



## **Research on Customer Service Practices in the Digital Transformation of China Eastern Airlines**

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## Abstract

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<p>With the rapid development of information technology and the advancement of global economic integration, digital transformation has become a key strategy for the aviation industry to improve service quality and enhance customer loyalty. This study takes China Eastern Airlines as the research object, delves deeply into its innovative customer service practices during the digital transformation process, and evaluates the impact of these practices on customer satisfaction based on the SERVQUAL model. The research adopted the questionnaire survey method to analyze customer satisfaction from five dimensions: reliability, responsiveness, assurance, empathy and tangibility.</p> <p>The research results show that China Eastern Airlines has implemented a series of customer service innovation measures in its digital transformation, such as mobile applications, online service platforms and intelligent customer service, significantly enhancing customer experience and satisfaction. Customers generally believe that these digital services enable them to obtain flight information more quickly, purchase tickets more conveniently, and have a positive impact on the brand image of China Eastern Airlines. However, the survey also revealed problems with China Eastern Airlines in terms of system stability, functional optimization, customer service response speed, interface design, data security and privacy protection, as well as feedback channels, which may affect customers' continuous satisfaction and loyalty.</p> <p>In response to the above problems, this study puts forward a series of improvement suggestions, including strengthening technical optimization, reinforcing data security management, enhancing employee training, optimizing the customer feedback mechanism and increasing customer interaction, etc. These suggestions are aimed at helping China Eastern Airlines further improve the quality of customer service and enhance its market competitiveness. This research not only provides a reference basis for the optimization of digital development of China Eastern Airlines, but also offers a reference for the digital transformation of other aviation enterprises or similar industries, which has important theoretical and practical significance.</p>
<b>Key words</b> Digital transformation; Customer service ;Customer satisfaction ;Service quality' Aviation industry

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# 1 Introduction

This chapter introduces the background, purpose and significance of the research, as well as the research ideas and methods. In recent years, competition in the global aviation market has intensified, and customer demands have become increasingly diverse. Digital transformation has become the key for the aviation industry to enhance service quality and competitiveness. This study aims to explore the innovative customer service practices of China Eastern Airlines in its digital transformation, analyze its achievements and deficiencies, and put forward improvement suggestions. The research mainly adopts the methods of literature analysis and questionnaire survey, combined with the stage model theory and SERVQUAL model, to systematically sort out the digital transformation process of China Eastern Airlines and evaluate customers' satisfaction with its digital services.

## 1.1 Research Background

In recent years, the global aviation market has shown a sustained growth trend. The volume of air transportation has been increasing continuously, the route network has become increasingly dense, and market competition has become more and more fierce. The digital transformation and development of enterprises have become the inevitable path for the aviation industry. On the one hand, with the increasingly diverse and personalized demands of consumers, the traditional aviation service model has been unable to meet the expectations of passengers. Customers are paying more and more attention to aspects such as flight selection, ticket purchasing convenience, and travel experience, and their requirements for the service quality of airlines are also getting higher and higher. On the other hand, the intensification of competition in the aviation market has gradually shifted the focus of competition among airlines from merely capacity allocation to the improvement of service quality. How to stand out in the fierce market competition and win the favor of more customers has become an urgent problem for airlines to solve.

Digital transformation has become an inevitable trend in the development of the global aviation industry. It not only enhances the operational efficiency of airlines and reduces costs, but also provides customers with more convenient, efficient and personalized service experiences. Through the application of digital technology, airlines can achieve digital upgrades throughout the entire process, from ticket booking and check-in to flight information inquiry and customer service, thereby better meeting the needs of customers in different scenarios. For example, the popularity of mobile Internet has made an increasing number of travelers accustomed to booking air tickets and managing itineraries through mobile phone applications. Big data technology can help airlines better understand customer needs and achieve precise marketing and personalized services. Artificial intelligence and intelligent customer service systems can provide customers with fast and

accurate consultation services, enhancing customer satisfaction. In addition, digital transformation can also help airlines enhance safety management. Through real-time monitoring and data analysis, potential safety hazards can be identified in a timely manner to ensure flight safety.

China Eastern Airlines, as one of the three major state-owned backbone airlines in China, has long occupied an important position in the domestic and international aviation market. In recent years, through the application of digital technology, China Eastern Airlines has comprehensively optimized and innovated in aspects such as customer reservations, check-in, in-flight services, and after-sales feedback. However, digital transformation is not always smooth sailing. China Eastern Airlines also faces many challenges in the process of customer service innovation, such as system stability, data security, and customer response speed. Therefore, an in-depth study of China Eastern Airlines' innovative practices in customer service during digital transformation and an analysis of its achievements and shortcomings are conducive to providing reference suggestions for the optimized digital development of China Eastern Airlines and have important practical significance for promoting the digital transformation of the aviation industry.

## **1.2 Research Objectives and Significance**

This study focuses on the innovation of customer service in the digital transformation of China Eastern Airlines, aiming to identify problems and put forward improvement suggestions. The theoretical significance lies in enriching relevant research, and the practical significance is to improve the customer service quality of airlines and enhance their competitiveness.

### **1.2.1 Purpose of the study**

This study aims to deeply explore the specific practical measures and effects of customer service innovation of China Eastern Airlines during the process of digital transformation. By sorting out the digital transformation process of China Eastern Airlines and analyzing its innovative practices in customer service, the successful experiences in improving customer satisfaction and loyalty are summarized. On this basis, the problems and challenges existing in the measures of China Eastern Airlines under the background of digital transformation are identified according to the results of the questionnaire survey. Put forward targeted countermeasures and suggestions to provide a reference basis for China Eastern Airlines to further optimize customer service, and also to offer lessons for the digital transformation of other aviation enterprises or similar industries.

### **1.2.2 Significance of the study**

Theoretical significance: Enrich and improve the theories related to digital transformation and customer service innovation. The aviation industry, as a service-oriented sector, its service quality

is of vital importance to the customer experience and the competitiveness of enterprises. At present, research on the digital transformation of the aviation industry mostly focuses on the application of technology and operation management, while systematic research on customer service innovation is relatively scarce. This study, through in-depth analysis of the practical case of China Eastern Airlines, further expands the theoretical research on the relationship between digital transformation and customer service quality, providing a new perspective and case support for subsequent research.

**Practical significance:** This research can help airlines better understand and implement customer service innovation. Through the research, the problems existing in customer service practice are discovered, and feasible solutions are analyzed and proposed, so as to improve the quality of customer service and enhance the competitiveness of enterprises. In the fierce competition of the aviation market, customer satisfaction and loyalty are one of the key indicators for the survival and development of airlines. By studying the customer service innovation practices of China Eastern Airlines, it can provide operational practice guidelines for other airlines, helping them improve customer service quality and enhance market competitiveness during the digital transformation process.

### **1.3 Research Ideas and Methods**

This part mainly introduces the ideas and methods of the research. Firstly, the research ideas section elaborates in detail on the background, purpose and significance of the research, and puts forward the main contents and methods of the research. Then, in the section on the main research methods, two methods, namely the literature analysis method and the questionnaire survey method, were introduced, and their specific applications and importance in the research were respectively explained.

#### **1.3.1 Research Ideas**

This article divides the research content into seven parts, namely, introduction, literature review and theoretical basis, introduction to research methods, case analysis, analysis and conclusion of questionnaire results, suggestions and summary for improving customer service quality. Firstly, analyze the background of the research, emphasize the importance and significance of the research. Then, starting from the theoretical basis and literature review, sort out the relevant theories of digital transformation and customer service quality, and analyze the current research status at home and abroad. Based on this theory, the digital transformation process and customer service innovation practice measures of China Eastern Airlines are introduced in detail. Then, a critical analysis of the customer service measures is conducted. The customer satisfaction data is

collected through the questionnaire survey method, and the data is analyzed in depth by using the five dimensions of the service quality theory. Finally, based on the results of the questionnaire survey, summarize the achievements and existing problems of China Eastern Airlines in customer service innovation, and put forward targeted countermeasures and suggestions according to the above conclusions.

### 1.3.2 Main research methods

(1) Literature analysis method: Literature analysis method is one of the important methods in this research. Through channels such as the Internet, libraries, annual reports of airlines, and electronic resource databases, relevant literature was reviewed and classified to gain an in-depth understanding of knowledge related to digital transformation and the quality of airport passenger services. By reviewing relevant domestic and foreign literature, the theoretical basis and research status of digital transformation and customer service innovation were systematically sorted out, providing a solid theoretical support for this research. The literature analysis will focus on the following aspects: The first one is the concept, theoretical model of digital transformation and its current application status in the aviation industry. The second one is the theoretical framework of customer service quality, especially the research on customer experience, satisfaction and loyalty related to digital transformation. The third one is the successful cases and lessons learned of domestic and foreign airlines in digital transformation and customer service innovation.

(2) Questionnaire survey method: The questionnaire survey method is the main approach for obtaining primary data in this study. This study will correlate the digital customer service measures of China Eastern Airlines to design a reasonable customer service quality satisfaction questionnaire, collect customers' evaluations and feedback on the customer service of China Eastern Airlines, and provide empirical support for the research. And passengers who have taken flights operated by China Eastern Airlines before will be selected as the research subjects. Questionnaires will be distributed and collected online. For example, the online survey will distribute questionnaires through channels such as the official website and APP of China Eastern Airlines. After eliminating the collected invalid questionnaires, the questionnaire data will be analyzed. After the data collection is completed, the five dimensions of the service quality theory will be used to conduct in-depth analysis of the data to ensure the reliability and validity of the questionnaire.

## 1.4 Overlay matrix

Investigative Questions	Theoretical Framework	Results	Questionnaire Questions
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What innovative customer service measures has China Eastern Airlines taken during its digital transformation?	Stage model theory, SERVQUAL model	3.2	Q5-Q12
What impacts have these digital measures had on customer satisfaction and loyalty?	SERVQUAL model	5.1-5.2	Q1-Q4
What are the gaps between customers' expectations of China Eastern Airlines' digital services and their actual perception?	SERVQUAL model	5.3	Q11
What problems and challenges does China Eastern Airlines face in terms of customer service innovation?	Stage model theory, SERVQUAL model	6	Q12

## 2 Theoretical basis

This chapter reviews the current research status of digital transformation in the aviation industry at home and abroad, and introduces the stage model theory and the SERVQUAL model. Domestic research mostly focuses on airport operation management, the application of technological innovation and the improvement of service quality, while foreign research pays more attention to the improvement of passenger experience and operational efficiency brought about by digital transformation. The stage model theory emphasizes that the digital transformation of enterprises should be advanced in stages, while the SERVQUAL model assesses service quality through five dimensions (reliability, responsiveness, assurance, empathy, and tangibility). This study will combine these two theories to conduct an in-depth analysis of China Eastern Airlines' digital transformation practices and their impact on customer satisfaction.

### 2.1 Current status of domestic research

In recent years, domestic scholars have conducted extensive and in-depth research on the digital transformation of the aviation industry, covering multiple aspects such as airport operation management, technological innovation application, and service quality improvement. These studies have provided rich theoretical support and practical references for the digital transformation and development of airlines and even the entire aviation industry.

#### (1) Digitalization of airport operation and management

Songtao Liu and Weiling Zheng (2024) took Pu dong Airport as an example to deeply explore the digital transformation of outsourcing management. Research indicates that by establishing a "1+7+N" smart airport area "one-network management" system, the digitalization level of airport operation management has been significantly enhanced. At the same time, transformation strategies such as improving top-level design, sorting out the outsourcing structure, and digital empowerment of outsourcing management have been proposed, providing practical paths for the digital transformation of airport outsourcing business. Jian Wang et al (2024) proposed an innovative solution to address the issue of airport data governance by integrating "six major data models" and "eight intelligent algorithms" into the data governance platform. It has promoted the integration, sharing and value mining of airport data, providing strong data support for airport operation and management. Li Shen (2024) found that through information technology, the levels of fault reporting, diagnosis, maintenance dispatching, tracking, evaluation and statistics of airport equipment can be automated, thereby improving the reliability and maintenance level of airport equipment and ensuring the smoothness of airport operations.

## (2) Innovative application of digital technology

Yaoguo Fu et al. (2024) explored the application of digital twin technology in the digital construction of airports. It is emphasized that this technology, by integrating multi-disciplinary and multi-physical quantity simulation processes, builds a digital model identical to that of physical airports, providing technical support for the construction of smart airports. Yang Jinxing and Yinhui Xie (2024) studied the digital technology in airport luggage sorting and loading operations, achieving adaptive luggage sorting and loading, and significantly improving the efficiency and accuracy of luggage handling. Wei Zhang and Lei Zhao(2024) discussed the digital traceability system for airport logistics based on blockchain technology. Research indicates that by leveraging the immutable and distributed ledger features of blockchain, it is possible to achieve full-process traceability of airport logistics, enhance the transparency and credibility of logistics, and improve management efficiency and security.

## (3) Service quality improvement and business collaboration

Wanling Liu (2023) believes that the application of digital technology in smart airports is conducive to achieving low-carbon operation, security guarantee, efficient resource utilization and accelerated operation and maintenance. By leading with technology to break through digital links, achieving centralized, visualized and intelligent management of business, and adopting facial registration solutions and expanding urban information models + smart construction platforms, etc., it is conducive to the airport completing intelligent transformation and enhancing the ground service experience. Xiaojiang Li and Hang Hu (2024)proposed the concept of digital collaboration in airports, covering multiple aspects such as data sharing, business collaboration, process collaboration, service collaboration, and management collaboration. They believe that through digital technology, the sharing and collaboration of internal and external resources of the airport can be achieved, thereby enhancing the operational efficiency and service quality of the airport. Nanping Chen (2023) pointed out that technologies such as big data and cloud computing provide full-stack services for the digital transformation of the transportation industry, which is conducive to achieving comprehensive perception and data sharing and exchange of elements such as infrastructure, transportation vehicles, traffic participants, and the environment, and creating intelligent and innovative applications. Enhance the business collaboration and management efficiency of transportation management and facilitate the construction and development of smart airports and other facilities.

## 2.2 Current status of foreign research

In the research on the digital transformation of the aviation industry abroad, the focus has been on how digital technologies can improve passenger experience, enhance operational efficiency, and cope with industry competition, achieving a series of inspiring research results.

### (1) Passenger experience improvement

The research of Henna Jalkanen (2023) indicates that digitalization is regarded as the main force driving organizational change in airlines, especially in the field of passenger services. The introduction of self-service equipment has changed the daily work of frontline employees, but it has also brought challenges such as technological adaptation, passenger resistance, and changes in job content. Zacharaki Maria Polyxeni(2023) focused on Aegean Airlines of Greece and found that during the process of digital transformation, the airline significantly improved the convenience and satisfaction of passengers through digital products such as online ticket booking, online check-in and mobile applications. However, at the same time, there are also security risks and user privacy issues that need to be given due attention when implementing the digital strategy. Aymeric Dussart(2021) emphasized that digital transformation is not only the application of technology, but also the reshaping of the business model of airlines. Montreal Trudeau International Airport has successfully achieved digital transformation by adopting cloud computing, data management and automation technologies, enhancing passenger satisfaction and loyalty.

### (2) Improvement of operational efficiency and reshaping of business models

The research by Iryna Heiets(2022) et al. explored the impact of digitalization on airline strategies, pointing out that digitalization can not only help airlines reduce costs, but also enhance customer loyalty by providing personalized services. Despite the huge potential of digital transformation, many airlines still face implementation obstacles such as insufficient technical infrastructure and lack of employee skills. Dini(2023) et al. found through the TAFE framework that some airports have a one-sided understanding of digital transformation as a process of enhancing passenger experience and cost base by improving service quality and operational efficiency, while neglecting other important factors. Svein Brathen (2021) et al. defined the key stages related to the digital maturity of airports using the maturity model, identified the key factors related to the digital transformation of airports, and provided an assessment and guidance framework for the digital development of airports.

### (3) Technology Application and Security Challenges

Lamb (2018) focused on the application of digital twin technology and the Internet of Things in the digital transformation of airports, pointing out that the security of these systems is of vital importance and the risks brought by security vulnerabilities are extremely serious. Meanwhile, human factors in enterprises, such as recruitment and change management, can also affect the effectiveness of digital transformation at airports. Liang (2020) research indicates that the application of behavioral science and automation technology in the aviation industry is the key to future development. The rational application of these technologies can significantly enhance the operational efficiency and safety of the aviation industry, while improving the travel experience of passengers. Pell (2018) et al. hold that the digital transformation of airports can not only improve operational efficiency and reduce costs, but also provide broader strategic opportunities by enhancing capacity and improving the passenger experience. At the same time, airlines also need to overcome technical and cultural barriers, develop internal technical capabilities, and address the challenges in organizational change, which is conducive to achieving digital transformation. Nau J and Benoit F (2017) et al. pointed out that the Internet of Things will greatly change people's lives. Smart airports are the future of airport operations. By applying advanced technologies, airports can improve operational efficiency and safety, provide more personalized and comfortable passenger experiences, and promote the transformation of the industry to adapt to modern technologies.

### **2.3 Review of Domestic and Foreign Research**

Overall, both at home and abroad, significant progress has been made in the research of digital transformation in the aviation industry. Domestic research pays more attention to combining the actual cases of specific airports to explore the specific practical paths and strategies of digital technology in airport operation management, technological innovation application and service quality improvement, etc. It emphasizes optimizing the business processes and resource allocation of airports through digital means to enhance the operational efficiency and service level of airports. Foreign research, on the other hand, focuses more on exploring the profound impact of digital transformation on airlines and airports from a strategic perspective, paying attention to how digital technologies can improve passenger experience, enhance operational efficiency, and address industry competition. It also analyzes the technical, management, and cultural challenges faced during the digital transformation process.

In the future, with the continuous development and application of digital technology, the digital transformation of the aviation industry will become more in-depth and extensive. When the aviation industry uses digital technologies for customer service, it is even more necessary to consider passenger experience, the quality of passenger service, and the security of customers' personal privacy information. At the same time, customer satisfaction can be used for assessment and

feedback to identify deficiencies in the digitalization process and make timely corrections, thereby promoting the improvement of customer service quality and the smooth progress of digital transformation.

## **2.4 Relevant theories**

This section introduces two important theories related to the research. The first one is the stage model theory, which points out that the digital transformation of enterprises needs to be advanced in stages. The second one is the SERVQUAL model, which evaluates the quality of service through five dimensions (reliability, responsiveness, assurance, empathy and tangibility). This study designed a questionnaire based on this model to analyze the effect of digital services of China Eastern Airlines.

### **2.4.1 Stage model theory**

The digital transformation of enterprises needs to be advanced in stages. The core logic is that the application of technology needs to be advanced in stages. The achievements of the previous stage provide the foundation for the subsequent stage, and ultimately achieve an overall improvement in operational efficiency and customer value (Nolan, 1979). This study, in combination with the actual digital transformation process of China Eastern Airlines, divides it into three major stages, namely "process electronicization" to "information optimization", and ultimately realizes the progressive process of "data-driven decision-making". The stage model can clearly reflect the gradualness of its digital transformation. China Eastern Airlines is selected as a research case. As one of the three major airlines in China, its transformation process is typical. This theory is mainly applied in the research of the part "4.2 Digital Transformation Process of China Eastern Airlines".

### **2.4.2 SERVQUAL model**

The SERVQUAL model (Service Quality Perception Model) is a tool used to evaluate service quality. It measures service quality by comparing the gap between customers' expectations of service quality and their actual perception. It includes five dimensions such as assurance, reliability, empathy, responsiveness and tangibility.(Parasuraman et al. 1988) [21]. This study will design a questionnaire based on the SERVQUAL model to evaluate the customer service satisfaction of China Eastern Airlines. By analyzing the issues related to digital services involved in the survey questionnaire, the digital service quality of China Eastern Aviation is evaluated and analyzed from five dimensions: tangibility, reliability, responsiveness, guarantee and emotional investment, in order to identify its advantages and disadvantages in digital services and put forward corresponding improvement suggestions, providing theoretical support and practical guidance for

enterprises to improve the quality of digital services. This theory mainly analyzes the questionnaire design in the part of "3.2.2 Questionnaire Survey Method".

### **3 Research Methodology**

This chapter elaborates on the research methods, research questions and purposes, the design ideas based on the stage model theory and the SERVQUAL model, as well as the specific implementation of the questionnaire survey. The research aims to analyze the digital transformation process of China Eastern Airlines through the stage model theory, and design a questionnaire based on the SERVQUAL model to evaluate customers' satisfaction with its digital services. The subjects of the questionnaire survey were passengers who had taken flights of China Eastern Airlines, and a total of 104 valid questionnaires were collected. The limitation of the research method lies in the small sample size and possible bias. Subsequent studies can further optimize it.

#### **3.1 Research Questions and Objectives**

This section clarifies the specific issues and purposes of the research. The research questions involve the digital customer service measures of China Eastern Airlines, their impact on customer satisfaction and loyalty, the gap between customer expectations and actual perceptions, and the challenges faced. The purpose of the research is to sort out the practical path of digital customer service of China Eastern Airlines, evaluate customer satisfaction, identify the gap between customer expectations and actual perception, and put forward corresponding improvement suggestions.

##### **3.1.1 Research Questions and Objectives**

- (1) What innovative customer service measures has China Eastern Airlines adopted during its digital transformation process?
- (2) What impacts have these digital measures had on customer satisfaction and loyalty?
- (3) What are the gaps between customers' expectations of China Eastern Airlines' digital services and their actual perception?
- (4) What problems and challenges does China Eastern Airlines face in terms of customer service innovation?

##### **3.1.2 Research purpose**

This study aims to analyze the digital transformation process and customer service practice measures of China Eastern Airlines through stage theory, and investigate customers' satisfaction and feedback on digital measures based on the SERVQUAL model. The main goals of the

research include: sorting out the innovative practice paths of customer service in the digital transformation of China Eastern Airlines; Evaluate the satisfaction and loyalty of customers towards the digital services of China Eastern Airlines; Identify the gap between customer expectations and actual perceptions and provide a basis for optimizing customer service; Put forward targeted countermeasures and suggestions to help China Eastern Airlines further improve the quality of customer service.

### **3.2 Analyze the digital transformation process of China Eastern aviation based on the stage model theory**

In this section, the stage theory will be adopted to analyze the digital transformation process of China Eastern Airlines. Then, based on the collected data, the progressive process of China Eastern Airlines' digital transformation from "process electronicization" to "information optimization", and ultimately achieving "data-driven decision-making" will be sorted out. Through the analytical framework of stage theory, the study will meticulously sort out the digital transformation measures of China Eastern Airlines at each stage and the specific impact of these measures on customer service.

### **3.3 The questionnaire was designed based on the SERVQUAL model**

The questionnaire survey method is the main data collection method in this study, which is used to evaluate customers' satisfaction with the digital services of China Eastern Airlines. The questionnaire design will be based on the five dimensions of the SERVQUAL model: reliability, responsiveness, assurance, empathy and tangibility, and combined with actual customer experience questions. The questionnaire design is divided into three parts: The first part is the basic information of the customers, including gender, age, occupation, frequency of taking China Eastern flights, etc. The second part is about customer satisfaction with digital services: Based on the five dimensions of the SERVQUAL model, specific questions are designed to evaluate customers' expectations and actual perceptions of China Eastern Airlines' digital services. The third part is open-ended questions: Collect customers' overall evaluations of China Eastern Airlines' digital services, their advantages, areas for improvement, and expectations for the future. The following is a specific analysis of the questionnaire design based on the five dimensions of the SERVQUAL model:

- (1) Reliability : According to Q4: "How often do you take China Eastern flights?" Although this issue does not directly mention the efficiency of the registration procedures, it can indirectly reflect the degree of customers' trust in the flight. If customers frequently choose China Eastern flights, it indicates that they have certain expectations for the reliability of the flights.

From the results, 42.31% of the customers take the flight at least once a month, indicating that this group of customers have high expectations and actual perceptions of the reliability of China Eastern flights. According to Q8: "Do you think China Eastern Airlines' digital services enable you to obtain flight information faster, purchase tickets more quickly and conveniently?" This issue directly measures customers' expectations and actual perceptions of digital services in terms of obtaining information and purchasing tickets. The results show that 60.58% of the customers think that the digital service is "very convenient", indicating that in terms of reliability, China Eastern Aviation's digital service has met the expectations of the customers.

- (2) Responsiveness : According to Q5: "Do you know about China Eastern Aviation's digital services (such as mobile applications, online service platforms, and intelligent customer service, etc.)?" This issue can indirectly reflect customers' expectations for the responsiveness of digital services. Although the question itself does not directly mention responsiveness, the extent to which customers understand digital services can affect their expectations for responsiveness. The results show that 36.54% of the customers "have a very good understanding" and 42.31% "have some understanding", which indicates that most customers have certain expectations for digital services and hope that they can respond to their demands quickly. According to Q11: "In your opinion, in what aspects can China Eastern Airlines' digital services be improved?" The customer mentioned that the "customer service response speed" needs improvement, indicating that China Eastern Airlines still has room for enhancement in terms of responsiveness. 50.96% of the customers chose this option, indicating that the customers' expectations for response speed have not been fully met.
- (3) Assurance: According to Q10: "Would you be willing to continue using China Eastern Airlines' digital services in the future?" This issue comprehensively reflects the overall satisfaction and trust of customers in China Eastern Aviation's digital services. The results show that 51.92% of the customers are "very willing" and 37.5% are "relatively willing", indicating that the majority of customers have a relatively high guarantee awareness of China Eastern Airlines' digital services. According to Q9: "Do you have a more positive view of China Eastern Aviation's image because of its digital services?" This issue directly measures customers' trust and satisfaction with digital services. The results show that 45.19% of the customers are "very positive" and 35.58% are "relatively positive", indicating that China Eastern Airlines' digital services perform well in terms of assurance, but there is still room for improvement.
- (4) Empathy : According to Q7: "Would you be more willing to choose China Eastern Airlines' flights because of its digital services?" This issue reflects customers' personalized demands

and emotional connections for digital services. The results show that 54.81% of the customers "will definitely" and 32.69% "may", indicating that the majority of customers have a strong emotional identification with China Eastern Airlines' digital services. In Q11: "In your opinion, in what aspects can China Eastern Airlines' digital services be improved?" The mention of "optimizing feedback channels" by Chinese customers indicates that they hope airlines can pay better attention to their personalized needs and feedback. 40.38% of the customers chose this option, indicating that China Eastern Airlines needs further optimization in terms of empathy.

- (5) Tangibles : According to Q8: "Do you think China Eastern Airlines' digital services make it faster for you to obtain flight information, purchase tickets faster and more convenient?" Although this issue mainly measures the efficiency of digital services, it also indirectly reflects customers' expectations for airlines' tangible facilities, such as websites and mobile applications. The results show that 60.58% of the customers think that the digital service is "very convenient", indicating that in terms of tangibility, China Eastern Airlines' digital service has met the expectations of the customers. In Q11: "In your opinion, in what aspects can China Eastern Airlines' digital services be improved?" The customer mentioned that "system stability" needs improvement, indicating that in terms of tangibility, China Eastern Airlines' digital services still have room for enhancement.

Through the above analysis, it can be seen that China Eastern Airlines performs well overall in digital services, but there is still room for improvement in terms of responsiveness, empathy and tangibility. For instance, the response speed of customer service and the stability of the system are areas where customers have given more feedback and need improvement. In the future, China Eastern Airlines can optimize in these aspects to further enhance customer satisfaction.

### **3.4 Sample selection and data processing of the questionnaire**

The subjects of this questionnaire survey are passengers who have taken flights operated by China Eastern Airlines. To ensure the wide range of data collection, an online method was adopted for collecting questionnaires for evaluation. Questionnaires with a answering time of less than 2 minutes or more than 30 minutes were excluded to ensure the validity of the data. Eventually, the number of valid questionnaires collected was 104. In terms of gender, the proportion of males in the sample was 46.15% and that of females was 53.85%, which basically conformed to the gender distribution characteristics of the customer group of China Eastern Airlines. Regarding age, the sample covers all age groups from under 18 to over 60. Among them, those aged 18-30 account for 39.42%, those aged 31-45 account for 25%, those aged 46-60 account for 31.73%, and those over 60 account for 3.85%. However, customers under the age of 18 were not covered in this

survey. This might be because the proportion of customers in this age group in China Eastern Airlines' customer base is extremely low, or this age group was not fully considered when the sample was selected. In terms of occupations, the sample covered 24.04% of students, 40.38% of office workers/enterprise managers, 14.42% of freelancers and 21.15% of retirees, basically reflecting the occupational diversity of China Eastern Airlines' customers. In terms of flight frequency, 42.31% of the customers in the sample took the flight at least once a month, 29.81% at least once a quarter, 13.46% at least once a year, and 14.42% rarely took the flight. This indicates that the sample covers customer groups with different flight frequencies. In conclusion, the sample of the questionnaire survey basically covered customer groups of different genders, ages, occupations and travel frequencies, and strict data quality control measures were taken to ensure the accuracy and reliability of the data

### **3.5 The limitations of the research methods**

Although this study adopted scientific research methods and rigorous questionnaire design, there are still some limitations. These limitations may affect the accuracy and applicability of the research results. Firstly, during the process of questionnaire design, due to the subjective factors of the designers, the expression of some questions and the setting of options may have ambiguity or guidance, thereby affecting the accuracy of the data. Secondly, there may be deviations in the sample data. Even though the stratified sampling method was adopted, the selection of samples may still have deviations. For instance, the samples are mainly concentrated in specific age groups (such as 18-30 years old and 31-45 years old) and occupational groups (such as office workers/enterprise management), which may lead to the research results not fully reflecting the true situation of all customer groups. Meanwhile, although 104 valid questionnaires were retrieved, the sample size was relatively small and the time span was short, which might not fully reflect the characteristics of the overall customer group of China Eastern Airlines. In addition, the questions in the questionnaire design lack comprehensiveness. Although the questionnaire design is based on the five dimensions of the SERVQUAL model, there may still be some key issues that have not been covered. For instance, customers' concerns about data security and privacy protection may not have been fully reflected. In view of the limitations existing in the research, we should be cautious when interpreting the research results and take corresponding measures to improve them in the subsequent research. For example, the reliability and validity of the research results can be further enhanced by increasing the sample size, enriching the sample composition, extending the research period, improving the questionnaire design and expanding the data collection channels, etc.

## 4 Case Study

This chapter introduces the background of China Eastern Airlines, its digital transformation process, and a critical analysis of its digital customer service measures through case studies. As one of the three major state-owned backbone airlines in China, China Eastern Airlines has gradually advanced its digital transformation since 2009, going through a progressive process from "process electronicization" to "information optimization" and then to "data-driven decision-making". Digital transformation has significantly enhanced customer experience and operational efficiency, but it also faces issues such as insufficient system stability, data security and privacy protection.

### 4.1 Introduction to China Eastern Airlines

China Eastern Airlines is one of the three major state-owned backbone airlines in China, with its headquarters located in Shanghai. As the world's seventh-largest airline, China Eastern Airlines has a large fleet and a wide route network, covering many important cities at home and abroad. The predecessor of China Eastern Airlines can be traced back to the first flight squadron of the Shanghai Civil Aviation Administration established in 1957. It was officially formed in 1988 and completed its reorganization and listing in 2002. It joined SkyTeam in 2011 and received its second domestically produced C919 passenger aircraft in 2023, achieving open use of "In-flight Wi-Fi" below 3,000 meters, demonstrating its technological and service innovations. In addition, its company operates nearly 640 passenger and cargo aircraft, with an average age of less than 5.5 years, making it one of the youngest fleets among global airlines. Its route network covers 177 countries and 1,062 destinations around the world. As a member of SkyTeam, frequent flyers of China Eastern Airlines' "Eastern Miles" program can enjoy membership benefits of 20 airlines within the alliance and access to 672 airport lounges worldwide.

Against the backdrop of the rapid development of information technology and the accelerated process of global economic integration, the aviation industry has encountered fierce market competition and the increasingly diverse demands of passengers. In order to enhance operational efficiency, cut costs and boost competitiveness, China Eastern Airlines has regarded information construction as a key strategy since 2009 and gradually carried out digital transformation work. The digital transformation strategy of China Eastern Airlines centers on "IT empowering business innovation". By building advanced technology platforms, optimizing business processes, and enhancing data governance levels, it helps the company transform from a traditional airline to a digital one. Its transformation goal is to leverage digital technologies to significantly enhance operational efficiency, comprehensively optimize the passenger experience, and drive the innovative upgrade of business models, thereby achieving a more competitive position in the global aviation market.

## 4.2 The digital transformation journey of China Eastern Airlines

Since 2009, the development of informatization has become one of the key strategies of China Eastern Airlines. After years of development, informatization has fully permeated all aspects of China Eastern Airlines' company management, safe operation, production and operation, etc. After undergoing the transformation from electronicization, automation, informatization to digitalization 1.0 respectively, China Eastern Airlines has established a leading position in domestic civil aviation and initially has the foundation to compete with world-class airlines, possessing comprehensive digital capabilities for the enterprise. China Eastern Airlines is promoting "innovation" as a corporate strategy, comprehensively accelerating the development of Digital 2.0, empowering business innovation through IT, and gradually moving towards intelligence. (China Civil Aviation News, 2022)

The process and practical measures of digital transformation					
Development stage	Overview	Key technologies	Main objective	Actions	Functions
Process electronicization (2010-2015)	Transform traditional offline business processes into electronic operations, reduce reliance on manual labor, and enhance basic efficiency.	Build basic IT systems: such as ticketing systems and departure systems	Reduce paper-based processes and shorten the waiting time for customers	Electronic boarding pass service ; Online check-in via APP ; Accumulate basic passenger data through the ticketing system	Enhanced customer experience ; The cost of manual counters has decreased
Information Optimization (2016-2020)	Optimize business processes and support decision-making	Enterprise resource planning; Integration of customer relationship	Strengthen data exchange; break down data silos,;	Build a data middle platform; Implement the Dynamic Pricing	Increased operational efficiency Customer stickiness has increased

	through system integration and data connection	management system.	promote cross-departmental collaboration	System (RMS); Integrate omni-channel services	
Data-driven Decision-making (2021-Present)	Utilize big data, AI and other technologies to achieve predictive analysis of customer images and personalized services.	Machine learning, Internet of Things, AI algorithms.	Shift from "post-event response" to "pre-event prediction" to create new business models.	Predictive maintenance using sensors; Apply the personalized recommendation system Strengthen intelligent scheduling by using AI algorithms	Increased operational efficiency; Customer stickiness has increased; Customer satisfaction and consumption frequency have increased

Overall, through the gradual advancement of three phases, China Eastern Airlines has achieved remarkable results in its digital transformation process. These measures have not only enhanced the company's operational efficiency and market competitiveness but also significantly optimized the travel experience of passengers. The digital transformation of China Eastern Airlines has also provided valuable experience and reference for the entire civil aviation industry, which is conducive to promoting the overall digital development process of the industry.

### 4.3 Critical Analysis on Digital Customer Service Measures

During its digital transformation, China Eastern Airlines has vigorously promoted customer service innovation, such as intelligent customer service, dynamic pricing, and personalized products. Although these measures have improved efficiency and enhanced the customer experience, there are still some issues worthy of reflection. This section will conduct a critical analysis from both positive and negative dimensions.

### 4.3.1 Positive influence

In terms of efficiency improvement and cost optimization, China Eastern Airlines has not only significantly alleviated the pressure on manual customer service through the measure of intelligent customer service, but also enhanced the standardization efficiency of services. In addition, the dynamic pricing system adjusts air ticket prices in real time by analyzing historical data and market demand, significantly increasing the revenue of routes and further optimizing revenue management and market sensitivity.

In terms of customer experience optimization, China Eastern Airlines has launched the "Weekend Unlimited Flight" product. It can precisely match customer needs based on precise customer profiling technology. This innovative product has successfully attracted price-sensitive customers and significantly enhanced user stickiness. Meanwhile, the facial recognition boarding service at Shanghai Hongqiao Airport has enabled "face-scanning customs clearance", significantly enhancing the efficiency of passenger passage, effectively reducing queuing time, and greatly improving the convenience for customers. These innovative measures not only optimized operational efficiency but also provided customers with a more efficient and convenient travel experience, fully demonstrating the active exploration and practical achievements of China Eastern Airlines in digital transformation.

### 4.3.2 Negative influence

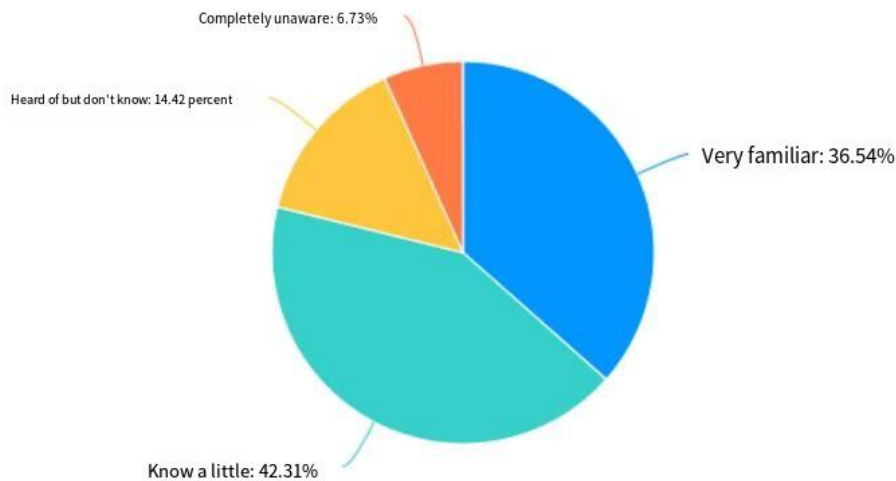
Although China Eastern Airlines has achieved certain results in the process of digital transformation, it still faces some limitations and challenges in practice. For instance, in terms of data technology, although AI customer service can efficiently handle standardized issues, it still requires human intervention for complex complaints. Moreover, some elderly passengers are not familiar with digital interaction, which can easily lead to service gaps. In terms of privacy and data security, the application of facial recognition technology is particularly prone to controversy. For instance, in 2021, due to a vulnerability in a third-party system, the biometric information of some customers was leaked, raising concerns among some passengers about personal privacy and security. Meanwhile, some passengers are resistant to contactless services, believing that excessive data collection may be abused.

These issues indicate that the digital transformation of China Eastern Airlines requires not only enhancing the application of technology but also further optimizing service scenarios and strengthening data integration, while balancing the relationship between convenience and privacy protection.

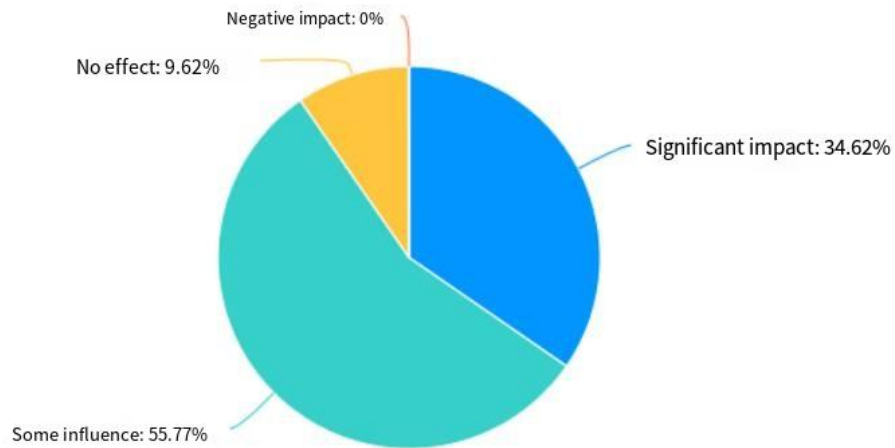
## 5 Analysis and conclusion of Questionnaire results

This chapter analyzes the results of the questionnaire survey, summarizes the current situation of customer satisfaction and loyalty, as well as the problems and challenges existing in the digital services of China Eastern Airlines. Research has found that the digital services of China Eastern Airlines have achieved remarkable results in enhancing customer satisfaction and loyalty. Customers have a high awareness of its digital services and have a more positive view of its brand image. However, customer feedback has also revealed problems in aspects such as system stability, functional optimization, customer service response speed, interface design, data security and privacy protection, as well as feedback channels.

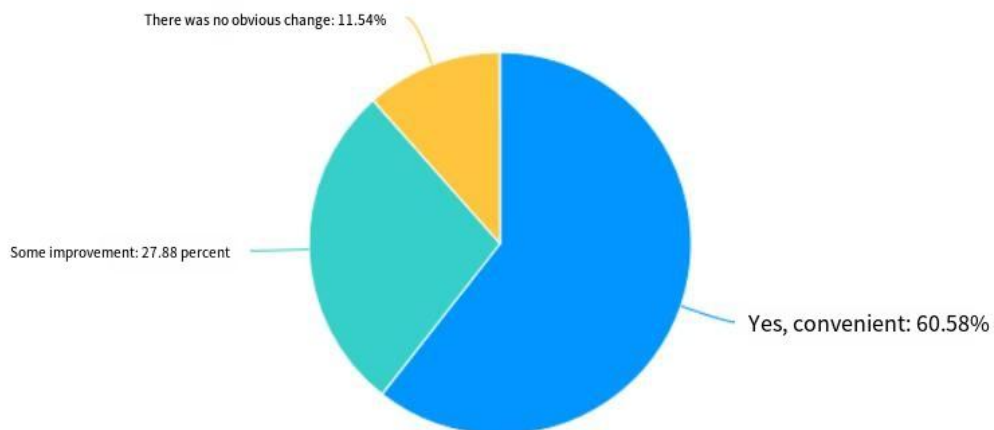
### 5.1 Increase in customer satisfaction



- (1) The awareness of digital services is relatively high: According to question 5 (Do you know about China Eastern Airlines' digital services, such as mobile applications, online service platforms, and intelligent customer service, etc.?) As a result, 36.54% of the customers indicated that they "have a very good understanding" of China Eastern Airlines' digital services, and 42.31% said they "have some understanding". This indicates that China Eastern Airlines has achieved certain results in promoting digital services, and the majority of customers have a relatively high level of awareness of digital services.



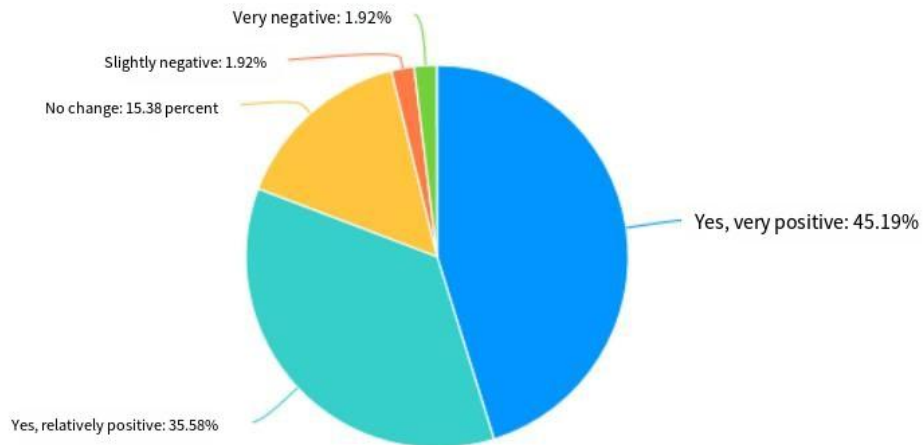
- (2) The impact of digital services on customer choices is obvious: Question 6 (How do you think digital customer service has influenced your choice of China Eastern Airlines?) It shows that 34.62% of the customers believe that digital customer service has a "significant impact" on their choice of China Eastern Airlines, and 55.77% of the customers think it has a "certain impact". This indicates that digital services have become an important factor for customers to choose China Eastern Airlines.



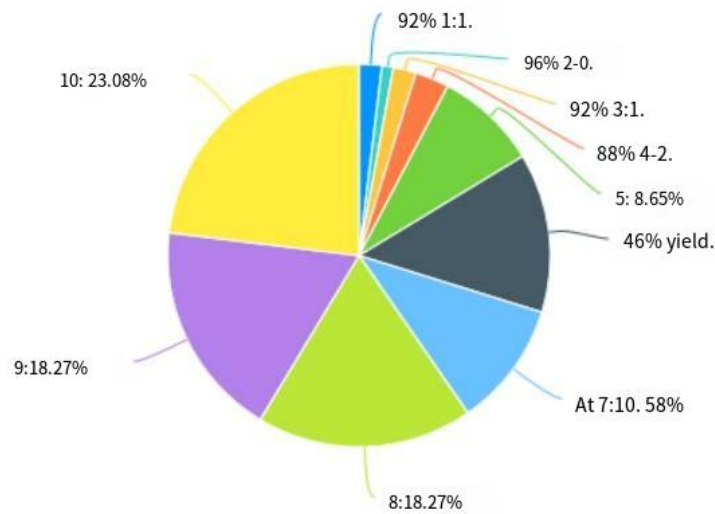
- (3) Customers have a high recognition of the convenience of digital services: Question 8 (Do you think that the digital services of China Eastern Airlines enable you to obtain flight information faster, purchase tickets faster and more conveniently?) The data shows that 60.58% of the customers think that the digital services of China Eastern Airlines are "yes, very convenient", and 27.88% of the customers believe that "there has been a certain improvement". This

indicates that the digital services of China Eastern Airlines have indeed brought convenience to customers in terms of obtaining flight information and purchasing tickets.

## 5.2 Improvement of customer loyalty



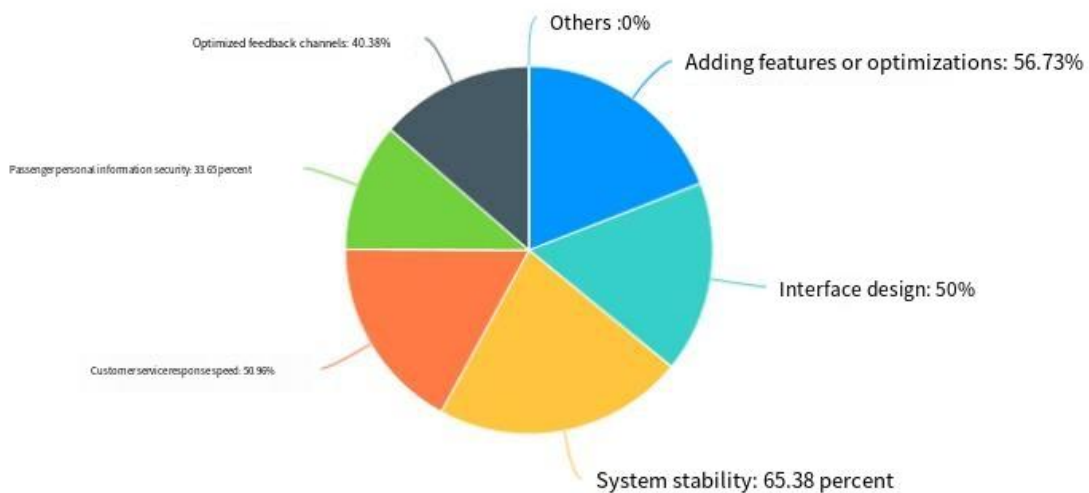
- (1) Digital services have significantly enhanced the brand image of China Eastern Airlines: According to question 9 (Do you have a more positive view of China Eastern Airlines' image because of its digital services?) According to the survey results, 45.19% of the customers formed a "very positive" view of the brand image of China Eastern Airlines due to its digital services, and another 35.58% of the customers said it was "relatively positive". This fully demonstrates that digital services have played a crucial role in enhancing customers' positive perception of the China Eastern Airlines brand. In addition, the majority of customers have given China Eastern Airlines a more positive evaluation of its image due to digital services. This not only indicates that digital services have greatly optimized the customer experience but also further strengthened the brand image of China Eastern Airlines.



(2) High customer recommendation willingness: Question 12 (How likely are you to recommend China Eastern Airlines to your friends or colleagues?) The data shows that 23.08% of the customers said they were "very willing" to recommend China Eastern Airlines to their friends or colleagues, and 18.27% said they were "relatively willing". This indicates that a relatively high level of customer satisfaction has translated into a certain degree of customer loyalty and willingness to recommend.

### 5.3 Existing problems and challenges

Although the digital service practices of China Eastern Airlines have achieved remarkable results, the results of the questionnaire survey also reveal some areas that need improvement.



- (1) System stability is the main issue: According to Question 11 (In your opinion, in what aspects can China Eastern Airlines' digital services be improved?) As a result, 65.38% of the customers believe that the digital services of China Eastern Airlines need to be improved in terms of "system stability", which indicates that system stability is one of the most concerned issues for customers.
- (2) Functional optimization requirements: 56.73% of the customers believe that it is necessary to "add functions or optimize", which indicates that there is still room for improvement in the richness and practicality of the digital services of China Eastern Airlines.
- (3) The response speed of customer service needs to be improved: 50.96% of customers believe that the "response speed of customer service" needs to be enhanced, which indicates that customers have high expectations for rapid response, but the current response speed may not fully meet their demands.
- (4) Interface design needs optimization: 50% of the customers believe that the "interface design" needs to be optimized, which indicates that there is still room for improvement in the friendliness and ease of use of the user interface for China Eastern Airlines' digital services.
- (5) High attention is paid to data security and privacy protection: 33.65% of customers believe that the "passenger personal information security" needs to be improved, which indicates that customers are very concerned about data security and privacy protection. China Eastern Airlines needs to strengthen measures in these aspects to enhance customer trust
- (6) Feedback channels need to be optimized: 40.38% of the customers believe that "feedback channels need to be optimized", which indicates that customers hope for more and more convenient feedback channels to better express their opinions and suggestions.

## **6 Suggestions for improving customer service of China Eastern Airlines**

This chapter puts forward specific improvement suggestions for the problems found in the previous analysis. The first one is to suggest that China Eastern Airlines promote technological optimization to enhance system stability and functional richness. The second one is to strengthen data security management to ensure the security and privacy of customer information. The third one is to strengthen staff training to enhance their proficiency in digital tools and service awareness. The fourth is to optimize the customer feedback mechanism and establish an efficient customer feedback processing procedure to enhance customer interaction and increase their sense of participation and loyalty.

### **6.1 Promote technological optimization**

To promote technological optimization, China Eastern Airlines can start from two aspects: enhancing system stability and optimizing functional design. In response to the system stability issues reported by customers, the company can increase technological investment, optimize server performance to enhance the system's carrying capacity and stability. At the same time, regular system maintenance and upgrades should be carried out to reduce system failures and lag, ensuring that customers can enjoy a smooth experience when using digital services. In addition, the company can also add and optimize digital service functions based on customer needs. For instance, it can further improve the flight inquiry, reservation, check-in and other functions of the mobile application, provide more personalized service options such as seat reservation and pre-selected luggage check-in, and simplify the operation process to enhance the ease of use and convenience of the functions.

### **6.2 Strengthen the security management and safeguard measures for customer data**

To ensure the security of customer data, China Eastern Airlines can enhance data security protection and improve privacy policies. Firstly, China Eastern Airlines can improve its data security management system, enhance the security of customer data during the collection, storage and transmission processes, and conduct regular data security audits and vulnerability scans to promptly identify and fix potential security risks. Then, when providing digital services, China Eastern Airlines clearly informs customers of the scope and purpose of data usage to ensure their right to know and control their personal information. At the same time, it strengthens data security training for employees and enhances their awareness of privacy protection to prevent data leakage caused by improper internal operations. Through the above measures, China Eastern Airlines can effectively enhance the security level of customer data and increase customers' trust in its digital services.

### **6.3 Strengthen staff training and development**

The service level of employees usually has a significant impact on the customer experience. High-level service can enhance the customer experience. Therefore, strengthening the professional capabilities and service levels of employees in digital services can effectively improve the digital service level of airlines. China Eastern Airlines can regularly organize its employees to participate in digital skills training, enabling them to master the operation methods of digital tools and service platforms proficiently. It can also regularly carry out training courses and practical exercises, thereby enhancing the professionalism and efficiency of employees when dealing with digital service issues. Not only that, strengthening employees' service awareness can enable them to demonstrate greater enthusiasm and sense of responsibility in the process of interacting with customers. Through training and assessment mechanisms, employees are encouraged to proactively provide high-quality services to customers, thereby enhancing customer satisfaction.

### **6.4 Optimize the channels and mechanisms for customer experience feedback**

Customer feedback is an important reference approach for airlines to improve customer service. In order to better collect and handle customer feedback, China Eastern Airlines can start from two aspects: expanding feedback channels and establishing a rapid response mechanism. In terms of expanding diverse feedback channels, the instant feedback function can be added in the mobile application, and customer opinions can be collected through social media platforms to facilitate customers to put forward suggestions and complaints anytime and anywhere. In terms of the customer feedback handling mechanism, an online optimization approach for the customer service AI assistant can be adopted to ensure that customers' opinions and suggestions can be responded to and handled promptly. In addition, a dedicated customer service team can be set up offline to follow up on customer feedback and regularly inform customers of the progress and results of handling, thereby enhancing customers' sense of participation and trust.

## 7 Summary

This study takes the innovative practice of customer service of China Eastern Airlines in its digital transformation as the research object. Through the stage model theory, it analyzes its digital transformation process and investigates and evaluates the satisfaction of digital customers based on the SERVQUAL model. The aim is to summarize the achievements and deficiencies of China Eastern Airlines' digital transformation and put forward targeted improvement suggestions. With the aim of providing references and lessons for the digital transformation of the aviation industry.

Through the review of the digital transformation process of China Eastern Airlines, the research finds that it has gone through a progressive process from "process electronicization" to "information optimization", and then to "data-driven decision-making". During this process, China Eastern Airlines has implemented a series of innovative measures in customer service, such as intelligent customer service, dynamic pricing, and personalized products, significantly enhancing the customer experience and operational efficiency. The research also revealed the challenges faced by China Eastern Airlines during its digital transformation, including insufficient system stability, the need for functional optimization, slow customer service response speed, unfriendly interface design, data security and privacy protection issues, as well as unsmooth feedback channels.

In response to the above problems, this study puts forward the following improvement suggestions: First, promote technological optimization to enhance the stability and functional richness of the system; Second, strengthen data security management to ensure the security and privacy of customer information. Third, strengthen employee training to enhance their proficiency in digital tools and service awareness. Fourth, optimize the customer feedback mechanism and establish an efficient customer feedback processing procedure to enhance customer interaction and increase their sense of participation and loyalty.

In summary, the digital transformation of China Eastern Airlines has achieved remarkable results in enhancing customer satisfaction and loyalty. However, continuous improvements are still needed in areas such as technological optimization, data security, and customer experience. In the future, with the continuous development of digital technology, the digital transformation of the aviation industry will become more in-depth. China Eastern Airlines needs to improve the quality of customer service while paying attention to the protection of customer privacy and data security to achieve sustainable development. This research not only provides a reference basis for China Eastern Airlines to optimize customer service, but also offers a practical guide for the digital transformation of other aviation enterprises or similar industries, which has significant theoretical and practical significance.

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## Appendices

### Appendix 1. Questionnaire

1. What is your gender?

Male  Female

2. How old are you?

Under the age of 18  18-30 years old  Aged 31 to 45  Aged 46 to 60  Over 60 years old

3. What's your occupation?

Student  Office workers/enterprise management  Freelancer  Others (please indicate)

Retired personnel

4. How often do you take Eastern flights?

At least once a month  At least once every quarter  At least once a year

Seldom take a ride

5. Do you know about the digital services of China Eastern Airlines (such as mobile applications, online service platforms and intelligent customer service, etc.)

Understand very well  Know something

I've heard of it but don't understand it  Have no idea at all

6. How do you think digital customer service has influenced your choice of China Eastern Airlines?

Have a great influence  Have a certain influence  No influence  Have a negative impact

7. Would you be more willing to choose flights of China Eastern Airlines because of its digital services?

Surely  Maybe  Uncertain  will  No.

8. Do you think the digital services of China Eastern Airlines enable you to obtain flight information faster, purchase tickets more quickly and conveniently?

Yes, it's very convenient  There has been certain improvement  There is no obvious change

9. Do you have a more positive view of the image of China Eastern Airlines because of its digital services?

Yes, very positive Yes, it's quite positive No change Slightly negative Very negative

10. Would you like to continue using the digital services of China Eastern Airlines in the future?

Very willing More willing Uncertain Not very willing Very reluctant

11. In your opinion, in what aspects can China Eastern Airlines' digital services be improved?

Add functions or optimize Interface design System stability

Customer service response speed Passenger personal information security

Optimize the feedback channel

12. How likely are you to recommend China Eastern Airlines to your friends or colleagues?

(1 to 10 points, from low to high)