



**Customer experience bottlenecks in the customer journey for  
airline customers with disabilities: Recommendations and  
implications**

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## Abstract

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<p>According to the statistical report released by the World Health Organization, there has been a constant increase in the global population of disabled individuals, currently accounting for approximately one-sixth of the world's total population. The challenges faced by disabled passengers during air travel have emerged as a significant concern within the aviation industry. In order to assist airlines in enhancing the customer experience for disabled passengers and ensuring their comfort and dignity throughout their journey, this paper aims to address various barriers that different types of disabled passengers may encounter. By employing a mixed research method that combines qualitative and quantitative approaches, researchers will conduct an in-depth questionnaire survey to thoroughly investigate the customer journey of disabled passengers. After conducting a validity test on the questionnaire, the researchers conducted an analysis of the obtained results and identified that the bottlenecks in the customer journey of disabled passengers primarily stemmed from challenges related to accessing information about wheelchair facilities' availability and difficulties encountered during disability services application. Furthermore, it was observed that different types of disabled passengers faced distinct problems. Based on an examination of satisfaction survey outcomes among disabled passengers, this study proposes solutions in three key areas: digitizing disability services, upgrading disability equipment, and establishing a reasonable supervision mechanism to address all issues highlighted in the questionnaire survey. The objective of this paper is to provide practical recommendations for enhancing airlines' customer experience for disabled passengers and facilitating sustainable development within the aviation industry.</p>
<b>Key words</b> customer journey, customer experience, accessible air travel, inclusive air travel, airline

## Table of contents

1	Introduction .....	1
1.1	Research problem, purpose, and objectives .....	1
1.2	Thesis structure .....	2
2	Background .....	4
2.1	Travel of Disabled Passengers .....	4
2.2	Different Stages of Disabled Customers' Travel in Airlines .....	5
3	Theoretical framework .....	8
3.1	Customer Experience (CX) and customer journey .....	8
3.2	Scope and Classification of Disabled Passengers .....	9
3.3	Four tier Framework Analysis of Barriers Faced by Disabled Passengers in Travel .....	11
3.4	Functional requirements for accessible air travel .....	12
3.5	Regulations on Disabled Passengers' Travel .....	14
4	Research Methods .....	16
4.1	Literature Review Method .....	16
4.2	Questionnaire Method .....	17
4.2.1	Principles of Questionnaire Design .....	18
4.2.2	Questionnaire Design .....	18
4.2.3	Method of Questionnaire Satisfaction Scoring .....	22
4.2.4	Questionnaire reliability and validity analysis .....	23
4.3	Case Study Research .....	27
5	Results .....	30
5.1	Quantitative Analysis Results .....	30
5.2	Qualitative Analysis Results .....	36
5.2.1	People with reduced mobility .....	36
5.2.2	People who are deaf or hard of hearing .....	38
5.2.3	People who are blind or have low vision .....	38
6	Discussion .....	40
6.1	Digitalization of Accessible Services for Airlines .....	41
6.1.1	The retrieval of information with a single click .....	41
6.1.2	One-click access to barrier-free services .....	42
6.1.3	Information Tracking Reminders and Analysis .....	43
6.2	Updating of Accessible Equipment .....	44
6.2.1	Upgrading Accessible Boarding and Disembarking Equipment .....	44
6.2.2	Accessible In-Flight Equipment .....	45
6.2.3	Accessible In-Flight Entertainment .....	46

6.3	Establish a robust oversight mechanism for ensuring accessibility services in enterprises	46
6.4	Closing words .....	47
Sources	.....	49
Appendices	.....	52
Appendix 1.	Disability Passenger Satisfaction Survey in the Airline Customer Journey Map ....	52

# 1 Introduction

According to the statistics report from the World Health Organization, there has been a global increase in the number of individuals with disabilities. The mobility challenges faced by people with disabilities have become a significant social concern. When disabled persons are unable to travel normally, it not only contradicts the International Civil Aviation Organization's promotion of air travel for all as a means of enjoying dignity but also poses a major obstacle to their courage in facing new life experiences. To enhance inclusivity within the aviation industry and ensure that sustainable development goals are met while enabling everyone to enjoy convenient and equal access to air travel, improving customer experience for airline passengers with disabilities during their journey is an urgent issue that requires attention. This paper focuses on airlines' social responsibility towards sustainable development and highlights how research standards can be used to improve customer experience for those with reduced mobility or disability. By identifying bottlenecks encountered by these customers during their airline journeys, analysing reasons behind such obstacles, and providing professional improvement suggestions, we can promote barrier-free development within the aviation service industry and work together towards building a happy and equitable future where comfortable and free travel is accessible to all.

## 1.1 Research problem, purpose, and objectives

The core objective of this study is to gain a deeper understanding of the experiences of disabled passengers in the airline customer journey. Since the adoption of the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD) in 2006, the level of awareness and policy actions surrounding the rights of persons with disability has significantly and positively increased. However, barriers limiting the ability of elderly and disabled persons to take full advantage of international air transportation services remain. (IATA 2021a) In order to promote the sustainable development of the aviation industry and ensure equal and accessible air travel experiences for all individuals, this study specifically examines the bottlenecks in customer experience faced by passengers with disabilities within the airline sector.

The purpose of this study is to investigate the distinct requirements and obstacles faced by passengers with disabilities during their journey, and propose viable solutions to address these issues. Through thorough analysis of pertinent customer feedback and acquisition of new knowledge, our objective is to offer tailored recommendations to airlines for enhancing the travel experience of disabled passengers. These recommendations may encompass enhancements to existing services and processes, as well as innovative measures aimed at ensuring that airlines continue to foster socially responsible and inclusive services.

Through an analysis of the experiences encountered by disabled passengers throughout their customer journey with an airline, this paper aims to investigate the following inquiries: 1. What are the prevalent challenges faced by disabled passengers during their customer journey with an airline? 2. What specific travel or experiential difficulties do different categories of disabled passengers encounter? 3. How can airlines enhance their services to meet the needs of disabled passengers and improve overall customer experience for sustainable development?

## 1.2 Thesis structure

This thesis aims to provide a comprehensive understanding of the challenges, barriers, and expectations faced by disabled passengers during air travel through an extensive study utilizing a combination of literature review, questionnaire survey, and case study methods. The thesis is structured into six chapters. Chapter 1 and Chapter 2 focus on the research objectives, structure, and background. Chapter 3 presents a theoretical framework that enhances the originality of the content. Chapter 4 describes the research methodology in detail. The questionnaire survey method collects direct feedback from disabled passengers by adhering to meticulous design principles including questionnaire design, satisfaction scoring methods, as well as reliability and validity analysis. Case analysis further deepens our comprehension of specific barriers encountered by disabled passengers. In Chapter 5, the research findings are presented which reveal the primary issues faced by disabled passengers. Finally, in Chapter 6 an analysis of these research results is conducted along with proposed improvement measures aimed at assisting airlines in enhancing service quality while creating a more equitable, comfortable, and respectful travel experience for disabled passengers.

The Overlay matrix is a good reflection of the structure of this paper Table 1.

Investigative questions	Theoretical framework (chapters)	Results (chapters)	Questionnaire questions
Accessible booking stage for the Customer Experience of Disabled Passengers	3. 1 3. 3 3. 4 3. 5	5. 1	4-7

Check-in stage for the Customer Experience of Disabled Passengers	3. 1 3. 3 3. 4 3. 5	5. 1	8-12
Boarding and deplaning stage for the Customer Experience of Disabled Passengers	3. 1 3. 3 3. 4 3. 5	5. 1	13-18
In-flight service stage for the Customer Experience of Disabled Passengers	3. 1 3. 3 3. 4 3. 5	5. 1	19-24
Baggage claim and transfer stage for the Customer Experience of Disabled Passengers	3. 1 3. 3 3. 4 3. 5	5. 1	25-28
Passenger Feedback stage for the Customer Experience of Disabled Passengers	3. 1 3. 3 3. 4 3. 5	5. 1	29-32

Table 1. Overlay matrix (adapted from Peltonen 2017, 3)

## 2 Background

The aviation industry, as a crucial service sector catering to global passengers, bears the vital responsibility of connecting diverse countries and regions. With the continuous development and progress of society, airlines have gradually recognized that the needs and rights of disabled passengers are increasingly prominent. Disabled passengers encounter numerous difficulties and challenges during air travel, including issues related to flight bookings, airport accessibility, and safe boarding procedures. The absence of relevant services and support may adversely impact their travel experience and even hinder them from completing their journey seamlessly. Therefore, exploring and resolving how airlines can better meet the needs of disabled passengers while enhancing service quality and user experience has become an urgent issue in current research and practice.

### 2.1 Travel of Disabled Passengers

According to the World Health Organization (WHO), an estimated 1.3 billion individuals are affected by severe disabilities, accounting for approximately one in six or 16% of the global population. Persons with disabilities encounter fifteen times more challenges when it comes to inaccessible and unaffordable transportation compared to those without disabilities (IATA 2023c). The number of disabled travellers continues to rise annually, exemplified by a 30% increase in wheelchair requests from about 15 million in 2016 to around 19.5 million in 2017 (IATA Wheelchair Initiative Report). Given the growing demand for travel among disabled individuals, enhancing their travel experience not only contributes to sustainable development but also fosters business growth (IATA 2022b).

Since the adoption of the UN Convention on the Rights of Persons with Disabilities in 2006, 185 countries and territories have ratified the Convention, effectively advancing the well-being of individuals with disabilities. The implementation of the 2030 Agenda for Sustainable Development and other international development frameworks has also significantly contributed to empowering persons with disabilities, fostering an inclusive and accessible world. To ensure a cohesive and coordinated aviation policy that delivers high-quality services, IATA urges the International Civil Aviation Organization (ICAO) and its member states to develop comprehensive strategic plans encompassing appropriate inter-country coordination mechanisms. These plans will serve as a foundation for sustainable and transformative change across all facets of aviation. Establishing a unified system of standards and accountability will facilitate airlines, airports, and other stakeholders in enhancing their services while achieving their objectives.



Ensuring accessibility in aviation remains a formidable challenge, as it entails high costs for airlines. However, income inequality is often directly linked to disability, resulting in atypical travel purchasing patterns within the industry. Moreover, the air transport sector has been significantly impacted by both the ongoing pandemic and the conflict in Ukraine, leading to disruptions in service levels and subsequent repercussions for special assistance. As the air commerce gradually recovers post-pandemic, efforts are being made by the industry to restore service levels; however, it has yet to fully meet the growing demand. This shortfall can prove detrimental for disabled travelers who heavily rely on accessible services. According to data from the U. S. Department of Transportation (DOT), American Airlines alone mishandled over 800 wheelchairs during this period – equating to nearly 1.5 damaged chairs per every 100 flights conducted by them. Additionally, DOT received a total of 1,394 complaints related to disabilities from airline passengers. (DOT 2023)

The right to barrier-free air travel is sometimes denied to individuals with disabilities due to the financial burden of making accessibility modifications. Barriers for passengers with disabilities encompass not only physical obstacles, but also non-physical barriers such as limited access to information, communication challenges, and insufficient understanding of their needs by service personnel. Despite the implementation of laws and regulations by international organizations and certain governments to safeguard the travel rights of persons with disabilities, airlines still encounter numerous hurdles in effectively implementing these regulations, thereby impacting the quality of service provided. Enhancing the accessibility of air travel necessitates collaborative efforts among governments, airports, airlines, and other stakeholders in order to pursue improvements and provide support that enables individuals with disabilities to lead fulfilling lives.

## **2.2 Different Stages of Disabled Customers' Travel in Airlines**

In general, airlines bear the responsibility of providing or ensuring the provision of appropriate services for disabled passengers at airports, encompassing wheelchairs and assistance services among others. These services encompass the entire journey from curbside or terminal entrance to boarding gates, between connecting flights, and from arrival gates to terminal exits. Airlines must also ensure that disabled passengers have access to key areas within terminals such as ticket counters and baggage claim, while offering necessary assistance with restroom facilities. If a passenger is unable to handle their own luggage due to disability, the airline should assist in transporting checked or carry-on bags and provide adequate support for service animals. These arrangements are designed to guarantee comfortable and seamless travel experiences for disabled passengers, affording them equal rights and conveniences as other travelers. (GAO 2021,9-11)

Disabled passengers can request assistance at any time. When a disabled passenger requests assistance, the airline must promptly contact relevant staff or ground service providers to ensure a seamless journey for the disabled passenger. However, due to the pandemic's impact on airline revenue since 2000, most airlines have chosen to outsource ground aviation services to private contractors in order to manage costs effectively. The special service request code required by disabled passengers can be added at various stages of their journey, such as during booking or by airline staff or ground service agents. Upon arrival at the airport, passengers are responsible for notifying airline staff that they have arrived and require assistance. To facilitate travel for disabled passengers and enhance their overall service experience, certain airports and airlines have designated seating areas where passengers can wait for the necessary services. (GAO 2021,9-11)

The airline customer journey diagram encompasses the following key stages, which also serve as the focal points of this paper. By analyzing and studying these stages, we aim to ensure that disabled passengers can enjoy a convenient, comfortable, and respectful travel experience. This analysis identifies existing issues and provides suggestions to achieve the goal of enabling disabled passengers to have a comfortable, unrestricted, and barrier-free travel experience.

**Booking a flight:** When making a flight reservation, passengers with disabilities may require specific seating arrangements or other specialized services, such as wheelchair accessibility and special dietary requirements. Passengers with disabilities should adhere to the reporting procedures of different airlines and inform them about their specific needs. It is crucial for customer service personnel to have a comprehensive understanding of the requirements of passengers with disabilities in order to make appropriate accommodations.

**Check-in service** offers comprehensive accessibility and assistance for passengers with disabilities, ensuring smooth arrival to check-in. This includes wheelchair transportation, dedicated ticket counters, support with checked baggage, priority access to security check lanes, and more.

The airlines are obligated to provide boarding and disembarkation assistance for passengers with disabilities, including the provision of landing chairs, specialized ramps, and other facilities and services to ensure their safe and convenient access to and from the aircraft.

**In-flight services:** Passengers with disabilities may require specialized seating arrangements, safety briefings, or other tailored services while on board the aircraft. The cabin crew should be knowledgeable about and accommodate their specific needs, including arranging appropriate storage space and providing assistance with utilizing in-flight facilities. In case of an emergency situation, the cabin crew should promptly offer assistance to passengers with disabilities.

Baggage claim and transfer services: Airline personnel ensure seamless baggage retrieval for passengers with disabilities, while also providing comprehensive guidance and assistance during flight transfers.

Feedback: Airlines should actively solicit feedback from passengers with disabilities and proactively implement customer suggestions to enhance the service experience.

### **3 Theoretical framework**

A multi-dimensional theoretical framework is employed in this study to investigate the customer experience bottleneck faced by airline passengers with disabilities during their journeys and its impact on customer satisfaction. The theoretical framework encompasses not only the customer journey and customer experience, but also the scope and classification of disabled passengers, as well as the four-layer classification of barriers faced by disabled passengers and the conditions for inclusive travel. These elements enable researchers to identify potential barriers at each stage of an airline's disabled passenger customer experience, providing comprehensive and authoritative recommendations for improvement.

The aim of this comprehensive theoretical framework is to provide a holistic perspective for analysing and identifying potential bottlenecks that disabled customers may encounter during their travels, while exploring the influence of these issues on their overall travel experience.

#### **3.1 Customer Experience (CX) and customer journey**

This research focuses on the experiential bottlenecks encountered by disabled customers of airlines during their travel journey, examining how these bottlenecks impact customer satisfaction and proposing relevant improvements.

the theory of Accessible Tourism offers a perspective on how to create an accessible, inclusive tourism environment (Simon&Tracey 2009,32-44). This theory stresses the importance of removing physical, informational, and attitudinal barriers, aiming to provide equal travel opportunities and experiences for everyone, including individuals with disabilities.

Jagdish, Varsha and Anupama (2023) followed the mental models of the practitioners to develop a framework for customer-centric support experience across the customer journey. The airline industry can enhance the customer experience for disabled passengers by providing comprehensive support throughout their entire journey and establishing customer focus groups to understand the expectations of disabled passengers regarding accessible support services. Inclusion of continuous improvement in accessible services for disabled customers should be a strategic consideration for enterprises. When formulating enterprise strategies, it is important to take into account the complete customer journey in order to optimize the overall experience for disabled passengers. By continuously refining support service processes based on customer data and insights, airlines can adopt a customer-centric approach. For instance, offering diverse and thoughtful support services will make this specific group of customers feel valued and result in an enhanced overall customer experience.

Moreover, the Customer Journey Theory (Lemon & Verhoef 2016,69-96) provides a framework for analysing the entire customer journey, from booking flights to the flying experience, and onwards to after-service. Each step has the potential to be a bottleneck affecting the experience of disabled customers. By mapping and analysing each touchpoint of the customer journey, we can more specifically identify and understand the challenges faced by disabled customers.

In fact, according to the study conducted by Elphine, Poja, Anders, and Line (2024), it was found that prior overall satisfaction significantly influences future intentions, thereby confirming this assertion. Within the customer journey context, airlines should consistently prioritize customer needs as their core focus in order to enhance service quality. This approach is instrumental in fostering long-term satisfaction and cultivating stronger customer loyalty. Consequently, it becomes imperative for airlines to enhance their development by improving the travel experience of customers with disabilities

By integrating these three theoretical perspectives, this study aims to construct a comprehensive framework to identify the experiential bottlenecks in airlines' service for disabled customers and propose effective improvement suggestions based on this. This theoretical framework not only offers a solid theoretical basis for the research but also provides clear guidance for practice, with the goal of enhancing the travel experience of disabled customers, thereby improving their satisfaction and loyalty.

### **3.2 Scope and Classification of Disabled Passengers**

The article adopts the definition of Part I of the Convention on the Rights of Persons with Disabilities, which is widely recognized worldwide and has participation from approximately 185 countries and regions, as there is no universally accurate definition for disabled passengers. Persons with disabilities include those who have long-term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others. The purpose of the Convention is to promote, protect and ensure the full and equal enjoyment of all human rights and fundamental freedoms by all persons with disabilities, and to promote respect for their inherent dignity. The Treaty not only defines the term, but also confirms the idea that all persons with disabilities should enjoy all rights and freedoms fully and equally. (UN 2012)

The ACAA's implementing regulations define an individual with a disability as any individual who has a physical or mental impairment that, on a permanent or temporary basis, substantially limits one or more major life activities, has a record of such an impairment, or is regarded as having such an impairment. (GAO 2021,9-11)

Within the European Union (EU), the Regulation No 1107/2006 of the European Commission (2006, 3) states a PRM passenger similarly as: any person whose mobility when using transport is reduced due to any physical disability (sensory or locomotor, permanent or temporary), intellectual disability or impairment, or any other cause of disability, or age, and whose situation needs appropriate attention and the adaptation to his or her particular needs of the service made available to all passengers.

Passengers with disabilities have similar content to PRM passenger. The scope of disabled passengers, however, extends beyond that of PRM passengers. IATA (2023a,7) provides clear definitions for the various categories of passengers with disabilities. Passengers with disabilities include, but is not limited to, passengers with the following types of disabilities and temporary or permanent conditions: 1. People with reduced mobility (PRM). 2. People who are blind or have low vision. 3. People who are deaf or hard of hearing. 4. People with speech disabilities. 5. People with intellectual and developmental disabilities. 6. People with cognitive disabilities, including people with mental health conditions. 7. People with an illness and are authorized to travel by medical authorities, but whose mobility is impaired due to pathology in progress; and people unable to stand or walk due to injury.

The airline industry usually uses different codes to distinguish between them to facilitate communication. To determine the necessary support level and the type of assistive technology needed for a Passenger with Reduced Mobility (PRM), the International Air Transport Association (IATA) has established a standard recommendation for all airlines and airport operators to utilize Special Service Requirement (SSR) codes. These codes facilitate the acceptance and transport of passengers requiring special assistance. As illustrated in Figures 7 and 8, SSR codes are categorized by physical and intellectual disabilities. Additionally, medical cases are assigned specific descriptive codes. These codes do a good job of separating passengers with disabilities into different types and conveying this information in a concise way.

The impact of invisible disabilities cannot be disregarded, particularly for individuals with conditions that are inconspicuous such as deafness, autism, or dementia, who encounter notably challenging circumstances. These imperceptible disabilities often go unnoticed, misunderstood, misjudged, and unfairly assessed due to their lack of visibility. The global comprehension of these hidden impairments and the specific assistance they necessitate at airports and during flights remains considerably limited. Nevertheless, certain airlines and airports have already implemented effective measures encompassing the provision of comprehensive pretravel information, heightened awareness education within airport premises, requisite support from airlines in appropriate domains, direct assistance throughout the flight duration, as well as auxiliary services in case of

unforeseen disruptions. These measures play a pivotal role in raising awareness among passengers with invisible disabilities and enhancing their travel experience. (IATA 2023b. 1)

### **3.3 Four tier Framework Analysis of Barriers Faced by Disabled Passengers in Travel**

Many researchers in the aviation industry have examined disabled passengers as a homogeneous group; however, it is important to note that different types of disabilities present distinct challenges. To comprehensively analyze the barriers encountered by disabled passengers throughout their aviation customer journey, this study employs a four-layer framework. The framework can be broadly categorized into three sections. The proposed framework initiates by comprehensively examining the challenges encountered by passengers, subsequently identifying the shared limitations faced by individuals with disabilities, irrespective of the severity. It then concentrates on specific disability types and associated barriers before ultimately delineating the particular travel difficulties that disabled passengers may encounter. This stratified and interactive approach facilitates a layered analysis of problems, enabling the authors to accomplish their objective of problem identification at various levels. (McKercher&Darcy 2018) Through careful analysis, researchers can fully examine the barriers that disabled passengers of all types may face.

Tier 1: Barriers faced by all tourists. (McKercher&Darcy 2018) The challenges encountered by air travelers in this section encompass internal barriers to travel, interpersonal communication obstacles, and structural constraints. Among these challenges, disabled passengers often face the most difficulties due to their inherent desire to travel, limited personnel support, and the associated costs. Although these factors significantly impact disabled passengers' air travel experiences, they are not the primary focus of this article. Instead, this study primarily examines barriers concentrated within the latter three layers.

Tier 2: Issues faced by all people with disabilities. The second tier of constraints relates to issues that are common to them as a collective, regardless of the disability. The literature identifies five broad categories, including: ignorance; attitude; trustworthiness of information; issues related to the tourism industry itself, and; the person. (McKercher&Darcy 2018)<sup>1</sup>. Ignorance and negative attitudes towards disabled passengers in the airline customer journey are pervasive, as the lack of awareness among regular passengers about the challenges faced by others leads to attitudinal issues. However, ignorance also exists within airlines' service, where even professionally trained staff may not fully understand the needs of disabled passengers. The problems arising from inadequate staff training stem from a broader industry-wide lack of understanding. One major challenge for disabled travelers is obtaining reliable information during booking to ensure smooth

travel arrangements - this issue affects not just one or a few individuals but rather the entire community of disabled passengers.

Tier 3: Issues unique to specific disabilities. (McKercher&Darcy 2018) 1. This layer necessitates an analysis of the diverse challenges encountered by individuals with disabilities across various categories. For passengers with mobility impairments, crucial concerns include the provision of timely assistance by ground service agents during boarding at the airport, the boarding process itself, transferring to a wheelchair on the plane, and ensuring safe transportation of wheelchairs. In terms of visually impaired passengers, voice navigation and comprehensive guidance from ground service personnel in navigating an unseen environment are highly significant. Timely and accurate textual prompts, along with human assistance, are crucial for deaf passengers. For passengers who are unable to travel due to illness, timely and professional support from airport staff can enhance the accessibility of their journey. These challenges and obstacles represent potential sources of factors of dissatisfaction in the overall customer experience for disabled passengers.

Tier 4: The moderating factors of 'impairment effects. Accommodating for individual impairment effects requires a higher level of service provision for these individuals across the tourism system. (McKercher&Darcy 2018) Some barriers are individual-specific and airlines should do their best with-in the regulations to provide disabled passengers with accessible and dignified air travel experiences.

### **3.4 Functional requirements for accessible air travel**

Accessibility - The term accessibility is often used when speaking of persons with disabilities and their right of access, enabling the use of assistive technology so that they can do what they need to do in a similar amount of time and effort as someone that does not have a disability. (IATA 2023a) The concept of accessible travel embodies the principles of social equity and human rights, with a focus on eliminating physical and informational barriers to foster inclusive growth. Enhancing accessibility not only enhances the quality of life for individuals with disabilities and other special needs, but also plays a pivotal role in advancing overall societal progress and constructing fully inclusive societies.

In the research on the functional requirements for inclusive transportation conducted by Bjerkan and Øvstedal (2020), a total of 8 functional requirements for inclusive transportation were proposed. The following presents eight functional requirements that must be met for a particular transport service to represent a real alternative for people with disabilities and thus facilitate social inclusion. The requirements are relevant in most social and cultural context.



**Accessible, centralized information:** The information pertaining to the travel arrangements of passengers with disabilities should be consolidated into a single point, encompassing details on routes and departure times, eligibility criteria, available assistance services, subsidies, as well as relevant policy requirements. Even if the source of this information is not directly affiliated with the airline or airport, it should still be accessible through a centralized platform. This section also encompasses provisions for aiding visually or hearing-impaired individuals through means such as accessible web pages, real-time text or audio updates, and clear signage. Airlines are expected to offer tailored in-formation services in exceptional circumstances.

**Flexibility:** Flexibility in air travel refers to the flexibility of flight schedules and other aspects of airline operations. Flexibility implies several, available transport solutions for the same trip. t there are fewer equal alternatives available to people with disabilities when considering the effort involved in taking them into use. This disallows for choosing the transport solution that is more appropriate in a given situation or a given day. (Bjerkan&Øvstedal 2020)

**Safety and security:** The concept here encompasses both the physical and psychological aspects. The physical aspect pertains to ensuring the safety of disabled passengers during air travel, safeguarding them from harm. The psychological dimension refers to the internal experiences of disabled passengers, including potential fears and negative emotions that may arise in various situations or interactions.

**Physically accessible design:** Accessible design should be integrated throughout the entire customer journey for disabled travelers. For example, the design of the onboard environment of an airplane should consider factors such as space, toilet facilities, air quality, seating, and cleanliness.

**Reliability:** Airlines must ensure the accuracy of all information regarding flights in their communication with passengers. They should have a system in place to quickly handle issues such as flight delays and gate changes. Disabled passengers often feel more pressure than regular passengers when faced with flight delays and other similar situations.

**Economic predictability:** this functional requirement holds more than affordability: the affordability must be predictable. Costs and expenses must be anticipated by the user for the foreseeable future. (Bjerkan&Øvstedal 2020)

**Reduced administration:** The disparities in special assistance contracts between airports and airlines regarding air travel regulations may lead to confusion and bewilderment among disabled passengers. This lack of clarity can result in a misunderstanding of the provisions and procedures for special assistance offered by different airlines and airports, potentially leading to inadequate support being provided. The application process for disabled passengers, whether it is for utilizing

in-flight services of an airline or availing services at an airport, often entails significant lengthiness, bureaucracy, and complexity. (Bjerkan&Øvstedal 2020)

Short, predictable travel times: They also show that unpredictable and long travel times force employees with disabilities to start their work travel very early in the morning just in order to arrive on time, resulting in exceedingly long workdays. (Bjerkan&Øvstedal 2020) The flow and efficiency of assistance provided by airline staff at different stages of the journey should be seamless and effective, helping to enhance the travel experience of disabled passengers.

### **3.5 Regulations on Disabled Passengers' Travel**

One concern is the varying disability legislation across the globe, causing confusion for passengers with disabilities, difficulties for airlines, and potential safety issues. There is no universal definition of a passenger with disabilities or a consensus on minimum service levels they should expect when flying. (IATA 2023b)

IATA advocates for a joint government and industry approach to meet the needs of passengers with disabilities, ensuring efficient and safe air transport. Working with the International Civil Aviation Organization (ICAO), IATA is urging states to involve the airline industry in integrating the UN Convention on the Rights of People with Disabilities (UN CRPD) into national aviation legislation and policies for accessible air travel. (IATA 2023b) Since the adoption of the UN Convention on the Rights of Persons with Disabilities in 2006, 185 countries and territories have ratified the Convention, effectively advancing the well-being of individuals with disabilities. The Covenant mandates States Parties to ensure that all measures pertaining to the exercise of legal capacity incorporate sufficient and effective safeguards, which are subject to regular scrutiny by competent, independent, and impartial authorities or judiciary. Safeguards should be commensurate with the degree to which such measures impact the rights and interests of individuals. (UN 2006)

In addition to the rights afforded to passengers with disabilities and the corresponding responsibilities of airlines, there exist regulations governing travel for individuals with disabilities. Of particular importance are those pertaining to the transportation of wheelchairs, guide dogs, and other assistive devices.

To ensure the convenience of travel for passengers with disabilities, it is recommended to clearly communicate the necessary information and purpose of providing documentary proofs. This includes specifying the size and type of assistive mobility devices so that airlines can make appropriate transportation arrangements. Typically, airlines collect this information in the reservation record for efficient management and coordination. To ensure comprehensive collection

of documentary information, consistent procedures and requirements should be adopted by both airlines and reservation agents. (IATA 2023a)

In addition to joining international organizations for the protection of disabled passengers' rights, many countries have also implemented specific regulations tailored to their own circumstances. Taking China as an example, in order to safeguard the legitimate rights and interests of disabled individuals during air transportation and standardize the management and services provided for them, China has formulated the Measures for the Administration of Transport for Disabled Persons. These measures are based on the Law of the People's Republic of China on the Protection of Disabled Persons, Civil Aviation Law of the People's Republic of China, along with other relevant laws, regulations, rules, and taking into account international practices as well as references from International Convention on the Rights of Persons with Disabilities. (CDPF 2022) The provided document offers comprehensive and detailed regulations pertaining to passengers' rights and obligations concerning flight reservations and ticket purchases, airport security checks and boarding services, in-flight services and assistance, emergency rescue measures, the responsibilities and obligations of relevant institutions and airline companies, as well as feedback on related matters.

For example, when a wheelchair passenger boards the plane, the Administrative Measures on Transport of Persons with Disabilities require carriers, airports, and airport ground service agents to provide complimentary mobility aids for eligible individuals during boarding and deplaning. These aids include accessible electric vehicles and shuttles within the terminal area and from the gate to the aircraft, wheelchairs for use in the airport premises as well as during boarding and deplaning procedures, and narrow wheelchairs specifically designed for airplane use. Carriers are prohibited from requesting disabled passengers who meet the boarding requirements to sign a waiver relinquishing their right to claim compensation for any damage or loss incurred by their mobility aids, except in cases where such damages occur during collection or delivery. (CDPF 2022)

## 4 Research Methods

The objective of this paper is to enhance the customer experience of disabled passengers in airlines. The research topic of this paper focuses on enhancing the customer experience for disabled passengers in the airline industry. To gain a more comprehensive and profound understanding of this subject, a mixed research method combining qualitative and quantitative approaches is employed.

The utilization of qualitative research enables an exploration into the genuine experiences and specific needs of disabled customers. As the name itself suggests, qualitative research is concerned with the qualitative process. It generally works with the study of human behavior. It generally works with the study of human behavior.” Patel M. and Patel N. also refer (2019, 49) qualitative research as “motivation research”. Quantitative research method has the advantages of objective and reliable results, quantitative comparison of results and strong repeatability of results. Each type of data proved to be insightful in different ways. (Hand 2022) Using mixed methods exposes “the different dimensions of a phenomenon and to enrich understandings of the multifaceted, complex nature of the social world” (Moran et al 2006).

This paper employs a combination of literature review, questionnaire survey, and case analysis as research methods. By utilizing the aforementioned three methodologies, researchers can gain a comprehensive understanding of the challenges and obstacles encountered by disabled passengers during air travel, as well as their expectations and recommendations for services. This profound comprehension can assist airlines in effectively adapting and enhancing their services, thereby elevating the overall travel experience for disabled customers.

### 4.1 Literature Review Method

Literature reviews play an important role as a foundation for all types of research. They can serve as a basis for knowledge development, create guidelines for policy and practice, provide evidence of an effect, and, if well conducted, have the capacity to engender new ideas and directions for a particular field. (Snyder 2019) The judicious utilization of the literature review method can assist in establishing a solid foundation for the paper, elucidating the theoretical framework, thereby enhancing the potential for content innovation.

Firstly, the school library resources were utilized to retrieve books, journal articles, newspapers, and magazines pertaining to airline services for disabled customers in order to comprehend the current research status and service challenges.

The research will focus on selecting several exemplary cases of disabled travelers' travel experiences, followed by a comprehensive analysis of their approach towards handling disabled customer service. Special attention will be given to identifying innovative practices as well as existing challenges in managing customer experience issues. Through the examination of successful cases and identified shortcomings, this study aims to extract best practices and provide improvement suggestions.

Finally, in conjunction with the findings of relevant literature, theoretical frameworks, and empirical research, this paper proposes targeted recommendations for enhancement. For instance, it aims to optimize accessibility services throughout the boarding process, personalize in-flight services, and enhance wheelchair assistance upon disembarkation. By doing so, it facilitates airlines in elevating service quality and fostering a more equitable, comfortable, and respectful travel experience for passengers with disabilities.

## **4.2 Questionnaire Method**

Surveys can be categorized into qualitative and quantitative types. Qualitative surveys primarily focus on gathering subjective descriptive information, often utilizing open-ended questions to encourage respondents to freely express their perspectives and emotions. Conversely, quantitative surveys concentrate on collecting measurable data, frequently employing closed-ended questions that require respondents to select the most suitable answer from a predetermined list of options. The survey questionnaire designed for this study is a mixed-method survey questionnaire, which combines qualitative and quantitative research approaches in order to leverage the strengths of both methods and obtain more comprehensive and profound data insights. The primary objective of the quantitative survey is to conduct statistical analysis and quantitative research on disabled passengers' satisfaction with the airline's customer journey, aiming to acquire objective and comparable data results. On the other hand, the qualitative survey aims at exploring key pain points in disabled passengers' customer journey by gathering a substantial number of cases. By selecting representative cases for analysis, researchers can facilitate understanding of the underlying reasons and motivations behind disabled passengers' viewpoints, attitudes, and behaviors.

In order to study the experience of disabled passengers in the airline customer journey, this paper designs a questionnaire around the customer journey of disabled passengers, the service quality of different airlines and the customer experience satisfaction of disabled passengers. And the researchers will send the questionnaire to disabled passengers with different types of disabilities to fill in, and finally get the results.

#### 4.2.1 Principles of Questionnaire Design

In the questionnaire design, the researchers followed the following principles.

Customer experience: The survey questionnaire should be designed in accordance with the sequential customer journey map, and it should adhere to the Customer Journey Theory (Lemon & Verhoef 2016, 69-96), which provides a comprehensive framework for analyzing the entire customer journey. According to Lemon & Verhoef (2016, 69-96), the customer experience can be categorized into three main stages: prepurchase, purchase, and post-purchase. In relation to disabled passengers' complete journey on airlines, this process includes accessible booking, check-in, boarding and deplaning procedures, in-flight service experience, baggage claim or transfer process as well as passenger feedback collection. To facilitate data collection purposes while considering similarities between boarding and deplaning processes during service delivery on board aircrafts, these two stages are combined "Boarding and Deplaning".

The satisfaction issue design framework uses a four-layer framework to help researchers gain a deeper understanding of the problems that disabled travelers may encounter during their travels. It can be divided roughly into three parts, with the first tier reflecting issues faced by all tourists, the second tier identifying constraints that are common to all PWD regardless of the disability and the last two tiers focusing exclusively on individual types of disabilities. (McKercher & Darcy 2018) By analyzing the customer journey map of disabled passengers from each stage of the journey in layers, we can comprehensively observe the problems that disabled passengers may encounter.

Based on these two principles, a questionnaire was designed and the satisfaction factors were selected.

#### 4.2.2 Questionnaire Design

In order to gain a comprehensive understanding and conduct an in-depth analysis of the challenges that disabled passengers may encounter during their customer experience, two qualitative questions were formulated with the purpose of selecting representative cases for further examination, as illustrated in the figure below.

\* 33. Could you kindly provide me with your recommendations regarding airline accessibility facilities?

Figure 1 Qualitative question1

\* 3. Classification of mobility impairments

- Vision disorder
- Hearing disorders
- Communication disorders
- Mobility disorder
- Mental disorders
- Other disorders

(People with an illness and are authorized to travel by medical authorities, but whose mobility is impaired due to pathology in progress; and people unable to stand or walk due to injury.)

Figure 2 Qualitative question 2

In the questionnaire, "A1-A6" are the primary indicators of this study, and "B1-B29" are the secondary indicators. There are 29 questions related to the indicator system. The questionnaire was designed based on the investigation of the indicator system.

This questionnaire is mainly distributed to people in China, regardless of occupation and education level. The survey invitation was distributed through social media, and to ensure accessibility for disabled passengers of different types, some of the survey questions were conducted via telephone interviews by researchers, who then compiled and collected the results to form a written survey report. After distribution, 111 questionnaires were received, and 11 invalid questionnaires were deleted. Finally, 100 questionnaires were used for data analysis.

Main survey objectives	Tier 1 indicators	Secondary indicators
Disability Passenger Satisfaction Survey in the Airline Customer Journey Map	<i>Accessible booking stage A1</i>	Personal Information Application B1
		Personal Information Inquiry B2
		Human assistance B3
		Website Accessibility Design B4
	<i>Check-in stage A2</i>	Accessible facilities B5
		Inclusive communication B6
		Flight Information Update Reminder B7
		Timeliness of Help B8
		The degree of interconnection between different services B9
	<i>Boarding and deplaning stage A3</i>	Priority disembarkation B10
		Boarding priority arrangement B11
		Assistants assist B12
		Accessible boarding equipment B13



		Accessible equipment operation proficiency B14
		Up-to-date information B15
	<i>In-flight service A4</i>	Seating arrangements B16
		Timely assistance B17
		Auxiliary Technical Support B18
		Communication with the crew B19
		Comfort of Accessible Facilities B20
	<i>Baggage claim and transfer stage A5</i>	Cohesion of Special Service Assistance B21
		Accessibility Assistance B22
		Integrity of the Special Services Unit B23
		Timely Information Notification B24
		Transportation of auxiliary equipment B25
	<i>Passenger Feedback stage A6</i>	Understanding the scope of one's own rights and interests B26

		The Way of Feedback Response B27
		Problem solution B28
		Problem Solving Results B29

Table 2 Satisfaction factor selection

#### 4.2.3 Method of Questionnaire Satisfaction Scoring

The Likert Scale is a widely utilized assessment tool in survey research for gauging respondents' attitudes towards specific perspectives, statements, or issues. The satisfaction survey questionnaire employed in this study adopted a design based primarily on the Likert-type scale due to the following reasons.

Firstly, the Likert scale design employs a five-level option system, encompassing "very dissatisfied," "dissatisfied," "neutral," "satisfied," and "very satisfied. " This approach facilitates respondents' comprehension and response accuracy, thereby enhancing the questionnaire's validity and reliability. Secondly, the Likert scale design underscores the inherent coherence and logicity of its item arrangement, ensuring that respondents can unambiguously grasp each question and provide objective evaluations. Consequently, this aids in obtaining genuine user feedback and opinions. Further-more, the Likert scale design enables researchers to quantify and compare respondents' attitudes and satisfaction levels pertaining to specific issues or services. As a result, it renders research findings more comparable and scientifically robust.

The present study opted for the design of a Likerttype scale questionnaire to ensure the rationality and accuracy of the survey instrument, thereby facilitating a more comprehensive and objective understanding of respondents' perspectives and opinions on pertinent matters.

The options for each question consist of five choices, with corresponding scores assigned as follows: "Very dissatisfied" = 1 point, "Dissatisfied" = 2 points, "Neutral" = 3 points, "Satisfied" = 4 points, and "Very satisfied" = 5 points. The satisfaction calculation method employed in this paper is a simple average. The formula for calculating satisfaction is as follows: Satisfaction = (sum of satisfaction scores for each item) / (total number of items).

#### 4.2.4 Questionnaire reliability and validity analysis

The evaluation questionnaire's reliability and validity ensure the accurate and consistent capture of challenges and issues faced by disabled customers throughout their journey. By analyzing its reliability and validity, we can verify if the questionnaire genuinely reflects key bottlenecks in the airline experience for disabled customers, providing a dependable data foundation for research analysis and conclusions. This study will analyze the reliability and validity of the designed questionnaire tool to ensure its effectiveness in exploring bottlenecks in the airline experience for disabled customers.

When conducting reliability analysis of a questionnaire, the researcher initially divides it into six parts based on the six satisfaction level indicators (A1-A6) and subsequently calculates the reliability of each dimension separately. The Cronbach's alpha coefficient is utilized to assess the internal consistency, specifically the correlation between items within each dimension. Different results can be obtained depending on the range of Cronbach's alpha value: less than 0.7 indicates poor internal consistency requiring further improvement; between 0.7 and 0.8 suggests acceptable general internal consistency; between 0.8 and 0.9 implies good internal consistency with high questionnaire reliability; greater than 0.9 signifies very good internal consistency with an extremely high level of questionnaire reliability.

After conducting calculations, it is evident that all six dimensions exhibit high reliability. This is supported by the fact that all Cronbach's alpha values exceed 0.8 (as depicted in the accompanying figure), thereby indicating a strong internal consistency and reliability of the entire questionnaire. Consequently, this signifies that the questionnaire design and structure effectively capture pertinent information regarding disabled passengers' satisfaction in their customer experience, thus providing dependable data for subsequent analysis and conclusive inference.

Tier 1 indicators	Secondary indicator numbers	Cronbach. $\alpha$ coefficient values
Accessible booking stage A1	4	0.936
Check-in stage A2	5	0.947
Boarding and deplaning stage A3	6	0.845

In-flight service stage A4	5	0.921
Baggage claim and transfer stage A5	5	0.923
Passenger Feedback stage A6	4	0.833

Table 3 Cronbach.  $\alpha$  coefficient values

In the evaluation of questionnaire validity, researchers employ three methods: KMO measurement, Bartlett's Sphericity Test, and factor analysis to ascertain the accuracy and reliability of the scale or questionnaire employed in the study. The KMO measurement primarily assesses the appropriateness of questionnaire data for factor analysis. Bartlett's Sphericity Test is utilized to examine variable independence within the dataset and ensure factor analysis validity. Factor analysis serves as an effective technique for data reduction that identifies latent related factors, elucidates data structure, and reveals relationships between variables. By comprehensively employing these three methods, we can thoroughly evaluate questionnaire validity while ensuring research results' precision and dependability.

The Kaiser-Meyer-Olkin (KMO) measure is a crucial statistical indicator used to assess the suitability of data for factor analysis. It ranges from 0 to 1, with values closer to 1 indicating a higher degree of shared variation among variables, thereby making the data more suitable for factor analysis. Conversely, lower KMO values suggest less common variation and may indicate unsuitability for factor analysis. An acceptable KMO value falls between 0.7 and 0.8, while a value below 0.5 signifies that the data is not appropriate for factor analysis. The Bartlett's Sphericity Test examines whether there are correlations between variables in the dataset or if they are independent from each other.

In this study, the questionnaire yielded a high KMO value of 0.978, well above the threshold of 0.5, indicating its excellent suitability for factor analysis purposes. Additionally, Bartlett's Sphericity Test produced a significant result with a test statistic value of 3976.411 and degrees of freedom (df) equal to 406; further confirming that the dataset is indeed suitable for conducting factor analysis.

<b>Assessment of questionnaire validity</b>		
<b>Bartlett's test of sphericity</b>	<b>Approximate cardinality</b>	<b>3976. 411</b>
	<b>Freedom</b>	<b>406. 000</b>
	<b>Significance</b>	<b>0. 000</b>
<b>KMO Number of sampling tangibles</b>		<b>0. 978</b>

Table 4 Assessment of questionnaire validity sheet

In the analysis, the researchers extracted a significant common factor from the questionnaire data with an eigenvalue of 22. 04, explaining 76. 01% of the total variance and demonstrating its high explanatory power for the main variation in the questionnaire data. Moreover, all secondary indicators exhibited loadings above 0. 84 on this factor, while their coefficients of communality exceeded 0. 70 as depicted in Figure X. This further confirms a strong correlation between each item and the common factor, indicating that most of the item variance can be accounted for by this shared factor. The substantial loading and coefficient of communality values attest to excellent internal consistency within the questionnaire, where all items converge around a central concept, thereby reinforcing confidence in its structural validity.

<b>Subject</b>	<b>Factor Comonotonic</b>
<b>Website Accessibility Design</b>	0. 833
<b>Personal Information Inquiry</b>	0. 781
<b>Human assistance</b>	0. 762
<b>Personal Information Application</b>	0. 756

<b>Accessible facilities</b>	0. 783
<b>Inclusive communication</b>	0. 793
<b>Flight Information Update Reminder</b>	0. 787
<b>Timeliness of Help</b>	0. 760
<b>The degree of interconnection between different services</b>	0. 726
<b>Accessible boarding equipment</b>	0. 700
<b>Accessible equipment operation proficiency</b>	0. 701
<b>boarding priority arrangement</b>	0. 808
<b>Priority disembarkation</b>	0. 793
<b>Assistants assist</b>	0. 757
<b>Up-to-date information Assistants assist</b>	0. 811
<b>Seating arrangements</b>	0. 779
<b>Comfort of Accessible Facilities</b>	0. 733
<b>Timely assistance seating arrangements</b>	0. 760
<b>Communication with the crew</b>	0. 754

Auxiliary Technical Support	0. 719
Timely Information Notification	0. 740
Accessibility Assistance	0. 802
Integrity of the Special Services Unit	0. 709
Cohesion of Special Service Assistance	0. 768
Transportation of auxiliary equipment	0. 723
Understanding the scope of one's own rights and interests	0. 761
The Way of Feedback Response	0. 751
Problem solution	0. 742
Problem Solving Results	0. 751

Table5 Factor analysis validity data sheet

The reliability and validity of the questionnaire were assessed in this study, specifically focusing on its content, internal consistency, and potential bottlenecks experienced by airlines when serving disabled passengers. As a result, the structural validity and internal consistency of the questionnaire were confirmed to be satisfactory. This outcome establishes a dependable tool and foundation for gaining further insights into the challenges faced by airlines in accommodating disabled passengers.

### 4.3 Case Study Research

The case study method is a research approach that involves conducting in-depth observation and analysis of specific cases to comprehend the essence of problems and solutions. Case study research places emphasis on capturing the subjective feelings and meaning-building process of

respondents, aiding researchers in gaining a profound understanding of individuals' inner world, complexity, as well as their interactions with the environment and its impact. Utilizing the case study method for conducting comprehensive analysis and discussion on target cases within research will facilitate uncovering the underlying causes behind low satisfaction among disabled passengers while proposing effective solutions. Consequently, this will provide valuable insights and recommendations for enhancing both the travel experience of disabled passengers and airlines' customer experience management. The questionnaire invitation was disseminated through social media platforms, while certain aspects of the questionnaire content were obtained via telephone interviews conducted by the researcher. These responses were then compiled to form written questionnaire results.

When selecting a representative case analysis subject, the following criteria are used first: 1. The case subject must be at least 18 years old. 2. The case subject must have a disability. 3. The case subject must have had an air travel experience.

Secondly, as case analysis serves to complement the limitations of quantitative analysis, the researcher initially conducted a comprehensive examination of the entire sample and discovered that the satisfaction levels of three distinct categories of disabled passengers were significantly below the average level (as depicted in the subsequent figure). These three categories encompass diverse disability types and travel requirements, rendering them representative and pivotal. Hence, we opted to concentrate our research on these specific categories.

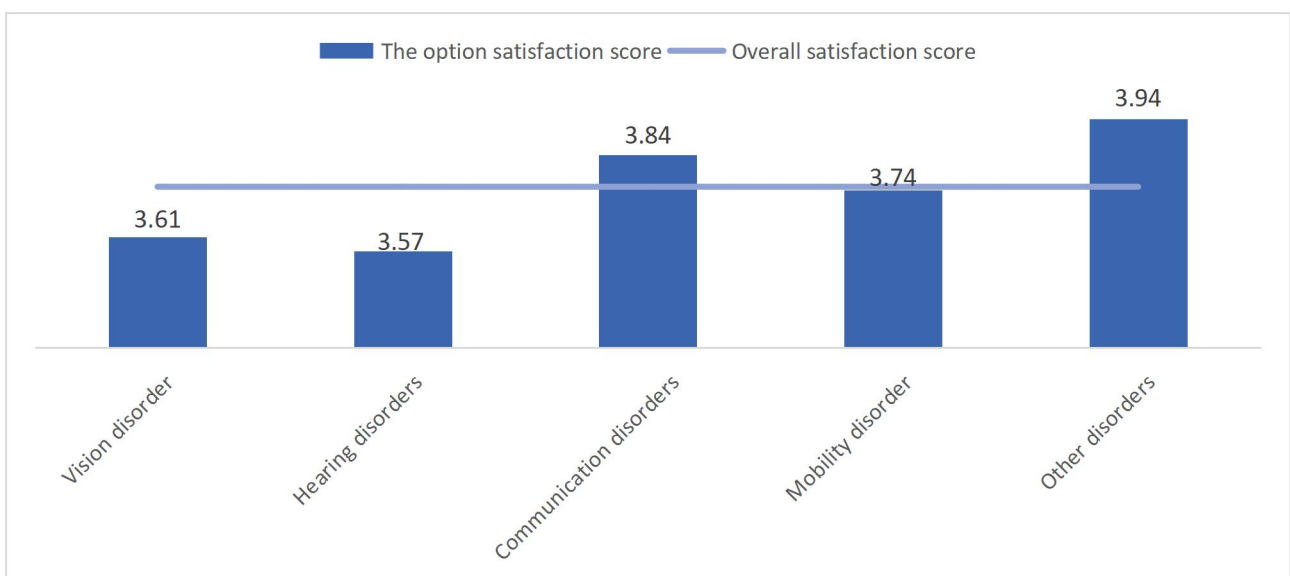


Figure 3 Satisfaction statistics of passengers with different types of disabilities



When selecting target cases, researchers choose them based on the data collected from the questionnaire survey database. As all respondents meet the basic requirements, researchers need to filter out different types of disabilities and exclude irrelevant information from the responses. The database is filtered according to the conditions of the target cases, as illustrated in the figure below.

3.Classification of mobility i...	Vision disorder	🗑️
33.Could you kindly provide me...	exclude	Nothing

Figure 4 Visual disorder case selection screening criteria

3.Classification of mobility i...	Hearing disorders	🗑️
33.Could you kindly provide me...	Exclude	Nothing

Figure 5 Hearing disorder case selection screening criteria

3.Classification of mobility i...	Mobility disorder	🗑️
33.Could you kindly provide me...	Exclude	Nothing

Figure 6 Mobility disorder case selection screening criteria

Based on their responses to the qualitative questions, cases with rich and comprehensive content, representative characteristics, and high consistency were selected for in-depth analysis. The final target cases included one visually impaired passenger, one hearing impaired passenger, and two passengers with mobility difficulties. These three categories of disabled passengers exhibited a significant level of dissatisfaction with the airline's customer experience in the qualitative questions, and their responses provided explicit and detailed reasons. The selection of these target cases aimed to acquire a profound understanding of the problems and challenges that different types of disabled passengers may encounter during air travel, thereby enabling more precise recommendations and improvement suggestions to be offered.

Through this process, researchers successfully identified five target case studies of disabled passengers with low satisfaction levels and established the groundwork for further in-depth case analysis. These selected cases will enable researchers to analyze the underlying causes of dissatisfaction among disabled passengers, explore potential solutions, and provide valuable insights for enhancing airline customer experience management. By meticulously selecting and screening these specific case studies, the research ensures that the findings are representative and reliable, thereby establishing a solid foundation for conducting the entire study smoothly.



Figure7 Satisfaction statistics at different stages

In the barrier-free booking stage, the average score for dimensions was 3.68. Among them, the score for personal information inquiry was 3.57, and the score for Personal Information Application was 3.43, both of which were lower than the dimension average score and overall satisfaction average score. This indicates that disabled passengers have a poor experience in terms of personal information inquiry during their customer journey, and improvements are needed in terms of information inquiry methods and application process of special services to enhance customer experience. The score for Website Accessibility Design was 3.71, higher than the dimension average score but lower than the overall satisfaction score, indicating that this aspect of design is relatively common. However, 14.29% of respondents chose "disagree" in this question, suggesting that this part of the design did not achieve its goal of providing barrier-free services and should improve barrier-free technology to enhance service experience accordingly. The highest scored aspect was Human Assistance with a rating of 4 points out of 5 points possible; indicating that airlines provide excellent experiences for disabled passengers in terms of human assistance.

Question	Score on the Test	Dimension Score
4. Website Accessibility Design	3.71	3.68
5. Personal Information Inquiry	3.57	3.68
6. Personal Information Application	3.43	3.68
7. Human assistance	4	3.68

Table6 Dimension satisfaction score 1

During the ticket inspection phase, the dimension achieved an average score of 3.80. The "Timeliness of Help" dimension outperformed both the dimension average and overall satisfaction score with a score of 4 points. On the other hand, the "Degree of interconnection between different services" dimension scored lower than both the average and dimension average at 3.43 points, indicating excessive waiting time for disabled passengers during service transitions. Conversely, in terms of "Accessible facilities," airlines received a higher-than-average score of 4 points, suggesting relatively comprehensive provisions for disabled individuals. However, there is room for improvement in the area of barrier-free communication as reflected by a below-average score of 3.

57 in the "Inclusive communication" dimension. Additionally, scoring above average at 4 points is the "Flight Information Update Reminder" dimension; however, slight deficiencies were observed in both interconnection between different services and inclusive communication dimensions.

Therefore, further enhancements are necessary to improve overall service quality.

Question	Score on the Test	Dimension Score
8. Timeliness of Help	4	3.80
9. The degree of interconnection between different services	3.43	3.80
10. Accessible facilities	4	3.80
11. Inclusive communication	3.57	3.80
12. Flight Information Update Reminder	4	3.80

Table7 Dimension satisfaction score2

During the boarding and deplaning process, the average satisfaction score was 4.10, surpassing the overall satisfaction score. The data suggests that the service provided during this stage was satisfactory, particularly for disabled passengers who experienced a better customer experience. The satisfaction score for priority boarding was higher at 4.29, while the satisfaction score for priority deplaning was slightly lower at 4 points. Although this score is slightly below average, it still exceeds the overall satisfaction score, indicating some minor issues in the arrangement of deplaning procedures for disabled passengers but not to a significant extent. The satisfaction scores for Assistants assist, Accessible boarding equipment, and Accessible equipment operation proficiency all reached 4.14, exceeding both the overall and total satisfaction scores. However, there were some concerns regarding Up-to-date information with a lower satisfaction score of 3.86 compared to other dimensions but still higher than the overall satisfaction score. This indicates that certain disabled passengers may be dissatisfied with this aspect and highlights a need for improved assistance from the airline in terms of providing prompt information.

Question	Score on the Test	Dimension Score
13. boarding priority arrangement	4.29	4.10
14. Priority disembarkation	4	4.10
15. Assistants assist	4.14	4.10
16. Accessible boarding equipment	4.14	4.10
17. Accessible equipment operation proficiency	4.14	4.10
18. Up-to-date information	3.86	4.10

Table8 Dimension satisfaction score3

In the In-flight service stage, the average satisfaction of this dimension is 3.74, which is slightly lower than the overall satisfaction of the questionnaire. The rating for "Seating arrangements" was 3.71, marginally lower than the dimension's average score of 3.74, indicating a slightly below-average satisfaction level with seating arrangements among users. Airlines should consider implementing more detailed arrangements to cater to different types of disabled passengers. The rating for "Timely assistance with seating arrangements" was 4, suggesting that users were relatively satisfied with the prompt assistance provided in arranging their seats, surpassing the average score for this dimension. The score for "Comfort of Accessible Facilities" is 3.43, indicating user dissatisfaction with the comfort of onboard accessible facilities. There is a need to upgrade disabled facilities or provide more suitable arrangements. Similarly, the score for "Communication with the crew" is also 3.43, suggesting a need for improvement in communication with the crew providing in-flight services for disabled passengers due to higher complaint rates observed. On a positive note, users are satisfied with auxiliary technical support as indicated by its score of 4; however, some respondents mentioned issues related to this aspect.

Question	Score on the Test	Dimension Score
19. Seating arrangements	3.71	3.74
20. Timely assistance seating arrangements	4	3.74
21. Comfort of Accessible Facilities	3.43	3.74
22. Communication with the crew	3.43	3.74
23. Auxiliary Technical Support	4	3.74
24. Timely Information Notification	3.86	3.74

Table9 Dimension satisfaction score4

In the stage of Baggage claim and transfer, the satisfaction score for this dimension was 3.71, which aligned closely with the overall satisfaction score. The score for "Accessibility Assistance" stood at 4.14, surpassing the dimension score by 0.43 points. This indicates that users are highly satisfied with the accessibility assistance provided, exceeding the average level of satisfaction. The score for "Integrity of the Special Services Unit" was recorded as 3.29, reflecting a deviation of -0.42 points from the dimension score of 3.71. This suggests that users perceive a lower level of integrity in relation to airport special services unit compared to their expectations within this dimension; thus improvements are necessary to enhance user satisfaction in this aspect. The score for "Cohesion of Special Service Assistance" amounted to 3.57, slightly below (-0.14 points) than the dimension's average rating (3.71). Although this service falls short in meeting average levels of satisfaction, it is generally accepted by disabled passengers; however there remains room for improvement regarding cohesion in special service assistance during transfer processes. The score for "Transportation of auxiliary equipment" reached 3.86, surpassing (+0.15 points) the dimension's average rating (3.71). Consequently indicating that auxiliary equipment transportation services have exceeded expected levels and users express relatively high levels of satisfaction towards these services.

Question	Score on the Test	Dimension Score
25. Accessibility Assistance	4.14	3.71
26. Integrity of the Special Services Unit	3.29	3.71
27. Cohesion of Special Service Assistance	3.57	3.71
28. Transportation of auxiliary equipment	3.86	3.71

Table10 Dimension satisfaction score5

In the passenger feedback stage, the dimension satisfaction value of 3.5 is lower than the overall satisfaction. The satisfaction score for the topic "Understanding the scope of one's own rights and interests" is 3.43, slightly below its dimension average score of 3.50 by a margin of 0.07 points, indicating a minor deficiency in participants' understanding of their own rights and interests compared to the average performance within this dimension. The score for "Problem Solving Results" finally stands at 3.29, which falls below its dimension average of 3.50 by a margin of 0.21 points. In an airline context, inadequate problem feedback and solutions can manifest as customers facing challenges in receiving prompt and effective resolutions after encountering issues. Difficulties may arise in contacting the responsible personnel for problem handling, and even if contact is established, timely responses or solutions might not be forthcoming. Such instances can leave customers feeling neglected or poorly served, resulting in frustration and dissatisfaction when faced with flight delays, lost luggage, etc. In such scenarios, airlines need to enhance their problem feedback and solution processes to elevate customer satisfaction levels while improving the efficiency of resolving problems.

Question	Score on the Test	Dimension Score
29. Understanding the scope of one's own rights and interests	3.43	3.50

30. The Way of Feedback Response	4	3.50
31. Problem solution	3.29	3.50
32. Problem Solving Results	3.29	3.50

Table 11 Dimension satisfaction score

## 5.2 Qualitative Analysis Results

The selection of four representative passengers with low satisfaction scores for in-depth analysis was conducted in order to gain a better understanding of the specific barriers faced by different types of disabled passengers, as quantitative research primarily focuses on these common obstacles. In the research on the functional requirements for inclusive transportation conducted by Bjerkan and Øvstedal (2020), a total of 8 functional requirements for inclusive transportation were proposed. 1. In conducting a comprehensive analysis of the case, this paper evaluates the airline's services based on the eight functional requirements for barrier-free travel through meticulous examination of relevant case studies. To ensure utmost confidentiality of the interviewees' information, two physically disabled passengers are identified as A and B, while a hearing-impaired passenger is referred to as C, and a visually impaired passenger as D. The flight experiences of these aforementioned individuals have been subjected to rigorous statistical analysis, predominantly involving Chinese airlines with only limited international flight experiences. Consequently, this research primarily focuses on identifying deficiencies in customer experience within Chinese regional airlines.

### 5.2.1 People with reduced mobility

According to this theory, passenger A's suggestion regarding the obstacles in accessible travel can be summarized as non-compliance with the requirement of 1. Accessible, centralized information. Disabled passengers are unable to access basic information such as whether a plane is equipped with an onboard wheelchair through a single click on a web-page. 2. Furthermore, there is non-compliance with the reliability requirement. When disabled passengers' resort to telephone consultation after being unable to obtain necessary information through website inquiries, they are once again informed that it cannot be determined. This response not only seriously violates the reliability requirement of accessible transportation but also results in a negative experience for disabled passengers and damages the airline's reputation among its customers. Such behavior



has a detrimental impact on enterprise development. 3. The requirement for short, predictable travel times is not met. Disabled passengers have experienced financial, time, and experiential losses when they find that the flight does not provide an onboard wheelchair. This also partially violates the requirement for economic predictability. All of these issues occurred during the barrier-free booking stage, leading passenger A to believe that Kunming Airlines performed poorly.

\* Could you kindly provide me with your recommendations regarding airline accessibility facilities

1. Some narrow-body aircraft operated by certain airlines do not provide wheelchair services, which fails to meet the needs of passengers with disabilities and hinders their ability to travel smoothly. When inquired about this matter, customer service representatives often respond with a vague statement of "it depends on the situation," thereby increasing uncertainty for travelers who may only be left with the option of seeking refunds or rescheduling (negative review for Kunming Airlines). We strongly urge airlines to minimize reliance on such ambiguous responses and encourage proactive planning for independent disabled travel, as uncertainties can result in significant time, energy, and financial losses. The online self-service wheelchair reservation process is complex; while applying for ground wheelchair assistance is relatively straightforward, obtaining onboard wheelchair assistance requires submitting various supporting documents through separate channels like email instead of directly via the app. In contrast, railway authorities have established partnerships with Disabled Persons' Organizations to streamline identification processes for eligible passengers. We hope that airlines can also enhance service efficiency by eliminating repetitive explanations during each booking made by certified passengers. Although telephone reservations for wheelchair services are comparatively simple, customer service staff often lack comprehensive knowledge regarding these specific requirements; therefore, we recommend enhancing training programs.

Figure 8 The specific answer from Passenger A

Passenger B possesses extensive expertise in accessible air travel, primarily expressing dissatisfaction with the boarding and deplaning procedures. The passenger's experience is predominantly attributed to the airline's failure to meet the requirements of physically accessible design and ensure short, predictable travel times. The design of the boarding ramp on the shuttle bus fails to comply with accessibility standards, resulting in a need for manual assistance. Although this did not impede their journey, it significantly impacted their overall experience and emotional well-being. 1. Secondly, the Civil Aviation Administration of China (CAAC) has issued the Implementation Regulations of the Civil Aviation Law, which explicitly mandates that airlines must prioritize the boarding and deplaning process for disabled passengers and provide essential amenities such as ramps, auxiliary facilities, guidance, and assistance (CAAC 2015). However, in passenger B's case, there was virtually no opportunity for this standard to be implemented. According to passenger B's subsequent account shared with us, the ground service agent responsible for luggage collection and departure from the airport failed to deliver a comprehensive level of service. For vulnerable groups like disabled passengers, lodging complaints and resolving issues independently is an arduous task. The aviation industry should strive towards self-improvement in order to create an authentically inclusive and barrier-free travel experience for all passengers.

\* Could you kindly provide me with your recommendations regarding airline accessibility facilities

1. Last year, I took a total of 14 flights, with 4 for business purposes and 10 for personal reasons. During my business travels, Shandong Airlines provided me with priority disembarkation service once. However, on the other occasions, I found myself being among the last to disembark on China Airline s twice, Donghai Airlines twice, and East Airlines once due to the additional time required for wheelchair passengers. Generally speaking, airports usually have wheelchairs prepared at the cabin door in advance and inform passengers about their position in terms of disembarkation order. If a wheelchair needs to be checked in or retrieved upon arrival, it may take an extra 20-30 minutes compared to regular passengers' disembarkation time. This is understandable as wheelchair passengers may require more assistance than other disabled individuals; therefore priority disembarkation services might not always be feasible.

2. When it comes to meeting shuttle buses after landing at airports, taking a business car is usually not an option; instead only buses are available. So metimes even the bus cannot lower its body sufficiently if the ramp angle exceeds 60 degrees; under such circumstances both staff members and drivers have no choice but to abandon this method and find alternative solutions which can be quite inconvenient.

Figure 9 The specific answer from Passenger B

### 5.2.2 People who are deaf or hard of hearing.

The deaf passenger C expresses dissatisfaction with the lack of timely and reliable information alerts throughout the entire airline customer journey, which contradicts the requirements of Short, predictable travel times and Accessible, centralized information in inclusive travel. While barriers do not impede their actions, deaf passengers primarily rely on text-based forms for obtaining information and communication. In terms of meeting the Reliability function requirement, airlines have fallen short in providing adequate services for deaf passengers, thereby violating the rights of disabled passengers. Such practices should be ceased promptly. Through analyzing this case, researchers have identified specific barriers faced by deaf individuals during air travel and propose improved suggestions.

\* Could you kindly provide me with your recommendations regarding airline accessibility facilities

I have a hearing impairment and I hope airlines will prioritize adherence to the guidance and reminders provided in software and manual communication. As someone heavily reliant on text for understanding, it would be beneficial to have prompts displayed on large screens at the departure gate during flight transfers, as real-time audio announcements are not conducive for individuals with hearing impairments. Additionally, not all airports offer disembarkation assistance services, and even when requested, there may be instances where staff is unavailable to arrange such support.

Figure 10 The specific answer from Passenger C

### 5.2.3 People who are blind or have low vision

The accessibility of booking stages throughout the aviation customer journey was hindered by issues within the airline, leading to dissatisfaction from blind passenger D. The primary challenges stemmed from a lack of functional requirements for inclusive transportation, specifically Reliability, Reduced administration, and Short, predictable travel times. Given the variations in auxiliary services across airlines and airports, it is crucial for airlines to offer accurate assistance through reliable auxiliary services. Even when service disparities exist, consultation with ground service agents should be sought to ensure seamless support. Furthermore, the airport failed to prominently establish a comprehensive service counter as mandated by Article 16 of Chapter 4 of

the Disability-friendly Aviation Transportation Management Regulations. This regulation stipulates that airports must set up a conspicuous service counter at the main entrance of the terminal building with clear signage providing flight information to eligible passengers and assisting them in contacting carriers or facilitating check-in and security procedures. (CAAC 2015)

\* Could you kindly provide me with your recommendations regarding airline accessibility facilities

1. I encountered a situation at Beijing Daxing International Airport on a United Airlines flight where I was unable to secure a specialized service for visually impaired passengers. Upon contacting United Airlines to request such assistance, the customer service representative informed me that no corresponding service was available. In order to facilitate my travel, I could only arrange for wheelchair assistance; however, the airport's specific services necessitated a separate phone application. While the appointment process at Wenzhou Airport proceeded smoothly, Daxing Airport stated that they did not accept reservations. Ultimately, after persistently insisting on it, I managed to successfully book an accommodation for assisting blind passengers. Nevertheless, the constant back-and-forth between the airport and airline counters during my journey caused significant inconvenience. Therefore, I sincerely hope that the airline can enhance and modify this particular service in order to ensure seamless travel experiences for individuals like myself.

Figure 11 The specific answer from Passenger D

## 6 Discussion

This chapter will provide a comprehensive analysis and interpretation of the research findings, delving deeper into the meaning and relevance of the content derived from the research results. It will establish connections with existing literature and theories to offer valuable insights for enhancing the customer experience of disabled passengers in their journey with airlines, thereby facilitating better sustainable development for airlines. Given that the primary focus of this research was on domestic flight experiences of disabled passengers in China, these findings primarily target Chinese airlines for their sustainable development efforts. By employing a mixed research method that combines qualitative and quantitative approaches, this study effectively addresses the first two research questions. The key issues reflected by these summarized and generalized findings are as follows.

1. There are challenges pertaining to information inquiry and declaration for disabled passengers during the process of ticket booking. 2. The comprehensiveness and connectivity of accessible services need improvement. 3. The feedback mechanism for addressing passenger issues requires enhancement. These challenges represent common barriers encountered by all disabled passengers.

4. Some airplane boarding assistance equipment is not widely accessible, and the level of comfort provided by onboard accessibility equipment is inadequate. This poses a common challenge for passengers who use wheelchairs.

5. The absence of timely text notifications for accessible services poses a bottleneck in the customer experience for passengers who are deaf or hard-of-hearing.

6. The population of individuals with neglected mental disorders encounters a wide range of challenges, without any apparent limitations in terms of mobility. It is evident from the survey findings that many passengers with mental disorders do not perceive the need for assistance from accessible services, and airlines tend to overlook the customer experience of this particular passenger group.

To enhance the customer experience of disabled passengers in the airline industry and address the aforementioned issues, it is imperative for airlines to embrace corporate social responsibility and sustainable development. In addition to proposing solutions to these challenges, careful consideration should also be given to the impact of emerging trends in the airline industry. Furthermore, it is essential to take into account the application of innovative technologies such as robot services, blockchain, and accessible entertainment systems on board. This paper aims to

provide practical suggestions and explanations by integrating insights from both the evolving landscape of the airline industry and advancements in technology at each stage of disabled passengers' journey.

## **6.1 Digitalization of Accessible Services for Airlines**

The issue of inconvenience in the process of information inquiry and reporting faced by disabled passengers can be resolved through facilitating airlines' digitization of their data. The digital transformation holds the potential for mutual benefits between airlines and disabled passengers, as it not only addresses the most challenging issues in accessible services but also significantly enhances operational efficiency within the aviation industry through widespread adoption of digital technologies. The issue of deaf passengers lacking timely access to text information alerts has been effectively resolved through the implementation of digital technology. Airlines can effectively coordinate and oversee all aspects of accessible services, thereby enhancing the seamless integration and comprehensiveness of such services.

These advanced technological applications offer more efficient means for passengers to enhance their travel experience during air travel. According to survey research (Heiets et al. 2022), it is evident that most passengers hold a positive attitude towards the integration of digital technology in air travel. Furthermore, implementing digital transformation in barrier-free services provided by airline companies will not only improve the experience of disabled customers but also fulfill corporate social responsibility.

### **6.1.1 The retrieval of information with a single click**

Airlines have the capability to digitize a wide range of information and upload it onto their website or app. By transforming pertinent airline details, such as flight information, service information, and operational data, into a format that can be digitally processed and stored, airlines can effectively manage and analyze this information to enhance operational efficiency, optimize flight scheduling, and improve the customer experience. For passengers with disabilities, digitizing airline information can facilitate easy access to various disability-related services without any barriers. This includes checking whether specific assistive devices are allowed on board. Achieving digital transformation of air-line information enables the fulfillment of two essential requirements for inclusive transportation: accessible centralized information and reliability.

The United Airlines has developed a user-friendly webpage dedicated to barrier-free travel information queries. This platform enables passengers to access detailed information regarding the airline's comprehensive range of barrier-free services tailored for different passenger profiles, as well as the availability of specific barrier-free equipment and wheelchairs on various aircraft types.

Furthermore, even if such inquiries are not made prior to booking, passengers can still utilize the app post-booking to retrieve relevant details about the assigned flight's accessible amenities and wheelchair compatibility. By offering this extensive content specifically designed for disabled travelers, United Airlines significantly mitigates potential issues during the booking process while reducing waiting times associated with service confirmation inquiries - ultimately enhancing overall travel convenience and cost-effectiveness.

### **6.1.2 One-click access to barrier-free services**

The survey revealed that certain airlines have complicated the application process for accessible services. In some instances, passengers are unable to directly apply for comprehensive accessible services throughout their entire flight via the airline's official website. Instead, they are required to submit documents and schedule two phone appointments. Researchers suggest that improvements can be made to streamline this particular application process by drawing inspiration from schemes implemented during the pandemic. According to the "Digital & Data Think Tank White Paper" published by IATA, digitalization within airlines has the potential to ultimately achieve the following streamlined process.

During the process of searching for travel options, airline systems are capable of responding to requests for accessible services or other inquiries made by an intelligent agent acting on behalf of a disabled passenger. Although the specific identity of the passenger may not be ascertainable at this stage, it is known that these requests are being made by a representative of a potential passenger (i.e., an actual human). Subsequently, the airline can integrate this standard with existing mobile applications designed for accessible travel, enabling disabled passengers to access their bookings and retrieve other relevant information from the application. Once the order is confirmed and the ticket is stored in the passenger's digital wallet, the airline's system can securely access this wallet to obtain any necessary credentials (such as medical certificates from hospitals or disability certificates issued by relevant authorities). Due to its secure connection with the wallet, the airline's system can provide updated service status information and offer alternative solutions. This approach ensures both flexibility and streamlined administration in line with inclusive transportation principles (IATA 2021b).

In order to facilitate the aforementioned process, airlines must establish connections with various airports and stay updated on changes in the requirements for accessible services provided by airport service providers. Similarly, airlines should also establish a linkage of identity information with websites associated with disabled people's associations. This way, when the airline receives passenger identity information, it can reflect the necessary services and assistance that may be required. However, some passengers may have concerns about completing the online application

for accessible services without human contact as they fear selecting incorrect tickets or services. Such worries can generate customer anxiety and stress (Heiets et al., 2022). Therefore, it is essential to provide manual verification services to minimize potential mental issues or errors for passengers.

### **6.1.3 Information Tracking Reminders and Analysis**

Through the analysis of survey results, researchers have identified that airlines face challenges in tracking the journeys of disabled passengers, resulting in a lack of timely reminders for deaf passengers and less smooth handover of barrier-free services. By leveraging data tracking technology, seamless handover of barrier-free services can be achieved for disabled passengers, leading to reduced waiting times. In case any issues arise during the process, they can be promptly addressed with alternative solutions implemented. According to IATA (2021b), the customer journey for digital barrier-free services is outlined as follows.

**Booking:** Automatically upload relevant documents and submit an application for accessible services. The airline accepts the service application and arranges staff for each stage.

**Bag drop:** Automatic seat selection and registration based on passengers' convenience or past preferences. Emphasizes baggage check-in to speed up service. Special service team members are promptly on hand to assist passengers with check-in smoothly.

**Check-in:** The airline app reminds disabled passengers to prepare and arranges staff for each stage as boarding begins. Passenger is immediately notified of disruption selected rail service, alternatives with costs and estimated journey times offered.

**Boarding and in-flight service:** The crew obtains relevant information and provides assistance to passengers with different types of disabilities. For example, preparing assistive boarding equipment and reminding deaf passengers to prepare for disembarking.

**Disembarking and transfer:** Ground staff are arranged to provide wheelchair assistance in a timely manner, ensuring seamless coordination between various steps to help wheelchair passengers disembark promptly. The airline's app provides timely reminders to passengers about various information and offers a flowchart for transfer procedures.

**Collect baggage and leave the airport:** Facilitate baggage collection and departure from the airport by providing clear instructions on the designated location and sequence for collecting baggage. Additionally, ensure that appropriate assistance is arranged for disabled passengers, either through staff escort or by offering wheelchair-accessible routes, based on their specific needs.

The digital customer journey for disabled passengers mentioned above effectively fulfills the functional requirements of ensuring short, predictable travel times, enhancing reliability, and providing flexibility in inclusive transportation. This ultimately enhances the overall customer experience for disabled passengers while simultaneously assisting airlines in achieving sustainable development.

## **6.2 Updating of Accessible Equipment**

In order to address the inadequate onboard assistive devices and incompatible boarding assistive devices faced by wheelchair passengers, it is imperative to upgrade the accessibility equipment. The enhancement of onboard accessibility equipment can also facilitate visually impaired passengers in obtaining information. The improvement of ground and boarding equipment, as well as the accessibility bus, requires joint efforts from both airlines and ground service providers. Both aspects are equally crucial. Upgrading in-flight equipment depends on increased financial investment by airlines and industry agreements that incentivize them to improve conditions. Upgrades to accessibility equipment also facilitate airlines in meeting the functional requirement of Physically accessible design, which constitutes a pivotal aspect of inclusive transportation.

### **6.2.1 Upgrading Accessible Boarding and Disembarking Equipment**

The IATA Standard Ground Handling Agreement (SGHA) is an agreement between airlines and Ground Service Providers that outlines the terms and conditions of contracted ground handling services. It consists of the legal and regulatory requirements, qualitative standards, and operational details. (IATA 2022a) By improving the accessibility of boarding and deplaning through the Standard Ground Handling Agreement (SGHA), airlines can take the following measures:

1. Enhanced Disability Access Standards: The SGHA comprehensively delineates the precise standards and prerequisites for ground service providers to deliver disability access services, encompassing the availability, upkeep, and operational criteria for assistive boarding devices, accessible buses, elevators, and other amenities.
2. Enhanced training requirements: Ensure that the SGHA incorporates provisions for regular training of ground service personnel on accessible services, encompassing the proper utilization of accessible equipment and techniques for delivering person-centered assistance, in order to ensure that all relevant employees possess the capability and knowledge to provide high-quality accessible services.
3. Establish performance indicators: Incorporate measurable performance indicators into the agreement, such as assistive device availability, response times, passenger satisfaction levels, etc.,



to assess the quality of ground service providers' offerings and ensure their compliance with airline company service standards.

4. Conduct regular inspections and audits: Airlines can utilize SGHA to request periodic service quality inspections and audits of ground service providers. This encompasses monitoring the utilization and maintenance of accessibility equipment, as well as assessing the service quality delivered by ground service personnel. A feedback system is in place to collect and leverage passenger input for evaluating and enhancing accessibility services. Such feedback can directly influence SGHA's performance assessment, ensuring continuous improvement in the service quality provided by ground service providers.

5. The SGHA incorporates a dispute resolution mechanism to facilitate airlines in resolving issues in an organized manner when ground service providers fail to meet the prescribed accessibility service standards outlined in the agreement. Simultaneously, punitive measures are established to incentivize compliance with the agreement by ground service providers. The SGHA promotes the adoption of cutting-edge accessibility technologies and facilities, encourages innovative solutions, and enhances overall accessibility services.

The SGHA can effectively ensure service quality and guarantee equal, respectful, and convenient travel experiences for all passengers, including those with special needs, by enhancing the requirements for accessible services. These strategies enable the achievement of physically accessible design as a functional requirement for inclusive transportation.

### **6.2.2 Accessible In-Flight Equipment**

Due to the fact that flight passengers' mobile network is usually turned off most of the time, they are unable to utilize the airline's app for real-time information retrieval. Airlines can facilitate communication for disabled passengers by incorporating assistive devices within the cabin. For instance, there exist contemporary artificial intelligence tools that aid disabled passengers in obtaining information promptly. Artificial intelligence assists disabled passengers through the following means: 1. Text-to-speech and speech-to-text: Artificial intelligence-driven technology for text-to-speech and speech-to-text has fundamentally revolutionized how visually impaired individuals access information. These tools convert written content into spoken language and vice versa, enabling auditory access to written materials. 2. Image recognition and description: Artificial intelligence-powered image recognition and description tools empower visually impaired individuals to explore the visual realm effectively. These technologies possess the capability to identify objects, people, and emotions depicted in images while providing valuable contextual details. Of course, it

is not solely artificial intelligence that can benefit airline passengers; airlines should also consider alternative approaches to ensure a seamless flying experience for deaf or blind travelers.

For passengers requiring wheelchair assistance to board the aircraft, many planes lack the necessary provisions for accommodating their personal wheelchairs. The quality of onboard wheelchairs significantly impacts the overall customer experience for individuals with limited mobility. The issue of discomfort experienced by mobility-impaired passengers due to onboard wheelchairs has long been recognized and addressed by the international community. All Wheels Up recently organized a gathering of industry leaders from both aviation and wheelchair sectors, aiming to explore discussions and innovations pertaining to wheelchair accessibility options. Representatives from Boeing, Airbus, Delta Air Lines, Southwest Airlines, American Airlines, as well as wheelchair manufacturers were all in attendance at this meeting. Regrettably though, there is currently no viable solution available for this problem.

### **6.2.3 Accessible In-Flight Entertainment**

The survey results show that there are limited in-flight accessible entertainment facilities on some Chinese airlines. To enhance the customer experience of disabled passengers and enjoy a comfortable and free flight, the customer experience of disabled passengers on airlines can be promoted through the form of cooperation supported by industry associations and government agreements. The US Department of Transportation (DOT) has announced that its negotiated rulemaking committee, the ACCESS Advisory Committee, has reached a significant agreement aimed at enhancing the accessibility of lavatories and in-flight entertainment on single-aisle aircraft. Presently, numerous airlines do not offer in-flight entertainment services with captions or audio descriptions for passengers. As per the agreement, certain movies and programs aired on these planes will be equipped with captions to enable deaf and hearing-impaired passengers to enjoy them. Additionally, audio description entertainment services will be provided to allow blind individuals to listen to a description of the movies and programs. Airlines may only play content without captions or audio descriptions if an alternative non-captioned or non-audio-described version cannot be obtained from the content provider. (DOT 2016)

### **6.3 Establish a robust oversight mechanism for ensuring accessibility services in enterprises**

The survey revealed that airlines were insufficiently attentive to service feedback and disregarded hidden barriers, primarily due to the absence of a dedicated department overseeing disability-related services and inadequate regulations incentivizing airlines to enhance their services based on input from disabled passengers. Consequently, establishing a regulatory framework for

accessible services becomes an imperative measure towards fostering sustainable development within China's aviation industry. The realization of a free, equal, and barrier-free flight experience for disabled passengers necessitates effective supervision from pertinent departments. To further enhance oversight and implementation of services provided to disabled passengers by airlines, the following measures can be undertaken:

1. Engage in communication with the aviation industry, disabled persons' associations, and other relevant sectors to formulate policies that incentivize airlines to upgrade their accessibility equipment and services. Regulatory authorities should collaborate with all stakeholders involved in the regulatory process, including airlines, disability rights organizations, airport management agencies, etc., to establish comprehensive and targeted regulations. These regulations should encompass not only specific operational procedures such as reservations, check-ins, boarding processes, in-flight services and disembarkation but also precise standards for required facilities; staff training content; and criteria for evaluating service quality.
2. Enhance the optimization of the complaint handling process. It is essential to not only monitor the feedback and management of complaints from disabled passengers within the airline but also establish a user-friendly complaint handling platform, encompassing websites, hotline telephone numbers, and mobile applications, to ensure prompt collection and resolution of complaints. Clearly define the timeline for complaint handling, promptly provide feedback on the outcomes of such handling, and thoroughly investigate reasons behind recurring complaints while demanding fundamental improvements from the airline.
3. Fine-tune the personnel training plan: Develop a comprehensive personnel training program to ensure that airline, airport staff, and service personnel possess a thorough understanding of the regulatory requirements for assisting passengers with disabilities. The training should encompass specialized knowledge of accessible services, operational skills, and service attitude, and should be conducted through realistic work simulations. Regular refresher trainings and evaluations should be implemented to guarantee up-to-date knowledge and services.

By implementing these measures, not only can the enforcement of airline policies regarding disabled passengers be enhanced, but also the advancement of accessible air travel can be promoted, ultimately achieving equal and convenient travel for individuals with disabilities.

#### **6.4 Closing words**

Upon reflecting on the time I spent writing my thesis, I had the privilege of encountering numerous remarkable individuals and experiences. In order to gain a deeper understanding of the theme and research content, I extensively conducted research and established new connections. As someone

who has always enjoyed good health, delving into how disability impacts daily life was truly enlightening. By comprehending the challenges faced by disabled passengers during air travel, I became aware of their countless inconveniences and hardships that had never crossed my mind before. Choosing this topic proved to be an enriching decision as it allowed me to gain profound insights into their lives while offering some assistance.

The process of writing a thesis is undeniably challenging. Throughout this arduous journey, I would like to extend my heartfelt appreciation to my supervisor, Hanna, for her invaluable guidance and unwavering support. Additionally, I am deeply grateful to Yujun Niu and Yuwei Qi for their generous provision of indispensable research materials and their instrumental assistance in the completion of this thesis.

The completion of this thesis has not only facilitated my personal growth and expanded my knowledge, but also holds the potential to assist airlines in enhancing the customer experience for passengers with disabilities and achieving sustainable development.

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## Appendices

### Appendix 1. Disability Passenger Satisfaction Survey in the Airline Customer Journey Map

## Disability Passenger Satisfaction Survey in the Airline Customer Journey Map

1. Your gender :

male

female

2. Your age group :

Under 18 years old

18~25

26~30

31~40

41~50

51~60

60 years old and  
above

4. Classification of mobility impairments

Vision disorder

Hearing disturbance

Communication disorders

Mobility disorder

Mental disorders



☐Other disorders

(People with an illness and are authorized to travel by medical authorities, but whose mobility is impaired due to pathology in progress; and people unable to stand or walk due to injury.)

5. Website Accessibility Design

very  
dissatisfied      ○1      ○2      ○3      ○4      ○5      very  
satisfied

6. Personal Information Inquiry

very  
dissatisfied      ○1      ○2      ○3      ○4      ○5      very  
satisfied

7. Human assistance

very  
dissatisfied      ○1      ○2      ○3      ○4      ○5      very  
satisfied

8. Personal Information Application

very  
dissatisfied      ○1      ○2      ○3      ○4      ○5      very  
satisfied

## 9. Accessible facilities

very  
dissatisfied      1      2      3      4      5      very  
satisfied

## 10. Inclusive communication

very  
dissatisfied      1      2      3      4      5      very  
satisfied

## 11. Flight Information Update Reminder

very  
dissatisfied      1      2      3      4      5      very  
satisfied

## 12. Timeliness of Help

very  
dissatisfied      1      2      3      4      5      very  
satisfied

## 13. The degree of interconnection between different services

very  
dissatisfied      ○1      ○2      ○3      ○4      ○5      very  
satisfied

14. Accessible boarding equipment

very  
dissatisfied      ○1      ○2      ○3      ○4      ○5      very  
satisfied

15. Accessible equipment operation proficiency

very  
dissatisfied      ○1      ○2      ○3      ○4      ○5      very  
satisfied

16. boarding priority arrangement

very  
dissatisfied      ○1      ○2      ○3      ○4      ○5      very  
satisfied

17. Priority disembarkation

very  
dissatisfied      ○1      ○2      ○3      ○4      ○5      very  
satisfied

18. Assistants assist

very  
dissatisfied                      ○1              ○2              ○3              ○4              ○5              very  
satisfied

19. Up-to-date information

very  
dissatisfied              ○1              ○2              ○3              ○4              ○5              very  
satisfied

20. Seating arrangements

very  
dissatisfied              ○1              ○2              ○3              ○4              ○5              very  
satisfied

21. Comfort of Accessible Facilities

very  
dissatisfied              ○1              ○2              ○3              ○4              ○5              very  
satisfied

22. Timely assistance seating arrangements

very  
dissatisfied      1      2      3      4      5      very  
satisfied

### 23. Communication with the crew

very  
dissatisfied      1      2      3      4      5      very  
satisfied

### 24. Auxiliary Technical Support

very  
dissatisfied      1      2      3      4      5      very  
satisfied

### 25. Timely Information Notification

very  
dissatisfied      1      2      3      4      5      very  
satisfied

### 26. Accessibility Assistance

very  
dissatisfied      1      2      3      4      5      very  
satisfied

## 27. Integrity of the Special Services Unit

very  
dissatisfied      1      2      3      4      5      very  
satisfied

## 28. Cohesion of Special Service Assistance

very  
dissatisfied      1      2      3      4      5      very  
satisfied

## 29. Transportation of auxiliary equipment

very  
dissatisfied      1      2      3      4      5      very  
satisfied

## 30. Understanding the scope of one's own rights and interests

very  
dissatisfied      1      2      3      4      5      very  
satisfied

## 31. The Way of Feedback Response

very  
dissatisfied    1        2        3        4        5        very  
satisfied

32. Problem solution

very  
dissatisfied    1        2        3        4        5        very  
satisfied

33. Problem Solving Results

very  
dissatisfied    1        2        3        4        5        very  
satisfied

34. Could you kindly provide me with your recommendations regarding airline accessibility facilities?

.