

**The Impact of Airport Service Quality on Passenger Satisfaction  
at the Hong Kong International Airport**

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# **DECLARATION**

## **STATEMENT 1**

This work has not already been accepted in substance for any degree and is not being concurrently submitted in candidature for any degree.

Signed: Angela Calista LAU

Date: 20 November 2022

## **STATEMENT 2**

This thesis is the result of my own investigations, except where otherwise stated by reference or acknowledgment. A bibliography is appended.

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## **ABSTRACT OF THESIS**

### **Purpose –**

This research aims to ascertain the attributes of airport service quality from the perspectives of airport passengers and to examine the impact of airport service quality on passenger satisfaction by conducting research on Hong Kong International Airport.

### **Methodology –**

An exploratory sequential approach was adopted in the research methodology. In the first phase, qualitative data was collected through interviews with experts from airport management and aviation related organisations. In the second phase, the phenomena discovered from the qualitative findings were further explored quantitatively by conducted a survey targeted at passengers of Hong Kong International Airport.

### **Findings –**

The research findings reveal that airport service quality has three major dimensions, namely function, communication, and diversion. Each of these dimensions positively influences airport service quality, which then positively correlates with passenger satisfaction.

### **Research significance –**

Given the increasing importance of passenger orientation in modern airports, finding an effective way to understand the attributes of airport service quality and the relationship with passenger satisfaction could put the airport in an advantageous position in today's competitive industry landscape.

### **Research implications –**

This research contributes to the management of airport operations by enabling a structured analysis of the composition of service quality using a passenger-centric approach. This would allow airport management to optimise resource allocation and prioritise business initiatives.

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# **The Impact of Airport Service Quality on Passenger Satisfaction at the Hong Kong International Airport**

## **1. Introduction**

In the most basic form, airports are in essence a piece of land for aircraft take-off and landing. However, the role of airports has evolved dramatically over the years. A few decades ago, an airport operated almost like a bus terminal, purely a mega-sized transportation facility where passengers could catch their planes. Over the years, airports have dramatically been transformed from mere aerodromes to complex infrastructures where travellers can indulge themselves in a wide range of activities. Given the pace of aviation development, it is crucial that airport operators remain sensitive to market changes and are able to adapt to the rapidly changing industry climate. Consequently, the changing nature and scope of airports require a prompt review of the airport operator's strategies to ensure that the provision of services are consistent with the future market trends.

As air transportation becomes more prevalent and accessible, passengers' needs and expectations continue to rise. Traditional aeronautical functions of an aerodrome have gradually turned into standard provisions that constitute only the bare minimum requirements that are expected of an airport. Hence, modern airports strive to remain competitive through expanding their scope of service to not only meet, but to exceed their customers' expectations. To achieve this end, a deeper understanding of the perspectives of the air travellers is required so as to attract and retain the passengers amidst the modern, competitive landscape.

The change in the industry environment could be traced back to the deregulation of aviation activities around the world which became visible during the past 50 years. In particular, governments' centralised control over airline and airport services have been significantly relaxed in places such as the US, the UK as well as other countries in Europe. As the degree of control by the government lessened, new forces began to emerge in the market, gradually exerting pressure on market players and increasing the intensity of competition amongst airports.

Furthermore, the challenges encountered by airports are amplified by the global surge in passenger volume. The robust growth in the number of global air passengers also has a profound impact on airport operations both in terms of increased efficiency demand as well as the ever more diversified customer needs to cater to. According to the International Air Transport Association ("IATA"), a globally recognised worldwide airline trade association,

the number of annual air travellers increased by 170% in 20 years since 1998 to reach 4 billion in 2017 (Garcia, 2018). Moreover, over the next 20 years, 44% of increase in passenger volume will come from China and India (IATA, 2019). Thus, the continuous growth in the number of travellers entail a more complex clientele and more intricate passenger profiles that an airport needs to satisfy. These future projections for growth in passengers were made before the covid pandemic.

Given that Hong Kong is a major gateway and transit hub connecting mainland China with the rest of the world, it could be reasonably expected that HKIA would experience strong associated growth. Passenger traffic at HKIA has increased by 50% in the past 10 years and is expected to surge from 75 million in 2018 to 102 million in 2030, according to a consultancy report (Airport Authority, 2018). Despite the impact brought upon by the recent COVID-19 pandemic outbreak, it remains inevitable that the overall development trend and ever-increasing traffic volume will continue to pose major challenges to operations efficiency.

Furthermore, as airports develop more commercial business aspects over time, increasing emphasis is placed on delivering non-aeronautical services to passengers to satisfy their diverse needs and to secure various commercial revenue sources. Several previous studies support the importance of fulfilling the service standards in commercial-related passenger activities as it is found to have considerable impact on the airport's income. For instance, ACI (2016b) finds that for every 1% of increase in passenger satisfaction, there is a 1.5% increase in the airport's non-aeronautical revenue, and that it is a more important factor that affects the revenue compared with the provision of more commercial spaces or an increase in passenger volume.

As a result of such evolution, airports have grown into some of the most complex and diverse facilities in the world today, which can be analogised to a “small city with all of the associated functions from receiving aircraft to providing chapels” (Pitt, 2001, p.150). Thus, one of the most challenging disruptions to the traditional airport services is the diversity created by the variety of passenger users, who vary from travel characteristics, travel purposes to consumer preferences. As the scope of airport services develops and becomes more extensive, the service environment also grows into one that is increasingly complex. Therefore, amidst the increasing standards and expectations as well as proliferating passenger throughput, the way that airport services are evaluated also needs to be critically reviewed. In this regard, this research aims to examine the impact of airport service quality on passenger satisfaction by conducting an empirical study on Hong Kong International Airport.

## **2. Background – Airport industry overview**

### **2.1 Overview**

Being at the heart of air transport, the airport connects a wide array of stakeholders and interacts with multiple customers, such as passengers, airlines, concessionaries, contractors and employees. To allow a more focused and in-depth analysis, this research aims at dissecting the relationship between the airport and its end-users, namely the airport passengers. Although most airport passengers go through a similar process at the airport, their profiles are vastly diversified owing to different travel purposes, demographics, travel experiences, etc. Nevertheless, the need to keep abreast of the developing profiles has been long undermined, largely owing to the fact that the aviation industry has traditionally been heavily regulated and well-protected from competition.

### **2.2 Inherent Market Advantages**

Traditionally, the aviation industry was deemed a highly regulated market that was essentially walled from competition. For airlines, the strongly centralised regime that governed the industry structure, flight routes and price-setting coupled with stringent security and operational protocols set exceptionally high barrier to enter into the market. As airlines were, and still are, one of the most fundamental business partners of an airport, the absence of new entrants created relatively stable market conditions in an airport setting. Naturally, airport operators would focus on providing stable aeronautical services to attract and retain airlines which are major stakeholders that do not only bring direct revenue to the airports, but also increase passenger footfall and generate cargo demand that complement the airport business (Barret, 2000; Jimenez, Claro and de Sousa, 2014). In this context, the sense of certainty about a steady growth and promised demand in the future inevitably led to a lack of competition between airlines as well as airports, who are accustomed to operating without a great deal of commercial pressure from the external environment.

Furthermore, it is generally believed that passengers' decision to fly at a particular airport depends little on the quality of its ancillary services. Instead, the choice of airport is often driven by the inherent qualities of the airport, such as its geographic location, flight scheduling as well as the connectivity with other airports. This phenomenon creates a general impression that airport services are demand-driven as opposed to supply-driven in a sense that an airport's lack of ancillary services will not deter the passenger from flying at the airport if it serves the purpose of a travel terminal. After all, airports are not a "destination" for travellers, but are instead a "transition point" where passengers seek to

connect from one place to another (Fodness and Murray, 2007, p.493). Therefore, airport management conventionally focuses on establishing “connectivity” by leveraging on the airport’s inherent advantages rather than diverting resources to upgrade non-core businesses that have nominal effect on the travellers’ choice of airport.

### **2.3 Liberalisation of the Industry**

Although connectivity remains as an integral contributing factor of an airport’s attractiveness, new market forces are gradually formed due to the liberalisation in the industry around the world. The US is one of the earliest markets that witnessed the advancement of air travel. In the early twentieth century, the US federal government established the Civil Aeronautics Board (CAB) to regulate interstate air travel, forming centralised policies to oversee flight routes, frequency and even airfare. However, recognising the need to popularise air travel, the landmark Airline Deregulation Act was passed in 1970s that lifted restrictions on route access and price-setting, resulting in the emergence of new airlines and fierce market competition that quickly drove prices down. Air travel was no longer a luxury that was only enjoyed by the privileged, which was evident in the upsurge of enplaned domestic passengers which increased by 87% from 1978 to 1993, while departing flights also increased by over 40% during the same period (Goetz and Sutton, 1997).

Moving on to 1980s, the UK also saw a significant change brought upon by the privatisation of the British Airports Authority (BAA). The BAA was established in 1965 through the Airports Authority Act with an attempt to assume ownership and responsibilities over four major airports originally owned directly by the government when the operations became too complex amidst the booming commercial aviation sector. Further to the Airports Authority Act which transferred the airport ownership from the government to the BAA in the capacity of an agency, the Airports Act of 1986 continued to push towards privatisation by dissolving the BAA, transferring its rights and liabilities to a newly-formed public limited company, BAA plc, which then went on to be listed on the London Stock Exchange with a capitalisation of £1,225 million (ICAO, 2013). According to Graham (2011), the top three objectives for airport privatisation are to improve efficiency and performance, provide investment and improve management or diversification. Graham (2020) opines that these were also the intended rationale for privatising the UK airports in the 1980s. As airport operations became more commercialised and diversified over time, the inherent advantages that airports had heavily depended upon would become less prominent in the changing environment.

Thereafter, the momentum to liberalise the aviation market continued around the globe, which was especially evident in the three liberalisation packages adopted by the European Council around 1990s (Chang and Williams, 2002; Burghouwt and de Wit, 2015). In 1987, the first package had removed the “single designation” provisions, allowing more airlines to operate the major international routes. After establishing a sound foundation, the second package which came into effect in 1990 further relaxed the regulations of fares and market access. The third package reinforced the concepts in the second package by implementing more specific measures, such as to adjudicate the licensing of air carriers and to ensure fair slot allocations by the airports in the Member States. Throughout 1990s, favourable economic and regulatory conditions allowed new players to enter the market which upset the monopoly of veteran airlines in Europe.

Calls for further liberalisation in the Chinese aviation market is gaining momentum in the recent decades. Following China’s entry to the World Trade Organization in 2001 which entailed liberalisation commitments, the Civil Aviation Administration of China, an industry regulator, commenced the process of restructuring Chinese airlines into three major clusters led by Air China, China Eastern Airlines, and China Southern Airlines, with an aim to promoting diversity in both domestic and international markets amidst the increasingly competitive environment (Zhang and Chen, 2003). Furthermore, Wang et al. (2020) point out that liberal aviation policies, such as the Belt and Road initiative, could bring significant positive impact to the Central Asia-China market. In particular, the robust, integrated transportation networks in the Greater Bay Area comprising 7 airports, 90 rail stations and over 250 passenger depots are also key to the achievements in its rapid economic development (Chen and Lu, 2020). Air transport in China has evolved and improved tremendously over the past several decades as a result of the worldwide momentum to deregulate the aviation industry as well as the national policies adopted by the government.

Overall, government policies and regulation certainly played a major role in opening the market to fresh forces and innovation in the recent decades, which in turn propelled airport management towards commercialisation (Barret, 2000; Burghouwt and Huys, 2003; Jimenez, Claro and de Sousa, 2014).

## **2.4 New Competitive Landscape**

As elucidated above, liberalisation of the industry has changed the market dynamics and consumers have become more empowered than before, bringing a real challenge to the unrivalled market position that has long been enjoyed by airports. As the industry is driven

towards commercialisation, the inherent market advantages once enjoyed by airports are diminished and a new landscape is gradually formed where airports experience fiercer competition with each other. With the growing number of airports and rapid development of other ground transportation means, passengers' loyalty to an airport is bound to be reduced as the consumers' bargaining power increases in light of more available alternatives. The overall business environment has become vastly different from the traditional market as customers now have more choices and have higher demands. Thus, maintaining customer satisfaction becomes a critical factor in retaining passengers who are now more willing to switch to other airports or even alternative modes of transportation to suit their needs.

Even though most airports still enjoy a degree of security in terms of passenger footfall, passengers nowadays have a great number of options in the choice of airport or even the mode of transportation to travel from one place to another. For instance, the Civil Aviation Administration of China (CAAC, 2021) reported that in the 8-year period between 2012 and 2020 alone, the number of airports nationwide increased substantially from 183 to 241, with the number of air routes surging by 120% to over 5,500. Not only that 88% of the population is covered by air transport, but an increasing number of residents from lower-tier cities now also have access to air travel, thus strengthening the connectivity between local, regional, and international hub airports in the country (CAAC, 2021).

In Hong Kong, although HKIA is the only commercial airport in the city, the rapid development of existing airports and construction of new ones in the Greater Bay Area in mainland China ought to be acknowledged. For example, Guangzhou Baiyun International Airport is undergoing one of the largest airport expansion projects in the country which involves the construction of a third terminal and two more runways by 2022. Furthermore, the increasingly mature land and sea transport, particularly the Hong Kong-Zhuhai-Macau Bridge that was commissioned in 2018 as well as the popularisation of high-speed rail, which effectively connect Hong Kong with mainland China, offer travellers abundant alternatives when planning their journeys. While these transportation developments could favour HKIA by expanding its catchment area, they could, *vice versa*, produce the same benefit for airports in the Greater Bay Area. Even though it could be reasonably assumed that there would be some degree of regional coordination under which the airports would have different market positioning, such as the signing of a Memorandum of Understanding between the Mainland and Hong Kong in 2019 (The Government of HKSAR, 2019), HKIA must not overlook the potential competition or, at least, comparison that passengers would make against the neighbouring airports. On a global level, better global connection and cheaper fares continue to contribute to the rising number of travellers and their travel frequencies. In 2000, an

average citizen travelled by air only once every 44 months in 2000, but in less than two decades in 2018, the frequency had doubled to once every 21 months (IATA, 2019). Overall, in light of the surge in the availability of airports and a more robust air travel network around the world, it is indisputable that travellers now have more flexibility in transportation arrangements, which airports must recognise and promptly review their business strategies accordingly in order to excel in this new competitive landscape.

Commercial pressure on airports is further accentuated by the increasing prevalence of air travel and growing sophistication amongst airport users, which continuously leads to higher demands in the service that is offered at the airport in addition to its primary function as an aerodrome. More educated customers mean more empowered customers who are aware of their options and expect the service providers to meet and exceed their expectations. In general, studies suggest that customers of this day and age exhibit more sophistication largely due to the access to information, aggregated learning, and greater exposure to other environmental factors in a marketplace where a myriad of goods and services are available (Amaldoss and Jain, 2005; Liu, 2010). In the same way, as airport passengers aggregate more travel experience at HKIA as well as other airports, they become more experienced and knowledgeable about the processes and touchpoints during their journeys which allow them to make comparisons and informed judgments on the service delivery.

Air travel is no longer a luxury commodity enjoyed only by the privileged as it has become more affordable and accessible over time and experienced travellers have higher expectations on airport services. As a result, the experience of passengers, as the end consumers of the services, have now come under the spotlight in the service delivery by airports. This created a new landscape in the industry and brought competition between airports, resulting in the growing emphasis on service quality and customer experience that would distinguish an airport from its counterparts. The earlier an airport recognises this phenomenon, the more advantage it could reap by making the most effective investments to address the changing needs and stay ahead of the competition.

## **2.5 Challenges Emerging from Passenger Increase**

Furthermore, the challenges encountered by airports are amplified by the expected exponential growth in the number of air passengers worldwide, which could have profound impact on airport management not only in terms of the demand for higher efficiency, but also the increasingly diversified and complex customer base. Prior to the outbreak of COVID-19, the aviation industry had continuously experienced dramatic growth in air traffic,

with the number of global passengers proliferating from 1.5 billion in 1998 to almost 4 million in 2017, representing an increase of over 170% in just two decades (Garcia, 2018). In 2016, ICAO had estimated that global air transport demand would increase by threefold in 30 years from 2020 (ICAO, 2016); while IATA had expected that the number of global passengers would more than double from 2020 to 2040 (IATA, 2019). Considering the grave impact of COVID-19 on air travel, the short-term recovery is expected to be slow, but the industry outlook remains largely positive in the long run. Taking into account the impact of the pandemic, IATA (2020) estimates that the global passenger throughput would grow by 1.5% to 3.8% over the coming two decades between 2020 and 2040. Given the massive global passenger base, this would still amount to a considerable impact on the increase in the actual number of passengers despite the slower growth rate.

It goes without saying that higher traffic throughput demands higher operational efficiency. In a near-saturated environment like the HKIA, any further increase in capacity could pose a grave challenge to airport management. This is since such enhancements inevitably involve an incredibly wide range of planning. In terms of hardware, the airport's planning pertaining to infrastructural development, procurement and maintenance planning of airport facilities and equipment, as well as the use of automation are all integral to whether the airport can successfully increase capacity to cater to more passengers. On the other hand, software enhancements including streamlining operational processes, improving resource allocation and providing adequate staff training are equally important in order for an airport to achieve maximal efficiency to handle the increase in traffic. Therefore, managing operational efficiency is the first hurdle that airport operators must overcome to cope with the growth in future passenger throughput.

Apart from operational efficiency, airport operators are faced with another challenge stemming from the increase in global air passengers, namely the complexity of clientele that grows alongside the increase in passenger throughput. Previous research has revealed that different passenger characteristics could have influence on their satisfaction regarding various aspects of airport service (Brida, Moreno-Izquierdo and Zapata-Aguirre, 2016; Jiang and Zhang, 2016; Lubbe, Douglas and Zameblis. 2011). Even though the extent of the effects could vary depending on different traveller characteristics, it is inevitable that the types of passengers would only become more complex, leading to more diversified passengers' needs that airports must cater to. In addition, it is also possible that as travel frequency increases and that passengers become more familiar with air travel, their expectations on the services provided by the airport would also become more demanding than before (Bezerra and Gomes, 2015, Jiang and Zhang, 2016). In short, given the massive



clientele, airport operators ought to carefully plan the ways in which they could develop an understanding of the passengers' needs, such as utilising established frameworks and databases that allow onward analysis and planning. Hence, it is not sufficient for airports to simply enhance operational efficiency to provide a satisfactory travel experience to passengers without adequate considerations on addressing the evolving passenger base and their corresponding characteristics.

## **2.6 Expansion of Airport Business Scope**

The increased complexity in the business nature as well as commercialisation in airport operations have led to airports competing at various levels (Halpern and Graham, 2018). This change in the industry means that airports now compete for passengers and flights which bring them steady aeronautical revenue, but an equally, if not more important source of income is the associated spending by these passengers in other ancillary activities that generate non-aeronautical revenue for the airports.

The extensiveness of the services now provided at airports is evidenced in the number of service attributes that are assessed in various both internal and external monitoring programmes. For instance, the Airport Service Quality survey established by the international airport association, Airports Council International ("ACI") as well as the global quality ranking programmed established by Skytrax, rate airports in seven to eight different service attributes, encompassing services across departure and arrivals processes, security and control, shopping, and dining as well as other facilities provision. Today's travellers desire a seamless, end-to-end airport journey where they can indulge in a wide range of activities. Thus, apart from continuously improving core aeronautical-related processes, airports must invest in other ancillary businesses to craft a customer experience that fulfils the passengers' needs.

Traditionally, airlines have been at the forefront of the service sector in the airport industry, investing abundant resources into elevating different aspects in the customers' experience, from loyalty programmes, omnichannel communication, to various customised in-flight services. In recent years, however, the airline industry has become more competitive than ever, and the emergence of budget airlines have driven many legacy airlines to also focus on price and convenience in order to maintain their market shares, which inevitably sacrifices customer service to an extent.

Nonetheless, the demand on customer experience by air travellers remains strong despite airlines' retreat behind cost-saving policies and airports who are responsive to this market

change have stepped into this space by fully capitalising on their customers' needs. For example, although check-in services are primarily managed by airlines, airport operators can also play a key role in accelerating the development of digitalised self-services to increase efficiency and customer empowerment by providing a centralised platform that can be used across different airlines. At HKIA, for instance, AAHK has developed self-check-in and bag-drop facilities which can be commonly adopted by participating airlines, significantly reducing the development and operating costs required by individual airlines while providing a common platform to passengers who can adapt to the use of these new technologies with ease regardless their choice of airline.

It is important to acknowledge that airports are no longer deemed as simple infrastructure providers but are instead complex and competitive businesses that provide multi-faceted services. As a result, passenger experience ought to be placed at the top of the agenda as it can directly influence the airport brand and essentially differentiate the airport from its competitors. Considering the increasingly extensive range of services provided at airports, practitioners must identify the critical moments along the airport journey that most significantly impacts the passengers' overall satisfaction. A thorough mapping of the passengers' journey is thus required for airport management to grasp the drivers of satisfaction at different touchpoints and to effectively allocate resources.

## **2.7 Impact of COVID-19**

The COVID-19 pandemic has ushered a wave of crisis around the globe and across numerous industries. Due to the implementation of travel restrictions to control the spread of virus, the air transport industry is amongst one of the most abruptly impacted sectors in the world. This does not only pose grave challenges to airport operators but also to all stakeholders in the aviation sector, forcing the players to urgently adjust to the crisis and adapt to the situation at an unprecedented pace. Although industry players had anticipated that traffic would quickly rebound as soon as the virus wore away, after almost two years into the pandemic outbreak, it has become apparent that the associated impact caused by the ongoing pandemic will last longer than the industry had hoped.

The adverse impact on air traffic volume and associated businesses thus far has been severe and disruptive. Between 2019 and 2020, the number of international and domestic passengers globally plunged from 4,500 million to 1,800 million, representing a 60% drop and over USD370 million loss in terms of gross passenger operating revenue for airlines (ICAO, 2021). Similarly, air traffic is a critical source of revenue for airports as aeronautical revenue is tightly correlated to the traffic volume. However, as airports are capital-intensive,

a large proportion of operating costs cannot be reduced at the same level as the decrease in air traffic. ACI (2021) estimates that airports suffered a revenue contraction of approximately USD130 million, or 65%, in 2020 compared with the original forecast of USD200 million that had been projected before the pandemic outbreak. Overall, the traffic as well as financial shortfall created by COVID-19 is stark and airports must stay proactive formulating strategies to return to the trajectory of growth.

Apart from the indisputable setback in traffic, COVID-19 might also affect travellers' behaviours and expectations on airport services, especially in the realm of health and safety. The growing emphasis on hygiene in airport services is evidenced by the issuance of directives as well as the creation of hygiene-related awards and accreditation by international organisations. To promote the importance of hygiene, SKYTRAX introduced the COVID-19 Airport Safety Rating which provides an assessment and certification of the airport's implementation of safety measures with reference to international industry standards, with more than 50 airports being awarded the rating as of October 2021 (SKYTRAX, 2021). Similarly, ACI launched the Airport Health Accreditation Programme in July 2020 with a view to allowing airports to systematically validate the measures taken through measurable indicators. These recognitions and accreditations enable airports to provide reassurance and confidence to travellers and other stakeholders and demonstrate their efforts in hygienic measures in a methodical, established manner.

Nevertheless, the greater emphasis on airport cleanliness inevitably increases pressure on airport operators in terms of manpower and financial resource allocation. It is not difficult to imagine that apart from stepping up manual cleaning of high-touch facilities, other autonomous sanitising and disinfection tools, such as disinfection channels, cleaning robots and antivirus coating all require substantial investments. Furthermore, capital-intensive technological developments on a "touchless" airport experiences involving self-services and biometric checks that minimises physical contact might be accelerated as one of the measures to enhance the hygiene levels for travellers. All in all, as airports begin their recovery plans, investments in the protection of health and safety of travellers and the airport community will inevitably require more attention from airport managers than the pre-COVID era, while further changes on passengers' expectations on other aspects of airport services ought to be closely monitored.

## **2.8 Hong Kong International Airport**

Hong Kong International Airport ("HKIA") serves as the only commercial international airport in the city of Hong Kong. Since the relocation of the old Kai Tak International

Airport, HKIA commenced operations on the reclaimed island Chek Lap Kok after an overnight transition in July 1998. The airport under the management of Airport Authority Hong Kong (“AAHK”), which is a statutory body established in 1995 under the Airport Authority Ordinance. HKIA has a site area of 1,255 hectares of which 730,000 square metres are taken up by terminal buildings. The two runways were built to accommodate the largest aircraft types in the world and the Civil Aviation Department that governs aircraft movement gradually increased the maximum runway hourly capacity since commissioning, leading up to a peak of 429,000 flight movements in FY2018/19 (Airport Authority, 2019).

Hong Kong possesses strong inherent advantages stemming from its geographical location. Unparalleled by other airports, HKIA has exceptional air connectivity that reaches 50% of the world’s population within five hours of flying time. As of FY2018/19, HKIA has over 120 operating airlines and 220 destinations worldwide. In the same year, the passenger traffic stood at a record-high 75.1 million. After surpassing Memphis Airport in 2010 as the world’s busiest cargo airport, HKIA continued with the momentum and handled 5.1 million tonnes of cargo and airmail in FY2018/19.

Apart from air-to-air transport, HKIA has developed a mature intermodal connectivity with strong links with the Pearl River Delta area which can be connected seamlessly by coaches, limo and even ferries to and from HKIA. For instance, the airport caters to sea-to-air travellers through ferry services that connect to nine ports in the Greater Bay Area as well as land-to-air passengers travelling to and from the Hong Kong-Zhuhai-Macao Bridge, thereby further expanding its catchment area. Coupled with the development of the Three Runway System, it is anticipated that the flight movement capacity at HKIA would be increased to 620,000 per year, translating to the throughput of 100 million passengers and 9 million tonnes of cargo by 2030 (Transport and Housing Bureau, 2015).

Having proved its traffic capacity and excellence in operational efficiency, HKIA begins placing increasing attention in enriching travellers’ experience at the airport. Over the two decades following its commissioning, HKIA has turned into one of the most renowned airports in the world, accumulating over 70 “World’s Best Airport” awards. In AAHK’s annual report FY2019/20 (Airport Authority, 2020), elevation of the airport experience remains a strong, distinct theme throughout the publication, revealing a series of infrastructural and technological enhancement projects that aim at offering an aesthetic environment and enlivening the passengers’ journeys. Its efforts to provide services in a customer-oriented approach is well recognised internationally in various awards and accreditations, such as ACI’s Airport Customer Experience Accreditation obtained in March 2021 and Airport Health Accreditation in September 2021. Achieving customer satisfaction

by placing passengers at the centre of its business strategy thus appears to be one of the key development directions for HKIA.

This research aims to examine the concepts of service quality and customer satisfaction by conducting a study on HKIA on the ground that it is one of the top aviation hubs in the world that demonstrates both maturity in functionality and advancement in pursuing passenger satisfaction. It is therefore anticipated that the professionals working at the airport would be able to provide valuable insights into the management of airport services, whilst passengers who have had the opportunity to experience the wide variety of services offered at HKIA would also be able to share their perspectives based on first-hand experiences. Overall, HKIA is deemed to be an appropriate setting with optimal research conditions that could yield valuable results and findings in the current study that probes into different facets of airport services.

## **2.9 Airport Authority Hong Kong**

Managing one of the world's busiest airports requires prudent management and expertise. For this purpose, the Hong Kong government established Airport Authority Hong Kong ("AAHK") in 1995. As such, AAHK is a statutory body governed by law, namely the Airport Authority Ordinance, and is regulated by the government's Civil Aviation Department ("CAD") to ensure that aviation safety standards are met. However, even though AAHK is overseen by the government, it is deemed as a half-governmental body that is financially independent and endowed with sufficient autonomy and expertise to operate the airport on its own.

As an airport operator, the core role for AAHK is the management of aeronautics-related business. The crux of any airport is the airfield, which includes runways, taxiways, and the ramp. Except air traffic control, which is managed by the CAD, AAHK operates and manages the entire airfield including safety and service delivery, provision and maintenance of infrastructure as well as daily ramp operations. An extended arm of the airfield is the terminal buildings, within which AAHK is responsible for the provision of facilities, flow management and service delivery.

Moreover, AAHK also manages non-aeronautical activities that complements the provision of a more extensive airport service scope. Retail and catering offerings are a major commercial stream that is becoming increasingly important to passengers. In this respect, AAHK manages the trade-mix planning, licensing, onward property management as well as marketing and advertisement. Furthermore, HKIA has grown into the world's most prominent cargo hub in 2018 with cargo tonnage exceeding 15% of that of the second busiest

cargo airport, Memphis International Airport, which is the central logistic hub for FedEx Express. To this end, AAHK is responsible for managing the cargo franchisees, cargo facilities and the expansion of freight routes. Additionally, AAHK also manages property development in and around the airport, with the recent development to turn the city airport into an “airport city”, an integrated commercial complex adjacent to the airport, being a prominent project at hand.

All in all, AAHK is entrusted, by virtue of law, with the authority and responsibility to operate and development the airport with a view to maintaining HKIA’s status as an international aviation hub. This is evidently translated into its vision, which is “to strengthen HKIA as the leading international aviation hub and a key engine for the economic growth of Hong Kong”.

## **2.9 Airport Industry – Porter’s Five Forces Analysis**

To fully understand the relationship between an airport and its passengers, it is important to first establish a holistic view of the operating environment and the ways in which the competitive forces in the industry interact with each other. The five forces framework developed by Porter (1979) lays the foundation for analysing an organisation's standing in its external environment by evaluating the competitive forces encountered by the market players, including the power of suppliers, power of buyers, threat of entry, threat of substitutes, and intensity of rivalry. The model is a powerful tool that allows managers to identify the relevant industry players and to assess the market outlook amidst a competitive landscape using an outside-in perspective (Johnson, Scholes and Whittington, 2008). Despite modern development and the growing significance of globalisation and technology, the model remains highly relevant in today's business world and cannot be considered outdated, although the degree of impact varies between different industries (Mohapatra, 2012). Therefore, this section aims to analyse the airport industry using Porter’s Five Forces Model to gain a clear understanding of the stakeholders in the airport industry and the competitive forces surrounding the airport operator.

### **2.9.1 Power of suppliers**

Powerful suppliers enjoy stronger bargaining power against the industry players, which can consequently reduce the profitability of the industry. Suppliers of the aviation industry are deemed to have medium level of such power.

An airport has numerous suppliers that provide different types of services at the airport, including airlines, ramp handing operators, retail, and dining operators, to name but a few.

Amongst the supplier, it could be reasonably deduced that airlines enjoy that most power on the ground that the role of airlines is essential, and the absence or failure of their services could paralyse, or at least gravely impact the airport's fundamental service provided to the passengers. Other suppliers such as ramp handling operators who handle airfield and baggage related operations and maintenance suppliers who manage airport facilities and systems also enjoy relatively high supplier powers. Regulatory and licensing threshold for these types of suppliers are also likely to be high, which increases the switching costs for airport operators. By comparison, retail and dining operators have lower supplier powers since the services are non-proprietary and competition amongst the suppliers is strong.

Despite the inherently high supplier powers on the whole, airport operators do exercise a degree of control over airlines and other suppliers, for example through Memorandums of Understanding and service contracts that impose actionable obligations on these stakeholders. Furthermore, airport operators might also be endowed with regulatory authority by virtue of international aviation regulations and local government policies. Take Hong Kong as an example, Airport Authority Hong Kong is empowered by the Airport Authority Ordinance and Bylaws to manage, *inter alia*, the daily operations at the airport through establishing its own rules and regulations. As such, suppliers must adhere to certain rules and regulations enforced by the airport operator should they wish to carry business despite their status as suppliers of the airport, which curtails their power to an extent.

Even though the impact of disrupted supply on airport operations is high, suppliers are subject to a relative high degree of control by airport operators. Thus, the overall power of suppliers is medium.

### **2.9.2 Power of buyers**

Powerful buyers can exert pressure upon the industry players and make the industry less profitable. To produce a clear analysis, the definition of buyers is limited to airport passengers only; other potential customers, such as cargo operators who require the airport's services, or even other airports which procure airport consultancy services, are excluded from the analysis.

As discussed in the previous sections, from a traditional point of view, the power of buyers is low primary since airport passengers do not have a great deal of choices over which airport to choose, nor do they have substantial influence over the standard of services provided by the airport. Even though airport passengers generate important aeronautical income for airports, they generally have negligible power as consumers.

The situation, however, has changed considerably over time as airports are now encountered with more commercial pressure to satisfy their customers largely owing to the increased accessibility and prevalence of air travel. Passengers now expect a large variety of services to be made available at the airport which are, such as staff attitude, shopping and dining options and terminal ambience, all of which are be considered as ancillary services that had not traditionally been a focus at airports. Additionally, the rapid development of land and sea transport as well as new airports allow passengers to have more alternative options when they travel. Seeing that non-aeronautical revenue has become a critical source of revenue to airports and that passengers' opinions carry increasingly more weight in leading international organisations when evaluating the performance of an airport, airport services are becoming more customer oriented.

Taking into account the diminished inherent advantages enjoyed by airports as the service providers and the evolving industry landscape, the overall power of buyers is considered as medium.

### **2.9.3 Threat of entry**

This is to examine whether or not the market is easy for new competitors to join in. The more difficult it is to enter the market, the less likely that the market share will be upset. In the airport industry, the threats of entry stemming from the opening of new competing airport can be assessed by evaluating the barriers to entry, including government policies, access to distribution and capital requirements.

The higher the barriers for new entrants, the lower the threat of entry. The first barriers that new entrants must face in the airport industry are those dictated by government policies and international aviation regulations. It is not difficult to imagine the high thresholds for expanding an existing airport or building a new airport, concerning a wide range of factors, such as land availability, funding, air rights, environmental considerations, to name but a few. Government policies are also critical to the access to distribution, which for an airport predominantly refers to the availability of airspace and hence the flight routes that can subsequently be distributed to airlines.

Assuming that government policy is in favour of the airport's development, other barriers to entry remain prominent, such as the high capital requirements and the need to recruit suitable management personnel given that airport operations often involve specialist knowledge and expertise. Even with government support, such developments require a relatively long period of preparation time. Beijing Daxing International Airport, one of the biggest airports in the world commissioned recently in 2019 and designed to reach an ultimate annual



capacity of 100 million passengers, cost approximately US\$17.5 billion to build (Beijing Daxing International Airport, 2021).

Nonetheless, despite the *prima facie* high entry barriers, the threat of new entrants cannot be fully dismissed. As mentioned in the previous section, the number of airports in mainland China surged by 58 during 2012 to 2020, equivalent to an increase of over 30%; while the number of air routes also experienced a growth of 120% during the same period, complementing with the increase of airports (CAAC, 2021). In addition, Beijing Daxing International Airport which is a mega-hub consisting of four runways and an enormous terminal building covering 700,000m<sup>2</sup> was constructed at an unprecedented speed in just five years (Lord, 2019). Furthermore, in Europe where smaller, regional airports are deemed as a vital part of the aviation system has also seen expansion of airports and transformation of military airports into commercial ones (Niestadt, 2021), which is evident in respect to the support and endorsement by governments. Ultimately, sufficient attention must be paid to government policies, which is the most important factor determining the entry barriers in the aviation market.

Considering all the above factors, the general barriers to entering the market are high due to stringent regulatory requirements, access to distribution and high capital investment, thus yielding an overall low threat of entry. The actual level of threat, however, ought to be assessed with abundant consideration of the contemporary government policies, which could significantly influence the emergence of new entrants. As such, in locations such as the Greater Bay Area in which HKIA is situated and where government support on nearby airport development is strong, the threat of entry is greater.

#### **2.9.4 Threat of substitutes**

Substitutes are products or services that are different from the current offering yet are able to satisfy the same needs required by the customers. Hence, the threat of substitutes is high when other players can offer more attractive alternatives. Although airport services might appear to be one-of-a-kind, the extent to which the airport business is threatened by potential substitutes depends on whether consumers are convinced that air travel cannot be replaced by any other viable alternatives. For airports, the potential threat of substitutes comes from other available transportation services mainly in road, rail and sea travel.

Rail transport is broadly recognised as a substitute for passengers requiring short-haul flight (Yang and Zhang, 2012). For instance, research has shown that the high-speed rail service between London and Paris provides a viable alternative for travellers, creating competition to both low-cost and legacy airlines and bringing challenges to airports in the intercontinental

market (Behrens and Pels, 2012). In Asia, a study conducted by Fu, Zhang and Lei (2012) suggests that high-speed rail service in mainland China will bring competition to airlines in terms of network connectivity, required travel time and travel expenses, especially in short to medium routes. The authors further suggest that the aviation market could, however, survive the entry of national railway services and the ensuing competition through transformation from point-to-point to hub-and-spoke networks as well as configuration of international network to reduce reliance on the domestic market. Similarly, in the context of Korea's rail and air services, the introduction of the high-speed rail, Korea Train Express, in 2004 was found to have contributed to the reduction in the short-haul, domestic air demand coupled with the new highways and expansion of national truck routes (Park and Ha, 2006).

For medium to long haul travel, however, the threat of substitute is relatively low since other transportation modes are unlikely to be able to offer the same or service level than that offered by air travel. For example, a trip from Hong Kong to Beijing would take approximately 9 hours by high-speed rail but only 3.5 hours by air. Considering the simpler and shorter processing time in railway service, this alternative travel option might still not be attractive enough for travellers to consider it as a substitute for air travel. This is contrasted by shorter trips where the advantages of road, rail and sea transport are more apparent than those of air travel, particularly with the commissioning of the high-speed rail service as well as the Hong-Kong Zhuhai Macau Bridge in 2018, which effectively provide faster, more convenient means of cross-boundary transport to and from Hong Kong and mainland China. Apart from travelling time, factors such as the operational frequency and service reliability would also affect passengers' preferences over the transportation mode (Park and Ha, 2006), thus the impact of alternative services ought to be evaluated holistically.

On the whole, airports are hard to substitute given the unique nature of air transport services. The threat of substitute for long-haul flights is low given that the possibility of finding a more attractive means of travel is low. In contrast, the threat of substitute for short-haul flights is greater as air travel could experience a higher chance of being substituted by other transportation options, such as road, rail and sea transport which could offer similar or better connectivity, shorter travel time and lower travel fare.

### **2.9.5 Intensity of Rivalry**

The intensity of rivalry influences the environment of the market and the ability of existing industry players to achieve profitability. In the airport industry, this requires an assessment of the level of competition between different airport operators and the degree of pressure they exert on each other in gaining more business.

From a traditional point of view, and a view still held by many today, airports are monopolies operating in a stable environment where the number of competitors is limited and that in any case, there is a high degree of certainty over the growth in traffic demand and the associated revenue. For decades, airports have assumed a passive role considering the common view that little can be done by an airport to increase demand or to divert business from other airports (Tretheway and Kincaid, 2016). Coupled with the high barriers to enter the market, the number of players is well-controlled, resulting in airports typically only serving their own catchment areas without the need to compete with other airports for passengers. In areas where there is more than one airport, there is often a reasonable degree of coordination between the operators so as to differentiate their services positioning to maximise synergy.

In addition, the competitiveness of an airport is also determined by its size which largely influences the handling capacity such that rivalry between airports is, to an extent, limited between airports of different sizes. Even if a smaller airport is seen as more attractive than a larger one, the former could only absorb limited passenger throughput until capacity saturation. Wiltshire (2018) opine that even after the market liberalisation in Europe, little evidence suggests that secondary airports can effectively compete with primary ones. While operational enhancement could increase the airport capacity, further infrastructural expansion could be difficult and time-consuming. For instance, HKIA's proposal revealed in the Master Plan 2030 (Airport Authority, 2021) to build a third runway sparked public controversy and underwent fierce scrutiny, lobbying, consultation before it was eventually approved.

Nevertheless, despite the seemingly lack of competitive forces in the market, the industry dynamics have changed dramatically over the recent decades after experiencing market liberalisation, gradually leading to the expansion in airport business scope as well as the evolving passenger characteristics. Considering the movement towards commercialisation, airports are encountered with more pressure to increase competitiveness in the market so that they could attract more passengers.

While passenger volume remains a key indicator of the performance level of an airport, the overall travel experience perceived by passengers is now equally important to airport operators. Branding and marketing are no longer an oxymoron for airports, but if pursued effectively, could enable an airport to stand out from its counterparts and impress the passengers. In sum, while there is increasing competition in traffic throughput between airports, the performance of an airport is no longer only measured by its passenger handling capacity, but also the quality of service as a total experience.

### **3. Research Question, Aim and Objectives**

#### **3.1 Research Aim**

Given the increasing importance of passenger orientation in modern airports, finding an effective way to understand the attributes of airport service quality and the relationship with passenger satisfaction could put the airport ahead of today's competitive industry landscape. Therefore, this research aims to examine the impact of airport service quality on passenger satisfaction by conducting research on Hong Kong International Airport.

#### **3.2 Research Question**

The type and nature of the research problem play key roles in designing the research and subsequently the selection of appropriate research philosophy (Saunders, Lewis and Thornhill, 2009). In light of the research aim set out above, this research aims to shed light on a core question:

- How does airport service quality affect passenger satisfaction?

#### **3.3 Research Objectives**

In order to answer the research question, the following objectives will be explored:

- (i) To ascertain the attributes of airport service quality from the perspectives of airport passengers
- (ii) To examine relationship between each dimension and airport service quality
- (iii) To analyse the impact of airport service quality on passenger satisfaction

#### **3.4 Current Research Gaps**

In a comprehensive literature review that comprises 380 documents regarding airport performance, Bezerra and Gomes (2016b) highlights the persistent emphasis of objective 'benchmarking' in most previous studies. Due to the weak competition amongst airports in the earlier days, research had been scarce and interest in airport performance had been largely limited to the measurement of operational efficiency. It is not until the millennial era that researchers begin to recognise that benchmarking based solely on efficiency yields limited value as it undermines the multidisciplinary nature of airport business (e.g. Bazargan and Vasigh, 2003, cited in Bezerra and Gomes, 2016b). Fodness and Murray (2007) addresses to the lack of attention given to passengers' perspectives in evaluating airport services, as objective indicators per se are insufficient to conceptualise the qualities of a *service* industry.

Despite the gain in momentum in a passenger-centric approach and the introduction of various under-explored dimensions, the traditional benchmarking approach remains deep-rooted in the industry. Even when the service quality is examined under a broader perspective that encompasses diverse service qualities, the concept remains superficial seeing as the service attributes are mostly developed through discussions with experts and professionals rather than with passengers. For example, the research of Rhoades, Waguespack and Young (2000) identifies four key quality factors including (1) passenger services such as dining, toilets, and shopping, (2) access and transportation, (3) flight related services such as baggage claim, boarding areas and information displays and (4) inter-terminal transportation. Nevertheless, these attributes are developed by a questionnaire filled out by airport operators and consultants, who first rate the importance of the pre-identified factors in their own capacities as industry professionals, and then answered the same set of questions again from the perspective of passengers. This limitation is in fact acknowledged by the authors who point out that experts were targeted for the ease of accessibility, but that they might fail to recognise or understand the service attributes that matter to the passengers. In other words, the fact that passengers are not involved at all in the data collection hampers the objective of this research, which is to design an index of quality factors “from the perspectives of all airport service customers”. Notwithstanding the apparent limitations, the research remains an authoritative and frequently cited piece of work in the realm of airport service quality.

In a more recent study by Fernandes and Pacheco (2010) conducted on six international airports in Brazil, passengers are again not included in the data collection process, as both the generation of primary indicators and the subsequent weighting of the same are developed through discussion with experts in the airport industry only. Similarly, Yeh and Kuo (2002), another frequently cited research in defining airport service quality, does not include any passengers in forming the key service categories, although the research is one of the few studies that has moved away from simple benchmarking and opens to qualitative measures of airport services.

Bearing in mind the abovementioned phenomenon, the service quality attributes proposed in this present study are based on selected research that have considered passengers’ perspectives, so as to ensure that the indicators present passenger-centric qualities. The preliminary conceptual model of the present study is mainly built upon the final model postulated by Fodness and Murray (2007), which is developed by qualitative research with passengers and then refined after exploratory and confirmatory factor analyses. However, since this research is based on a US airport, other research is also used to supplement the

item pool to offer a more holistic, global view in the contemporary landscape. Furthermore, as air traffic volume continues to proliferate at a phenomenal speed in the recent decade, coupled with the rapid development in technological applications at airports, it is inevitable that passengers have developed new perspectives towards what an airport ought to deliver in its services. In a business setting that increasingly emphasises customer experience in addition to the traditional service scope, more research on airport service quality ought to be conducted in order to portray a more complete, contemporary picture on this concept.

### **3.5 Research Significance**

Customers are key to the success of a business and the importance of service quality perceptions as well as their impact on customer satisfaction ought to be properly acknowledged. Just as the launch of a successful product starts from identifying the customer needs that stimulate the onward product development, attractive service provision also requires a detailed understanding of the end customers to cater to their needs. This echoes Abell's framework which proposes a step-by-step approach in developing the appropriate business strategies. With customer experience emerging as one of the fastest growing phenomena in the mainstream of the service industry, the way that businesses identify with their customers is just as important as the quality of the service itself. A successful business must, therefore, strive to address the needs of the end users and manage their perceptions to be able to fully resonate with its customers.

In relation to the airport industry, the activities encountered by passengers at the airport as well as the ways in which they interact with the airport contribute to the definition of their customer experience. Thus, airport operators must strive to create the airport journey from the perspectives of the end users in order to provide adequate facilities and services that match the passengers' needs, or more importantly, ones that the passengers perceive as important to them. This unequivocally requires having a thorough understanding of the customers' characteristics, needs and viewpoints. The importance for an airport to understand its customers and to maintain customer satisfaction, in the same way that other businesses should, is elucidated by Kirk (2013) in three different aspects, namely customer loyalty, service differentiation and profit generation.

#### **3.5.1 Establishing customer loyalty**

Briefly, customer loyalty might not appear as a priority for airports that have countless other important agenda items lining up in their business plans. This is perhaps rooted in the conventional view that passengers give little thought over which airport to fly at given that

the choice of airport largely depends on whether the airport can offer the flight connectivity required by the passengers. Thus, attempts to make passengers loyal to an airport might seem uncustomary and might not appear attractive to airport operators who are required to allocate resources in the most effective way.

Nevertheless, it has been mentioned in the previous chapter that the inherent market advantages traditionally enjoyed by airports are gradually diminishing with the emergence of new market forces. Over time, more airports have been able to acquire greater freedoms of the air, strengthen the airline network, develop more mature land-to-air and sea-to-air transportation links, while expanding the service offering to passengers with a view to becoming more competitive. Considering the continuous development of the industry, airports will undoubtedly be able to create a competitive advantage by gaining an early start in building up customer loyalty that could attract and retain more passengers to use the airport recurrently.

### **3.5.2 Differentiating services from competitors**

Furthermore, as the passengers become more experienced consumers and have more bargaining power, there is higher demand on airport operators to provide better quality services and offer greater value propositions compared with other airports. Passengers begin to look for a total travel experience rather than mere provision of service and it is inevitable that passengers would compare airports with one another even if they are not always deemed as direct competitors. Apart from their personal experiences, other indicators such as internationally recognised accreditations and awards would inevitably affect the customers' impression on the airport.

In recent years, a number of industry recognitions have been designed to evaluate the performance of airports specifically based on passengers' opinions and experiences, reflecting the increasing acknowledgement from the suppliers in the market. For instance, the Airports Council International ("ACI") which runs a globally recognised and renowned Airport Service Quality ("ASQ") programme that promote airport excellence has been advocating the importance of passenger satisfaction by recently introducing the Airport Customer Experience Accreditation, which aims at recognising and improving airports' long-term capacity in this aspect.

Through these contemporary measurement aids, airport operators could effectively benchmark their performances against other airports and better position themselves in the market through a structured framework so as to differentiate their services and deliver a unique experience to the passengers that set them apart from their competitors.

### **3.5.3 Increasing revenue**

It can be safely assumed that if an airport successfully attracts and retains more passengers as suggested above, the associated revenue will also be increased as a result. The most direct increase in revenue would be from traffic-related aeronautical revenue, such as the standard service and security charges paid by the passengers which are usually embedded in the airfare, as well as aircraft landing and parking fees paid by airlines since the number of flights would also increase. The revenue generated by traffic is considerably straightforward and secure, while the growth rate is also relatively predictable depending on the volume of passengers and flights handled by the airport.

Furthermore, stronger customer loyalty could also have a significant impact on non-aeronautical revenue and increase the airport's profits. It is broadly accepted that customer satisfaction has a positive impact on customer revenue (Ittner and Larcker, 1998; Reichheld and Teal, 1996). For example, Williams and Naumann (2011) find a solid correlation between satisfaction levels and the financial performance of a large *Fortune 100* company through a longitudinal analysis. Edvardsson *et al.* (2000) even puts forward that the relationship between satisfaction, loyalty and performance is evidently stronger for services than for products.

Although revenue increase owing to customer satisfaction is more difficult to predict than straightforward earnings such as the aeronautical revenue described, its impact should not be overlooked. In fact, Otto, Szymanski and Varadarajan (2019) point out that primary studies can be useful in providing point estimates of satisfaction outcomes that are specific to the firm, for example by estimating that a one-point increase in customer satisfaction leads to a certain amount of change in revenue or shareholder value. In research commissioned by the ACI (2016b) that analysed annual global surveys carried out at over 300 airports worldwide in which over half a million passengers participated annually, it was found that passenger satisfaction and airport revenue form a positive relationship. As an estimation, the non-aeronautical revenue of an airport grows by 1.5% for every 1% of increase in the global passenger satisfaction mean, which is more significant than the impact brought about by expansion of retail space and increase in passenger throughput (ACI, 2016b).

### **3.5.4 Overall practical implications**

Airport service quality is no longer based solely on objective benchmarks such as operational efficiency, but increasingly creating a complete airport experience, which involves a number of domains ranging from fundamental customer understanding, governance, service design



and innovation, to stakeholders' collaboration. Thus, as the components of airport service quality evolve, airport operators must constantly review their business strategies to ensure that the services offered to the passengers stay relevant to the passengers. Even though passenger satisfaction is not the only indicator of the performance of an airport, it certainly is an integral factor that reflect the service quality delivered to the passengers.

All in all, the significance of the current study lies not only in contribution to academic research, but essentially in the practical implications that it entails and insights that airport management could draw upon, which serves as a contribution to the ongoing development of the aviation industry. Given the extremely wide scope of business of modern airports, it is essential that airports grasp a thorough understanding of the multi-faceted business from the perspectives of their customers in order to allocate resources wisely and deliver the services in a cost-effective way.

Therefore, through analysing the components of airport service quality and the way that these components affect passenger satisfaction, airport operators could gain insights into future development plans and subsequent implementation of services using a passenger-centric strategy. By rigorously analysing and answering the research questions set out in the previous section, the study aims to provide practical guidance to industry players and to establish a framework under which airport operators could seek to enhance service quality through a systematic approach.

## **4. Literature review**

### **4.1 Overview**

The purpose of this chapter is to synthesise and present a cohesive summary of arguments and ideas of existing knowledge pertaining to the research topic. By gaining an understanding on the existing research on service quality and customer satisfaction, this chapter aims to conceptualise the research and formulate the hypotheses. A preliminary conceptual model is presented at the end of this chapter as a foundation for the onward qualitative and quantitative research.

### **4.2 Customer Analysis**

#### **4.2.1 Application of Abell's framework**

Derek Abell's (1980) seminal work endows an organisation's business with a three-dimensional definition. In essence, this framework begs three questions when analysing a business:

- Who are the customer groups?
- What are the customer needs?
- How can the needs be satisfied?

The framework is strategically important to an organisation on different levels. On a corporate level, leaders gain a more holistic picture of the organisation's performance and opportunities to assess whether they are mapping the right direction towards the corporate vision. On a business level, the model provides a reality check framework for management to delve into their customers' views instead of solely focusing on the products or services being offered. On a working level, Abell's framework also prompts the organisation to explore suitable means in furtherance of satisfying the customers' needs.

The Airport Authority Hong Kong ("AA") has now been established for over two decades. Coupled with the fast-changing industry dynamics, the said business definition framework would act as a useful tool in examining the success and shortcoming of the airport operator as well as determining upcoming strategies.

#### **4.2.2 Identifying HKIA's customers**

The "customers" of an airport operator are remarkably diverse. Unlike regional airports that adopt a particular positioning to serve particular client groups, for example by focusing solely on domestic, short-haul or cargo flights, HKIA can be described as a "24/7

intercontinental airport” that caters to a wide range of customers (de Neufville, 2003). Jimenez, Claro and de Sousa (2014) posit that customer groups other than ‘passengers’ are emerging in the recent years, as airport business continue to expand and even globalise, for example through acquisitions or provision of consultancy services to other airports. In the case of AA, while the airport’s clientele is gradually growing into more non-aeronautical sectors such as property development and consultancy projects, the predominant customer group remains to be airport passengers. Hence, this paper identifies AA’s principal customers as airport passengers who depart from and arrive at HKIA.

Since HKIA is an international airport handling a complex and diverse group of passengers, it is crucial to first identify the core segments that AAHK ought to pay particular attention to. Finding an effective way to profile and segment the clientele could put the airport ahead of today’s competitive industry landscape.

#### 4.2.2.1 Segmentation by age group

Different groups of passengers require different facilitation and carry different travel behaviour, and their demographics and traits have an impact on their expectations and subsequent satisfaction level at the airport (Bezerra and Gomes, 2015). In this respect, age is an important means of analysis given the disparity in commonplace differences as well as specific travel preferences between generation cohorts. With regard to the demarcation of generations, various research has developed a general consensus on the definition and age range, typically referring to five generations as illustrated in Figure 4.2.2.1 (Dimock, 2019): the Silent Generation (1928-1945), Baby Boomers (1946-1964), Generation X (1965-1980), Millennials (1981-1997) and Generation Z or the post-Millennials (1998-present) (Dimock, 2019; Fry, 2016; Stein, 2013). According to AA’s quarterly passenger survey (2018), millennials and post-millennials represent over half of HKIA’s passengers, with the overall average age of HKIA’s passengers being 30 years old.

Millennials (born between 1981-1996) grew up in a world saturated with technologies and are thus often referred to as “digital natives”, namely “native speakers of the digital language” (Prensky, 2001, cited in Obal and Kunz, 2013, pp.49). Their impact on the aviation industry and the world’s economy at large cannot be underestimated given that the concurrent drive in global technological advancements. In Hong Kong, 27.8% of the population are aged between 20 to 39 in 2018 (Census and Statistics Department, 2018) while Miller and Lu (2018) predicted that Millennials would account for 31.5% of the world’s population in 2019. Millennials are emerging as a key driver of the travel industry, travelling frequently from an early age (Gardiner et al., 2014), and are expected to spend an estimated amount of US\$340

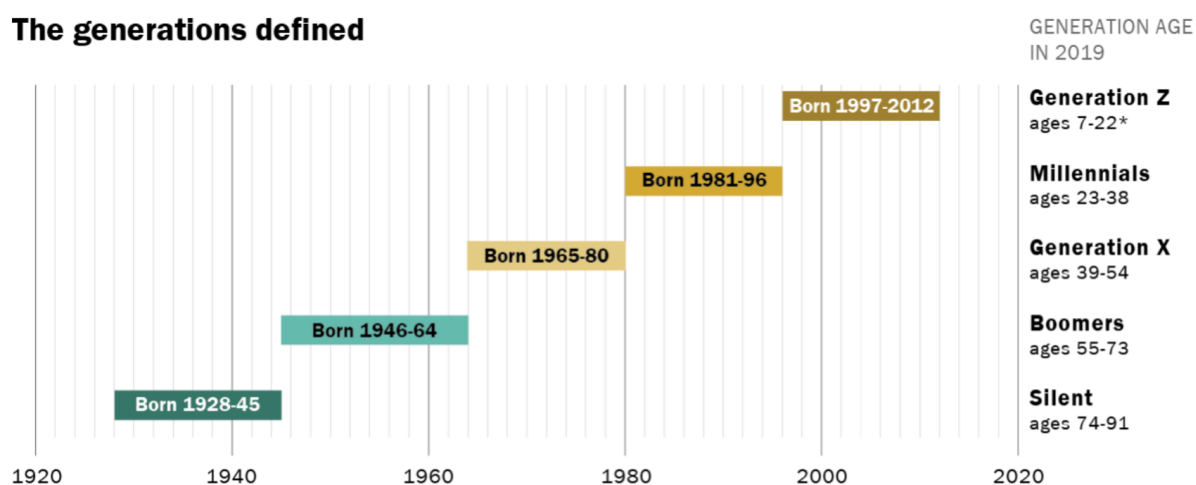
million by 2020 (Oxford Economics, 2010, cited in Bernardi, 2018). Thus, a generational perspective becomes ever more important for airports in identifying future demands.

These tech-savvy travellers are changing the aviation industry in that they have profoundly different consumer behaviour largely due to having grown up with digital technologies (Moscardo and Beckendorff, 2007), causing the “greatest disruption” so far (Veiga et al. 2017). Travel tendencies are markedly different in that Millennials are hyper-connected (Schewe and Meredith, 2004; Taylor and Keeter, 2014) and highly informed. For example, in planning a trip, Millennials use an average of nine different sources to obtain and compare information (Şchiopu et al. 2016). Moreover, Millennials prefer a higher degree of freedom and empowerment which gives them a sense of autonomy (Beekman, 2011), and are often more demanding in processing speed as they are used to digital rather than manual processes. The latest Global Passenger Survey conducted by the International Air Transport Association (2018) identifies various preferences of Millennial passengers, such as:

- Using e-boarding pass
- Using e-check-in
- Having notifications pushed through an app
- Scanning my own boarding pass when boarding
- Having biometric identification replacing my passport
- Less than 5 minutes to wait for my baggage at arrival
- Less than 30 seconds to drop off my baggage at departure

All in all, Millennial travellers are accustomed to digital, innovative solutions and demand a stronger sense of control over their travel.

**Figure 4.2.2.1 – Definition of generations (Dimocks, 2019)**



#### 4.2.2.2 Segmentation by dwell time

To optimise the use of passengers' dwell time, airports constantly strive to improve overall efficiency, for example by reducing processing time and having clearer signage across the terminals. Nevertheless, processing time is only part of a passenger's experience at an airport and our travellers' needs and expectations go far beyond short queues and fast processing. Airports which can fully exploit passengers' entire dwell time can make a real difference to the overall airport experience.

Apart from in-terminal movement and processing activities, the in-between time and discretionary time are of equal importance to passengers, especially to business travellers (Darko, 1999, cited in Fodness and Murray, 2007) and transit passengers who comparatively spend more time waiting in the terminal (often called "dwell time"). However, as mentioned in the previous section, AA's data also shows that a large proportion of ordinary departing passengers spend considerable time waiting at the boarding gates. These passengers are reluctant to leave the gate area probably for the fear of missing their flight, thus often referred to as "Gate Huggers". Therefore, airport operators shall look to provide different amenities and services to help passengers with different lengths of dwell time to fully exploit the airport's offerings during their stay in the terminal.

Furthermore, since passengers are often stressed during processing activities, it is important that the service provider manage passengers' discretionary time in a way that alleviates anxiety and brings positive experiences to the travellers (Livingstone et al. 2012). Popovic, Kraal and Kirk (2009) identify two main types of activities on which travellers spend their discretionary time, namely the "necessary activities" that are travel-related and "informal activities" such as shopping and dining. Thus, airports must be able to divert passengers' attention from the often frustrating "processing activities" to an environment that offers "aesthetic, cognitive and sensory satisfaction" (Fodness and Murray, 2007, p.501). All in all, the extent to which an airport can facilitate passengers in spending their dwell time could have a significant impact on its service quality.

In a Smart City Datathon co-hosted by The Chinese University of Hong Kong and the HK Cyberport Management Company in October 2018, a group of university students who were inspired by Airport Authority Hong Kong's idea of "Smart Airport" proposed an innovative passenger profiling method that involved categorising passengers by dwell time. Data analysis showed that half of the passengers departing from Hong Kong International Airport arrive at least 2 hours in advance of the scheduled departures time, but over 30% of them spend about 1 hour waiting at the boarding gates. To better utilise the waiting time, the

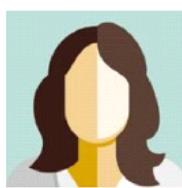
group proposed categorising the passengers into 4 categories based on their dwell time: "less than 30 minutes", "about 1 hour", "less than 2 hours" and "over 2 hours". The airport could then push customised information such as way-finding and shopping advice through its mobile app to the passengers accordingly so as to cater to the demands of different travellers.

#### 4.2.2.3 Segmentation by traveller persona

Another effective way of profiling customers is by creating user 'personas' to represent the different goals and characteristics of core customer groups to provide a view into what each segment of customers usually looks for. As opposed to traditional one-dimensional profiles, customer personas can reveal insights about their attitudes, concerns, and personality traits (Simpson, 2017). Rather than just focusing on demographics segmentation, several factors that reflect the customers' goals are taken into account when designing personas so as to project genuine scenarios that the customers would encounter while using the product or service. In other words, discovering the users' mindset is a fundamental element in persona profiling. By gaining a deeper understanding of the passengers' incentive and what drives their behaviours, airports could better empathise with individual passengers and hence provide the right kind of information and services as the particular traveller moves through the airport.

In 2016, ACI launched an innovative guide, *ACI Passenger Personas: A new approach to passenger profiling*, based on data gathered from over 550,000 travellers and 300 airports worldwide (ACI, 2016a). The six passenger personas, including the Workman, the Friendly Vacationer, the Value Seeker, the Sunlounge tourist, the Timekeeper, and the Airport Enthusiast, are portraits of key profile groups that reflect in-depth passenger behaviour, as illustrated in Figure 4.2.2.3 (ACI, 2016a). Typically, leisure travellers consist of Friendly Vacationers, Sunlounge Tourists, Airport Enthusiasts and Value Seekers; whereas business travellers are often Timekeepers and Workmen. Through building these fictitious characters, airport operators can better empathise with the passengers by visualising their needs as they move through the airport. This segmentation allows airports to strategically create different customer experiences to meet the needs of different passenger types.

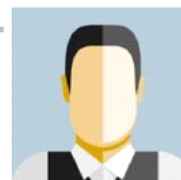
**Figure 4.2.2.3 – The six traveller personas (ACI, 2016a)**



Friendly Vacationer

The friendly vacationer is organised, looks for efficiency in airport processes and places importance on traditional customer service. This passenger persona has clear core needs and is highly responsive to airports that get it right with consistently clear wayfinding and a friendly staff.

The timekeeper is not a frequent flyer but is confident in using airports. This persona has clear and specific priorities and is likely to be satisfied by the airport experience if their needs are met.



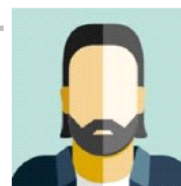
Time Keeper



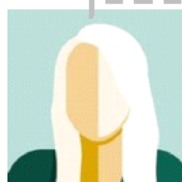
Value Seeker

Although the value seeker does not fly frequently, this persona is confident in their expectations of the airport experience. The value seeker is highly demanding, not easily satisfied and has clear expectations of both the efficiency of processes and the quality of the retail and food and beverage experience. This persona is the highest spender but expects value for money.

The airport enthusiast has a very positive attitude to airports and wants to enjoy the experience. This persona understands the airport passenger process and, while keen to gain discretionary time in the lounge, is accommodating to occasional delays.



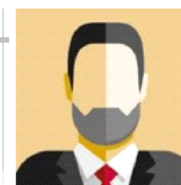
Airport Enthusiast



Sunlounge Tourist

Although the sunlounge tourist is not a seasoned airport traveller, they are an experienced consumer eager to enjoy an entertaining experience at the airport.

The workman is an experienced and demanding passenger with specific needs and high expectations.



Workman

#### 4.2.2.3 Segmentation by tier of loyalty

In the previous chapter, the importance of establishing customer loyalty in an airport was discussed. The more satisfied the passengers are, the more likely they will grow loyal to the airport, which in turn has implications on the airport's standing as well as its revenue. As a result, loyalty programmes are becoming more relevant to airports than ever before.

A successful loyalty programme does not only reward loyal customers; more importantly, it offers rewards that the customers want. This again highlights the importance of understanding the passengers' desires. In a loyalty programme, this often translates into profiling passengers based on their attitude towards the brand or in this case, the airport, essentially grouping them by tiers of loyalty.

In essence, this is another adaptation of user personas that could help airports identify their core audiences' wants and needs. These semi-fictional personas, however, would not be meaningful without further analysis that could pair the fictitious profiles with real passengers. One way of conducting this type of analysis would involve the use of a Customer Relationship Management system, which shall be discussed later in this chapter. This aims to categorise passengers into different tiers of loyalty and subsequently suggest corresponding relationship management tactics, such as customised marketing materials, after analysing the passengers' overall airport activities and travelling habits.

Although it might be a rather novel idea to categorise passengers in terms of their attitude or loyalty towards an airport, the industry is growing more competitive day by day and airport operators ought to diligently examine ways of retaining passengers and to fully acknowledge the benefits that loyal customers could bring to the airport. Finding an effective way to profile and segment the passengers could put the airport ahead of today's fierce competition.

#### **4.2.3 Understanding the customers' needs**

Kano's (1984) seminal work on categorising customer needs divides a product or service into three distinctive features, while Thompson (1998) similarly posits that it is crucial to stratify customers' needs into a hierarchical model to allow organisations to develop strategies specific to a single group of customers. Essentially, the three layers in the hierarchy are: (i) *must-be attributes* which customers treat as basics and take for granted such that these attributes would lead to customer attrition if not met; (ii) *one-dimensional attributes* which positively influences customer satisfaction when fulfilled but adversely when not fulfilled; and (iii) *attractive attributes* which could increase satisfaction and attract a certain customer group if provided but which absence would not cause dissatisfaction.



In an airport’s scenario, this hierarchy reflects the paradigm and evolution of the role of an airport mentioned in the previous section. Traditionally, airports used to be public utilities that focus on basic, must-have needs, including attributes such as aviation safety, aeronautical business, security measures, etc. Nowadays, airports have developed into multifaceted businesses in a competitive environment, hence investing more resources in one-dimensional attributes, for example by liaising specific flight routes, establishing land-to-air or sea-to-air connections, and the provision of specialised cargo facilities that are essential to transporting certain types of goods. Finally, attractor attributes are especially important to airports. Unlike other industries, it is difficult to compare airports apple-to-apple using financial performances because of the different geographic constraints as well as the vastly different governmental regulations and support in every country. Instead, customer satisfaction is often used to measure airport performances and as such, even though attractive attributes might not increase the airport’s market share, they could have a substantial impact on the airport’s ultimate international standing. The different types of customer needs at HKIA are presented in Table 4.2.3.

**Table 4.2.3 – HKIA’s customer needs**

<b>Type of needs</b>		<b>Major types of customer addressed</b>
<b>Must-have</b>	Safety and security	All types of customer
<b>One-dimensional</b>	Processing speed; Efficiency; Convenience	Business travellers, passengers with short dwell time, Millennials, Timekeepers, Workmen, Value Seekers
	Customer service	Friendly Vacationers, Sunlounge Tourists
<b>Attractor</b>	Customer empowerment. Digital engagement	Millennials, Airport Enthusiasts
	Local culture elements	Leisure passengers, Passengers with longer dwell time
	Entertainment	Friendly Vacationers, Sunlounge Tourists, Airport Enthusiasts

#### **4.2.4 Meeting the customers’ needs**

As illustrated in the last sections, the customer base and hence the customer needs in an airport environment are intrinsically diverse and complex. As a public utility service provider, AAHK ought to cater to as wide a range of customers as possible. However, given

the inevitable constraints in time and resources, it is necessary to categorise and prioritise those needs to maximise efficiency in formulating the most effective strategies. In this chapter, three different models related to service quality are explored, through which strategies or “technologies” are developed and discussed to meet the customers’ needs.

#### 4.2.4.1 “Quality Function Deployment” – addressing each type of customer needs

In this respect, Matzler and Hinterhuber (1998) laid down the groundwork of integrating Kano’s model of customer satisfaction into Quality Function Deployment (“QFD”). Like Kano’s three-dimensional hierarchy, the crux of QFD also lies in its emphasis on customer orientation, thereby providing a practical and structural approach for managers to develop a product or service through a thorough assessment of the customers’ needs. The development process can often be outlined in a seven-step approach (Hauser and Clausing, 1988; Hauser, 1993, cited in Matzler and Hinterhuber, 1998):

- (i) Identifying customer needs**
- (ii) Structuring the needs and prioritising them**
- (iii) Comparing customers’ perceptions (comparison with competitors)
- (iv) Identifying product/service attributes**
- (v) Developing the relationship matrix
- (vi) Developing the roof matrix
- (vii) Estimation of costs, feasibility and technical difficulties**

In the context of evaluating AA’s service, steps (i), (ii), (iv) and (vii) are the more important parts on the ground that unlike many other industries, every airport is rather unique given their intrinsic characteristics endowed by geographic location, each country’s air traffic rights and other variables which are hard to control. Thus, an apple-to-apple comparison with other airports would have limited value in developing the airport’s own services. Rather, a focus on identifying the airport’s attributes and developing strategies that correspond to the various categories of customers’ needs would be more relevant in this context. Since step (i) has been done in the previous chapter, the following section aims to structure the identified needs according to Kano’s model with a view to prioritising them, and the corresponding strategies shall be examined.

#### 4.2.4.2 “Human Activity Modelling” – creating a holistic customer experience

Human Activity Modelling (“HAM”) (Constantine, 2009) is grounded on the application of activity theory in practice. Having its crux based on Russian psychologists Vygotsky and Leontiev in the early 20<sup>th</sup> century, activity theory gained significant momentum in the recent

decades and attracted increasing attention with a view to operationalise this theory, for example the “activity interview” postulated by Duignan, Noble and Biddle (2006, cited in Teixeira et al. 2012) and “user-centric design” by Norman (2013). At its core, activity theory is about “who is doing what, why and how” (Hasan and Kazlauskas, 2014).

As an extension of the activity theory, Constantine’s HAM provides a practical framework in analysing and designing work through the study of the customers’ activities as well as the context in which the activities are carried out (Teixeira et al. 2012). In other words, it is crucial for the service provider to understand the blueprint of a customer’s journey and the context in which the customer performs the activities rather than to simply focus on the customer’s opinions on separate points of the service (Bettencourt, 2010; Dahlsten, 2003). The diversity of the components of customer experience ought to be recognised, fully captured, and systematically analysed. Thus, service providers must embrace the holistic nature of customer experience to accurately address the customers’ needs.

Hence, through mapping out the passengers’ entire airport journey and emphasising on the string of passengers’ activities, an airport operator effectively offers passengers a comprehensive and coherent overall service.

#### 4.2.4.3 “Customer Relationship Management” – customising each airport experience

Although a holistic service could ensure that passengers’ overall needs are attended to, a *customised* experience, on the other hand, would allow the airport to leave an impactful impression on the individual passenger. To capitalise on passengers’ needs, therefore, the airport must establish a sustainable system that allows the operator to manage, process and analyse the vast flows of information. In this respect, developing a Customer Relationship Management system (“CRM”) could help an airport manage its interactions with the passengers more effectively and, in turn, strengthen the relationship and enhance customer satisfaction.

Acquiring the right technology is undoubtedly an important part of modern-day CRM. However, CRM should be seen as a ‘system’ and not purely as a ‘technology’ (Meena and Sahu, 2021; Ferrer-Estévez and Chalmeta, 2023). In essence, an information system consists of technology, people, and process (Bavarsad and Hosseinipour, 2013; Muang, Setiawan and Masati, 2020). It is imperative that we find the right hardware and technological solutions, but it should be borne in mind that technology is only part of a successful CRM. Airport managers must, before implementation, consider the system’s new process flows and have a genuine understanding of all the users involved if the CRM were to succeed.

The amount of passenger information and customer feedback can be overwhelming, and airports will find themselves drowning in a sea of information if there is no systematic way to organise the data. Having in place a modern CRM system, which often employs technological solutions, could enable airports to store, process and analyse the passengers' data. Airport managers will then be able to extract insightful analysis on passenger segmentation, preferences, and predictive modelling.

Having obtained useful information about the passengers through data analysis, airports could then customise their interactions with the passengers. Airports must be made aware of the wealth of possibilities brought about by establishing a robust CRM, which could help them provide passengers with the right kind of information, increase passenger engagement, establish loyalty, and increase customer satisfaction. After all, a passenger who feels like they are being treated diligently as individuals is more likely to establish loyalty towards the airport than a counterpart who feels like they are just 'any other traveller' who is being processed, not engaged.

By creating a central pool of data, CRM could act as a foundation that facilitates and streamlines many processes and campaigns. It could also be integrated with other platforms such as mobile applications, loyalty programmes and marketing automation. As a result, operations, and services such as disseminating customised information, handling customer feedback and targeted marketing campaigns could all ride on the same pool of data. This could give airport managers a more holistic view of an 'end-to-end' passenger experience.

### **4.3 Conceptualisation and Hypotheses**

#### **4.3.1 Service quality**

Service quality can be defined as "a consumer's judgment about the overall superiority of a product or service" (Zeithaml, Bitner, & Gremler, 2009, cited in Suhartanto and Noor, 2012, pp. 3). It is commonly acknowledged as one of the most pivotal determinants in any business organisation. For this reason, this subject has attracted a great deal of research across different industries over the years to conceptualise the notion of service quality and to examine its effect on other business components in order to optimise organisational performance and strategies. Although there is no absolute consensus on the dimensions or measurements of service quality despite several studies on this subject, the SERVQUAL model could be seen as a valid and authoritative seminal work in this domain, providing a solid foundation that could be adapted for evaluation of service quality in various industries.

The SERVQUAL scale was developed by Parasuraman et al. (1988) to provide a more systematic measurement in light of the intricate and complex process involved in service quality. The scale is essentially founded upon the expectancy-disconfirmation theory (Oliver, 1980), which will be further elaborated in the following sections. In essence, the theory acknowledges that there could be a gap between a customer's perceived performance of a product or service and their expectations formed prior to consumption. Where there is a gap, disconfirmation occurs. Based on this concept, the dimensions of SERVQUAL were developed so as to reveal the criteria used by customers in assessing service quality. Through exploratory research, the original dimensions identified included reliability, responsiveness, competence, access, courtesy, communication, credibility, security, understanding the consumer, and tangibles. However, some of these dimensions were found to be overlapping and thus they were refined and finally boiled down to five, namely tangibility, reliability, responsiveness, assurance and empathy.

In a nutshell, tangibility refers to the appearance of physical facilities, artefacts, personnel or equipment related to the service; reliability means to the ability to deliver the pledges and undertaken services; responsiveness refers to the willingness and readiness of the service personnel to promptly provide the service to the customers; assurance refers to the knowledge and competence of the service personnel in executing the service in a confident way; and empathy means the capability to provide individualised attention and care for the customer.

However, despite the consensus that the dimensions of SERVQUAL are a good instrument commonly used to measure service quality from the perspective of a consumer, this model has nevertheless attracted criticism over time. One of the most well-known adaptations of the SERVQUAL model is SERVPERF, developed by Cronin and Taylor (1992) having cast doubt on the conceptual basis of the former model especially for its unclear distinction with the concept of service satisfaction. The SERVPERF model proposes in addition to the five components, the 'performance' of a service should also be used to measure its quality which is in fact a core element of the consumers' evaluation of a service. The argument was that technical attributes, namely what is delivered in the service, and functional attributes, such as how and when the service is delivered, are both integral to the customers' perception of the service quality. In other words, Cronin and Taylor deemed that SERVQUAL focused too narrowly on the process of service delivery but neglected important attributes in the actual outcome and performance of the service (Ravichandran et al. 2010). Advocates of SERVPERF therefore argue that this model produces better results of reliability, validity, and predictive power than using SERVQUAL, though to date there has not been a conclusive

decision on the superiority of these models in evaluating service quality (Jain and Gupta, 2004).

### **4.3.2 Airport service quality**

As air travel became more prevalent in the past few decades, academic research on the service quality of relevant service providers also gained momentum. Specifically, services provided at airports have attracted researchers' interest for the multifaceted service dimensions and the fact that airports are the central conduits that allow air travel. The preliminary conceptual model of the present study proposed below is mainly built upon the final model postulated by Fodness and Murray (2007), which is developed by qualitative research with passengers and then refined after exploratory and confirmatory factor analyses. It is proposed that airport service quality has three core dimensions, namely function, interaction, and diversion. In short, 'function' refers to the capacity of an airport to facilitate effective and efficient movement of the passengers, through e.g., spatial layout, facilities and signage, etc.; 'interaction' refers to the quality of interaction between customers and the service provider; while 'diversion' refers to the airport's ability to divert the passengers' attention from the dull and stressful processing activities to an environment that offers aesthetic, cognitive and sensory satisfaction. Therefore, the components of 'function' and 'diversion' well demonstrate the core attributes of the SERVPERF model by reflecting on the technical and functional aspects in airport services; whereas the items in 'interaction' largely relate to service quality process dimensions in the SERVQUAL model.

#### Dimension 1: Function

Airport passengers are often time-pressed. Thus, the capacity of an airport to facilitate effective and efficient movement of the passengers within the terminal is fundamental. The importance of "servicescape" to service business where customers are physically present to experience the service within a "factory", namely the physical facility provided by the firm, is theorised by Bitner (1992). Servicescape is comprised of a wide array of environmental features which covers three main constructs, including spatial layout, signs and symbols, ambient conditions. In this study, the first dimension focuses on the first two functional aspects in servicescape. In an airport setting, these include wayfinding signage that directs passengers' movement, flight information, physical layout of the airport terminal in relation to the ease of access to relevant facilities, location of various facilities such as baggage carts and toilets, etc. (Bezerra and Gomes, 2016a; Widarsyah, 2013). Furthermore, the timeliness of the provision of service such as baggage delivery and check-in processes is a recurrent theme in almost all literature that attempts to conceptualise airport service quality (e.g.

Bezerra and Gomes, 2016a; Fodness and Murray, 2007; Humphrey, Humphreys, Francis and Fry, 2002; Mirghafoori, Izadi and Daei, 2018).

In regard to efficiency, the use of self-service facilities in delivering timely terminal services also appears to be an emerging attribute related to airport functions. Self-service facilities commonly include check-in kiosks, bag-drop, immigration gates and boarding gates. Research finds that passengers use self-service facilities to save time and avoid long queues (Gelderman, Ghijsen and van Diemen, 2011; Meuter et al. 2000), and that those who have shorter dwell time in the airport are more likely to use self-service facilities (Castillo-Manzano and López-Valpuesta, 2013). This research suggest that such facilities are perceived by passengers to have a positive impact on increasing their efficient movement at the airport, and Bogicevic et al. (2017) suggest that the use of airport self-service technologies have a positive impact on passengers' overall satisfaction. Thus, as passengers perceive such technologies to be a prevalent and integral part of airport service, self-service facilities ought to be included as an important function delivered by an airport. In light of the above, it is hypothesised that:

*H1: Airport service quality is positively influenced by the basic functions delivered by the airport.*

#### Dimension 2: Interaction

In the service sector, the impact of the quality of interaction between customers and the service provider is well-established. Although it is contended that the airport setting is more complex than ordinary service businesses, the SERVQUAL scale introduced by Parasuraman et al. (1988) which is widely adopted in service industries nevertheless sheds light on airport services qualities, particularly regarding the interaction with customers. The model proposed by Fodness and Murray (2007) supports a number of SERVQUAL dimensions, for example the appearance of the airport staff are tangibles, while the attitude of employees relate to empathy and assurance. In addition, knowledge and expertise of the staff are also important factors that customers take into account when evaluating the interaction with the service provider (Brady and Cronin, 2001). Overall, it is postulated that passengers' perceptions of the airport's service quality are influenced by interaction with the personnel who deliver the service.

*H2: Airport service quality is positively influenced by the interaction between airport personnel and passengers.*

### Dimension 3: Diversion

Recall that the first dimension deals with effectiveness and efficiency in the delivery of various airport functions. However, apart from in-terminal movement and processing activities, the in-between time and discretionary time are of equal importance to passengers, especially to business travellers (Darko, 1999, cited in Fodness and Murray, 2007) and transit passengers who comparatively spend more time waiting in the terminal. Furthermore, since passengers are often stressed during processing activities, it is important that the service provider manage passengers' discretionary time in a way that alleviates anxiety and brings positive experiences to the travellers (Livingstone et al. 2012). Popovic, Kraal and Kirk (2009) identify two main types of activities on which travellers spend their discretionary time, namely necessary activities that are travel-related and informal activities such as shopping and dining. Thus, airports must be able to divert their attention from processing activities to an environment that offers "aesthetic, cognitive and sensory satisfaction" (Fodness and Murray, 2007, p.501). All in all, the extent to which an airport can facilitate passengers in spending their dwell time could have a significant impact on its service quality.

*H3: Airport service quality is positively influenced by diversion activities and facilities offered by the airport during passengers' discretionary time.*

#### **4.3.3 Customer satisfaction**

Customer satisfaction is a well-established topic in the academic field which has been critically examined over the years by various researchers. Its importance lies fundamentally in the consensus that satisfaction has a pivotal role in influencing repurchase behaviour and development of customer loyalty towards the product or service (Ravichandran et al., 2010). One of the most grounded and influential seminal works on this concept is the expectancy-disconfirmation paradigm postulated by Oliver (1980), arguably the most widely accepted amongst this field (Ekinci, Massey and Dawes, 2008). The expectancy theory developed by Vroom (1964) seeks to explain the cognitive processes regarding motivation, which in simple terms depends on an individual's assessment on "how much we want something and on how likely we are to get it" (Zehrer, Crofts and Magnini, 2011, pp. 108).

In essence, the expectancy-disconfirmation theory views customer satisfaction as an affective state of mind or emotion that the customer has towards the product or service. According to this theory, satisfaction can be measured through comparison between a customer's expectation on the goods or service prior to consumption and their perception on the performance of the goods or service post-consumption. If there is no discrepancy



between the prior anticipation and the perceived performance, congruence occurs. If the performance exceeds expectations, positive disconfirmation occurs, which translates into higher customer satisfaction. Conversely, negative disconfirmation or dissatisfaction occurs if the customer finds that the performance does not live up to their expectations. In other words, the prior expectations held by the customers become a standard against which the performance of the goods or services would be compared. This concept of disconfirmation lies at the heart of Oliver's expectancy-disconfirmation paradigm (Gale, 1994, cited in Suhartanto and Noor, 2012).

#### **4.3.4 Airport service quality and passenger satisfaction**

Although customer satisfaction and service quality are often discussed concurrently, literature consistently characterises them as two distinct constructs despite their close relationship (Taylor and Baker, 1994). Customer satisfaction is postulated as a process and could be affected by several 'non-quality' issues (Oliver, 1993), whereas service quality's underlying dimensions are more specific and are based on perceptions of excellence (Taylor and Baker, 1994). As regard the way that these two constructs are specifically related, various seminal works suggest that perceived service quality is positively related to customer satisfaction (e.g. Monroe and Chapman, 1987 cited in Oh, 1999). Woodside et al. (1989, cited in Oh, 1999), in investigating customers' purchase intentions, also recognises that satisfaction is a mediating variable between service quality and purchase intention. The expectancy-disconfirmation theory has been widely applied particularly in research in the tourism industry since the 1990s and has remained an authoritative and valid framework that is used to determine customer satisfaction (e.g. Barksy, 1992; Weber, 1997; Zehrer, Crotts and Magnini, 2011). In more recent empirical studies, Ravichandran et al. (2010) also recognises the correlation between service quality and customer satisfaction, though the study particularly aimed at evaluating the banking industry. In the airline industry, while acknowledging such correlation, Suhartanto and Noor (2012) find that the perceptions of service attributes differ from full-service airlines and low-cost airlines, such that the same level of service provided by different types of airlines could lead to varying degrees of satisfaction. Nevertheless, the core findings are that service quality does impact customer satisfaction. In this light, the present research proposes that:

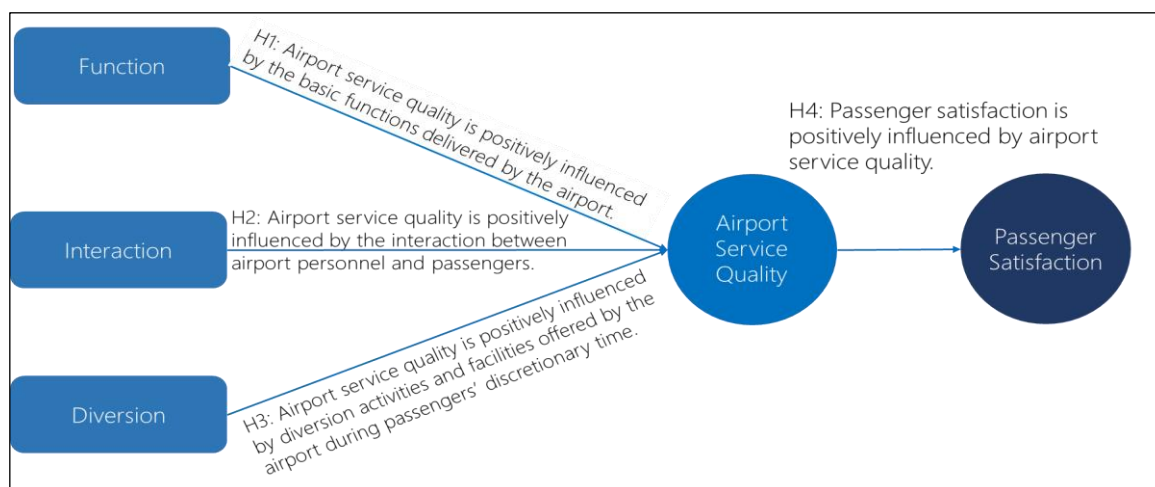
*H4: Passenger satisfaction is positively influenced by airport service quality.*

#### **4.3.5 Preliminary conceptual model**

A preliminary conceptual model formulated based on the above hypotheses is illustrated in Figure 4.3.5, demonstrating the proposed constructs and relationships. A summary of

literature on the concept of airport service quality underlying the preliminary conceptual model is also presented in Table 4.2.6.

**Figure 4.3.5 – Preliminary conceptual model**



**Table 4.3.6 – Summary of literature on airport service quality**

Parasuraman et al. (1988)	Developed the SERVQUAL model to measure service quality from the customer's perspective, consisting of tangibility, reliability, responsiveness, assurance and empathy.
Cronin and Taylor (1992)	Challenged the comprehensiveness of SERVQUAL and proposed the SERVPERF model that places more emphasis on the technical and functional attributes of the service provided.
Bitner (1992)	Recognised the importance of 'servicescape' in the service industry, which is comprised of a wide array of environmental features which covers three main constructs, including spatial layout, signs and symbols, ambient conditions..
Darko (1999)	Apart from in-terminal movement and processing activities, the in-between time and discretionary time are of equal importance to passengers, especially to business travellers.
Brady and Cronin (2001)	Knowledge and expertise of the staff are also important factors that customers consider when evaluating the interaction with the service provider.

Humphrey, Francis and Fry (2002)	Highlighted the importance of the timeliness of the provision of service at airports, such as prompt baggage delivery and efficient check-in processes.
Fodness and Murray (2007)	Evaluated service quality specifically for airport services and proposed an airport service quality model consisting of three dimensions, namely function, interaction and diversion, comprising elements of both the SERVPERF and SERVQUAL models.
Popovic, Kraal and Kirk (2009)	Identified two main types of activities on which travellers spend their discretionary time at the airport, which are (i) necessary activities that are travel-related and (ii) informal activities such as shopping and dining.
Gelderman, Ghijsen and van Diemen, (2011)	Empirical research found that passengers use self-service facilities to save time and avoid long queues.
Livingstone et al. (2012)	Recognised the importance for service providers to manage passengers' discretionary time in a way that alleviates anxiety and brings positive experiences to the travellers.
Castillo-Manzano and López-Valpuesta (2013)	Discovered that travellers who had shorter dwell time in the airport were more likely to use self-service facilities.
Widarsyah, (2013); Bezerra and Gomes, (2016a)	Elucidated the different components of 'function' in an airport setting, which included wayfinding signage, physical layout, ease of access to facilities and availability of flight information, etc.
Bogicevic et al. (2017)	Empirical research found a positive relationship between airport self-service technologies and travellers' confidence benefits and enjoyment, which resulted in positive effects on overall traveller satisfaction.
Prentice and Kadan (2019)	Quantitative research sampling Australian airport passengers showed that airport service quality ("ASQ") positively affected passenger satisfaction, airport reuse and destination revisit. ASQ was measured by five dimensions: check- in, security, ambience, facilities and servicescape.

## **5. Methodology**

### **5.1 Overview**

This section explains the nature of this research as well as the underlying philosophies, including the ontology, epistemology, axiology, and methodology adopted herein. The methodology of the two-stage sequential exploratory research is discussed in detail, presenting the objectives, sampling methods, potential challenges and subsequent data analysis techniques in the qualitative and quantitative phases. With reference to the research purpose, the reasoning leading to the selected means of data collection and analysis are also presented. As such, a clear conceptual framework within which the research will be conducted is formed.

#### **5.1.1 Research Design**

The design and strategy adopted in a study have direct, profound impact on the practicality and outcome of the research. The importance of research design is explained by Kothari (2004) who opines that the design decisions “constitutes the blueprint for the collection, measurement and analysis of data”. A thorough design will allow the researcher an advance opportunity to comprehensively review the proposed study and to realise the research operations in an efficient manner (Kothari, 2004). Furthermore, knowledge of the research methodology, including the processes and limitations, will allow the researcher to analysis the findings meaningfully. This is particularly true given that no amount of analysis can compensate improperly collected data (Bernard et al., 1986). Thus, it is of utmost importance that the methodology of a research is holistically scrutinised and justified in depth to ensure that the research can yield maximal information and constructive findings. Before delving into the means through which data collection and analysis will be conducted, this section explains the design of this research based of the nature of the study and the associated rationales underpinning the chosen methodology.

In general, research design can be characterised by three major categories, namely exploratory, descriptive, and causal (Mayer, 2015). Exploratory research is where new ideas and insights into a certain subject are sought, often through flexible and open-minded approaches. Rather than to derive evidence, the aim of exploratory research is to develop points of interest and serve a foundation for onward research (Mayer, 2015). Thus, it could be particularly useful for developing conceptual models or when the research topic has not been extensively explored. In contrast, descriptive research addresses more specific issues by depicting the characteristics of a population or phenomena in detail (Creswell, 2003).

Information gathering questions on who, what, when, where and how are central to this type of research (Zikmund et al., 2010). Lastly, causal research, or often known as explanatory research, seeks to investigate the relationship between variables and the way they are affected by each other (Creswell, 2003; Saunders, Lewis and Thornhill, 2009).

According to the above interpretations of research design, it will appear that this study is both exploratory and causal in nature. The first research question seeks to explore the concept of airport service quality and to ascertain the attributes that it is composed of. This requires the researcher to search for ideas and insights that could be used to for a conceptual model and build a foundation for further research. Subsequently, this research aims to examine the impact of airport service quality on passenger satisfaction, which in essence requires an investigation on the causal relationship between these variables. The following section explains the rationale underlying the research design structure according to the abovementioned exploratory and causal features of the study.

### **5.1.2 Mixed-Method Technique**

Over the years, the purposes for mixing research methods have been extensively discussed. Critics have debated over whether such a combination can produce valid representations of the phenomenon. Bryman (2006) challenged that the rationale for combining these methods is not always clearly explained by researchers and that the presentation of findings from the two different research methods often lack coherence. Notwithstanding the paradigm wars and inherent differences between qualitative and quantitative research, however, mixed methods have become broadly accepted nowadays as a sound approach that allows researchers to produce outcomes stronger than either method individually (Kelle, 2006; Malina, Norreklit and Selto, 2011). When used appropriately, the combination of methods could complement each other and compensate for mutual shortfalls, leading to a more robust analysis and a better understanding of the research problem (Green, Caracelli and Graham, 1989; Johnson and Turner, 2003; Ivankova, Creswell and Stick, 2006).

Given that the nature of this research is both exploratory and causal as elucidated in the above section, the mixed-method technique is employed with a view to optimising the data collection process for a project that entails multifaceted dimensions in the subject in question. Specifically, the qualitative stage is intended to stimulate ideas and investigate the complex composition of airport services through an open-ended approach; whilst the primary goal of the quantitative stage is to explain the phenomena through objective criteria that can be generalised to a larger population. Neither qualitative nor quantitative data alone can provide sufficient material to examine the research questions and to capture the details of the

intended subject. Thus, it is anticipated that this combination of methods would provide efficient, practical means to divulge the intricate features of airport services as well as to objectively analyse the causal relationship with passenger satisfaction.

Furthermore, in mixed-method research, the sequence of data collection is imperative to the study and ought to be carefully designed based on the research questions and objectives because the way that the vastly different qualitative and quantitative research methods are incorporated within a single study lies in the heart of the integration (Creswell, 1999). The three basic designs of mixed methods are generally classified into sequential exploratory, sequential explanatory and convergent (Fetter, Curry and Creswell, 2013). In this study, a sequential exploratory design is adopted, which calls for qualitative research to be conducted based on the conceptual framework developed from the literature review, followed by the collection and analysis of quantitative data which expands on the previous stage (Onwuegbuzie, Bustamante and Nelson, 2010). In this order of sequence, the qualitative inquiry can generate hypotheses and refine the quantitative instruments (O'Cathain, Murphy and Nicholl, 2010), after which the quantitative stage can further explain findings from the qualitative data (Fetters, Curry and Creswell, 2013).

### **5.1.3 Research philosophy**

Having established the use of mixed-method technique, this section expounds the philosophical stances from theoretical perspectives underpinning the combination of qualitative and quantitative research method. The importance of understanding the philosophical assumptions in research is well-explicated by Huff (2008). Firstly, the researcher's assumptions cultivate the formulation of research questions and, in turn, influences the way by which information is sought to answer those questions. In essence, the underlying philosophy provides a direction that steers the research goals and outcomes. Secondly, the impact that the associated discipline and corresponding research training and culture have on research philosophy ought not to be undermined as the way that research methods are perceived and adopted is deeply rooted in different fields of study. Lastly, as philosophical stances form the basis of evaluative criteria when a study is examined, it is crucial that the author and the reviewer understand each other's beliefs to resolve points of difference and constructively evaluate the research. According to Creswell and Poth (2018), research philosophy is surrounded by four major assumptions, namely ontology, epistemology, axiology and methodology, each of them explicated from both qualitative and quantitative perspectives below. The research philosophy is summarised in Table 5.1.3.

### 5.1.3.1 Ontology

Ontology pertains to the way that the nature of reality, or the theory of being, is interpreted. The two contrasting ideologies, namely realism and relativism, each represent different approaches to the way through which “reality” is interpreted. From an ontological point of view, relativists believe that truth is relational, that is, the way that reality is interpreted may vary according to the context (Drummond, 2005); whereas realism entails the belief that truth is static and objective, which can therefore be generalised (Killam, 2013).

The ontological perspective in the qualitative stage of this research is one of relativism. Creswell and Poth (2018) explain that in qualitative studies, researchers embrace the idea of multiple realities which can be seen through different views. It is further expounded that qualitative research does not seek to prove a single truth about the above topics, but instead intends to report the different perspectives of individual respondents as gradually divulged in the findings. Under this interpretation, the components of ‘airport service quality’ and the contributing factors towards ‘passenger satisfaction’ depend on subjective measures that vary across different passengers. The core service qualities that are perceived as important by airport passengers will be explored in depth and insights will be developed based on the view that ‘truth’ is multifaceted.

In contrast, quantitative studies intend to generalise the findings to a population as they seek to reveal a single truth. This reflects that the quantitative stage is based on realist perspectives in terms of ontological assumptions. This means that notwithstanding the different views of individual passengers that might be divulged from the qualitative study, the quantitative stage can be seen as an objective way to obtain the ultimate ‘truth’ behind what service quality means and the way it relates to passenger satisfaction. The instrument used in this research stage shall be designed in such a way that allows the researcher to produce results that can be applied to a larger population.

The combination of ontological perspectives, namely relativism and realism, shape the design of the corresponding research stages. An understanding of the underlying principles is therefore important to both the research procedures and onward analysis, particular since the way that a researcher views reality predicates the other philosophical assumptions (Holden and Lynch, 2004) which are explicated below.

### 5.1.3.2 Epistemology

Epistemology is considered crucial to the interpretive framework and is inherently embedded in the theoretical perspective (Crotty, 1998; Denzin and Lincoln, 2011). In essence, it refers

to the theory of knowledge which probes into the relationship between the researcher and the research and requires the researcher to consider the way that knowledge is acquired in the study (Ormston et. al, 2014). On the one hand, the etic approach emphasises that reality is view from an external point of view, often founded upon on pre-existing theories and requires an application of quantitative research methods; on the other hand, the emic approach advocates that reality requires insight into an insider's thoughts, which often requires capturing the participant's views using qualitative methods (Lett, 1990; Yin, 2016; Markee, 2013).

The epistemology in the qualitative research stage is one of emic for it consistently emphasises exploring the core values of airport passengers' engagement at the airport. In other words, the researchers seek to understand the phenomenon through grasping the participants' standpoints, namely from the individuals who are participating in the context (Cohen, Manion and Morrison, 2007), implying that the evidence is largely subjective. In essence, these constructs are believed to be elicited through interaction between the researcher and interviewee (Yilmaz, 2013). Thus, in this research, the qualitative study shall collect in-depth data from air passengers who are primary users of the airport or other people who are deeply engaged in airport activities, such as experts in the aviation industry.

#### 5.1.3.3 Axiology

Axiology pertains to the role of values and is engaged with the way that the researcher assesses their own values throughout the research process (Creswell, 2007). Its importance lies in the influence over the formation of the research questions and the subsequent data analysis as the underlying philosophy will inevitably drive how the research is conducted and what is valued in the findings (Biddle and Schafft, 2015). In quantitative research, it is often deemed as essential that the data collection and analysis remain value-free, as researchers seek to be as unbiased and objective as possible with a view to explaining or predicting a population; conversely, qualitative researchers acknowledge that biases are present and that such research ought to be value-laden (Yilmaz, 2013).

In this research, the latter approach is adopted as the study of core values from the insider perspective of the airport passengers is crucial in the research objective. Hence, it is acknowledged that the stance of the researcher and the participants would substantially and the research findings are analysed with such underlying values and assumptions in mind.



### 5.1.3.4 Methodology

Methodology is defined as the plan or design underlying the methods chosen by the researcher which support the outcomes (Crotty, 2000). It relates to the philosophies that prompt the ways through which researchers gather and analyse knowledge in the context of a particular paradigm (Mertens, 2007). Qualitative research is characterised by inductive logic, which requires the researcher to study the topic within its context and give abundant attention to the details of the particulars (Yilmaz, 2013). Thus, the qualitative research in the current study adopts the inductive approach in forming its foundational set of beliefs. By using open coding strategies, the researcher allows the participants' core values and patterns to emerge from the findings, hence forming the ultimate proposed model after analysis. In contrast, the quantitative stage adopts a deductive approach that focuses on causality, beginning with formulating hypotheses followed by testing the instrument.

**Table 5.1.3 – Summary of research philosophy**

Ontology	<ul style="list-style-type: none"> <li>● Relativist</li> <li>● There is no single “truth” about what airport service quality comprises and what contributes towards satisfaction as these are subjective measures that depend on individual passengers.</li> <li>● The qualitative research does not attempt to generalise the findings to the whole population. Instead, the aim is to explore, in depth, the core service qualities that are perceived as important to the passengers in the airport setting so as to develop insights in the way that they could be catergorised.</li> </ul>
Epistemology	<ul style="list-style-type: none"> <li>● Emic</li> <li>● Need the insiders' perspectives of the passengers who are primary users of the airport; internal viewpoints.</li> </ul>
Axiology	<ul style="list-style-type: none"> <li>● Biases are present and the research is value-laden</li> <li>● Vital to honour individual values and allow meaningful inferences to emerge from the findings</li> </ul>
Methodology	<ul style="list-style-type: none"> <li>● Inductive approach in the qualitative stage – Understand the interviewees' viewpoints before contextualising their experiences</li> <li>● Deductive approach in the quantitative stage – Formulate hypotheses and test the instrument</li> </ul>

## **5.2 Stage 1 – Qualitative Research**

### **5.2.1 Objective**

Prior to collecting qualitative data, a thorough literature review was carried out with a view to determining the major domains of airport service quality. Having developed a framework from the literature, the objectives of this qualitative research phase is to derive the items that relate to and represent each domain as well as to probe into the relationship between service quality and passenger satisfaction. In qualitative research, rigorous data collection procedures are key contributing factors that significantly impact the data quality and trustworthiness as well as the results of the study (Kitto, Chesters and Grbich, 2008). Hence, this section aims to elucidate the details of the chosen methodology in the qualitative study that is developed with the objective of exploring the abovementioned concepts.

### **5.2.2 Research method and target participants**

#### 5.2.2.1 Semi-structured interviews

As the qualitative research strives to understand the subjective perspective of the phenomenon, interviews are adopted in the research phase to explore the concepts of airport service quality and passenger satisfaction. Interviews are a common strategy in collection qualitative data, which is generally categorised as structured, semi-structured and unstructured. In a nutshell, structured interviews often produce quantitative data; semi-structured interviews are pre-arranged and develop from a set of open-ended questions prepared in advance; while unstructured interviews generate questions over time as the interviewer learns about the setting and are often carried out in conjunction with observational data collection (DiCicco-Bloon and Crabtree, 2006).

This study adopts a semi-structured approach. One of its most prominent advantages is that a semi-structure interview strikes a balance between providing a framework that facilitates a focused, efficient discussion, whilst allowing a degree of flexibility to the researcher in controlling the flow of the interview. Namely, the rigidity of the interview structure can be adjusted based on the purpose of the study and the research questions, thus allowing the interviewer to develop more follow-up questions depending on the response given by an individual interviewee (Kallio et al., 2016). Therefore, a set of main interview questions were prepared in advance (Appendix 2 – Interview Core Questions) to keep the discussion flowing as participants shared their thoughts. It was borne in mind that the questions ought

to be based on previous studies in the research topic area (Wengraf, 2001), thus reference was made to various literature that adopted qualitative research while formulating the main interview questions, such as the study by Fodness and Murray (2007).

#### 5.2.2.2 Purposive expert sampling

The advantages of random or probability sampling are extensively discussed, and randomisation is generally seen as an effective way to reduce bias and allow the results to be generalised to a larger population. Nonetheless, where probability sampling is not feasible, non-probability sampling methods may be devised to produce results that are also useful and valid despite the exposure to bias (Tongco, 2007). Furthermore, non-probability sampling is typically categorised into convenience sampling where the sample is taken from participants who are easy to reach, and purposive sampling where the researcher exercises judgment over the selection of participants (Etikan, Musa and Alkassim, 2016).

In this study, the objective of the qualitative research suggests that purposive expert sampling is an appropriate method on several grounds. As mentioned above, the main purpose of this research phase is to probe into the different components within the dimensions of airport service quality and its correlation with passenger satisfaction. Whilst it is possible to directly interview regular airport passengers to discover their perspectives on the above subjects, a random sampling or even convenience sampling might not produce the most informative data considering the greatly diversified passenger profile at an international airport like HKIA and the limited time that air passengers have at the airport, unless it is compensated by other means, such as concurrently collecting observational data regarding the passengers' behaviour. In contrast, a purposive sampling having selected experts in the aviation industry to participate in the interviews could generate useful and meaningful data in an efficient manner that cannot otherwise be achieved. The fact that experts are familiar with both the general consensus as well as arguments in their subject area could contribute to a thorough investigation that is qualitatively valid and reliable (Trotter II, 2012).

The target participants in this qualitative research are experts in the aviation industry whose background shall vary from airport management as well as other aviation related organisations. The rich experiences of the interviewees in terms of years of service and seniority as well as the coverage of different realms of airport services could facilitate the data collection process and contribute to the quality of the collected data. It is anticipated that these experts could share succinct information in a well-articulated manner that allows the interviews to cover the relevant questions effectively. In order to capture different

aspects of airport service quality and passenger satisfaction, however, the interviews are designed such that the participants would be interviewed both in the capacities of a passenger as well as a professional in the aviation industry.

Nonetheless, sufficient consideration should be given to the definition of an 'expert'. Although some opine that the status of expert can be ascribed by the researcher based on their own judgement, Meuser and Nagel (2009) argues that this interpretation stands the risk of inflating the meaning of an expert such that expert interviews can no longer be distinguished from other interviews. It has been explained above that purposive sampling is a non-random technique wherein certain informants are deliberately solicited by the researcher to provide information based on specific qualities or knowledge that they possess. Thus, the selection and definition of experts adopted by the researcher should be scrutinised in order to demonstrate that such discretion is exercised prudently based on justifiable criteria. Furthermore, it is important that the method is reproducible such that another research conducted in the same way would produce similar results, regardless of whether the informants are selected purposively (Tongco, 2007). Hence, this section provides the details of the considerations and criteria used to select the interview participants.

In this study, the decision of whether an informant qualifies as an expert is based on several elements, including the employment experience, seniority, and year of service as well as the scope of work. For instance, experts who are directly employed by airport management organisations, such as Airport Authority Hong Kong, would be prioritised for the obvious reason, though experts from other organisations that are related to airport services, such as airlines and ground handling agents who have close contact with service provision to airport passengers would also be targeted in order to generate a more holistic picture of the research topic. Furthermore, whether the participant qualifies as an expert does not solely depend on the years of service. For example, an informant who oversees the development of e-marketing or other digital experiences at the airport might have shorter service period compared with other traditional realms of airport services but might be equally capable of sharing rich information that would benefit the research. Thus, the researcher ought to exercise prudent judgment in assessing and qualifying an informant as an expert. All in all, it must be emphasised that the selection of experts in this study is not an arbitrary choice but is instead based on the pre-determined criteria and overall recognition of expertise in the informants' particular field.

### 5.2.2.3 Individual interviews

Having identified the target interviewees, the next step is to determine whether to conduct the interviews on an individual or group basis. Individual in-depth interviews allow the research to delve deeply into the research questions and generate rich information and by inviting the respondent to express their personal opinions pertaining to a certain topic, where the interviewee is considered the expert and the interviewers the student (Milena, Dainora and Alin, 2008). In contrast, a focus group represent a “single entity” within a sample of groups, involving multiple participants sharing their knowledge on a specific topic and should not be seen as a shortcut to circumvent individual interviews (DiCicco-Bloon and Crabtree, 2006). Moreover, the dynamics and interaction between group members should also be observed and included in data analysis (Duggleby, 2005).

In the current study, interviews would be conducted in individual sessions rather than in groups for two main reasons. Firstly, since the qualitative research targets experts in the aviation industry, an individual session would provide more privacy to the interviewees who could comfortably discuss their experiences with less concern on disclosing excessive or sensitive information to other participants in focus groups. This is supported by Boyce and Neale (2006) who opine that individual interviews should be adopted in place of focus groups where the participants might not be able to comfortably talk in a group or where individual opinions need to be distinguished. Since the interviewees might know each other given the tight circle in the aviation industry in Hong Kong, they might not be willing to discuss their opinions openly in the presence of other co-workers or business partners as this might affect their future working relationships, especially given that the research topic studies the service quality at HKIA. Secondly, as the qualitative research was conducted during the COVID-19 outbreak, face-to-face meetings were usually avoided and where necessary, the number of participants were kept to a minimum. Taking into account the above considerations, individual interviews were adopted in this research.

### **5.2.3 Sample size**

Determining the sample size is equally important in qualitative and quantitative research as it leads to both scientific and ethical issues that affect the research outcome. While a sample size that is too small might not be informative enough and cause the results to be idiosyncratic, excessive samples might also waste resources and participants’ time, causing the research to be ineffective (Francis et al., 2010).

In qualitative research, the idea of data collection until ‘saturation’ has been invoked in various research (Glaser and Strauss, 1999; Guest, Bunce and Johnson, 2006; Mason, 2010). Notwithstanding that there is a potential risk of closing the research too early without realising the new ideas are yet to emerge (Dey, 1999; Strauss and Crobin, 1990; O’Reilly and Parker, 2013), the concept provides a useful principles and guidelines for researchers to plan the sample size based on reasonable grounds nevertheless. Thus, rather than be treated as the sole criterion, data saturation ought to be carefully evaluated alongside any other appropriate considerations that are unique to the study or deemed appropriate to be factored in. Ultimately, researchers should ensure that the results are as informative as possible through an appropriate sample size while exercising a degree of control to prevent the study from becoming excessively lengthy and inefficient in terms of resource allocation.

On this front, the model of ‘information power’ which stems from the concept of data saturation is proposed by Malterud, Siersma and Guassora (2016) with an aim to pragmatically assess the sample size in qualitative studies. In essence, the authors suggest that the higher the information power of the collected data, the smaller the sample size of the study. The level of information power comprises five elements, namely the breadth of the study, sample specificity, use of established theory, quality of dialogue and analysis strategy.

The information power of the current research is evaluated accordingly. Firstly, the aims of ascertaining the different aspects of airport service quality and its correlation with passenger satisfaction is deemed relatively broad in a sense that the types of airport service are diverse. Nonetheless, the area in which the services are provided to passengers is mainly confined to the terminal buildings, which narrows down the research focus and offsets the breadth of the study, though only to a limited extent. Secondly, the sample specificity is high in this qualitative research on the ground that the target interviewees are industry experts who have rich experiences in the topic. Thus, the participants possess highly specific characteristics that relate to the study aim, which justifies a less extensive sample. Thirdly, established theories, such as SERVQUAL and other models specific to airport services are examined thoroughly in literature review and are applied in forming the conceptual structure of this research to synthesise existing knowledge. This indicates that the current study, which is adequately supported by theoretical background, does not require as big a sample as one that starts from scratch. Fourthly, the quality of dialogue in the proposed study is fairly high considering that the participants are experts who can be deemed sufficiently articulate and able to provide critically evaluated information. Furthermore, the fact that the researcher also has a strong airport management background and familiarity with the airport

environment adds to the dynamics of interviews as well as the post-interview analysis. Finally, as this study requires an exploratory cross-case analysis, it might require more participants compared with one that heads for in-depth analysis of narratives. Taking all the above factors into account, however, it would appear that the sample size should be inclined towards the lower end of the spectrum.

A number of research involving similar research scope and methods are reviewed. In particular, Fodness and Murray (2007) developed a model of airport service quality through qualitative research including interviews, focus groups and verbatim comments. The research engaged 100 passengers in interviews while they were waiting the terminal of a major Southwestern airport in the US and 72 frequent flyers of American Airlines in several focus groups held in Los Angeles, Dallas and Miami. Comparing the above study with the current proposed research, it is deemed that the latter requires fewer participants on several grounds. Firstly, in spite of HKIA's being one of the busiest aviation hubs before COVID-19, it is the only airport in Hong Kong, whereas Fodness and Murray based their study on more than one airport in the US which collectively serve a larger population than HKIA. Furthermore, the current research invites industry experts who are able to share their views as professional as well as passengers, thus yielding stronger information power. After considering all the factors, it is proposed that the target sample size is 30 interviewees for this study, which is deemed sufficient to generate sufficient information power and meaningful data for onward analysis.

#### **5.2.4 Ethical issues**

##### 5.2.4.1 Informed consent

Each participant gave full and informed consent by signing a written consent form before the start of the interview sessions (see Appendix 1 – Consent Form Template). The consent form was sent to the interviewees prior to the interview session so that they could have sufficient time to peruse the information and decide whether to participate in the research in an undisturbed environment. The consent form introduced the purpose of the study and outlined the procedures of the personal interview. For better time scheduling and expectation management by the interviewees, it was stated that the interview would take approximately 30-45 minutes. At the beginning of the actual interview, the researcher went through the consent form with the participant to explain the content and offered time for the participant to raise any questions. After ensuring that the participant fully understood the content, the form was signed and a copy would be provided to the participant upon request.

#### 5.2.4.2 Data collection and retention

To facilitate the consolidation of interview data, participants were given a choice to have the interview recorded by audio-taping or note-taking. The consent form stated that with the permission of the participant, the interview would be audio-recorded for the sole purpose of accurately transcribing the conversation. The researcher also explained that if the participant did not wish to be audio-recorded, field notes would be taken as an alternative and emphasised that this was no pressure on the interviewees to choose either method. DiCicco-Bloom and Crabtree (2006) highlights that since recordings could be a source of danger to those who are recorded given that such data is incontrovertible, recorded data must be carefully managed and generally ought to be destroyed after transcription or completion of analysis. Thus, the purpose and handling of recorded data were clearly explained to the participants before their consent was given.

#### 5.2.4.3 Voluntary participation

It was emphasised that participation was entirely voluntary, meaning that the respondent was free to participate and could choose to withdraw at any stage of the research, including during or after the data collection, without negative consequences. Apart from the right to withdraw, respondents were reminded that they did not have to disclose any confidential information about their working organisations, nor did they have to answer any questions or discuss any topics that made them feel uncomfortable. Lastly, they did not have to provide any reason for not responding to any question or for not taking part in the interview.

#### 5.2.4.4 Compensation and potential benefits

Although there was no direction compensation involved with participation, it was explained to the target respondents that their participation in the research would contribute to the overall development of airport operations by providing valuable insights into the attributes of airport service quality and its impact on passenger satisfaction. This would shed light on the fast-changing development in the aviation industry and allow airport service providers to adapt to the rapidly changing industry climate.

#### 5.2.4.5 Confidentiality

Furthermore, the consent form detailed the confidentiality policy including that any such data collected from the participants would be treated confidentially with controlled access by the research team and analysed overall with the participants' identities to remain anonymous. Kaiser (2010) suggests that confidentiality can be achieved by maintaining the



anonymity of the research participants while allowing qualitative researchers to present rich and detailed accounts of the interviews. One of the most common discussed forms of anonymisation is to replace the names of the respondents with pseudonyms (Moore, 2012; Saunders, Kitzinger and Kitzinger, 2015). Saunders, Kitzinger and Kitzinger (2015) opine that using pseudonyms rather than numbers could present a more personal touch and make it easier for readers to follow the individual narratives of the participants.

In the current research, however, it is deemed more appropriate to use numbers rather than pseudonyms due to the large number of interviewees as it would be rather difficult for the readers to remember dozens of names. Moreover, this research focuses on particular aspects of airport services, as opposed to analysing the decision-making about serious medical treatments in the research of Saunders, Kitzinger and Kitzinger which would require readers to form a complete picture of each participant's individual story. Therefore, for the purpose of data analysis in the current research, respondents are each assigned with a number, which serves the purpose of concealing their identities while allowing readers to comprehend the research findings in an accessible way. However, the gender of the participants is not masked having considered that gender is a possible contributing factor to travellers' behaviour but such information would not reveal the identities of the respondents given the other anonymisation measures.

Another measure adopted in this research is to avoid deductive disclosure by concealing the organisation that the respondents work at. Deductive disclosure, sometimes referred to as internal confidentiality, occurs when the interview subjects could be identified through a combination of traits in the final report. In particular, as an insider might recognise another insider more easily through the way the data is presented which could potentially harm both the researcher and interviewees, researchers ought to take time to learn what information is innocuous and what information might cause damage if read by another insider (Tolich, 2004). This may be illustrated by an example given by Sieber (1992) hypothesising a research studying teachers that reveals the interviewee's age, gender, teaching experience and school district might provide a combination of information sufficient to someone who is familiar with the school district to identify the particular teacher.

By the same token, the airport is located in a relatively confined area with unique work scopes, such as air traffic control, aerodrome licensing, airline coordination, terminal management, to name but a few. Thus, revealing information about the interviewees' organisation or details about job functions might lead to deductive disclosure of their identities. Furthermore, this is accentuated by the fact that some interviewees are referred by other participants through snowball sampling, meaning that some insiders are likely to be

familiar with the personal and professional traits of other insiders. Therefore, the data presentation in this research refers to the experts as aviation professionals as a whole and avoids mentioning their respective organisations in order to fully protect the interviewees' identities.

### **5.2.5 Building rapport**

Apart from gaining consent, the process of establishing rapport with the participants is a vital component in qualitative research which largely depends on the interaction between the interviewee and the interviewer (Palmer, 1928; Douglas, 1985). Rapport means the processing of establishing mutual trust and respect that provides a foundation for the interviewees to share information as well as the means of establishing a safe and comfortable environment where the interviewees could speak freely, and the stages typically include apprehension, exploration, co-operation and participation (DiCicco-Bloom and Crabtree, 2006). Given the limited time in the interview sessions, it was important that rapport was built as quickly as possible in order to allow all four of the abovementioned stages to occur in time within the interview.

Wengraf (2001) emphasises the importance of sequencing within the communicative exchange in an interview and its potential impact on the interviewee's response. In this research, in order to collect interviewees' views both as a passenger and as an expert in the aviation industry, participants were asked to discuss and share their airport experiences both in the capacity of a passenger as well as a professional of the aviation industry. The questions were originally designed in this sequence with a view to allowing the respondents to casually ease into the interview by sharing their past travel experiences in a personal capacity before moving on to the professional perspective draws on their expertise knowledge, which would facilitate the initial apprehension phase. This sequence, however, was adjusted according to the actual dynamics of the interviews, as elucidated in the following section. In any case, before the respondents embarked on sharing expert opinions about airport services, they were invited to give an overview of their usual work scope in order strengthen the rapport between the interviewee and the researcher and to allow the researcher to follow up with appropriate questions during the session based on the interviewee's job nature and experiences.

The location where interviews take place is also important and has wide-reaching implications on the interaction between the interviewee and the researcher. Elwood and Martin (2000, p.649) describe the interview sites as "microgeographies" that constitute special relations and meanings. As all target participants were aviation experts whose

working locations were in surrounding areas of the airport, most interviews were scheduled to take place in the participant's office or conference room at the workplace. This was intended to create a private setting and a familiar environment where the participants could get accustomed to quickly and feel at ease during discussion.

However, attention was paid to McDowell's (1998) observation that some respondents might be reluctant to discuss their private lives in an interview conducted at their workplace, for instance about domestic responsibilities and childcare. During the first two to three interviews that were conducted in the workplace, the researcher observed that respondents were somewhat prudent in sharing their personal travel experiences at the beginning of the interviews and would sometimes include expert opinions while discussing them. This might be attributed to the fact that personal travel experiences often involved friends and families, which the respondents might appear more cautious to discuss in workplace, as McDowell had observed. In light of these observations, the subsequent interviews that took place in an office environment were adjusted such that the respondents were invited to describe their professional roles and opinions before gradually moving on to their experiences as a passenger. In general, this appeared to be an effective way of building rapport with the expert respondents and it is believed that the flexibility in sequencing the questions allowed effective communication which increased the quality of the dialogues.

Moreover, where the participants preferred, some interviews took place over lunch meetings, mostly due to time scheduling or that the participants preferred to be interviewed in a more relaxed environment. If this was the case, the location of the lunch meetings was carefully selected to provide a reasonably private and quiet setting even though the surrounding environment was not entirely private. Seeing that those who chose to have the interview conducted in a more relaxed setting were more likely to prefer more casual conversations, the sequence of interview questions was arranged such that the interviewees would describe their usual travel patterns in the capacity of a passenger before addressing the questions from the professional perspective. All in all, the interview locations were carefully selected with considerations of balancing the interests of the participants and that of the research with a view to optimising useful qualitative data.

## **5.3 Stage 2 – Quantitative Research**

### **5.3.1 Objective**

Having identified the major variables to develop the instrument from the qualitative stage, the primary objective of the quantitative research phase is to test this product and revise the proposed conceptual model as appropriate. Using the instrument developed in the previous stage, a survey will be conducted such that the hypotheses set prior to carrying out the survey can be tested against the findings. This will involve statistically generalising the findings and inferencing from a smaller but representative sample to the population at large through the identified measurable items. Through a well-developed instrument, a robust data collection and thorough analysis process, this quantitative study aims to test the predefined hypothesis and answer the research questions.

To verify the face validity and content validity, experts in the airport industry who possess practical experience on the subject matter and experts in the academic field who are equipped with theoretical knowledge will then be invited to review the questionnaire. Subsequently, a pilot study will be undertaken to assess the adequacy of the instrument. The above processes will be repeated as appropriate until it is positive that the final survey instrument is reliable and valid.

### **5.3.2 Concept of sampling**

Sampling is the process through which a small group of samples is identified from a larger pool of population, results of which are then used to make estimates of the population. Although such estimates only come from a small group, sampling can be advantageous as it provides a practical method for researchers to yield representative results with minimal time and resources. In addition, compared with censuses which involve collecting data from a complete enumeration of the entire population, a sample survey allows more time to be spent on each respondent and thus enables more detailed information to be collected since only part of the population is examined. Furthermore, censuses might also entail more non-sampling errors which could affect the results of the investigation. In some practical situations, sampling might be the only option to resort in view of the nature of population, for example if the population is too large or is hypothetical, thus censuses could not produce the information sought within limited time and resources constraints.

Ultimately, the primary objective of sampling in quantitative studies is to achieve maximum precision in the estimates within a predefined sample size and to avoid as much bias as possible in the selection of the sample. Therefore, a careful examination of the adoption of

sampling and the associated process is required with a view to obtaining representative information about the target population. According to Blaire and Blaire (2015), the sampling process consists of the following steps: (i) defining the target population, (ii) determining the sampling frame, (iii) drawing the sample and (iv) executing the research. In the following sections, the abovementioned sampling procedures will be outlined, with the third step sub-divided into the selection of sampling method and determining the sample size, which together contribute to drawing the sample and subsequent execution.

### **5.3.3 Target population**

The first step of sampling is to define the target population. In essence, this addresses the question of what the desired population is and who possesses the information sought in the research. This involves defining the population units, setting population boundaries and screening respondents. In the present study, the population units are individual airport users of HKIA as service quality at the airport is experienced by travellers on an individual level. Next, the population boundaries shall be established in order to set apart those who are of interest in the research from those who are not.

This quantitative study aims to draw upon the respondents' experiences as end users of airport services so as to allow a robust evaluation from their perspectives amid an increasingly customer-oriented environment. In order to ensure that the participants have adequate information sought, additional criteria pertaining to behaviour and geography will be imposed to require these airport users to have departed from and arrived at the airport, specifically HKIA, as an air traveller. Transfer and transit passengers will not be part of the population since they have limited access to the facilities and services offered at the airport.

Furthermore, the time of travel is also an important boundary that ensures participants have recent memories to draw upon, while setting apart those who have not travelled at HKIA for an extended period of time. Originally, the study only planned on including travellers who have both departed and arrived at HKIA within the past 12 months from the time of conducting the survey. Given the large passenger throughput at HKIA, a timeframe of 12 months was deemed to be achievable. Due to the sudden, unforeseen pandemic outbreak, however, air travel restrictions were imposed worldwide and the passenger throughput at HKIA plummeted from 74.7 million in 2018 to 8.8 million in 2020 (Airport Authority, 2021). As a result, both inbound and outbound travel in Hong Kong became stagnated. In addition, the social movement in Hong Kong that occurred in the latter half of 2019 also led to a considerable drop in traffic at HKIA. Therefore, instead of setting an exclusive timeframe as a sampling boundary, the questionnaire allowed participants to select when the most

recent time of which they travelled at HKIA. It could be reasonably anticipated that most respondents would have travelled at HKIA within the past 3 years, namely during the period of 2018 to 2021.

Lastly, this study is all-inclusive in terms of demographics characteristics such as gender, nationality as well as travel frequency since the research probes into airport service quality in general rather than for specific groups of travellers. The only demographics boundary set for the quantitative study is that participants need to be at least 18 years of age. Apart from avoiding ethical issues of conducting research with minors, young travellers may not be fully aware of the airport facilities and services since they are often accompanied by adults, for example during check-in process, and are required to be escorted by airline agents via designated routes if they travel alone. Thus, adults are more likely to have a fuller experience of airport services that can contribute to the research questions.

In short, target participants of this survey can be defined as adult air passengers who have recently departed from and arrived at HKIA. By defining the target population as such, airport users who do not possess sufficient and relevant information would be excluded from the study.

#### **5.3.4 Sampling frame**

A frame is a list or system that identifies all the members of the population from which sample will be drawn. Ideally, an exhaustive list containing one-to-one correspondence with the members is the preferred type of sampling frame. With a definite list, samples can be easily drawn without encountering list problems such as omissions, ineligibles, duplications and clustering (Blair and Blair, 2015). In the current study, the target population involves the vast majority of passengers who travel at HKIA, which cannot be boiled down to an exhaustive list. While it is possible to obtain lists of specific groups of passengers, such as frequent travellers of a specific airline or premium members of a specific airport lounge (Fodness and Murray, 2007), such a list can only represent an insignificant fraction of the target population in this study, categorically omitting the majority of eligible participants who travel less frequently or with other airlines. Moreover, given that traits such as demographics, travel frequency and purpose can affect the perception of airport services, to settle on a list with narrow passenger profile will adversely impact the research results, which cannot be statistically applied to the larger population. Hence, this quantitative study requires sampling to be done without a list of the population.

### 5.3.5 Sampling method

The absence of a list of the target population in this study is closely associated with the selection of sampling method. Typically, where a list of the population is not available, sampling is conducted from counting frames. This essentially requires the researcher to estimate the size of the population, then collect data by counting and randomly selecting a number of samples within the frame. In an example given by Blaire and Blaire (2015), in a study sampling visitors to a shopping mall where footfall is estimated to be 10,000 during the survey period, and if the sample size is 500, there are two ways to count the frame. The first option is to select 500 numbers randomly within the 10,000 visitors, or alternatively the researcher could interview every 20<sup>th</sup> visitor who enter the mall to reach a total of 500 samples within the 10,000-person frame.

The original proposal was to adopt systematic sampling for survey which resembled the abovementioned method elucidated by Blaire and Blaire (2015) in order to allow better assessment of sampling error. That is, every N passenger queuing up for check-in at the airport's departures hall would be asked to answer the questionnaire. This would be repeated for every check-in aisle to cover passengers taking different airlines, conducted at different times of the day and would cover different days of the week. This method could be used for both pilot study and the full-scale survey.

However, due to various unexpected conditions since 2019, access to the terminal and to passengers was hindered. In mid-2019, the social movement in Hong Kong involved sit-ins at the airport and thus the terminal environment was not suitable for carrying out research during this period, in addition to the fact that the sit-ins led to the airport obtaining a court injunction order that restricted access to the terminal. Subsequently, the COVID-19 pandemic broke out which further limited the access to passengers and face-to-face communication, especially given the strict social distancing regulations implemented both at the airport and around the city.

Ultimately, the sampling method was adjusted in light of the unforeseen conditions and snowball sampling was adopted. In essence, snowball sampling is a non-probability technique that involves a chain-referral process in which the researcher selects the first tier of samples, and subsequently these primary subjects refer to the researcher other samples that they deem suitable to take part in the research (Cohen and Arieli, 2011; Heckathorn, 2011). For this study, acquaintances of the researcher were invited to participate in the survey via various digital means, including email and social media channels. The participants were encouraged to extend the invitation to their acquaintances whom they

identified as potential subjects for the research. In replacement of a face-to-face survey, the participants completed a self-administered online questionnaire via a link provided by the researcher.

Although an online survey inevitably entails limitations given that the researcher is absent when the participant fills out the questionnaire, it was deemed an appropriate alternative method under the pandemic situation. For health reasons, an online survey could yield better response in this setting since participants would likely feel safer to fill out the questionnaire without physical contact. More importantly, however, a clear advantage of using an online survey during the pandemic was that it allowed the survey to reach subjects who belonged to the target population but were not present at HKIA. This is because during the pandemic, a number of air travel restrictions were imposed which meant that there was a drastic change to the distribution of the types of airport users. For instance, leisure travellers, which constituted an important customer sector for HKIA, were unable to travel for vacation and thus would not appear in the airport. Thus, a physical survey conducted at the airport during the pandemic would result in a rather limited travellers' profile both in terms of demographics and travel purpose, which could not accurately reflect the usual phenomenon found at HKIA. In contrast, an online survey could reach and collect data from subjects who belonged to the target population but would otherwise be unable to participate in the research.

### **5.3.6 Sample size**

Kumar (2019, p.295) explains the two major factors that may influence the degree of certainty of the inferences that are drawn from the sample, namely the size of the sample and the extent of variation in the sampling population. Firstly, the greater the sample size, the more accurate the estimate of the population will be, as findings based on a greater number of responses generally provide more certainty than those based on a smaller sample. Secondly, the greater the variation in the characteristics of the subjects in the study population, or in technical terms the greater the standard deviation, the higher the uncertainty or the standard error. For example, if the population is homogenous, a smaller sample size can provide reasonably accurate results than if the population is heterogeneous. Overall, it must be borne in mind that the selection of the sample can affect the difference between the sample statistics and true population mean as well as the ultimate usefulness of the findings.

As explained in the sampling frame analysis, the total size of the target population in this quantitative study is difficult to ascertain with certainty as the population includes the massive pool of airport users who travelled at HKIA. For reference, however, the total passenger throughput at HKIA in the recent years, departures and arrivals inclusive, was



74.7 million in 2018, 71.5 million in 2019 and 8.8 million in 2020 (Airport Authority, 2020; Airport Authority 2021). Although a definite sampling frame is not available in the present quantitative study, the target population is large as elucidated above. Furthermore, considering that the population is heterogeneous as airport passengers have diverse profiles, a larger sample size would be desirable so as to produce more accurate results.

Lastly, the data analysis method used in the research should be considered when determining the sample size. According to Israel (1992), if the data is used only for descriptive analysis to obtain information such as the mean and frequency, then almost any sample size will suffice; whereas for multiple regression, a larger sample size of 200 to 500 will be required in order to perform more rigorous evaluation; and for factor analysis, the sample size should not be smaller than 100 (Kotrlík and Higgins, 2001). Sudman (1976) also suggests that the typical sample size for a study of a regional group of people or household is 200 to 500. Taking into account the characteristics of the target population in this study, it is deemed appropriate to aim for the higher end of the range proposed by Sudman (1976), namely a sample size of 500 for the full-scale survey.

For pilot studies, a sample with N between 10 and 30 is deemed reasonable and practical in survey research (Isaac and Michael, 1995; Hill, 1998). Johanson and Brooks (2009) also suggest that if a single point estimate is required, 30 samples that are representative of the target population would be a reasonable minimum size for a pilot study targeting a preliminary survey or scale development. Considering that the sample size for the full-scale survey is 500 and that the main purpose of the pilot study is for preliminary instrument development, a sample size of 30 is adopted.

#### **5.4 Data Analysis Procedures and Techniques**

After collection of the qualitative data, the transcripts will be coded into themes to retrieve and cluster data in a meaningful way as well as to relate different emerging ideas to one and other (Stuckey, 2015). To analyse the pilot test, an exploratory factor analysis will be run to reduce the data set and identify the structure of the relationship between the variables, after which the questionnaire will be adjusted and modified as appropriate.

In the analysis of the survey, exploratory factor analysis will be conducted, again to demonstrate the structure of the variables. Secondly, multiple regression analysis will be used to find out the relationship between the independent variables, namely the dimensions of airport service quality, with the dependent variable, airport service quality. Lastly, correlation analysis will be run to ascertain the relationship between the airport service

quality and passenger satisfaction. The sequential exploratory design is summarised in Table 5.4.

**Table 5.4 – Summary of sequential exploratory design**

	<b>Qualitative Research</b>	<b>Quantitative Research</b>
Research method	Interviews and focus groups	Survey
Objective	Based on the framework developed from literature review, derive the items that relate to and represent the domains of “airport service quality”. Revise the preliminary proposed model and hypotheses as appropriate.	Validate the survey instrument and test the hypotheses.
Number of participants expected	30	500
Target participants	Experts from airport management and aviation related organisations	Air passengers who have recently travelled at HKIA.  In view of the travel restrictions due to COVID-19 outbreak but to also ensure that participants can draw on relevant experiences, passengers will be asked to indicate the last time that they had travelled via HKIA to facilitate analysis of the results.
Sampling method	Snowball sampling - Experts from airport management and aviation related organisations who have relevant experiences would be invited. The research participants would then refer and recruit more potential participants.	Snowball sampling - acquaintances of the researcher were invited to participate in the survey. The first tier respondents were encouraged to extend the invitation to their acquaintances whom they identified as potential subjects for the research.

## **6. Findings and Data Analysis**

### **6.1 Overview**

This chapter presents the findings of the research in the qualitative and quantitative stages. For the qualitative data, analysis was conducted by using manual coding, after which the conceptual model was revised. For the quantitative data, results of the pilot study and the main study are presented by using relevant descriptive and inferential statistical techniques, such as exploratory factor analysis, multiple factor analysis and correlation analysis. The final section presents the results of the hypothesis testing and the final model.

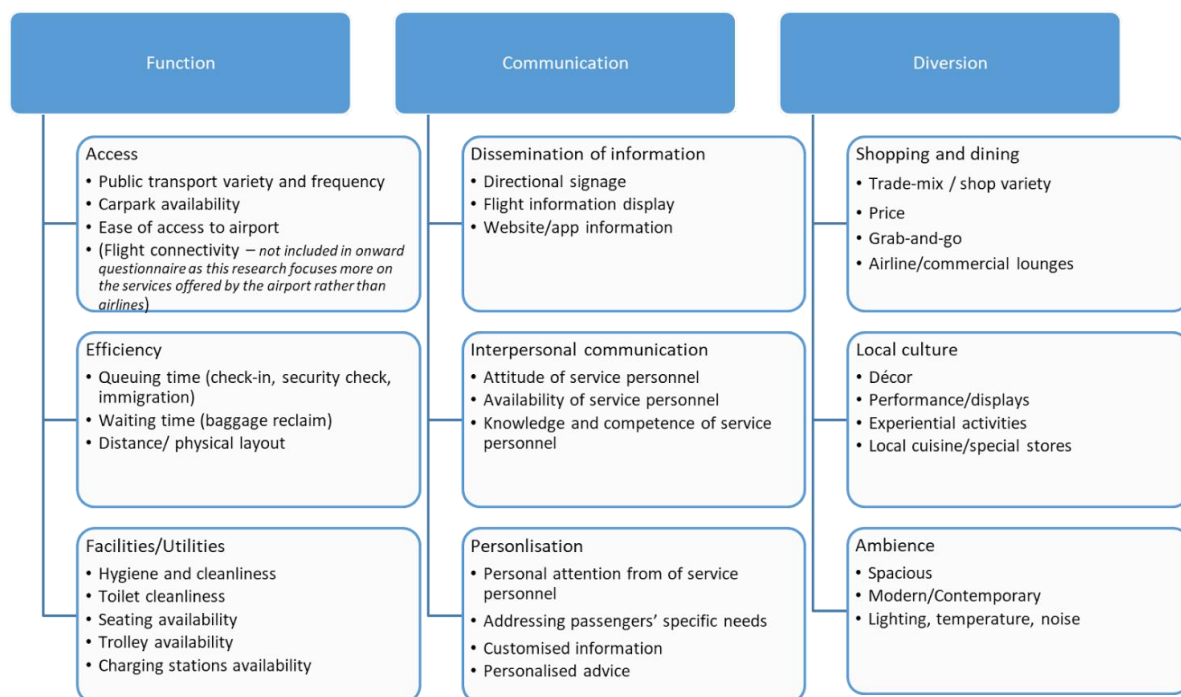
### **6.2 Qualitative Research**

A total of 30 experts who were working in the aviation industry participated in the qualitative research and the interviews were conducted over a course of three months from January to March 2021 according to the methodology as set out in the previous chapter. This chapter presents the findings of the interviews.

#### **6.2.1 Findings – Codes and Themes**

Analysis of the qualitative research revealed several major themes. First and foremost, service qualities relating to the basic “function” of the airport were time after time mentioned by the interviewees throughout the interview process and appeared as a common theme during all the interviews. Second, the “communication” through which the airport disseminated information and connected with the passengers emerged as an equally important element in airport service. Lastly, services that provided “diversion” to passengers were identified as a dimension that could also considerably impact the quality of the time spent at the airport. Figure 6.2.1 below shows a summary of the codes and themes developed from the qualitative research.

**Figure 6.2.1 – Summary of Codes and Themes**



### 6.2.1.1 Function

In general, interviewees are of the opinion that functionality of the airport lies at the heart of the service provision to passengers. When answering the interview questions in the capacity of a passenger, many respondents emphasise that the most fundamental role of an airport is a transportation facility, which naturally ought to ensure that the services are provided with a view to facilitating passengers to, frankly, catch their flight. When asked whether landmark attractions or festive performances would provide attract him to increase his dwell time at the airport, a respondent expressed his explicit view towards airport services:

*“I am not attracted by fancy decorations and facilities. The main purpose that the airport serves is transportation.” (Respondent 8)*

Certainly, there are other respondents who assign more weighting to discretionary activities at the airport but first and foremost, whether the airport can perform its primary function is of paramount importance to the travellers without a doubt. This aligns with the hierarchy of customers’ needs put forward by Kano (1984) which has been elaborated in the previous section. In essence, the fundamental functions of an airport are ‘must-be’ attributes, which passengers see as basic provisions, and the absence of which is likely to lead to dissatisfaction from passengers. These features must not be overlooked as they comprise the essential components of airport services. Maintaining these functions are, therefore, key to establishing a sound foundation on which other service attributes can be built to increase

the overall customer satisfaction. Based on the interviews, the dimension of ‘function’ can be illustrated in three aspects, namely efficiency, facilities/utilities, and access to the airport.

### Efficiency

At the centre of an airport’s functions, the level of efficiency at various checkpoints is one of the most frequently mentioned indicators of the perceived service quality of the airport during the interviews.

*“Ultimately, the most important attribute is efficiency. Other service enhancements are value-added... The journey should be fast and convenient, so that the passengers don’t need to spend too much effort to figure things out.” (Respondent 14)*

It is not surprising that queuing and processing time from check-in, security checks, immigration to arrival baggage reclaim appear to be important quality benchmarks. However, it is worth highlighting that the perception of efficiency at different checkpoints might be associated with each other as illustrated by a respondent when discussing the much-debated efficiency in arrival baggage reclaim at HKIA where travellers often feel that the waiting time is too lengthy.

*“I have experienced the long wait for my arrival bag .... Though, when you come to think about it, the processing time for arrival bags at Hong Kong airport is not that long. It just feels long because the immigration processing time is so short! In some other airports you might have to wait for an hour to get through immigration, and by the time you get to baggage reclaim, of course your luggage would already be there.” (Respondent 3)*

This suggests that instead of using a straightforward performance indicator that measures the waiting time at a particular location inside the airport, it might be worthwhile for airport managers to review operation efficiency by considering different checkpoints altogether in order to draw a complete picture of the passengers’ journey from their perspectives.

Furthermore, the efficiency of a particular service might have significant impact on a passenger’s travel behaviour:

*“When I go on short trips, I avoid bringing any check-in luggage at all costs because I know that I’ll have to wait for a long time [at the arrival baggage reclaim] when I come back to Hong Kong. I’d rather sacrifice my luggage allowance than to regret it when I have to waste time at the reclaim hall. This is especially true if I go on weekend business trips because every minute I waste means less time to spend with my family since the travel schedule is so tight.” (Respondent 20).*

Another respondent has similar travel behaviours that stem from the efficiency of baggage processing time:

*“I only carry a backpack with me when I travel to certain destinations, for example Shanghai Pudong Airport – not because I don’t want to bring luggage, but only because of the terrible queue at the security screening after reclaiming the arrival bag. There are hundreds of people waiting to be screened at the same time. But if you don’t have luggage with you, they’ll divert you to a much shorter queue and that saves a huge amount of time. I cannot tell you how much it stresses me out to have to queue up for an hour right before you can leave the airport. The first time I went there I missed the last train to the city because of this screening process, so ever since then I either avoid bringing luggage or I choose another airport.” (Respondent 9)*

As passengers are the end users of airport services, if, and when there are certain attributes that they are unable to influence or change to their satisfaction, passengers might choose to change their travel behaviour in order to adapt to the airport environment. As policy makers and managers of the airport, airport operators ought to actively reach out to the users and stay responsive to their needs and feedback.

Lastly, the physical layout and walking distance within the terminal also play a vital role in the passengers’ perception of efficiency.

### Facilities and Utilities

The cleanliness and availability of various facilities and utilities inside the terminal is also identified as an important branch of airport functions valued by passengers. High-touch and common facilities such as toilet, public seating and baggage trolleys are repeatedly highlighted and discussed by the interviewees. These frequently accessed facilities can shape the impression that a passenger has on the airport, or even on the city.

*“Toilet cleanliness is very important to me. Generally speaking, I feel that the cleanliness of the toilets somewhat reflects the level of civilisation of that place.” (Respondent 3)*

*“When I arrived at the airport station and stepped out of the train, the first thing I noticed was the way that the trolleys were laid out one by one in neat, diagonal lines, you know, not just stacked up like you’d see in a supermarket... So, everyone could place their luggage onto the trolleys without an effort. I’d never seen anything like*

*that before at any other airports and that has stuck with me ever since.” (Respondent 30)*

Furthermore, when asked whether the COVID-19 outbreak has changed their expectations as passengers on the hygiene and cleanliness maintained by the airport, respondents had diversified opinions.

*“I only realised after the pandemic outbreak that the baggage tubs used in security screening X-ray machines are very dirty. I would expect alcohol wipes to be provided to passengers. This is already available in some Australian airports. General hygiene is important.” (Respondent 8)*

*“My expectations wouldn’t change much. Personal hygiene is the most important so I wouldn’t count much on other people... Frankly speaking, having more hand sanitising dispensers or social distancing signs wouldn’t make me feel more impressed about the airport’s performance.” (Respondent 28)*

*“It’s about transparency... To an extent, I know that a little cleaning robot can’t do much in such a huge space, but the fact that I can see a few of them patrolling around and cleaners working hard on cleaning the seats sort of reassures me a little. At least I know that the airport is making an effort.” (Respondent 25)*

In the capacity of an airport operator, however, respondents generally agree that hygiene measures need to be stepped up, even though this might be different from their expectations as passengers. For example, Respondent 28 who expressed that, as a passenger, he would not feel impressed by the airport’s additional anti-epidemic measures, also opined that an airport should nevertheless implement such actions primarily because the lack of it might attract criticism from airport users who do have such expectations from the airport, even though they might not be the majority. Other respondents also emphasise that public expectations might be higher on a public utility provider such as an airport, such that the provision of anti-pandemic utilities or equipment should be held to a higher standard rather than simply fulfilling the minimum regulatory requirements. Instead of viewing anti-pandemic measures as one-dimensional attributes and attractive attributes which both aim to increase passenger satisfaction, they could well be must-be attributes which passengers treat as a basic service of the airport, especially given the prolonged COVID-19 outbreak. Failure to meet this attribute could lead to adverse impact on passengers’ satisfaction level. Therefore, rather than focusing on whether such actions could impress the passengers, airport operators ought to be aware of the negative consequences that might follow in the absence of anti-pandemic facilities and measures.

## Access

Access to and from the airport marks the starting point as well as the conclusion to the passengers' airport journeys and is an important functional aspect of the airport that every airport user would encounter, one way or another. Apart from the variety of transportation modes, the frequency and reliability of public transportation were also discussed by the interviewees.

*“When I travel to Shanghai, one of the reasons that I always fly Hongqiao instead of Pudong is because of their public transport. The subway linking to Hongqiao is very convenient – just a 5-minute walk from the terminal in a covered walkway. Then the first time that I travelled to Pudong, I arrived at 10pm and got out at around 11:30pm after queuing up for an hour for security screening, only to find out that the subway had already stopped!... It’s a big international airport so I never thought I had to worry about public transport.” (Respondent 25)*

Even though public transportation is the most common way to commute in Hong Kong, carpark availability at the airport is equally important given that driving is not substitutable for some travellers.

*“I nearly always drive to the airport even since we had our kids. It’s not an option for me to take public transport or even to queue up for the taxi carrying two toddlers and all the luggage... I also find the website quite useful for checking the car park availability before you arrive. But I don’t think a lot of people know about it yet.” (Respondent 19)*

*“For land-to-air travellers, appropriate car park facilities like park-and-fly will be very attractive, especially now that the Hong Kong-Zhuhai-Macao Bridge is opened. More and more people will come to Hong Kong by car and connect to a flight.” (Respondent 10)*

### 6.2.1.2 Communication

In the original conceptual model developed from the literature review, the second dimension to airport service quality is defined as ‘interaction’. After analysis of the qualitative research, this dimension is renamed as ‘communication’. ‘Interaction’ has a narrower focus on personal interaction between the passengers and airport employees; whereas as the revised definition has a wider context that covers a variety of ‘communication’ features, ranging from personal interaction, the way that the interaction or information is customised to the general dissemination of information through signage, flight information displays as



well as other digital means. The findings reveal that a broader interpretation of communication paints a more comprehensive picture of the factors impacting passengers' perception of airport service quality.

### Dissemination of Information

Items grouped under the “dissemination of information”, such as clarity of in-terminal signage and availability of flight information displays are traditionally categorised as basic ‘functions’ of the airport that relate to operational efficiency and terminal movement. Nonetheless, the interviews reveal that value of the abovementioned items to the passengers might not rest so much on the ‘functional’ aspects, but instead on conveying essential ‘information’ to the passengers and having effective ‘communication’ that facilitates their journey. The importance of timely and effective communication is highlighted by the following account:

*“Passengers need to feel that they are ‘well-informed’. Regardless of whether the situation is good or bad, be it a flight delay or a construction blocking my way requiring me to detour, I wouldn’t want to just stand there without knowing what’s going on. This is important because as a passenger I feel that I’m in a relatively passive position and I need the airport to tell me, one way or another, what I need to do.” (Respondent 14)*

In other words, signage and information displays do not only serve the sole function of navigation, but more importantly they are channels through which the airport can communicate effectively with the passengers, offering them a feeling of certainty and reassurance. It should also be noted that effective dissemination of information nowadays is no longer limited to physical directories in the terminal and needs to be extended to other digital channels such as websites and mobile applications. If used appropriately, these tools can relay comprehensive, advance information to the passengers even before they arrive at the airport.

### Interpersonal Communication

A passenger encounters a great number of airport staff during the journey, from enquiry counters, check-in counters, security channels, to retail shops and restaurants, and even toilets and nursing rooms. Human interaction thus has a vital part in shaping the passengers' journeys as much as it does to customers in other service sectors. Even though self-serviced facilities such as check-in kiosks, self-bag drop machines and e-security channels are gaining prevalence, human contact will remain an important element in delivering airport services.

This is accentuated by the information-intensive nature of airport journeys seeing as passengers often need to obtain a large amount of information in a short period of time in a place where they do not frequently visit but where time is of the essence. Under such circumstances, whether the time pressed travellers could obtain the information in a timely manner becomes particularly important to their perception of airport services. Moreover, since travellers are often placed in a time-sensitive and high stress situation, the attitude of the staff encountered by the travellers play a key role in managing the travellers' emotions and easing their anxieties. Thus, the availability of airport staff at a time when the travellers are in need as well as their communication skills are both vital indicators of airport service quality.

*“Oftentimes the politest airport staff that I encounter are airline staff and commercial lounge staff. I think it is to do with their training and how the airline and lounge businesses emphasise service quality. But in my opinion other employees at the airport should also receive enough customer service training - from baggage trolley helpers - because that’s usually the first thing that I need after arriving at the airport - to cleaners, even to security personnel.” (Respondent 6)*

### Personalisation

Customisation can be a powerful tool in managing customer relationships in the service industry. Addressing the customer's personal needs can often increase the perceived service quality, establishing a higher level of trust between the service provider and customer. This has a positive impact on achieving higher customer satisfaction as well as customer loyalty in various service industries, demonstrating the efficacy of service customisation in relationship marketing (Coelho and Henseler, 2012). Thus, a thorough assessment of the effects of personalised services can help airport managers to effectively allocate resources to maximise service enhancements for passengers.

In the interviews, the theme of personalisation emerged not only as a valued part of general airport service provision, but more specifically, as an important aspect of communication between the airport operator and the passengers. This ranged from the level of attention received by the respondents from the service personnel, how well they answered the passengers' questions, to the extent to which the information addressed the passengers' specific needs.

*“I find it useful when airline or airport websites categorise their information for different passengers, especially now that there are so many COVID regulations. When I was trying to check the arrivals information for a friend, I had to scroll*

*through the whole page to find the information that I needed because the page contained all the COVID regulations for departures, arrivals, and transit passengers... Then I looked at some other airport's website, their layout is very clear – you can choose whether you are departing or arriving, or whether you are just picking up a friend, then once you click into that page, it only contains the information that you need – I don't have to waste time reading through information that is for other types of passengers.” (Respondent 5)*

*“Technology can help us customise information. You know about the iBeacons installed inside the terminal – if you have the airport app, it'll prompt relevant information to you depending on your location and your flight. There are lots of things you could do with this kind of technology – imagine if you arrived early at the airport, the app could prompt you more shopping and dining options, whereas if you had a tight connection time, we could advise you the fastest route to go to the boarding gate.” (Respondent 21)*

*“The services at the airport are already very wide-ranging. What is important is not just to keep adding new services whenever you receive a new suggestion from the airport users because you can never have enough services or facilities customised for each passenger. It would make more sense to find a way to provide customised ‘information’ to them, so that in their limited time they can find the shops that they like, get to where they need to go in the fastest way... that's customisation in my point of view.” (Respondent 10)*

While there are limitations to the extent to which airport services can be customised given its wide range of customers, passengers expect that airport operators can succinctly communicate with them and disseminate selected information to make their experiences personalised. Therefore, airport operators shall not merely focus on expanding the range of services, but more importantly on providing specific and personalised information to the passengers in order to effectively fulfil their needs and optimise their time spent at the airport.

#### 6.2.1.3 Diversion

Diversion of the passengers' attention from rigid and stressful processing activities at the airport might be key to yielding higher customer satisfaction. The following three sub-themes, namely shopping and dining, local culture, and ambience, emerge in the interviews as important dimensions relating to diversion. The impact of diversion ought not to be underestimated as it might act as a powerful tool in creating a pleasant experience for

passengers or even capable of turning the airport experience around by compensating the shortfalls in other functional airport services.

*“My best airport experience, without a doubt, would be at Incheon Airport in Korea. I actually had to queue up for a very long-time during customs and immigration check [for departure], but my overall experience was very happy. Because after the long queue, I was able to go to a cultural handicraft workshop before my flight, which I very much enjoyed; and there were musical performances to watch, which were all very impressive. When I think about that trip again, my impression is still very positive.” (Respondent 14)*

### Shopping and Dining

Airports have the inherent advantage of having a captive audience who must stay inside the terminal for a certain period of time before departure and after arrival which, from a commercial perspective, creates more spending opportunities for passengers at the airport compared with shopping malls where customers can visit anytime at will. Nevertheless, the fact that passengers are trapped in the airport does not necessarily guarantee effective sales conversion.

Airport retail and dining is unique in the sense that the operator must cater for a large variety of customers, as opposed to shopping malls which can proactively determine their marketing positioning and target customer segment. Airports are also faced with other difficulties, such as limited customer dwell time as well as customs and flight restrictions. To address this, airports should adopt a customer-centric mentality and make service quality a strategic priority.

While passengers' spending decision depends on various factors, the availability of options and the price level are the two major themes that emerge from the interviews. Regarding shop variety, most of the respondents opine that the shopping options at HKIA are limited and focus on luxury brands, and that the dining price is generally too high at HKIA. Nevertheless, some opine that it is normal for shopping and dining at the airport to be more expensive than downtown.

*“It's a public utility. I shouldn't have to spend so much on essentials – and I'm not talking about luxury goods – when we have no choice but to stay inside the airport when we travel.” (Respondent 2)*

*“It is expected that things are expensive at the airport – it's the same around the world. I wouldn't complain.” (Respondent 16)*

*“I like shopping at airports, especially when I’m at a foreign airport. When I have a feeling that I’m on vacation, I’m usually less sensitive to price. But for dining, I usually only buy water and some light snacks because I don’t have time to sit down and eat. Occasionally, if I have plenty of time, I’d go to a [commercial] lounge instead of a sit-down restaurant because I can get a variety of food and enjoy a quiet environment, and I only have to pay a little extra.” (Respondent 25)*

While respondents have diversified satisfactory levels regarding shopping and dining at HKIA, it can be reasonably inferred that the perceived value of retail offering as well as the choice of shops and restaurants are key drivers of passenger satisfaction in terms of shopping and dining. Nonetheless, even if the issues shopping and dining options and price level are addressed, airport operators must also recognise that limited dwell time might present another barrier to spend. To stimulate spending, airports need to explore ways to increase passenger dwell time and shorten other processing time as much as possible. More streamlined and convenient shopping and dining options, such as clear shop zoning and grab-and-go food services, should also be made available.

### Local Culture

As gateways to the city, airports often form the first and last impressions of the city for the travellers. This is consistent with the findings from the interviews as participants share their expectations through the terminal decors, cultural activities and performances as well as specialty stores and food. In general, the interviewees often speak of these cultural experiences about foreign airports and have less expectations if they fly at their home airports. As airports are evolving into more than a place for travel, they ought to seek to promote awareness and appreciation of the local culture. Incorporating local elements into the airport’s appearance and service offerings could create a sense of uniqueness and an authentic identity for the airport, allowing travellers to connect to the cultural heritage and leaving a memorable experience to travellers who get a taste of the local culture at the first and last stop at their destination.

*“The cultural elements are quite strong in many Southeast Asian Airports. Thai airports in general are particularly so. From the decorations, the uniform that their staff wear, to the souvenir packaging... Everything is very cultural and makes me feel like I’m on vacation.” (Respondent 12)*

*“Changi Airport has a local heritage zone in one of its terminals. It certainly left an impression on me even though the shops were just chain stores. The design and decorations in that whole area was very impressive.” (Respondent 25)*

*“To me local culture doesn’t necessarily have to be traditional. For example, the indoor rainforest at Changi Airport is very modern-looking, yet I feel that it is a good representation of Singapore’s geographical characteristics. I had seen a lot of photos of the waterfall before, but when I was there in person, I still found it captivating, and you can’t possibly forget it.” (Respondent 11)*

*“It is understandable that luxury brands will always be the predominant sector in an international airport. But I do appreciate the smaller boutiques and local dining options that are introduced in the recent one or two years at HKIA. I can only imagine that it must be difficult for small businesses to enter the airport given the high rent and high operation standards, but having some local shops is definitely attractive to international travellers, and as a local, I’d also be happy to see people from around the world to get to experience the local culture. Yes, of course they can find local stores downtown, but there’s no better place to showcase your business than a place like the airport – it’s the city’s gateway; it represents the city’s standards.” (Respondent 5).*

### Ambience

As the service scope of airports becomes more diverse, it is important that airports recognise that the terminal ambience is a key driver of passenger satisfaction. Ambience covers a range of tangible and intangible measures, such as spaciousness, facilities aesthetics, interior design, and decorations, etc, all contributing to the overall attractiveness of the servicescape. During the interviews, respondents referred to the airport ambience in various ways and examples at HKIA as well as other airports were given, suggesting the ways that this attribute influences passengers’ perceptions of airport services towards the terminal space both consciously and subconsciously.

*“Compared with other airports, Hong Kong Airport is very calm and modest in terms of the decorations and colour tones. Everything is very clean and standardised, and the colours, mainly grey and blue, are consistent inside the terminal. Personally, I quite like this ambience, but of course, having a cold colour tone might limit the decorations to an extent, but I think we can overcome it with pop-up or seasonal decorations and exhibits.” (Respondent 8).*

*“Chicago O’Hare Airport has an entire tunnel walkway decorated with neon light. To be honest I found the walking distance really long inside the terminal, but the light installation inside the tunnel was quite interesting and I think it distracted us a little when my family and I walked through it... I’d still prefer a short walking*

*distance, that's for sure, but I think this kind of modern art or decoration is good for enhancing the overall ambience and the tunnel in O'Hare Airport is something I'd remember from that trip" (Respondent 11).*

### **6.2.2 Conclusion of qualitative research**

As elucidated in the methodology, the qualitative research involved interviews with experts who were working in the aviation industry. The experts provided valuable insights into the attributes of airport service quality in a structured manner from the perspective of airport management, while their input in the capacity of a passenger provided an opportunity to check if the answers deviated significantly and if so, the reasons underlying such discrepancies. In general, it was found that the responses given in both capacities by the same respondent were similar, though differences were sometimes observed in topics related to the use of technologies.

For instance, when asked whether the COVID-19 pandemic outbreak had in any way affected the airport operations and services, one respondent opined that the development and application of technologies to create a touchless experience would be important in tackling passengers' concern of hygiene in light of the pandemic. However, when asked about whether the pandemic would change his expectations on airport services or travel habits, the same respondent expressed that the implementation of anti-pandemic measures would not significantly change his perception of the airport's performance. The respondent further elaborated on the difference in his views towards the impact of the pandemic on airport services, explaining that despite his opinion as a passenger, anti-pandemic measures should nevertheless be implemented so as to avoid criticism from passengers who do have such expectations from the airport. Moreover, making changes to the airport services, particularly those involving the application of new technologies, typically took a prolonged period from development to implementation, such that airport management must make an early decision on whether to proceed with the initiatives based on the anticipation of future passenger and operation needs.

Overall, conducting interviews with the industry experts allowed a structured, in-depth investigation of the research questions that provided exclusive insights and insider knowledge. On the whole, the interviewees' perspectives were consistent both in the capacities of an expert and a passenger, and where discrepancies were observed, such differences were sufficiently justified. The experts' interest in the research topic and professional curiosity also resulted in an actively engaged and productive interview environment. Therefore, it can be concluded that the qualitative research successfully

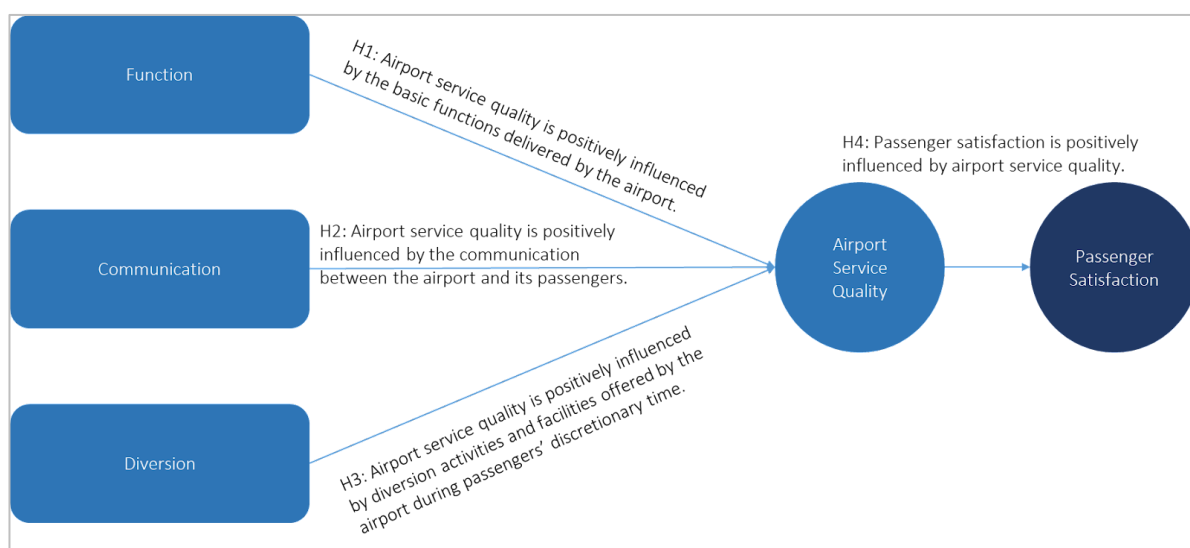
gathered data in an efficient and concentrated manner, deriving items that represent the airport service attributes and their potential relationship with passenger satisfaction.

To conclude, the analysis of the qualitative research illustrates that the concept of airport service quality is threefold. Firstly, the basic functions provided by an airport can be evaluated by the access to and from the airport, the efficiency at various touchpoints and a range of facilities and utilities provided to passengers. Secondly, effective communication between the airport operator and the passengers covers a number of aspects, ranging from the dissemination of information, international communication to personalisation of information and services. Thirdly, diversion elements, such as shopping and dining, activities or decor that reflect local culture and enhance the overall terminal ambience, could also considerably affect the quality of time spent at the airport and are thus valued by passengers as well as airport management. Accordingly, the proposed model developed from literature review was refined based on the findings of the qualitative research.

### 6.2.3 Revised model

Figure 6.2.3 below shows the revised model and hypothesis developed from the qualitative research.

**Figure 6.2.3 – Revised model**



### 6.3 Quantitative Research

The objective of the quantitative study is to test the instrument that is developed from the qualitative study. In this chapter, the findings will be presented, interpreted, and analysed by using different descriptive and inferential statistical techniques. The chapter first presents the findings from the pilot study, analysis of the results and the modifications made to the



survey instrument as a result. Subsequently, findings and analysis of the main study are presented, including (1) demographics and travel characteristics, (2) exploratory factor analysis, (3) multiple regression analysis, (4) correlation analysis and (5) hypothesis testing.

### **6.3.1 Findings and analysis of the pilot study**

As explicated in the methodology chapter, a pilot test was conducted prior to the main survey with an aim to score the feasibility of the quantitative research process. Although conducting a pilot test does not guarantee the success of the full-scale survey, pre-testing the research instrument on a smaller scale does increase the likelihood of success and can contribute to establishing a robust study design. Since pilot tests carry a number of important functions that entail valuable insights into the enhancement of the subsequent research process, the findings ought to be adequately acknowledged and presented in order to systematically review the instrument before commissioning the main survey on full scale. In the present study, the pilot test was evaluated based on the data analysis of the responses as well as feedback collected from the respondents through an open-ended question incorporated at the end of the survey. This section discusses and presents the outcomes of the pilot test and the adjustments made to the questionnaire accordingly.

#### **6.3.1.1 Demographics and travel characteristics**

A total of 38 questionnaires were received, of which 30 were completed and usable. Table 6.3.1.1 summarises the demographics and travel characteristics of the pilot test participants. At the beginning of the survey, it was stated that participants must be at least 18 years old, and they were instructed to provide their answers based on their own travel experience at HKIA within the past 24 months. To reinforce these essential criteria, screening questions were included to ensure that all participants were over 18 years old and had travelled at HKIA as both a departure and arrival passenger within the past 24 months. In the pilot test, 8 (21%) out of 38 participants did not fulfil the travel experience pre-qualification requirement, in which case the online questionnaire automatically came to an end without going on to the subsequent questions except for the last open-ended question inviting overall feedback about the questionnaire. Out of the 30 participants who fulfilled the first requirement, all of them also fulfilled the age requirement and hence carried on answering all following questions.

The gender distribution was equal, with 14 (47%) male and 16 (53%) female participants. Of the 30 respondents, the largest age group was 25-34 (50%), followed by 34-44 (23%), 55-64 (13%), 18-24 and 45-54 (both 7%) and none were 65 or above (0%). In terms of education level, 47% of respondents were bachelor graduates, 40% were master graduates,

10% were at high school level or below, and 3% had a doctor degree. 29 respondents (97%) were Hong Kong residents and only 1 respondent (3%) was a non-Hong Kong resident.

For travel characteristics, the most frequent travel purpose of the respondents was for leisure (67%), followed by 6 for business (20%), 2 for visiting family (7%) and 2 for study (7%). In the year 2019, the travel frequency was as follows: most respondents (12) travelled 1-3 times a year (40%), 9 respondents 4-6 times a year (30%), 5 respondents travelled 7-9 times a year (17%) and 4 of them travelled 10 times or above a year (13%).

**Table 6.3.1.1 – Demographics and travel characteristics of pilot test participants**

	Frequency	Percentage
<b>Have you departed from <i>and</i> arrived at Hong Kong International Airport by air at least once in the past 24 months?</b>		
Yes	30	79%
No	8	21%
<b>Are you 18 years old or above?</b>		
Yes	30	100%
No	0	0%
<b>Gender</b>		
Male	14	47%
Female	16	53%
<b>Age group</b>		
18-24	2	7%
25-34	15	50%
35-44	7	23%
45-54	2	7%
55-64	4	13%
65 or above	0	0%
<b>Education</b>		
High school or below	3	10%
Bachelor	14	47%
Master	12	40%
Doctor	1	3%
<b>Are you a Hong Kong resident?</b>		
Yes	29	97%
No	1	3%
<b>What is your most frequent travel purpose?</b>		
Business	6	20%
Leisure	20	67%
Visiting family	2	7%
Study	2	7%
Others	0	0%
<b>How many times did you travel by air in the year 2019?</b>		
1-3	12	40%
4-6	9	30%
7-9	5	17%
10 or above	4	13%

After careful consideration, several adjustments were made to the questions relating to demographics and travel characteristics. Firstly, it appeared that the first screening question requiring participants to have travelled at HKIA during the past 24 months was too stringent, as 8 out of 38 participants declared that they did not meet this criterion. As the pilot test was

conducted in July to August 2021, a 24-month period prior to that dated back to mid-2019, which was several months before COVID-19 broke out. However, airport operations and access at HKIA during 2019 was also significantly affected by a social movement in HK which involved sit-ins at the airport, thus many passengers were not able to travel to and from HKIA. Since the full-scale survey would be conducted towards the end of 2021, it was anticipated that a considerable number of travellers would not have the relevant experience to take part in the survey had the pre-qualification requirement remained the same. Having considered the feasibility of the data collection process, therefore, it was decided to remove this screening question that strictly filtered out certain respondents. Instead, two questions asking the respondent to state the time of their most recent travel experience at HKIA were added, such that respondents could specify the year in which they last departed from and arrived at the airport. This way, the window of time during which respondents travelled at HKIA could be presented in a more flexible way that enhanced the practicality of data collection without materially compromising the accuracy of the results.

Secondly, respondents opined that the question “How many times did you travel by air in the year 2019?”, which was intended to discover the respondents’ travel frequency prior to COVID-19, caused some confusion as respondents were instructed to complete the questionnaire based on their travel experience in the past 24 months, but the question relating to travel frequency referred only to the year 2019 specifically. Hence, to improve the clarity, this question was rephrased to "On average, how many times did you travel by air per year before the COVID-19 outbreak"? Although the time of outbreak may vary from place to place, it is anticipated that the difference is negligible and does not affect the purpose of this question, which is to find out the normal travel frequency by the respondent.

#### 6.3.1.2 Internal consistency

Subsequently, the reliability of all the scale items of the instrument were analysed by reviewing the standard deviation and Cronbach’s alpha, details of which are tabulated in Table 6.3.1.2. These were evaluated together with the respondents’ feedback. Cronbach’s alpha is one of the most commonly used reliability measures of internal consistency that reveals how closely connected the items within the same construct are. Ranging from 0 to 1, the higher the value of Cronbach’s alpha, the greater the internal consistency of the group of items. The Cronbach’s alpha is 0.723 for the first construct “function”, 0.880 for the second construct “communication” and 0.842 for the third construct “diversion”. As a rule of thumb, a value of over 0.7 is widely considered as a desirable level (Taber, 2018). Hence, the value for all three constructs in the instrument could be deemed as fairly high, indicating that the test items were appropriately grouped under the constructs.

Moreover, it would be useful to check the impact on the alpha if a particular item was removed from the scale. If this would result in an increase of the value of Cronbach's alpha, it would be an indication for the researcher to consider reducing the scale items accordingly. In the pilot study, for instance, it was found that by omitting Item 3 "There are sufficient car parking spaces", Cronbach's alpha of the construct "function" would be increased from 0.723 to 0.784. Furthermore, Item 3 had a standard deviation of 0.077, which was significantly lower than other items. Although a low standard deviation is not necessarily less desirable, it signifies that the data points are clustered closely around the mean and that the results from different respondents do not vary a great deal. This could perhaps be explained by the prevalence of public transportation in Hong Kong such that the respondents, having less or no experience in using the car parks at the airport, tended to give a neutral score around the midpoint, resulting in a mean of 3.57. However, car parks are deemed as an important element of access to the airport according to previous research, and it is possible that with a greater sample size in the main study, the survey could capture respondents who have relevant experiences. All things considered, it was decided that Item 3 relating to the availability of car parks would be retained in the scale, but attention would be drawn to this item when evaluating the final results from the main study.

Apart from evaluating the reliability of the instrument, clarity of the language used in forming the questions is equally important. A number of adjustments were made based on the comments provided by the pilot test respondents, including the choice of words, expressions and phrasing. A summary of the changes made is listed in Table 6.3.1.

**Table 6.3.1.2 - Summary of pilot test items**

		Mean	Standard deviation	Cronbach's alpha	Cronbach's alpha after removing this item
	<b>Construct 1: Function (13 questions)</b>				
	<b>Access</b>				
1	A variety of ground transportation options to and from the city is available.	4.47	0.571	<b>0.723</b>	
2	The ground transportation frequency is adequate.	4.37	0.718		
3	There are sufficient car parking spaces.	3.57	0.077		0.784
4	The distance from the ground transportation terminus to the airport terminal is adequate.	4.10	0.803		
	<b>Efficiency</b>				
5	Queuing and processing time for check-in is short.	3.80	0.761		
6	Queuing and processing time at security screening/checkpoint is short.	3.83	0.747		
7	Queuing and processing time at immigration checkpoint is short.	4.23	0.626		
8	Waiting time for my arrivals baggage is short.	3.13	0.809		
9	The airport's physical layout avoids crowding and enables easy movement.	3.97	0.809		
	<b>Facilities/Utilities</b>				
10	The airport's facilities and utilities (e.g. toilets, seating, baggage trolleys) are clean.	4.30	0.466		
11	The waiting areas provide comfortable seating.	3.83	0.747		
12	Business facilities such as charging points, computers, wifi are available.	4.03	0.669		
13	The baggage trolleys are conveniently located.	4.00	0.587		
	<b>Construct 2: Communication (14 questions)</b>				
	<b>Dissemination of Information</b>				
14	The airport's signs clearly direct me to services/facilities.	4.07	0.907	<b>0.880</b>	
15	The flight information displays are clear and sufficient.	4.33	0.711		
16	The airport's website/mobile app provides clear information about my flights.	3.90	0.885		
17	The airport's website/mobile app provides sufficient information about the airport's facilities.	3.70	0.702		
18	Getting information about the facilities and services of the airport is easy ( <i>reaching information via phone, internet, in-terminal directories, etc.</i> )	3.93	0.740		
	<b>Interpersonal Communication</b>				
19	Employees at the airport are courteous.	3.90	0.607		
20	Employees at the airport are always willing to serve customers.	3.77	0.626		
21	Employees at the airport are available when needed.	3.87	0.681		
22	Employees at the airport have in-depth occupational knowledge (professional skills, foreign language, communication skills, etc.)	3.90	0.759		
23	Employees at the airport understand my queries and requirements.	3.83	0.648		

		Mean	Standard deviation	Cronbach's alpha	Cronbach's alpha after removing this item
	<b>Personlisation</b>				
24	Employees at the airport are able to give me individualised attention.	3.50	0.938		
25	Employees at the airport understand my specific needs.	3.50	0.820		
26	Employees at the airport are able to provide me with customised advice that serves my needs.	3.53	0.860		
27	The airport's website/mobile app provides me with customised information that serves my needs.	3.27	0.691		
	<b>Construct 3: Diversion (14 questions)</b>				
	<b>Shopping and Dining</b>				
28	A variety of retail outlets are available.	3.83	0.874		
29	A variety of food and beverages are available.	3.80	0.805		
30	Quick-service and/or grab-and-go food and beverages options are available.	4.10	0.803		0.824
31	The price level of food and beverages is reasonable.	3.03	1.066		
32	Airline and/or commercial lounges are available.	4.13	0.681		0.851
	<b>Local Culture</b>				
33	The airport's decor and/or displays match the local culture of the city.	3.60	0.855		
34	The airport provides performances that reflect the local culture of the city.	3.30	0.837	<b>0.842</b>	
35	The airport provides cultural activities that I can take part in.	2.87	0.900		0.853
36	Local cuisine and local specialty retail stores are available.	3.73	0.828		
	<b>Ambience</b>				
37	The terminal is spacious.	4.16	0.747		
38	The terminal's interior is modern.	4.07	0.907		
39	The terminal's lighting is adequate.	4.40	0.621		
40	The temperature at the airport is comfortable.	4.27	0.691		
41	The noise levels at the airport is acceptable.	4.23	0.679		
	<b>Overall Service Quality</b>				
42	The overall service quality at Hong Kong International Airport is good.	4.13	0.681		
	<b>Overall Passenger Satisfaction</b>				
43	I am happy with the experiences I have had at Hong Kong International Airport.	4.10	0.673		
Correlation between overall airport service quality and overall passenger satisfaction		0.685 (p <.001)			

**Table 6.3.1 – Summary of major changes to the scale items**

Item	Statement	Findings and Comments	Changes made
4	The distance from the ground transportation terminus to the airport terminal is adequate.	The word “adequate” is not typically used to describe distance and might cause confusion to the respondents.	The word “adequate” is changed to “short”, which is more commonly used to describe distance and is easier to comprehend.
10	The airport's facilities and utilities (e.g. toilets, seating, baggage trolleys) are clean.	It is preferred not to list the specific examples since this is an overall question about the facilities and utilities at the airport, which are diversified and cannot be exhaustively listed in the examples given.	The item is revised to a more general statement "Overall, the airport's facilities and utilities are clean".
22	Employees at the airport have in-depth occupational knowledge (professional skills, foreign language, communication skills, etc.)	The phrase “in-depth occupational knowledge” is difficult to understand albeit examples are given.	The item is revised to a simpler statement "Employees at the airport are able to answer my queries".

Overall, the pilot study proved to be valuable to the overall success of the onward main survey which largely benefited from the modifications made to the initial instrument. Even though the sample size was small compared with the main study, the pilot test nevertheless shed light on possible flaws and offered an opportunity to rectify and improve the item reliability as well as measurement procedures. Analysing the data and addressing the comments provided by the respondents thus effectively identified ambiguous items in the questionnaire and tested the clarity of instructions that was perceived by the participants. Therefore, it could be concluded that the objective of conducting the small-scale pilot study was achieved as the results suggested useful modifications to the instrument and facilitated the onward planning of the main study.

### **6.3.2 Findings and analysis of the main study**

#### 6.3.2.1 Demographics and travel characteristics

A total of 500 questionnaires were completed and usable. Demographics and travel characteristics are summarised in Table 6.3.2.1. First and foremost, whether the participants possessed relevant travel experience at HKIA was a crucial factor directly affecting the usefulness of the results. Even though air travel in Hong Kong plummeted due to the outbreak of COVID-19, 92% of the participants had nevertheless departed from and arrived



at Hong Kong International Airport within the past three years from the taking the survey, and 100% participants travelled at HKIA within the past four years. It could be reasonably assumed that the participants therefore had relatively recent memories of their experiences which the responses were based upon.

The respondents consisted of a relatively equal gender distribution of male (57%) and female (43%). Of the 500 respondents, the largest age group was 35-44 (36%), followed by 25-34 (33%), 45-64 (18%), 18-24 (4%), 65 or above (3%) and none were under 18 (0%). To ensure that all participants were at least 18 years old, apart from placing the age requirement at the beginning of the survey, the online questionnaire was designed such that if the participant selected the age group "Under 18", no further questions would be asked and the survey would come to an end. In terms of education level, 58% of respondents were bachelor graduates, 32% were master graduates, 8% were at high school level or below, and 1% had a doctor degree.

87% of the respondents were Hong Kong residents and 13% of them were non-Hong Kong residents. Most respondents were Hong Kong residents, which might not fully represent the distribution between local and foreign travellers before the pandemic as HKIA is an international airport. However, as explained in the methodology section, having the survey conducted online instead of in person at the airport, which was in any case not possible given the pandemic outbreak, was an attempt to reach a higher number of foreign travellers given the circumstantial restraints. Had the survey been conducted at the airport, the number of local respondents was likely to have been even higher than 87% seeing that leisure and business travel had plummeted, such that those who could travel to and from HKIA at the time of the survey were predominantly Hong Kong residents flying for study purposes or family visits.

For travel characteristics, the most frequent travel purpose of the respondents was mainly for leisure (70%), followed by 103 for business (21%), 32 for visiting family (6%), 9 for study (2%) and the remaining 2 % for other purposes. Before the COVID-19 outbreak, the travel frequency was as follows: most respondents (206) travelled 1-3 times a year (41%), 184 respondents 4-6 times a year (37%), 73 respondents travelled 7-9 times a year (15%) and 37 of them travelled 10 times or above a year (7%).

**Table 6.3.2.1 – Demographics and travel characteristics of survey participants**

	Frequency	Percentage
<b>Gender</b>		
Male	287	57%
Female	213	43%
<b>Age group</b>		
Under 18	0	0%
18-24	20	4%
25-34	167	33%
35-44	179	36%
45-54	88	18%
55-64	32	6%
65 or above	14	3%
<b>Education</b>		
High school or below	42	8%
Bachelor	292	58%
Master	160	32%
Doctor	6	1%
<b>Are you a Hong Kong resident?</b>		
Yes	434	87%
No	66	13%
<b>What is your most frequent travel purpose?</b>		
Business	103	21%
Leisure	348	70%
Visiting family	32	6%
Study	9	2%
Others	8	2%
<b>When was the last time that you departed from Hong Kong International Airport by air?</b>		
Year 2021	11	2%
Year 2020	125	25%
Year 2019	322	64%
Year 2018	42	8%
Year 2017 or before	0	0%
<b>When was the last time that you arrived at Hong Kong International Airport by air?</b>		
Year 2021	11	2%
Year 2020	141	28%
Year 2019	306	61%
Year 2018	42	8%
Year 2017 or before	0	0%
<b>On average, how many times did you travel by air per year before the COVID-19 outbreak?</b>		
1-3 times/year	206	41%
4-6 times/year	184	37%
7-9 times/year	73	15%
10 times/year or above	37	7%

### 6.3.2.2 Exploratory factor analysis

Exploratory factor analysis is generally used to identify the potential factors underlying a set of items, or in other words, to uncover the common factors that can explain structure amongst the measured variables (Watkins, 2018). The scales used to test the dimension hypotheses are (1) function (Items 1 to 13), (2) communication (Items 14 to 24) and (3) diversion (Items 25 to 34). For each of the above dimensions, exploratory factor analysis was conducted in order to determine whether the items originally assigned to the particular dimension after from the literature review and qualitative study actually represented that group. As the instrument was adopted, with modification, from the research conducted by Fodness and Murray (2007) which explored the measurement of passengers' expectations towards airport service quality, the quantitative analysis method takes reference from the aforementioned research where appropriate, including the exploratory factor analysis method. The results of the exploratory factor analysis are summarised in Table 6.3.2.2(b).

Firstly, the Kaiser-Meyer-Olkin ("KMO") Measure of Sampling Adequacy, which indicates the adequacy of the set of data for factor analysis, was studied for each scale. The lower the proportion of variance that might be common variance, the more suitable the data is for conducting factor analysis, and thus the KMO measure should not be less than 0.6 (Hair et al., 1998). Next, Bartlett's Test of Sphericity was conducted for each scale to test if the correlation matrix was significantly different from an identity matrix. In all three scales, the KMO values were over the acceptable threshold of 0.6. They ranged from 0.845 to 0.902, indicating that the samplings were meritorious to marvellous for conducting factor analysis. Moreover, the *p* value in Bartlett's Test of Sphericity was less than 0.05 for all three scales, showing that the correlation matrix had significant correlations. Overall, the prerequisites were fulfilled, indicating that the set of observed variables was adequate for analysing using the exploratory factor analysis and the results are presented in Table 6.3.2.2(a).

**Table 6.3.2.2(a) – KMO and Barlett's Test of Sphericity**

		Scale 1 – Function	Scale 2 – Communication	Scale 3 – Diversion
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.866	.902	.845
Bartlett's Test of Sphericity	Approx. Chi-Square	3173.415	3963.240	2892.736
	df	78	55	45
	Sig.	.000	.000	.000

The exploratory factor analysis produced a number of factors for each scale. To determine which factors should be retained, the eigenvalue of each individual factor was first studied as it measured the common variance of the variable that the factor explained. Only those with a value of over 1 were retained so as to capture the most significant variance in the variables, and those which fell below 1 were discarded as a result. Although a scree plot could be used in conjunction with evaluation of the eigenvalue, such interpretation could be subjective, and it would be deemed that the use of eigenvalue alone would suffice for the purpose of this analysis.

The extracted factors were then subjected to a Promax rotation to obtain more interpretable loadings. Commonly, factor analysis rotations can be categorised into orthogonal and oblique rotations, where the former assumes that factors are uncorrelated with one another and the latter assumes otherwise. Among the most common of these categories are Varimax for orthogonal rotations and Promax for oblique rotations. In general, it is recommended that researchers use oblique rotations where the underlying factors are deemed to be correlated, and orthogonal rotations for uncorrelated factors (Johnson and Wichern, 2002), though McDonald (1997) opines that it is unlikely that the factors are truly uncorrelated in the test scale. To date, there is no definitive consensus as to the performance of the two methods under various conditions and as to which technique practitioners ought to choose in order to yield more interpretable solutions. In a study conducted by Finch (2006), the findings suggest that either Promax or Varimax rotation will produce similar results in matching the items to their associated factors and will reasonably identify the underlying factor structure. For the purpose of the analysis in this research, Promax rotation was adopted on the ground that the various underlying factors in airport service quality were potentially correlated, although either Promax or Varimax would have been acceptable.

### Function

For Factor 1 (Function), the scale developed for the survey originally consisted of three items, namely access, efficiency and cleanliness of facilities/utilities. The factor analysis, however, indicated that only two subfactors were obtained respectively from Items 1 to 9 and Items 10 to 13. This could be explained by the fact that access to and from the airport would appear to be connected with the efficiency of movement and dwell time spent at the airport. For example, if the mode and travelling time of the public transport were reliable, a passenger could better plan ahead about how much time they would spend at the airport instead of arriving hours before their flight. Thus, 'access' in this sense would make the passengers' journey more efficient in the overall airport journey. It is also possible that the distance from the ground transportation terminus to the airport terminal is a better indicator of the

efficiency rather than ease of access as passengers might perceive this as part of the 'processing time' which essentially affects 'efficiency'. All in all, if Items 1 to 9 all belonged to one factor, 'efficiency' would appear to be the more dominant item compared with 'ease of access'. Considering the scope of the items included in Items 1 to 9, the term 'efficiency' can essentially be interpreted as 'efficiency of process and movement', though for the sake of clarity in the final model, the term 'efficiency' will be adopted. The second factor in Scale 1 relating to the airport's facilities and utilities, consists of Items 10 to 13, which aligns with the original scale. This included the availability, cleanliness, and convenience of the facilities and utilities commonly used by the passengers.

On a conventional continuum, the lowest acceptable cut-off value should be set at 0.4 on the liberal end and 0.6 to 0.7 in a more conservation approach (Matsugana, 2010). With regard to communalities, items yielding at least 0.4 are generally considered acceptable, but should be removed if below 0.2 (Osborne, Costello and Kellow, 2008; Child, 2006). For Scale 1, the items clearly loaded on to their associated factors with no cross-loading between the two factors in the Pattern Matrix. All the items had a loading of over 0.6, though Item 3 relating to the availability of car parking spaces scored 0.440, which is noticeably lower than other items and is just slightly above the liberal acceptable threshold. The communalities in Scale 1 are all over the acceptable threshold of 0.4, again with the exception of Item 3 scoring only 0.225. Furthermore, similar to the results in the pilot study, Cronbach's alpha of the factor "Efficiency" would be increased from 0.884 to 0.890 if Item 3 was disregarded, while that of the entire construct "Function" would experience negligible change from 0.879 to 0.878. As suggested in the pilot study analysis, this could be caused by the prevalence of public transportation in Hong Kong, leading to a lower demand of car parks by the passengers. Even though the provision of car parks is important at the airport, the majority of passengers access HKIA by public transportation, hence the availability of car parks might not come across as an element that is significantly related to other items grouped under the same factor, in turn resulting in a low factor loading and communality. Since the item obtained a marginal score in factor loading and a low score in communality, it would be considered appropriate to take out Item 3 in the final model.

### Communication

For Factor 2 (Communication), all the items were linked to the three different subfactors as originally anticipated in the survey instrument, with Items 14 to 17 belonging to 'dissemination of information', Items 18 to 21 'interpersonal communication' and Items 22 to 24 'personalisation'. The loading for each item was over 0.6 and communalities well over

0.4. Furthermore, the eigenvalues for these three factors were all over 1, yielding a high cumulative percent of variance explained at 77.2%.

### Diversion

Lastly, for Factor 3 (Diversion), three subfactors were obtained, with Items 25 to 28 linked to 'shopping and dining', Items 29 to 31 linked to 'local culture' and Items 32 to 34 linked to 'ambience'. The eigenvalues were all over 1; communalities over 0.4; factor loadings over 0.6; and the cumulative percent of variance explained was at 75.7%. However, Item 31 regarding the availability of local cuisine and specialty retail stores loaded on two factors, namely 'local culture' (0.602) and 'shopping and dining' (0.247). One widely utilised approach is to discard the item wherever it loads onto more than one factor. Nonetheless, retention of items by evaluating the primary and secondary factor loadings is also a common technique employed in social science studies. That is, its cross-loading can be accepted if there is sufficient difference between the primary and secondary factor loadings (Matsugana, 2010). For example, an item can be retained if the highest loading is over 0.5 and the second highest loading is also below 0.2. Other criterion, such as 0.6/0.3 or 0.6/0.4 are also adopted by practitioners (Henson & Roberts, 2006; Park, Dailey and Lemus, 2002). Considering that there was a primary-secondary factor loading difference of 0.355 for Item 31, and that the primary factor 'local culture' was the intended associated factor in the survey instrument, the item was retained in the final model. The potential limitation in the data presentation should be acknowledged nevertheless.

**Table 6.2.2.2(b) – Exploratory factor analysis summary**

Construct 1 - Function

	<b>Items</b>	<b>Factor 1 Efficiency</b>	<b>Factor 2 Facilities &amp; Utilities</b>	<b>Communalities</b>
1	A variety of ground transportation options to and from the city is available.	0.689		0.551
2	The ground transportation frequency is adequate.	0.662		0.440
3	There are sufficient car parking spaces.	0.440		0.225
4	The distance from the ground transportation terminus to the airport terminal is short.	0.635		0.424
5	Queuing and processing time for check-in is short.	0.801		0.645
6	Queuing and processing time at security screening/checkpoint is short.	0.790		0.572
7	Queuing and processing time at immigration checkpoint is short.	0.716		0.510
8	Waiting time for my arrivals baggage is short.	0.638		0.421
9	The airport's physical layout avoids crowding and enables easy movement.	0.794		0.623
10	Overall, the airport's facilities and utilities are clean.		0.719	0.566
11	The waiting areas provide comfortable seating.		0.807	0.640
12	Business facilities such as charging points, computers, wifi are available.		0.760	0.550
13	The baggage trolleys are conveniently located.		0.747	0.562
	<i>Cronbach's alpha (Factor)</i>	0.884	0.843	
	<i>Cronbach's alpha (Construct)</i>	0.879		
	<i>Eigenvalue</i>	5.490	2.103	
	<i>Percent of variance explained</i>	42.228	16.175	
	<i>Cumulative percent of variance explained</i>	42.228	58.403	

Construct 2 - Communication

	<b>Items</b>	<b>Factor 2 Interpersonal Communication</b>	<b>Factor 3 Personalisation</b>	<b>Factor 1 Dissemination of Information</b>	<b>Communalities</b>
14	The airport's signs clearly direct me to services/facilities.			0.597	0.647
15	The flight information displays are clear and sufficient.			0.710	0.672
16	The airport's website/mobile app provides clear and sufficient information.			0.799	0.602
17	Getting information about the facilities and services of the airport is easy (reaching information via phone, internet, in-terminal directories, etc.)			0.690	0.563
18	Employees at the airport are courteous.	0.827			0.741
19	Employees at the airport are always willing to serve customers.	0.752			0.704
20	Employees at the airport are available when needed.	0.650			0.692

21	Employees at the airport are able to answer my queries.	0.819			0.635
22	Employees at the airport are able to give me individualised attention.		0.820		0.776
23	Employees at the airport understand my specific needs.		0.813		0.779
24	The airport provides me with customised information that serves my needs.		0.814		0.736
	<i>Cronbach's alpha (Factor)</i>	0.899	0.906	0.847	
	<i>Cronbach's alpha (Construct)</i>	0.928			
	<i>Eigenvalue</i>	6.436	1.112	1.003	
	<i>Percent of variance explained</i>	58.509	10.113	8.57	
	<i>Cumulative percent of variance explained</i>	58.509	68.622	77.192	

### Construct 3 - Diversion

	<b>Items</b>	<b>Factor 1 Shopping and Dining</b>	<b>Factor 3 Ambience</b>	<b>Factor 2 Local Culture</b>	<b>Communi- ties</b>
25	A variety of retail outlets are available.	0.900			0.750
26	A variety of food and beverages are available.	0.900			0.747
27	The price level of food and beverages is reasonable.	0.646			0.509
28	Airline and/or commercial lounges are available.	0.618			0.439
29	The airport's decor and/or displays match the local culture of the city.			0.770	0.690
30	The airport provides performances or activities that reflect the local culture of the city.			0.911	0.697
31	Local cuisine and local specialty retail stores are available.	0.247		0.602	0.563
32	The terminal is spacious.		0.828		0.694
33	The interior of the airport is modern.		0.889		0.775
34	The terminal's overall ambience (e.g. lighting, temperature, noise level) is adequate.		0.853		0.755
	<i>Cronbach's alpha (Factor)</i>	0.852	0.890	0.831	
	<i>Cronbach's alpha (Construct)</i>	0.852			
	<i>Eigenvalue</i>	4.962	1.475	1.130	
	<i>Percent of variance explained</i>	49.616	14.754	11.304	
	<i>Cumulative percent of variance explained</i>	49.616	64.37	75.674	

#### 6.3.2.3 Multiple regression analysis

The ultimate objective of this analysis is to predict the dependent variable using the independent variables whose values are known by ascertaining the weighted value of each predictor variable which indicates their relative contribution to the overall outcome (Moore et al., 2006). In the previous part, exploratory factor analysis was used to identify the main factors in the scales and match them with the associated items. It was therefore hypothesised



that function, communication and diversion could positively predict the airport service quality. To test this hypothesis, multiple regression analysis was conducted with a view to ascertaining the relationship between airport service quality as the dependent variable and the three aforementioned independent variables.

Although there are a number of available multivariate statistical techniques, multiple regression is deemed to be an adequate analysis method for this research as it allows for the examination of the strength of the relationship between the dependent variable (airport service quality) and multiple independent variables (function, communication and diversion). Furthermore, the analysis also sheds light on the associations and weighted effect of each of the predictors on the dependent variable (Petchko, 2018). Thus, the three independent variables were entered simultaneously into the regression equation to predict airport service quality.

#### 6.3.2.4 Assessing the utility of the model

One way of assessing the utility or the goodness-of-fit of the model is by evaluating the statistic  $R^2$ . The statistic measures the strength of the relationship between the predictors of the model by indicating the amount of variance in the dependent variable that can be explained by the independent variables collectively. However, one issue with  $R^2$  is that its value could be inflated by increasing the number of predictors into the model regardless of whether these predictors are sensible. Having a model that contains too many predictor variables is not desirable as it may be excessively customised to the random noise in the sample rather than holistically reflecting the overall population. This would result in overfitting the model, yielding misleadingly high  $R^2$  values yet failing to produce an accurate prediction model.

Thus, it is desirable to adjust  $R^2$  by taking into account the size of the model. Unlike  $R^2$ , the value of the adjusted  $R^2$  increases only if the new variable improves the model fit by a sufficient amount. A value of adjusted  $R^2$  that is substantially smaller than  $R^2$  flags a potential issue that the model may contain too many predictors. Therefore, although a higher  $R^2$  indicates a higher percentage of variations that can be explained by the model, the value of  $R^2$  ought not to be used alone in evaluating the utility of the model, and the adjusted  $R^2$  should also be considered as it shows whether a new variable is useful in predicting the output.

Results show that the  $R^2$  and adjusted  $R^2$  are equal to 0.567 and 0.564 respectively ( $F(3,497)=216.570$ ),  $p<.001$ ), meaning that approximately 56-57% of the variation can be explained by the three predictor variables. In general, a model is considered to be more

predictive if it has a higher  $R^2$  value, though there is no absolute rule as to how high the value should be in order for the model to be accepted, especially in social sciences where human behaviour, which is bound to change under different circumstances, is involved in the research (Ozili, 2022). Overall, given that the value of  $R^2$  in this analysis is well over 50% and that all of the explanatory variables are statistically significant, it can be safely assumed that the percentage is within the acceptable range in terms of how well the sample data represents the data that is expected to be found in the actual population.

R, which represents the simple correlation, is equal to 0.753. Thus, this indicates a strong association.

### F-test

The F-Test examines the overall appropriateness of the multiple regression model by testing the significance, or in other words, by testing the significance of the independent variables as a whole for predicting the dependent variable. In a nutshell, Gill (1999) summarises that the test of significance put forward by Neyman and Pearson in 1936 consists of several important steps. Firstly, two complementary hypotheses, namely the null hypothesis symbolised by  $H_0$  and the alternative hypothesis symbolised by  $H_A$ , which is different from Fisher's (1955) approach that only requires testing the null hypothesis. However, there are two common types of errors in hypothesis testing. Type I error occurs when the null hypothesis is rejected when it is in fact true; while Type II error occurs when we fail to reject the null hypothesis when it is in fact false. Therefore, it is important to determine a significance level for the test, which quantifies the tolerance for Type I error. In other words, if the significance level is set at 0.05, it is accepted that there is a probability that the null hypothesis is falsely rejected 5% of the time. The test statistic shall then be calculated and compared against the predetermined significance level. If the test statistic is within the set critical value, the probability of making Type 1 error can be tolerated and thus the null hypothesis can be rejected.

For the current analysis, a regression parameter is formulated and set out below. The first equation is a null hypothesis which proposes that there is no difference, or no statistical relationship between airport service quality and the three identified independent variables. Conversely, the alternative hypothesis proposes that the effect does exist in the population. As the null hypothesis is presumed to be true until proven otherwise, the test statistic is calculated from the data and analysed accordingly.

$$H_0: \beta_1 = \beta_2 = \beta_3 = 0$$

$$H_A: \beta_1 \neq \beta_2 \neq \beta_3 \neq 0$$

In essence, the  $p$  value represents the probability that a regression coefficient of 0 or above could have occurred coincidentally if the null hypothesis were true (Rubinfeld, 2000). As the level of  $p$  value required to obtain a statistically significant result is typically set at 0.05, the null hypothesis would be rejected if the  $p$  value was less than the predetermined value; and conversely the alternative hypothesis would be rejected if the  $p$  value was greater than 0.05.

The results from the data show that the  $p$  value is  $<0.001$  and as elaborated above, a value less than 0.05 indicates that it is statistically significant. According to the procedures of the test of significance, the null hypothesis is therefore rejected in favour of the alternative hypothesis. This suggest that the overall multiple regression model is useful and is good enough in predicting the outcome variable.

### T-Test

The T-Test is a statistical hypothesis testing technique that is used to test the significance of individual regression coefficients in the multiple regression model. The test is important since adding a new variable to the model makes it more effective only if the variable is sufficiently significant; in contrast, the model will be weakened if the newly added variable is unimportant.

In the population, there is a significant relationship between the Y variable (overall service quality) and the X variables (function, communication and diversion). The summary of the T-Test is presented in Table 6.3.2.4(a).

**Table 6.3.2.4(a) – Summary of T-Test**

<b>H<sub>0</sub></b>	<b>H<sub>A</sub></b>	<b>P value</b>	<b>Significant? p &lt; 0.05?</b>	<b>Reject H<sub>0</sub>?</b>
$\beta_1 = 0$	$\beta_1 \neq 0$	$< .001$	Yes	Yes
$\beta_2 = 0$	$\beta_2 \neq 0$	$< .001$	Yes	Yes
$\beta_3 = 0$	$\beta_3 \neq 0$	$< .001$	Yes	Yes

### Interpreting the standardised regression coefficient

Regression coefficients can be defined as estimates of the population parameters and is an indicator of the strength of the relationship between the dependent and independent variables. The standardised coefficient represents the change in the final score of the dependent variable for each unit change in the individual independent variable, when all other

independent variables are held constant. In other words, they are the values that multiply the predictor values. A positive coefficient indicates that as the independent variable increases, the dependent variable also increases. The standardised coefficient of each independent variable is presented in Table 6.2.2.4(b), which shows that communication has the strongest effect on service quality out of all the independent variables.

**Table 6.3.2.4(b) – Standardised coefficients of independent variables**

<b>Independent variable</b>	<b>Standardised coefficient (beta)</b>	<b>Effect on dependent variable</b>
Function	0.247	Lowest
Communication	0.337	Strongest
Diversion	0.305	Medium

Looking at the unique individual contributions of the predictors, the results show that function ( $\beta=0.247$ ,  $t=5.580$ ,  $p<.001$ ), communication ( $\beta=0.337$ ,  $t=9.253$ ,  $p<.001$ ) and diversion ( $\beta=0.305$ ,  $t=7.336$ ,  $p<.001$ ) all positively predict airport service quality. This suggests that services that cover basic airport functions as well as those offering diversion activities and strong communication with passengers are all integral components of airport service quality.

In particular, the standardised coefficient for communication is 0.337, which is the highest out of the three dependent variables. The standard deviation of overall service quality is 0.674. This means that an increase of score equal to one standard deviation unit in communication, which is 0.587, is associated with an increase of score in the overall service quality equal to  $0.674 \times 0.337 = 0.227$ .

A comparison can be drawn with that construct “function”, which appears to have the lowest effect on the dependent variable with a standardised coefficient of 0.247. This means that an increase of one standard deviation in function is associated with an increase of score in the overall service quality equal to  $0.674 \times 0.247 = 0.166$ .

Furthermore, diversion has a standardised coefficient of 0.305, which is 0.032 lower than communication and 0.058 higher than function. For every increase of standard deviation in diversion, there is an increase of score in the overall service quality equal to  $0.674 \times 0.305 = 0.206$ .

The difference in change in score in the overall service quality between the strongest and lowest predictor variables is therefore  $0.260 - 0.229 = 0.031$ . On a 5-point scale, this is equivalent to a difference of  $0.031 / 5 \times 100\% = 0.62\%$ .

#### 6.3.2.5 Correlation analysis

Having established the factors that comprise airport service quality, the research further seeks to discover the relationship between airport service quality and passenger satisfaction. In the preliminary conceptual model, it was hypothesised that airport service quality positively influenced passenger satisfaction. Thus, a correlation analysis was conducted to test the way and the extent to which these two quantitative variables were related to each other. In essence, the correlation test tests the null hypothesis that the correlation between the variables equal to zero.

$H_0: \rho = 0$ , that is, the null hypothesis is that there is no association between the two variables (airport service quality and passenger satisfaction)

$H_a: \rho \neq 0$ , that is, the alternative hypothesis is that there is an association between the two variables (airport service quality and passenger satisfaction)

The correlation, or the degree of association, between two quantitative variables is measured by a correlation coefficient which spans from +1 through 0 to -1. In a linear relationship, a positive correlation is where one variable increases by a fixed amount as the other increases by a unit, and the closer the value is to +1, the stronger the relationship is. In contrast, a negative correlation is where one variable decreases by a fixed amount for every unit increase in the other, such that a correlation of -1 indicates a perfect descending linear relation. If the correlation coefficient is 0, the two variables are not linearly associated at all even though other non-linear relations may be present.

Data analysis shows that the Pearson correlation coefficient between the overall airport service quality and overall passenger satisfaction is 0.848, which indicates a very strong degree of association between the two variables. Since the p-value is less than 0.001, the association is statistically significant. The null hypothesis can therefore be rejected, such that the change in magnitude in airport service quality is positively associated with that of passenger satisfaction in the same direction.

#### 6.3.2.6 Hypothesis Testing Results

Before concluding this chapter with the final model, this section summarises the major findings of the quantitative research in the following order: (i) the dimensions of airport service quality, (ii) the association between airport service quality and its determinants, and (iii) the association between airport service quality and passenger satisfaction.

## Dimensions of airport service quality

The findings from the exploratory factor analysis revealed three dimensions of airport service quality, namely function, communication and diversion. The KMO values and the significance level of the Barlett's Test of Sphericity were first examined to confirm that the data were suitable to be analysed using the factor analysis. Factors were then extracted and were further retained only if they explained a sufficient percentage of variance in the dimension; and the items were also subjected to Promax rotation in order to further verify whether they were correctly loaded on to the associated factor. The test of significance was also conducted to ensure that the data had sufficiently strong evidence to reject the null hypothesis.

In the exploratory factor analysis, the number of factors in the first dimension 'function' was reduced from three to two after careful examination. The results suggested that 'access' to and from the airport, which intended to include transportation and walking distance from the ground transportation terminus to the airport terminal, should be combined with 'efficiency', which originally covered the efficiency of certain processes, such as check-in time and baggage reclaim time. Considering that the essence of the above items lied upon the performance, or the 'efficiency', of the particular passenger activity, the abovementioned two factors were merged into the same factors named 'efficiency'. Furthermore, the second item of 'function' was found to be 'facilities and utilities', which included overall cleanliness of the airport facilities and utilities, availability of seats, availability of baggage trolleys and other provisions such as charging points and Wi-Fi. Hence, 'efficiency' and 'facilities and utilities' are two fundamental factors of the 'functions' of the airport service quality perceived by passengers.

The second dimension was 'communication' between the airport service provider and the passengers. The findings in the quantitative research showed three different factors in this dimension, namely dissemination of information, interpersonal communication and service personalisation. This aligned with the preliminary findings obtained from the qualitative research. Dissemination of information included items such as the clarity of signage and information displays, website information, and overall availability and ease of access to information which were disseminated through various channels. Interpersonal communication mainly referred to the interaction between airport personnel and passengers, such as attitude, politeness, availability and capability. Lastly, personalisation of service was also found to be a key factor of communication which evaluated whether the airport service provider was able to provide individualised attention, customised information and to understand the customers' specific needs. Thus, this dimension is named as 'communication'

instead of 'interpersonal communication' for the fact that while face-to-face human interaction is traditionally seen as an important attribute, other communication channels such as in-terminal signage and displays, website and phone also carry an important function of effectively communicating with the airport users.

The third dimension, 'diversion', which referred to a variety of diversion activities in the airport, was found to contain three factors, namely shopping and dining, local culture and ambience. Shopping and dining included items such as the availability of retail shops, restaurants, commercial lounges, as well as the price level of food and beverages at the airport. Local culture was found to be reflected in the airport's décor, displays, performances, as well as local specialty stores and restaurants. Moreover, the overall ambience in the airport was also found to be an important attribute of diversion. This ranged from in-terminal spaciousness, modern interior, lighting, temperature to noise level. All in all, it is important to bear in mind that airport service quality is not limited to the provision of basic functions, as results show that communication and diversion are also key to establishing the service quality at an airport.

#### Association between airport service quality and its three dimensions

Having established that dimensions that comprise airport service quality, the strength of relationship between these independent variables and the dependent variable can be explained by the results obtained from the regression analysis. The analysis showed that all the predictor variables had a positive relationship with the response variable, and the degree of influence exerted by the quality of communication between the airport service provider and the passengers on the overall service quality was found to be the strongest, followed by diversion activities, and lastly the basic functional services offered by the airport. In other words, an increase in the score in items under the communication construct would lead to the greatest increase in the overall score for airport service quality out of the three constructs. This echoes with previous studies that highlight the increasingly extensive nature of airport services and the growing need to satisfy passengers in various processes and activities outside of the traditional aeronautical operations. It is not to say that independent variables with a lower predictor value are unimportant, yet their relative strengths of relationship with the dependent variable present a fuller picture to practitioners in making informed decisions which best prioritise and allocate resources in order to deliver the highest service quality to passengers.

### Association between airport service quality and passenger satisfaction

The correlation analysis shows a strong, positive relationship between airport service quality and passenger satisfaction, which is in line with prior research. Although the concept of service quality is often deemed to be dependent upon perceptions of excellence, while passenger satisfaction could typically be affected by a number of other issues, various studies have nevertheless established the association between these constructs and the results of this study serves to reinforce this relationship in the context of airport services. The importance of achieving high customer satisfaction has been thoroughly discussed in previous chapters, which essentially boils down to the issues of passenger loyalty, revenue in both aeronautical and non-aeronautical businesses, as well as the international standing of the airport. Thus, even though service quality is not the only factor contributing to passenger satisfaction, the strong correlation found in the present study underlines the importance of striving excellence in service performance in an attempt to elevate the passenger experience at the airport.

#### 6.3.2.7 Final Model

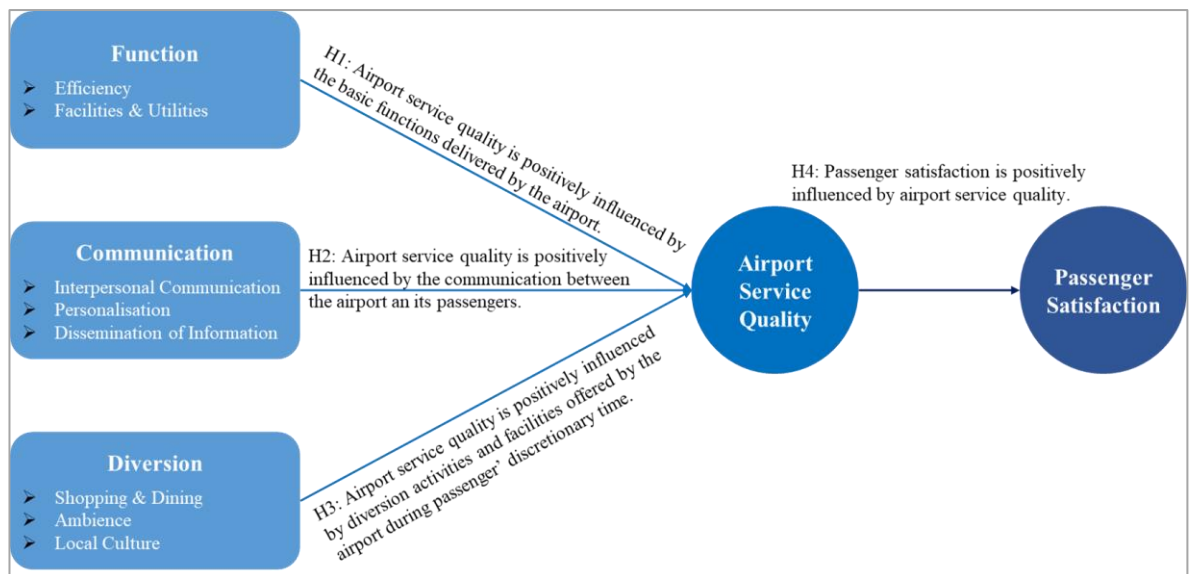
After careful examination and robust testing procedures, the following hypotheses, which were set out at the beginning of the study and revised after the qualitative research, were accepted:

- H1: Airport service quality is positively influenced by the basic functions delivered by the airport.
- H2: Airport service quality is positively influenced by the communication between the airport and its passengers.
- H3: Airport service quality is positively influenced by the diversion activities and facilities offered by the airport during the passengers' discretionary time.
- H4: Passenger satisfaction is positively influenced by airport service quality.

The hierarchical structure for airport service quality was finalised and presented in Figure 6.3.2.7.



**Figure 6.3.2.7 – Final model**



## **7. Discussion**

### **7.1 Overview**

This chapter aims to review the research findings and put them into context of an airport. The first section discusses the extent to which HKIA has fulfilled its customers' needs, namely whether the different types of customer needs are addressed, whether the customer experience is holistic, and whether such an experience is adequately customised. The second section evaluates the extent to which AAHK's mission statement align with the passengers' needs. The last section reviews the managerial implications and applications of the research findings.

### **7.2 To what extent has HKIA fulfilled its customers' needs?**

#### **7.2.1 Addressing each type of customer needs**

Having categorised and prioritised the different types of customer needs, it appears that the characteristics of AA's core customer groups give rise to not only must-have needs and one-dimensional needs, but also a number of attractive attributes.

Firstly, in terms of must-have needs, safety and security are undoubtedly the major attributes demanded by all types of customers. In this regard, AAHK consistently fulfils the international and governmental regulatory standards, evidenced by the annual Aerodrome Licence granted by the Civil Aviation Department upon satisfactory assessment of the AAHK's competence in operating a safe aerodrome. In addition, various initiatives have been implemented by AAHK in further increasing the safety level on runways, such as the automation in airfield ground lighting inspection system and automated foreign object debris detection system.

Secondly, with regard to one-dimensional qualities, considerable resources have been used for process enhancements. Particularly, by developing a "single-token" through the use of biometrics identification and automated departures facilities, processing time could be further shortened, thereby fulfilling passengers' demand in this aspect. The use of the airport mobile app also enhances wayfinding and caters to the often time-pressed passengers.

Thirdly, it would appear that AAHK excels in providing innovative attractive attributes that exceed the customers' expectations. The provision of self-service facilities, development of suggested in-terminal routes to fully exploit passengers' dwell time and the omni-channel retail strategy altogether create excitement in the customer experience. Such continuous effort in innovation could surprise the customer and yield paramount satisfaction.

### 7.2.2 Creating a holistic customer experience

The importance of treating the customer experience as a holistic picture is emphasised by various theories and frameworks that emphasise on understanding a customer's activities as a whole rather than on a single point of service. In the context of HKIA, it would appear that AAHK deploys abundant resources in researching passengers' different needs at various stages of their airport journey. It is clear that Customer Journey Mapping research that accentuates the concept of an "end-to-end" journey supplements other existing research and surveys, thereby constructing a fuller picture of the customers' journey. This has in turn prompted various project developments that extend the airport service to the city, as well as service enhancement that addresses passengers' emotions during different stages of their airport journey.

In an attempt to collecting passenger insights, AAHK has in place various channels such as a Customer Enquiry Feedback System, which comprises a telephone response centre, online and written feedback; social media listening, which discovers valuable real-time insights from a large pool of airport users; and regular service quality surveys, which aim to monitor customer satisfaction and identify any shortfalls in a particular point of service. Nevertheless, it is observed that these existing approaches are not comprehensive enough to depict a passengers' entire airport journey. Therefore, AAHK commissioned a "customer journey mapping" ("CJM") in order to cover the current blind spots in the airport journey.

CJM emphasises on an "end-to-end" journey and recognises that the journey pre and post the passengers' actual stay at the airport also has an impact on their satisfaction level with the airport. For example, the study revealed that many departing passengers are bothered by the pre-airport journey caused by having to carry their luggage around, or having to keep an eye on their luggage during transportation time, such that by the time they arrive at the airport, the passengers are exhausted and cannot relax until they complete the check-in process. With a view to create a hassle-free journey, therefore, AAHK has developed an "off-airport check-in" service, which is being launched by phase. Departing passengers would be able to check-in their luggage from home and have their luggage delivered straight to the aircraft, such that they need not worry about travelling with bags or queuing up for bag-drop during the departure journey at the airport.

Furthermore, CJM also takes into account the emotional level of the airport users at different stages of their journey, which in turn helps AAHK to implement relevant measures. For instance, it is found that passengers often feel more anxious upon arrivals, hoping to get to their next destination as soon as possible. However, due to a saturation of space and high

passenger volume, baggage reclaim is often identified as a pain point for arrivals passengers. While long-term measures are gradually being implemented to speed up the baggage reclaim process, the CJM's emotions indicators brought to light that interim measures that could soothe the passengers' emotions and divert their attention could also be effective. Consequently, a range of corresponding measures have been planned and are being implemented, such as the addition of mood music, themed seating, and enrichment of tourist information and services in the baggage reclaim area.

Hence, through mapping out the passengers' entire airport journey and emphasising on the activities carried out by the passengers, it appears that AAHK is able to cater to its customers' needs comprehensively and holistically.

### **7.2.3 Customising each airport experience**

Conventionally, the quality of airport services might be focused on the provision of basic functions of an aerodrome and the efficiency of processing flights and passengers. Thus, the notion of service personalisation in the context of an airport would not receive much attention or might even be seen as impractical given the large number of passengers that an airport needs to serve. Nonetheless, the literature review in this study suggested otherwise, as a robust Customer Relationship Management ("CRM") system could be applied to a wide array of airport activities to offer a personalised experience to passengers. The subsequent qualitative research and followed by the quantitative research also revealed findings that supported the importance of customised services, which could be achieved through effective communication with the passengers.

While the dissemination of information and interpersonal communication are both key components of effective communication, this study reveals that personalisation is also a factor that significantly impacts on the quality of communication in airport services. As a measure to establish customised relationships with its passengers, HKIA has been adopting and implementing different technological applications that enables service personalisation. For instance, the airport has installed over 10,000 iBeacons around the terminal to prompt personalised messages according to the passenger's specific circumstances. That is, for example, a passenger could receive geo-specific proximity messages about an art exhibition enroute to the boarding gate, or information about a sales promotion at a retail shop that is close to the passenger's real-time location.

In the future, these push messages could be extended to cover special occasions or contingencies, for example in the event of mass flight delays that is expected to cause congestion in the main food court, the airport operator could prompt personalised messages

to the passengers suggesting alternative dining options to divert the passenger flow based on the location of their boarding gates and updated time of departure. To make the experience even more personalised, the suggestions could be made based on the individual passenger's profile, travel patterns and previous shopping and dining behaviour at the airport.

However, many of these initiatives are still underway and yet to be developed, especially in terms of establishing a mature loyalty programme. Such a loyalty programme could provide a number of value-added services and promotions that would not only attract business flyers, but also many frequent leisure travellers. Furthermore, even though HKIA is already making good use of the iBeacons to customise real-time experience, more emphasis now needs to be placed on the collection and analysis of these data in order to extract valuable information for onward development. By strengthening data collection and creating a data pool coupled with AI technology, passengers would be able to experience a truly customised airport journey.

Moreover, a well-established CRM system does not only consist of the use of technologies, but also the overall communication between the airport service provider and the passengers. In other words, technologies are merely one of the communication channels and other tools and mediums that could facilitate service customisation are equally important. As passengers often encounter service personnel at different points of service at the airport, the performance of relevant airport staff and their ability to provide information specific to the individual passenger's needs becomes one of the critical indicators of the quality of service. At HKIA, the customer service staff are directly employed by the AA, and a robust in-house training system and exposure to the overall operations of the organisation provides a solid foundation for the development of the customer service staff. Furthermore, HKIA also attained a number of service awards and accreditation, such as the Level 3 Airport Customer Experience Accreditation awarded by Airport Council International in 2021.

The service personnel encountered by passengers at the airport, however, are not limited to the AAHK customer service staff, but includes a wide range of staff under the employment of different service providers, such as airlines, ground handling agents, retail shops, restaurants, and many other service contractors. Clearly, this presents a challenge to any airport operator in terms of achieving a consistent service level across different business operators serving at the airport, especially since passengers are unlikely to distinguish between different airport staff in their overall perception of the service quality provided by the airport. At HKIA, the AAHK maintains a high level of control over the service performance of the business operators through a well-established contractual relationship that sets out the required performance standards and obligations, while a structured incentive

and demerit system also facilitates the ongoing control and monitoring of the required standards. Furthermore, the Hong Kong International Aviation Academy (“Aviation Academy”) provides standardised training to relevant airport personnel, which is yet another measure through which the HKIA can consistently fulfil the service standards. By implementing a high level of service performance standards across all airport services, a sound foundation can be formed upon which the airport services can be further customised to the needs of the passengers.

To conclude, it is evident that HKIA adopts a range of measures aimed at enhancing passenger experience through a personalised customer service strategy, including the use of technology as well as staff training and performance monitoring. Overall, it can be reasonably concluded that the level of service personalisation is well developed, and passengers are able to enjoy services and access information that are fairly specific to their needs. To further improve the service quality, other technologies such as big data analysis and artificial intelligence could be employed in order to achieve a higher level of personalisation in a massive pool of customers. In the near future, therefore, personalisation of the service provision ought to be identified as an important area of focus for HKIA if the airport were to drive the service quality to an even higher standard.

### **7.3 To what extent does AAHK’s mission statement align with its customers’ needs?**

By virtue of law, AAHK is entrusted with the authority and responsibility to operate and develop the airport with a view to maintaining HKIA’s status as an international aviation hub. This is evidently translated into its vision, which is “to strengthen HKIA as the leading international aviation hub and a key engine for the economic growth of Hong Kong” (Airport Authority, 2022). To make the vision become tangible and actionable, the mission statement further defines the organisational goals and develops the roadmap. For AAHK, the mission is “to excel in the operation and development of HKIA in collaboration with our partners” by various means, including striving to exceed customer expectations, applying prudent commercial principles, valuing people, fostering a culture of innovation, upholding high standards in safety and security and operating efficiently with care for the environment.

With reference to the customer needs identified in this study which are further categorised into different types of needs according to Kano’s hierarchy in the previous section, it can be derived that AAHK’s vision and mission statements adequately align with its customers’ needs. The “must-have needs” in airport safety and security are clearly stated as a fundamental goal; while the “one-dimensional” and “attractor” needs require the airport

operator to exceed customer expectations, foster an innovation culture, apply prudent commercial principles and value the organisation's talents. Even though previous research and the current study do not find that the airport's core customer groups display particularly high demand in environmental initiatives taken by the airport operator, it is nevertheless sensible to make environmental policies a priority in the mission statement given the strong contemporary public sentiment and consciousness in sustainability and corporate social responsibility. Therefore, it could be concluded that despite the growing complexity in airport passengers' needs and expectations, AAHK's mission statement nevertheless aligns with its customers' needs to a large extent, allowing the organisation to not only fulfil the basic needs, but also to develop more attractive attributes that could strengthen HKIA's international status as an aviation hub.

#### **7.4 Managerial Implications and Application of Research Findings**

This study has important practical managerial implications on the measurement of airport service quality and the management of passenger-related airport operations. Firstly, the research findings provide insights into the passengers' perspectives regarding airport service quality, emphasising the adoption of a customer-driven approach in a service-oriented environment rather than over-relying on expert opinions. Secondly, the empirical findings of this study enrich our understanding on the constructs of airport service quality and the relationship with passenger satisfaction by providing a tested structure or a conceptual model that is developed based on a sound, transparent methodology, avoiding biases entailed by commercially available instruments. Thirdly, having understood the meaning of service quality and the determinants of passenger satisfaction, airport management could well benefit from the present research by examining the way that resources ought to be allocated in order to optimise the service level and prioritise the areas that are most valued by the customers. This section discusses the three major practical contributions put into the context of a real airport setting.

First of all, it has been emphasised time and again in this study that the meaning of airport service quality must be defined and accepted by the airport passengers who are the ultimate service customers. Several previous research studies explored the realm of airport services from the perspectives of industry experts. It is unquestionable that expert opinions are insightful and often provide information that could otherwise not be observed by the researchers. Eliciting knowledge from experienced industry insiders, therefore, can be an effective method to ensure that the research begins with a sensible framework and that it continues to stay on track during the research stage. Hence, the findings from these studies

would often come across as practical and capable of being executed. Nevertheless, it must be borne in mind that in an industry that is fundamentally customer oriented, researchers as well as management must stay conscious and be aware of the importance of considering the perspectives of the service end users. Thus, this study contributes to the realm of airport operations that is applicable to both the academia and practitioners not only by analysing expert opinions, but more importantly by placing abundant attention to passenger's views as to the perception of airport service quality and their satisfaction level.

In the qualitative research stage, industry experts were interviewed based on information consolidated from a careful review of past literature with a view to clarifying the framework upon which the notion of airport service quality ought to be developed. In order to ensure that the proposed model also sufficiently reflected the customer-oriented nature of airport services, the experts were asked to share their views in the capacity of a passenger as well as from the perspectives of managers of the airport. This was an attempt to develop a suitable conceptual basis for further research in the subsequent quantitative survey which would be completed by airport passengers. Essentially, having a survey instrument that was adopted from previous literature and modified according to expert and passenger opinions effectively constructed an adequate framework and minimised the chance of discovering major deviations from the understanding of the concept of airport service quality by the survey respondents, who were customers of the airport, at the quantitative stage. Any major deviations as such would have had grave impact on the research process as the instrument would have been found inadequate, resulting in repeated model revisions and a prolonged data collection process. All in all, the inclusion of passengers' opinions in both qualitative and quantitative research stages presented a clear stance that the understanding of passengers' needs and expectations in a service industry came fundamentally from grasping the customers' points of view.

Having fully acknowledged the importance of a passenger-driven framework, airport operators can further benefit from this research by gaining a deeper understanding of the ways in which the airport service quality can be defined and measured in order to effectively fulfil the needs of the customers. While clearly defining the business goals provide a sense of direction for strategy planning, it is equally important to translate them into measurable and actionable items that allow managers to assess and systematically keep track of the service performance. To this end, this study sheds light into the components constituting the notion of service quality in an airport environment as well as the associated sub-dimensions. This allows airport managers to compare their existing practices with the interpretation of service management derived from the empirical findings and to further develop a



management system that includes the most significant factors affecting the passengers' airport experience. Although the study must be construed in light of its research limitations and thus cannot be universally generalised, airport management would nevertheless benefit from the fundamental framework established herein that could serve as a basis upon which practitioners could further investigate and evaluate according to the specific operational circumstances. In actual airport management, passenger-facing service performance monitoring typically involves the use of customer surveys that are provided or recognised by leading industry institutions. Although these measurement scales are widely adopted in the industry and can serve as useful performance indicators, they are nevertheless often associated with awards and recognitions organised by the institutions, not to mention that the methodologies underlying the scale development are often not disclosed. This could, to an extent, impact the method and scope of measurement given that they had been designed for a variety of purposes. Therefore, while these readily available scales are accessible and easy to adopt, practitioners should consider the monitoring system as a whole and to ensure that the adopted model is formulated and tested rigorously so that the results depict a fair picture of the actual quality level according to the passengers' perception. After all, the crux of effective, sustainable service quality management lies in the establishment of a robust system that utilises measurable performance indicators. Thus, a major contribution of the present research is that the empirical findings advance our existing understanding of the structure of airport service quality and provide a model that can be applied in practical ways, facilitating practitioners to formulate actionable strategies.

A third practical contribution of this study derives from the impact that the research findings have on the allocation of resources in airport management. Traditionally, airport performance assessments are largely based on one-dimensional, objective performance indicators, such as process time, queuing time and waiting time. These standards stem from the fundamental, deep-rooted concept that 'time' is of the essence in airport operations as the main function of an airport is to facilitate flight movement. Naturally, considerable resources are invested on enhancing operational performance, such as process improvement, hardware upgrade and automation, with a view to increasing efficiency and reducing the process time. Overall, there is general consensus among different literature, and as suggested by the findings of the present research, that process efficiency and other functional service provision are much valued by airport service providers and travellers. Therefore, it is justifiable to allocate sufficient resources enhancing the functional features of the airport. Nevertheless, while efficiency is indeed critical in daily operations and that these indicators remain as an integral part of airport services, results of the present research suggest that they

are not the only factors that affect the perception of the quality of service and passenger satisfaction.

The findings, therefore, essentially pose a question to airport managers as to how effectively resources are currently being used to maintain or improve services that matter the most to the passengers. In practice, the management of an airport is multi-faceted and day-to-day operations need to be carried out by different teams. For instance, say the goal of the baggage operations department was to ensure efficient operations in baggage handling at the airport. The budget held by this department would then naturally be used to mainly focus on improving work processes, operations manpower and equipment upgrade to increase the baggage handling efficiency and reduce associated process or waiting time. The effectiveness of the budget spending and performance of the department would, thus, be measured by indicators such as the overall baggage handling time, passenger waiting time and baggage handling accuracy. However, senior management overseeing various departments would need to consider the question of whether the goals of not only the baggage operations department alone, but of all departments together contribute to achieving the overall organisational goal. Furthermore, suppose the operations efficiency improved by a certain percentage over the past year - does this mean that the perception of airport service quality also improved by the same extent? As the research suggests, airport service quality consists of a number of factors, with efficiency only being one of them. Thus, from a holistic point of view, management must assess the extent to which efficiency, or any other factors, affect the overall airport service quality in order to decide the number of resources to be invested on these aspects. To this end, the present research contributes to the practical field by ascertaining the different factors that airport operators need to manage, as well as the strength of association between the identified factors and the overall service quality.

In a practical scenario, having a clear understanding of the different service dimensions and their respective impact on service quality will facilitate management to make informed decisions about resource allocation in consideration of the expected return. All in all, airport management ought to acknowledge the changing nature of the industry landscape in that the airports nowadays do not only focus on 'operations', but instead ought to strive to enhance their performances in 'service' provisions.

## **8. Conclusion**

### **8.1 Overview**

This study aimed at exploring the constructs of airport service quality and examining their relationships with passenger satisfaction. The results have been thoroughly analysed and discussed in the previous chapters, and it can be concluded with confidence that the research objective has been met in this study. This final chapter aims to summarise the contributions of the research, address the limitations and identify the opportunities for future research.

### **8.2 Summary and Contributions of the Research**

This study makes various contributions in the academic realm essentially by offering knowledge-increasing findings that broaden and enrich existing literature pertaining to airport services. Firstly, a rigorous review of literature sheds light on the current understanding of the concepts of airport service quality and passenger satisfaction. The overall aviation industry outlook and associated market forces in the contemporary environment are also analysed, laying a solid foundation for the onward formulation of research questions and methodology. Through a combination of qualitative and quantitative research methods, the proposed conceptual model developed from literature review is tested and modified, forming a valid framework that institutionalised the understanding of the constructs and variables constituting airport services. The three dimensions of airport service quality revealed in this study, namely functions, communication, and diversion, add to the existing knowledge and offer fresh insights that go beyond the traditional, technical performance measures. Moreover, the passenger-centric approach adopted in this study and the emphasis on end-user participation throughout the research process are key to producing results that accurately reflect the perspectives of the airport users who ultimately determine the service quality of the airport. All in all, the model put forward in this research represents a step forward in the formulation of a holistic framework that conceptualises the relationship between airport service quality and passenger satisfaction, while stimulating and providing various avenues for future research.

In addition to academic contributions, this research also has significant implications that are of practical value to airport managers. The impact of service quality perception by customers on their satisfaction level have been discussed in numerous studies (e.g. Anderson et al. 1994; Oh, 1999; Ravichandran et al. 2010), and the present study supports the extension of this relationship to the context of airport services. Recognising the importance of customer satisfaction and striving for excellence in service quality have become key to managing an

airport, which has developed a broad scope of services over time. This is especially true as most airport management organisations have to liaise with many sub-contractors whose service delivery standards can impact on overall quality assessments.

In this day and age where cross-border transportation is highly accessible by the public, travellers become more sophisticated customers who have more complex needs and higher demands, such that whether an airport can live up to their expectations might well be a key factor influencing their choice of airport. Even though customer retention is a relatively novel concept in airport management owing to the traditionally strong supplier power, the bargaining power of customers is progressively increasing, resulting in a range of benefits that airport operators can reap from promptly addressing the needs of their passengers. Furthermore, as the aviation industry is growing more competitive, airports seek to constantly improve the service standards and surprise their customers with outstanding service offerings that set them apart from other competitors. Although airports can create synergies by collaborating in a number of ways, such as benchmarking and promulgation of best practices, it is inevitable that there is some degree of comparison and competition between airports, which is also accentuated by the growing prevalence of world ranking of airports awarded by various internationally recognised institutions.

Moreover, in addition to aeronautical revenue which grows in tandem with passenger traffic, airports could also drive higher income from non-aeronautical revenue sources by effectively managing passengers' experience. As revealed in the findings of this study, there are several factors other than those related to functional services that passengers value. For instance, knowing that passengers spend a considerable amount of time on discretionary activities, the airport operator could enrich the retail options and strengthen the use of customised proximity messages to stimulate spending during the dwell time which the passenger would otherwise spend waiting at the boarding gate. All in all, decision-makers at any airport are obligated to focus resources and maximise business value, thus by utilising and applying in the study, practitioners could formulate passenger-oriented strategies in a measurable, systematic approach.

### **8.3 Limitations of the Research**

While this study has revealed important findings, its contributions ought to be construed in light of its limitations. As no research can be truly devoid of limitations, it is important to adequately acknowledge and clearly explain the deficiencies contained in the study in order for the readers to fully apprehend the findings of the study. In a study conducted by Ioannidis (2007) with an aim to review the adequacy of addressing research limitations in the scientific

literature, the author examined a total of 400 articles published in eight leading journals. It was found that while over 60% of the articles either directly or indirectly mentioned their research limitations, such problems were often presented in a neutral context without sufficient elaboration on the potential constraints posed to the research findings, thus the author opined that limitations ought to be better covered in research articles and that journals should more widely encourage the discussion of limitations. Even though the study was conducted based on the review of articles in the scientific realm, the importance of addressing limitations remains fundamental in any research field. Properly identifying and evaluating the weakness of the presented work allows readers to adequately place the findings in context, interpret the work and assess its credibility level.

Price and Murnan (2004) point out that researchers might be reluctant to expose the shortcomings and weaknesses of the study for several reasons. These include incorrect perceptions such as an increased risk of having the paper rejected from being published, receiving less credit for the findings or having to be held accountable for the success of a commercially commissioned study, to name but a few. Regardless of whether the reluctance is based on misconceptions of the researcher, however, the practice of adequately presenting the research design and findings, of which limitations are an integral part, is a matter of ethics and a principle by which researchers shall always adhere to.

Limitations in research studies can be grouped under two main categories, namely threats to internal validity and threats to external validity. Internal validity refers to the extent to which the research design and observed results accurately represent the truth in the concerned population, which is affected by methodological errors, such as the measurement used to collect data, selection of participants and sample size. External validity, on the other hand, refers to the extent to which the research findings can be generalised and applied to a broader context or in other words, how accurately the results represent the truth in a larger population. Nonetheless, external validity should only be considered after establishing internal validity by confirming that the results do not deviate from what the study intended to measure in the research population. If the results are not internally valid, then external validity is irrelevant (Fink, 2003; Price and Murnan, 2004).

In the present study, internal limitations include self-reported data in the quantitative stage, access to data in the survey due to pandemic-related travel restrictions, sample size that sufficiently represents a massive target group as well as the Hawthorne effect which might have occurred during the interview with industry experts. Moreover, external limitations to the study might also exist, seeing as the data was collected at HKIA only and thus the results might be airport-specific to a certain extent. Furthermore, the travel behaviour of passengers

around the world might have changed or will change due to the unforeseen impact brought about by the COVID-19 pandemic, which could also affect the results if they were generalised in the entire population because the passengers' change in behaviour might occur at different times or pace. This chapter discusses the above limitations of this study in detail, concluding that in spite of certain possible limitations, the observed data is substantially valid internally. In terms of external validity, the results can also be generalised to an extent, though consideration ought to be given to limitations when applied in a global context and in view of the ongoing changes brought about by the pandemic.

### **8.3.1 Internal limitations**

One of the factors affecting the internal validity of this study stems from the self-administered data in the quantitative survey which was conducted electronically online. Web-based surveys pose several potential issues in terms of methodological concerns and technical challenges when compared with traditional face-to-face surveys administered by a facilitator (Burn, 2008). Andrade (2020) opines that online surveys are commonly encountered by two methodological issues.

Firstly, online surveys are typically distributed through various means over which the researcher has limited control, for example through email and social platforms, and often respondents are requested to forward the questionnaire to other potential participants. As the researcher could hardly control who the questionnaire will reach, it would be difficult to identify and describe the characteristics of the population that had access to the questionnaire, which is crucial to assessing the degree of generalisation of the results. In addition, the fact that the progress of survey distribution is largely dependent on the speed of referrals by the participants rather than the research team means that the researcher lacks control on the data collection duration. The researcher thus risks having to extend the scheduled data collection period to reach the predetermined sample size, or alternatively to cut down the sample size if time were of the essence to the research.

In this study, data collection for the quantitative stage spanned across a period of three months, which was within the scheduled period and did not actually impact the research timeline. It is, nevertheless, undeniable that the data collection progress was difficult to anticipate and control. Had the number of responses not achieved the required level predetermined in the methodology, the data collection period would probably have been extended as a sample size smaller than 500 would not have been desirable for a large target population nor for the onward factor analysis. Moreover, to alleviate the problem of identifying and describing the characteristics of the respondents and to allow better

generalisation of the results, screening questions were set to ensure that the participants met the criteria of the target population and that they had relevant travel experiences to draw upon. This, of course, assumes that the respondents were honest in answering the questions. Considering the abovementioned mitigation measures, issues pertaining to the identification of the target population had been mitigated as far as possible and the characteristics of the survey respondents were able to be captured and articulated. Thus, this methodological limitation arising from the use of a web-based survey had negligible effect on the research findings.

Secondly, Andrade (2020) puts forward that the sampling might be biased in that respondents must possess certain qualities, for instance they must be literate, have access to the Internet and most likely have sufficient interest in the research topic if they were to respond to the survey. In the context of the present study, persons at a younger age who were proficient in English and familiar with filling out online questionnaires, as well as those who were sufficiently interested in the topic, for instance persons working in the aviation industry, frequent travellers, airport users who were enthusiastic about air travel or persons in support of academic research, might be more likely to respond, resulting in an over-representation of these groups. In addition, it is possible that the respondents shared certain common traits as the questionnaire was passed on through a snowball approach, starting with the researcher inviting the first tier of respondents who then further invited other acquaintances whom they thought potentially qualified for participating. As the respondents were acquainted with the referrers, they might have some similar characteristics, such as similar age, occupations, social circles, interests, travel habits or even choice of airlines or airports.

While results of the survey showed a reasonable demographic distribution in terms of age, it is indeed possible that persons with the other characteristics mentioned above were more prone to responding to the survey invitation. In other words, compared with the genuine passenger profiles at HKIA, the observed data might under-represent persons who could not access or were less familiar with the Internet, non-English readers, and persons who were not interested enough to take their own initiative to complete the survey online, but might have agreed to answer the survey questions had they been approached in person. Nevertheless, the actual impact of this methodological limitation on the validity of the findings depends on the degree to which these groups were inadequately represented. In this day and age, the Internet and a number of social media platforms are prevalent and easily accessed by the public, and online survey forms are widely adopted in our everyday life, for instance registration forms, customer experience review forms and health declaration forms.

To further mitigate the limitations, the questionnaire was tested in a pilot test conducted prior to launching the main survey. During the trial phase, potential issues regarding the clarity of questions, use of language and phrases as well as the length of the questionnaire were addressed and evaluated, after which a number of adjustments were made based on the preliminary feedback by the respondents. Overall, it could be reasonably assumed that the use of a web-based form did not create a barrier that precluded a significant proportion of the target population from taking part in the survey otherwise.

Moreover, due to the heavy travel restrictions related to the COVID-19 outbreak during the data collection period, it is argued that even if the research team were able to conduct a face-to-face survey at the airport as originally proposed in the methodology, which was in fact not possible due to access restrictions for non-travellers implemented at HKIA at the time, the participants of the survey would not have reflected a more diverse, representative profile of the target population than an online survey. Under the pandemic situation, social distancing was widely encouraged in society and potential subjects at the airport might have been reluctant to have face-to-face contact with the interviewer, not to mention that due to a number of new departures and arrivals requirements, passengers might be more time-sensitive than usual when asked to participate in a survey during their travel time, leading to a lower response rate. Furthermore, various pandemic-related air travel restrictions during the pandemic caused a significant change to the types of airport users. For example, the number of leisure travellers plummeted while passengers who still travelled during the pandemic peak were mostly travelling for essential needs, such as business, study, and family visits. Thus, a physical survey conducted at the airport during the pandemic would result in a rather limited travellers' profile both in terms of demographics and travel purpose, which could not accurately reflect the usual phenomenon found at HKIA. An online survey, in contrast, was a sensible and practical alternative adopted with a view to reaching a more representative group of subjects belonging to the target population who would not have appeared at the airport during the data collection phase. However, even though the use of an online survey was justified under the circumstances of this study and did not significantly diminish the internal validity, the limitations pertaining to the population diversity discussed above cannot be entirely dismissed and should be properly acknowledged.

Thirdly, self-administered questionnaires present a key challenge to researchers as the quality of collected data is largely dependent on the self-discipline exercised by the respondents in the absence of an interviewer or facilitator. The participation of inattentive or non-serious respondents who exhibit less reliable answering behaviour and provide less well thought out responses would increase the noise level and pose a threat to the internal



validity of the results (Aust *et al.*, 2013). For bona fide respondents, issues might still occur since they must complete the questions on their own in the absence of professional guidance provided by the interviewer or facilitator in case questions arise during the survey. As the target population consisted of participants from around the world and that the questionnaire was written in English, clarity was especially important to ascertaining useful results since there was a high chance that English was a second language for most participants. To overcome this issue and reduce the likelihood of respondents giving misrepresented answers due to misunderstanding of the questions, clarity and the use of simple language were emphasised during the instrument development and pilot test stages. As elaborated in the data analysis section, several adjustments were made after conducting the pilot test, which revealed that the clarity of instructions and phrasing of the questions could be improved in order to minimise confusion to the participants. However, the risk of encountering inattentive or non-serious respondents inevitably exists and cannot be eliminated. Moreover, the fact that the data collection process is self-administered also means that it is difficult to verify the answers. In a face-to-face situation, even though most answers would still be hard to verify, such as the participants' travel frequency, usual travel purpose and service perceptions, there would nevertheless be a smaller chance of the respondent fabricating a fictitious person, such as to provide demographics that are vastly different from their identity. It would also be very unlikely that the same person would be interviewed more than once compared with an online platform where participants could submit the questionnaire more than once without the researcher knowing, although it could be argued that there was limited motivation for respondents to purposely upset the results of a non-contentious topic in an academic study, and that the overall likelihood and impact of such noisy responses were immaterial. Thus, misrepresented answers arising from the absence of an interviewer was mitigated by increasing the clarity of the questions, but inaccurate answers given by inattentive, non-serious or even mischievous respondents existed and corresponding limitations should be acknowledged.

A fourth limitation of this study pertains to the potential impact stemming from the Hawthorne effect during the qualitative interview stage. The Hawthorne effect refers to the phenomenon whereby participants attempt to change their behaviour as a consequence of their awareness of being observed in a study. In the original studies in which the Hawthorne effect was observed, factory workers were found to exhibit increased productivity when they were subject to a research study with the facilitation, or supervision, by the factory managers. Over time, the term has been gradually adopted to explain a range of methodological phenomena that do not necessarily include behavioural outcomes such that the construct can

be used to describe an alteration in behaviour or disclosure of information as a result of the subject being observed (McCambridge, Witton and Elbourne, 2014), and is deemed to be a factor influencing the validity of qualitative research where there is usually a strong relationship between the researcher and the interviewees (Coombs and Smith, 1999). In the context of the present study, industry experts were invited to participate in the interviews. Although the interviews were anonymous, there was a possibility that the interviewees answered the questions in a way that portrayed the HKIA in a more favourable light given their roles in managing or at least contributing to the airport, especially given that most subjects were known by the researcher who acted as the interviewer. Furthermore, experts of a certain area might tend to assign too much value to their own field when evaluating the overall airport services. For example, an expert in operations might over-emphasise the importance of efficiency in the overall airport service quality with an attempt to highlight operations-related achievements; whereas an expert in managing the technological development of the airport might overpraise the importance of an automated or touchless process when evaluating the passengers' expectation changes towards the airport experience amidst the pandemic, when in fact the passengers did not attach as much importance to these items. Although this would be difficult to prove or measure, such impact could nevertheless be alleviated by having the experts answer the same questions in their personal capacity as a passenger to check if any responses significantly deviated from the previous answers, and if so, whether there were sufficient justifications that explained the difference, after which the qualitative findings were tested in the quantitative stage using the survey. Hence, it should be recognised that the tendency to behave or answer questions differently in the interviews existed, though the limitations to the results were reduced to an acceptable level through methodological triangulation to increase the validity of the findings.

In sum, the internal limitations encountered in this study included challenges related to the use of an online survey in the quantitative stage as well as the expert interviews in the qualitative stage. Firstly, the web survey increased difficulties for the researcher to identify and characterise the respondents due to the open access by anyone who had the web link to the questionnaire and reduced the control by the researcher over the data collection timeline in comparison to an in-person survey. This limitation was largely overcome by the inclusion of screening questions to ensure that the answers were provided by qualified subjects who had relevant experience to draw upon when completing the questionnaire. Secondly, an online survey created the risk of having certain groups of respondents overrepresented in the results as the web-based nature of the questionnaire might have excluded persons who were illiterate, did not have access to the Internet, or those who were not interested enough to take

their own initiatives to complete a questionnaire online. As examined above, however, this limitation was considered to have minimal effect on the actual outcome, and an online survey was in fact a more desirable data collection method that allowed many qualified subjects to participate in the survey in view of the pandemic restrictions. Thirdly, in the absence of an interviewer, answers given by a participant who was inattentive, non-serious, mischievous, or simply did not fully understand the questions might adversely affect the validity of the outcome. To this end, clarity of the questions was improved through the pilot test to minimise the chance of the participants misunderstanding the questionnaire without the help from an interviewer. However, even though the chance of encountering mischievous respondents who provided false answers or repeated submissions is not substantial seeing that the nature of this research topic is not particularly contentious, it is undeniable that such possible occurrence should be acknowledged as a possible limitation of this study. Lastly, another limitation of the study pertains to the possibility of the participants in the qualitative interviews giving answers that were in favour of HKIA or overpraising a certain area related to the interviewees' expertise as a consequence of being aware of the interview purpose or their acquaintance with the researcher. Despite the possible occurrence of the Hawthorne effect, the impact had been alleviated by methodological triangulation, namely inviting the participants to respond in the capacities as both an industry expert and as a passenger, after which the results were tested again in the quantitative stage by passengers at large. Overall, while the limitations affecting the internal validity explicated above should be properly taken into account while appraising the findings, they did not materially affect the internal validity of the results.

### **8.3.2 External limitations**

Having established that the results were internally valid and that they did not substantially deviate from what the study intended to measure, the external validity could then be evaluated to assess the extent to which the results could be generalised to represent a larger population. Even though studies inevitably entail inclusion and exclusion criteria and cannot be fully generalised, once the results are determined to be internally valid, the findings could be interpreted holistically to ascertain the representativeness in the overall picture (Kukull and Ganguli, 2012). In this study, the main external limitations included the level of airport-specificity of the results if the findings were to be applied to a global context as well as limits to generalisability caused by the fast-changing COVID-19 travel requirements around the world which might affect passengers' expectations and perceptions.

Firstly, the generalisability of the observed findings should be assessed in light of the differences that exist between different airports. Although the initial theoretical framework

was derived from a range of previous studies conducted on a number of airports around the world, the present study was designed to explore the research questions specifically at HKIA, having considered its status as an international aviation hub as well as the access to primary data sources in the data collection process. As a result, the theoretical framework developed from literature review was modified in the qualitative stage based on the input provided by the interviewees who were aviation experts in Hong Kong. It is possible that the experts discussed airport-specific elements and analysed the importance of certain service qualities that were especially prominent to HKIA compared with other airports. For instance, at a large, international airport with several terminals like HKIA, having clear signage to guide passengers' movement might be deemed as a more important quality when compared with a smaller, domestic airport; or at an airport that handles incredibly high passenger throughput every day, process automation or digitalisation might be seen as essential to improving operational efficiency. Furthermore, as the research questions were developed around HKIA, respondents in the quantitative survey were also asked to answer the questions based on their recent experiences while travelling at this airport. For example, given the unique geographical characteristics of HKIA and the prevalence of public transport in Hong Kong, passengers might well be less demanding on the availability of car parks but instead have higher expectations on the bus routes and frequency. Since there could be great variability between airports (Graham, 2003), a single set of data collected from one specific airport could not, without any limitation, represent all the airports around the globe. In this sense, the model developed during this study might be prone to reflecting certain characteristics that were specific to HKIA, limiting the generalisability of the results if applied on an international level as the research findings might be different if this study was repeated at another airport.

Secondly, while the model developed in the present study can be used as a foundation for airport management, the impact on air travel resulting from the COVID-19 outbreak is yet to be determined and airport managers should be prudent in applying the research findings of this study in light of the uncertainties in the airport dynamics. Sufficient attention should be drawn to observing possible changes in the travel behaviour of passengers. For example, if vaccination or testing remain as prominent travel requirements, departures passengers might tend to arrive earlier at the airport to go through the process, while arrivals passengers might also need to go through more procedures before leaving the airport, in which case increase in the overall dwell time would prompt airport managers to review the importance of efficiency as well as discretionary activities that could elevate the passengers' experience while waiting. Another anticipated change in expectations pertains to the health and safety

measures implemented at the airport as general hygiene awareness and demands increase amongst the public, which could lead to the provision of sanitising utilities and touchless equipment or facilities gradually becoming a basic or essential part of the service scope as time progresses. Furthermore, depending on the border control policies, the profiles of an airport's passengers might change, for instance more stringent arrivals and quarantine requirements might result in a decrease of leisure or short-stay passengers, whereas vaccination requirements for inbound passengers might lead to a decrease in travellers from regions where the vaccination rate is modest. As the aviation industry is one where managerial decisions have a relatively important impact on the service capacity with a long lead time, the decisions made by the industry players during the pandemic in these few years will have prolonged influence on the post-pandemic era. Although the abovementioned issues and associated impact on airport users were not particularly visible and significant at the time of the research, the generalisability of this study ought to be assessed with considerations to the evolving environment and future development of the pandemic, which is a key factor affecting the external validity of the research findings.

Therefore, the external limitations in this study are twofold. Firstly, although the theoretical framework developed during the research could essentially be applied to other airports, some elements that were unique to HKIA would have been embedded in the findings due to the participation of respondents who were working or had travelled at HKIA, thus managers ought to pay attention to the unique characteristics of their own airports when applying this model. Secondly, given the uncertainties amidst the COVID-19 outbreak, potential effects of the pandemic must be recognised and caution ought to be taken not to overgeneralise the results in order to allow a fair interpretation of the findings. Despite these limitations, however, this research puts forward a conceptual model for planning and measuring the service quality and passenger satisfaction amongst airport professionals.

#### **8.4 Implications for Future Research**

This study has provided insights into the scope of airport service quality and passenger satisfaction. Whereas both academic and practical implications have been discussed in detail, more research will be needed to refine and further develop these insights as well as to expand the application of the findings to other contexts. The propositions put forward in this study as well as the shortcomings identified in the subsequent analysis therefore imply a rich agenda and raise a number of opportunities for future research. To stimulate future research concerned with airport management and service experience, several potential topics and directions that can be further examined are gathered in this section.

A first step for future research would be to refine and validate the overall model and associated constructs emerging from this study by means of replication of the present research. This can be achieved by reviewing other similar research and repeating the tests within the same target population to observe if similar results repeat under similar conditions. If the situation allows, it would be preferable to conduct the quantitative stage face-to-face with the participants in the presence of an interviewer to facilitate the data collection process. As the emphasis of airport services has traditionally been placed on functional services and that the concepts of personalisation and diversion in an airport setting are relatively novel, it is important to test and reinforce the significance of these constructs from the perspectives of contemporary air travellers. Thus, replication studies could provide valuable contributions to validate and refine the framework established in this research.

Secondly, researchers are encouraged to repeat this study in other airports with a view to extending the application of this conceptual model to other contexts, providing a more substantial basis for external validity. As discussed in the analysis of the research limitations, previous studies suggest that airport characteristics and qualities vary from place to place according to an array of factors. Although HKIA is internationally reputable and is one of the leading airports handling millions of passengers from around the globe, the needs and expectations by passengers who travel at different airports may vary nevertheless. A closer examination of such passenger perceptions on an airport-specific basis, or at least a regional basis, could shed light on the management priorities that best fit the particular clientele. By rigorously testing these boundary conditions, practitioners could also benefit from a higher awareness of the competitive advantages unique to their airports that allow them to optimise the travel experience for their customers. Hence, such replication could allow researchers to build upon the existing findings and overcome the present limitations in generalising the results beyond HKIA.

Thirdly, this study could be further extended in search of a more in-depth understanding of the passengers' actions and emotions throughout the airport experience by way of customer journey mapping. Owing to the complexity of services offered at the airport as well as the breadth of the airport journey, which stretch across various channels and start as early as checking in at off-airport sites, identifying the different touchpoints is essential to forming a holistic picture of the passengers' end-to-end experience. To this end, there are a number of ways to map out the passengers' journey. These include qualitative in-depth interviews with the passengers to gather the granular details about their journeys, observational research to probe into the ways the passengers interact at the key touchpoints, as well as quantitative surveys aimed at obtaining a statistical overview of their overall experiences. Therefore, by

obtaining authentic insights from the customers through a user-centric approach, a visual representation of the passengers' engagement with the airport could be developed, further enriching the framework established in this study.

Fourthly, there is enormous potential to study the application the findings of this research to specific groups of air travellers with a view to ascertaining the differences between passengers with different characteristics. There is abundant literature exploring and discussing the classification of air travellers and their respective needs and expectations during their journeys. However, further research examining the meaning of airport services and the associated satisfaction level amongst a specific type of passengers by applying the framework developed in the present study could be of significant value. Airport operators could also benefit from such research findings as they focus on analysing the habits of certain groups of passengers that their airports predominantly serve and prioritise resources effectively to achieve the highest passenger satisfaction level with limited resources. Thus, a direction for future research is to narrow down the target population when evaluating the constructs in order to sharpen the understanding of the key customer groups and allow more effective passenger segmentation.

Lastly, this study reveals that further work is needed to examine the impact of COVID-19 on global aviation, especially regarding passengers' activities occurring at or in connection with the airport. As addressed in the previous section, one of the limitations of this study is that the external validity is adversely affected owing to the uncertainties of the post-pandemic environment since the ways in which passengers' perception on service quality and the factors influencing their satisfaction level are yet to be ascertained. Passengers could potentially be affected in various aspects, ranging from their choice of transportation to and from the airport, the departures and arrivals dwell time spent at the airport, process activities that they are required to go through, to other psychological changes that could affect their travel behaviour. Since airport operators have little control over the development of the pandemic and the associated impact on the industry outlook, further research addressing these changes from the perspective of passengers could enable practitioners to methodically monitor the service provision to passengers and stay ahead of the changes in the post-pandemic era.

## **8.5 Conclusion**

In this study, we reviewed and scrutinised in depth the existing academic perspectives on airport service quality and its association with passenger satisfaction. Accordingly, a conceptual model was proposed by drawing upon relevant literature, which set forth the

components of interest and the expected relationships, providing rigour and a clear outline to the research process. The model was then empirically investigated using a sample of thirty airport experts and 500 passengers with a hybrid research methodology, from which the conceptual model was revised and finalised. Onward analysis suggests that function, communication, and diversion are key independent variables affecting the service quality of an airport, which is in turn strongly correlated with passenger satisfaction. While this study does not claim to be exhaustive and is subject to certain limitations, the results provide reasonable insights to both academics and practitioners with an emphasis on practical implications and discussions, offering substantiated recommendations and measurable indicators that facilitate the management of airport services. As the scope of airport services has become increasingly complex, managers of today ought to fully leverage on the relationship between research and practice to formulate strategies that systematically and effectively manage customer relationships and drive continual service improvement. Thus, outcomes of the research are highly relevant to contemporary airport management as the conceptual framework can provide guidance to industry decision makers when facing planning and operations issues. It is expected that this research will stimulate further investigation into the concept of service quality as well as the application of such a framework to facilitate airport management planning. Finally, it can be concluded that this study has successfully accomplished the objectives and addressed the questions postulated at the beginning of the research.



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## Appendix 1 – Consent Form Template

### Informed Consent Form

#### *The Impact of Airport Service Quality on Passenger Satisfaction at the Hong Kong International Airport*

You are invited to participate in a research study conducted by Ms. Angela Lau as part of the Doctor of Business Administration programme at the University of Wales Trinity Saint David.

#### **PURPOSE OF THE STUDY**

Given the increasing importance of passenger orientation in modern airports, finding an effective way to understand the attributes of airport service quality and the relationship with passenger satisfaction could put the airport ahead of today's competitive industry landscape. In this regard, this research aims to examine the impact of airport service quality on passenger satisfaction by conducting research on Hong Kong International Airport.

#### **PROCEDURES**

The format of the research will be in the form of a personal interview or focus group that will take approximately 30-45 minutes. With your permission, the interview will be audio-recorded for the sole purpose of accurately transcribing the conversation.

#### **POTENTIAL RISKS / DISCOMFORTS AND THEIR MINIMIZATION**

We do not anticipate that there are any risks associated with your participation in the interview, however please be reminded that you have the right to the following:

- You do not need to disclose any confidential information about your organisation;
- You do not have to answer any questions or discuss any topics that make you feel uncomfortable; and
- You do not have to provide any reason for not responding to any question or for not taking part in the interview.

#### **COMPENSATION AND POTENTIAL BENEFITS**

There is no direct compensation involved with participation. However, your participation in the research will contribute to the overall development of airport operations by providing valuable insights into the attributes of airport service quality and its impact on passenger satisfaction. This will shed light on the fast-changing development in the aviation industry and allow airport service providers to adapt to the rapidly changing industry climate.

#### **CONFIDENTIALITY**

Your data will be treated with full confidentiality and the information obtained in the study will be used for research purposes only. To ensure anonymity, participants' names would be removed and replaced by codes. Any summary interview content, or direct quotations from the interview, that are made available through academic publication or other academic outlets will be anonymised so that you cannot be identified, and care will be taken to ensure that other information in the interview that could identify yourself is not revealed. Access to the interview transcript will be limited to the researcher and academic colleagues and researchers with whom he might collaborate as part of the research process. If, with your permission, the interview is audio-recorded, you may review the audio records and/or withdraw from being audio-recorded.

**DATA RETENTION**

The data collected during this research will be destroyed after final approval of the thesis by the University's examination board.

**PARTICIPATION AND WITHDRAWAL**

Your participation is voluntary. This means that you can choose to withdraw at any stage of the research, including during or after the data collection, without negative consequences.

**QUESTIONS AND CONCERNS**

If you have any questions about the research or would like to receive a copy of the final report or summary of the findings, please feel free to contact Ms. Angela Lau at 6290-3448 or [angela.clau@uwhkma.com.hk](mailto:angela.clau@uwhkma.com.hk).

**SIGNATURE**

I \_\_\_\_\_ (Name of Participant)

am 18 years old or above. I understand the procedures described above and agree to participate in this study.

I \*\* agree / do not agree to the audio-recording during the procedure.

(\*\* Please delete as appropriate.)

\_\_\_\_\_  
Signature of Participant

Date:

## Appendix 2 – Interview Core Questions

In order to collect interviewees' views both as a passenger and as an expert in the aviation industry, participant will be asked to discuss and sharing their airport experiences first in the capacity of a passenger, then as a professional in the industry.

As a passenger:

1	How often do you travel and what is your usual travel purpose?
2	Could you take me through your typical airport journey and your usual activities at each stage? (Typical stages: access > check-in (self/manual?) > security screening > waiting time before boarding (F&B/shopping/use any other services?) > boarding; landing > baggage reclaim > (time before leaving the airport) > leave airport)
3	Which part of the airport do you spend the most time in?
4	What are your expectations from an international airport such as HKIA?
5	What are the things that are most important to you during your time at the airport?
6	Has the outbreak of COVID-19 changed the way you view airport service quality at all? If so, how? (Or if not, why?)
7	Could you share one of the best experiences that you encountered at HKIA?
8	Could you share one of the worst experiences that you encountered at HKIA?
9	What about your experience at other airports?

As a professional in the aviation industry:

1	Could you tell me about your role at the airport and your organisation?
2	Has the outbreak of COVID-19 brought about any changes to your work at all? If so, how?
3	Which part of the airport journey do you think is the most important to passengers?
4	Which part of the airport journey / what airport service do you see has the most opportunity to impress the passengers as a good airport?
5	Which aspect(s) of the airport services are the most important to/ require the most resources from your organisation?
6	What do you think the most important direction for an airport's future development is in terms of services offered to travellers?
7	How should airports/HKIA increase their competitive edge?

## Appendix 3 – Survey Questionnaire

### Questionnaire

#### *The Impact of Airport Service Quality on Passenger Satisfaction at the Hong Kong International Airport*

You are invited to participate in a research study conducted by Ms. Angela Lau as part of the Doctor of Business Administration programme at the University of Wales Trinity Saint David.

#### **PURPOSE OF THE STUDY**

Given the increasing importance of passenger orientation in modern airports, finding an effective way to understand the attributes of airport service quality and the relationship with passenger satisfaction could put the airport ahead of today's competitive industry landscape. In this regard, this research aims to examine the impact of airport service quality on passenger satisfaction by conducting research on Hong Kong International Airport.

#### **PROCEDURES**

You are invited to participate in a survey by completing a questionnaire that will take approximately 10-15 minutes.

#### **PRE-REQUISITE**

By taking part in the survey, you confirm that you are **18 years old or above**.

#### **POTENTIAL RISKS / DISCOMFORTS AND THEIR MINIMIZATION**

We do not anticipate that there are any risks associated with your participation in the interview, however please be reminded that you have the right to the following:

- You do not need to disclose any confidential information about your organisation;
- You do not have to answer any questions that make you feel uncomfortable; and
- You do not have to provide any reason for not responding to any question or for not taking part in the survey.

#### **COMPENSATION AND POTENTIAL BENEFITS**

There is no direct compensation involved with participation. However, your participation in the research will contribute to the overall development of airport operations by providing valuable insights into the attributes of airport service quality and its impact on passenger satisfaction. This will shed light on the fast-changing development in the aviation industry and allow airport service providers to adapt to the rapidly changing industry climate.

#### **CONFIDENTIALITY**

The survey is anonymous and any data collected will be treated with full confidentiality and the information obtained in the study will be used for research purposes only. To ensure anonymity, participants' names would be removed and replaced by codes. Any data, including demographics, that is made available through academic publication or other academic outlets will be anonymised and generalised so that you cannot be identified. Access to the survey will be limited to the researcher and academic colleagues and researchers with whom he/she might collaborate as part of the research process.

#### **DATA RETENTION**

The data collected during this research will be destroyed after final approval of the thesis by the University's examination board.

#### **PARTICIPATION AND WITHDRAWAL**

Your participation is voluntary. This means that you can choose to withdraw at any stage of the research, including during or after the data collection, without negative consequences.

#### **QUESTIONS AND CONCERNS**

If you have any questions about the research or would like to receive a copy of the final report or summary of the findings, please feel free to contact Ms. Angela Lau at [angela.clau@uwhkma.com.hk](mailto:angela.clau@uwhkma.com.hk).

Please give your answers based on your travel experience at HKIA and answer ALL questions.

<b>PART I – FUNCTION (13 questions)</b>		<b>Strongly Disagree &lt;---&gt; Strongly Agree</b>				
	<b>Access</b>	<i>Please circle the number</i>				
1	A variety of ground transportation options to and from the city is available.	1	2	3	4	5
2	The ground transportation frequency is adequate.	1	2	3	4	5
3	There are sufficient car parking spaces.	1	2	3	4	5
4	The distance from the ground transportation terminus to the airport terminal is short.	1	2	3	4	5
	<b>Efficiency</b>					
5	Queuing and processing time for check-in is short.	1	2	3	4	5
6	Queuing and processing time at security screening/checkpoint is short.	1	2	3	4	5
7	Queuing and processing time at immigration checkpoint is short.	1	2	3	4	5
8	Waiting time for my arrivals baggage is short.	1	2	3	4	5
9	The airport's physical layout avoids crowding and enables easy movement.	1	2	3	4	5
	<b>Facilities/Utilities</b>					
10	Overall, the airport's facilities and utilities are clean.	1	2	3	4	5
11	The waiting areas provide comfortable seating.	1	2	3	4	5
12	Business facilities such as charging points, computers, Wi-Fi are available.	1	2	3	4	5
13	The baggage trolleys are conveniently located.	1	2	3	4	5

<b>PART II – COMMUNICATION (11 questions)</b>		<b>Strongly Disagree &lt;---&gt; Strongly Agree</b>				
	<b>Dissemination of Information</b>					
14	The airport's signs clearly direct me to services/facilities.	1	2	3	4	5
15	The flight information displays are clear and sufficient.	1	2	3	4	5
16	The airport's website/mobile app provides clear and sufficient information.	1	2	3	4	5
17	Getting information about the facilities and services of the airport is easy ( <i>reaching information via phone, internet, in-terminal directories, etc.</i> )	1	2	3	4	5
	<b>Interpersonal Communication</b>					
18	Employees at the airport are courteous.	1	2	3	4	5
19	Employees at the airport are always willing to serve customers.	1	2	3	4	5
20	Employees at the airport are available when needed.	1	2	3	4	5
21	Employees at the airport are able to answer my queries.	1	2	3	4	5

<b>Personalisation</b>						
22	Employees at the airport are able to give me individualised attention.	1	2	3	4	5
23	Employees at the airport understand my specific needs.	1	2	3	4	5
24	The airport provides me with customised information that serves my needs.	1	2	3	4	5

<b>PART III – DIVERSION (10 questions)</b>		<b>Strongly Disagree &lt;---&gt; Strongly Agree</b>				
<b>Shopping and Dining</b>						
25	A variety of retail outlets are available.	1	2	3	4	5
26	A variety of food and beverages are available.	1	2	3	4	5
27	The price level of food and beverages is reasonable.	1	2	3	4	5
28	Airline and/or commercial lounges are available.	1	2	3	4	5
<b>Local Culture</b>						
29	The airport's decor and/or displays match the local culture of the city.	1	2	3	4	5
30	The airport provides performances/activities that reflect the local culture of the city.	1	2	3	4	5
31	Local cuisine and local specialty retail stores are available.	1	2	3	4	5
<b>Ambience</b>						
32	The terminal is spacious.	1	2	3	4	5
33	The interior of the airport is modern.	1	2	3	4	5
34	The terminal's overall ambience is pleasant.	1	2	3	4	5

#### **OVERALL EXPERIENCE**

<b>Overall Service Quality</b>						
35	The overall service quality at Hong Kong International Airport is good.	1	2	3	4	5
<b>Overall Satisfaction</b>						
36	I am happy with the experiences I have had at Hong Kong International Airport.	1	2	3	4	5



**BACKGROUND**

Please select ONE answer per question by ticking the box.

Gender

Male  Female

Age group

18-24  25-34  35-44  45-54  55-64  65 or above

Education

High school or below  Bachelor  Master  Doctor

Are you a Hong Kong resident?

Yes  No

What is your most frequent travel purpose?

Business  Leisure  Visiting family  Study  Others

When was the last time that you **departed from** Hong Kong International Airport by air?

Year 2021  Year 2020  Year 2019  Year 2018  Year 2017 or before

When was the last time that you **arrived at** Hong Kong International Airport by air?

Year 2021  Year 2020  Year 2019  Year 2018  Year 2017 or before

On average, how many times did you travel by air per year **before** the COVID-19 outbreak?

1-3 times/year  4-6 times/year  7-9 times/year  10 times/year or above

- END OF QUESTIONNAIRE -

- THANK YOU -