The Success behind the World's Best Airport: The Rise of the Changi

Thanavutd Chutiphongdech[1,*] and Rugphong Vongsaroj[2]

[1]Faculty of Sports Science, Chulalongkorn University, Bangkok 10330, Thailand
[2]Graduate School of Tourism Management, National Institute of Development Administration, Bangkok 10240, Thailand

[*]Corresponding author's e-mail: Thanavutd.C@chula.ac.th

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Abstract

Singapore Changi International Airport received the World's Best Airport from Skytrax. This was the 8th consecutive year that Changi won this renowned award. This paper aims to investigate Changi's overall business operations to track its accomplishments in airport development. Examining the lessons learned by using a descriptive analysis under the Business Model Canvas (BMC) framework, the results reveal that Singapore Changi International Airport is a destination in itself. This concept affects customers' segmentation, which links to different value propositions deriving from using key resources and synergy among strategic partnerships. This paper also suggests that sustainability should be added to the BMC framework since it is another component behind the airport's success. The practical contributions deriving from the lessons learned are presented.

Keywords: Airport development, Business model canvas, Skytrax, Singapore Changi International Airport, Destination development

Introduction

Singapore Changi International Airport has frequently been rated as the top airport among several airport charts (Kishnani, 2002). In 2020, Changi was voted the World's Best Airport. The announcement from Skytrax allows Singapore Changi International Airport to achieve this award for the 8th consecutive year since 2013, with the first time awarded by Skytrax in 2000. This number enables Changi to reach more than ten times receiving these awards (Figure 1).

The airport inaugurated its very first commercial flight in 1959. Its ownership structure belongs to the Singapore government, though it is managed by the Changi Airport Group (Singapore), Pte Ltd. This was established in 2009 to prepare for corporatization following the Changi Airport Group's (CAG) formation in the same year. As CAG acts as the airport

company that administers Changi International Airport, it undertakes many key activities relevant to airport operations and development. With a vision of transformation, CAG not only develops the airport as an aircraft-interchanging platform, but the airport grows as a destination itself in Singapore. According to the Changi Airport Group (Changi Airport Group, 2020b), the airport reported a 5.2% growth in passenger movement (66.3 million passengers) as of March 31, 2019. This number is a nearly 80% increase compared to when Changi was corporatized ten years ago. The cargo traffic has been steady, and was reported at 2.14 million tons, while commercial flights were steadily rising, with 386,000 flights as of the end of March in 2019.

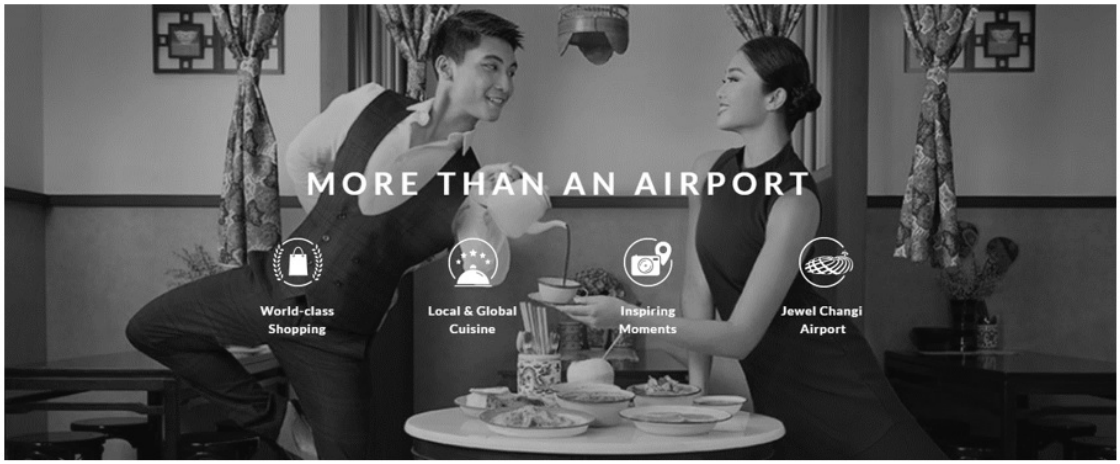

Figure 1 Singapore Changi international airport as the world's best airport
Source: Adapted from Changi Airport Group (2020a)

This paper seeks to answer the research question: What are the business operations behind the success of Changi International Airport? By extensively reviewing grey literature such as academic articles, annual reports, and other related documents available in the public domains, we have done a descriptive analysis of the business operations behind this accomplishment to shed light on the lessons learned from Changi's success. Using the BMC analytical framework of Osterwalder and Pigneur (2010), we provide several guidelines for airport business practitioners.

The article is organized as follows: The following section explains the BMC, the framework for analyzing the overall airport operations. The following section describes the results under the BMC, while the last part of the paper presents our conclusions and the managerial implications.

Business model canvas as an analytical framework

According to Osterwalder and Pigneur (2010), the BMC defines as a description of the rationale on how a firm creates, delivers, and captures value. It is a standard systematic process to represent business- operations archetypes compatible with the article's objective – to illustrate the overall airport business operations. The BMC components are classified into value and efficiency parts (Kalakou & Macário, 2013), consisting of nine components that illustrate how a firm does business (Figure 2). The BMC's nine building blocks are described below.

1) Customer Segments (CS) considers the different groups of customers being served. This block includes various groups of customers who are the source of earnings. If a firm offers products and services to different customer segments, it must justify and prioritize them to deliver the correct value to the right groups. The customer segments can be divided into the mass market, niche markets, segmented markets, diversified markets, and the multi-sided platforms or multi-sided markets, which are regarded explicitly as segmented for airport businesses.

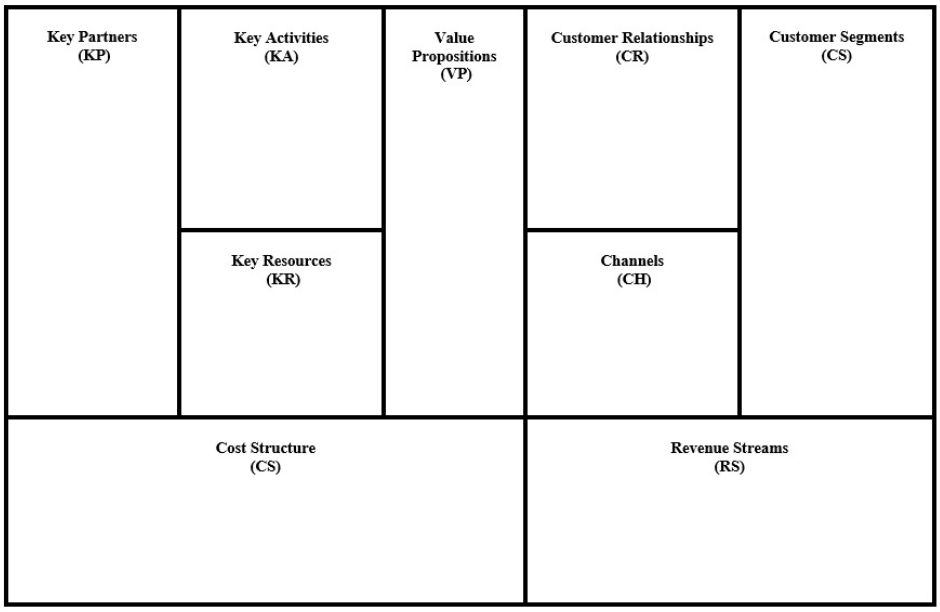

Figure 2 The business model Canvas's components
Source: Adapted from Osterwalder and Pigneur (2010)

2) Value Propositions (VP) are the goods and services that a firm offers and creates value for each customer segment. It also indicates customer's pain points and suggests solutions. A value proposition involves the following factors: newness, performance, customization, design, brand, getting the job done, price, costs and risk-reduction, accessibility, and usability.

3) Channels (CH) are defined as the methods to reach each customer segment and deliver value propositions. Such channels are crucial since they allow the airport to deliver value propositions to the right groups.

4) Customer Relationships (CS) elucidate the forms of interaction between a firm and each specific customer segment. Customer relationships can be divided into several categories, such as personal assistance, dedicated personal assistance, self-service, automated services, communities, and co-creation.

5) Revenue Streams (RS) show the revenue streams from each customer segment. This involves two different revenue streams - transaction revenues and recurring revenues. Transaction revenues are payments from one-time customers, while recurring revenues refer to continuous payments from customers. To generate revenue streams, a firm may sell assets, collect usage fees, brokerage fees, and subscription fees, or it may lend, rent, lease, license, or sell advertising.

6) Key Resources (KR) enable value propositions to customers, and they reach markets, maintain customer relationships with customer segments, and generate revenues. Key resources can be classified as physical, intellectual, human, and financial assets.

7) Key Activities (KA) are a set of activities a firm needs to drive its business model. This explains the main activities that a firm should undertake to deliver value propositions. Such activities include production, problem-solving, platform provision, and network management.

8) Key Partnerships (KP) are the networks between suppliers and firm's partnerships. Networking partnerships aim to optimize of scale, reduce risk and uncertainty, and acquire activities and resources to extend a firm's capabilities.

9) Cost Structure (CS) reflects the significant costs incurred from the other eight-block operations. Once other blocks are detailed, it is possible to calculate all the inherent expenses, which can be minimized. However, this depends on the type of business model, which may fall between cost-driven and value-driven ones.

The BMC is used as a framework for analyzing the success of Singapore Changi International Airport. The secondary data for analysing was collected from several grey literature. Information from the Changi Group's Annual Reports, Sustainability Reports during 2013 to 2019, secondary data from newsrooms and the Singapore Changi International Airport's website were gathered into the descriptive analysis. The overall pictures of the airport's business operations are demonstrated as follows:

Changi airport's business operations under the business model Canvas framework

1) Customer Segments (CS)

There are several customer segments involving airport operations (Figure 3). They can be classified into the aeronautical customer segments: airline, airports, passengers, and non-aeronautical customer segments. Thus, contrary to the conclusion said by Gillen (2011) that an airport is a two-sided platform involving passengers and airlines, we argue that an airport

should be considered a multiple-sided platform. The customer segments of Singapore Changi International Airport support this argument.

This unique airport serves businesses and passengers and pays attention to residents of all ages as Changi regards itself operating as a transportation platform and, performing as a destination (Hui & Wan, 2003; Lohmann et al., 2009). Several business activities beyond aircraft taking-off and landing, such as special events and holiday activities are held to attract diverse customer segments. For example, the Changi Love Kid, this project is arranged to serve the family segment. Such projects encourage residents to stay within airport areas (Wu & Tsui, 2020).

Because the company's vision prioritizes customers, the airport targets everyone from young children to the largest corporations. Changi has been in the process of developing terminals with a variety of universal design programs, which include facilities for disabled passengers as Changi posits itself as a user-friendly airport (Dawes & Rowley, 1996).

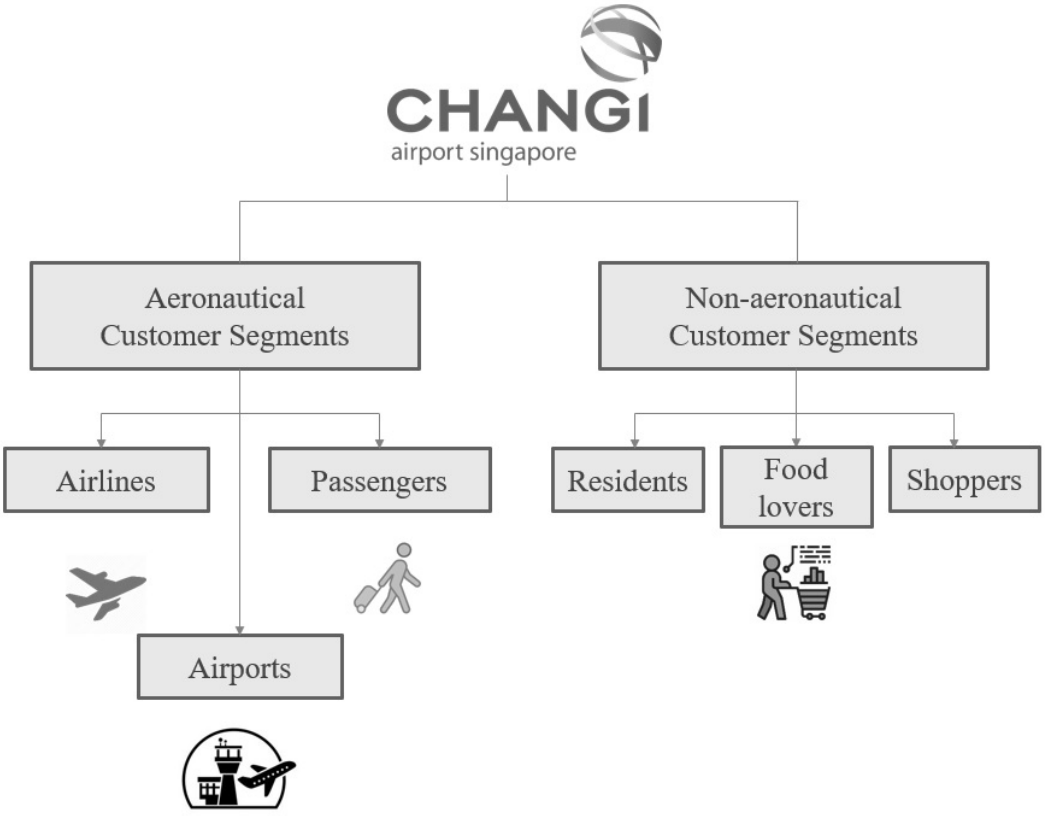

Figure 3 The Singapore Changi international airport customer segments
Source: Authors

Besides the customer as mentioned above segments, several airports in the world are customers of Changi, as CAG also runs consultation businesses and airport assets management called the Changi Airport International (CAI). Examples of its customers in the portfolio

include Clark International Airport, Fukuoka International Airport, Vladivostok International Airport, Chongqing Jiangbei International Airport, and King Abdulaziz International Airport (Changi Airport Group, 2020b).

2) Value Propositions (VP)

With eight cargo terminals, five-passenger terminals, and three runways planned to be ready in 2030 (Changi Airport Group, 2020b), Singapore International Airport offers value propositions such as newness, airport performance, customization, design, and usability to each customer segment. Daily airport operations and airside management serve thousands of aircraft taking off and landing every day. Aprons, taxiways, baggage belts, safety inspections, and other tasks relevant to in-and-out airport areas are delivered to the airlines. Creating passengers' experiences is the heart of the value proposition. The airport arranges attractions for children to adult passengers and residents. Everything is laid out in green environments. They include event spaces, indoor gardens, community spaces with seating areas, activities for the family, an inflatable playground, entertainment zones, movie theaters, lounges, Sesame Street exhibitions (Changi Airport Group, 2019, 2020a, 2020b).

The airport also provides Terminal Operations and Planning to serve passengers' demands and innovate passenger experiences. Changi International Airport offers customized and personalized services to enhance the experience of passengers of every age. The Changi Lounge provides fly-ferry and fly-cruise passengers comfortable and seamless luggage delivery. The baggage-transfer services are available from the airport on arrival to the local maritime terminals. While waiting for flights or ferries, passengers can enjoy the lounge facilities, such as showers, refreshments, seating areas, Etc. Furthermore, retail shops, dining services, and to-go destinations are available in the departure terminals and the Jewel project within Terminal 1 (Figure 4). This project is a human-made destination that combines gardens, attractions, over 500 retail stores, and more than 260 dining choices across the terminals and Jewel Project, along with accommodations and aviation facilities to support the airport's operations.

Engineering and Development provide a safe airport environment for stakeholders. The Sky Train, boarding bridges, airfield lighting, capacity planning, and terminal design are the values delivered to airlines, passengers, residents, and airport clients. Because of its high safety awareness, the airport has been awarded by the International Federation of Air Line Pilots' Associations (IFALPA) for almost 40 consecutive years. For these reasons, Singapore Changi International Airport offers baggage storage during passenger layovers. It applies the Explosive Trace Detector (ETD) to scrutinize luggage for safety and security (Changi Airport Group, 2019, 2020a, 2020b).

3) Channels (CH)

This component refers to the channels through which Singapore Changi International Airport reaches the customer segments. To propose retail businesses' values, the airport connects passengers, Singaporean residents and travelers through the highly interactive website

and iShopChangi (Figure 5). The e-commerce portal represents an attempt to enhance the digital experiences and ecosystem for linking the passengers with resident touchpoints. This platform is also redesigned to tailor and personalized customer preferences through various and other services. Correspondingly, Changi Rewards, the loyalty program, has been developed to introduce several member benefits as after-sale services. The benefits include airport lounge accessibility, free parking lots, and other membership privileges. With this user-friendly portal and more than 20,000 products from approximately 800 brands in the store, there are over 100,000 customers, and Changi Rewards set a new milestone of 1,000,000 members at the end of the 2018/2019 financial year (Changi Airport Group, 2020b; Changi Airport Group, 2019; Changi Airport Group, 2018).

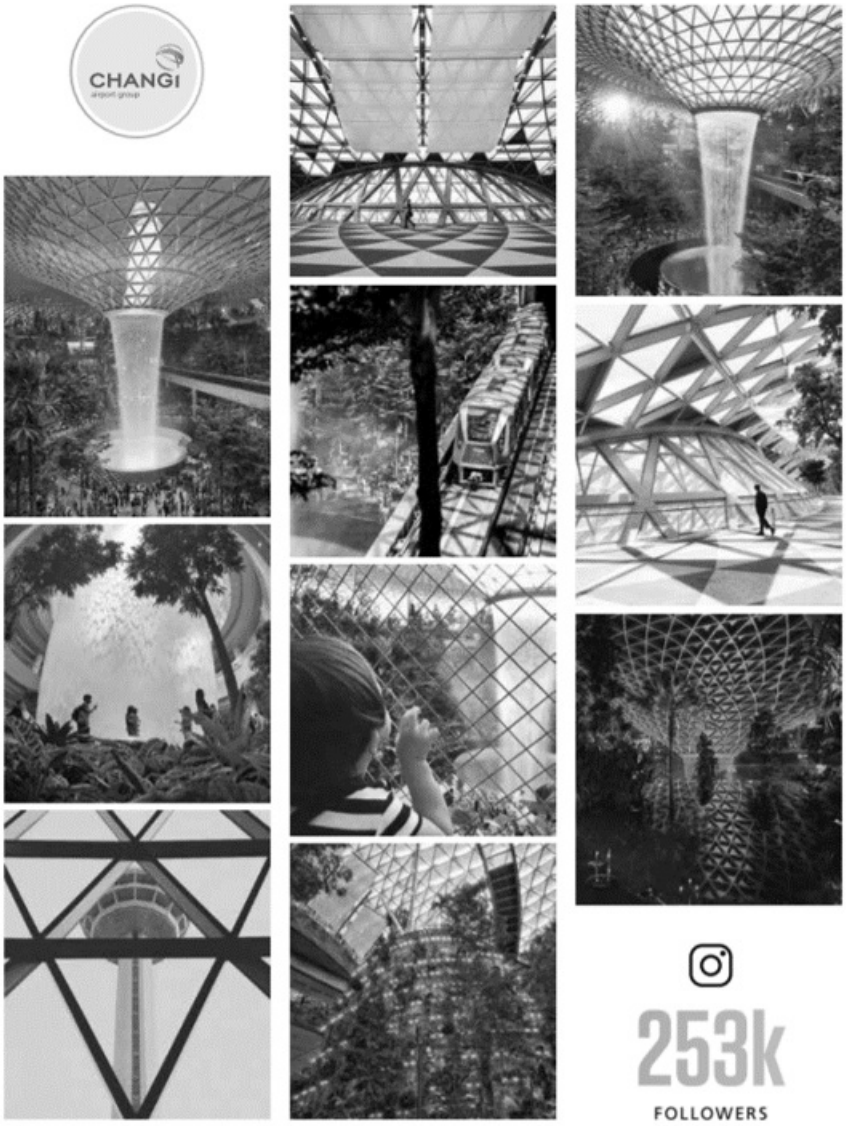

Figure 4 The Jewel project
Source: Changi Airport Group (2020a)

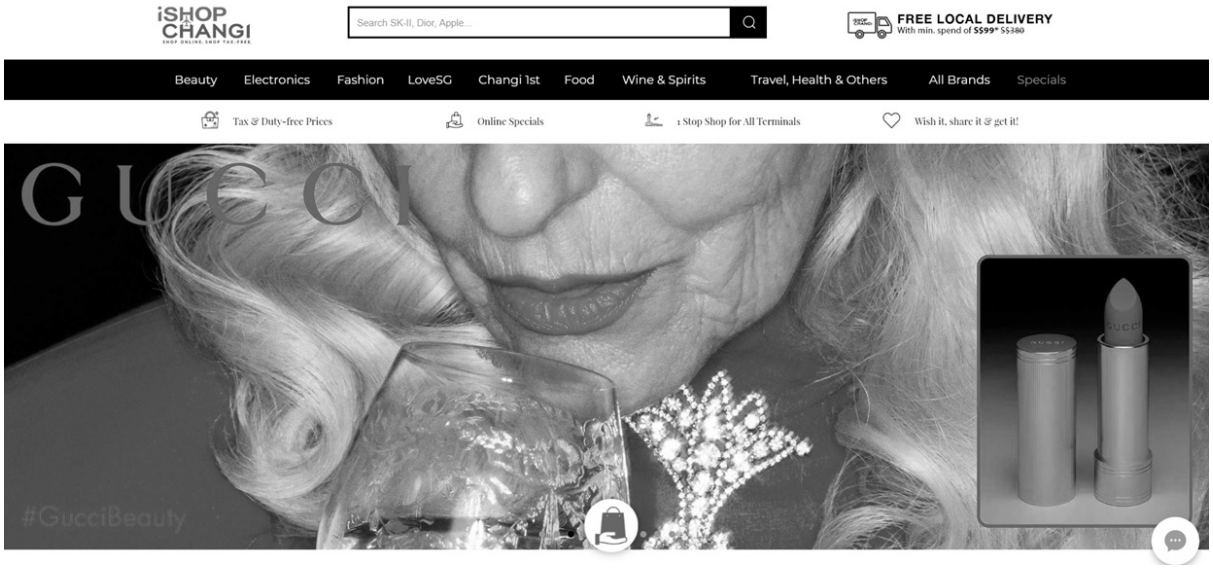

Figure 5 iShopChangi portal for retail businesses under the Changi airport group
Source: Changi Airport Group (2020a)

To redeem one's points, customers use the iChangi Mobile Application, which helps improve the airport's operational efficiency. It provides extensive experiences to airport users who need only a single username for all transactions relating to the airport, such as rewards redemptions, shops and dining information, flight alerts, and reservations for attractions.

Figure 6 Channels for maintaining a direct relationship with airport users
Source: Changi Airport Group (2020a)

The airport also creates a connection with passengers worldwide via social media (Figure 6). With Facebook, Instagram, LinkedIn, WeChat, Weibo, YouTube, and Twitter, the airport steadily engages travelers and residents, including during the COVID-19 pandemic, when all airport operations have ceased.

4) Customer Relationships (CR)

There are many types of customer relationships provided at this airport. Self-services are available throughout the process. With the automated FAST System (Fast and Seamless Travel), passengers can check-in, drop off their baggage, and pass through immigration and the boarding gate seamlessly (Figure 7). This self-automated service is regarded as a customer relationship by Osterwalder and Pigneur (2010). The airport also created the Changi Airport Growth Initiative (CAGi) for its customers. This program collaborates with airline customers to drive the traffic connectivity to Singapore Changi International Airport. It encourages customers to pursue business growth and especially helps airlines to strengthen their long-haul connections, which are key to the airport's success. This program also offers rebates to offset the incremental aeronautical charges (Changi Airport Group, 2013b).

Figure 7 Customer relationships via automated services
Source: Adapted from the Changi Airport Group (2020a)

Figure 8 A sample of personal automated assistant
Source: Changi Airport Group (2020a)

Another form of customer relationship is using automated personal assistance via Facebook Messenger and the iChangi Mobile Application. MAX powered by IBM Watson and Accenture is a virtual assistant developed by artificial intelligence technology. It offers on-demand answers to common inquiries and navigates passengers by giving them the necessary information regarding flights, dining, things to do in the airport, and the lost-and-found process. Pepper is a robot or "personal automated assistant." (Figure 8) With collaboration from various partners, this interactive robot is used to increase the shopping experience for passengers.

5) Revenue Streams (RS)

This component explains the sources of revenue from each customer segment. The airport revenues can be classified into aeronautical and non-aeronautical kinds. The aeronautical revenues consist of the parking, landing, and aerobridge charges. The non-aeronautical revenues are from concessions and rentals, which sharply rose from 537 billion in 2009 to 1.17 billion in 2019. Regarding the annual report for the 2018/2019 financial year, the airport's operating revenues approximately increased 8.1% due to the healthy growth of concessions and passenger traffic, which led to an increase in airport charges on airlines and passengers (Changi Airport Group, 2020a, 2020b). The higher proportion of non-aeronautical revenue, compared to aeronautical revenue, reflects the importance of non-aeronautical revenue in airport operations (De Neufville & Odoni, 2013; Assaf & Gillen, 2012; Graham, 2009; Oum et al., 2008).

Another revenue stream comes from Changi Airport International (CAI), which is a 100% subsidiary of Changi Airport Group. With the airport investments and consultancy services, the consolidation of financial performance indicates 3,040 million Singapore dollars (Figure 9).

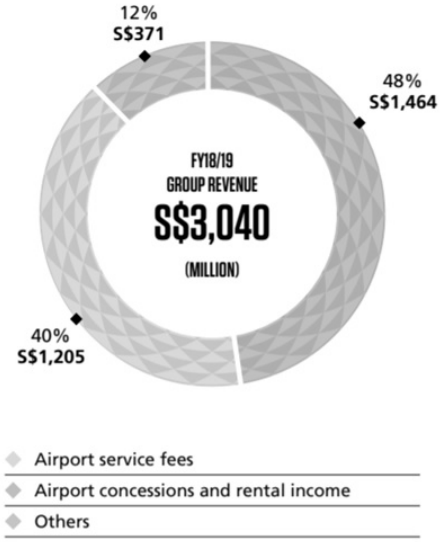

Figure 9 Revenue streams from airport operations
Source: Changi Airport Group (2020a)

6) Key Resources (KR)

The key resources involve the sources of value propositions. Singapore Changi International Airport always focuses on how to manage the talents in its organization. The airport values people's development as the key success factor (Figure 10). Through a series of talent pools via several engaging and training programs, Changi Airport Group creates a conducive culture, a sense of belonging in the workplace through the CAG Home Project; internal communications via the CAG social-networking application; a revamped company intranet; a collaborative and open atmosphere through crowdsourcing, personal development and growth; an Employee-Engagement Survey; and skills training for the fast-changing environments. Moreover, the airport offers scholarship programs by attracting talented young people from local universities. All of this is to make sure that the airport draws and retains the best talent.

Figure 10 Values of the Changi Airport Group
Source: The Changi Airport Group (2020a)

7) Key Activities (KA)

The airport's development in the form of a multi-sided platform is a key activity to propose the values for all stakeholders. Such development includes the FAST system in Terminal 4, the completion of 3 runways for sufficient capacity management in the future, and the Jewel Changi Project. The airport-development activities of the Jewel Changi Airport offer transit and department malls. To create fresh, green, and exciting experiences to passengers and residents, the Jewel areas comprise four main iconic destinations (Figure 11) - the HSBC Rain Vortex, the Shiseido Forest Valley, Canopy Park, and the Changi Experience Studio.

In the development areas, the project also provides more than 500 dining services and more than 250 food and beverage stores and shopping experiences arranged by many brands of local and international repute (Changi Airport Group, 2019, 2020a, 2020b). Changi Airport Group also moves on to the Changi East Project. It is airport development that's focused on growth and ensuring that Changi remains the aviation hub in the region. Since the airport has

an average traffic growth of approximately 5.4% per annum, Changi Airport Group initiated this project on 1,080 hectares. The project includes a fifth terminal, the three-runway systems, tunnels, underground systems, aviation facilities, and the Changi Industrial Zone (Changi Airport Group, 2020a, 2020b).

Figure 11 An example of airport development - the Jewel project
Source: Changi Airport Group (2020a)

8) Key Partnerships (KP)

This business model element explains the key partnerships that facilitate airports in proposing the values to their stakeholders. A strategic partnership approach is how Changi Airport Group engages with its partners. Stakeholder hearings under the rubric of the ONE Changi Project are initiated to have its partners contribute their ideas regarding improving customers' experiences and advancing a sense of belonging among the airport's partners (Changi Airport Group, 2020a). For example, the Immigration and Checkpoints Authority's (ICA) collaborations and the Certis Aviation Security aim to ease and facilitate passenger experiences during the customs and security-check procedures.

The airport maintains charges for its airline and air cargo partners to ensure its position as an aviation hub. The airport also facilitates quality input to support the needs of growth and future expansion. Changi Airport Group cooperates with the Singapore Tourism Board (STB) and Costa Cruises to participate in a tripartite partnership to develop the airport as a cruise destination in Southeast Asia.

Cross-industry cooperation and joint ventures are other forms of key partnerships found in the Jewel Project. The collaboration between Changi Airport Group and CapitaLand reflects the propositions. With several partnerships and sponsorships, such as HSBC, Shiseido, Manulife, DFS Singapore, Temasek Polytechnic, and SoftBank Telecom, travelers' experiences uplifting is possible.

9) Cost Structure (CS)

The cost structure of the airport mostly comes from the depreciation, amortization, and service and security-related fees of approximately 26 and 24% (Figure 12). As of the 2018/2019

financial year, the costs incurred from several airport developments, such as capacity investments, additional human-resources planning, and terminal expansion, support the various projects, whereas the new regulatory measures also contribute to an increase in operating costs.

10) Sustainability

Changi also focuses on sustainability. The airport pays attention to Sustainable Development Goals (SDGs) in compliance with the United Nations. The Sustainability Working Group and Changi Foundation were established to initiate social- responsibility programs across the country. The airport engages the local communities by giving students hands-on experience with the airport partners by implementing such projects. Such projects foster a sense of belonging among the airport and local communities.

To commit and align with the Singapore Climate Action Plan and Singapore Zero Waste, the airport is working on reducing carbon emissions by the end of the 2029/2030 financial year. Additionally, the airport installed food-waste digesters to convert food waste into incinerated (Changi Airport Group, 2020a, 2020b).

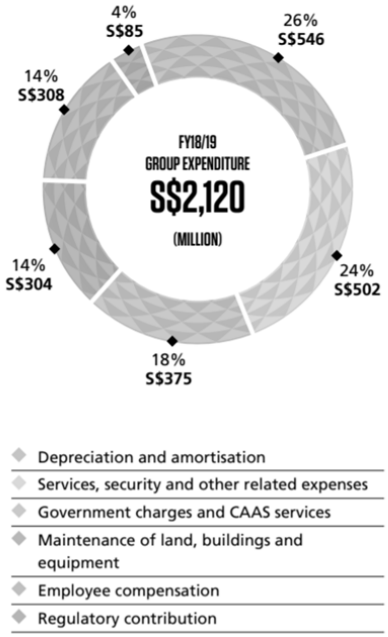

Figure 12 The cost structure of airport operations
Source: Changi Airport Group (2020a)

Conclusion and managerial implications

Several key operations have made Singapore International Airport the top of the chart for a decade. The framework of Osterwalder and Pigneur (2010) sheds light on how the airport manages its businesses. Although this conventional BMC well describes the overall airport

business operations, sustainability is another matter that the airport concentrates on. The lessons learned from the World's Best Airport provide several practical implications for airport management worldwide.

First, Singapore Changi International Airport is distinguished by its partnerships (KP). This allows partners' synergy, and it pools business resources to create several amazing mega-projects. The Jewel Changi Project is a good example. Such strategic partnerships are also involved in proposing values to all stakeholders. For example, the airport acts as a facilitator in providing car-parking services to residents to attend events around the airport. Stages or channels for hearing the strategic partnerships for airport business operations are advised to arrange. Even cross-industry collaboration is possible, creating win-win situations for all parties. Moreover, aspects of the strong partnerships among the stakeholders derive from the airport's sustainability projects, as such projects create a sense of belonging to the surrounding community, universities, and business sectors.

Secondly, Singapore Changi International Airport implements several proactive strategies to increase its revenues by using e-commerce channels and commercial platforms to reach airport stakeholders. Several communicative channels for users should be provided. Offline and online platforms are employed to receive customers' pain points and expectations to foster the airport to instantly serve their needs.

Thirdly, Singapore Changi International Airport itself is a tourist attraction. Full-area utilizations, from airport development to tourist events, are significantly found at the airport. The management considers the airport a destination, so they use the concept of destination development and link it with the authenticity and originality of local resources; thus, the value propositions are beyond the aeronautical businesses. So, the customer segments are not limited to the airlines and passengers. The other users, such as residents, tourists, or even gastronome, enjoy visiting the airport. Such airport users have the potential to increase non-aeronautical revenues.

Lastly, Singapore Changi International Airport is a public airport, a corporatized agency, CAG, administers its operations. To confirm that the ownership patterns impact the airport's performance seems to be the limitation of this article. This study used descriptive analysis as an approach to present the success behind airport operations. Therefore, further empirical study on the issue should be examined to confirm the statement.

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