanding customer complaint processes [11].

### **1.3.3 Development of a New Analytical Framework**

The effective classification and analysis of customer complaints is crucial for strategic decisions aimed at improving customer satisfaction in the service sector. Hu and Liu [12], noted that processing consumer reviews with sentiment analysis methods allows businesses to better understand customer feedback. In this regard, a new analytical framework based on NLP techniques has been developed in this study. This model enables the automatic categorization of customer complaints and the identification of root causes, contributing to the improvement of service quality in the telecommunications sector. The proposed method aims to provide data-driven solutions to industry problems by extracting meaningful insights from customer feedback.

### **1.3.4 Providing Strategic Recommendations for Telecommunications Companies**

The findings presented in this study contribute to the improvement of service quality in the sector by supporting data-driven decision-making processes for telecommunications companies to enhance customer satisfaction. The systematic analysis of customer complaints allows companies to better define their service strategies and develop solutions that are more responsive to customer expectations.

In this study, customer complaints and user feedback related to the telecommunications sector were analyzed using NLP techniques. The analysis process included stages such as data collection, data preprocessing, sentiment analysis, topic modeling, and keyword extraction using text mining methods. Additionally, customer complaints on digital platforms were compared with official complaints submitted to the BTK, identifying the sector's key problem areas. Such comparative analyses are considered an important tool for understanding how customer complaints are expressed across different channels and for developing comprehensive strategies for service improvement [13].

## **1.4 METHOD**

### **1.4.1 Data Collection**

The datasets used in this study were obtained from the Şikayetvar, App Store, and Google Play platforms to analyze customer complaints and feedback related to the telecommunications sector in Turkey. Customer reviews on digital platforms are an important data source for evaluating service quality in the sector and measuring customer satisfaction.

#### **1.4.1.1 Şikayetvar Data**

Customer complaints on the Şikayetvar platform were obtained directly from platform officials, with ethical considerations in mind. Web scraping or the use of APIs was not performed; instead, the data was provided directly for a specified time period. This dataset includes complaint titles, complaint texts, dates, response status, customer satisfaction, and churn information.

A detailed examination of customer complaints plays a critical role in identifying trends related to customer satisfaction and classifying complaint topics. In particular, analyses conducted using NLP techniques facilitate the processing of large amounts of textual data and contribute to a better understanding of customer expectations [14].

#### **1.4.1.2 Digital Platform Data (App Store and Google Play)**

**Google Play:** User reviews on Google Play were extracted using the Google Play Developer API. Through the API, user reviews, rating scores, date information, and sentiment tags for the apps were obtained. The API allows developers to collect in-app reviews, and during the data collection process, deeper analyses of user comments were conducted. Systematic collection of user feedback provides mobile app developers with valuable data to improve the user experience. Collecting such data plays a critical role in evaluating user experience and customer satisfaction [15]. Specifically, user evaluations of apps not only assess app performance but also shed light on future app development processes.

**App Store:** User reviews on the App Store were collected using web scraping methods due to the limited access capabilities of Apple's official API. Reviews for selected apps were periodically pulled, and text data, rating scores, and time information were stored. Web scraping has become a common technique to bypass API limitations and allows for the creation of large datasets of collected user reviews. This method is frequently used to gather and analyze user feedback more comprehensively [16]. However, to ensure the accurate and ethical collection of data, all necessary measures were taken to protect personal data during the collection process. This step is crucial to ensure compliance with data privacy and ethical guidelines.

All collected data was anonymized, and ethical rules regarding the protection of personal data were followed. Data security and anonymity ensure that the data collected is processed and analyzed securely in full compliance with legal regulations regarding user privacy. In particular, violations of ethical and legal requirements in the analysis of text data obtained from user reviews could negatively impact the validity and reliability of the data collection process.

### **1.4.2 Data Preprocessing**

In this study, the text data collected from digital platforms underwent a comprehensive data cleaning process before moving on to the analysis stage. In the first step, differences between uppercase and lowercase letters were eliminated, and unnecessary punctuation marks and special characters were removed. This step enhanced the consistency of the data, ensuring that the texts were analyzed more accurately. Additionally, stop words (irrelevant words) were filtered out, allowing the focus to be placed on important terms that would add meaning to the texts.

In the next step, words were standardized using lemmatization (reducing to base form), so different forms of the same word were reduced to a single word form. This process helped improve the accuracy of the analysis without disrupting the semantic integrity of the texts [17]. After the data cleaning procedures, the complaint texts were tokenized at the sentence and word levels. Tokenization allows the text to be broken down into smaller units (words and sentences), enabling more efficient application of NLP techniques [18].

All these data preprocessing steps are crucial for conducting healthy and accurate analyses. This process enables the effective application of NLP techniques such as text mining and sentiment analysis.

### **1.4.3 Text Analysis**

In this study, NLP techniques were used to interpret customer complaints and reviews:

**Sentiment Analysis:** Sentiment analysis is an NLP technique aimed at detecting emotional tendencies in texts. This technique categorizes customer feedback into three sentiment categories: positive, negative, and neutral, allowing for the analysis of user attitudes towards a specific topic [19]. Sentiment analysis helps understand the general tone behind customer complaints, offering useful insights into why customers may be dissatisfied. By identifying the emotional direction of the feedback, it becomes easier to understand common pain points.

**Topic Modeling:** Topic modeling is used to uncover themes within large collections of text. It organizes documents into groups based on shared content and topics. One of the most commonly used techniques for this is Latent Dirichlet Allocation (LDA), which assumes

that a document can relate to several topics at once. This approach is particularly helpful for analyzing large volumes of customer complaints. By applying LDA, complaint texts can be grouped into categories that reflect common issues in the sector. This helps identify which problems are most frequent and allows companies to focus on specific areas for improvement [20].

**Keyword Extraction:** Keyword extraction focuses on identifying the most relevant words and phrases within a body of text. TF-IDF is a method that gives weight to terms based on how often they appear, while also considering how rare they are across all documents. It helps bring out more meaningful terms, not just common ones. Another method, RAKE (Rapid Automatic Keyword Extraction), is especially useful for quickly finding keywords in large text datasets. Using these techniques, it becomes possible to detect recurring themes and better understand what customers are complaining about [21].

Once the complaints were analyzed, results from digital platforms were compared to formal complaints collected by the Information and Communication Technologies Authority (BTK). Differences were observed in how complaints were framed, the time taken for resolution, and overall satisfaction rates. Generally, complaints on digital platforms spread faster and were more informal, while those submitted to BTK were more structured and detailed. These differences highlight the varying nature of feedback depending on the platform and offer insights that can be used to enhance how customer feedback is collected and addressed.

The study included a labeling process to identify recurring themes. Complaints were grouped based on common topics, such as mobile, fixed-line, internet, satellite, or cable TV services. This allowed not just the frequency of complaints to be assessed, but also the intensity and distribution of themes across different platforms.

An example of the labeling structure used in the study is presented below.

```
Internet_keywords = ['internet', 'connection', 'modem', 'infrastructure', 'speed', 'wi-fi', 'ttnet', 'port']
```

```
Satellite_keywords = ['satellite', 'platform', 'tv']
```

```
Cable_tv_keywords = ['cable tv', 'television', 'broadcast', 'tivibu']
```

Mobile\_keywords = ['mobile', 'phone', 'line', 'gsm', 'data package', '4.5g', 'mobile network', 'signal strength', 'signal', 'base station', 'package', 'tariff', 'network']

Fixed\_telephone\_keywords = ['fixed phone', 'phone line', 'pstn', 'home phone']

Billing = ['bill', 'fee', 'overcharge', 'collection', 'reflection', 'excess', 'cost', 'payment', 'amount']

Connection / Service Quality = ['connection', 'interruption', 'disconnection', 'speed', 'modem', 'freeze', 'no internet', 'not loading', 'internet down']

Subscription Procedures = ['subscription', 'membership', 'cancellation', 'application', 'installation', 'transition', 'my subscription', 'activation', 'set up']

Incorrect / Incomplete Information = ['information', 'misleading', 'missing info', 'wrong', 'not stated', 'different information', 'incomplete']

Coverage Area / Service Quality = ['reception', 'signal', 'not working', 'network', 'base station', 'coverage', 'can't make a call', 'my line is not working']

## **2. GENERAL INFORMATION**

### **2.1 TELECOMMUNICATION**

Telecommunication is the process of transmitting voice, data, images, and other types of information from one place to another using various technological tools and communication infrastructures. This communication spans a wide range of technologies, from traditional electrical signals to radio waves, optical signals, and other carrier technologies. Telecommunication systems were developed to enable people and organizations to communicate quickly and effectively over long distances. In today's digital age, telecommunication plays a critical role for both individuals and businesses. These systems not only facilitate voice communication but also provide essential services such as data transmission and internet access. The widespread and advanced nature of communication infrastructures makes it possible for the global economy and societal structures to integrate more rapidly [22].

These developments are continuously increasing the impact of telecommunications on societal structures, providing a more accessible and efficient communication infrastructure for a broader user base.

#### **2.1.1 History and Development**

The historical development of telecommunications has marked one of the most significant milestones in the history of communication. The first telecommunications devices began with the invention of the telegraph in the 19th century, and following this, the invention of the telephone by Alexander Graham Bell in 1876 was a major breakthrough [23]. In the 20th century, with the development of radio, television, and satellite technologies, communication tools diversified. Along with this, the process of digitalization and the widespread use of the internet led to the greatest transformation in telecommunications [24]. Especially from the late 1990s, the internet becoming a global network revolutionized data transmission and, combined with mobile communication technologies, led to the global expansion of the telecommunications sector [25]. These developments are among the key factors shaping today's telecommunications infrastructure.

### **2.1.2 Modern Telecommunications Systems**

Modern telecommunications systems go beyond just phone calls, offering a wide range of communication services including data transmission, internet access, television broadcasts, digital radio, mobile communication, and more. These systems, formed through the combination of wired and wireless networks, satellite connections, fiber optic infrastructures, and the internet, create today's complex communication infrastructure, enabling high-speed and reliable data transmission. These networks allow users worldwide to send and receive data instantaneously through digital devices.

Advanced fiber optic networks significantly increase data transmission speeds, while mobile networks, especially 4G and 5G technologies, offer users high-speed internet access and seamless communication even while on the move. Fiber optic networks enable much higher speeds and more reliable connections by transmitting data through optical signals. On the other hand, mobile networks (4G and 5G) enable users to connect to the internet via mobile devices, making digital connections possible in all areas of modern life and increasing mobility [26]. These infrastructures are critical elements enabling users to participate in global communication networks by sending and receiving data from anywhere at any time.

### **2.1.3 Technological Innovations and Future Trends**

The telecommunications sector has undergone a significant transformation due to digitalization. This transformation has led to increased data transmission speeds and made communication more reliable, particularly with the widespread adoption of the internet. The widespread use of the internet has enabled individuals, companies, and governments to communicate effectively on a global scale, fundamentally changing business and social interactions worldwide [27]. This change in the early 21st century has allowed for the rapid diversification of digital platforms and internet-based services. This process has not only increased mobile internet speeds but also sparked significant innovations in various industries, particularly in areas like the Internet of Things (IoT), autonomous vehicles, smart cities, and Industry 4.0. The development of 5G technology, with ultra-low latency, wide bandwidth, and high data transfer speeds, is paving the way for the creation of future smart infrastructures. These developments will accelerate digital transformation in both social and

economic areas, radically changing individual user experiences as well as the way large businesses process data and provide services [28].

#### **2.1.4 Telecommunications and Global Connectivity**

The telecommunications sector has a significant impact on the global economy and social structures, and its development plays a critical role in both economic growth and social welfare. In particular, the digitalization of global trade, education, healthcare, and social interactions has made it essential to further develop telecommunications infrastructures. Today, the internet and mobile networks have become essential tools that allow individuals and businesses to establish fast and effective connections on a global scale [29]. This digitalization has not been limited to communication but has also enabled the widespread adoption of digital platforms and mobile technologies in many areas, such as healthcare, education, financial transactions, and entertainment. Through mobile phones, internet access, and digital platforms, communication has become faster and more efficient, and the digitalization of many services has also been made possible. These developments have facilitated closer connections between societies and businesses, ensuring the uninterrupted flow of information [25]. This transformation has reinforced the integration of global economies and increased competition among societies that benefit from the power of digitalization.

#### **2.1.5 Challenges and the Future of Telecommunications**

Although the telecommunications sector has undergone a major transformation with the process of digitalization, it also faces several significant challenges. The most notable challenges include security and data privacy concerns, the need for infrastructure development, digital inequality, and the increasing number of cyberattacks. Security threats and the protection of personal data have become increasingly important in the digital world, and these issues continually push industry players to develop new solutions [30]. Moreover, the widespread implementation of internet access and mobile communication infrastructures in developing regions remains one of the biggest challenges in the sector. Infrastructure deficiencies in these areas lead to digital inequality and create difficulties in maintaining balance in global communication. However, innovations such as 5G technology and the Internet of Things (IoT) seem to play a key role in overcoming these challenges in the future.

The high data transmission speeds and ultra-low latency of 5G will make communication faster and more reliable, while IoT will enable the construction of more efficient and integrated digital infrastructures. These developments will help address infrastructure gaps and contribute to accelerating the process of digitalization.

## **2.2 DIGITAL PLATFORMS AND CUSTOMER FEEDBACK**

Digital platforms have become environments where customer feedback spreads rapidly and reaches the widest audiences today. Platforms such as Şikayetvar, the App Store, and Google Play stand out as interactive spaces where users can directly communicate complaints and feedback to companies or share them with others. Compared to traditional complaint methods, these platforms provide much faster feedback and significantly increase the speed at which feedback spreads. Research by Zeng et al. [31] and Sweeney & Wyber [32], shows that digital complaints reach a much broader audience and spread rapidly through social interactions. These digital platforms also help companies track and manage customer complaints more effectively, contributing to the improvement of customer experience.

### **2.2.1 Speed and Interaction of Digital Complaints**

Complaints shared on digital platforms tend to spread rapidly and reach a much wider audience than traditional methods. Posting complaints online not only helps people communicate directly with companies but also allows them to engage with other consumers. This type of interaction often speeds up the spread of complaints, as users can quickly voice their concerns and expectations. Social media and online reviews make it even easier for such complaints to gain visibility and reach more people. Studies by Cheung et al. [33] and Sweeney et al. [34] indicate that digital complaints spread rapidly through social engagement and significantly influence customer satisfaction. Similarly, Zeng et al., found that online complaints have a broader reach than traditional channels and play a key role in shaping customer perceptions and satisfaction.

### **2.2.2 Reasons Why Users Share Complaints on Digital Platforms**

There are several reasons why users choose to share complaints on digital platforms. One of the main factors is that these platforms allow complaints to be submitted quickly and easily. At the same time, users can reach a broader audience, which helps them voice their concerns

more effectively. Online platforms also make it easier for users with similar issues to connect and form communities. This shared space enables people to express their concerns more openly and seek quicker solutions.

Digital complaints often lead to faster responses from businesses. Many companies aim to improve customer satisfaction by reacting promptly and efficiently to complaints received online [35].

Quick resolution not only addresses the issue at hand but also plays a key role in building customer loyalty. In this sense, well-managed complaint processes help businesses strengthen both their customer relationships and their public image [36]. Beyond resolving individual problems, digital platforms also foster a sense of community among users. These communities often play an active role in drawing attention to issues and supporting one another in finding solutions.

Hennig-Thurau et al. [37], emphasized that digital platforms enable users to share their customer experiences with a wider audience. They also noted that when complaints are addressed promptly, customer loyalty tends to increase. These findings show that digital complaints are not only about getting a response, but also about creating a broader sense of connection and engagement among users.

### **2.2.3 Differences Between Digital and Traditional Complaint Methods**

Digital complaints offer significant differences and advantages compared to traditional complaint methods. Traditional methods, such as phone calls, emails, or physical letters, involve more formal and one-way communication channels, and they may prolong the resolution process. In traditional complaints, users interact only with the company, and the process generally takes longer to receive a response [38]. Moreover, traditional processes may encounter more bureaucratic barriers, and the resolution rates tend to be lower than those on digital platforms.

In contrast, digital complaints can be instantly published via online platforms and are often communicated not only with companies but also with other consumers, reaching a broader audience. Digital platforms enable complaints to spread rapidly and gather more feedback, which contributes to faster resolution [39]. With the wide reach of digital complaints through

social media and other online channels, complainants can make their voices heard by more people, encouraging companies to respond more swiftly. Thus, both customer satisfaction and resolution processes are accelerated.

Research by Cheung et al. [39], revealed that digital complaints spread much faster than traditional methods and that digital platforms offer features that facilitate quick resolution. These findings show that digital complaints not only function as demands for resolution but also carry the potential for broader interaction, allowing companies to strengthen customer relations by responding promptly.

#### **2.2.4 The Impact of Digital Complaints on Customer Experience and Loyalty**

Customer complaints shared on digital platforms create significant and direct effects on customer experience and loyalty. Effective management of digital complaints not only increases customer satisfaction but also strengthens customer loyalty. This shows that faster resolution of complaints on digital platforms provides a major advantage for companies [40]. In particular, appropriately addressing and resolving digital complaints reinforces the sense of trust among customers and contributes to building customer loyalty. On the other hand, unresolved negative complaints can reduce customer trust and negatively affect brand loyalty. Such situations are directly related to how quickly and effectively companies can manage digital complaints.

A study by Zeng et al. [31], found that quickly resolving digital complaints increased customer satisfaction, and this positive outcome directly contributed to customer loyalty. These findings reveal that effectively managing digital complaints not only strengthens customer relationships but also enhances brand reputation.

### **2.3 NATURAL LANGUAGE PROCESSING (NLP) AND DATA MINING**

Natural Language Processing (NLP) is a technology based on artificial intelligence and linguistics, developed to enable computers to comprehend, interpret, analyze, and generate human language. Since human language is inherently complex, context-dependent, and often ambiguous, processing it in a machine environment requires advanced algorithms and statistical models [41]. In this context, NLP offers significant advantages in interpreting,

classifying, and automatically analyzing written or spoken language data, playing a critical role especially in processing large volumes of text data efficiently.

Customer complaints are typically generated in free-text format and in large volumes. This has rendered manual analysis methods insufficient and increased the need for automated text processing techniques. Operations such as classifying, summarizing, determining the emotional tone, and thematically categorizing complaint texts directly contribute both to companies' strategic decision-making processes and to policies aimed at enhancing customer satisfaction.

Sentiment analysis, one of the most frequently used techniques in NLP, aims to automatically determine whether customers' attitudes toward a product or service are positive, negative, or neutral. Sentiment analysis has many applications, including monitoring customer satisfaction, predicting potential customer churn, and identifying trends related to overall service quality [42], [43] Especially in user-generated content such as social media and online complaint platforms, sentiment analysis is an effective measurement tool for managing corporate reputation and understanding user expectations.

Another important NLP method, topic modeling, enables the automatic discovery of hidden topic structures within large-scale text datasets. The most commonly used algorithm for this purpose is Latent Dirichlet Allocation (LDA), which transforms document collections into probabilistic models representing the distribution of terms associated with particular topics [44]. Analyzing customer complaints with LDA makes it possible to identify the products, services, or processes that are most frequently criticized by users, helping service providers focus their efforts accordingly.

Keyword extraction is used to identify the most meaningful and frequently used terms in a text, quickly revealing the core content structure. This technique allows the concepts and main problem areas emphasized in complaints to be clearly identified. Statistical approaches such as TF-IDF (Term Frequency – Inverse Document Frequency) or more advanced deep learning-based methods are commonly used in such analyses.

All of these NLP techniques yield highly effective results, especially in the analysis of user complaints collected from digital platforms. For example, user reviews and complaint texts

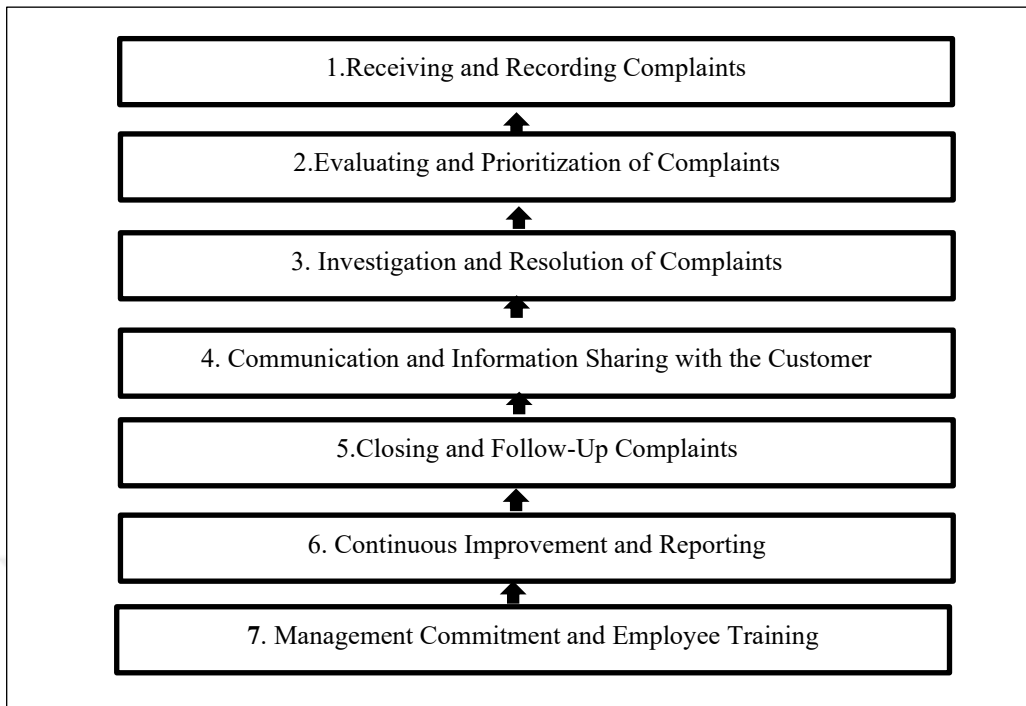
gathered from platforms like the App Store, Google Play, and Şikayetvar can be processed using sentiment analysis, topic modeling, and keyword frequency analyses. These analyses help companies develop strategies to improve customer satisfaction. In this regard, NLP and text mining applications are widely used not only in academic research but also in corporate decision support systems.

## **2.4 COMPLAINT MANAGEMENT PROCESS ACCORDING TO ISO 10002 STANDARDS**

The ISO 10002 standard is an internationally recognized quality management standard aimed at managing customer complaints effectively, systematically, and consistently. This standard not only enables organizations to resolve customer complaints, but also to transform this feedback into opportunities for improvement and integrate it into continuous improvement processes. ISO 10002 provides a structured approach encompassing all stages of complaint handling, including receiving, analyzing, evaluating, resolving, and monitoring the outcomes. In this way, the goal is to increase customer satisfaction and ensure long-term customer loyalty.

In addition, an effective complaint management system not only ensures individual customer satisfaction but also contributes to enhancing the overall service quality of organizations, increasing reliability, and gaining a competitive advantage [45]. For this reason, ISO 10002 serves as an important tool for integrating the principle of customer orientation into the corporate structure, especially for organizations operating in the service sector.

According to the ISO 10002 standard, the complaint management process consists of the following steps:



**Figure 2.1:** Complaint Management Process According to ISO 10002 Standards.

This figure provides a visual framework that outlines the steps of the customer complaint management process in detail according to the ISO 10002 standard.

#### **2.4.1 Receiving and Recording Complaints**

An effective complaint management process begins with the systematic collection of customer feedback. In this context, businesses must be open to receiving complaints through various communication channels such as phone, email, social media, web forms, and mobile applications. When receiving complaints, it is essential to accurately record information such as the customer's identity, contact details, the subject of the complaint, and the date and location of the incident. This data is critical for tracking and analyzing complaints and serves as a foundation for future improvement processes.

Stauss and Seidel [46], emphasize that complaints are not only important for individual customer satisfaction but also serve as a strategic tool for organizational learning and improving service quality. Additionally, del Río-Lanza [47], highlights that the perceived fairness of the complaint process has a significant impact on customer satisfaction. This

indicates that handling complaints correctly and systematically is not only an operational requirement but also a strategic necessity.

#### **2.4.2 Evaluation and Prioritization of Complaints**

For effective complaint management, evaluating and prioritizing customer complaints is of great importance. Especially in cases where organizational resources are limited, systematic classification of complaints allows resolution processes to proceed more efficiently. Criteria such as the urgency of the complaint, its impact on the customer, the likelihood of recurrence, and potential effects on the company's image should be considered during this classification.

Ben Hadid, Kheddouci, and Hadjadj [48], demonstrated that decision support systems based on customer profiles and complaint content create value in terms of customer loyalty through an automatic prioritization method they developed. Similarly, the framework presented by De Keyser, Lemon, Klaus, and Keiningham [49], highlights the strategic importance of prioritization processes by evaluating the impact of customer experience at various touchpoints.

#### **2.4.3 Investigation and Resolution of Complaints**

The analysis and resolution of complaints are critical for ensuring customer satisfaction. This process involves thoroughly investigating the root causes of complaints and developing appropriate solutions. A successful resolution requires not only accurate identification of complaints but also effective coordination among relevant departments [50]. Customer feedback and complaints offer businesses continuous learning opportunities that support sustainability. Thus, resolving complaints should be seen not only as addressing problems but also as an opportunity for service improvement.

In this context, managing the resolution process should include collaboration between departments and, if necessary, re-engaging with the customer.

#### **2.4.4 Communication and Information Sharing with the Customer**

Customers should be regularly informed at every stage of the complaint process. Transparent communication during the reception, evaluation, and resolution stages fosters trust in the process and creates a positive customer experience. The communication process not only

reinforces customer confidence in the resolution but also improves loyalty and overall satisfaction [51]. Furthermore, this type of communication helps strengthen long-term customer relationships and contributes to the organization's complaint management strategies [52].

#### **2.4.5 Closing and Follow-Up of Complaints**

Customers should be informed at every stage of the complaint process. Transparent communication at the stages of receipt, evaluation, and resolution enhances trust and creates a positive experience. This strengthens customer loyalty and improves business relationships in the long run.

#### **2.4.6 Continuous Improvement and Reporting**

Analyzing complaints plays a significant role in eliminating recurring problems. Complaints should be systematically examined to identify root causes and evaluate opportunities for improvement within the organization. Furthermore, regularly reviewing and improving the complaint management process helps increase both customer satisfaction and operational efficiency. Reporting complaint data informs strategic decision-making and enables operational enhancements.

#### **2.4.7 Management Commitment and Employee Training**

The complaint management process can be executed more effectively with the support of top management. Senior leadership should provide the necessary resources for the complaint management process and actively support it. Additionally, it is important for employees to receive training and regular updates on complaint handling. This training enables employees to develop quicker and more effective solutions to complaints, thereby improving efficiency in the process [50].

## **2.5 REDUCING POOR CUSTOMER EXPERIENCES IN THE TELECOMMUNICATIONS SECTOR**

### **2.5.1 Analysis of Digital Complaints and Service Improvement**

The analysis of digital complaints is a crucial tool for increasing customer satisfaction and improving services. In an era where complaints rapidly spread across digital platforms, it is evident that companies need to respond promptly. Techniques such as text mining and sentiment analysis facilitate the understanding of complaints and provide valuable insights into which service areas require improvement [53].

### **2.5.2 Increasing Customer Satisfaction and Loyalty Strategies**

Improving customer satisfaction is critical to the long-term success of companies. This satisfaction is not only achieved by resolving complaints but also by effectively managing customer expectations. Analyzing customer complaints not only helps increase satisfaction but also enables the development of loyalty-building strategies. Kotler and Keller [6], discuss the relationship between customer satisfaction and loyalty, explaining how these two factors function together.

### **2.5.3 Complaint Management Strategies that Contribute to Success**

An effective complaint management strategy enables telecommunications companies to enhance customer satisfaction while maintaining their competitive advantage in the industry.

### **2.5.4 Customer Experience Improvement Strategies on Digital Platforms**

Feedback received through digital platforms in the telecommunications sector is a valuable resource for improving customer service experiences. Complaints gathered via these platforms allow for rapid analysis of customer experiences. Zeithaml et al. [54], discuss how analyzing digital complaints is effective in increasing customer loyalty and how such analyses facilitate strategic decision-making.

### **3. MATERIALS AND METHODS**

This section provides a detailed explanation of the scope of the study, data sources, data collection and analysis methods, as well as ethical considerations.

#### **3.1 SCOPE AND TIME FRAME OF THE STUDY**

This study examines customer complaints directed at a telecommunications company operating in Turkey, covering the period from January 2021 to December 2023. The aim of the research is to systematically analyze customer complaints and develop strategies to improve service quality. This process not only involves resolving complaints but also understanding their root causes and developing appropriate solutions. In doing so, customer satisfaction can be enhanced and service quality improved.

#### **3.2 DATA SOURCES**

The data used in the study were obtained from various digital platforms and official reports. These sources offer a broad spectrum that enables the analysis of customer complaints and feedback from multiple perspectives. The data sources are as follows:

##### **3.2.1 Complaint Platform Data**

A total of 156,576 complaint records were collected from the Turkish complaint-sharing platform Şikayetvar within the specified date range. This platform allows users to express their complaints in written form and interact directly with companies, offering transparent insight into customer experiences.

##### **3.2.2 Google Play Reviews**

182,240 user reviews related to the mobile application of the relevant telecommunications company on Google Play Store were analyzed. These reviews reflect user experiences and satisfaction levels, serving as a significant source for complaint analysis.

### **3.2.3 App Store Reviews**

A total of 19,014 user reviews from the App Store for the same company's mobile application were analyzed. Since this platform contains feedback from iOS users, it provides an essential source for conducting cross-platform complaint analysis.

### **3.2.4 Bilgi Teknolojileri ve İletişim Kurumu (BTK) Data**

Data on the distribution of complaints by service type, the number of complaints per million subscribers by sector, and the top five most complained-about issues in the mobile sector for the years 2021, 2022, and 2023 were obtained from the market reports published by BTK. These reports are crucial for understanding sectoral trends and the overall structure of customer complaints.

## **3.3 DATA COLLECTION METHOD**

Data were collected via public interfaces, APIs of each platform, and official reports published by BTK. During the data collection process, full compliance with the platforms' terms of use and privacy policies was ensured, and utmost care was taken to protect personal information. Moreover, the data were collected in an anonymized form and used solely for research purposes. This guarantees the security of the data and compliance with ethical standards.

### **3.3.1 Variables in the Dataset**

The dataset collected from Şikayetvar includes the following variables:

**Table 3.1:** Data Content Collected from the Şikayetvar Platform.

| Variable Name         | Description                                                                           | Analytical Use                                                                                                                    |
|-----------------------|---------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Complaint ID          | A unique identifier for each complaint.                                               | Used as the primary key for data management and tracking.                                                                         |
| Complaint Title       | A brief title summarizing the customer's complaint.                                   | Used for topic classification and preliminary analysis.                                                                           |
| Complaint Text        | The detailed description of the customer's complaint.                                 | Serves as the primary data source for sentiment analysis and theme extraction using Natural Language Processing (NLP) techniques. |
| Complaint Date        | The date the complaint was submitted on the platform.                                 | Used for time series analysis and trend detection.                                                                                |
| Response Status       | Indicates whether the company has responded to the complaint.                         | Used to assess customer service performance.                                                                                      |
| First Response Date   | The date the first response was provided to the complaint.                            | Used to analyze response times.                                                                                                   |
| Satisfaction          | The level of satisfaction indicated by the customer after the complaint resolution.   | A critical indicator for measuring service quality.                                                                               |
| Churn (Customer Loss) | Indicates whether the customer left the service after the complaint.                  | Used for customer loyalty and churn analysis.                                                                                     |
| Expectation Survey    | Survey results where the customer expresses their expectations regarding the service. | Used to assess the level of expectation fulfillment.                                                                              |

The data collected from Google Play and the App Store includes the following variables:

**Table 3.2:** Data Content Collected from Google Play and App Store Platforms.

| Variable Name       | Description                                                             | Analytical Use                                                                                                            |
|---------------------|-------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| Author              | The anonymized name of the user who shared the comment.                 | Can be used for user-based analysis, but direct identity information is not used in the analysis due to privacy concerns. |
| Post (Comment Text) | The feedback written by the user about the app or service.              | Sentiment analysis, topic modeling, and complaint type classification can be done using NLP                               |
| Source              | The platform from which the data originated (Google Play or App Store). | Platform-based comparisons and analysis of the distribution of customer complaints across digital channels.               |
| Time                | The date the complaint was submitted on the platform.                   | Used for time series analysis and trend detection.                                                                        |
| App                 | The name of the app that the comment is about.                          | Cross-platform comparisons can be made for the digital customer experience processes of telecom operators.                |

BTK Data has been further analyzed under the following headings:

**Complaint Distribution by Service Type:** The ratios of complaints related to internet, mobile, landline, and other services have been analyzed in detail. This analysis reveals the distribution of customer complaints for each service type.

**Complaints per Million Subscribers by Sector:** To analyze general customer satisfaction trends in the telecommunications sector, the intensity of customer complaints across service providers in the sector has been compared. This data serves as an important reference point in determining the overall satisfaction level in the sector.

**Most Complained Topics in Mobile, ISP, Satellite Platform Service, and Landline Services:** The most frequently complained topics by customers have been identified, and areas for service improvement have been pinpointed. This analysis aims to classify the types of complaints in more detail and uncover weak points in specific services.

### **3.4 DATA ANALYSIS METHODS**

In this study, various data preprocessing and analysis techniques were applied to the collected data. The analysis process was carried out in four main stages: preprocessing, natural language processing, time series analysis, and statistical analyses. All analyses were conducted using the Python programming language, utilizing several open-source libraries such as sys, pandas, numpy, matplotlib, seaborn, scikit-learn, workcloud, os, image, stopwords, NLTK, counter, MinMaxScaler, statsmodels, LdaModel, pyLDAvis and gensim\_models.

#### **3.4.1 Preprocessing**

During the data preprocessing phase, missing and erroneous data were analyzed using the Pandas library. Missing values were either removed on a row basis or filled using appropriate statistical methods (e.g., mean or median imputation). For the textual data, preprocessing steps such as special character removal, lowercasing, and punctuation stripping were applied. These operations were performed using the re, string, and NLTK libraries. Additionally, date fields were standardized with the help of the datetime module to make them suitable for analysis.

#### **3.4.2 Natural Language Processing (NLP)**

NLP techniques were applied to the text-based complaint data. The main procedures and tools used in this process are as follows:

- a. **Sentiment Analysis:** The NLTK (Natural Language Toolkit) library was used to perform basic sentiment analysis on Turkish texts. A simple rule-based approach was adopted by creating word lists that represent positive and negative expressions. Since Turkish language support is limited, the analysis was supported by a custom-built Turkish sentiment lexicon.
- b. **Keyword Extraction:** Prominent words in the texts were identified using the TF-IDF (Term Frequency - Inverse Document Frequency) method. The TfidfVectorizer class from the scikit-learn library was utilized for this purpose.

- c. Topic Modeling: The Latent Dirichlet Allocation (LDA) algorithm was applied using the gensim library to uncover latent topics within the texts. The optimal number of topics was determined based on coherence scores.

### **3.4.3 Time Series Analysis**

To examine the temporal changes in complaints, time series analysis was conducted. In this context, historical data were analyzed and visualized using the Python programming language along with the pandas, matplotlib, and seaborn libraries.

Initially, the date columns in the complaint data were converted to datetime format, and the data were grouped on a daily, weekly, and monthly basis. The number of complaints for each time period was then calculated to identify trends of increase or decrease over time.

For data visualization, the matplotlib and seaborn libraries were used. Daily, weekly, and monthly distributions were presented separately through bar and line charts. Additionally, the number of complaints on a monthly and yearly basis was visualized using bar plots, with numerical values annotated above each bar.

### **3.4.4 Statistical Analyses**

The relationships between categorical variables such as response status, customer satisfaction, and customer churn were analyzed using the Chi-square test. These analyses were carried out with the scipy.stats module, and a 95% confidence level ( $p < 0.05$ ) was used as the threshold for statistical significance. These analyses enabled the identification of meaningful relationships between the variables.

## **3.5 ETHICAL CONSIDERATIONS**

Throughout the research process, ethical rules and privacy principles were followed in the collection and processing of data. During data collection, the terms of use and privacy policies of the relevant platforms were strictly adhered to. The data collected were anonymized, and the disclosure of personal information was prevented. Additionally, the data obtained were used solely for research purposes, and no actions were taken that could compromise the participants' privacy. Thus, the research adhered to ethical standards.

## **3.6 LIMITATIONS AND CHALLENGES**

This study aims to identify customer satisfaction and service quality issues in the telecommunications sector by analyzing customer complaints collected from Şikayetvar, Google Play, App Store, and BTK. However, there are several limitations and methodological challenges:

### **3.6.1 Limitations of Data Sources**

The data used in this study are limited to complaints from Şikayetvar, Google Play, App Store, and BTK. Feedback from other digital platforms (e.g., Twitter, Facebook, forums, or telecom operators' own customer service records) is not included. Therefore, the analyzed customer complaints may not fully represent the entire customer base, and the findings are limited to data from selected platforms.

### **3.6.2 Data Quality and Language Use**

Complaints written in free-text format often contain grammatical errors, incomplete or incorrect expressions, abbreviations, and spelling mistakes. These issues complicate the analysis of complaints using natural language processing (NLP) techniques. For example:

- a. Abbreviations: Use of shortened phrases like "net kptu" instead of "internet went down"
- b. Slang or emotional responses: Inclusion of slang or emotional words in complaints
- c. Machine translation and foreign language influence: Expression issues caused by automated translation tools or influence from foreign languages

Such linguistic issues required additional effort during data cleaning and preprocessing.

### **3.6.3 Representativeness and Sampling Limitations**

This study examines feedback only from customers who have submitted complaints. It is likely that complaints are written by individuals from specific demographic groups or those more inclined to use digital platforms. For example:

- a. Customers who are more active on digital platforms are more likely to leave complaints
- b. Tech-savvy users may provide detailed complaints, while others may use more general expressions

This limits the ability to make a homogeneous evaluation of the overall customer experience.

#### **3.6.4 Ethical and Legal Constraints**

All data used during the research process were anonymized and processed in accordance with ethical guidelines. To protect user identities, the following measures were taken:

- a. Personal data of complainants were masked, and only anonymized analyses were performed
- b. Data were processed in accordance with the Personal Data Protection Law in Turkey (KVKK) and relevant international data protection regulations

Accordingly, no direct access to personal data was provided, and no customer-specific analyses were conducted.

#### **3.6.5 Differences Between Data Sources**

The data obtained from platforms such as Şikayetvar, Google Play, App Store, and BTK differ in format and structure. For instance:

- a. Users on the Şikayetvar platform often write long and detailed complaints
- b. Comments on Google Play and the App Store are generally short and superficial
- c. BTK data include statistical distributions of official complaints at the sectoral level, rather than direct customer complaints

Due to these differences, additional methodological steps were required to normalize the data and ensure valid comparative analyses.

### **3.6.6 Limitation of the Telecommunications Company Under Review**

This study examines customer complaints related to a specific telecommunications company only. As there is no comparison with other telecom operators, it is difficult to conclude whether the results reflect general industry trends.

Therefore, the findings should be interpreted within a specific scope. Future studies could expand the scope and enhance the generalizability of insights by:

- a. Using broader data sources
- b. Analyzing positive customer experiences as well
- c. Conducting comparative studies between different telecom operators

## **4. FINDINGS**

### **4.1 RELATIONSHIP BETWEEN ŞİKAYETVAR AND BTK CONSUMER COMPLAINT SYSTEM DATA**

In this section, a comparative analysis is conducted to examine the relationship between data obtained from Şikayetvar and the Information and Communication Technologies Authority (BTK) Consumer Complaint System. The similarities and differences between customer complaints collected from digital platforms and the official data provided by BTK for the years 2021, 2022, and 2023 offer important insights for a better understanding of sectoral issues and more effective strategic decision-making.

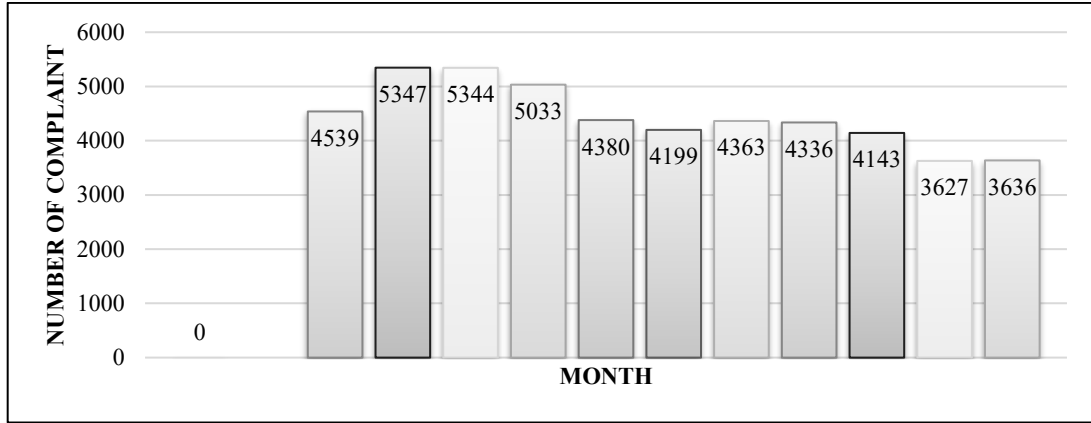
#### **4.1.1 Number of Complaints and Seasonal Distribution Over the Year**

The graphs below present a comparative overview of monthly complaint counts on the Şikayetvar platform and the number of consumer complaints per million subscribers published by the Information and Communication Technologies Authority (BTK). When both datasets are examined, it is observed that the number of complaints fluctuates periodically throughout the year.

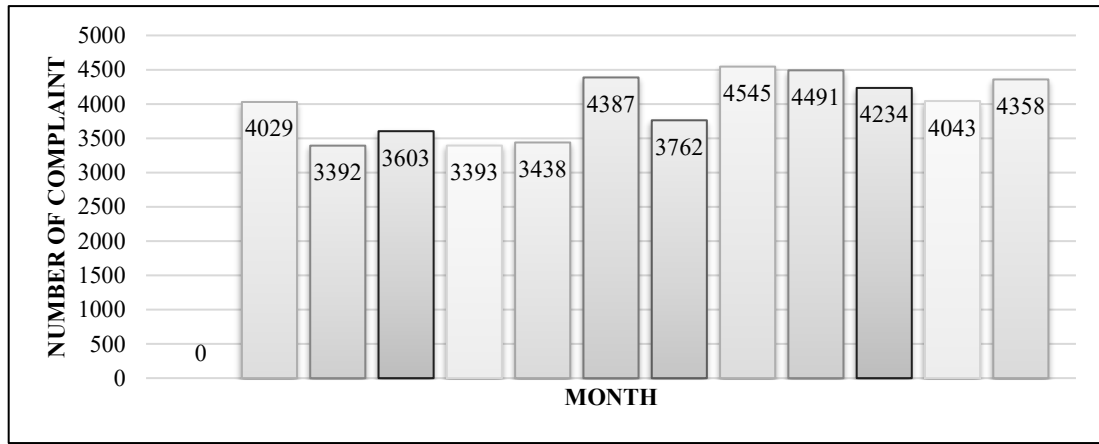
In particular, there were significant increases in complaint numbers during Q3 of 2021, Q3 of 2022, and the last two quarters of 2023. These increases are considered to be associated with industry dynamics such as the end of promotional periods, infrastructure changes, or renewal of subscription commitments.

BTK data, on the other hand, show relatively high complaint rates in the categories of mobile services and internet service providers (ISPs). While the number of complaints regarding mobile services peaked in early 2021 and then showed a downward trend, ISP-related complaints exhibited a more fluctuating pattern.

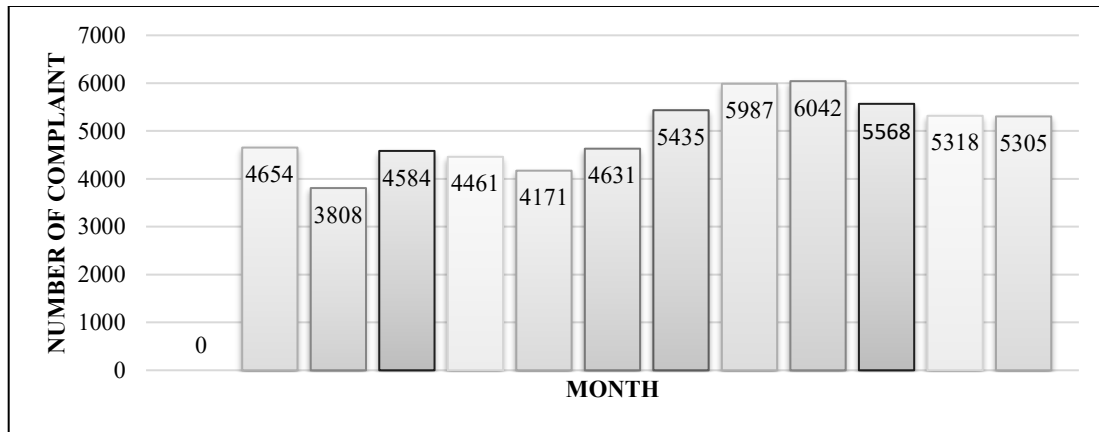
These findings reveal that user feedback expressed on digital platforms is directly related to structural or service-related changes in the sector. The periods with high complaint volumes provide critical feedback windows for service providers to analyze and improve user experience.



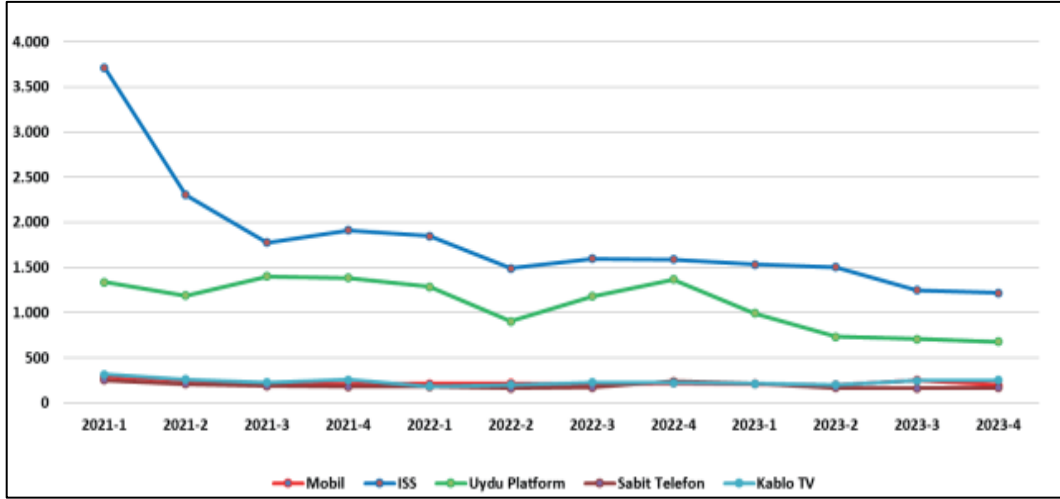
**Figure 4.1:** Monthly Distribution of Complaint Counts on Şikayetvar Platform in 2021.



**Figure 4.2:** Monthly Distribution of Complaint Counts on Şikayetvar Platform in 2022.



**Figure 4.3:** Monthly Distribution of Complaint Counts on Şikayetvar Platform in 2023.



**Figure 4.4:** Number of Consumer Complaints per Million Subscribers. [55]

#### 4.1.2 Complaint Topics and Relevant Sectors

The content analysis of consumer complaints was conducted comparatively using both digital platforms and official regulatory institution data. According to Şikayetvar data, the most frequently reported issues by users include internet speed, mobile data quality, coverage problems, and billing processes. These complaints are primarily related to the technical performance of the services and the overall customer experience.

An analysis of the complaint statistics published by the Information and Communication Technologies Authority (BTK) between 2021 and 2023 reveals that significant customer satisfaction issues persist across various service areas in Turkey's telecommunications sector. When broken down by sector, the data consistently shows that the most commonly reported issue in mobile communication services is "Billing". This indicates that mobile operators have not adequately met user expectations in terms of tariff transparency, bill monitoring systems, and informational communication.

Similarly, in the Internet Service Providers (ISP) category, complaints grouped under "Connection and Service Quality" have consistently had the highest proportion across all quarters, showing little to no variation over time. This finding highlights that the technical capabilities and infrastructural sustainability of fixed internet services represent a critical weakness in terms of customer experience. Common issues include unmet promised internet speeds, frequent disconnections, and inadequate technical support services.

For Satellite Platform Services, most complaints from users focus on "Subscription Procedures" and "Misleading Information". These complaints encompass problems such as insufficient explanation of contract terms, difficulties in cancellation procedures, and incomplete or inaccurate information provided by customer representatives. Similar themes were also observed in traditional services like landline and cable TV, especially concerning issues related to "Connection Quality".

Considering all the data, the recurring nature and nature of complaints signal the need for comprehensive and sustainable improvement policies across the industry. Service providers must prioritize not only technical infrastructure investments but also improvements in customer relationship management, transparency principles, and the development of digital complaint management systems.

When BTK's formal complaint records are compared with user reviews on digital platforms, it becomes clear that official complaints mainly focus on billing, contracts, subscription issues, and connection-related structural problems, whereas digital platform comments tend to be more emotional, experience-oriented, and relate to rapidly shareable issues. This highlights the need for a multi-channel complaint management approach and underscores the strategic importance of digital data in sectoral analysis.

The table below presents the most frequently reported issues within each service category and their share of total complaints. The data was obtained from BTK quarterly reports for the years 2021, 2022, and 2023 (Q1, Q2, Q3, and Q4).

**Table 4.1:** Distribution of Consumer Complaints by Sector (BTK).

[55] [56] [57] [58] [59] [60] [61] [62] [63] [64] [65] [66]

| Sector                     | Period  | Number of Complaints | Most Complained Topic           | Share Within Total Complaints (%) |
|----------------------------|---------|----------------------|---------------------------------|-----------------------------------|
| Mobile Services            | 2021-Q1 | 291                  | Coverage Area / Service Quality | 22.30%                            |
| Internet Service Providers | 2021-Q1 | 3,715                | Connection / Service Quality    | 44.30%                            |
| Satellite Platform Service | 2021-Q1 | 1,337                | Subscription Procedures         | 28.90%                            |

**Table 4.1:** Distribution of Consumer Complaints by Sector (BTK) “Table Continued”.

[55] [56] [57] [58] [59] [60] [61] [62] [63] [64] [65] [66]

|                            |         |       |                                 |        |
|----------------------------|---------|-------|---------------------------------|--------|
| Fixed Telephone Service    | 2021-Q1 | 250   | Connection / Service Quality    | 34.20% |
| Cable TV Service           | 2021-Q1 | 317   | Connection / Service Quality    | 26.90% |
| Mobile Services            | 2021-Q2 | 247   | Billing                         | 20.30% |
| Internet Service Providers | 2021-Q2 | 2,149 | Connection / Service Quality    | 41.90% |
| Satellite Platform Service | 2021-Q2 | 1,187 | Subscription Procedures         | 27.60% |
| Fixed Telephone Service    | 2021-Q2 | 208   | Connection / Service Quality    | 40.10% |
| Cable TV Service           | 2021-Q2 | 261   | Billing                         | 30.20% |
| Mobile Services            | 2021-Q3 | 212   | Coverage Area / Service Quality | 21.50% |
| Internet Service Providers | 2021-Q3 | 1,775 | Connection / Service Quality    | 31.50% |
| Satellite Platform Service | 2021-Q3 | 1,401 | Subscription Procedures         | 25.70% |
| Fixed Telephone Service    | 2021-Q3 | 189   | Connection / Service Quality    | 33.80% |
| Cable TV Service           | 2021-Q3 | 225   | Connection / Service Quality    | 26.10% |
| Mobile Services            | 2021-Q4 | 208   | Billing                         | 23%    |
| Internet Service Providers | 2021-Q4 | 1,913 | Connection / Service Quality    | 35.40% |
| Satellite Platform Service | 2021-Q4 | 1,383 | Subscription Procedures         | 26.00% |
| Fixed Telephone Service    | 2021-Q4 | 179   | Connection / Service Quality    | 38.70% |
| Cable TV Service           | 2021-Q4 | 254   | Connection / Service Quality    | 26.90% |

**Table 4.1:** Distribution of Consumer Complaints by Sector (BTK) “Table Continued”.

[55] [56] [57] [58] [59] [60] [61] [62] [63] [64] [65] [66]

|                            |         |       |                                 |        |
|----------------------------|---------|-------|---------------------------------|--------|
| Mobile Services            | 2022-Q1 | 215   | Coverage Area / Service Quality | 21.27% |
| Internet Service Providers | 2022-Q1 | 1,847 | Connection / Service Quality    | 41.61% |
| Satellite Platform Service | 2022-Q1 | 1,285 | Subscription Procedures         | 29.39% |
| Fixed Telephone Service    | 2022-Q1 | 180   | Subscription Procedures         | 37.49% |
| Cable TV Service           | 2022-Q1 | 181   | Connection / Service Quality    | 27.63% |
| Mobile Services            | 2022-Q2 | 215   | Coverage Area / Service Quality | 21.67% |
| Internet Service Providers | 2022-Q2 | 1,491 | Connection / Service Quality    | 39.92% |
| Satellite Platform Service | 2022-Q2 | 902   | Subscription Procedures         | 18.94% |
| Fixed Telephone Service    | 2022-Q2 | 160   | Connection / Service Quality    | 45.44% |
| Cable TV Service           | 2022-Q2 | 202   | Connection / Service Quality    | 27.11% |
| Mobile Services            | 2022-Q3 | 208   | Coverage Area / Service Quality | 22.28% |
| Internet Service Providers | 2022-Q3 | 1,599 | Connection / Service Quality    | 39.24% |
| Satellite Platform Service | 2022-Q3 | 1,181 | Subscription Procedures         | 21.78% |
| Fixed Telephone Service    | 2022-Q3 | 171   | Connection / Service Quality    | 49.19% |
| Cable TV Service           | 2022-Q3 | 226   | Connection / Service Quality    | 29.78% |
| Mobile Services            | 2022-Q4 | 218   | Coverage Area / Service Quality | 19.77% |
| Internet Service Providers | 2022-Q4 | 1,590 | Connection / Service Quality    | 40.78% |

**Table 4.1:** Distribution of Consumer Complaints by Sector (BTK) “Table Continued”.

[55] [56] [57] [58] [59] [60] [61] [62] [63] [64] [65] [66]

|                            |         |       |                                      |        |
|----------------------------|---------|-------|--------------------------------------|--------|
| Satellite Platform Service | 2022-Q4 | 1,336 | Connection / Service Quality         | 23.22% |
| Fixed Telephone Service    | 2022-Q4 | 240   | Connection / Service Quality         | 32.45% |
| Cable TV Service           | 2022-Q4 | 223   | Connection / Service Quality         | 30.53% |
| Mobile Services            | 2023-Q1 | 210   | Billing                              | 20.33% |
| Internet Service Providers | 2023-Q1 | 1,531 | Connection / Service Quality         | 36.91% |
| Satellite Platform Service | 2023-Q1 | 994   | Subscription Procedures              | 19.18% |
| Fixed Telephone Service    | 2023-Q1 | 212   | Subscription Procedures              | 38.37% |
| Cable TV Service           | 2023-Q1 | 213   | Connection / Service Quality         | 37.91% |
| Mobile Services            | 2023-Q2 | 202   | Coverage Area / Service Quality      | 28.83% |
| Internet Service Providers | 2023-Q2 | 1,504 | Connection / Service Quality         | 41.15% |
| Satellite Platform Service | 2023-Q2 | 734   | Misinformation / Lack of Information | 21.07% |
| Fixed Telephone Service    | 2023-Q2 | 168   | Connection / Service Quality         | 44.60% |
| Cable TV Service           | 2023-Q2 | 201   | Connection / Service Quality         | 37.59% |
| Mobile Services            | 2023-Q3 | 250   | Coverage Area / Service Quality      | 25.58% |
| Internet Service Providers | 2023-Q3 | 1,246 | Connection / Service Quality         | 36.53% |
| Satellite Platform Service | 2023-Q3 | 7,077 | Misinformation / Lack of Information | 20.01% |
| Fixed Telephone Service    | 2023-Q3 | 163   | Subscription Procedures              | 37.17% |

**Table 4.1:** Distribution of Consumer Complaints by Sector (BTK) “Table Continued”.

[55] [56] [57] [58] [59] [60] [61] [62] [63] [64] [65] [66]

|                            |         |       |                                      |        |
|----------------------------|---------|-------|--------------------------------------|--------|
| Cable TV Service           | 2023-Q3 | 248   | Connection / Service Quality         | 36.11% |
| Mobile Services            | 2023-Q4 | 195   | Billing                              | 20.85% |
| Internet Service Providers | 2023-Q4 | 1,219 | Connection / Service Quality         | 32.63% |
| Satellite Platform Service | 2023-Q4 | 678   | Misinformation / Lack of Information | 23.01% |
| Fixed Telephone Service    | 2023-Q4 | 167   | Subscription Procedures              | 40.14% |
| Cable TV Service           | 2023-Q4 | 252   | Connection / Service Quality         | 36.39% |

**Table 4.2:** Distribution of Consumer Complaints by Sector (Şikayetvar).

| Sector                      | Period  | Number of Complaints | Most Complained Topic | Share Within Total Complaints (%) |
|-----------------------------|---------|----------------------|-----------------------|-----------------------------------|
| Internet Service Providers  | 2021-Q1 | 7,605                | Billing               | 31.03%                            |
| Cable TV Services           | 2021-Q1 | 169                  | Billing               | 36.69%                            |
| Mobile Services             | 2021-Q1 | 2,020                | Billing               | 46.83%                            |
| Satellite Platform Services | 2021-Q1 | 92                   | Billing               | 34.78%                            |
| Internet Service Providers  | 2021-Q2 | 11,000               | Billing               | 20.73%                            |
| Cable TV Services           | 2021-Q2 | 211                  | Billing               | 27.96%                            |
| Mobile Services             | 2021-Q2 | 3,412                | Billing               | 30.04%                            |
| Satellite Platform Services | 2021-Q2 | 134                  | Billing               | 32.84%                            |

**Table 4.2:** Distribution of Consumer Complaints by Sector (Şikayetvar) “Table Continued”.

|                             |         |       |         |        |
|-----------------------------|---------|-------|---------|--------|
| Internet Service Providers  | 2021-Q3 | 9,522 | Billing | 19.17% |
| Cable TV Services           | 2021-Q3 | 210   | Billing | 29.05% |
| Mobile Services             | 2021-Q3 | 3,034 | Billing | 28.74% |
| Satellite Platform Services | 2021-Q3 | 132   | Billing | 31.06% |
| Internet Service Providers  | 2021-Q4 | 8,298 | Billing | 19.62% |
| Cable TV Services           | 2021-Q4 | 210   | Billing | 27.62% |
| Mobile Services             | 2021-Q4 | 2,756 | Billing | 29.39% |
| Satellite Platform Services | 2021-Q4 | 142   | Billing | 28.87% |
| Internet Service Providers  | 2022-Q1 | 7,886 | Billing | 20.52% |
| Cable TV Services           | 2022-Q1 | 214   | Billing | 24.30% |
| Mobile Services             | 2022-Q1 | 2,784 | Billing | 30.82% |
| Satellite Platform Services | 2022-Q1 | 140   | Billing | 33.57% |
| Internet Service Providers  | 2022-Q2 | 7,311 | Billing | 21.28% |
| Cable TV Services           | 2022-Q2 | 389   | Billing | 22.37% |
| Mobile Services             | 2022-Q2 | 3,343 | Billing | 35.51% |
| Satellite Platform Services | 2022-Q2 | 175   | Billing | 33.71% |
| Internet Service Providers  | 2022-Q3 | 9,077 | Billing | 19.48% |
| Cable TV Services           | 2022-Q3 | 265   | Billing | 24.15% |
| Mobile Services             | 2022-Q3 | 3,323 | Billing | 28.50% |
| Satellite Platform Services | 2022-Q3 | 133   | Billing | 26.32% |

**Table 4.2:** Distribution of Consumer Complaints by Sector (Şikayetvar) “Table Continued”.

|                             |         |        |         |        |
|-----------------------------|---------|--------|---------|--------|
| Internet Service Providers  | 2022-Q4 | 9,057  | Billing | 18.87% |
| Cable TV Services           | 2022-Q4 | 202    | Billing | 28.22% |
| Mobile Services             | 2022-Q4 | 3,237  | Billing | 28.02% |
| Satellite Platform Services | 2022-Q4 | 129    | Billing | 27.13% |
| Internet Service Providers  | 2023-Q1 | 9,264  | Billing | 19.51% |
| Cable TV Services           | 2023-Q1 | 189    | Billing | 25.40% |
| Mobile Services             | 2023-Q1 | 3,460  | Billing | 30.75% |
| Satellite Platform Services | 2023-Q1 | 133    | Billing | 30.08% |
| Internet Service Providers  | 2023-Q2 | 9,517  | Billing | 17.71% |
| Cable TV Services           | 2023-Q2 | 159    | Billing | 32.70% |
| Mobile Services             | 2023-Q2 | 3,436  | Billing | 28.90% |
| Satellite Platform Services | 2023-Q2 | 151    | Billing | 29.14% |
| Internet Service Providers  | 2023-Q3 | 12,553 | Billing | 17.88% |
| Cable TV Services           | 2023-Q3 | 170    | Billing | 31.18% |
| Mobile Services             | 2023-Q3 | 4,624  | Billing | 29.13% |
| Satellite Platform Services | 2023-Q3 | 117    | Billing | 29.91% |
| Internet Service Providers  | 2023-Q4 | 11,343 | Billing | 17.75% |
| Cable TV Services           | 2023-Q4 | 192    | Billing | 26.56% |
| Mobile Services             | 2023-Q4 | 4,502  | Billing | 28.96% |
| Satellite Platform Services | 2023-Q4 | 154    | Billing | 29.22% |

When the BTK data from 2021 to 2023 is analyzed, it is observed that user complaints vary depending on the type of service, with dominant themes such as "Billing" in mobile communication, "Connection and Service Quality" in fixed services, and "Subscription Procedures and Lack of Information" in satellite platforms. This indicates that complaints submitted via BTK tend to focus more on technical, structural, and contract-based issues.

However, when user data from the Şikayetvar platform during the same period is examined, no significant distinction between different service categories is observed. On the contrary, "Billing" emerges as the most complained-about issue across nearly all service types and time periods. This is especially notable in mobile services, where billing-related complaints consistently exceed 30%, and in Cable TV services, where they range between 20–30%.

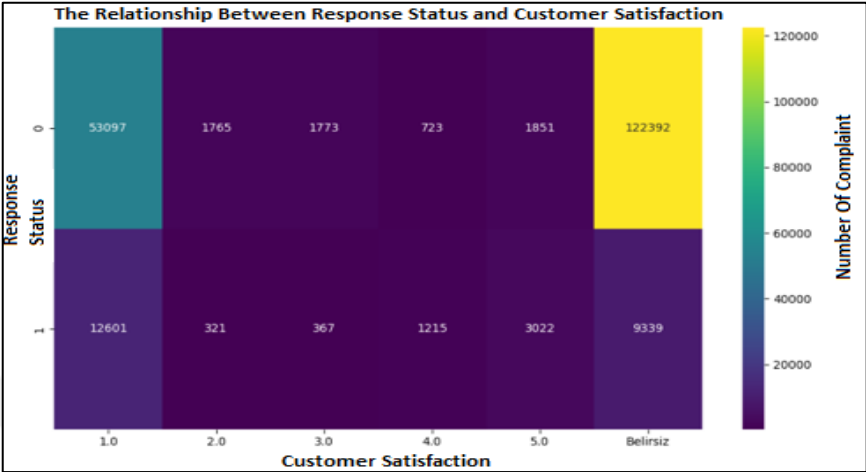
This finding highlights the influence of digital complaint platforms on user behavior and how complaint motivations differ depending on the platform. BTK complaints tend to be more formal, documented, and focused on seeking resolution, whereas complaints on digital platforms like Şikayetvar are usually faster, more emotional, and experience-driven. In particular, items reflected on the bill such as unexpected charges, campaign conditions, or additional service fees are quickly noticed by users and immediately turned into complaints on digital platforms. This demonstrates that users perceive a lack of transparency in billing processes and have developed a high level of sensitivity in this area.

Therefore, it can be said that there are content differences between official and digital complaint channels: BTK records focus more on infrastructural, contractual, or technical issues, while digital platforms highlight the user's instant dissatisfaction related to billing. This finding indicates the necessity of developing a multi-channel complaint management approach, offering significant feedback to the sector in terms of transparency in billing processes, user communication, and the effective management of digital feedback.

#### **4.1.3 Customer Satisfaction and Response Status**

One of the most important determinants of customer satisfaction in the complaint management process is the presence and quality of feedback given to complaints. Based on an analysis of Şikayetvar platform data, a significant relationship has been identified between the response status of complaints and the level of user satisfaction.

The heatmap below visualizes the interaction between the response status of complaints and user satisfaction scores. The color intensity represents the increase in the number of complaints, and each cell also includes the numerical value of complaints corresponding to that specific combination.



**Figure 4.5:** Relationship Between Satisfaction Level and Response Status.

Interpretation of the Chart:

- Unanswered Complaints and Satisfaction Status: For complaints with a response status of 0 (no response), a large portion shows a satisfaction level marked as "Unclear" (90,594 complaints). This indicates that when no response is provided to complaints, users either do not submit feedback on satisfaction, or it cannot be measured. In the same category, complaints with a satisfaction score of 1.0 (the lowest) are notably high (41,048 complaints). This suggests that unanswered complaints often lead to negative customer experiences. Complaints with high satisfaction scores are very few, such as only 1,353 complaints having a satisfaction score of 5.0.
- Answered Complaints and Satisfaction Status: When examining complaints with a response status of 1 (answered), the "Unclear" satisfaction category is still high (6,984 complaints). However, in this group, there is a more balanced distribution across other satisfaction levels. Notably, the number of complaints with a satisfaction score of 5.0 (2,180 complaints) suggests higher customer satisfaction when responses are provided. Despite the responses, the number of complaints with a satisfaction score of 1.0 (9,782

complaints) is high, indicating that the content and effectiveness of the responses also play a crucial role in customer satisfaction.

The analysis results show that lack of response to complaints significantly increases customer dissatisfaction. On the other hand, answered complaints exhibit a broader distribution of satisfaction scores, suggesting that effective communication and a solution-oriented approach can positively influence customer perception. The high proportion of "Unclear" satisfaction in both response categories indicates that companies need to improve their satisfaction measurement processes. In this context, collecting user feedback more systematically and in a guiding manner can increase the efficiency of complaint management processes and contribute to strengthening corporate reputation.

#### **4.1.4 Negative Score Analysis**

To examine the emotional level of customer complaints more deeply, a special negativity scoring system was applied using text-based analysis techniques. In this method, each complaint text in the Şikayetvar data was classified based on the intensity of negative expressions it contained. The classification was based on keywords grouped into three main categories: severe negative, medium negative, and mild negative expressions.

Each category of words was scored with different weights depending on the frequency they appeared in the complaint text. Severe negative expressions were scored three points, medium negative expressions two points, and mild negative expressions one point. A total negative score was calculated for each text. These scores were then normalized into the range of [0,1] using the MinMaxScaler method for comparison. The distribution obtained is as follows:

- a. 0-0.25 range negative score complaints: 148,224 complaints
- b. 0.25-0.5 range complaints: 3,730 complaints
- c. 0.5-0.75 range complaints: 78 complaints
- d. 0.75-1.0 range complaints: 7 complaints

This distribution shows that the majority of complaints on the Şikayetvar platform have low to medium negative sentiment. The relatively low number of complaints with a high negativity score ( $\geq 0.75$ ) suggests that users typically submit constructive or mild complaints, rather than expressing highly negative emotions.

## **4.2 COMPARATIVE EVALUATION OF DIGITAL PLATFORM COMPLAINTS WITH BTK DATA**

In this section, complaints collected from Google Play and App Store user reviews were analyzed and compared with BTK's sectoral complaint data. The goal was to determine how well the complaints expressed on digital platforms align with the complaint types reported at the corporate level. This way, the relationship between customer dissatisfaction expressed through digital platforms and indicators of service quality in the sector is analyzed.

### **4.2.1 General Characteristics of Digital Platform Complaints**

The analyzed digital dataset consists of 201,254 user reviews. When examining the distribution of sources, the number of records obtained from Google Play was found to be 182,240, and the number from App Store was 19,014.

These digital platforms are not primarily complaint-focused; rather, they are places where general user experiences are shared. Therefore, the sentiment analysis results cover not only negative content but also neutral and positive user feedback. Indeed, the sentiment analysis revealed that approximately 50.7% of the reviews were neutral, 40.1% were positive, and only 9.2% were negative. This distribution shows that the majority of users either provided neutral or satisfied content, but it also indicates that a notable portion experienced negative outcomes. However, since Şikayetvar functions as a platform dedicated to complaints, data from this platform can be directly regarded as negative user experiences, while the reviews from platforms like Google Play and App Store contain both complaints and expressions of satisfaction. Therefore, sentiment analysis based on Natural Language Processing (NLP) was applied to specifically highlight negative content from these platforms and analyze the digital complaint dimension. The most complained-about application category was messaging and communication platforms, followed by digital and content streaming applications, music streaming platforms, social media apps, and digital wallets and financial

services applications. The complaint distribution per app indicates that these digital services need significant improvements from the perspective of user experience.

According to temporal analysis, digital platform complaints showed a noticeable increase in the first quarter of 2022 and at the beginning of 2023. These periods can be associated with software updates, campaigns, or system problems in the applications, which may represent potential risk periods. Notably, in March 2022, the monthly number of complaints peaked at 16,098, indicating that service providers need to anticipate these seasonal peaks and develop stronger user support and system management strategies.

#### **4.2.2 Comparative Evaluation**

When comparing the complaints obtained from digital platforms with the official reports provided by BTK, there are clear overlapping areas:

- a. Connection issues, service access problems, and technical disruptions frequently mentioned in digital reviews are also among the categories with the highest complaint rates under Connection/Service Quality in BTK data.
- b. Complaints about billing issues, lack of information, and difficulty in subscription cancellation mentioned in digital store reviews can be directly linked to BTK's categories of Billing and Incomplete/Wrong Information.
- c. In application-specific analysis, messaging and communication platforms, which have high complaint rates, show that issues not detailed in BTK's service-type classifications can be identified through digital platforms.

## 5. RESULT

This study aimed to reveal the relationship between customer complaints in the telecommunications sector and data from digital platforms and the BTK. The study demonstrates that complaints on digital platforms such as Şikayetvar, Google Play, and the App Store provide significant insights into the main issues faced by the sector. The findings show that customer complaints are largely concentrated around service quality deficiencies, inadequate customer support services, and technical infrastructure issues. These results highlight the need to improve the current service approach and customer interaction processes within the sector.

Specifically, through the use of sentiment analysis and topic modeling techniques, it was identified that the most frequently complained about issues include fundamental technical problems such as connection failures and billing errors. These findings allow for a deeper understanding of the root causes of dissatisfaction in the sector. Comparisons with BTK data have revealed a disconnect and lack of data flow between digital platforms and regulatory institutions. While the data collected by BTK tends to be more official and limited in scope, complaints on digital platforms are more diverse and detailed.

In light of these findings, it can be said that complaints on digital platforms directly point to major issues in the industry. In particular, the inability of customer support services to respond quickly and effectively to feedback received through digital platforms undermines customer loyalty and fuels dissatisfaction. This situation emphasizes the necessity for telecommunications companies to accelerate their digital transformation processes and to develop new strategies that enable customers to reach resolutions more swiftly and efficiently.

The purpose of this study was to analyze customer complaints on digital platforms within the telecommunications sector, identify key problems the sector faces, and develop recommendations for addressing these issues. The findings reveal that complaints made through digital platforms highlight the extent of customer dissatisfaction and service deficiencies in the industry. The study has shown that data from platforms like Şikayetvar, the App Store, and Google Play have become valuable tools for identifying customer complaints and understanding problems in the sector.

Based on these findings, the telecommunications industry must take significant steps to improve the customer experience. The accumulation of complaints and the repetition of similar issues over time indicate the need to reassess the current service structure. Furthermore, regulatory bodies such as the BTK need to work more integratively with digital platforms to accelerate the collection and evaluation of customer feedback.

In conclusion, effectively analyzing customer complaints on digital platforms is of critical importance for improving overall service quality and increasing customer satisfaction in the sector. The findings of this study clearly demonstrate that stakeholders in the telecommunications industry need to develop customer-focused strategies and better integrate customer feedback into strategic decision-making processes.

Based on the findings of this study, the following recommendations are offered for the telecommunications sector:

**Improving Customer Service Processes:** Most complaints from digital platforms are related to inadequate customer support. Therefore, the digitization of customer service processes is essential for enabling quicker and more efficient responses to complaints. Customer service should be accessible 24/7, and complaint resolution times should be minimized.

**Integration of Digital Platform and BTK Data:** Establishing a more effective integration between complaint data collected from digital platforms and BTK data would enable quicker resolution of complaints. This integration would improve data-sharing processes and allow regulatory institutions to conduct more effective monitoring of companies' complaint management systems.

**Continuous Monitoring and Data Analysis of Complaints:** Complaints should not only be analyzed retrospectively but should also be monitored continuously to track trends in real time. In this way, issues that lead to customer dissatisfaction can be quickly identified, and preventive measures can be taken. Moreover, improving data analysis techniques and integrating machine learning processes can lead to a more efficient analysis system.

**Continuous Improvement of Service Quality:** To resolve core issues such as connection problems, billing errors, and failures in customer support services, the industry's service

infrastructure must be continuously improved. More investments should be made in this area, and technological innovations should be integrated into service quality improvements.

**Development of User-Friendly Digital Tools:** To ensure digital platforms play an effective role in complaint resolution, they must be made more user-friendly. Mobile applications and web platforms should be developed to allow customers to easily submit complaints and receive quick solutions.

In conclusion, this thesis provides an important source of information on the analysis of customer complaints in the telecommunications sector and contributes to the development of concrete recommendations for solving existing problems. More effective use of customer feedback by telecommunications companies and regulatory bodies would be a significant step toward reducing overall dissatisfaction in the industry.

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