

Article

Critical Components of Airport Business Model Framework: Evidence from Thailand

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Abstract: Because of the scarcity of extant studies in the literature on airport business models, this study aims to identify a framework for airport business model design. Exploratory research obtained from key Thai respondents was used, and the data analysis was further enhanced by an extensive review of related grey literature available in public domains. With our qualitative data analysis, we propose the generic airport business model framework as a foundation for designing business models. Strategic partners, core business activities, human resources and sustainability-related projects should be considered basic components driving an airport to achieve high performance. The remaining business model components should be customised depending on business environments and location contexts.

Keywords: air transport; airport development; airport management; airport business model; qualitative research



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1. Introduction

Deregulation of the airline industry exerted pressure on airports as service providers in the aviation sector. The growth in demand for air transport caused airports to invest in the development of infrastructure and service quality [1–3]. Therefore, airports, which are mostly owned and operated by governments, shifted to public enterprise management and multi-business companies to become more competitive and profitable [4–6]. Massive funding was required to refurbish airports and improve their cost efficiency. The airports were tasked with finding managerial instruments to provide a new business model [7]. Consequently, many scholars in the field are investigating the factors that affect airport efficiency, including measurements, benchmarks and other airport development tools that help retain airport strategic planning and nurture competitive advantage [8]. However, little attention has been paid to airport business model (ABM) propositions [6,9–12], despite the positive effects of business models on a firm's performance [13–20].

This paper makes an academic contribution to the ABM literature. Firstly, it provides the framework for a business model design, by providing the basic components used to illustrate focal business operations that create value for users. As the business model has been the unit of analysis in the management science literature for decades [21,22], there are few works related to ABM. Secondly, the study seeks to enhance data analysis, by examining lessons learned from the World's Best Airport. The associated findings shed light on the details of each business model component that enabled this airport to receive the latest World's Best Airport award from Skytrax. Finally, the study presents in-depth information collected from airport management in Thailand. Key informants from various airport ownership patterns were invited to express their own ideas regarding the improvement of airport performance and key activities that enhance operational efficiency. The key components were determined using these methods to construct an ABM analytical framework.

This paper develops a framework to address the components that airport management should focus on to design an ABM in order to improve airport performance. Exploratory research was used to discover the essential ABM components. Then, the data analysis was enhanced by an extensive review using the lessons learned from recipients of the highest honour of the World Airport Awards instituted by Skytrax: namely, the World's Best Airport award. This paper is organised as follows: Section 2 reviews the literature relevant to business models as they have been studied in the airport literature; Section 3 explains the qualitative research design; Section 4 presents the findings and discussions; finally, the managerial implications are provided in Section 5.

2. Literature Review

2.1. Business Model Conceptualisations

It is essential to define a business model, because it shows the relationships between a firm, strategy and performance [23]. According to Table 1, business model terminology is fragmented, and consists of diverse understandings of its terms from various scholars in different fields of study [24]. The definitions of terms are therefore unclear, and lack a theoretical background. This is something often misused and misinterpreted by scholars, practitioners and the business sector, despite its frequent use in the literature [25–27]. This is because most works adopt the case study methodology, especially in information technology businesses, instead of empirical testing and theoretical development. Consequently, the growing body of empirical testing and theoretical development is under-studied [28].

Although business model terminology is diverse, we can see consolidation trends in its conceptualisation. Table 1 presents the evolution of business model terminology, and some selected conceptualisations of the term. It is noticeable that business model terms fall into two categories. The first group defines a business model as a model [27,29,30], a way [31,32], a component [23], a template [20], a means [25], a tool [33], a plan [34], a system [35] and a set or bundle of activities [13,36], indicating how a firm performs overall as a business.

The second category defines a business model as a model [19,24,37–39], a tool [40], a way [41], a series of activities [42], an articulation [43], a component [15,44], a description [45], an architecture [46–48], a system [49], a view [50], an element [51], a combination of business resources [26], a rationale [52], a version [53], a structure [54] and a device [55], focusing on how a firm creates, captures and delivers value.

Table 1. The diverse conceptualisations of business model terminology.

Authors	Definitions
Porter [27]	The definition of a business model, most often, refers to how a firm does business and creates revenue. Simply put, this model sets a low bar for setting up and building a firm's operation.
Chesbrough and Rosenbloom [31]	In a general sense of business model, it is how a business is run, whereby a firm can organise itself to generate revenue. It shows how a firm makes money by indicating its standing in the value chain.
Magretta [38]	A business model tells the story of how a firm sells its products and delivers value.
Hedman and Kalling [23]	Business models are used to illustrate the key components of a company.
Morris, et al. [30]	It is the firm's economic model. It involves profit generation, revenue sources, methods of pricing, cost structures, profit margins and expected volumes.

Table 1. Cont.

Authors	Definitions
Osterwalder, et al. [40]	A business model is a conceptual tool containing elements that show the relationship and present the logic of a specific business. It describes the company value offered to various customer segments. In addition, it shows the architecture and networks of partners that deliver value to create and sustain revenues and profits.
Chesbrough [42]	Business models perform two crucial functions. They act as value creators and value captors. They define a series of activities from purchasing to final customers.
Zott and Amit [19]	A business model explains how a firm is connected with external parties, and how a firm interacts in economic exchanges to generate value for external stakeholders.
Zott and Amit [20]	A business model is a structural template describing a firm's focal transactions with all stakeholders.
Baden-Fuller and Morgan [25]	A business model is a means of describing and classifying businesses. It operates as a site for scientific investigation and provides guidelines to managers.
Amit and Zott [36]	A business model is the bundle of activities aimed to serve the market needs and parties, and it represents how these activities are linked together.
Chesbrough [37]	<p>A business model is a model fulfilling these functions:</p> <ul style="list-style-type: none"> - conveying the value proposition - classifying market segments and identifying the revenue creation mechanism - identifying the structure of the value chain- describing the revenue mechanisms that a firm offers - assessing the structure of profit, revenue and cost- illustrating the standing of a firm within the network connecting customers and suppliers - preparing competitive strategies.
Demil and Lecocq [43]	A business model may refer to the articulation of various company activities designed to provide value to customers.
Giesen, et al. [15]	<p>Business model components relate to these questions:</p> <ul style="list-style-type: none"> - What value is handed to customers - How the value is delivered to customers - How a firm's revenues are created - How a firm posits itself in the industry.
Osterwalder and Pigneur [45]	A business model is a description of the rationale on how a firm creates, delivers and captures value.
Teece [47]	A business model explains the architecture of value creation and delivery, and captures the business mechanisms it uses.

Table 1. Cont.

Authors	Definitions
Zott and Amit [49]	A business model acts as a system of activities transcending the firm's pinnacle and boundaries that allow a firm to create and share value.
Casadesus-Masanell and Ricart [44]	They suggested that a business model contains the components that inform managerial decisions as to the manner in which a firm should operate, the consequences of those managerial decisions and their impacts on the firm's strategy for value creation and value capture.
Cavalcante, et al. [33]	They posit a business model as a tool to provide stability for the development of a firm's activities. This model is flexible and subject to change.
Zott, et al. [50]	Business models provide a holistic view on how a firm runs its business. They explain not only how value is generated but also how it is captured.
Trimi and Berbegal-Mirabent [39]	A business model explains how a firm delivers value to users, where to allocate the money for the firm's sustainability and how to run the company.
Boons and Lüdeke-Freund [34]	A business model provides a plan that indicates how new ventures are able to become profitable.
Zott and Amit [32]	Business models depict the ways a firm does business. They are crafted to best provide customer satisfaction.
Bocken, et al. [51]	A business model is defined by three components: value proposition; value creation; delivery and value capture.
DaSilva and Trkman [26]	A business model is the combination of resources through transactions to create value for a firm and its customers.
Amit and Zott [21]	A business model explains the system of activities carried out by a firm, its parties and the mechanisms linking these business activities to one another.
Joyce and Paquin [52]	A business model is a rationale of how a firm creates, delivers and captures value.
Wirtz, et al. [24]	Apart from value creation and market component considerations, a business model simplifies and represents a firm's related activities to secure a competitive advantage.
Massa, et al. [29]	A business model explains how a firm is run in order to achieve its goals, such as profitability, growth, interaction with society and impacts, among others.
Saebi, et al. [46]	A business model is an architecture linking a firm's value proposition, market segment, value chain structure and value capturing.
Geissdoerfer, et al. [53]	Business models are defined as simplified versions of value proposition, creation, delivery and capture. They represent the interactions among these elements within a firm's unit.
Hahn, et al. [54]	A business model is the content, structure and control of transactions designed to create value over the exploitation of business opportunities.

Table 1. Cont.

Authors	Definitions
Teece [48]	A business model illustrates the architecture whereupon a firm generates and delivers value to users. It describes the mechanisms for capturing a share of value. It is a combined set of components, including costs, revenues and profits.
Afuah [13]	A business model is a set of activities performed to generate and utilise business resources in order to create, deliver and monetise benefits to customers.
Di Tullio, et al. [55]	A business model is a communication device that underlies the value-creation process.

2.2. Airport Business Model Literature

In contrast to business model definitions, ABM has received less attention in the literature in terms of both conceptualisation and related studies [6,10–12,56]. According to Frank [10], the first works describing overall airport operations were those by De Neufville and Odoni [2] and Gillen [57]. According to our review, however, we argue that the concept of ABM is not succinctly presented in these articles, because the authors explored how airport systems adapted to changes; hence, the literature review on these issues was much less comprehensive.

To the best of our knowledge, the only literature containing the keywords ‘airport business model’ or ‘business models for airports’ are those from Baker and Freestone [58], Frank [10], Kalakou and Macário [12], Everett Jr [59], Efthymiou and Papatheodorou [60] and Rotondo [6]. Table 2 presents the current literature on ABM, and the conceptualisations and the findings from the literature that includes the keywords ‘airport business model’ in their title.

In the literature, Baker and Freestone [58] explained how Brisbane Airport and Athens Airport adapted the airport city concept to their business operations. Although their work contains keywords relating to the ABM, they discussed something quite far removed from this paper’s research objective. In what is similar to Efthymiou and Papatheodorou [60], they discussed how airports ran businesses from pre- to post-deregulation, and described how airport businesses apply the concept of the airport city, or Aeropolis, to the operations.

By contrast, Frank [10] employed exploratory research using in-depth interviews to examine airport business practices, and proposed different types of ABM for the Talip International Airport (TIA), Mills International Airport (MIL) and Malik Airport (MAK). The author proposed the airport business model matrix, the components of which included customer value propositions, key profit formulas, stakeholder rewards, key processes, network value, and innovation and key resources. She concluded that the ABM design should be heterogeneous in nature, and that it should supply a holistic view of airport operations.

Kalakou and Macário [12] used the common Business Model Canvas (BMC) to conduct an analysis of 20 ABMs, because the authors believed that this model captured the overall airport operations as well as the business environment. They found that types and volume of traffic have a high impact on business models; in addition, they further developed Osterwalder and Pigneur’s [45] analytical framework, with the inclusion of a regenerator factor, which reflected expected investments and returns. The authors agreed with Frank [10], that an ABM should not be static, and should reflect present operations for future model development. Moreover, the authors explained that each element in the BMC illustrated the innovative process of airport business modelling. This is because all elements of the BMC affect the new value proposition; it therefore creates innovation building on current airport operations. Everett Jr [59] employed the same framework to explain small airport operations in Eastern Pennsylvania, which were operated by Lehigh–Northampton Airport Authority (LNAA). The author employed nine element-building blocks, and holistically

described the current operations related to the airport business environment. The author presented the overall operations for the selected airport.

Table 2. Airport business model literature.

Authors	Definition	Aspects of Studying
Baker and Freestone [58]	They did not clearly specify, but we can infer that they intended to describe how those airports do business.	The paper compared how two sampled airports from different scales embraced the airport city concept to develop their properties commercially in response to changes.
Frank [10]	The business model analyses and depicts the way the firm operates.	The author suggested a structure for airport business models, comprising the customer value proposition, breakthrough rule changing, regulators, key profit formula, stakeholders, governance mix, reform opportunity cost, key resources, key processes, network value, risk and externalities.
Kalakou and Macário [12]	An attempt to conceptualise business operations through a model, treating it as an operational tool to improve the firm's performance and revenues.	They explored a new framework for airport business model design by adapting elements from Osterwalder and Pigneur (2010). The authors presented additional building blocks, including the so-called regeneration factor, which includes expected investments and expected returns. The study concluded that high-performance airports shared the same airport business model components.
Everett Jr [59]	A business model is part of a business plan. This schematic model provides an overall picture of a firm, and is more comprehensive than other revenue or operating models.	The paper presents the framework for developing airport operations in a changing business environment. Using the example of a small airport in the USA, the author adopted components from Osterwalder and Pigneur (2010) to illustrate the application of the framework.
Efthymiou and Papatheodorou [60]	The authors did not give the definition, but we can interpret that it means how airports run businesses under changing environments.	The authors present how airport businesses evolve their operations during different periods of the aviation industry, in response to changing airline business models.

Table 2. Cont.

Authors	Definition	Aspects of Studying
Rotondo [6]	The author defines a business model using three elements: structure, value proposition and the market.	The study aims to develop a systematic and theoretically founded framework with which to interpret airport business models. It provides a structured and comprehensive examination of strategic methods using an approach to evaluate business models, and demonstrates the application of the concepts using airports in Italy.

The work by Rotondo [6] has recently enriched the ABM literature. In this study, Rotondo [6] made a distinct attempt to interpret and provide an ABM framework, by conducting a review of the strategic management and airport-related literature on capturing the environment affecting airport business operations. On the basis of Casadesus-Masanell and Ricart [44], he constructed the ABM framework by asking the questions that represent the components underlying the core logic for creating and capturing value. His goal for developing this framework was to assess the Italian airport system. However, Rotondo's ABM framework [6] lacks in-depth information from airport management that can potentially be crucial for ABM development. Therefore, the current study goes beyond his study by employing an exploratory research approach to build upon his findings and add value to ABM literature.

However, owing to the limitations of ABM conceptualisation, we began by using Rotondo's [6] ABM framework and the BMC of Osterwalder and Pigneur [45] as guidelines for developing the ABM analytical framework of this study, because these two frameworks share similar conceptualisations. Rotondo's [6] ABM framework provides details on each business model component, especially for the airport business. The BMC illustrates more comprehensive business model components, and shows the linkage between business activities and value creation. It provides a concrete model and visual presentation [51] that allows an understanding of business operations [61] and ideal foundations [52,62] for further study on developing an ABM analytical framework.

2.3. Analytical Framework of Business Model Design

To design business models, the components adopted in the business model ought to be consistent with the goals of the firm [19], and aligned with the business model definition employed. This is because the differences in definitions create disparities in business model components and designs. Various suggestions have been made as to what the appropriate business model components should be. Each definition provides different business model components that impact how firms design business models, such as the proposal by Hedman and Kalling [23]. They suggested that business model components include customers, competitors, offerings, activities and organisation, business resources and production factors. However, some studies present a common systematic process to design business model archetypes that correspond to the business model definition given in this study, such as the BMC published by Osterwalder and Pigneur [45]. Because the BMC components are classified into value and efficiency parts [12], the BMC was adopted as the elementary framework for qualitative analysis in this study (Figure 1).

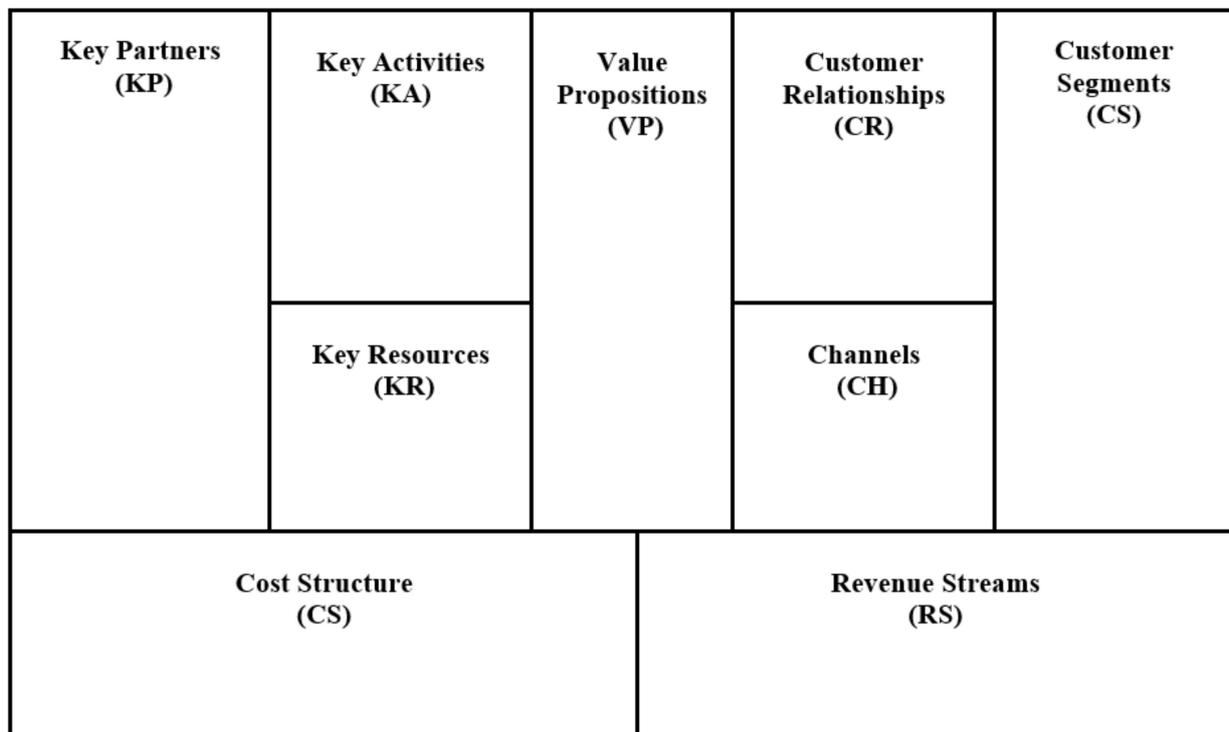


Figure 1. The common business model components. Source: Osterwalder and Pigneur [45].

Osterwalder and Pigneur [45] presented a BMC that includes the perspective of external participants. It comprises nine interconnected elements from the value proposition and efficiency parts. The key partnerships (KP), key activities (KA), key resources (KR) and cost structures (CS) reflect the efficiency of a firm, whereas the value propositions (VP), customer relationships (CR), channels (CH), customer segments (CS) and revenue streams (RS) are the value part of the BMC.

The BMC components proposed by Osterwalder and Pigneur (2010) are defined below:

1. Customer Segments (CS) consider the different groups of customers being served. This block includes various groups of customers who are the source of earnings in a business. If a firm offered products and services to various CS, it would be required to justify and prioritise them to deliver the right value to the right groups. The CS can be categorised into mass markets, niche markets, segmented markets, diversified markets and multi-sided platforms or multi-sided markets that are specifically regarded as segmented for airport businesses.
2. Value Propositions (VP) are the goods and services a firm offers that create value for each customer segment. It also indicates customer pain points and suggests solutions. VP involve these factors: newness, performance, customisation, design, brand, getting the job done, price, cost and risk reduction, and accessibility and usability.
3. Channels (CH) refer to the selected channels where a firm communicates with each customer segment about proposing value. Finding the right channel helps a company raise awareness among customers about its products, and allows the company to assess the best mode to convey messages to customers.
4. Customer Relationships (CR) elucidate the forms of interaction between a firm and each specific customer segment. CR can be divided into several categories. They include personal assistance, dedicated personal assistance, self-service, automated services, communities and co-creation.
5. Key Resources (KR) enable VP to customers and markets, maintain CR with CS and generate revenues. KR can be classified as physical, intellectual, human and financial.

6. Key Activities (KA) are a set of activities a firm needs to drive its business model. It explains the main activities a firm should undertake to deliver VP. Such activities include production, problem solving, platform provision or network management.
7. Key Partnerships (KP) are the networks underlying a supplier–firm partnership. The aims of networking partnerships are optimisation and economies of scale, reduction of risk and uncertainty, and acquisition of activities and business resources to extend a firm’s capabilities.
8. Revenue Streams (RS) show the revenue stream from each customer segment. This involves two different RS: transaction revenues and recurring revenues. Transaction revenues are payments from one-time customers, while recurring revenues refers to continuous payments from customers. To generate RS, a firm might sell assets; collect usage, brokerage and subscription fees; or lend, rent, lease, licence or sell advertising.
9. Cost Structure (CS) reflects important costs incurred from the other eight block operations. Once the other blocks are detailed, it is possible to calculate all inherent costs that can then be minimised. However, this depends on the type of business model that might fall between being cost-driven and value-driven.

3. Research Methodology

Exploratory research was employed to answer the research question, as to what components airport businesses should use in order to construct a business model to improve airport performance. This qualitative method was used to discover a study in grounded theory, and to seek additional information due to the limitations of the literature on this issue [63–65]. Firstly, we conducted in-depth interviews to search for business model components essential to efficient airport business operations. Secondly, we enhanced the data analysis further by examining the operations of Singapore Changi International Airport, recipient of the World’s Best Airport award from Skytrax, to draw lessons learned about constructing the ABM framework.

Management groups from various airport ownership patterns in Thailand, and airport scholars, were contacted to conduct in-depth interviews for collecting data from key informants and for allowing data triangulation (Table 3). The inclusion criterion consisted of key informants who had management positions or at least held the position of director. They were required to have had experience in strategic airport planning and business management. Key informants from the Airports of Thailand (AOT), representing privatised airports, and from Bangkok Airways Plc., which administrates private airports in Thailand, were invited to join the interview sessions. The opinions of the management of the Department of Airports (DOA), a public airport agency in Thailand, from both central and regional units were obtained. We invited airport scholars experienced in conducting at least one national airport development research project, or who held the position of a member of the advisory board of the Network of Thailand Civil Aviation Development (NTCAD), to give their opinions on the topics.

Table 3. Key informants for in-depth interviews.

Privatised Airports	Airport Managements			Airport Scholars	Total Key Informants Collected
	Private Airports	Public Airports (Central Unit)	Public Airports (Regional Units)		
2	1	2	4	2	11

Table 4 contains the set of semi-structured questions, developed from Osterwalder and Pigneur [45] and Rotondo [6], that was asked of the key informants during the in-depth interview process. With information collected from 11 key informants, the qualitative dataset met the data saturation principle, a benchmark for discontinuing data collection [66]. After data transcription, the dataset was later analysed using thematic analysis, which is a suitable method for exploratory research [67]. Thematic analysis is used to identify and

organise information into patterns of meaning, through a process of coding and grouping the keywords across qualitative datasets [68,69].

Table 4. A set of questions developed on the basis of Osterwalder and Pigneur [45] and Rotondo [6].

Business Model Components	Interview Questions
1. Customer Segments (CS)	Who are your customer segments or markets that your airport is serving? What segments allow you to achieve better business operations?
2. Value Propositions (VP)	What values or types of services do you offer to those markets? How do these relate to your performance?
3. Channels (CH)	Which channels do you find efficient for communicating or reaching your markets and delivering these values?
4. Customer Relationships (CS)	How do you efficiently interact with each customer segment?
5. Key Resources (KR)	What types of business resources, do you find, play a critical part in airport performance?
6. Key Activities (KA)	What types of activities do you consider a performance driver for the airport business?
7. Key Partnerships (KP)	Are there any stakeholders playing a critical part in your business operations?
8. Revenue Streams (RS)	What are the key drivers of airport business revenue?
9. Cost Structure (CS)	What are the significant costs from business operations that affect performance?
10. Other Business Model Components	Apart from the following business model components, in your opinion, what types of business components should your organisation consider, to improve airport performance?

Moreover, to enrich the analysis of data from the in-depth interviews, we gathered scientific grey literature available in the public domain—comprising airport newsletters, annual reports, corporate publications, airport websites and fact sheets [70,71]—to draw the lessons learned from Singapore Changi International Airport, the recipient of the World’s Best Airport award from Skytrax. According to Song, Guo and Zhuang [72], Skytrax, as an organisation, provides yearly performance benchmarks in terms of overall quality. It is one of the most well-known world airport rankings organisations, and is considered a leader in air travel research [73]. Singapore Changi International Airport has frequently been rated the top airport on several airport charts [74]. Singapore Changi International Airport achieved this award for eight consecutive years from 2013; it received the award for the first time in 2000. Singapore Changi has received the award more than 10 times [75]. Therefore, we selected this airport as a case study to supplement our data analysis by tracking its business operations accomplishments.

4. Findings

Using data triangulation, we found four main business model component keywords that met the data saturation principle. Strategic partnerships, business activities and human resources were the most common domains we found during the thematic analysis process, and most of the key informants agreed that these elements play critical roles in airport business operations.

4.1. Strategic Partnerships

To improve business performance, strategic partnerships should be focused. Airport strategic partnerships, in this sense, comprise business and non-business partners. Most of the key informants agreed that the airport authority should encourage stakeholders to participate in business planning. For example, one of the key informants mentioned the following:

Airport development is the responsibility not only of airport management but also of other parties in the area, such as provincial government agencies, local entrepreneurs, trade chamber organisations, tourism authorities and educational institutions. They can actively work together as partners to develop the airport business beyond being only a transportation platform.

What we learned from the in-depth interviews was corroborated by the lessons learned from Singapore Changi International Airport. We found that the airport strongly connects with its business partnerships, which creates cooperation among the partners, and pools business resources that enables them to create impressive mega-projects, such as the Jewel Changi Project, in the airport. Moreover, strategic partnerships with the airport dovetail in proposing values to all stakeholders by eliciting cooperation. The airport holds business meetings with the strategic partners to discuss ongoing and future activities. Even cross-industry partnerships are found in business operations. The airport has developed various channels to communicate with its users. It uses offline and online media to listen to customers/partners' complaints and expectations, in order to equip the airport to respond to their needs.

Besides its business strategic partners, the airport also connects with communities and educational institutions. Strong partnerships among airport stakeholder engagement projects, such as the mentorship for the Saturday Night Lights sport volunteer event programme, the 5-Day job attachment programmes, the hands-on-experience internship programmes, the CAG scholarships, the youth passport programme, and so on, provide major benefits. Such partnership projects create a sense of belonging, and engage the surrounding communities and universities.

4.2. Core Business Activities

According to the in-depth interviews, we found two sub-keywords under 'airport business activities'. The key airport business activities that foster airport performance should be based on business development activities and destination development within an airport. For example, one of the key informants mentioned the following:

If an airport posits itself as a 1.0 airport, then it can be only a transportation platform. But if it develops itself as a destination using the concept of aero marketing for developing its businesses, then it can achieve better operations.

(1) Business development:

Airport managements should provide training for positions involved in airport business development, because budget cuts have put pressure on airport operations. In addition, an airport needs to proactively increase utilisation, by attracting airlines to operate more flights. Since non-aeronautical revenues now play a crucial part in airport revenue generation, an airport should convert available areas into commercial platforms. To efficiently develop airport businesses, an airport needs to listen to stakeholders, and build KP. Public hearings are necessary, because they not only reduce the chances of an airline suffering losses due to abandoned projects, but also make management aware of the expectations and dissatisfactions of all airport users.

(2) Destination development:

To develop airport businesses together with destination development, an airport needs to develop its individual identity. The attractions of destinations near an airport should be researched and promoted. To link the attractions with airport businesses, airport staff should work with provincial authorities and other KP, such as government agencies, communities, airlines, local brands and well-known brands.

This idea from the key informants was consistent with the findings from an extensive review of the World's Best Airport. We learned that Singapore Changi International Airport has implemented several proactive strategies to enhance airport revenues through commercial activities, using e-commerce channels to reach out to airport customers. These activities have been developed not only for passengers but also residents, athletes, gastronomes and

tourists. These groups of airport users have the potential to increase non-aeronautical revenues. We found that the airport develops the areas effectively by arranging monthly and yearly business and leisure events. The airport turns itself into a destination by way of business partnership collaborations. Projects at the Singapore Changi airport include the HSBC Rain Vortex, the Shiseido Forest Valley, Canopy Park and the Changi Experience Studio.

4.3. Human Resources

Most of the key informants mentioned the importance of human resources, because these resources play a significant role in airport performance development. The sub-keywords put forward by the key experts can be classified as follows:

(1) Skills necessary for airport people:

Working in an airport requires specific knowledge for specific job functions.

However, most workers in an airport lack a solid foundation in airport business, and are unaware of the goals and mind-sets related to airport operations. Some of the management staff may have been promoted from non-airport organisations because of political motivations; therefore, they do not have the relevant background, and do not realise the importance of an airport with regard to social and local economic development. One of the key informants said:

Many of the top management staff still have a perspective that focuses on infrastructure development, despite the fact that the airport business itself is useful in terms of economic aspects.

In addition to having an airport business orientation, management should have skills relevant to business development and aero marketing. At present, the government budget for public airports is declining, and the airports are forced to generate revenues themselves. Hence, skilled airport staff who are motivated to develop the airport businesses and do the marketing are indispensable KR.

(2) Incentives towards their operations:

The structure of the civil servant system has a direct impact on some operational airport staff. Because airport budgets were slashed, some airports have been forced to outsource employment or hire limited numbers of permanent and temporary employees. As previously mentioned, working in an airport requires specific knowledge, especially in positions related to safety and security; therefore, the budget for training is largely spent on temporary employee positions. However, because there are no promotion or salary increments for temporary employees, motivation for employee engagement is almost zero. This lack of motivational incentives results in operational inefficiency.

(3) Manpower planning:

The shortage of human power in an airport is another issue that has been raised. Some airports offer only a few civil servant positions, and hire limited numbers of permanent and temporary employees. This means that some of them are required to work double shifts, which leads to fatigue and inefficiency in airport operations.

Personnel development is a key resource for airport business operations. Although many job functions have been replaced by technological devices, passengers prefer to communicate with other humans rather than communicating with artificial intelligence devices. Therefore, some of the key experts insisted that forming a team that has an airport business and goal orientation is an essential factor in improving efficiency.

Singapore Changi International Airport is administered by the corporatisation of its operations, and human power planning and other relevant human development issues are manageable (Singapore Changi is run by CAG, which is a corporatised company.). The airport focuses on talent pool management. It provides various engagement and training programmes for its staff, and creates an inclusive, open, collaborative and encouraging culture through crowdsourcing, personal development and growth. Moreover, the airport offers scholarship programmes to attract talented young people from local universities. This is to make sure that the airport draws attention and retains a good staff composition.

4.4. Sustainability-Related Projects

Airport operators need to prepare a systematic, well-developed plan for issues related to sustainability. There are several factors and dimensions to be considered. Firstly, a plan should be developed to absorb the necessary expenditure for compliance with laws regarding noise pollution, waste management, carbon footprint and other environmental problems. In addition, airport management needs to consider the potential effects of airport operations on local communities. For example, if airport expansion is being contemplated due to a growth in air travel, then operators are required to address the impacts of an increase in the frequency of flights. Moreover, business operations connected to shared values among airport stakeholders are an important part of improving sustainable business development.

During our extensive review, we found Singapore Changi International Airport itself engaging in several sustainability-related projects. The airport focuses on Sustainable Development Goals (SDGs) in compliance with the United Nations. Such projects include the Singapore Climate Action Plan, and the Singapore Zero Waste and food-waste digester programmes. It also founded the Sustainability Working Group and Changi Foundation to begin corporate social responsibility programmes for airport stakeholders, such as residents and local educational institutions.

5. Discussion and Implications

In recent decades, airport development has progressed beyond merely providing the infrastructure required for flights, and offering services only to airlines and passengers. Given the importance of commercial revenue for airport operations [3,11], attempts have been made to investigate innovative methods of developing a business model to improve airport performance.

Although we see a trend toward consolidation of business model conceptualisation, the ABM is in the process of development. Frank [10] presented the matrix of reference for the ABM. The author used 12 building blocks, and some of them shared the same elements as those found in Osterwalder and Pigneur [45]. She added other components that play a part in airport operations, such as ownership and government, regulators, externalities, risk management and reform opportunity cost. Conversely, Everett Jr [59] reconsidered and analysed the ABM of a small airport in Pennsylvania, using the conventional Osterwalder and Pigneur [45] model. Kalakou and Macário [12] modified the BMC of Osterwalder and Pigneur [45] by considering the life cycle of the ABM. The most recent work on ABM was that by Rotondo [6]. He illustrated the ABM by reviewing the business model literature, and created a framework using structure, VP and markets.

Although those studies attempted to suggest the ABM framework, none of them addressed the critical components as a foundation for designing the ABM. Based on our data analysis, we propose the generic airport business model (GABM) as a fundamental component for designing an ABM (Figure 2). The GABM should be founded on the basis of four main critical base components as a tool for creating value for airport users: Strategic Partnerships, Core Business Activities, Human Resources and Sustainability-related Projects. The four main airport business components in GABM have a close connection, because they ultimately affect the cost and revenue of airport business operations.

With strong, engaged strategic partnerships—such as airlines, central and local government agencies, chambers of commerce, tourism authorities, entrepreneurs and educational institutions—a variety of business development activities may benefit disparate airport users. The capital-intensive nature of airport businesses [76], and the diverse groups of airport users, affect different business development activities and values that the airport has to deliver. These business partners perform critical roles in driving core business activities, and airport outputs depend on the levels of commercial partner collaborations [10]. Because of the heterogeneous users in the airport business, we argue against Gillen's [57,77] proposition that an airport should be operated as a two-sided platform.

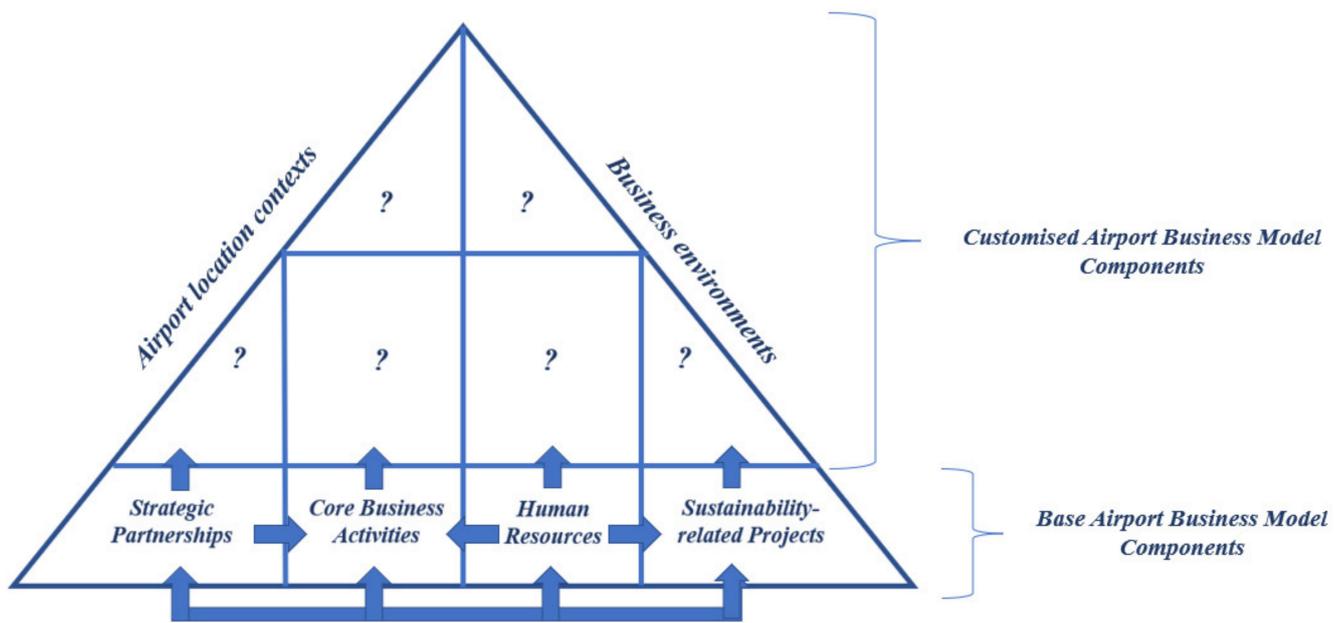


Figure 2. The generic airport business model framework.

The employment of skilled airport staff, keen on airport business administration, is also key to proactively driving an ABM. The appropriate quantity of human power and a high-quality workforce will play increasingly important roles in pushing other business model components forward. This study suggests another business model component: sustainability-related projects. They should be added to the ABM framework because sustainability projects create a relationship, and a sense of belonging, among airport stakeholders that encourage commitment and collaboration in other business development projects. Although this component performs a large part in the sustainable business model, it is rarely discussed in the business model literature [51,52].

The rest of the components are customised ABM components that should be developed on the basis of contextual circumstances. In other words, the ABM should be tailored, with regard to contexts and available resources, around the airport location [10,12]. There is a diverse ranges of airport user markets, and they affect how airport managements design a business model. For example, if the airport is in a military area, designing an airport business model should consider some military legislation and related policy, as the military is one of the airport stakeholders. ABMs therefore need to be dynamic in nature. We suggest the deployment of a decentralised, contextualised airport management policy that aligns with the local business environment and location.

6. Conclusions

Because of recent developments in the aviation industry, airports have been forced to find their own sources of finance, and improve their efficiency. Therefore, many scholars in the industry have focused their attention on airport development tools and performance improvement. Although business models have been shown to be an effective tool in improving a firm's performance, the literature relating to the ABM is still far from complete. Using the exploratory research approach, this study used the ABM framework to address this shortcoming.

Drawing from the literature review and our data analysis, we filled the gap in the literature by proposing that the ABM is an illustration of overall business operations that should be structured with strategic partners, core business activities, human resources and sustainability-related projects that assist airport operators in creating value for users. We introduced four ABM components as basic components for further designing an ABM, the

remaining components of which should be heterogeneously innovated with regard to the context of airport surroundings.

Based on our analysis, this study has some limitations that should be addressed in future ABM studies. The implementation of the GABM as a basic component should be observed and put into practice, by designing such a proposed framework, together with the addition of other business model components depending on business environment and location contexts, for general airports. This is to verify ABMs in different contexts. Moreover, it will further enrich the ABM literature. Future research could employ empirical analysis to investigate the relationships among our proposed ABM components.

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