Uttam Kumar Regmi

Essays on Air Transport Marketing and Economics

Molde University College
Specialized University in Logistics

PhD theses in Logistics 2013:1

Essays on Air Transport Marketing and Economics

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A dissertation submitted to Molde University College -

Specialized University in Logistics

For the degree of Philosophiae Doctor (PhD)

PhD theses in Logistics 2013:1

Molde University College-Specialized University in Logistics

Molde, Norway, 2013

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PhD theses in Logistics 2013:1

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No. 6402, Molde, Norway
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This dissertation can be ordered from Molde University College Library
biblioteket@himolde.no

Printing: EKH Trykk AS

ISBN: 978-82-7962-157-7

ISSN: 0809-9588

Dedication

"This thesis/study is dedicated to my parents."

Preface

The thesis has been prepared at Molde University College - Specialized University in Logistics, Norway as part of a PhD degree in logistics for three years from the period of September 2009 to September 2012 and defended on 4th February 2013. During this period I have been employed as a PhD student with a scholarship (Stipendiat) under the supervision of Associate Professor Nigel Halpern.

The thesis is believed to be of value to both academics and practitioners in the area of *air transport marketing and economics*. It examines the economics of airlines and marketing of airports. The thesis consists of four papers. It begins with a study of airline economics that encompasses revenue and cost convergence aspects of airline business models including traditional scheduled, charter and regional airlines in comparison to a low-cost airline in the UK. It follows with a study of theoretical and methodological issues associated with content analysis, particularly of airport websites. The issue of airport branding is another important area of research in this thesis which focuses on aspects of airport marketing, especially the nature and use of names, logos and slogans at airports worldwide including the study of regional differences in the nature and use of airport names and slogans in Europe. The fourth study is related to airport marketing communications and uses content analysis methodology to investigate the content of communication on the websites of airports in Europe. The length of the final thesis is 39857 words.

The thesis has been evaluated by a committee consisting of **Dr. Heidi Hogset**, Associate professor with the Department for Economics, Informatics and Social Sciences at Molde University College-Specialized University in Logistics, Norway; **Dr. Anne Graham**, Reader in Air Transport and Tourism at the University of Westminster, UK and now Editor-In-Chief of *"Journal of Air Transport Management"* and **Dr. Romano Pagliari**, Senior Lecturer and Director of the MSc in Airport Planning and Management with the Department of Air Transport at Cranfield University, UK.

Acknowledgements

First of all, I would like to pay my respectful and heartfelt gratitude for my esteemed supervisor Nigel Halpern (Associate Professor, Molde University College, Norway) for believing in me and my capabilities and giving me the opportunity to pursue my studies. His support and commitment, insightful advice and information, clear thinking, remarkable experience and cooperative nature always inspired me as a driving force throughout my PhD work to learn a lot more than what has been translated in this thesis. I am always grateful to him for being a constant source of encouragement and inspiration to accomplish this study successfully from its inception to its completion and to change my dream into reality, which cannot be expressed within the boundary of limited words.

It has been a privilege to pursue my PhD studies in a congenial research environment with the financial support provided by Molde University College. I would like to thank Rector and Dean including all faculty members, and all employees for being helpful and friendly and in particular, PhD secretary, the IT and Library staffs for their polite and professional guidance and Jens Erik Østergaard for helping me in the technical settings of my thesis in printable form. A special thank you goes to Professor Svein Bråthen for his sweet encouragement in my research work and giving me opportunity to present research paper at a Transport Research Group Meeting in Molde with valuable suggestions. I would like to thank all distinguished members of the evaluation committee of my thesis and members of PhD committee at Molde University College.

This study would not have been accomplished without the blessings and sacrifices of my respected parents (Kedar and Krishna), father in-law (Shree Prasad), sisters (Jeevan and Bijaya), brothers–in-law (Pushpa and Kamal) and uncle (Narendra Kumar Regmi) as well as good wishes and silent support of nephew Ranjan, and nieces Sumiran and Durga, all my relatives and whole Regmi families. I would also like to thank you all who directly or indirectly wished for my success. The deepest affection with all my heart and soul goes to my loving wife Nirmala and two beautiful daughters Unisha and Upama whose constant co-operation, encouragement and priceless support, patience and understanding, even living far away from home provided me strength to ease mental tension and complete this study on time.

I express my heartfelt gratitude to Jarle Sanden for his sweet love and guidance and Øivind Opdal as a very good friend of mine along with Vivi, Ingrid, Arnstein, Kåre and Anne for making my stay pleasurable in Norway. My deepest thanks and gratitude goes to dear friends Biju Kumar Thapalia and Ganesh Prasad Neupane, including all other colleagues and employees of Management Campus, executives and whole family of Purbanchal University for their love and encouragement as well as my all respected teachers, especially Gokul Shrestha, Purushhottam Ghimire and Lekhnath Ghimire for always remaining as a source of inspiration. I would like to especially thank Richard Glavee-Geo, my dear friend from Ghana with whom I worked together in a same office room for three years, for his very kind and friendly behaviour, a lot of fun, exchange of views and opinions and valuable suggestions from time to time. My sincere thanks go to all my fellow PhD students' and my seniors' whom I met in Molde. If I have missed anyone out, please accept my sincere apologies and thanks. Thank you all and pray to the Almighty for my successful career in future.

February, 2013, Norway Uttam Kumar Regmi

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Introduction

Over the past years, the air transport industry has become an increasingly important part of the world economy. It employs many thousands of people, creates additional employment in aviation support industries such as hotels, restaurants, rental car companies, real estate, construction, manufacturing, and so on. It includes an intricate set of suppliers of a wide variety of goods and services, a dynamic and exciting blend of people, as well as aircraft and ground support equipment and services that benefit economically from aviation.

The growth of air travel has enabled millions to travel to distant countries. Earlier it was considered largely as a privilege for rich and famous people but has now become an accepted means of travel across the world (Simpson, 1998). It is expanding continuously, generating new technologies, developing new procedures, creating new businesses and job opportunities and economic impacts. The tremendous prestige associated with air travel, the ability to meet closer deadlines quickly with more convenience at an acceptable cost and increase in productivity has made air transportation indispensable in business and government. It has become a means to expand sales, to reach out to new markets, to take advantage of distant suppliers, and to participate in mutually beneficial ventures with other companies (Eckrose and Green, 2002).

The air transport industry revolutionised the life of people in the second half of 20th century (Simpson, 1998). Practically starting from the earliest attempt of kites, hot air balloons, airships, gliders and other devices to fulfil the human ambition to fly, it has now reached up to the level of development of sophisticated and luxurious giant A-380 aircraft (also known as luxury in the sky) and the 787 Dreamliner to be able to revolutionise the world and make an enormous contribution to the world economy as an engine of economic growth.

European Aviation Market and Airlines Economics (rationale for paper 1 in this thesis)

The European aviation market was revolutionised after the liberalisation of air transport in Europe during the latter half of the 1990s. After deregulation, airlines moved to a hub-and-spoke system. It facilitated airlines to select some airports as a hub and the destination point for flights from a number of originating cities as spokes. Since most Full Service Network Carriers (FSNC), also known as Full Service Scheduled Airlines operate a hub-and-spoke model, for instance British Airways in the UK (operates a global network of routes in the long-haul market, though not exclusively), they are usually referred to as hub-and-spoke airlines with different product characteristics and marketing strategies such as connecting flights, a wide range of pre-flight and onboard services, loyalty ‘Frequent Flyer’ programs; sales commission for travel agents; different fare offers, computerised central reservations systems (CRS), code-sharing and franchising (Rodrigue et al., 2009). Although Virgin Atlantic (VA), is not really a network carrier as it focuses on direct long haul flights out of London and Manchester in a significantly different operating environment to British Airways (BA), the same category is used for VA as a full service network carrier in this study for the convenience of study.

On the other hand, the period of 1985-2004 was importantly known as the strategic era of aviation. During the period, the aviation sector passed through many important series of development such as deregulation and open skies policy, the low-cost concept of airlines,

global strategic alliances, use of modern technology, and more airport security especially after September 11 in the US (Burghouwt and Huys, 2003). Similarly, the period of 1993-2003 in Europe remained as the period of the emergence and growth of a new style of airline business model in the form of low-cost carriers (LCC) such as Ryanair and easyJet. The low-cost business model was evolved as a different model to that of traditional scheduled, regional and charter airlines as one of the most striking developments that were largely modelled on the successful US low-cost airline; Southwest Airlines. The growth of low-cost airlines as a new business model, typically without frills changed the European air transport market dramatically and encouraged something of a revolution within the airline industry. It enabled them to exploit a number of cost and revenue advantages compared to their rivals. Consequently consumers have benefitted from a wider range of choice in terms of increased competition, more destinations, greater frequencies, point-to-point routes, and a simple consumer product at a lower fare demonstrating a new way of doing business within the airline sector (Smyth and Pearce, 2006).

Similarly, Europe has a long tradition of aviation activity by 'charter airlines' such as Monarch Airlines and Thomson Airways in the UK, however many holiday flights are operated as scheduled, albeit often seasonal services. According to Shaw (2004), originally theses airlines were developed because of a gap in the regulatory blanket enveloping European carriers, whereby charter carriers were given much more freedom than scheduled airlines, providing they kept to the so-called 'Inclusive Tour' principle meaning that most holiday flights are not sold directly by the airline to the passenger but were included in charter packages by tour operators. Ehmer et al. (2008) mention that like LCCs, they achieve low costs per seat mile from focusing on direct point-to-point flights using a homogeneous fleet of medium to large aircraft with high density seating, however the main difference between LCCs and charter carriers can be observed in the field of network and yield management. Similarly Flybe (UK) has transferred elements of the low cost philosophy to the regional market as a regional carrier.

So, in light of above discussions, one of my keen interests was to study airline economics according to different models of operation taking operating and financial characteristics into consideration to know how big or small the revenue and cost differences are, given the differences in the business model of airlines. This is the focus of the first paper in this thesis entitled: **'Revenue and Cost Convergence of Airline Business Models in the UK'**. The study encompasses revenue and cost convergence aspects of airline business models including traditional scheduled, charter and regional airlines in comparison to a low-cost airline. Anecdotal evidence and a number of academic research articles that were reviewed before conducting the study suggest that convergence is taking place between different airline business models. However, the extent to which convergence has occurred is still largely unknown. Using airlines in the UK as a case study due to one of the most important countries regarding flight volumes in Europe, competitive environment, consistency in the operation of some models still today such as full cost scheduled airline British Airways and low cost airline easyJet, and the easy availability of airline data. The study investigates the extent to which the revenue and cost structures of different airline business models have converged towards that of a low-cost airline over time.

Content Analysis to Investigate Content of Communication (rationale for paper 2 in this thesis)

The second paper uses content analysis methodology to investigate the content of communication on airport websites. Content analysis is also used to some extent as the research methodology for the third paper and fourth paper in this thesis. Content analysis is a popular method that provides an objective, systematic, and quantitative description of the content of communication (Baran, 2002).

Wang (2006) mentions that the analysis of hyper-textual and interactive web content has become challenging due to the problems of unitisation, categorisation and coding of information. Similarly, two types of studies have dominated how websites are analysed (Hasley and Gregg, 2010); those that investigate factors associated with website success (e.g. Liu and Arnett, 2000) and those that investigate the types of information provided (e.g. Perry and Bodkin, 2000).

While conducting two empirical researches about airports as mentioned above (papers 3 and 4), I experienced difficulties regarding the analysis of content on airport websites due to a larger amount of web content on multiple pages, for instance Ben Gurion Airport in Israel has 396 pages of website information, London Heathrow Airport in the UK has 240 pages, and Frankfurt Main Airport in Germany has 233 pages. I felt it was important to develop a model for how to collect a large amount of website information systematically that can then be presented according to convenience and the need of airport operators, not according to the need of researchers. The basic objective was therefore to explain step-by-step processes from the time of generating research objectives to the statistical analysis of the content of communication (i.e. of information on airport websites). Although this paper was written after completing Paper 3 and Paper 4, it has been sequenced in this thesis as Paper 2 because it allows readers of this thesis to better understand the concept and methodology of content analysis before reading Paper 3 and Paper 4 that actually use content analysis as a research method. The second paper in this thesis is entitled: **'Use of Content Analysis for Airport Websites: Theoretical and Methodological Issues'.** It is believed that the paper will be useful for new and experienced users of content analysis as a research method.

Airport Branding (rationale for paper 3 in this thesis)

Deregulation has affected airline economics but also their choices of airports because deregulation means airlines are freer to choose which airports they fly to and from (Graham, 2003). Partly as a result of this, but also a more general trend towards commercialisation and privatisation of airports, airport marketing has grown as a management discipline. Airports are providing airlines with airport related services in exchange for landing fees and at the same time airlines are providing air transport services to the airport, with or without incentive money from the airport. Airports' efforts to improve airport services increase the attractiveness of the airport and helps airlines' efforts to bring more passengers, hence both enjoying more revenues (Hihara, 2010). In order to attract more passengers, airports have been increasingly developed as commercial enterprises by paying more attention to marketing and creating their separate identity. In order to achieve this, one possible way is to create its own 'Brand'.

The word *brand* is derived from the Old Norse word *brandr*, which means 'to burn'; as brands were, and still are, the means by which owners of livestock mark their animals to identify them (Interbrand Group, 1992). Branding has therefore been around for centuries as a way to distinguish the goods of one producer from those of another, not as a communication strategy, rather as a business strategy. For airports also, the essence of a brand is to achieve differentiation that is meaningful to target customers in their mental map when unique service is consistently delivered by an airport and promise is fulfilled (Basu and Wang, 2009). It is also reflected in the thoughts that arise when customers think about a particular airport (Paternoster, 2008).

New businesses are being attracted by providing excellent customer service that is often described by the services, products and experiences that an airport provides as a unique identity (Paternoster, 2008). Associated with the airport product is the idea of the airport brand that can be represented by a name, logo or design, or by a particular style of signing, merchandising or advertising (Graham, 2003). Every airport has a brand, just as individuals have a personal brand-namely, the esteem in which they are held when people think about their name. More and more companies and other organisations have come to realise that one of their most valuable assets is the brand name associated with their products and services (Paternoster, 2008).

According to Halpern (2010), branding creates distinctiveness and adds tangible cues to what is essentially an intangible service. It can also promote recognition, preference and loyalty amongst target markets which may be based upon a number of features, such as:

- The region that is served (e.g. Ireland West Knock Airport)
- Natural attractions (e.g. Lakselv Banak North Cape Airport)
- Man-made attractions (e.g. Bardufoss Snowman International Airport)
- Aspects of historical importance such as famous people (e.g. Kavala International Airport Alexander the Great)
- The size and scope of services available (e.g. Evenes Lofoten International airport)

Technically speaking whenever a marketer creates a name, logo, or symbol for a new product, he or she has created a brand (Keller et al., 2012). Corporate brands are those which are based on a firm's principle trading name (Shaw, 2004) and can be an extremely effective shorthand means of communication and tied to the product that is reflected in the minds of consumers (Keller et al., 2012).

In general it is believed that brand awareness is improved when brand names are chosen that are simple and easy to pronounce or spell, familiar and meaningful and different, distinctive and unusual. Choosing a simple, easy-to-pronounce, familiar and meaningful brand name can, on the one hand, assist recallability, on the other, to improve brand recognition (Robertson, 1989).

In addition, an extension of the brand name is to have a slogan which is a memorable phrase that says something about who the company is and what they do (Sloganmaniac, 2006). Both tangible or intangible and functional or symbolic components can be positioned through the use of slogans which can promote word-of-mouth publicity and reinforce image (Balakrishnan, 2008). A growing trend in recent years has been for airports to develop brand names, sometimes accompanied by a slogan that attempts to define the airport.

Although the name is typically the central element of the brand, visual brand elements can also play a critical role in building brand equity, especially in terms of brand awareness. According to Keller et al. (2012), logos are the graphic elements of a brand and have a long history as a means to indicate origin, ownership or association. Often logos are devised as symbols to reinforce or embellish the brand meaning. Some logos are literal representations of the brand name, enhancing brand awareness. It can be concrete or pictorial in nature. Clearly logos have meaning and associations that change consumers' perceptions of the company (Henderson and Cote, 1998). A logo can represent certain values but also help to foster brand awareness because of its impact on customers' recall or experience when they think of a specific symbol (Simeon, 2006).

So, the interesting literatures mentioned above increased my curiosity to study the use of brand names and slogans at airports as well as the extent to which logos are used by airports. This is the focus of the second paper in this thesis entitled: **'What's in a Name? Analysis of Airport Brand Names and Slogans'**. The study therefore focuses on aspects of airport marketing, especially the nature and use of airport names, logos and slogans from a worldwide sample of 1562 airports. It also identifies regional differences in the nature and use of airport names and slogans in Europe with a sample of 451 European airports.

Airport Marketing Communications (rationale for paper 4 in this thesis)

Staying with the theme of airport marketing, Internet use has grown dramatically in recent years and this has provided airports with a new means of communicating with target markets, normally via a corporate website.

Most airports in Europe now have their own website or at least have a dedicated page on the website of their owner. Developing an online presence may subsequently contribute to the wider marketing activities of airports and allow airports to generate additional sources of revenue. Airports therefore seem increasingly involved in providing online travel planning support to passengers (e.g. by providing online timetable services and links to airline websites, and travel planning portals) (Halpern, 2010).

Airport websites may show the destinations that are served; provide links to airline websites; car hire and coach transfers; timetable information; tourism information for the region; information about the airport infrastructure and services; details about the airport user charges; incentive scheme and so on. It means the airport website can act as a wider tool for marketing to airlines (e.g. via a business aviation section of the website) and maximise revenue generating opportunities available to airports from selling their own services.

Keller et al. (2012) argue that with the growth of the web, marketers have scrambled to build a presence in cyberspace. The main advantage to marketing on the web is the low-cost and level of detail and degree of customisation that it offers. By capitalising on its interactive nature, marketers can construct sites that allow any consumer to choose brand information relevant to his or her needs or desires. As such, interactive marketing can help build relationships. For that, it is important to deliver timely and reliable information. Websites can store company and product information, press releases, advertising and promotional information, as well as links to partners and vendors.

Marketing on the web changes according to the change in technology. Airports therefore seem more interested and innovative now at advertising their products via their website to

capture a target market and attracting passengers, who generally belong to a group with more spending power and remain in the same location for a longer period of time.

Airport websites are the focus for the third paper in this thesis that is entitled: **'Content Analysis of European Airport Websites'**. The study uses content analysis methodology to investigate the content of communication on airport websites. The first part of the study investigates what types of information are provided by airports, and to different types of customer. The second part analyses airport site maps to investigate website size and structure and examine whether differences exist according to airport size, the way in which they are owned and operated, and the country or region that they are located.

Methodology

This section provides a summary of the methodologies used in each of the four papers.

Paper 1: Revenue and Cost Convergence of Airline Business Models in the UK

An operating and financial dataset of UK airlines was compiled from data published by the UK Civil Aviation Authority. The data is provided in a consistent pattern and financial data is presented in the same currency; Great British Pound (GBP). The study is limited to an analysis of operating and financial data from 1999 (the first year of publication of financial data for low-cost airline easyJet) to 2010. Financial data was not adjusted for inflation because the analysis is based on UK airlines only.

The study is based on the selection of Type 'A' (e.g. refers to the permission to carry passengers, cargo and mail on aircraft with 20 or more seats) operating license holder airlines in the UK that have been in continuous operation from 1999 to 2010. Airlines that emerged after 1999 or went bankrupt or ceased operations after 1999 were not included. This resulted in the selection of six airlines for the study; easyJet (EZ), British Airways (BA), Virgin Atlantic (VA), Monarch Airlines (MA), Thomson Airways (TA) and Flybe (FB). BMI British Midland was not included because it consists of group data for a number of airlines. In addition, Thomas Cook Airlines was not included following the merger of Thomas Cook AG and My Travel Group PLC to form Thomas Cook Group PLC.

The total operating cost (TOC) of the six airlines was divided into direct operating costs (DOC) and indirect operating costs (IOC). The revenue and cost components of each airline were then measured in unit terms. Convergence is measured in this study according to gaps (i.e. differences) between unit costs and revenues of the airlines, using EZ as the basis for comparison and average gap was defined as the average of the gaps in each year. In order to measure revenue convergence of airlines, first the yield that includes passenger yield and total yield was analysed. Furthermore, unit revenue and operating revenue per employee were also analysed.

Paper 2: Use of Content Analysis for Airport Websites: Theoretical and Methodological Issues

The first part of the paper is explained by some theoretical issues of content analysis that include historical perspectives of content analysis, followed by different approaches used over time about how content analysis has been developed as a technique including some criticisms and myths as well as truths. The second part explains methodological issues of content analysis on the basis of a model derived by the author, especially for assessing web-based information of airports using content analysis. The model basically deals with the quantitative analysis of data using a combination of both deductive and inductive approaches. The model of study proposes 12 systematic steps to complete the task as explained in the paper.

Paper 3: What's in a Name? Analysis of Airport Brand Names and Slogans

Airports Council International (ACI)'s membership database was used as the sampling frame for the study. The database is publicly available on the Internet and as of 31 March 2011, the database included information for 1562 airports including links to airport websites which were then used to conduct the content analysis. Data for each airport was entered into data analysis software; PASW Statistics 18. A monitoring (observation) process was applied while collecting data without any attempt to control or manipulate any of the variables. The human coder system was chosen rather than computer aided analyses of content and all reasonable precautions were taken to ensure the correct entry of data including the maintaining of inter-coder reliability between two researchers.

The study is primarily based on content analysis using deductive measurement in that specific coding categories were identified for most variables before conducting the analysis. For instance, coding categories for brand names are identified, to a large extent, from anecdotal evidence. Slogans and logos were not coded into categories because it is often difficult to understand the meaning behind them and it is therefore difficult to accurately assign them to one particular category. However, airports were given a code according to whether they have a slogan or logo, or not. Slogan and logo variables were further dichotomised according to whether the slogan or logo is unique to the individual airport or whether it is used for a group of two or more airports. Variables were also needed for where the airport is geographically located, airport size, and corporate governance structure of the airport. Categories used to create these variables were taken from categories that are already used by ACI.

During the analysis, there were too few counts for some of the categories of airport size and corporate governance structure so variable categories were reduced. For airport size, airports were dichotomised between 'smaller airports' (airports that serve less than five million passengers) versus 'larger airports' (airports that serve five million or more passengers). For corporate governance structure, airports were dichotomised between 'public airports' (airports that are publicly owned and operated) versus 'private airports' (airports that are publicly or privately owned and operated by partial or full private interests).

Data was analysed using frequency analysis on airport names, slogans and logos. Pearson's Chi-Square test was used to investigate use of airport names, slogans and logos according

to geographic location of the airport, airport size and corporate governance structure of the airport.

Paper 4: Content Analysis of European Airport Websites

The study uses content analysis to describe the content of communication on airport websites. The study uses a combination of both deductive and inductive measurement for content analysis because four main coding categories were identified before conducting the analysis. The four main categories were identified, to a large extent, from anecdotal evidence provided in the background to this paper: (1) passenger services and information, (2) aviation-related business areas, (3) non-aviation related business areas, (4) corporate communications. Emergent coding was then used to develop sub-categories and example items of content.

Site maps of airports were used as the basis for emergent coding of content. The content analysis was conducted by a single researcher in order to ensure for consistency. A second researcher acted as an observer and controlled the coding and data entry process. The researchers recorded scores for over 100 individual items of content for 451 airports available from the membership database of Airports Council International (ACI) at the time of conducting this study.

Total terminal passengers at each airport for 2011 were used to create the variable for airport size. Data was sourced from ACI-Europe (2011), airport websites, relevant airport authorities and Air Transport Intelligence (ATI). Passenger data for 2011 was not available for 150 airports so sample size is reduced when using that particular variable. Published data is available on the ownership and operation of ACI's European airports (see ACI-Europe, 2010) and the data from that study was updated by the authors so that it was consistent with when the content analysis was conducted.

For size of airports, group 1 (e.g. 25 million or more passengers per annum) and group 2 (e.g. 10 to <25 million passengers per annum) airports were combined. For ownership and operation, airports were assigned to one of three groups; 'public (admin)' for airports that are publicly owned and operated by an airport operator as part of the administration, 'public (corporation)' for airports that are publicly owned and operated by a corporatized airport operator, and 'private' for remaining airports that are owned or operated by partial or full private interests. Similarly, there were too few counts for many countries so they were grouped into one of four European regions. The classification of countries is based largely on the United Nation's sub-regions of Europe; Northern, Western, Southern and Eastern.

Pearson's Chi-Square test was conducted to investigate significant differences between the proportions of airports providing content on different types. Similarly, One-way ANOVA was used to investigate significant differences in the average number of website pages according to airport characteristics such as geographical region, size and ownership of airports as well as internet penetration in the country that the airport is located in.

Scientific contribution

This section covers the scientific contribution provided by each of four papers.

Paper 1:

This paper compares revenue and cost structures of six fairly different types of airline business model in the UK including a low-cost carrier with which the revenue and cost structure of other airlines is compared to by using airline operating and financial data published by the UK Civil Aviation Authority. Based on a time series analysis from 1999 to 2010, the study finds that there is little evidence of convergence in unit revenue and cost. Cost gaps are decreasing slightly but large revenue gaps still exist and are generally increasing in favour of the low-cost airline.

The study thus demonstrates the comparison of operating and financial characteristics of six fairly different business models of airlines operating in the UK market and tries to find evidence of revenue and cost convergence.

Paper 2:

This paper serves as a guide how to use content analysis to assess web-based information of airports. Based on a manual coding system, it begins with the basic information aimed at exploring theoretical issues that include various arguments by researchers and philosophers followed by historical perspectives of content analysis, different approaches about how content analysis has been developed over time as a technique, criticisms and some misconceptions. It concludes with an explanation of a model focused on assessing, analysing and interpreting website information of airports using quantitative content analysis.

Paper 3:

This paper investigates the use of brand names and slogans at 1562 airports worldwide using content analysis of airport websites. The study finds that three quarters of airports are named after a single place. Almost half include a reference to the size or scope of services available at the airport in their name. Significant differences exist between world regions. Naming an airport after natural or man-made attractions is most common in Europe, after a political leader/revolutionary in Latin America/Caribbean, and after royalty in the Middle East. Only a tenth of all airports use a slogan and this is mainly a North American phenomenon. A more detailed analysis of airports in Europe finds that a quarter of airports have two or more place names; one is typically the name of the place that the airport is located in while the other tends to be the name of the nearest main city or town. Including a reference to the size or scope of services available at the airport is significantly more common at larger versus smaller airports in Europe. The use of a slogan is significantly more common at airports in Europe that are owned or operated by private interests versus those that are publicly owned and operated.

The paper thus demonstrates the nature and widespread use of airport names worldwide as well as the nature and limited use of airport slogans worldwide. It also identifies regional differences in the nature and use of airport names and slogans. It finds that, in Europe, use of airport name and slogan varies according to the size of the airport and style of corporate

governance. In addition, it provides a typology of airport names and slogans worldwide that airport managers can use to inform their own branding decisions.

Paper 4:

This paper uses content analysis to describe the types of information provided by airports for different types of customer on their website. The sampling frame consists of 451 member airports of Airports Council International-Europe and the analysis is conducted with a view to identifying the main objectives of contemporary airport websites. Airport site maps are also analysed to investigate how website size and structure varies between different airports. The study finds that the most common content provided by airport websites is on passenger services and information. Content on aviation related business areas and corporate communications are also commonly provided. Content on non-aviation related business areas is less commonly provided, especially by smaller airports and airports that are publicly owned or operated. The average number of pages on airport websites is 52, and on a hierarchy of between one to four levels. The average number of pages is significantly higher at larger airports and at airports that are owned and operated by private interests. The average is also significantly higher at airports in countries that have higher rates of Internet penetration.

The paper thus contributes to the literature of online dissemination of information via airport websites and to identify their main objectives.

Author's contribution and summary of papers

This section presents a summary of the four papers including how the papers evolved, their publication status, and a list of International Conferences where papers have been presented.

Paper 1:

This paper is co-authored with my supervisor Nigel Halpern. The initial idea came from the continuation of project work done under his supervision during my master's degree. However, the paper was developed and written by me. My supervisor provided ideas about how to focus the paper, and suggested areas where clarity of explanation could be improved.

I presented an initial version of this paper at the German Aviation Research Society (GARS) student workshop held in Amsterdam, Netherlands from 1st-3rd July 2010. A full paper was submitted to GARS and was subjected to a peer review process, receiving valuable feedback from Dr. Andreas Paptheodorou, University of the Aegan, Greece. A substantially revised version of the paper was then presented at the 14th Air Transport Research Society (ATRS) World Conference held in Porto, Portugal from 6th-9th July 2010. A full version of the revised paper was included in the proceedings of the 14th ATRS conference in 2010. Feedback from ATRS allowed me to make further improvements to the paper. The current version of the paper is included in this thesis and was presented at a Transport Research Group Meeting in Molde by me as invited by the Chairman of the Transport Research Group Prof. Svein Bråthen, on 19th January 2012.

Paper 2:

The paper was developed and written by me and represents an independent and original contribution from me. The motivation for this paper was from papers 3 and 4. Both papers used content analysis methodology on the basis of information available on airport websites. The experience gained and difficulties faced while conducting content analysis, especially with regards to collecting and analysing information from airport websites, made me realise the importance of developing a suitable model for conducting content analysis. It also made me more interested in developing a clearer understanding of the concept of content analysis. Paper 2 therefore discusses theoretical and methodological issues associated with content analysis. The paper was researched and developed while working on Paper 3 and Paper 4, and especially Paper 4 as it was vital to have a clear understanding of the theories and methodologies associated with content analysis before actually using it as a research method.

An abstract has been submitted to the 17th Air Transport Research Society (ATRS) World Conference to be held in Bergamo, Italy from 26th to 29th June, 2013.

Paper 3:

This paper is co-authored with my supervisor Nigel Halpern. I was responsible for developing the research including the collection of primary data for a sample of 1562 airports worldwide, under the guidance of my supervisor who acted as an observer and controlled the coding and data entry process. The paper was initially developed and written by me. My supervisor then recommended changes to the text and analysis, and suggested areas for improvement. He also did some text editing before sending the paper to a journal to be considered for publication.

An initial version of the paper was presented by me at the 15th Air Transport Research Society (ATRS) World Conference held in Sydney, Australia from 29th June-2nd July 2011. The paper was included in the proceedings of the 15th ATRS conference in 2011. Based on feedback from ATRS, a revised version of the paper was submitted and subsequently accepted for publication in the Journal of Airport Management. As part of the review process for the Journal of Airport Management, two anonymous referees contributed ideas that helped to improve the paper that is included in this thesis and was published in the *Journal of Airport Management*, Volume 6, Number 1, pp 63-79, October-December 2011. ISSN 1750-1938.

Paper 4:

This paper is co-authored with my supervisor Nigel Halpern. I was responsible for developing the research including the collection of primary data for a sample of 451 airports in Europe, under the guidance of my supervisor who acted as an observer and controlled the coding and data entry process. The paper was initially developed and written by me. My supervisor then recommended changes to the text and analysis, and suggested areas for improvement. He also did some text editing before sending the paper to a journal to be considered for publication.

An initial version of the paper was presented at the 16th Air Transport Research Society (ATRS) World Conference held in Tainan, Taiwan from 27th June-30th June 2012. A full version of the initial paper was included in the proceedings of the 16th ATRS conference in 2012. Based on feedback from ATRS, a revised version of the paper, which is included in this thesis, was submitted in consideration for publication to the Journal of Air Transport Management. The paper was accepted for publication subject to minor modifications. As part of the review process for the Journal of Air Transport Management, anonymous referees helped to improve the paper that is included in this thesis and was published in the *Journal of Air Transport Management*, 26 (2013), 8-13. ISSN: 0969-6997.

Linkages between papers

Deregulation has affected airline economics but also their choice of airports because deregulation means that airlines are freer to choose which airports they fly to and from (Graham, 2003). Partly as a result of this, but also a more general trend towards commercialisation and privatisation of airports, airport marketing has grown as a management discipline. Both airlines and airports are the most prominent and important exchange partners and the relationship between them is among the most important interface within the aviation industry. Both share a strong relationship. Airlines are business entities, clients, customers, consumers of airport services, and service providers and operators to the airport. On the other hand, airports seek to understand the airlines business, recognise their needs, help them in good and bad times and work to make their business viable. They share common interests in three major areas such as efficient services (e.g. quality service delivery, on time departure); facilities (e.g. proper information and signage for airlines, airport operators and passengers, sufficient passenger facilities) and cost (e.g. competitive costs and value for money services) (Poh, 2007). Out of the four research papers of this thesis, one purpose was to conduct deeper research on the economics of airlines which was served by first paper.

So, considering these views in mind, efforts were made to show a link between the first paper and the three remaining papers that focus more on airport marketing and communications. There are similarities between the papers in terms of methodologies as papers 1, 3 and 4 are all based on quantitative analysis of data. Paper 2 is designed as a guide on how to use content analysis quantitatively to assess website information of airports. This thesis therefore tries to put more effort on interlinking various aspects of research on both airline economics and airport marketing.

Future research

Paper 1:

A lack of available data has limited the study to the investigation of gaps and convergence, and not the effect on costs and revenues of factors such as airline corporate governance, revenue management approach, government subsidies, and gains/losses from hedging policy for fuel or from currency fluctuations. Similarly, a lack of available data has limited the study from investigating possible cost savings that airlines can achieve from shared facilities, flying to certain destinations, the effect of fleet size operations, risk management policies, structural reforms, alliance or merger, and the management of peak load pricing.

Some literature argues that it is essential to include the ASKs that traditional scheduled airlines buy from regional airlines when calculating unit cost. It is not included in the study because the exact amount of capacity purchased by traditional scheduled airlines and the amount of money spent on capacity purchased from regional airlines is not reported in the dataset. It would be an interesting study for further research. Further research could also benefit from extending the number of airlines in the analysis, including airlines from a range of world regions to investigate if the findings vary for different airlines in different regions. Another area of interest for further research is the effect that cyclical or external factors have on profitability and productivity. Finally, some empirical studies have shown that gaps exist between different airline business models in the area of infrastructure cost, aircraft capital cost, and asset-related cost. Such gaps have not been investigated in the study but are worth investigating if data is available. There might have been some scope for multivariate analysis (e.g. perhaps investigating if the airline models were significant in explaining cost and revenue differences in various time periods) has not been conducted in this study because of the small airline samples.

Paper 2:

The roadmap with 12 systematic steps as proposed in this paper is basically a guide for how to use content analysis, especially on assessing the information provided on airport websites and how to analyse that information in a stepwise, quantitative manner. The roadmap contributes to literature on online communications, particularly of airport websites. However, it would be more interesting to do more research in the future on how to make it easier to assess and analyse information on airport websites including a comparative analysis according to geographical world region, given the complexities of website design and information that changes frequently on the web.

Paper 3:

The findings of the study are based only on a content analysis of airport websites. This means that there may be more airports that use slogans and logos but do not publish them on their website. Also, airport names on websites may not reflect the registered name of the airport or any names that are used in the marketing activities of an airport. The scope of the study was to try and understand how widespread the practice of airport branding is, and the nature of that practice, especially in terms of the types of names and slogans used by airports. It would be interesting to conduct a similar study, but on a more broad range of aspects associated with airport branding such as the meaning of slogans and logos, the use

of other elements of airport branding, and the processes involved in branding an airport. These issues could only really be investigated through conducting airport surveys or in-depth interviews.

The more detailed analysis in the study is limited to European airports and this was due largely to difficulties in accessing comparable data on airport size and corporate governance structure for airports in other world regions. This is a limitation of the study but also an opportunity for future research. Also, the sampling frame of airports in the study is limited to member airports of ACI.

The findings of the study contribute to literature on the branding of airports from a supply-side perspective. It would be interesting for future studies to investigate the full range of branding activities but also the value that airports derive from branding. It would also be interesting to investigate airport branding from a demand-side perspective. For instance, what are consumer opinions about airport brands?. This study also does not cover the potential impacts of rebranding and its ability to improve an airport's competitive advantage. In addition, no real evidence was covered by this study on the effects of branding on an airport's market appeal to both passengers and airlines. These would be some interesting topics for future research.

Paper 4:
The findings of the study are based on content analysis of websites of European airports only. The scope of the study was to investigate the types of information provided by airports for different types of customer on their website. The purpose was to identify the main objectives of contemporary airport websites. The study also investigates website size and structure to see if differences exist between airports.

The more detailed analysis in the study is limited to European airports and this was due largely to difficulties in accessing comparable data on airport size and corporate governance structure for airports in other world regions. This is a limitation of the study but also an opportunity for future research. Also, the sampling frame of airports in this study is limited to member airports of ACI.

The findings of the study contribute to the literature on the online dissemination of information via airport websites and to identify their main objectives. It would be interesting for future studies to investigate the full range of activities among airports worldwide, including a comparative analysis according to geographical world region.

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Paper I

Revenue and Cost Convergence of Airline Business Models in the UK

Revenue and Cost Convergence of Airline Business Models in the UK

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Abstract

The liberalisation of air transport markets in Europe allowed for the emergence of scheduled low-cost airlines that introduced a business model that was different to that of existing scheduled and charter airlines, and enabled them to exploit a number of revenue and cost advantages compared to other airline business models. In an effort to reduce costs and increase revenues, many airlines have adopted certain elements of the low-cost model, especially in the UK where competition from low-cost carriers is particularly strong. However, the extent to which revenue and cost convergence has taken place is largely unknown. Using airline operating and financial data published by the UK Civil Aviation Authority, this study compares revenue and cost structures of six fairly different types of airline business model in the UK including a low-cost carrier with which the revenue and cost structure of other airlines is compared to. Based on a time series analysis from 1999 to 2010, this study finds that there is little evidence of convergence in unit revenue and cost. Cost gaps are decreasing slightly but large revenue gaps still exist and are generally increasing in favour of the low-cost airline.

Key words: revenue, cost, convergence, airline business model.

1. Introduction

The liberalisation of air transport markets in Europe allowed for the emergence of low-cost airlines, initially in UK and Ireland with the introduction of easyJet and Ryanair that were largely modelled on the successful US low-cost airline; Southwest Airlines. Low-cost airlines increased competition in the aviation market, reduced prices, and stimulated traffic growth and new gateways throughout the European Union.

An airline's business model is a description of the value the company delivers to targeted customers and how it configures resources internally and externally to achieve this (Holloway, 2008). The growth of the low-cost airlines as a new business model, typically without frills changed the European air transport market dramatically and encouraged something of a revolution within the airline industry. Consumers have benefitted from a wider range of choice in terms of increased competition, more destinations, greater frequencies, more point-to-point routes, and a simple consumer product at a lower fare. The low-cost business model with its differentiation strategy was therefore different to that of traditional scheduled, charter and regional airlines, and enabled them to exploit a number of revenue and cost advantages compared to their competitors that were in existence before deregulation. In particular, the low-cost airline business model exploits advantages through

low operating costs (e.g. from high utilisation and productivity of aircraft, a standard fleet of one or a few aircraft types, airport price incentives and marketing support, online distribution, and ticketless travel), a simple product/service that charges extra for ancillary services, and a certain positioning in the market that focuses largely on point-to-point schedules promoted using dedicated marketing campaigns.

It means that low-cost airlines have now created a challenge for many airline companies by leading towards strong competition and a need to contain costs relative to industry rivals, and in essence, create a sustainable cost advantage over competitors (Flouris and Oswald, 2006). It has further compelled them to generate more revenue, reducing costs and earning profit to minimise revenue and cost gaps without making fundamental changes to their business model, given the different characteristics and structure of airlines.

In an effort to reduce cost, increase revenue and earn profit, some convergence has been seen between the traditional scheduled network airlines and low-cost airlines in terms of their increasing focus for sources of ancillary revenue by unbundling product attributes and selling them separately from the core transportation service (Holloway, 2008). Convergence also seems to have taken place between low-cost and charter airlines, with the latter responding to the encroachment of the former into leisure markets by offering well over a third of their output on a seat-only scheduled basis (Holloway, 2008).

Anecdotal evidence and a number of research articles that will be reviewed in section two of this paper suggest that convergence is taking place. However, the extent to which convergence has occurred is still largely unknown. Using airlines in the UK due to one of the most important countries regarding flight volumes in Europe, competitive environment, consistency in the operation of some models still today such as full cost scheduled airline British Airways and low cost airline easyJet, and the easy availability of airline data. This paper investigates the extent to which the revenue and cost structures of different airline business models have converged towards that of the low-cost airline over time. Section two of this paper provides a review of previous research that underpins the study. Section three outlines the methodological approach taken by the study. Section four provides a summary of the main findings. Section five provides a conclusion including limitations of the study and recommendations for future research.

2. Previous research

Morell (2005) investigated cost gaps between US network and low-cost airlines. The study found that low cost airlines have very significant cost advantages system-wide over network airlines, especially in labour and capital where cost gaps in labour and capital have narrowed. He further found little progress on cost reduction as the US legacy carriers have done little over the past seven years to reduce the gap in unit costs with Southwest. On the other hand, Southwest has widened the productivity gap with legacy airlines. The largest area of difference also lies in staff costs, driven by the low-cost airlines' higher productivity and lower wage and salary rates as well as in selling costs. Similarly, a study conducted by Tsoukalas et al. (2008) found clear signs of cost convergence in the US airline industry between network airlines and low-cost airlines. At the same time they found a gap in unit

costs between two groups, explained in large part by the difference in non-labour unit costs. In addition, there exists a structural unit cost gap between two groups that simply cannot be reduced much further. Lawton and Solomko (2005) conducted a comparative analysis of revenue and cost structures between traditional scheduled network and low-cost airlines in Asia with those in North America and Western Europe and suggested that the cost gap in Asia is likely to be much narrower than in North America or Western Europe because of the high volume markets and greater use of wide-bodied aircraft in Asia.

Despite the findings of the afore-mentioned literature, there is little conclusive evidence of actual revenue and cost convergence between traditional and low-cost airlines. This is largely because previous literature has focused on how different factors might create revenue and cost gaps, rather than investigating actual convergence. For instance, structural and operational differences between different models of airlines are themselves a major reason for revenue and cost gaps that subsequently limit the ability to compare business models. In addition, larger aircraft (economies of size), higher stage length (economies of scale) and lower turnaround times of aircraft by just five minutes might have substantial effects on revenue and cost (Kumbhakar, 1999). High passenger load factors, a relatively low proportion of capacity related costs, younger and more efficient fleets, and supplementing passenger load with freight can also have substantial effects (Antoniou, 1992).

Similarly, traditional scheduled airlines often have complex operations (e.g. in terms of extensive and costly network infrastructure, interline agreements, membership with strategic alliances, sophisticated frequent flyer programs, diverse distribution channels, a mixed fleet of aircraft, and greater staffing requirements) and are often burdened by significant costs relating to labour contracts and pension plans. These factors mean that it may be difficult for them to reduce costs quickly enough to restore profitability (Williams and Mason, 2004). According to Gillen and Morrison (2005), a fleet of single or uniform aircraft types may enjoy greater contractual purchasing power, cost savings in the training of flight crew and maintenance, and better utilisation of pilots. It further helps for the reduction in cost by means of market power in the negotiation of services, reduced need for a spares inventory, and reduced variation in the type of tools, equipment and infrastructure needed with the help of a more streamlined focused administration in an effort to reduce costs.

Traditional scheduled airlines may incur additional costs due to higher product quality (e.g. network connections, flexibility, product comfort, more convenient airports, and personal rewards through loyalty schemes). In addition, Smyth and Pearce (2006) suggest that traditional scheduled airlines may be less fuel efficient and have higher maintenance costs compared to low-cost airlines due to a higher average fleet age (e.g. 10 years for traditional scheduled network airlines compared to 4.5 years for low-cost airlines such as easyJet). Route structure and network characteristics, airline marketing and product policy, aircraft type and characteristics, financial policies, corporate strategies and quality of management, seat pitch (generally 29 inches for low-cost airlines versus 31 inches for conventional economy class pitch) are other issues that create a big impact on revenue and cost gaps (Doganis, 2010). However, government support to some airlines (e.g. by way of rescue and restructuring aid, financing for re-organisation, and priority over extra-community routes through bilateral agreements) may help to reduce costs for traditional airlines (Domanico, 2007).

According to Franke (2004), the considerable cost reduction of low cost airlines comes from an intensive use of the aircraft (e.g. the aircraft in the air, on average, more hours a day compared with traditional scheduled airlines). This generates higher productivity of aircraft and crew. Moreover, lower maintenance cost, due to simple fleets and lower landing/ground handling fees negotiated with secondary airports without congestion problems, cause also relevant differences in the production process. In addition, network configuration and streamlined production processes are their most relevant success factors.

Graf (2005) simply explained the business model of airlines as the way of how a company, corporate system, or industry creates value in the market. The business model itself is one of the reasons to create gaps. For instance, the selective and simple offer; only one customer segment addressed; selective presence through classic brand awareness advertised in the relevant geographical markets and simple pricing system. To add more, various sources of revenues; reduction of complexity through separation of a business unit; focus on efficiency gains; simple organisation; dynamic corporate culture (e.g. value addicted to efficiency, supporting integrity and leadership without hierarchies) and application of one single and simple model (e.g. explicit contracts with suppliers and revenue partners) are some of the features of low-cost airlines against the complex business models of network scheduled airlines. It helps them to generate more revenues and reduce costs, thereby creating more revenue and cost gaps with other airline business models.

3. Methodology

3.1 Data and selection of airlines

An operating and financial dataset of UK airlines was compiled from data published by the UK Civil Aviation Authority. The data is provided in a consistent pattern and financial data is presented in the same currency; Great British Pound (GBP). The study is limited to an analysis of operating and financial data from 1999 (the first year of publication of financial data for low-cost airline easyJet) to 2010[1]. Financial data was not adjusted for inflation because the analysis is based on UK airlines only.

This study is based on the selection of Type 'A'[2] operating license holder airlines in the UK that have been in continuous operation from 1999 to 2010. Airlines that emerged after 1999 or went bankrupt or ceased operations after 1999 were not included. This resulted in the selection of six airlines for this study; easyJet (EZ), British Airways (BA), Virgin Atlantic (VA), Monarch Airlines (MA), Thomson Airways (TA) and Flybe (FB). BMI British Midland was not included because it consists of group data for a number of airlines. In addition, Thomas Cook Airlines was not included following the merger of Thomas Cook AG and My Travel Group PLC to form Thomas Cook Group PLC. A summary of airline operating characteristics in 2010 is shown in table 1.

[1] Operational data is for year-ending 1999 to 2010. Financial data is for financial years 1998/99 to 2009/10 (but is referred to in this paper as 1999 to 2010).

[2] Refers to the permission to carry passengers, cargo and mail on aircraft with 20 or more seats.

Table 1: Summary of airlines operating characteristics of 2010

	Airlines					
	EZ	**BA**	**VA**	**MA**	**TA**	**FB**
Aircraft km ('000)	376656	580560	138051	44776	18094	60955
Stage flights	323426	232472	19471	20640	4690	135526
Aircraft hours (A/C)	638806	854274	175872	66431	25112	122189
No. of passengers uplifted	42400581	29707006	5293293	3691355	987941	6618112
Seat km available ('000)	58283234	135052236	46195821	9472177	4183687	5305148
Seat km used ('000)	49225537	104919624	38135064	8011271	3865399	3176726
Load factor (%)	84.5	77.7	82.6	84.6	92.4	59.9
Average daily utilisation per A/C (hours)	10.1	10.5	12.7	9.8	11	5
No. of employees	5989	38289	8236	1968	4250	2962
No. of aircraft	177	225	38	30	62	70
Airbus 300-600	-	-	-	4	-	-
Airbus 318	-	2	-	-	-	-
Airbus 319	145	33	-	-	-	-
Airbus 320-100/200	24	39	-	5	5	-
Airbus 321	-	11	-	16	2	-
Airbus 330-200	-	-	-	2	-	-
Airbus 340-300	-	-	6	-	-	-
Airbus 340-600	-	-	19	-	-	-
Boeing 737-300	-	-	-	-	4	-
Boeing 737-400	-	19	-	-	-	-
Boeing 737-700	8	-	-	-	-	-
Boeing 737-800	-	-	-	-	13	-
Boeing 747-400	-	49	13	-	-	-
Boeing 757-200	-	3	-	3	25	-
Boeing 767-300ER/F	-	21	-	-	13	-
Boeing 777-200	-	3	-	-	-	-
Boeing 777-200 ER	-	43	-	-	-	-
Boeing 777-300 ER	-	2	-	-	-	-
Bombardier Dash 8 Q400	-	-	-	-	-	56
Embraer ERJ195	-	-	-	-	-	14

Data source: (UK CAA)

There is a fairly clear demarcation of the selected airlines in terms of their business models. BA was traditionally the UK's state-owned flag airline. The airline is now privately-owned, operates a global network of routes in the long-haul market, though not exclusively, and is the largest airline in the UK according to international scheduled passengers. BA is categorised here as a traditional scheduled airline. Although VA is not really a network carrier as it focuses on direct long haul flights out of London and Manchester in a significantly different operating environment to BA, the same category is used for VA for the convenience of study, and on the basis that VA is also generally considered to be a full-service carrier.

EZ is the second largest scheduled low-cost airline in Europe according to total passengers and the first low-cost airline in the UK that operates a range of domestic and intra-European routes, including the operation into hubs such as Paris Charles de Gaulle and Amsterdam Schiphol which goes against the original low-cost concept of operating only into secondary or regional airports. EZ is categorised here as a scheduled low-cost airline and is used as the basis for comparison between airlines in this study.

FB is a niche airline that has become one of the largest regional airlines in the UK and Europe according to total passengers. The airline serves a network of domestic and European routes. It is categorised in this study as a scheduled regional airline. Regional airlines are typically defined as those that operate aircraft smaller than 120 seats, might be owned or franchised by a network airline, are strategically orientated towards feeding its hub(s) or might operate largely point-to-point networks under their own brand identity (Holloway, 2008).

MA is the largest charter airline in the UK in terms of total non-scheduled passengers. The airline operates mainly to holiday destinations worldwide. TA is the third largest charter airline in the UK following the recent merger between Thomson fly and First Choice Airways. Both airlines are categorised here as charter airlines although it is worth noting that MA has in recent years, rapidly increased its proportion of scheduled passengers (from 9.8 per cent in 2000 to 70.0 per cent in 2011).

3.2 Data analysis

The total operating cost (TOC) of the six airlines was divided into direct operating costs (DOC) and indirect operating costs (IOC) as shown in table 3**.** The revenue and cost components of each airline were then measured in unit terms (see table 2). Convergence is measured in this study according to gaps (i.e. differences) between unit costs and revenues of the airlines, using EZ as the basis for comparison.

Table 2: Variables and measurement

Variables	Measurement
Passenger yield	Passenger revenue/Revenue passenger kilometres (RPKs)[3]
Unit revenue	Total operating revenue/Available seat kilometres (ASKs)[4]
Total yield	Operating revenue/RPKs
Unit cost	Total operating cost/ASKs
Load factor	RPKs/ASKs
Operating revenue per employee	Operating revenue/Number of employees
Average annual cost per employee	Average annual cost/Number of employees
Break Even Load Factor (BELF)%	((Operating cost/(Operating revenue/RPK))/ASK)*100

In order to measure revenue convergence of airlines, first the yield that includes passenger yield and total yield was analysed. Furthermore, unit revenue and operating revenue per employee were also analysed. The reason is that unit revenue is the function of both load factor and passenger yield that presents a more comprehensive and favourable picture of company operations than passenger yield only (Drake, 1998). Similarly operating revenue per employee is a function of a number of organisational and operational characteristics that covers many aspects such as load factor, yield per passenger, crew to passenger ratio,

[3] RPKs is a measure of the volume of passengers calculated as the number of revenue passengers multiplied by aircraft kilometers travelled by the number of passengers, excluding passengers travelling under fares available to airline employees and babies as well as children not having their own seat.

[4] ASKs is a measure of passenger capacity of airlines calculated as the number of seats available multiplied by the number of aircraft kilometers flown.

incidental revenues and the ratio of flying to non-flying employees (Williams and Mason, 2004). A direct fixed cost is calculated by adding insurance, leasing, fixed maintenance and depreciation cost in order to calculate the breakeven point of airlines (Berritella et al., 2009). Average gap was calculated as the average of gaps in each year.

Table 3: Categories of cost

Direct Operating Cost (DOC)	
Flight operations	*Flight crew salaries* *Flight crew allowances and expenses* *Flight crew training*
Fuel and oil	
Landing fees and en-route charges	*Landing and departure fees* *En-route and other navigation charges*
Maintenance	*Fixed* *Variable*
Depreciation/rental/insurance	*Depreciation of aircraft fleet* *Depreciation of ground property and equipment* *Flight equipment insurance* *Amortization of development cost* *Rental of flight equipment*
Indirect Operating Cost (IOC)	
Station and ground	
Passenger services	*Passenger services* *Passenger embarkation fees* *Passenger insurance* *Cabin crew salaries* *Cabin crew allowances and expenses*
Ticketing, sales, promotion and commission	
General and administration	
Other operating expenses	
Handling charges and parking fees	
Specific cargo	
Total Operating Cost (TOC) = DOC+IOC	

Source: Doganis (2010)

4. Findings

The findings of this study are presented in three parts. The first part investigates revenue gaps and convergence. The second part investigates cost gaps and convergence.

4.1 Revenue gaps and convergence

Sources of income for airlines include passenger revenue, ancillary revenue and other revenues from scheduled and non-scheduled mail, excess baggage and cargo. The largest proportion of revenue for each airline is from passenger revenue.

Table 4 shows strong growth in the average increase in total operating revenue for EZ compared to the other airlines. The higher growth achieved by EZ is likely to be due to the dramatic increase in ancillary revenue (e.g. from charges for seat assignment, on-board sales, car hire, hotel bookings and insurance) which is around 19 per cent of total operating revenue in 2010 for EZ compared to less than 1 per cent in 1999. Such an increase has helped EZ to narrow the revenue gap and achieve more efficiency compared to the other airlines. In this revenue stream, EZ in 2010, earned more than the other airlines, creating gaps of about 10 per cent compared to TA, 8 per cent BA, 3 per cent VA, and 4 per cent FB. Table 4 also shows that large differences exist at least by 26 per cent of EZ with other airlines in terms of average growth in percentage of total operating revenue for the given time period.

Table 4: Average change growth rate (%) of total operating revenue (1999-2010)

Airlines	Average revenue growth rate (%) (1999-2010)	Difference with EZ
EZ	40%	
BA	1%	(39%)
VA	7%	(33%)
MA	9%	(31%)
TA	10%	(30%)
FB	14%	(26%)

As clear and concise trends over time were not observed by line graphs, bar diagrams were used in Figure 1 and Figure 2. Figure 1 shows the average gap (times), in total yield, passenger yield and unit revenue of each airline compared to EZ with a base value '1' for comparison during the period 1999-2010. FB in general is increasingly efficient at generating yield and revenue compared to the other airlines. It shows that the average gap between FB and EZ is two or more times (i.e. 100 per cent more) in each. However, comparing the figure for 1999 with 2010 only in terms of percentage, gaps were found to be widened by around 5 per cent for unit revenue, 9 per cent for passenger yield and 10 per cent for total yield.

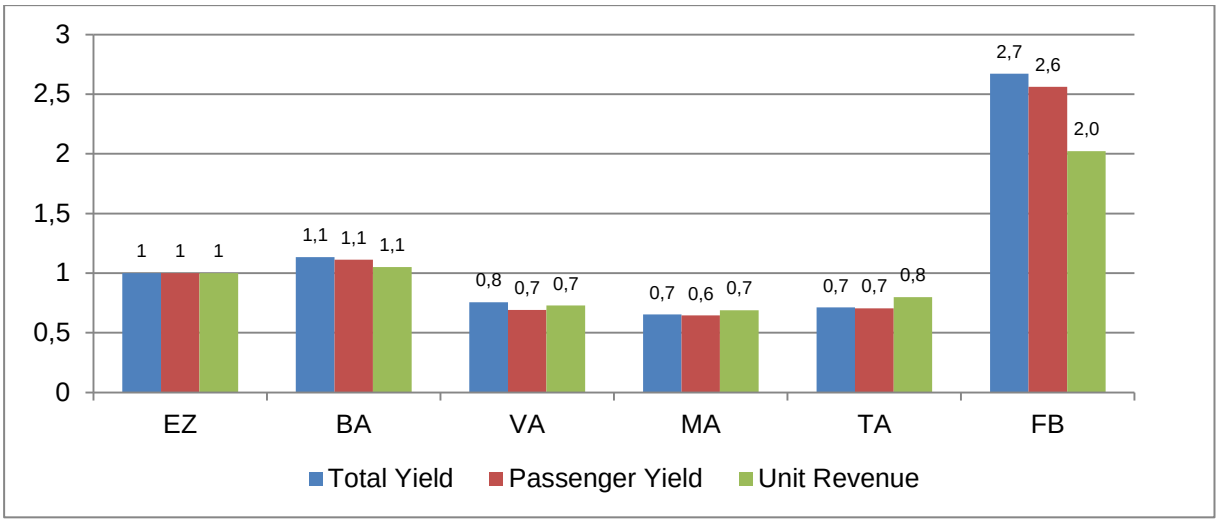

Figure 1: Average gap (times) in total yield, passenger yield and unit revenue with EZ (1999-2010)

Similarly, small higher gaps were observed between BA and EZ of less than 1 per cent for all three yields in 2010 compared with 1999, although the average gap is more than 5 per cent in each for the twelve year period. This is the result of increased earnings from BA during the period (increase by 11 per cent), which helped it to narrow the gaps by 18 per cent for unit revenue and 7 per cent for total yield in 2010 as compared to 1999. It achieved efficiency by 15 per cent for passenger yield during the same period. The total yield gaps of other airlines except FB have remained within a range of 2 per cent in 2010 compared with 1999. However, the overall average gap is more than 20 per cent in each. The findings for MA and TA are almost similar (as compared to EZ) and are expected given that the charter airline business model typically allows it to have exceedingly low cost structures (Williams and Mason, 2004).

Figure 2 shows the gaps for operating revenue per employee of each airline compared to EZ during the period 1999-2010. The ratio to EZ is 1:0.57 for BA, 1:0.68 for VA, 1:0.87 for MA and 1:0.99 for TA. Employee data is not available for FB. Revenue earned per employee for traditional scheduled airlines is typically diluted due to their more complex operation model that includes interline agreements, alliances, complex distribution channels, a mixed fleet of aircraft, higher staffing requirements, higher costs, and lower load factors (Williams and Mason, 2004). It shows that revenue gaps in terms of employee productivity have widened over the time period.

Over the period of 12 years, average yield of traditional scheduled airlines BA and VA also is declining compared to that of EZ, which may be due to reduced prices as a result of increased competition (e.g. from low-cost airlines), efficiency gains passed on to customers, and increased average sector length (the length of the journey flown by the aircraft) as a result of a focus on long-haul (Smyth and Pearce, 2006). This places downward pressure on yields that is likely to be affected by the intense competitive pressure on certain routes, seasonal fluctuations and holiday seasons. It may also be a reflection of the operating environment that different airlines operate in rather than marketing weaknesses (Williams, 2001).

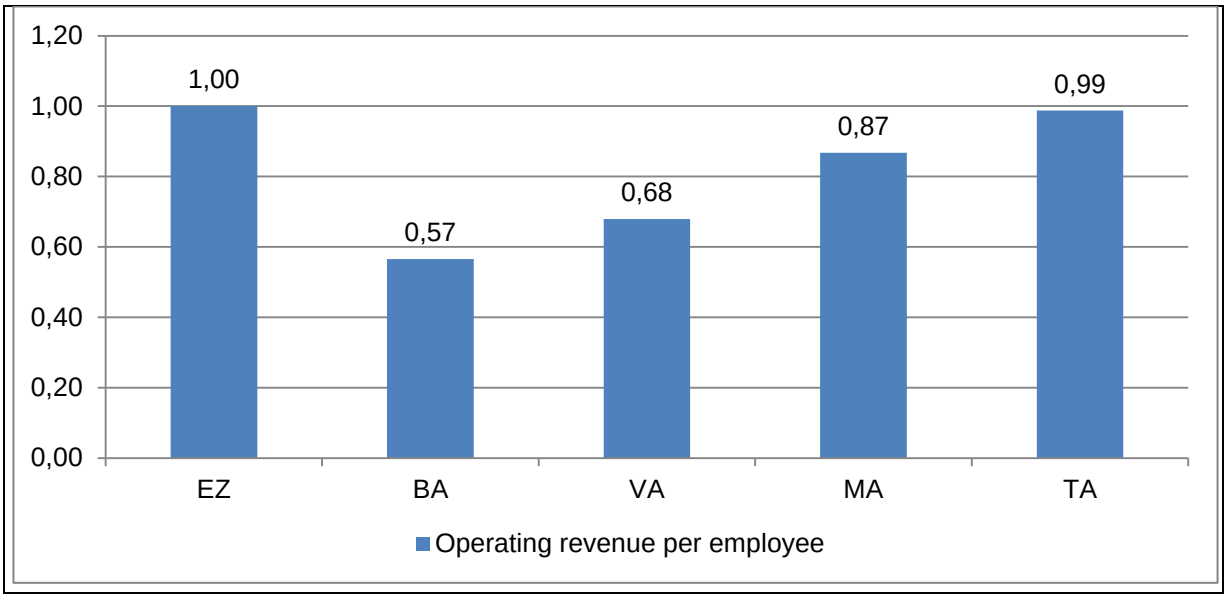

Figure 2: Operating revenue per employee (times)

In addition, the demand (as measured in RPKs), market share (as measured in number of passengers) and ASKs (capacity of airlines) for EZ has risen sharply; almost doubling during the given time period, and increasing by at least 23 per cent more than other airlines with an average change of around 40 per cent. It is possibly due to the strategy of EZ to expand their operations and market share, focus on thick routes as well as larger markets, offer higher frequencies, and compete to increase revenues in a lower yield environment. It results in greater profit because of their lower cost structure despite generally operating at main airports (Williams and Mason, 2004). It results in capturing passengers and winning business travellers from traditional scheduled airlines, and also generates new traffic. This has enabled EZ to achieve modest profits even during the financially difficult years of 2001 to 2003, and 2009. It possibly results in widening the revenue gap between EZ and other airlines.

Similarly, the increase of ASKs for MA seems primarily due to the nature of their business that involves the use of larger aircraft with higher utilisation and perhaps with a lower proportion of employees working in non-operational roles, especially in sales. There is evidence that the increased capacity per aircraft with high load factors and high aircraft utilisation leads to a reduced unit cost, both fixed and variable. On the other hand, the average difference between load factor and Break Even Load Factor (BELF) achieved by EZ from 1999 to 2010 is generally higher than for the other airlines. For instance, 5 per cent difference for EZ compared to 4 per cent for BA, 2 per cent for both VA and MA, 6 per cent for TA, and 1 per cent for FB. It indicates the ability of airlines to maintain their position for long-term sustainability in terms of earning profit and can be the reason for the creation of gaps. Interestingly, the BELF of EZ converges with VA in 2005 and BA in 2008 with a figure of 77.1 per cent and 67.5 per cent respectively.

Despite having a regular trend of convergence with EZ over the given period of time, the airline revenue in terms of passenger yield of EZ seems to converge with VA in 2009 by 5.4 per cent. Similarly the operating revenue per employee of EZ seems to converge with BA and MA in 2000 and 2002 with 134.2 and 204.5 times respectively. But unit revenue and total

yield of other airlines do not seem to have converged with EZ at any point in time. It is possibly due to the higher rate of increase in ancillary revenue and higher load factor of EZ compared to the other airlines.

4.2 Cost gaps and convergence

Compared to the total operating cost per ASK of EZ, BA and FB have respective average gaps in cost that were 1.1 times and 2.2 times higher respectively but VA, MA and TA have respective lower average gaps in cost that were in the ratio of 1:0.8 for VA, 1:0.7 for MA and 1:0.8 for TA (see figure 3). The average gap for FB has been higher than that of EZ for all items meaning that the cost gap between them is increasing in all areas because of higher aircraft utilisation by EZ. It is also due to the lower aircraft financing cost, airline overheads, and lower stage length of FB (Williams and Mason, 2004), which is on average two times lower for FB compared to EZ. More take-offs and landings for short flights are particularly fuel intensive, which drives up fuel cost per ASK. There is evidence of a negative correlation between sector length and unit cost.

The average gap percentage for VA, MA and TA has been lower than that of EZ for all items meaning that cost gaps with that of EZ are decreasing in all areas (the average gap reduced by 2 per cent, 6 per cent and 13 per cent for VA, MA and TA respectively in 2010 compared to 1999). In addition, average cost gap has been narrowed by 7 per cent for BA and 40 per cent for FB. In addition, the total cost per ASK excluding fuel cost seems to be narrowing among airlines except FB by an average 4 per cent for each of them.

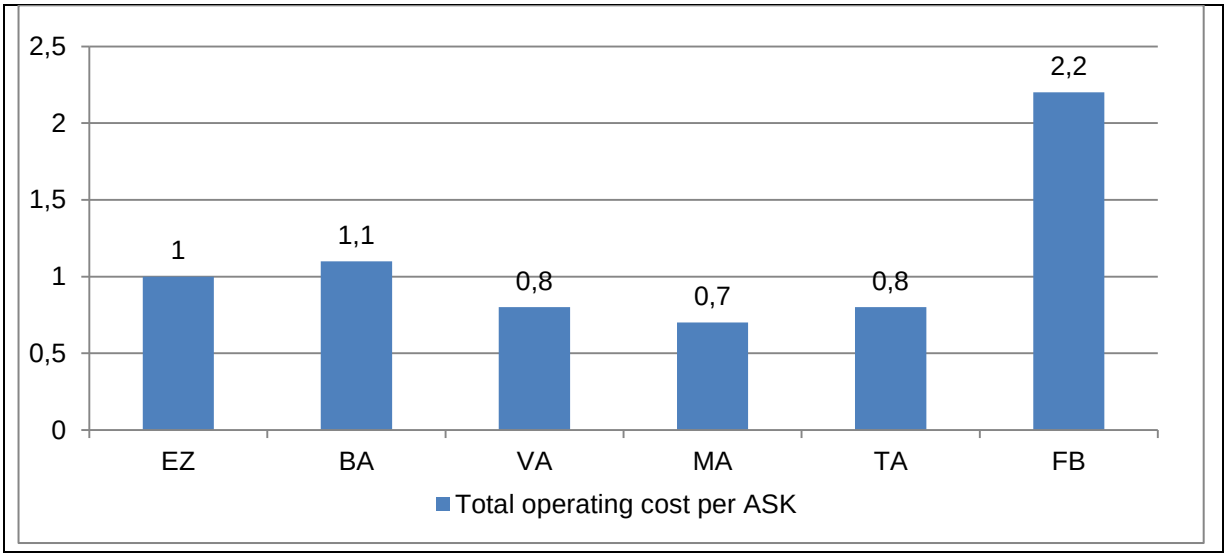

Figure 3: Total operating costs per ASK compared to that of EZ (times)

The gap for average maintenance cost for BA with that of EZ has widened (average 10 per cent higher) perhaps because of its older fleet and different fleet structure, which is likely to be more expensive to operate due to less fuel-efficient aircraft and a higher maintenance cost. In general, the overall maintenance costs gaps are decreasing as the average percentage change in costs are lower than that of EZ. However, it depends on the strategic approach of each airline to reduce its maintenance, which can be achieved by fleet

harmonisation, reducing average fleet age, optimising maintenance activities, and joint purchasing of some work (Smyth and Pearce, 2006).

There seems a larger differences in individual operating cost per ASK with EZ rather than convergence as shown in table 5 and Figure 4 and 5. Figures 4 and 5 show the operating cost per passenger in terms of passenger services and ticketing, sales promotion and commission. Passenger-related costs are calculated per passenger instead of percentage changes because of large numbers compared to per ASK. In general, the figures show a decreasing trend in costs, except for with VA.

Table 5: No evidence of convergence with individual operating cost

1.	The gap for average landing fees and en-route charges per ASK is on average less than by 33 per cent for BA, 34 per cent for MA, 58 per cent for VA and 35 per cent for TA with EZ. That indicates efficiency gains for the four airlines.
2.	The average flight operation and handling and parking fees are lower for the four airlines compared to EZ. The costs are higher for FB compared to EZ.
3.	The average combined cost of depreciation, rental (leasing) and insurance for BA, VA and FB are higher than that of EZ but lower for MA and TA. The latter may be due to the greater use of older or leased aircraft.
4.	Station and ground handling cost represents an average 6 per cent for BA, 2 per cent for VA and less than 1 per cent for FB out of total operating cost with almost zero per cent for EZ, MA and TA thereby reducing costs compared to other airlines.
5.	A reduction in terms of cargo cost was observed by an average of 0.3 per cent for BA and 2 per cent for VA over the period of time.
6.	There is a gap of 2 per cent observed in transport related expenses such as en-route and navigation charges among all airlines except for MA, which saved transportation cost by an average of 6 per cent compared to EZ over the period of time.
7.	The average fuel and oil cost of EZ is higher than for BA and FB but lower than for MA and TA. It is equal to that of VA. Only the average fuel cost of FB seems different to that of EZ as it is 63 per cent higher. The average change in fuel cost increase of BA is 19.5 per cent from 1999-2010 against an average change in revenue of 1.2 per cent during the same period. This figure is fairly similar for the other airlines too.

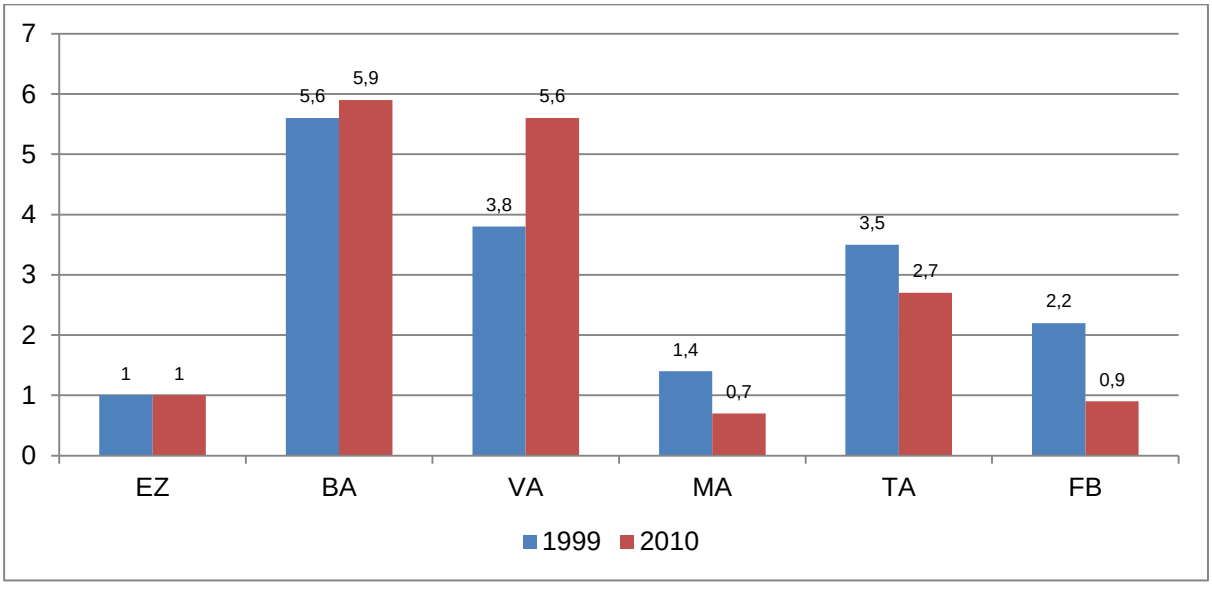

Figure 4: Passenger services (£) per passenger

The higher passenger service cost and ticketing, sales, promotion and commission cost was observed for VA compared to EZ despite VA having a lower total operating cost per ASK compared to EZ. This perhaps reflects the increased focus of VA on long-haul and value-added services. There is evidence that the higher the productivity (e.g. of VA), the lower the unit cost. The figures also show differences between airlines, especially compared to EZ. For instance, passenger service cost for MA and TA is lower than for EZ. This may be because charter ticketing is largely undertaken by tour operators with minimal sales efforts or commission payments to travel agents. Differences may also depend on the standardisation of Service Level Agreements (SLAs), loading/unloading support from crew and their pre-cleaning activities, and insourcing and outsourcing strategies of airlines (Smyth and Pearce, 2006).

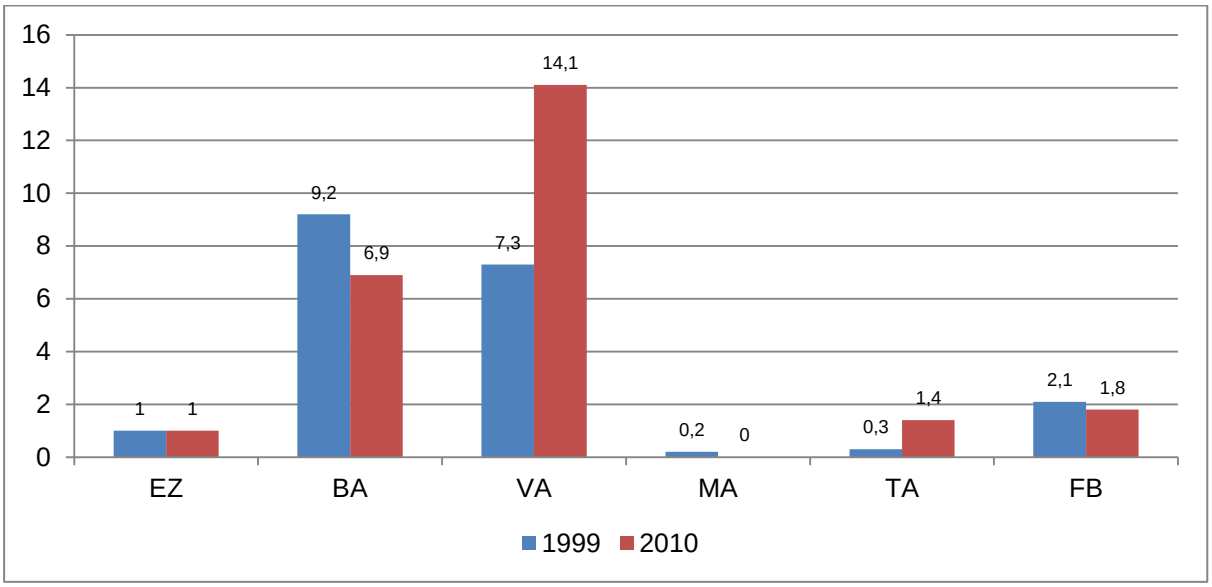

Figure 5: Ticketing, sales promotion and commission (£) per passenger

Cost convergence is investigated in table 6. Rental cost, fleet insurance, cabin crew cost and depreciation seem to be the major cost drivers. Fuel cost is excluded when considering total operating cost because volatile fuel prices can be experienced as a result of global factors or unexpected internal factors. In addition, the strategic cost and risk management approach of airlines (e.g. proactive fuel hedging strategy, reducing delays, product innovation, and seating policy) can act as levers for reducing fuel cost and may vary from one airline to another (Smyth and Pearce, 2006).

There are very few instances of cost convergence (see table 6) of other airlines with EZ. The unit cost per ASK for total operating cost, flight operations, fuel cost, landing and departure fees, maintenance, depreciation/rental (leasing)/insurance for BA, MA, TA and VA seem to converge with EZ in different periods of time but with some fluctuations. It is simply based on the calculation of unit cost of different categories of cost of different airlines as shown in table 3 comparing with unit cost of easyJet in respective cost categories as a basis of comparison, not as a benchmark. There do not seem any instances of cost convergence in 1999 and from the period of 2007-2009, hence excluded from Table 6. This convergence seems to happen by chance and may be due to measurement error or the expansion of routes and moving into new markets by airlines during a particular period.

Table 6: Cost convergence (equal unit cost (pence) per ASK) with EZ

Year	Categories of cost					
	Total Operating cost excluding fuel cost	Flight Operation	Fuel cost	Landing and departure fees	Maintenance	Depreciation/ rental(leasing) /insurance
2000		0.32 (TA)	0.34 (MA)			
2001					0.40 (VA)	0.76 (TA)
2002						0.72 (TA)
2003	4.30 (BA)					
2004				0.46 (MA)	0.47 (BA)	
2005				0.36 (MA)		
2006		0.29 (BA)			0.40 (BA)	
2010	3.32 (TA)				0.31 (BA)	

Other reasons may include the use of mixed aircraft types (see table 1) and sizes, and the operational model of each airline. For instance, even the operation of the same A320-200 model of aircraft used by traditional scheduled airlines produce less output than those operated by a low-cost airline, whereas charter airlines produce more output. This may be because the nature of the traditional scheduled 'full service' product requires longer turnaround times and a schedule buffer time (e.g. to allow for air traffic and taxi delays at congested hubs and for delayed connecting passengers to make their transfers) (Holloway, 2008).

Personnel cost is one of the largest single cost components for airlines. Airlines are therefore focused on effective staff utilisation and high efficiency by improving planning of crew logistics, lowering block hour[5] restriction, reducing extra-wage allowances, and reducing the need and allowances for overnight stays in an effort to reduce personnel cost (Smyth and Pearce, 2006). There is evidence of a positive correlation between staff efficiency and profitability. It also seems that BA has higher employee costs than others. This might be due to a highly tenured work force, higher pension cost and higher salaries paid to pilots and cabin attendants.

Given the revenue and cost structure of airlines, the impact of fixed cost was analyzed using the Break Even Model. It was assumed that if fixed cost is increased by 1 per cent with other costs remaining constant for 2009, it would result in an increase in the number of passengers required by airlines to break even as shown in table 7. On the basis of direct fixed cost data for 2009 for instance to look at the sensitivity of fixed cost, it was observed that BA, VA and FB have a higher direct fixed cost compared to EZ in 2010 and require an average 3 per cent (BA and VA) and 14 per cent (FB) lower BELF compared to EZ, whereas MA and TA have a higher variable cost compared to EZ and require an average 4 per cent and 3 per cent more passengers than EZ to break even. A possible reason for this is that airlines with high fixed costs can see a greater increase in operating revenue after reaching the breakeven point when the number of passengers is increased as compared to airlines with high variable costs. However, the increase in the amount of fixed cost means the airline requires more passengers (see table 7) to breakeven, which is not easy due to the competitive nature of the

[5] Block hour refers to the time between the departure of an aircraft up to its arrival at the destination as recorded in the flight log table of an aircraft.

airline industry, and may subsequently result in the creation of increased gaps between airlines in terms of revenue and cost.

Table 7: Break Even Point (BEP) Model

Airlines	% of fixed cost to total cost		Average change of fixed cost to total cost (%)	Number of passengers required
	1999	2010	1999-2010	2009
EZ	30.5	09.3	-8.7	246715
BA	26.1	16.7	-3.6	349901
VA	28.0	14.5	-8.7	55230
MA	27.3	14.7	-4.2	41284
TA	24.7	17.4	-1.4	72593
FB	25.7	28.4	+4.8	74277

5. Conclusion

This study aims to investigate the extent to which the revenue and cost structures of different airline business models have converged towards that of the low-cost airline, and to investigate factors that may widen or narrow the gaps between different airlines over time. Each of the six airlines has a fairly different business model, so it is possible to investigate revenue and cost convergence between different airline business models using a typical low-cost airline as the basis for comparison.

This study finds that gaps of at least 26 per cent exist between the low-cost airline (EZ) and other airlines in terms of average growth in total operating revenue from 1999 to 2010. In addition, EZ has achieved efficiency gains in terms of revenues other than passenger revenue by achieving at least 6 per cent more than other airlines in 1999 and 3 per cent in 2010, except for with FB, which achieved 4 per cent more than EZ. The overall figure shows that revenue gaps are increasing but passenger yield gaps and unit revenue gaps are generally narrowing between traditional scheduled, charter, regional and low-cost airlines in the UK.

This study finds that cost gaps between airlines exist in almost all areas of operations, but in general, it is decreasing. Given the diversity in operations of different airlines, many factors and reasons as well as sensitivity issues, there seem to be a range of differences between airlines regarding their costs and revenues. This study finds that there are a few cases of convergence of airlines with EZ at some point in time but that there is not a regular trend for convergence from 1999. In fact, the findings of this study indicate a widening of gaps rather than convergence. Due to the diversity in operations, it seems difficult to compare one model of airline with another, and the conclusions drawn from the analysis may be misleading and difficult to justify by including components which create distortion to unit cost. For instance, easyJet acquired both GO and GB Airways under the period of consideration of this study which might influence the findings, especially those related to total revenue and demand that have been overlooked in this study because of one combined financial statement for easyJet in the data set.

A lack of available data has limited the study to the investigation of gaps and convergence, and not the effect on costs and revenues of factors such as airline corporate governance, revenue management approach, government subsidies, and gains/losses from hedging policy for fuel or from currency fluctuations. Similarly, lack of available data has limited the study from investigating possible cost savings that airlines can achieve from shared facilities, flying to certain destinations, the effect of fleet size operations, risk management policies, structural reforms, alliance or merger, and management of peak load pricing. There might have been some scope for multivariate analysis (e.g. perhaps investigating if the airline models were significant in explaining cost and revenue differences in various time periods) but this has not been done in this study because of the small sample of airlines.

Some literature argues that it is essential to include the ASKs that traditional scheduled airlines buy from regional airlines when calculating unit cost. It is not included in this study because the exact amount of capacity purchased by traditional scheduled airlines and the amount of money spent on capacity purchased from regional airlines is not reported in the dataset. It would be an interesting study for further research. Further research could also benefit from extending the number of airlines in the analysis, including airlines from a range of world regions to investigate if the findings vary for different airlines in different regions. Another area of interest for further research is the effect that cyclical or external factors have on profitability and productivity. Finally, some empirical studies have shown that gaps exist between different airline business models in the area of infrastructure cost, aircraft capital cost, and asset-related cost. Such gaps have not been investigated in this study but are worth investigating if data is made available.

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Paper II

Use of Content Analysis for Airport Websites: Theoretical and Methodological Issues

Use of Content Analysis for Airport Websites: Theoretical and Methodological Issues

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Abstract

This study serves as a guide on how to use Content Analysis (CA) to assess website information of airports. It begins with background and theoretical issues of CA that includes its historical development and different approaches developed over the period of time as a method along with some criticisms and misconceptions. It concludes with an explanation of a model that explains 12 systematic steps to assess, analyse and interpret website information of airports using quantitative content analysis.

***Key words**:* website information, content analysis, theory, methodology.

1. Introduction

The popularity of Content Analysis (CA) as an area of academic research has grown. The widespread use of CA is applied to examine any piece of writing or occurrence of recorded communication such as the area of marketing and media studies, literature and rhetoric, ethnography and cultural studies, gender and age issues, sociology and political science, psychology and cognitive science as well as other fields of inquiry (Abrahamson, 1983).

The present era is an era of Internet technology. Interest in the Internet and, more specifically, the World Wide Web, commonly known as 'Web' represented by 'WWW' has been soaring rapidly. Use of the Internet has more than doubled worldwide during the last five years; increasing from 1,151 million users by 2006 to 2,421 million by 2011 (ITU, 2012). It has become the fastest growing mechanism for electronic markets because it offers a variety of techniques with which to communicate and provides substantial market potential (Liu et al., 1997).

Both airlines and airports seem more interested to use the Internet as a source for disseminating information and generating revenue, through developing e-business platforms. Websites have become an easier medium for airports to advertise their products according to their strategies. For instance, the focus of airport websites has been on Business-to-Consumer (B_2C) communications by offering online information for passengers (e.g. about flight information, travel to/from the airport and passenger services and facilities at the airport) in order to capture a target market by attracting them, who generally belong to a group with more spending power and remain in the same location for a longer period of time. Airports have also Business-to-Business (B_2B) relationships with airlines and have

traditionally used their websites to provide technical information about the airport and its operational capabilities. It means the growth and unique capabilities of Websites help companies to present opportunities to communicate directly with Internet users who are increasingly more like their target customers (Perry and Bodkin, 2000). But the analysis of web content is more complex because of its hyper-textual and decentralised interactive nature that changes frequently and allows any web user to create and transmit various forms of information anytime from anywhere. This is due to the problems of sampling, unitisation, categorisation and coding of information (Wang, 2006).

So, the objective of this paper is to develop a suitable guide to assess, analyse and interpret web-based airport information using content analysis as a methodology. Although many good books and literatures are written about the concepts and methodology of Content Analysis (CA), there is a clear gap in literature about how CA can be applied as a technique to conduct quantitative research in a systematic manner, particularly to assess web-based content of communication of airports.

In addition, some researchers and philosophers argue that CA yields very little in terms of quantitative analysis of content. This is possibly due to the lack of clarity about the method and limited understanding within the research communities of how CA can fit into the broader scheme of methodological choices. So, another objective of this paper is to present essential literature that includes various arguments by researchers and philosophers about CA, how different approaches have been developed over time along with some criticisms (pros and cons), and misconceptions (myths and truths). It is believed that the sound understanding of the theoretical issues of CA can be beneficial for any researcher to understand methodological issues of CA more clearly.

Broadly based on the methodology written by three well-known authors; Holsti (1969); Krippendorff (2004), and Neuendorf (2002), this paper serves as a guide to provide both theoretical and methodological aspects of CA to analyse quantitative data. The paper is presented in two parts. The first part (section 2 of this paper) starts with theoretical issues of CA. The second part (section 3 of this paper) introduces a model focused on assessing website information of airports.

2. Theoretical Issues

CA is explained by different arguments by many authors from different perspectives. Berelson (1971) describes CA as a research technique for the objective, systematic and quantitative description of the manifest content of communication (see table 3 for description). It may be briefly defined as the systematic, objective, quantitative analysis of message characteristics and perhaps the fastest growing technique in quantitative research (Neuendorf, 2002). According to Krippendorff (2004), it is a systematic, replicable technique for compressing many words of text into fewer content categories based on explicit rules of coding. It can also be defined as “the study of recorded human communications and essentially a coding operation with coding being the process of transforming raw data into a standardised form (Babbie, 2001). It has become more popular now, for instance 1.2 billion documents on CA were found in 20 seconds using the Google search engine on 31st July 2012.

However, CA as a method is not free from criticism or misconceptions. Some of them are presented in table 1 below.

Table 1: Criticism (pros and cons) and misconceptions (myths and truths) about CA

	Explanation	Study
Pros	• Relatively inexpensive method to build a representative sample. • Ability to use retrospective data and to track changes over time. • Unobtrusive in nature - no involvement of researchers interacting with the people/things being studied eliminating unwanted interaction effects between subject and researchers. • Using explicit procedures and quality control checks, it makes it possible to analyse large volumes of textual data. • Allows for both qualitative and quantitative operations with large numbers of data. • Can help evaluators learn more about the issues and programs they examine because it is systematic. • Handles unstructured matter as data.	GAO (1996)
Cons	• Manual CA can be a very labour-intensive project, particularly as the amount of material to be studied increases or the coding scheme becomes more complex. • Can identify relationships and correlations between variables but on its own, it cannot explain how those relationships came to exist. • The inability to assess causality. • If the potential users of the results will be uneasy about the judgment-making process, it may not be advisable. • Time-consuming process. • Poses reliability and validity problems.	GAO (1996)
Myths and truths	**Myth 1:** Content analysis is easy. **Truth:** Content analysis is as easy-or as difficult-as the researcher determines it to be. It is not necessarily easier than conducting a survey, experiment, or other type of study. **Myth 2:** The term *content analysis* applies to *all* examinations of message content. **Truth:** The term does not apply to every analysis of message content, only those that meet a rigorous definition. Clearly, calling an investigation a content analysis does *not* make it so. **Myth 3:** Anyone can do content analysis; it doesn't take any special preparation. **Truth:** Indeed, anyone can do it…but only with training and with substantial planning. **Myth 4:** Content analysis is for academic use only. **Truth:** Not.	Neuendorf (2002)

The historical perspectives of CA and different approaches developed over a period of time while using CA as a technique are shown in table 2 and table 3 below respectively.

2.1. Historical Perspectives

Table 2: Historical Perspectives of CA (development process as a method)

Historical perspectives of CA	Study
The systematic analysis of text without the use of term "Content Analysis" can be traced back to inquisitorial pursuits by the Church in the 17th Century. Probably the first well-documented analysis of printed matter occurred in the 18th century in Sweden.	Krippendorff (2004)
It was first used as a method of analysing hymns, newspaper and magazine articles, advertisements and political speeches in the 19th century.	Elo and Kyngäs (2008)
It analysed items such as communist propaganda and military speeches for themes and created matrices searching for the numbers of occurrences of particular words/phrases.	Roberts (2001)
In 1903, Eugen Löbl published in German an elaborate classification scheme for analysing the "inner structure of content" according to the social functions that newspapers perform.	Krippendorff (2004)
By the 1930's, sociologists started to make extensive use of survey research and polling. The experience they gained in analysing public opinion gave rise to the first serious consideration of methodological problems of Content Analysis (CA), published by Woodward in a 1934 article titled *"Quantitative Newspaper Analysis as a Technique of Opinion Research"*.	Krippendorff (2004)
CA was already an often utilised research method by the 1940's despite its impracticality for large texts due to human errors and time constraints; however the term *'Content Analysis'* did not appear in English until 1941.	Krippendorff (2004)
After a series of development, it became a more credible and frequently used research method since the mid-1950's, as researchers started to focus on concepts rather than simply words, and on semantic relationships rather than just presence.	de Sola Pool (1959)
The development is fundamentally connected to the development of mass media and international politics that gained significance in the first half of the 20th century with the dramatic expansion of mass communication. It was believed to have developed and compared with texts in hermeneutic contexts (e.g. Bible interpretations), early newspaper analysis, graphological procedures, and even Freudian dream analysis can be seen as early precursors of CA even before that period.	Titscher et al. (2000)
A long history of use in communication, journalism; sociology, psychology, and business which is being used with increasing frequency by a growing array of researchers.	Neuendorf (2002)
Since then researchers in many fields, including anthropology, library and information studies, management, political science, psychology and sociology have used CA with affective, cognitive, social, cultural and historical significance.	White & Marsh (2006)

2.2. Approaches to CA

Table 3: Approaches to CA developed by different authors and philosophers over a period of time while using CA as a technique

Approaches	Explanation	Study
Quantitative and qualitative	• CA as an objective, systematic and quantitative technique.	Smith (1975)
	• Suggests that some blend of both quantitative and qualitative analysis should be used because qualitative CA differs from quantitative CA in some issues primarily in its emphasis on interpretation over quantification, subjectivity over objectivity, flexibility in process over outcome, and concern for influence of context on the research process.	Silverman (1993)
	• The value of CA lies in its capacity to explore questions unanswerable by more quantitative methods.	Bos and Tarnai (1999)
	• As quantitative CA flows from a positivist research tradition and is deductive in its approach, its objective is to test hypotheses, not to develop them.	Neuendorf (2002)
Inductive and deductive	CA is a method that may be used with either qualitative or quantitative data in both inductive and deductive ways. Both approaches are generally found to be applied as a common ground of generalization as directions of theorizing despite having different arguments in favor or against among philosophers. The use of this method is determined by the purpose of study. • Deductive measurement requires the development of specific coding categories before a researcher starts a content analysis. • Inductive measurement begins with specific views and moves towards general ones where generalizations are generally based on individual instances, finally combined into a general statement, for instance qualitative research. • Inductive supports the practice of emergent coding, which means that the basic research question or hypothesis for a formal content analysis emerges from the unit of observation. • If there is not enough former knowledge about the phenomenon or if this knowledge is fragmented, the inductive approach is recommended.	Elo and Kyngäs (2008)
Manifest and latent	Much of the CA has concentrated on *manifest* content, the "elements that are physically present and countable".	Gray and Densten (1998)
	An alternative is to also consider the *latent* content, consisting of unobserved concept(s) that "cannot be measured directly and have no defined metrics (units of measurement) but can be represented or measured by one or more indicators, however there is one controversy regarding the use of it and this is whether the analysis should be limited to *manifest content* (e.g. surface meaning of the text) or extended to more *latent content* (e.g. deeper structural meaning embedded in the document).	Hair et al. (1998)
Internet and CA	The Internet emerged in the 1990s as an important new source of mediated messages. Shortly thereafter, the World Wide Web combined characteristics of existing media (e.g. print, audio, and video) with a number of new critical attributes, including hypertexuality and interactivity.	Newhagen and Rafaeli (1996)
	McMillan reviewed 16 of the first studies in 1999 that attempted to content analyze messages on the Internet but faced a problem due to the lack of a clear unit of measurement across studies and little information about coder training and reliability. Potter in the same year 1999 also addressed the difficulty of sampling from the Web, given its size and "chaotic design structure". Currently a number of computer Web text analysis program are available.	Neuendorf (2002)

3. Methodological Issues

According to Thayer et al. (2007), CA often encompasses two types of content units; unit of analysis and unit of observation. The unit of observation is examined using two measurement methods; deductive measurement and inductive measurement (see table 3). As deductive and inductive methods often go hand in hand, the model in figure 1 is based on both methods, especially focused on deductive approach for the quantitative analysis of data.

CA is a flexible method. There is no simple, 'right' way of doing it (White and Marsh, 2006). An enormous amount of work and long-time is required during the process. Generally the beginning of the categorisation phase seems chaotic, because several seemingly unconnected pieces of information are processed at that time (Elo and Kyngäs, 2007) and the researcher may find it hard to maintain the credibility of research findings that is generally dependent on how well the categories cover the data (Graneheim and Lundman, 2004). So, in order to cover all necessary categories well, it is essential to know the complexity of airport website regarding its size and structure.

It could be argued that airport websites have a fair degree of commonality. They are often developed by companies that are up-to-date with current trends in terms of what information should be provided. Such companies may be responsible for a number of airport websites and take a similar approach to the development of each website. Airports may also want to imitate each other's website to avoid losing a competitive advantage. However, anecdotal evidence suggests that there are differences between airports, especially in terms of size and structure. Some are presented on a single page or on multiple pages containing limited information.

Other airports offer a vast array of information and hyperlinks that connect to multiple pages on the site or to other sites on the Internet. There are also various links from the homepage. Industry examples suggest that the size and structure of airport websites may vary according to the way in which an airport is owned and operated. Differences may also exist according to airport size on the assumption that larger airports have broader and deeper customers compared to smaller airports and therefore have a greater range and depth of information to communicate. Larger airports may also have a larger budget for investment in information technology and telecommunications.

There may also be differences according to the country that the airport is located in given that Internet penetration varies from country to country. Internet penetration is likely to determine how relevant and effective a corporate website is as a means of communication. For instance in European context, Internet penetration is generally higher in countries located in Northern or Western Europe compared to countries in Southern and Eastern Europe. Over 90% of the population uses the Internet in Iceland, Norway, Sweden, Luxembourg and the Netherlands while less than 40% uses the Internet in Romania, Ukraine, Moldova and Kosovo (Internet World Stats, 2012).

This section therefore aims to explain step-by-step processes to assess, analyse and interpret website information of airport websites as shown in Figure 1 below.

Figure 1 shows a model of CA.

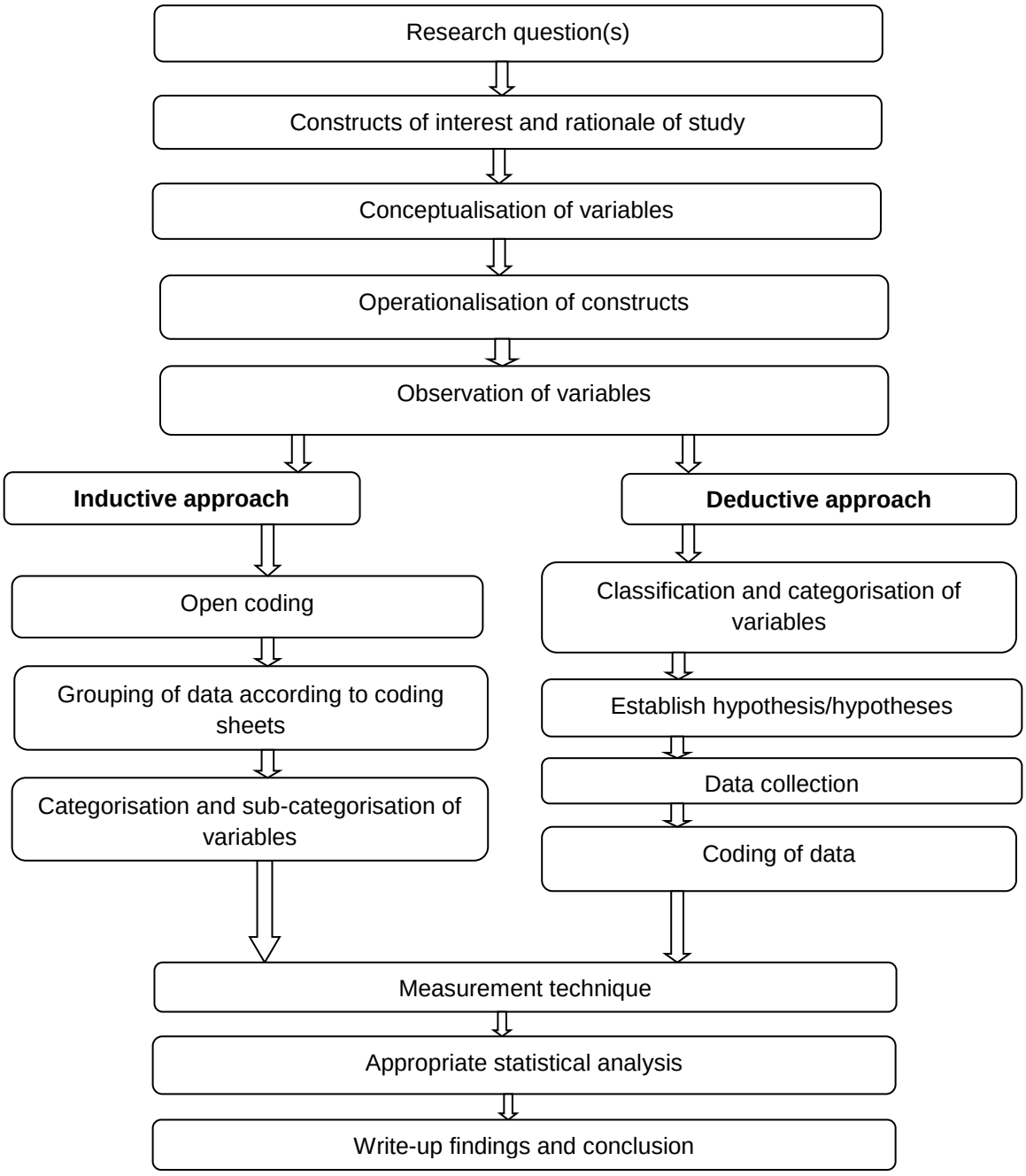

Figure 1: A Model for Quantitative Content Analysis

3.1. Research question (s)

Both methods of CA first begin with research question (s) like all good research to fill the gap in literature. It explains about empirical reality, typically driven by theory or prior non-scientific observation (Neuendorf, 2002). It generally delineates several possible and initially uncertain answers and entails truth claims that could be supported, if not by direct observation, at least by plausible argumentation from related observations (Krippendorff, 2004). Sometimes research question (s) is motivated by intriguing observations from inductive case study research (Davis and Bingham, 2007).

After finding the gap in literature, basically three important questions are considered while formulating research questions (Troye, 2010):

(i) What do we want to explain (explanand)?
(ii) What do we want to explain it with (explanans)?
(iii) How are explanand and explanans related?

3.2. Constructs of interest and rationale of study

On the basis of previous theory and literature, the second important focus is to think about the construct of interest and its rationality together, for instance:

- What content will be examined and why it is important to study or focus?
- Does it seem more rationale to investigate? Or is there any significant gap in the literature?
- Does the research idea that is supposed to be investigated fall under the right use of CA on the basis of set research question (s), kind of data required, data availability, kind of analysis required, and resources needed?

Web-based communication of European Airports; can be considered as an example of a construct of interest.

3.3. Conceptualisation of variables

The next step is to conceptualise variables. It means to define what variables will be used in the study. It basically refers to identifying a definable and measurable concept, things or events that vary, identifying subjects, things, or events and that will help to answer the question (GAO, 1996). It should be made sure that everything has been covered that is supposed to be defined. Most importantly, the researcher should not be confused with the concept of both constructs and variables. Sometimes they can be used interchangeably.

3.4. Operationalisation of constructs

Operationalisation is another important step to follow after conceptualisation of variables that simply means the process of developing appropriate measures. However, operationalisations of constructs mean to decide the unit of analysis for unitising the data. Krippendorff (2004) mentions that the first task in any empirical study is to decide what is to be observed as well as how observations are to be recorded and thereafter consider the data. It can be any other result of “breaking up a ‘communication’ into bits”, which are called units of sampling, units of data collection, and units of analysis (Carney, 1971). As with all research methods, both conceptualisation and operationalisation need to match each other; this matching is what many call internal validity (Babbie, 2001). There are no easy ways to describe specific tactics for developing categories or to suggest how to go about defining (operationalising) these tactics. The *entire website of airports* can be considered as the unit of analysis, but be sure how to measure them well for the credibility of the findings.

3.5. Observation of variables

Observation is a tool of scientific inquiry, which is systematically planned to record the relevant facts related to the specific phenomenon of interests (Churchill and Brown, 2004). It is a procedure for gathering data in which the researcher does not manipulate key elements of a study, but instead observes behaviour (McQueen and Knussen, 2002).Observation method may be structured or unstructured. CA is basically used to deal with unstructured observation. A great deal of flexibility is allowed for the observers in terms of what they note and record.

When the website of any airport is browsed, it seems that different types of information are found under different main headings or sub-headings (e.g. generally hierarchy from level 1 to level 4). For instance, Amsterdam Schiphol Airport in Holland has B2B sections on their website for aviation-related business areas in route development, cargo, and travel agents. The website also has B2B sections for non-aviation related business areas in advertising and office for rent (see figure 2). Similarly, East Midlands Airport in the UK has B2B sections on their website for aviation, cargo, retail opportunities, airport advertising, tender opportunities and property (see figure 3).

Figure 2: Website View of Schiphol Amsterdam Airport showing B2B information (source: http://www.schiphol.nl/)

Frankfurt Main Airport in Germany has eight first-level headings from its homepage; flights, direction and parking, transfer, check-in and luggage, shop and enjoy, bookings, business location, and business partners. There are then 56 second-level headings and 169 third-level headings with 233 pages. There are also various links from the homepage (i.e. to passenger assistance, airport maps, services at the airport, news, contact, alternative language options, weather, corporate information, and social media sites). Ørland Brekstad Airport in Norway is owned and operated by Ørland Municipality. The 'public services' section of the Municipality website has a link to a single page for the airport that provides two paragraphs of text about

the location of the airport, recent infrastructure developments, basic technical and operating information, contact details, air service provision, and a link to the airline operator.

In this way websites of airports offer a vast array of information and hyperlinks that connect to multiple pages on the site or to other sites on the internet. The researcher therefore needs to use a fair degree of judgement to assign pages of information to a relevant item of content and record them accordingly.

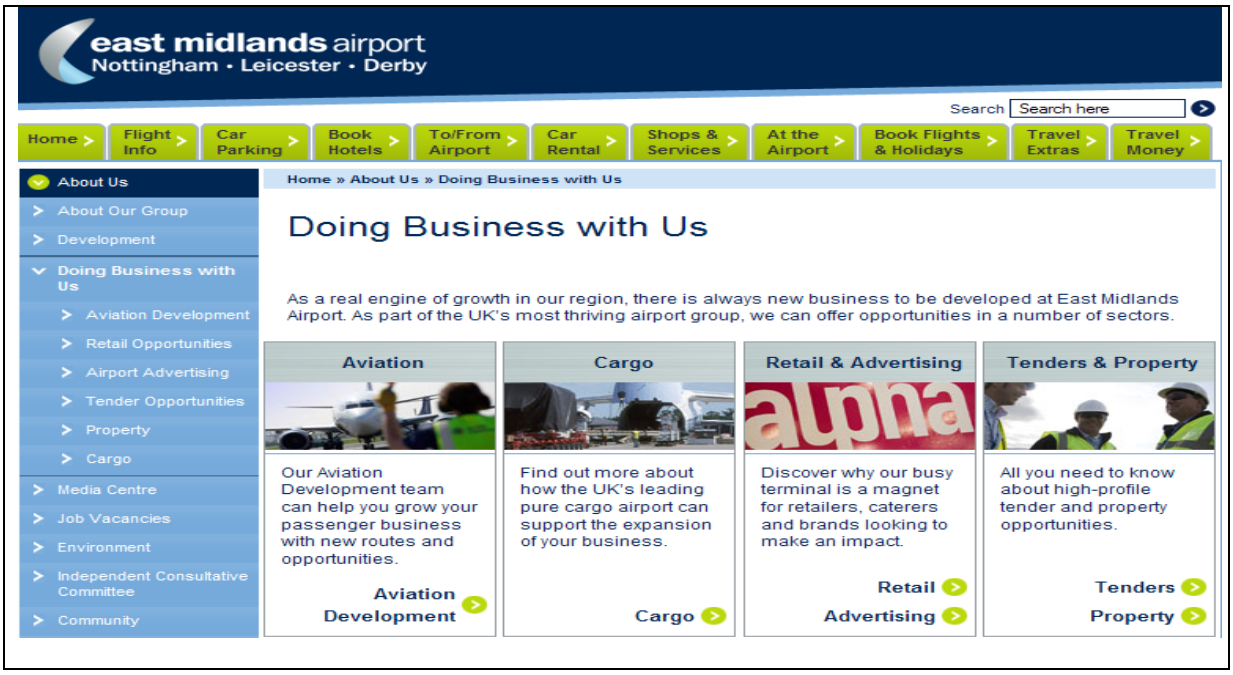

Figure 3: Website View of east midlands airport showing B2B information

(Source: http://www.eastmidlandsairport.com/emaweb.nsf)

3.6. Classification & categorisation of variables

One of the suitable ways to classify information is to make a detailed list of the main themes first to cover all of the possibilities to develop unstructured pieces of information into structured categories as shown in table 4. Similarly, categorisation of variables distinguishes one subject, thing, or event from others by putting them each and severally into a limited number of categories (GAO, 1996). The researcher should be careful to classify variables and select the right categories and sub-categories into smaller measurable units according to research questions on the basis of already listed observed items as shown in table 4 (see figures 4 and 5 for categorisation).

In addition, the important thing is to reduce data to a manageable size for the purpose of selective reduction by grouping similar items of contents together. After breaking down the content of materials into pertinent units of information and avoiding irrelevant information, such information is analysed and interpreted. In order to make the classification process easier, some categories can be combined if they are overlapped because they must be mutually exclusive (non-overlapping). If there are very few counts for some of the categories, they can be reduced during the analysis.

Table 4: Some example items of content observed from the websites of airports

SMS flight updates	Incentive schemes at airports	Operational capabilities
Destination served by airlines	Real estate and area development	Hangars and ramp
Route map	Flying clubs	Facilities and services for cargo and logistics
Getting to/from the airport	Flight schools	Catchment area information
Customs	Maintenance	Tourism development opportunities
Immigration	Sanitation	Business centres
Passenger terminal information	Car parking	Advertising opportunities
Shops, food and beverage	Terminal infrastructure	Conference and events
Calculator for airport charges	Air rescue and fire fighting	Consulting services
Business park	Executive lounges	IT and telecommunication business services
Organisation and corporate governance	Awards	Image gallery
Customer surveys	Shares information	News and RSS feeds
Airport contact details	Events and presentation	Media policy
Training	Airport master plan	Jobs and carrier opportunities
Environmental, social and economic management,	Culture	Expansion project
Sponsorship	Community	Education

Illustration:

Research Question

What types of aviation and non-aviation related information do airports provide on their websites?

In order to answer this research question, the researcher should first decide the unit of analysis and unit of observations. Here the unit of analysis would be “airport websites” and unit of observations (variables) would be “aviation and non-aviation related information of airports”, and then categorise the items correctly, for instance see figures 4 and 5. If the focus of research is to observe the objectives of airport websites, all items (e.g. table 4) can be categorised into their suitable categories.

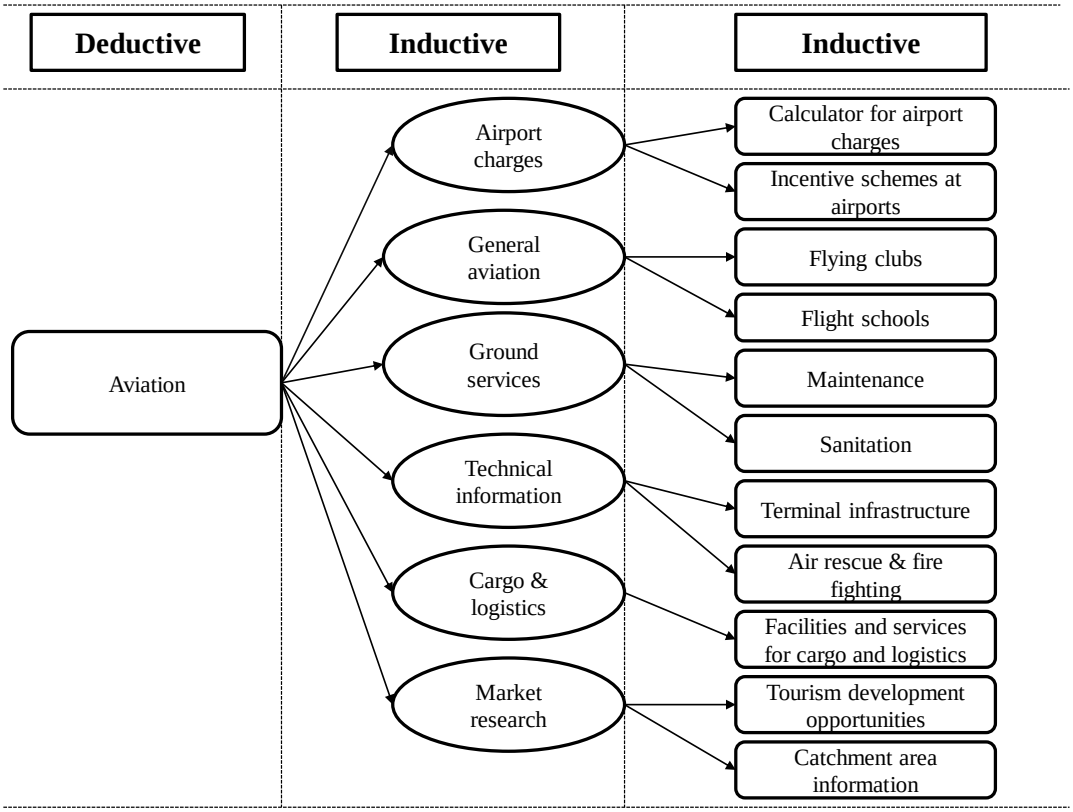

Figure 4: Categorisation of aviation related information (see table 4 for items)

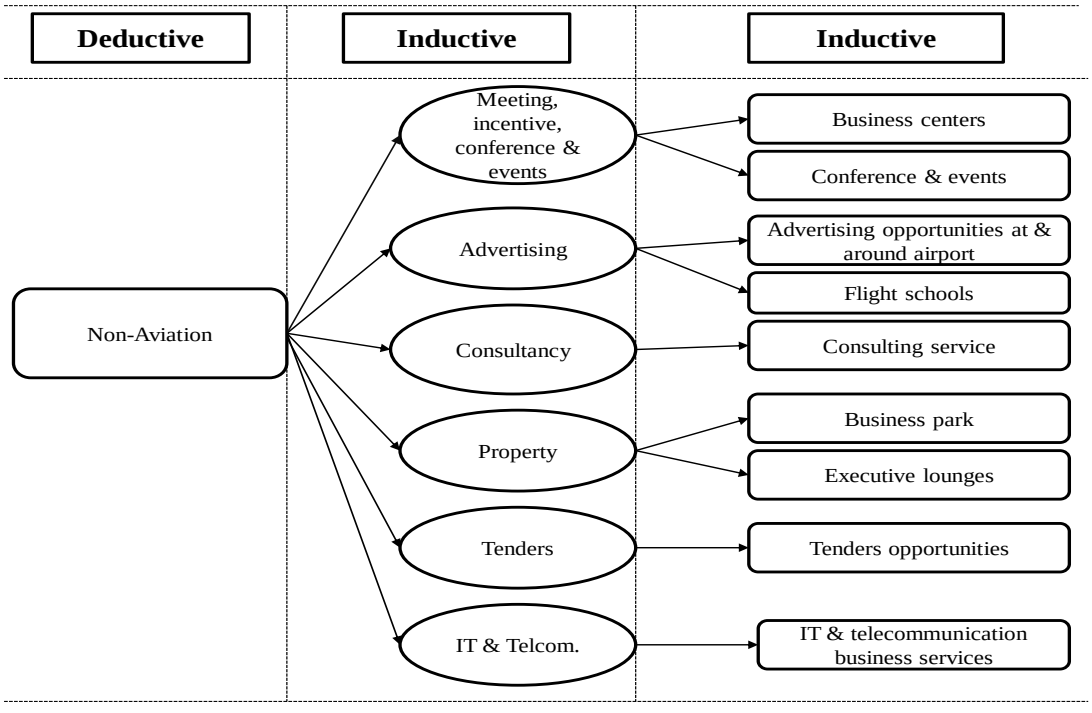

Figure 5: Categorisation of non-aviation related information (see table 4 for items)

This model suggests using the combination of both approaches e.g. deductive and inductive. Deductive refers to the development of specific coding categories before CA is carried out. So, four main categories (e.g. Passenger Information and Services; Aviation; Non-Aviation and Corporate Communication) are identified (see table 4). Figure 4 and 5 show categorization of items according to aviation and non-aviation related information on the basis of some example items of content observed from the websites of airports as shown in table 4. On the other hand, inductive measurement supports the practice of emergent coding. Here, emergent coding was used to develop sub-categories and example items of content.

3.7. Establish hypothesis/hypotheses

According to research question, the researcher should establish one or more hypotheses that can be tested using CA. A hypothesis is a statement that specifies how two or more measurable variables are related. Each variable must be carefully defined. In a scholarly CA, variables should be linked in the form of research questions or hypotheses In the deductive scientific model, hypotheses and research questions are both posed *before* data are collected (Neuendorf, 2002). These hypotheses flow from what is already known about the problem and the extant research question (s).

Each hypothesis is tested deductively and statistically to see if the predicted relationships hold true (Neuendorf, 2002). If the test is statistically significant, it is said to have achieved support for the hypothesis. If not, it means a failure to find support (Neuendorf, 2002). The most traditional way to come to a valid analytical construct is to test several mutually exclusive hypotheses (conceivable constructs) (Krippendorff, 2004).

3.8. Data collection

Data are the starting point of any empirical research (Krippendorff, 2004) and provide useful evidence for testing hypotheses or answering research questions (White and Marsh, 2006). But the major problem with web-based research is to collect the enormous data properly because the web expands rapidly, so a better idea would be to assess the data during a certain time frame, for instance up to 31st March 2012. The data collected from the web means the information originated by the researcher for the purpose of the investigation at hand, and therefore serves the nature of 'primary data'.

In order to collect data, a collection plan is decided to be sure how much time is needed to cover the possibilities. Now the population should be defined for the study. Population refers to the set of units being studied and the set of units to which the researcher wishes to generalise whereas sampling is the process of selecting a subset of units for study from the larger population (Neuendorf, 2002). Once the size of the population is defined, it must serve as the basis for any sampling.

There is a general thought (not universal) that quantitative research has, as a preference, large sample sizes, meaning that quantitative research generally relies on large samples and the statistical techniques that go with them (McQueen and Knussen, 2002). However the definition of "small" and "large" depends on the nature of the study. In the case of a small population, there may be no need to draw a smaller, representative sample of the population. Rather, all units in the population may be included in the study, which would then be called a *census.* Now decide, whether the work is done on the basis of sampling or census. If census of the content is possible, the choice to go for census would be suitable. Sampling would be

suitable if the universe of material is too extensive to be reviewed. Be sure to use the appropriate sampling method and decide the appropriate sample size in an unbiased way. At the same time, the nature of independent and dependent variables should be decided.

Sampling units serve to identify the population and establish the basis for sampling (White and Marsh, 2006). The researcher should take the right decision of using different sampling techniques such as systematic sampling, stratified sampling, probability sampling (random sampling), non-probability sampling, cluster sampling, snowball sampling, relevance sampling, census or convenience sampling (Krippendorff, 2004) according to the nature of the work.

But the question that naturally follows is how large the sample must be to answer the research question with sufficient confidence. There is no set answer to this question and no sampling guidelines exist for researchers to select an adequately effective sample in examining the contents on the web (Wang, 2006). The size of population has no direct effect on the size of the sample; what directly affects the size of the sample is the variability of the characteristics in the population (Churchill and Brown, 2004). However the researcher can arrive at an appropriate sample size to justify research question using suitable statistical tools. A more generalised method of determining the desired sample size is to calculate it using formulas for standard error (see table 7 for explanation) and confidence intervals (Neuendorf, 2002). However this paper does not show the calculation technique.

3.9. Coding of data

Coding is the technical procedure by which raw data are transformed into symbols (numerals) in computer readable form but the coding process involves considerable effort on the part of the coder (Churchill and Brown, 2004). As the Web data collection can be thought of as a large online survey without non-response rate, this paper suggests coding the pre-determined variables into symbols manually directly on the computer, however proper training for coder is a minimal requirement.

All measures for human CA coding need to be fully explicated in a document called a *codebook, which corresponds to a coding form* to provide spaces appropriate for recording the codes for all variables measured. In order to code data, a code book is now prepared in human coding systems with all variable measures fully explained (Neuendorf, 2002). A code book contains explicit directions about how data from data collection forms are to be coded in the data file (Churchill and Brown, 2004). The objective is to make the work complete and unambiguous by almost eliminating the individual differences among coders. It can be updated all the time with repeated revisions right up until the moment when coding begins.

The researcher should consider the following important coding guidelines while coding data as suggested by Holsti,(1969), Neuendorf (2002) and Krippendorff (2004).

- Prepare a code book that should include the names of variables to be used in statistical analyses for each variable included in the data file and a description of how each variable is coded.
- Before coding, conduct a pre-test of the suitability of the categories, the coding instructions, and the reliability of coding among coders.

- Be sure to get familiarised with the categories and their definitions. If it is not clear, classify the categories and redo the classification because CA stands or falls by its categories.
- All relevant aspects of the constructs are represented, so it should be exhaustive (e.g. all relevant content can be categorised); mutually exclusive (e.g. data can be placed in one and only one category), and independent (e.g. the assignment of data to one category does not affect the assignment of other data to a category)
- Never assume that the analytic relevance of one variable with another until the analysis of data show it to be relevant.
- It is more common that at each stage the code book can be revised (e.g. changes, additions or deletions) as needed.
- If it is modified during the coding, it must be reapplied to the data already coded so that all data are coded according to the same coding scheme.
- In order to minimise the complexity, individual codes may be combined after the coding to develop a composite measurement, otherwise grouped to show relationships among the measures.
- Again, be sure to check for reliability of coding and adjust coding process if necessary.
- Try to maintain inter-coder reliability, in case there are at least two researchers.
- Always try to be aware of potential coding error that are more apparent such as deficiencies in the documents; ambiguity in the judgment process; coder bias and coder error.

3.10. Measurement technique

Measurement means the process of assigning numerals to objects or events according to a set of rules (Stevens, 1951) whereas measurement technique refers to the assigning of a “true” value for each variable on each unit, the value that we are trying to discover (Neuendorf, 2002). It describes the concept of validity, accuracy, precision and reliability.

3.10.1 Why validity?

Validity is that quality of research results that leads to accept them as true, as speaking about the real world of people, phenomena, events, experiences, and actions (Krippendorff, 2004). The measure of validity cannot be valid if it is not reliable, accurate and relatively precise. Similarly, a measure may be reliable, accurate and precise and still not be valid (Neuendorf, 2002). It is simply an expression of the extent to which a test is actually measuring what it is supposed to be measuring, although the methods available to demonstrate this quality are often far from simple (McQueen and Knussen, 2002).

Similarly, accuracy is the extent to which a measuring procedure is free of bias (non-random error), whereas precision is the fitness of distinction made between categories or levels of measure, for instance measuring a character’s age in years is more precise than measuring in decades. It is generally a good thing, but extreme precision may be counterproductive, for instance measuring age in days is technically more precise than measuring in years but is likely to be too tedious and error prone to be useful (Neuendorf, 2002). It is also important to note that all validity issues as mentioned above may not be simpler and easier to incorporate in one research.

Table 5: Some opinions about validity assessment

Explanations	Study
Construct validity represents the most difficult form of validity to demonstrate, since the concepts being measured are really theoretical entities whose existence is inferred by observation of related activities.	McQueen and Knussen (2002)
Face validity is more common in CA that demonstrates that the measure can be accepted as theoretically valid on its face; through consensus; or through prediction, but not a true indication of validity.	Norton (2008)
Criterion validity relies on assessing the correspondence between the code and criteria.	White and Marsh (2006)
Content validity looks at the completeness of representation of concept meaning that the content of the test must accurately and adequately reflect the content of the phenomenon under investigation.	McQueen and Knussen (2002)
Convergent validity refers to whether the measure actually characterises the concept in question.	Norton (2008)
Discriminant validity asks whether the measures allow a given concept to be distinguished from other similar but different concepts.	Norton (2008)

3.10.2 Why reliability?

Data, by definition, are the trusted ground for reasoning, discussions, or calculation. To stand on indisputable ground, the researcher must be confident that their data (a) have been generated with all conceivable precautions in place against known pollutants, distortions, and biases, intentional or accidental, and (b) mean the same thing for everyone who uses them. Reliability grounds this confidence empirically (Krippendorff, 2004).

Table 6: Some opinions about reliability measurement

Explanations	Study
It refers to its stability, or the tendency for coders to consistently recode the same data in the same way over a period of time and to classify categories membership in the same way.	Neuendorf (2002)
In the quantitative approach, reliability is expressed in a numeric value indicating the level of agreement between two independent coders and measuring procedure that yields the same results on repeated trials.	Carmines and Zeller (1979)
It is the extent to which a measuring procedure represents the intended, and only the intended, concept. It means to answer the question “Are we measuring what we want to measure?”	Neuendorf (2002)
Pearson’s correlation coefficients exceeding .75 to .80 as an indicative of high reliability as a “widely accepted rule of thumb”.	Ellis (1994, P.91)
Cohen’s *kappa* with .75+ indicating excellent agreement beyond chance; .40 to .75 fair to good agreement beyond chance; and below .40 poor agreement beyond chance.	Banerjee et al. (1999)
Reliability coefficients for each variable generally should fall within the well accepted range of 0.70-1.00, if not, differences in coding of data should be reviewed and resolved by the researcher. Two others such as Scott’s *pi* and Spearman’s *rho* are also considered.	Neuendorf (2002)

It refers to the precision or consistency of measurement (Brown, 2006). If the coders differ substantially, then the results of the CA become questionable (GAO, 1996) and content analysis measures are meaningless without acceptable levels of reliability (Neuendorf, 2002). But what constitutes an acceptable level of intercoder-reliability for each variable is open to debate. Unfortunately, common standards are not in place (Krippendorff, 2004).

If the test for each variable does not fall under the prescribed criteria, means to adjust the coding process can be used, if necessary. It is very important to minimise threats to reliability which might be caused due to a poorly executed coding scheme, inadequate coder training, and coder fatigue. It is also important to note that all reliability issues as mentioned above may not be simpler and easier to incorporate in one research.

Although the scope of this study is not to cover the procedure of computer aided content analysis (CACA), some discussions about available software have been assessed for interested researcher (see Table 7).

The author assessed PASW 18 (Predictive Analytics SoftWare) previously branded as SPSS (Statistical Package for the Social Sciences) as the user friendly software. It was released in its first version in 1968 after being developed by Norman H. Nie, Dale H. Bent and C. Hadlai Hull. It is among the most widely used programs for statistical analysis in social science. It is used by market researchers, health researchers, survey companies, government, education researchers, marketing organizations and others. It seems useful for analysing data obtained from surveys, experiments and other sources. Some analyses include descriptive statistics (e.g. cross tabulation, frequencies), bivariate statistics (e.g. means, t-test, ANOVA, correlation), prediction for numerical outcomes (e.g. linear regressions), prediction for identifying groups (e.g. factor analysis, cluster analysis) and so on.

Table 7: List of some available software for CACA

Softwares	Developed by	Applications
InfoTrend	Prof. David Fan at the University of Minnesota	It has been used to successfully predict public opinion based on analysis of news media text on wide range of topics.
Minnesota Contextual Content Analysis (MCCA)	Prof. Donald McTavish and collegues at the University of Minnesota	It has been used in many social science investigations to systematically score open-ended textual information.
DICTION 4.0	Prof. Roderick P. Hart at the University of Texas, Austin.	It is similar in some respects to MCCA, including the fact that it is a revised version of an earlier mainframe-based program.
VBPro.	Prof. M.Mark Miller at the University of Tennessee, Knoxville.	It can produce files of key terms in context, create lists of words in a file along with their frequency in alphabetical order or by descending order of frequency, and code various text units.

(Source: Bengston, 2000)

3.11. Appropriate statistical analysis

The statistical analysis of CA is similar to that of other good social science research. The following key methodological considerations are suggested for data analysis (Churchill and Brown, 2004).

- How many independent and dependent variables are accommodated in your test?
- Distinguish between Univariate and Bivariate/Multivariate analyses, meaning that "Will one variable be analysed at a time (Univariate analysis) or in relationship to one or two or more other variables (Bivariate/Multivariate analysis?)"?
- Be sure what level of measurement (nominal, ordinal, interval, ratio scale is used to measure the variable(s)? (see table 8 for explanations)
- No need to diagnose non-response/non-sampling errors because of the use of web-based information.
- Test the hypothesis.
    - According to Neuendorf (2002), there are two types of statistics-inferential (parametric) and non-inferential (non-parametric/descriptive). The first allows to establish how certain we are that our findings may be generalised to the population from which our sample was drawn. Notice that if a census study has been conducted, there is no need for inferential statistics. Non-parametric/ descriptive statistics do not attempt to gauge the certainty of generalising the finding to a population (i.e. no parameter is estimated). They may be entirely descriptive in nature such as mean or median.
- The one–tailed significance test is appropriate for testing a directional hypothesis, whereas the two-tailed version is appropriate for a non-directional hypothesis.
- Describe frequency analysis (e.g. drawing inferences from the frequency of codes with which subjects fall into each category), also known as **one-way tabulation** (e.g. a univariate technique that involves counting the number of responses that fall into various response rates) to communicate the results of the study in general.
- If two (or more) categorical variables are to be studied, use the **cross-tabulation technique.** It is a widely used multivariate data-analysis technique for studying the relationship among and between variables e.g. one variable (the independent variable) on another variable (the dependent variable) or two or more variables treated simultaneously.
- Discuss the confidence interval for proportions (e.g. the range within which the true proportion of the population will fall, with a given level of confidence, usually 95% (as a cut-off) confidence which is equal to the sample proportion (p) plus or minus estimated sampling error). The statistical significance of *p* less than 0.05 indicates that we are more than 95% confident in generalising the finding to all characters in the population from which the sample was drawn. See Table 9 for appropriate inferential analysis.

Table 8: Some common terminologies and explanations

Terminologies	Explanation	Permissible descriptive statistics
Nominal scale	A system of measurement in which observations are placed into categories that differ from one another. Numbers identify and classify objects (e.g. gender classification, student registration numbers).	Percentages, mode
Ordinal scale	Numbers indicate the relative positions of the objects but not the magnitude of differences between them (e.g. ranking of service quality delivered by a number of banks, rankings of the top 4 teams in the football World Cup).	Percentile, median
Interval scale	A system of measurement in which observations are made on a scale comprising equal intervals. Differences between objects can be compared; Zero point is arbitrary (e.g. temperature, opinions, index numbers).	Range, mean, standard deviation
Ratio scale	Possesses all the properties of the nominal, ordinal and interval scales, and in addition, an absolute zero point (e.g. weight, length, age, income, costs, sales).	Geometric mean, harmonic mean
Standard error	A statistic based on the standard deviation of a group of sample means, which provides a measure of how close the sample mean might be to the population from which it has been drawn. In other words it reflects the extent to which an element within a population varies.	
Independent variable	It refers to a variable that has an antecedent or causal role, usually appearing first in a hypothesis.	
Dependent variable	It refers to a variable that has a consequent, or affected, role in relation to the independent variable.	
Statistical significance test	It means a test of inference that conclusions based on a sample of observations also hold true for the population from which the sample was selected.	

Source: McQueen and Knussen (2002)

Table 9: Some statistical analysis according to the nature of research

Comparisons between cases	Appropriate inferential analysis	Explanation
Categorical independent variables (nominal) and categorical dependent variables (nominal), for instance airport websites	A combination of *cross tabulation* and *chi-square statistics* followed by degrees of freedom *(df)* and finally a significance value	Chi-square is a procedure for comparing the observed frequency of response with expected frequencies in a nominal-nominal study. However a problem with this particular statistic is that it merely informs us that there is an effect of some kind within the associated variables, but not where.
Categorical independent variables (nominal) and continuous dependent variables (interval) between group comparisons	Independent ***t*-**test	A test that compares the means of two different groups measured on some outcome variable.
Categorical independent variables (nominal) and continuous dependent variables (interval) within group comparisons	Paired ***t*-**test	This test compares the means of two different measures on a single outcome variable taken from a single group, usually on two different occasions.
Continuous independent variables (interval) and continuous dependent variables (interval)	Correlation analysis	A procedure whereby relationships between pairs of interval-scaled variables can be explored.
Predicting one continuous variable from another continuous variable	Simple regression	A procedure whereby the precise influence of one interval-scaled variable can be determined on another
One categorical independent variable (nominal) and one continuous dependent variable (interval) between group comparisons	One-way ANOVA	In ANOVA (Analysis of Variance) terminology, the independent variable is usually called a **factor**. It aims to determine whether or not the observed differences among distributions are significant or perfectly acceptable, given the effects individual differences and errors have on measurement.
More than one categorical independent variable (nominal) and one continuous dependent variable (continuous) between group comparisons	Two-way ANOVA	An extension of the one-way ANOVA test that is used when there are more than one independent variable, and multiple observations for each independent variable. It aims to provide some unique and relevant information about how variables *interact* or combine in the effect they have on the dependent variable.
More than one continuous independent variable (interval) and one continuous dependent variable (interval)	Multiple regression and partial correlation	Multiple regressions are a procedure whereby the precise influence of several interval-scaled variables on some outcome measure can be determined. Partial correlation is a procedure whereby relationships between pairs of interval-scaled variables can be explored, while holding the effects of other variables constant.
Multivariate Analysis	Structure equation modelling	Structure equation modelling technique is considered as the most comprehensive form of multivariate analysis, allowing multistep causal links to be specified and tested.

Source: McQueen and Knussen (2002)

3.12. Write-up findings and conclusion

The final step is to write-up findings and conclusion after interpreting results correctly. The empirical support of results with the research question and the generalisation of findings are considered to be two important aspects that the researcher should think about. The empirical support means to judge the extent to which the goal has been accomplished; for instance R^2 in regression analysis; Chi-square in structural equation modelling and so on (Troye, 2010). Similarly, in order to generalise the findings, different researchers claim in many ways, for instance Lee and Baskerville (2003) claim that an increase in sample size will also lead to greater generalisability of the sample points to a sample estimate because of the greater convergence expected from the larger sample size. However it has been also criticised by other philosophers. It is also worth noting that it is not simpler and easier to generalise all findings.

4. Conclusion

This paper attempts to provide a roadmap to conduct CA especially assessing airport data from their websites. It provides the background and theoretical issues of CA that includes its historical development and different approaches developed over the period of time as a method along with some criticisms and misconceptions. In addition, it explains a model for assessing, analysing and interpreting website information of airports using CA in a step wise manner with 12 systematic steps that discuss the quantitative analysis of data. It concludes that CA is well-suited to analysing the multifaceted information of websites as it deals with large volumes of textual data. The study would have been more useful to have seen a more developed discussion relating to how different the analysis of airport websites is compared to other websites and whether there are special considerations (passenger vs. airlines need) might be good area for future research.

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Paper III

What's in a Name?
Analysis of Airport Brand Names and Slogans

What's in a Name?
Analysis of Airport Brand Names and Slogans

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Published in "Journal of Airport Management" Volume 6, Number 1 (2011), 63-79.

Abstract

This study investigates the use of brand names and slogans at 1562 airports worldwide using content analysis of airport websites. The study finds that three quarters of airports are named after a single place. Almost half include a reference to the size or scope of services available at the airport in their name. Significant differences exist between world regions. Naming an airport after natural or man-made attractions is most common in Europe, after a political leader/revolutionary in Latin America/Caribbean, and after royalty in the Middle East. Only a tenth of all airports use a slogan and this is mainly a North American phenomenon. A more detailed analysis of airports in Europe finds that a quarter of airports have two or more place names; one is typically the name of the place that the airport is located in while the other tends to be the name of the nearest main city or town. Including a reference to the size or scope of services available at the airport is significantly more common at larger versus smaller airports in Europe. The use of a slogan is significantly more common at airports in Europe that are owned or operated by private interests versus those that are publicly owned and operated.

***Keywords**:* airports, marketing, branding, slogans.

1. Introduction

Historically, airports have been behind their airline counterparts in terms of marketing; failing to demonstrate professionalism, and lacking a proactive or dynamic approach (Butot and Jones, 2003). However, airport marketing has developed rapidly during the last few decades. For instance, many airports in the UK established marketing departments during the 1990's, started to use pricing tactics and promotional campaigns to attract new customers, and began to undertake market research (Humphreys, 1999). Similarly, airports have adopted more market-driven management practices and have become more proactive and innovative in their approach to marketing, including with the promotion of a recognised brand (Halpern and Pagliari, 2008).

The title of this paper is borrowed from William Shakespeare's play *Romeo and Juliet:* "What's in a name?" Here, Juliet tells Romeo that a name is an artificial and meaningless convention, and that she loves the *person* who is called Montague, not the Montague name and not the Montague family. However, a name is a key feature in branding that is recognised for its ability to provide symbolic meaning to both tangible and intangible products and services. The symbolic meaning associated with a name may then be reinforced through the use of a slogan that identifies the product or services.

Anecdotal evidence exists about the use of brand names and slogans in the airport industry (e.g. see Byron, 2008). However, the authors of this paper are not aware of any empirical studies that have been carried out on the subject. Consequently, the extent to which airports use brand names and slogans is fairly unknown. This paper aims to narrow the gap in literature by investigating the use of airport brand names and slogans. The sampling frame for this study consists of member airports of Airports Council International (ACI, the international association of world airports with 580 members operating 1,650 airports in 179 countries and territories) and data were extracted from websites, using content analysis, of 1562 airports worldwide. The analysis investigates the use of airport brand names and slogans at these 1562 airports worldwide including differences according to geographic location of the airport. A more detailed analysis is then conducted on the use of airport brand names and slogans at 451 airports in Europe according to airport size and corporate governance structure of the airport.

This paper provides a written account of the study. The first section provides an introduction, followed by the background to the paper including examples of airport brand names and slogans, and a review of literature that is relevant to the study. The third section outlines the methodological approach taken by the study, followed by a summary of the main findings. The final section provides a conclusion including the limitations of the study and recommendations for future research.

2. Background

Kotler et al. (2005; p549) define a brand as: “a name, term, symbol, design or combination of these, that identifies the maker or seller of the product or service.” It is the glue that holds the broad range of marketing functions together (Ries and Ries, 1998) and presents the company as a distinctive, trusted, exciting and reliable entity (Bates, 2010). Powerful brands create meaningful images in the minds of customers (Keller, 1993) and those images may result in functional, emotional, and self-expressive benefits (Aaker, 1991). Marketers invest in branding because brand image and reputation enhance differentiation (Kapferer, 1995) but brand value is also important for companies from a consumer-perspective.

Emphasising the importance of brand value because of its association with benefits to consumers and not just to marketers, Bates (2010; p40) cites one of Coca-Cola’s top executives:

‘If Coca-Cola were to lose all of its production-related assets in a disaster, the company would survive. By contrast, if all consumers were to have a sudden lapse of memory and forget everything related to Coca-Cola, the company would go out of business.”

The essence of a brand is to achieve differentiation that is meaningful to target customers when unique service is consistently delivered and promise is fulfilled (Basu and Wang, 2009). This can be enhanced by managing the functional needs of passengers, airlines and businesses at an airport. However, it is also important to think that negative perceptions, if placed in people’s mind due to bad reviews, may create irreversible damage for the reputation of an airport’s brand (Bates, 2010).

Perhaps the most fundamental element of brand awareness is the brand name. It must be distinctive, memorable, easy to pronounce and meaningful (whether in real or emotional terms) (Brassington and Pettitt, 2006). It should also be capable of registration and legal protection (Kotler et al., 2005). A brand name provides symbolic meaning that aids customer recognition of the service provider and assists in predicting the service outcome (Herbig and Milewicz, 1993). Marketers often give considerable attention to the name and a carefully created name can bring value to the brand, provided that the brand name has desirable properties within the target markets (Usunie and Shaner, 2002).

An extension of the brand name is to have a slogan which is a memorable phrase that says something about who the company is and what it does (Sloganmaniac, 2006). Both tangible or intangible and functional or symbolic components can be positioned through the use of slogans which can promote word-of-mouth publicity and reinforce image (Balakrishnan, 2008).

Although Juliet tells Romeo that a name is an artificial and meaningless convention, anecdotal evidence from airports worldwide suggests the opposite to be the case. A name is real and meaningful, and may even be able to create a competitive advantage for airports. In his article 'The Name Game', Byron (2008) discusses the rapidly growing trend for airports to change their names and adopt slogans.

> *'Gone are the days when it was acceptable just to use the nearest city, town or village to prefix their name. Competition for airlines, passengers and businesses has reached the level whereby airports will try every trick in the book to attract new business, and this even extends to the once-sacred airport name..... And it's not just the name – airports are increasingly adopting "straplines" that attempt to define what the airport is, does, or represents' (Byron, 2008: p52).*

Many airports are simply named after the city, town or village that they serve and/or are located in (e.g. Melbourne Airport serves the city of Melbourne in Australia). Some are named after a region (e.g. Sunshine Coast Airport is named after the Sunshine Coast region in Australia). Other airports assume national importance by naming themselves after their country, city-state or special administrative region (e.g. Malta International Airport, Singapore Changi International Airport and Hong Kong International Airport). However, airports typically serve a range of catchment areas and may use multiple names, partly as a means of satisfying the various areas served. East Midlands Airport Nottingham Leicester Derby is an airport in the UK that is named after the East Midland's region and the three main cities of Nottingham, Leicester and Derby. Formerly known as East Midlands Airport, the decision was taken in 2003 to add Nottingham to the title because the city is the best known in the East Midlands. However, the name change faced fierce criticism on the basis that the airport was actually closer to the cities of Leicester and Derby. In 2006, the airport added the other two cities to its name.

It is perhaps the risk of offending a particular area that has led some airports to avoid using a city-name altogether. Tri-Cities Regional Airport is an airport in Tennessee in the USA. The airport serves a number of cities in Northeast Tennessee, Southwest Virginia and North Carolina. The name Tri-Cities Regional provides an umbrella name for the various regions and cities served by the airport without specifically referring to them.

A number of secondary airports, especially those used by European low-cost carriers, have added the name of the nearest main city or town whilst retaining their existing name, even though the nearest main city or town may be some distance away from the airport. Frankfurt Hahn Airport in Germany is 120 kilometres from the city of Frankfurt and Stockholm Skavsta Airport in Sweden is 100 kilometres from the city of Stockholm. A similar approach has been taken by some airports serving tourist destinations. Pajala-Ylläs Airport is an airport located in the Swedish municipality of Pajala but provides access to the ski and mountain resort of Ylläs, which is 85 kilometres from the airport and is actually located in Finland.

Airports are not only named after places. Some, especially those serving tourist destinations have had natural or man-made attractions incorporated into their name. Lakselv North Cape Airport in Norway includes 'North Cape' which is a steep cliff that is often referred to as the northernmost point of Europe. Rovaniemi Santa Claus Airport in Finland includes 'Santa Claus'. In 2011, Bardufoss Airport in Norway changed its name to Bardufoss Snowman International Airport as part of a major development to attract more tourists to the region. The rebranding of Bardufoss Airport also included use of the word 'international' in the airport name in order to emphasise the ability of the airport to cater for international passengers. A reference to the size or scope of services available at the airport is often included in the name of airports and some examples include: George Bush 'Intercontinental' Airport in the USA, Vienna 'International' Airport in Austria, Leros Island 'National' Airport in Greece, Asheville 'Regional' Airport in the USA, Arar 'Domestic' Airport in Saudi Arabia, Orlando 'Executive' Airport in the USA, Homestead 'General Aviation' Airport in the USA, Jean 'Sport Aviation' Centre in the USA and Mt Hawley 'Auxiliary' Airport in the USA.

Naming an airport after a famous person, especially someone that has died in unusual circumstances such as by assassination has been common in the past but seems to have grown in popularity in recent years. The person is often associated with the area served by the airport and examples are typically associated with royalty (e.g. King Abdulaziz International Airport in Saudi Arabia is named after King Abdul-Aziz; the first monarch of Saudi Arabia), political leaders (e.g. John F. Kennedy International Airport in the USA was named after US President John F. Kennedy shortly after he was assassinated in 1963), and/or revolutionaries (e.g. Veer Savarkar International Airport in India is named after the Indian freedom fighter Vinayak Damodar Savarkar).

There is also a category of what is referred to in this paper as 'other famous persons'. This category includes religious icons or mythical gods (e.g. John Paul II International Airport Kraków Balice in Poland is named after Pope John Paul II while Quetzalcóatl International Airport in Mexico is named after Quetzalcoatl from the Aztec religion who was a benefactor god, considered a leader among the deities, that would return after his departure to take back the empire), entertainers (e.g. Bob Hope Airport in the USA is named after the British-born American comedian and actor Bob Hope), aviators (e.g. Halim Perdanakusuma Airport in Indonesia is named after the Indonesian aviation Halim Perdanakoesoema who became lost in a storm in the Malacca Strait in 1947), sporting starts (e.g. George Best Belfast City Airport in Northern Ireland is named after the footballer George Best), and legends (e.g. Robin Hood Airport Doncaster Sheffield in the UK is named after the legend of Robin Hood).
There is another category of airport names that is difficult to define and is referred to in this paper as 'other' brand names. Most of them could be grouped as names of historical importance even though they refer to different aspects such as music (e.g. Linz Blue Danube

Airport in Austria is named after the Blue Danube waltz that was written and composed by Johann Strauss II in 1866) or massacre (e.g. Sétif International Airport 08 May 1945 in Algeria is named after the date of the Sétif massacre).

The array of slogans used by airports is just as diverse as the names used and, while it is not easy to identify a clear typology of slogans, they can generally be divided according to whether they reflect the size or scope of services on offer at the airport (e.g. Barkley Regional Airport: 'Your connection to the world'), the general location or access provided by the airport (e.g. Halifax Stanfield International Airport 'You have landed at Nova Scotia' or Cheddi Jagan International Airport: 'The gateway to South America'), product/service characteristics of the airport or area(s) served by the airport (e.g. Singapore Changi Airport: 'The feeling is first class' or Ivalo Airport: 'Airport for wilderness and trekking'), some kind of strategic message (e.g. Baghdad International Airport 'Working for prosperous Iraq'), or some kind of play-on-words (e.g. Fort Wayne International Airport: 'A whole new altitude').

The play-on-words category of slogans includes airports that make use of a famous slogan that is often associated with the area served by the airport. Liverpool John Lennon Airport is named after assassinated musician and peace activist from Liverpool, John Lennon. The airport uses the slogan 'above us only sky' which is taken from his classic hit song 'Imagine'. Another example is with the slogan 'Pure dead brilliant', which is a popular Glaswegian colloquialism adopted by Glasgow Prestwick Airport in 2005. Including the word 'dead' in the airport proved highly controversial and the slogan was greeted with a fair degree of criticism.

There are other elements of airport branding that, in addition to the name and slogan, allow airports to create distinctiveness and add tangible cues to what is essentially an intangible service. Paternoster (2008) investigates how customer service contributes to airport branding. Butot and Jones (2003) provide the example of how Copenhagen Airport in Denmark has created a Tivoli Bar inside the airport that represents the popular Tivoli Gardens leisure park in the city. Graham (2003) provides the example of the airport operator BAA using a particular style of signposting, colour scheme, and interior design to enhance commonality and consistency across all of its airports in the UK. Graham (2003) also mentions the use of logos and designs on promotional information and within the terminal itself.

A logo can represent certain values but also help to foster brand awareness because of its impact on customers' recall or experience when they think of a specific symbol (Simeon, 2006). Chhatrapati Shivaji International Airport in India uses a logo with a peacock feather inscribed within it that is meant to represent the countries heritage and value and reflect India's vibrant and colourful city.

The main focus of this study is on the use of names and slogans at airports; however, the study will also investigate the extent to which logos are used by airports. The study does not investigate the meanings behind different types of logo that are used, nor does it investigate other elements of airport branding such as the contribution of customer service or the use of particular styles of signage, colour or design. The meaning of logos and the use of other elements can only really be investigated through conducting airport surveys or in-depth interviews.

This study investigates the use and nature of airport brand names and slogans, and the use of airport logos, according to information available on airport websites (using content analysis). This will help to understand how widespread the practice is and the nature of that practice in terms of the types of names and slogans used by airports. It is also worth noting that this study focuses largely on the supply-side of airport branding. It is sometimes debated as to whether airports are in fact considered as brands (Bates, 2010) or whether there is any competitive advantage to be gained from airport branding (Graham, 2003). Investigating such issues is beyond the remit of this study.

Of course, every airport needs to be marketed in its own way due to unique features of the airport and the business environment within which it operates. The use and nature of brand names and slogans, and the use of logos, may vary according to where the airport is geographically located due to differences in business environments but also because of the diversity in tradition and culture across the world. It may vary according to airport size because the marketing focus and efforts of an airport may change once an airport gets to a certain size (Graham, 2003). It may also vary according to corporate governance structure of an airport because this has been found to affect the extent to which an airport is market-orientated (Halpern and Pagliari, 2007). The latter is of particular interest given that the nature of airport ownership and operation has undergone something of a transformation in recent years; moving gradually from a regulated and public controlled activity towards a liberalised and commercially-oriented activity and there is now a diversity of corporate governance structures at airports (e.g. see ACI, 2010a). This transformation has implications for how airports are owned and operated, and the degree of autonomy and resources available to them (Graham, 2003).

Factors that may affect the use and nature of brand names and slogans, and the use of logos at airports will be investigated in this study, especially according to where an airport is geographically located, the size of the airport, and the corporate governance structure of the airport.

3. Methodology

Content analysis allows researchers to empirically examine the characteristics of messages, expose hidden connections among concepts, reveal relationships among ideas and inform the decision-making process (Thayer et al., 2007). It is an established social science methodology concerned broadly with the objective, systematic, and quantitative description of the content of communication (Baran, 2002). This study uses content analysis of airport websites in order to develop a database of airport brand names and slogans, and whether or not a logo is used.

ACI's membership database was used as the sampling frame for the study. The database is publicly available on the Internet and as of 31 March 2011, the database included information for 1562 airports including links to airport websites which were then used to conduct the content analysis. Data for each airport was entered into data analysis software (PASW Statistics 18). A monitoring (observation) process was applied while collecting data without any attempt to control or manipulate any of the variables. The human coder system was

chosen rather than computer aided analyses of content and all reasonable precautions were taken to ensure the correct entry of data including the maintaining of inter-coder reliability between two researchers.

According to Thayer et al. (2007), content analyses often encompass two types of content units; unit of analysis and unit of observation. The unit of observation is examined using two measurement methods; deductive measurement and inductive measurement. Deductive measurement requires the development of specific coding categories before a researcher starts a content analysis while inductive measurement supports the practice of emergent coding, which means that the basic research question or hypothesis for a formal content analysis emerges from the unit of observation. This study is primarily based on deductive measurement in that specific coding categories were identified for most variables before conducting the analysis. For instance, coding categories for brand names are identified, to a large extent, from anecdotal evidence provided in the background to this paper.

A summary of brand name categories used in this study is provided in Table 1. Slogans and logos were not coded into categories because it is often difficult to understand the meaning behind them and it is therefore difficult to accurately assign them to one particular category. However, airports were given a code according to whether they have a slogan or logo, or not. Slogan and logo variables were further dichotomised according to whether the slogan or logo is unique to the individual airport or whether it is used for a group of two or more airports.

Table 1: Categories of brand name

Categories	Sub-categories	Examples
Place	Country, city-state, administrative region	Malta International Airport
	Region	Sunshine Coast Airport
	City, town, village	Melbourne Airport
	Multiple cities, towns, villages	Oslo Gardermoen Airport
Attraction	Natural attraction	Lakselv North Cape Airport
	Man-made attraction	Bardufoss Snowman International Airport
Size or scope of services	International	Vienna International Airport
	National	Leros Island National Airport
	Regional	Asheville Regional Airport
	Domestic	Arar Domestic Airport
	Executive	Orlando Executive Airport
	Other	Page Field General Aviation Airport
Famous person	Royalty	King Abdulaziz International Airport
	Political leader/revolutionary	Indira Gandhi International Airport
	Other	Bob Hope Airport
Other	None	Linz Blue Danube Airport

Variables were also needed for where the airport is geographically located, airport size, and corporate governance structure of the airport. Categories used to create these variables were taken from categories that are already used by ACI and are summarised in Table 2. During the analysis, there were too few counts for some of the categories of airport size and corporate governance structure so variable categories were reduced. For airport size, airports were dichotomised between 'smaller airports' (airports that serve less than five million passengers) versus 'larger airports' (airports that serve five million or more passengers). For corporate governance structure, airports were dichotomised between

'public airports' (airports that are publicly owned and operated) versus 'private airports' (airports that are publicly or privately owned and operated by partial or full private interests).

Data were analysed using frequency analysis on airport names, slogans and logos. Pearson's Chi-Square test was used to investigate use of airport names, slogans and logos according to geographic location of the airport, airport size and corporate governance structure of the airport. Pearson's chi-square is a statistical test that is commonly used to investigate whether distributions of categorical variables differ significantly from one another and it does so by comparing differences between observed and expected values, and the extent to which those differences are the result of chance. The test produces a chi-square value (χ^2) and degrees of freedom (*df*). The more degree of freedom, the larger the chi-square value that is needed to achieve statistical significance. Statistical significance is indicated by the *p* value. A *p* value of less than 0.05, in percentage terms, means that there is less than a 5 percent probability that the difference is the result of chance. A value of less than 0.05 is generally considered by researchers to be an acceptable level of significance and means that the null hypothesis (when there is no significant difference) can be rejected.

Table 2: Categories for other variables

Variable	Categories
Geographic location	Africa Asia-Pacific Europe Latin America/Caribbean Middle East North America
Airport size	Group 1 (25 million or more passengers per annum) Group 2 (10 to <25 million passengers per annum) Group 3 (5 to <10 million passengers per annum) Group 4 (<5 million passengers per annum)
Corporate governance structure	Publicly owned and operated by an airport operator as part of the administration Publicly owned and operated by a corporatized airport operator Mixed public-private ownership and operated by an airport operator with the public sector owning a majority share Mixed public-private ownership and operated by an airport operator with the private sector owning a majority share Mixed public-private ownership and operated by an airport operator with equal ownership between public and private sectors Publicly or privately owned and operated as a concession or BOT (build operate transfer) project Fully privatised and corporatized airport owner and operator

4. Findings

The findings of this study are presented in two parts. The first part provides analysis of the use of airport brand names, slogans and logos at 1562 airports worldwide including differences according to geographic location of the airport. The second part provides a more detailed analysis of the use of airport brand names and slogans at 451 airports in Europe according to airport size and corporate governance structure of the airport. Focus on one geographic region for the second part of the analysis was guided largely by the availability of data. Data was available on European airports in terms of airport size (from ACI-Europe, 2010b) and corporate governance structure (from ACI-Europe, 2010a). Comparable data is not readily available for airports in other world regions.

4.1. Analysis of airports worldwide

Table 3 provides a frequency analysis of airport brand name categories. 80.0% of the 1562 airports in this study are named after at least one place with the majority (75.4% of all airports) being named after a city, town or village. 20.0% of airports are not named after a place. 'Non-place' names are particularly common for airports in Latin America/Caribbean where 42.9% of airports in that region are not named after a place. Instead, they tend to be named after a famous person (e.g. Augusto C. Sandino International Airport in Nicaragua is named after Nicaragua's national hero, Augusto César Sandino). Naming an airport after the size or scope of services available is also popular (43.4% of airports have done this) and this is always in addition to, as opposed to in place of, an existing name. Table 3 highlights a number of regional differences. In particular, naming an airport after multiple regions and natural attractions is particularly common in Europe, after size or scope of services and royalty is particularly common in the Middle East, and after political leaders/revolutionaries is particularly common in Latin America/Caribbean.

Pearson's Chi-Square was performed on airport brand name categories by region. Five categories were included in the analysis (non-place, multiple places, attraction, services, and famous person). The 'other' category in Table 3 was not included on the basis that there were too few cases. Each category was dichotomised by 'yes' or 'no', depending on whether that category of brand name is present at an airport or not (see Table 4). The full range of sub-categories listed in Table 3 was not included because some of the cells would not have had the expected minimum count for Pearson's Chi-Square. Significant differences between regions were found for each of the five brand categories ($p < 0.05$) meaning that there were significant differences between regions according to whether they were branded after the name of a place, attraction, scope of services or famous person

Table 3: Proportion of airports (%) in each region that use each brand name category

	Region						
Category	**Africa**	**Asia-Pacific**	**Europe**	**Latin Am. /Carib.**	**Middle East**	**North America**	**Total**
Place	**84.9**	**77.5**	**89.8**	**57.1**	**78.3**	**76.0**	**80.0**
-Country	*1.1*	*2.4*	*0.9*	*0.7*	*3.3*	*0.0*	*1.0*
-Region	*3.0*	*4.0*	*3.3*	*3.3*	*1.7*	*10.9*	*5.2*
-City, town, village	*81.4*	*71.9*	*88.9*	*53.9*	*73.3*	*66.7*	*75.4*
-Multiple places (2 or more)	*11.4*	*12.5*	*27.3*	*3.9*	*1.7*	*9.4*	*14.5*
Attraction	**3.8**	**11.2**	**14.0**	**8.4**	**6.6**	**7.3**	**9.3**
-Natural attraction	*2.3*	*10.4*	*13.1*	*5.8*	*3.3*	*5.2*	*7.8*
-Man-made attraction	*1.5*	*0.8*	*0.9*	*2.6*	*3.3*	*2.1*	*1.5*
Services	**40.5**	**47.4**	**16.8**	**63.6**	**85.0**	**59.4**	**43.4**
-International	*39.4*	*47.4*	*12.2*	*63.0*	*53.3*	*44.8*	*37.0*
-National	*1.1*	*0.0*	*4.0*	*0.0*	*0.0*	*3.7*	*2.2*
-Regional	*0.0*	*0.0*	*0.0*	*0.6*	*8.3*	*7.0*	*2.1*
-Domestic	*0.0*	*0.0*	*0.0*	*0.0*	*21.7*	*0.0*	*0.8*
-Executive	*0.0*	*0.0*	*0.0*	*0.0*	*1.7*	*1.6*	*0.5*
-Other	*0.0*	*0.0*	*0.6*	*0.0*	*0.0*	*2.3*	*0.8*
Famous person	**14.8**	**13.3**	**10.4**	**42.2**	**16.7**	**27.9**	**19.3**
-Royalty	*1.9*	*4.4*	*0.9*	*2.0*	*10.0*	*0.0*	*1.9*
-Political leader/revolutionary	*9.5*	*4.0*	*3.5*	*23.4*	*5.0*	*14.0*	*9.2*
-Other	*3.4*	*4.8*	*6.0*	*16.9*	*1.7*	*13.8*	*8.2*
Other	**0.7**	**0.8**	**0.0**	**1.3**	**0.0**	**1.0**	**0.7**
Number of airports	**264**	**249**	**451**	**154**	**60**	**384**	**1562**

Table 4: Pearson's Chi-Square outputs for brand name category by region

	Region (% airports with each brand category)							
Brand category	**Africa**	**Asia-Pacific**	**Europe**	**Latin America/ Carib.**	**Middle East**	**North America**	**Total**	**Chi-Square outputs**
Non-place	15.1	22.5	10.2	42.9	21.7	24.0	20.0	X^2=155.456, df=10, p=0.000
Multiple places	11.4	12.5	27.3	3.9	1.7	9.4	14.5	X^2=92.187, df=5, p=0.000
Attraction	3.8	11.2	14.0	8.4	6.6	7.3	9.3	X^2=24.630, df=5, p=0.000
Services	40.5	47.4	16.8	63.6	85.0	59.4	43.4	X^2=239.733, df=5, p=0.000
Famous person	14.8	13.3	10.4	42.2	16.7	27.9	19.3	X^2=102.505, df=5, p=0.000

Figure 1 illustrates the use of airport slogans by region. Only 13.0% of the 1562 airports in this study use a slogan; 10.1% for the airport itself, 2.9% for a group of two or more airports. The low proportion suggests that airports do not generally include the use of slogans as part of their branding activities. However, readers should note that the findings of this study are based only on content analysis of airport websites. This means that there may be more airports that use slogans but do not publish them on their website. The use of slogans is very

much a North American phenomenon with over a quarter of airports in that region (27.4%) using slogans. 14.5% of airports in Europe use slogans and 8.8% of airports in Asia/Pacific. Outside of those three regions, the use of slogans is scarce; Middle East 5.0%, Latin America/Caribbean 4.5%, and Africa 0.4%. Pearson's Chi-Square was performed on the use of airport slogans by region and the slogan category was dichotomised by yes or no, depending on whether a slogan is used by an airport or not. The difference between regions is significant because the use of slogans is very much a North American phenomenon followed by Europe and Asia Pacific regions; however the use of slogans is scarce in remaining world regions.

Figure 2 illustrates the use of airport logos by region and shows that the use of logos is widespread. 96.2% of the 1562 airports in this study use a logo; 31.5% for the airport itself, 64.7% for a group of two or more airports. Significant differences exist between regions although the differences are fairly small and the proportion of airports using a logo is high in all world regions. All of the Middle East airports use a logo and almost all of the airports in Europe (99.6%), North America (98.7%), Asia/Pacific (97.2%), and Latin America/Caribbean (94.8%) use a logo. The proportion in Africa is much lower than for other world regions (85.9%) but is still a high proportion. Readers should note that, as with airport slogans, the findings are based only on content analysis of airport websites. This means that there may be more airports that use logos but do not publish them on their website.

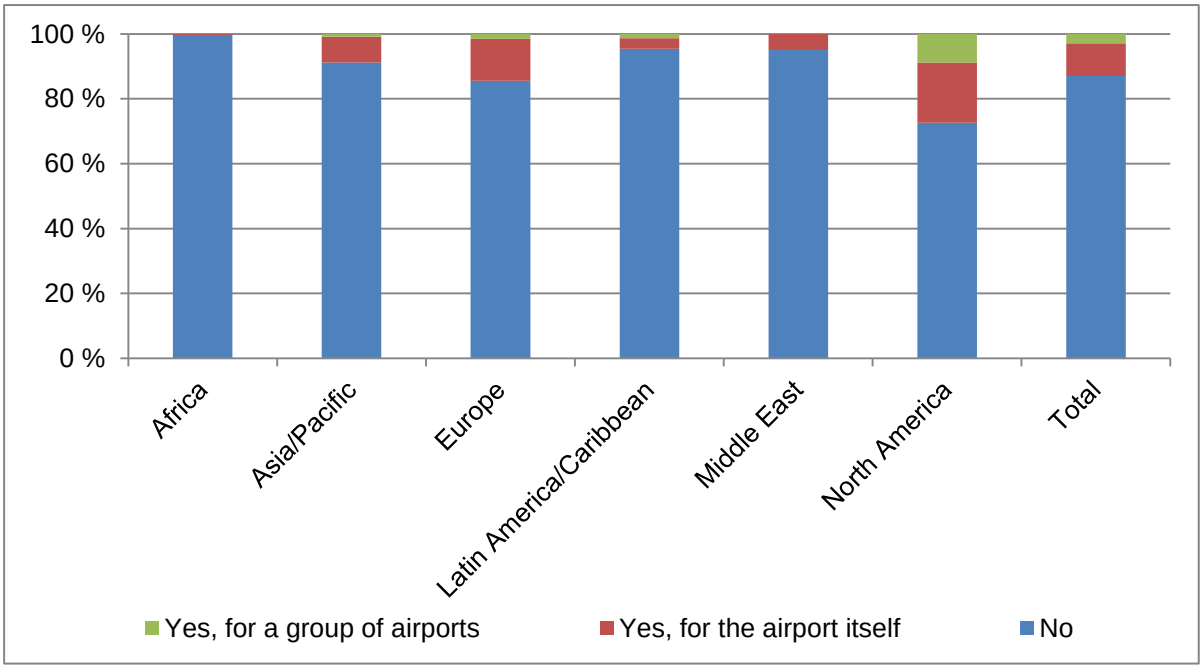

Figure 1: Use of airport slogans by region

Pearson's Chi-Square (categories yes/no by region): $X^2=124.811$, df=5, p=0.000.

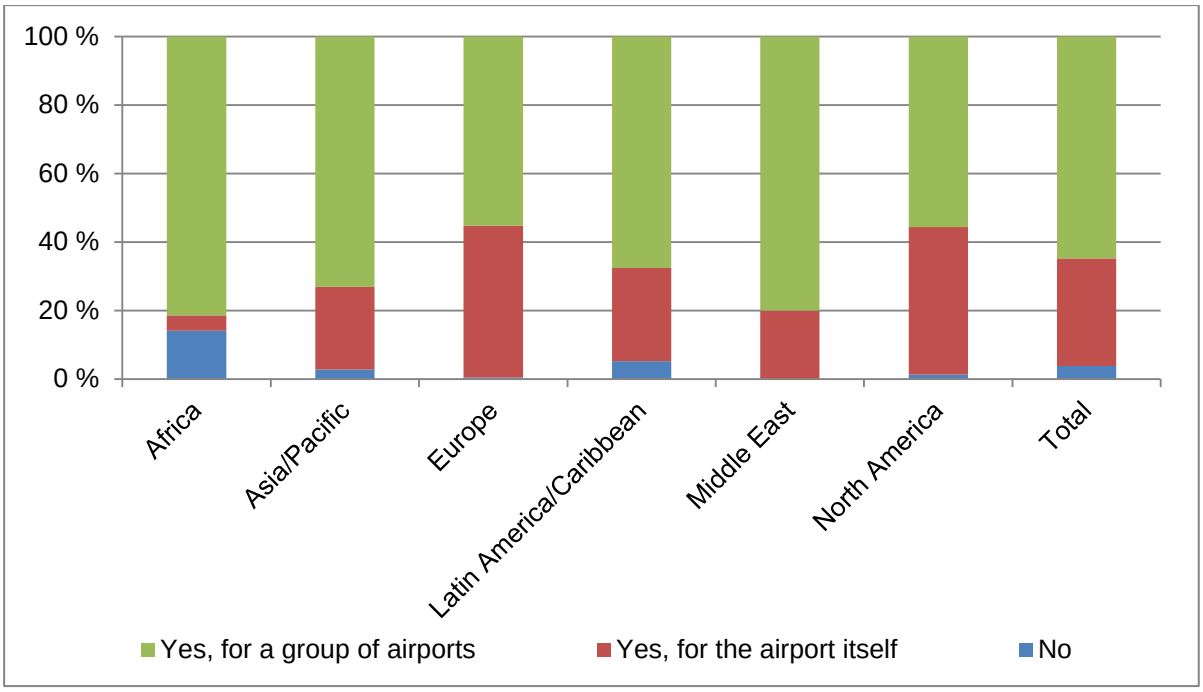

Figure 2: Use of airport logos by region
Pearson's Chi-Square (categories yes/no by region): X^2=100.589, df=5, p=0.000.

4.2. Analysis of airports in Europe

Of the 451 airports in Europe, 63.2% of the 451 airports in Europe are named after one place. 36.8% are what might be considered as being 'branded' (named after multiple places, an attraction, size or scope of services, a famous person, or some other aspect). From Figure 3, it can be seen that the most common way of branding is to name the airport after multiple places (27.3% of the 451 airports in Europe do this). 25.7% of airports have just one additional place name, 1.3% are named after three places, and one airport (0.2%); East Midlands Airport Nottingham Leicester Derby, is named after four places. Naming an airport after the size or scope of services available is also popular; 16.8% of European airports do this. 14.0% are named after a natural or man-made attraction, 10.4% after a famous person and one airport (0.2%); Linz Blue Danube Airport is named after some other aspect which in this case is the Blue Danube waltz.

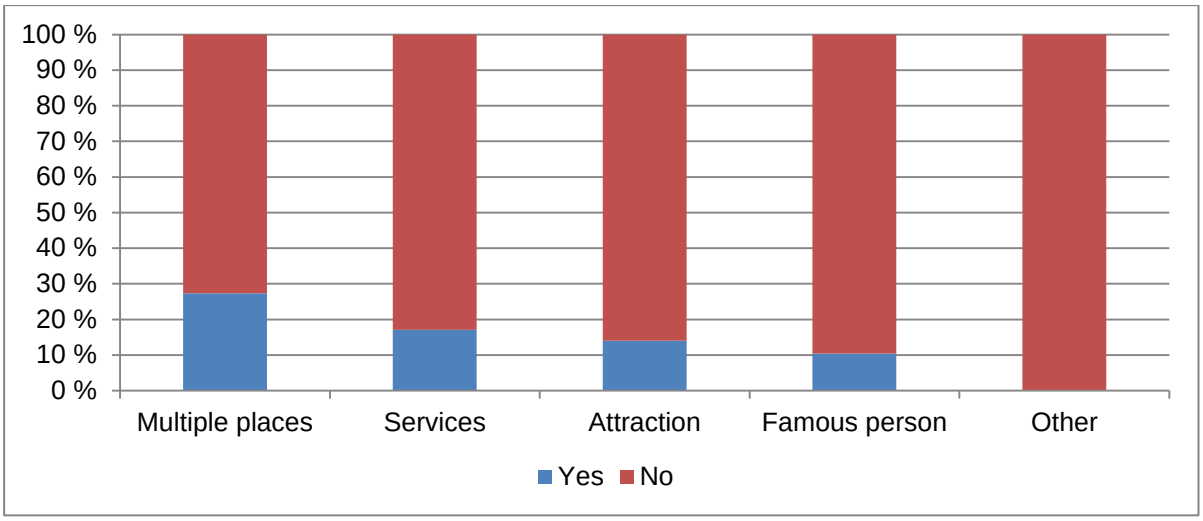

Figure 3: Brand categories used by airports in Europe

Table 5: Distance from airports to their nearest main city or town

Distance (Kms)	Number of airports	Valid airports (%)	Cumulative airports (%)
1-10	300	66.5	66.5
11-20	94	20.8	87.4
21-30	27	6.0	93.3
31-40	15	3.3	96.7
41-50	6	1.3	98.0
51-60	3	.7	98.7
61-70	1	.2	98.9
71-80	1	.2	99.1
91-100	2	.4	99.6
100+	2	.4	100.0
Total	**451**	**100.0**	

The multiple places category is interesting. Airports in this category typically name themselves after a local place and then another place that is almost always the nearest 'main city or town'. Data was gathering on airport proximity to the main city or town in the airport name of all airports in Europe. The average distance for the 451 airports is 12 kilometres but this varies by airport (see Table 5). 26.8% of airports with multiple place names are 21 kilometres or more from the nearest main city or town compared to just 7.3% of airports with a single place name and the difference between groups is significant (see Figure 4).

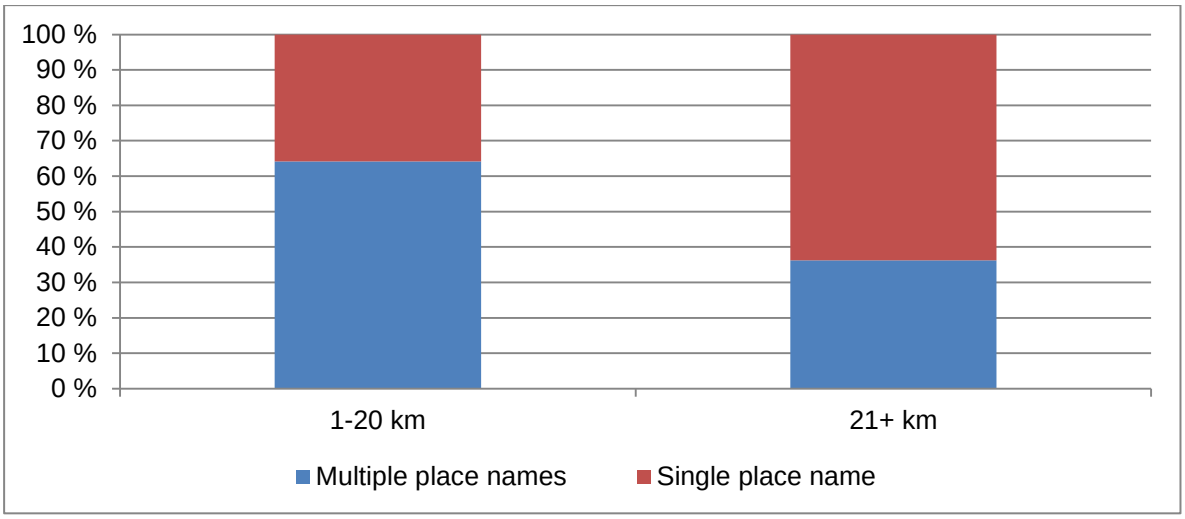

Figure 4: Distance from airports to the nearest main city or town in their name according to whether the airport has a single place name or multiple place names

Pearson's Chi-Square (categories 1-20 km/21+ km by single place/multiple place): X^2=30.846, df=1, p=0.000.

Further analysis was also conducted on airports that name themselves after the size or scope of services available because during the content analysis and data entry phase of this study, it appeared to be the larger airports that named themselves after the size or scope of services available, normally using the word 'international' in their name. Pearson's Chi-Square finds that a significantly higher number of larger airports name themselves after the size or scope of services available compared to smaller airports (see Table 6). Note that the total number of airports in Table 6 is less than the sample size of 451 airports in Europe. This is because passenger data was not available for 179 airports in the sample.

Table 6: Use of the services brand category according to airport size

Use the services category	Number of airports according to airport size (passengers p/annum) Group 1 (25mn+)	Group 2 (10-<25mn)	Group 3 (5-<10mn)	Group 4 (<5mn)	Total
Yes	0	9	8	23	40
No	13	17	26	176	232
Total	**13**	**26**	**34**	**199**	**272**

Pearson's Chi-Square (categories yes/no by groups 1-3/group 4): X^2=5.858, df=1, p=0.016.

The significance of differences between branded airports (e.g. those with a yes for any of the categories in Figure 3) and non-branded airports (i.e. those with a no for all of the categories in Figure 3) according to airport size and corporate governance structure was investigated using Pearson's Chi-Square. No significant differences were found (see Figure 5).

Of Europe's 451 airports, 14.4% of Europe's 451 airports use a slogan. The significance of differences between airports that use and do not use a slogan according to airport size and corporate governance structure was investigated using Pearson's Chi-Square. There is no significant difference according to airport size. However, there is a significant difference according to corporate governance structure with a significantly higher use of slogans by airports that are publicly or privately owned but operated by partial or private interests compared to airports that are publicly owned and operated (see Figure 6).

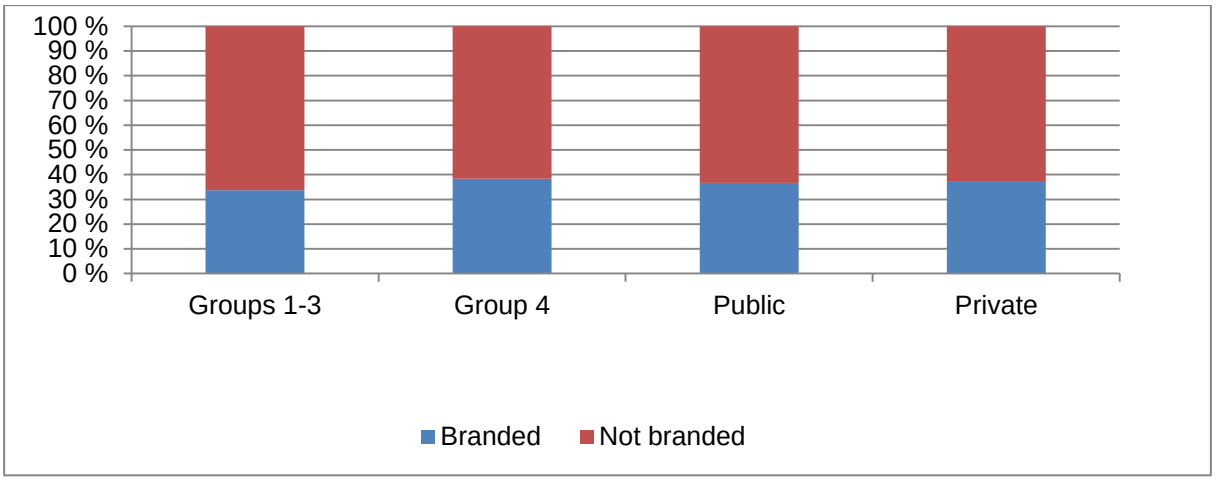

Figure 5: Branded airports according to airport size and corporate governance structure

Pearson's Chi-Square (categories branded/not branded by groups 1-3/group 4): X^2=0.516, df=1, p=0.472.
Pearson's Chi-Square (categories branded/not branded by public/private): X^2=0.005, df=1, p=0.944.

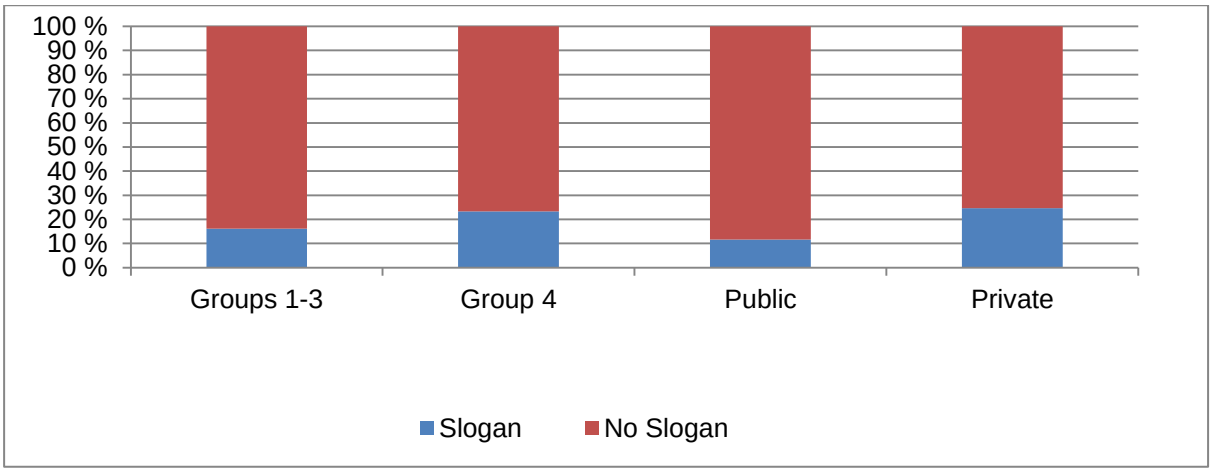

Figure 6: Use of slogans according to airport size and corporate governance structure

Pearson's Chi-Square (categories slogan/no slogan by groups 1-3/group 4): X^2=1.878, df=1, p=0.171.
Pearson's Chi-Square (categories slogan/no slogan by public/private): X^2=10.690, df=1, p=0.001.

No further analysis was conducted on the use of logos by airports in Europe because of the high level of use (and therefore low number of airports that do not use a logo). 99.6% of Europe's 451 airports use a logo. As can be seen in Figure 2, the majority of airports in Europe (55.2%) use a logo that belongs to a group of two or more airports, 44.4% of airports in Europe use their own individual logo.

5. Conclusion

This study conducted content analysis of websites for 1562 airports worldwide using ACI member airports as the sampling frame. The findings are presented in two parts. The first part provides analysis of the use of airport brand names, slogans and logos at 1562 airports worldwide including differences according to geographic location of the airport. The second

part provides a more detailed analysis of the use of airport brand names and slogans at 451 airports in Europe according to airport size and corporate governance structure of the airport.

The study finds that over three quarters of airports worldwide are named after a single place. A fifth of world airports are not named after a place and this is particularly common for airports in Latin America/Caribbean where almost half of airports in that region are not named after a place. Instead, they tend to be named after a famous person, especially a political leader/revolutionary. Almost half of airports worldwide name their airport after the size or scope of services available, and this is always in addition to, as opposed to in place of, an existing name. Significant differences exist between world regions. Naming an airport after multiple regions and natural attractions is particularly common in Europe, after size or scope of services and royalty is particularly common in the Middle East, and after political leaders/revolutionaries is particularly common in Latin America/Caribbean.

Only 13% of world airports use a slogan. However, significant differences exist between world regions. The use of slogans is very much a North American phenomenon with over a quarter of airports in that region using slogans. Approximately one in ten airports in Europe and Asia/Pacific use slogans however, the use of slogans is scarce in remaining world regions. In fact the results appear to support a priori assumptions that the use of slogans is more prevalent in more competitive and privatised airport markets. Almost all airports worldwide use logos and while significant differences exist between world regions, the differences are fairly small and the proportion of airports using a logo is high in all world regions.

A more detailed analysis of European airports reveals a trend for naming an airport after multiple places; over a quarter of airports in Europe do this. The name usually includes a local place name and the name of the nearest ‘main city or town’. Average distance from European airports to the main city or town in the airport name is 12 kilometres but airports are up to 120 kilometres from the main city or town in their airport name.

Almost a fifth of airports in Europe name themselves after the size or scope of services available at their airport, in addition to an existing name. A significantly higher number of larger versus smaller airports do this. Otherwise, the use of airport names does not vary between airports in Europe according to airport size or corporate governance structure.
Almost 15% of airports in Europe use a slogan. The use of slogans does not vary significantly according to airport size. However, there is a significant difference according to corporate governance structure with a significantly higher use of slogans by airports that are owned or operated by partial or private interests compared to airports that are publicly owned and operated.

The findings of this study are based only on content analysis of airport websites. This means that there may be more airports that use slogans and logos but do not publish them on their website. Also, airport names on websites may not reflect the registered name of the airport or any names that are used in the marketing activities of an airport. The scope of this study was to try and understand how widespread the practice of airport branding is, and the nature of that practice, especially in terms of the types of names and slogans used by airports. It would be interesting to conduct a similar study, but on a more broad range of aspects associated with airport branding such as the meaning of slogans and logos, the use of other elements of

airport branding, and the processes involved in branding an airport. These issues could only really be investigated through conducting airport surveys or in-depth interviews.

The more detailed analysis in this study is limited to European airports and this was due largely to difficulties in accessing comparable data on airport size and corporate governance structure for airports in other world regions. This is a limitation of the study but also an opportunity for future research. Also, the sampling frame of airports in this study is limited to member airports of ACI.

The findings of this study contribute to literature on the branding of airports from a supply-side perspective. As has already been mentioned, it would be interesting for future studies to investigate the full range of branding activities but also the value that airports derive from branding. It would also be interesting to investigate airport branding from a demand-side perspective. For instance, what are consumer opinions about airport brands? In this context, it is important to note that consumers are not just passengers that use the airport but also airlines and other businesses. Other issues relating to the potential impacts of rebranding and its ability to improve an airport's competitive advantage are not covered in this study. These issues are still debatable, for instance when the name of Nottingham East Midlands Airport was changed to East Midlands Airport - Nottingham, Leicester, Derby, it was argued and defended by bosses of the airport authority at that time that name change was necessary to enable foreign travellers to identify where the airport was, with Nottingham being the best known city in the East Midlands. Despite fierce criticism of the new name, passenger figures increased year on year, and the airport won the accolade of Best UK Airport in 2005 since the name change (Theguardian, 2006). Similarly Bristol Airport in the UK claimed that high customer satisfaction level was obtained, with 84% of passengers 'likely' or 'very likely' to use Bristol Airport again and 87% of those surveyed were 'likely' or 'very likely' to recommend the airport to others according to Pragma Market Research (2011, August) after it introduced the slogan "Amazing Journeys Start Here".

Despite this, there also seems to be an argument that for most destinations, rebranding is out of the question because the destination's core appeals are unlikely to have changed significantly in visitors' eyes because it is difficult to truly understand how visitors and potential visitors perceive the destination. No real evidence was covered by this study on the effects of branding on an airport's market appeal to both passengers and airlines. This would be a good topic for future research.

As principal management implications, the paper demonstrates the nature and widespread use of airport names worldwide as well as the nature and limited use of airport slogans worldwide. It also identifies regional differences in the nature and use of airport names and slogans. It provides a typology of airport names and slogans worldwide that airport managers can use to inform their own branding decisions.

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Paper IV

Content Analysis of European Airport Websites

Content Analysis of European Airport Websites

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Published in "Journal of Air Transport Management", 26 (2013), 8-13.

Abstract

This study uses content analysis to investigate the types of information provided on 451 European airport websites. Airport site maps are also analysed to investigate differences in website size and structure. The study finds that content on passenger services and information has the greatest presence on airport websites. Content on aviation related business areas and corporate communications also has a high presence. Content on non-aviation related business areas is less common, especially at smaller airports and at airports that are publicly owned or operated. The average number of pages on airport websites is 52, and on a hierarchy of between one to four levels. The average number of pages is significantly higher at larger airports, airports that are owned or operated by private interests, and airports located in countries with higher rates of Internet penetration.

Keywords: content analysis, online communication, website hierarchy, European airports.

1. Introduction

Internet use has grown dramatically in recent years. This has provided airports with a new means of communicating with target markets, normally via a corporate website. Most airports now have their own website or at least have a dedicated page on the website of their owner.

Two types of studies have dominated how websites are analysed (Hasley and Gregg, 2010); those that investigate factors associated with website success (e.g. Liu and Arnett, 2000) and those that investigate the types of information provided (e.g. Perry and Bodkin, 2000). Bartell (2005) evaluates website usability of 214 commercial service airports in the U.S. The study is focused largely on issues relating to website design and how this might affect success and usability of the site. There are also a number of similar studies from other sectors of the aviation industry, especially the airline sector (e.g. Harison and Boonstra, 2008; Shchiglik and Barnes, 2004). As far as the authors are aware, no studies have examined what information airport websites actually contain.

The study investigates the types of information provided by airports for different types of customer on their website. The purpose is to identify the main objectives of contemporary airport websites whether the focus of that content is on aviation related or non-aviation related or others. This study also investigates website size and structure to see if differences exist between airports.

2. Background

Use of the Internet has more than doubled worldwide during the last five years; increasing from 1,151 million users by 2006 to 2,421 million by 2011 (ITU, 2012). In Europe alone, there were over 500 million users by 2011, representing 61% of the population (Internet World Stats, 2012). This has provided opportunities for airports to use the Internet as a means of communication and along with emails, texts and social networking sites, websites are now routinely used by airports to communicate and conduct business with their customers around the world (Bates, 2010). 94% of world airports now have their own website or feature on a corporate website of some kind (Halpern, 2012).

2.1 Types of information provided by airport websites

Traditionally, the main focus of airport websites has been on Business-to-Consumer (B2C) communications by offering online information for passengers (e.g. about flight information, travel to/from the airport and passenger services and facilities at the airport). This is still an important function for airport websites given that they increasingly represent the first opportunity for an airport to make a positive impression, and facilitate good customer service, starting from when the passenger is surfing the Internet at home (Thurling in Twentyman, 2010).

Airport websites have traditionally 'pushed' information to passengers. However, "they also offer an outstanding opportunity to sell a whole range of services directly through a fast, convenient channel (Twentyman, 2010; p47)." SITA (2009) found that 24% of airports were already using their web presence to sell directly to customers; a further 18% were planning to do so by the end of 2010. Airport websites also have the opportunity to support the distribution of services offered by their airlines, travel trade partners and concessionaires by offering hyperlinks to booking pages on other websites. Bristol Airport in the UK sells car parking, executive lounge access, and fast-track security directly on their website. Their website also provides hyperlinks to other websites where passengers can book flights and holidays, car rental, foreign currency, local accommodation, dedicated airport taxi services, baggage wrapping, and airport porter services. Passengers can also go online to pre-order Tax and Duty Free shopping from the airport with World Duty Free and collect and pay for the shopping when they arrive at the airport.

Airports have Business-to-Business (B2B) relationships with airlines and have traditionally used their websites to provide technical information about the airport and its operational capabilities. This includes at airports offering General Aviation services where the relationship may be B2B or B2C. Increased deregulation in the airline industry and competition between airports has meant that airports are increasingly market-driven and have become particularly proactive in route development, offering information on their catchment area and potential demand, airport charges, and incentive schemes to attract new services and grow or retain existing services (Halpern, 2010). This is important given that airport websites, along with other sources of information, are increasingly used by airlines and tour operators when investigating possible opportunities for route development (Lavelle, 2012; Halpern, 2012).

Evolution of the airport industry has also witnessed an increased commercial-orientation that extends beyond passengers and airlines. Information and services are increasingly provided for non-travelling airport users such as local residents or businesses, workers at the airport, tourists and aviation enthusiasts, and so-called 'meeters and greeters' (Jarach, 2001). Other new areas of business activity that are pursued by airports, and are largely non-aviation related, include offering advertising opportunities at or around the airport, consultancy services (e.g. on airport retail or planning and development), property development and real estate services, tendering and procurement services, cargo and logistics services, and meetings facilities (e.g. business centres and infrastructure and services for meetings, incentives, conferences and events). 36% of the 154 airports surveyed by Halpern et al. (2012) own and have meetings facilities available for hire and promote them on their airport website. Amsterdam Schiphol Airport in Holland has B2B sections on their website for aviation-related business areas in route development, cargo, and travel agency. The website also has B2B sections for non-aviation related business areas in advertising and office rental. Similarly, East Midlands Airport in the UK has B2B sections on their website for aviation development, cargo, retail opportunities, airport advertising, tender opportunities and property.

Public finances are under growing pressure. This, and a general trend towards airport commercialisation, means that private sector involvement in airports is increasing, through the provision of privately financed facilities or the partial or total sale of the airport owner or operator. ACI-Europe (2010) found that over 20% of airports in Europe are already privatised or operated as a Public-Private Partnership. The study also found that airports with private shareholders accounted for almost 50% all passenger traffic at European airports in 2008. In addition, most publicly-owned airports in Europe are now operated as corporatized entities that are managed under normal commercial and fiscal considerations.

Trends towards privatisation and corporatisation mean that there is an increased need for airports to communicate effectively with shareholders and state institutions. Airport websites offer an opportunity to do this, especially with regards to the dissemination of information relating to investor relations. The potential impact of airports, positive and negative, is also of growing importance and there is increased attention on the need for airports to effectively manage their corporate social responsibility (Skouloudis et al., 2012). Airport websites are used for corporate communications with a range of publics in order to maintain good relations and develop goodwill towards the airport (e.g. with customers, shareholders, employees, trade unions, local businesses and members of the general public, community groups, pressure groups, charities, politicians, and the media). The website for Athens International Airport in Greece has a 'press' section that manages online communication operations of the airport. The website also has a section called 'the company' that provides information on the airport company, corporate responsibility (including corporate policy and the airport's code of business conduct, sponsorships, the environment, arts and culture, and events for children), human resources and airport facts and figures.

Growth in the use of social media has allowed airports to use the Internet to interact with users as opposed to simply pushing information or selling a range of services (although social media is used for those purposes too). Airport websites can act as a platform for social media and related online initiatives. The use of social media remains experimental for many airports however most airports expect social media to make a contribution as an additional

communication channel (SITA, 2011). 19% of ACI world airports and 28% of ACI airports in Europe offer access to at least one form of social media via their website (Halpern, 2012). In Europe, 77% of passengers pass through an airport that has a social media presence (ACI-Europe, 2012).

The first part of this study aims to investigate types of information provided by airports, and to different types of customer. Four main categories of content have been identified; B2C in terms of passenger services and information, B2B in terms of aviation and also non-aviation related business areas, and corporate communications that includes information for target markets and all publics that have an interest in the airport.

2.2 Size and structure of airport websites

It could be argued that airport websites have a fair degree of commonality. They are often developed by companies that are up-to-date with current trends in terms of what information should be provided. Such companies may be responsible for a number of airport websites and take a similar approach to the development of each website. Airports may also want to imitate each other's website to avoid losing a competitive advantage. However, anecdotal evidence suggests that there are differences between airports, especially in terms of size and structure. Some are presented on a single page or on multiple pages containing limited information. This seems most common at airports that are publicly owned and operated by a government department, agency or local authority. Ørland Brekstad Airport in Norway is owned and operated by Ørland Municipality. The 'public services' section of the Municipality website has a link to a single page for the airport that provides two paragraphs of text about the location of the airport, recent infrastructure developments, basic technical and operating information, contact details, air service provision, and a link to the airline operator. Similarly, airports in Greece that are publicly owned and operated by the Hellenic Civil Aviation Authority (HCAA) have a dedicated page on the HCAA website. The dedicated page for each airport generally provides a link to six subsequent pages of information under the headings; brief presentation, hours of operation, available services, entities operating at the airport, transportation, and statistical data. Each page offers a few paragraphs of text, at the most.

Other airports offer a vast array of information and hyperlinks that connect to multiple pages on the site or to other sites on the Internet. This seems to be most common at airports that are privately owned and operated. Frankfurt Main Airport in Germany has eight first-level headings from its homepage; flights, direction and parking, transfer, check-in and luggage, shop and enjoy, bookings, business location, and business partners. There are then 56 second-level headings and 169 third-level headings. There are also various links from the homepage (e.g. to passenger assistance, airport maps, services at the airport, news, contact, alternative language options, weather, corporate information, and social media sites).

Industry examples suggest that the size and structure of airport websites may vary according to the way in which an airport is owned and operated. This could be because airports that are owned or operated by private interests tend to be more market orientated and therefore have a greater focus on marketing communications compared to airports that are publicly owned or operated (e.g. see Halpern and Pagliari, 2007). Differences may also exist according to airport size on the assumption that larger airports have broader and deeper customers

compared to smaller airports and therefore have a greater range and depth of information to communicate. Larger airports may also have a larger budget for investment in information technology and telecommunications. Market rates vary. However, based on examples of websites that have been developed for a number of mid-sized regional airports in Europe (with between 1-3 million passengers per annum), it is likely to cost €20-40,000 for an airport to have its own website developed by professionals, with a further €3-6,000 a year in maintenance costs (e.g. for support and the use of a dedicated server to host the website). This is likely to exceed the budget available to smaller airports.

There may also be differences according to the country that the airport is located in given that Internet penetration varies from country to country. Internet penetration is likely to determine how relevant and effective a corporate website is as a means of communication. Internet penetration is generally higher in countries located in Northern or Western Europe compared to countries in Southern and Eastern Europe. Over 90% of the population uses the Internet in Iceland, Norway, Sweden, Luxembourg and the Netherlands while less than 40% uses the Internet in Romania, Ukraine, Moldova and Kosovo (Internet World Stats, 2012).

The second part of this study analyses airport site maps to investigate website size and structure and examine whether differences exist according to airport size, the way in which they are owned and operated, and the country or region that they are located in.

3. Methodology

Content analysis provides an objective, systematic, and quantitative description of the content of communication (Baran, 2002). In particular, it provides a means for condensing large amounts of text into fewer content categories based on explicit rules of coding (Krippendorff, 2004). Content analysis has been used by previous studies to determine the range of information provided on corporate websites (e.g. see Gerstenfeld et al., 2003; Bauer and Scharl, 2000; Perry and Bodkin, 2000). This study uses content analysis to describe the content of communication on airport websites.

Content analysis often encompasses two types of content units; units of analysis and units of observation (Thayer et al., 2007). This study encompasses units of observation (e.g. airport websites), which can be examined using deductive or inductive measurement. Deductive measurement requires the development of specific coding categories before content analysis is carried out while inductive measurement supports the practice of emergent coding. This study uses a combination of the two because four main coding categories were identified before conducting the analysis. The four main categories were identified, to a large extent, from anecdotal evidence provided in the background to this paper: (1) passenger services and information, (2) aviation-related business areas, (3) non-aviation related business areas, (4) corporate communications. Emergent coding was then used to develop sub-categories and example items of content.

Over three quarters of the airports in the sampling frame provide a site map on their website that lists each individual page of content on the site. Site maps were therefore used as the basis for emergent coding of content. Content analysis of websites without a site map was

conducted by observing content on the site itself. This was relatively easy given that websites without a site map tended to have limited content on them. The content analysis was conducted by a single researcher in order to ensure for consistency. A second researcher acted as an observer and controlled the coding and data entry process including rechecking of a larger number of coded data in order to ensure the reliability of findings.

Table 1 provides a summary of the main categories, sub-categories and example items of content recorded during the content analysis. A score of '1' was recorded if an airport website provided information relating to one of the example items of content and a '0' if they did not. Allocating pages of information to example items of content is not an exact science. Airports often use different headings and terminology for similar items of content so the researchers needed to use a fair degree of judgement to assign pages of information to a relevant item of content. There was also a certain degree of overlap whereby some pages of information could be allocated to two or more items of content. In such circumstances, a score of '1' was recorded for each item of content.

During the content analysis, the researchers attempted to group similar items of content so that the number of items could be kept to a manageable level. As an example, the 'community and environment' page on the website of London Heathrow Airport in the UK provides a link to a second-level page labelled 'sustainability' that subsequently links to 18 third and fourth-level pages of information (e.g. on climate change, aircraft noise, air quality, waste, water and biodiversity). Content analysis provides a means for condensing large amounts of text, or in this case, pages of information into fewer content categories and with the example of London Heathrow Airport, the researchers did this by assigning a score of '1' under an item of content labelled 'environmental, social and economic management' instead of recording all of the 18 pages of information. Despite this, the researchers still recorded scores for over 100 individual items of content for 451 airports during the content analysis.

Table 1: Categories of content on airport websites

Main category	Sub-category	Example items of content
Passenger services &information	Flight information	Airlines, destinations served, route map, flight timetables, SMS flight updates
	Transport & directions	Getting to/from the airport, car parking & valet parking
	Travel information & support (Including e-commerce)	Customs, immigration & passport control, transit/transfer & flight connections, passenger rights, safety & security (inc. police), special assistance, baggage reclaim & info., meeting points (including drop-off & collection), check-in including e- & self-service, airport maps, travel planning (support & booking), travel with children or animals (including quarantine), hotels & car hire
	Passenger services & facilities	Passenger terminal info.,shops, food & beverage, Internet/Wi-Fi, VAT refund, families & children, health & medical, rest rooms, worship, executive lounges, fast-track & VIP, cash machines, guided tours, trolleys, porterage, baggage wrapping, post, smoking areas, viewing area & visitor centre (includ. museum and art gallery), information desks, concierge, lockers, lost property, dry cleaning
Aviation	Airport charges	Calculator for airport charges, conditions of use for aircraft ops (including charges for peak/off-peak, emissions, noise & weight categories, passengers, parking), incentive schemes (discounted charges & marketing support)
	General Aviation	Flying clubs, flight schools
	Ground services	Maintenance, passenger & aircraft handling, sanitation
	Technical information	Terminal infrastructure, airside infrastructure & operational capabilities, air rescue & fire fighting, regs, procedures & other information relating to aircraft operations
	Cargo & logistics	Facilities & services for cargo & logistics
	Market research	Catchment area infor. & potential demand, specific route or tourism dev. ops, opinion poll for new or existing routes
Non-aviation	Meeting facilities	Business centres and facilities and services for meetings, incentives, conferences & events
	Advertising	Advertising opportunities at & around the airport
	Consultancy	Consulting services
	Property	Business park, commercial rental properties including office space, executive lounges, ticket desks, hangars & ramp
	Tenders	Tender opportunities
	IT & Telecomm.	IT & telecommunication business services
Corporate Communications	About the airport	Introduction to the airport including history, corporate policy & code of business conduct (including corporate intentions such as vision, values, mission & objectives), organization & corporate governance, awards
	Media	Press kit, fact sheets, image gallery, news & RSS feeds, FAQ's, media policy e.g. for filming & photography, links to airport social media accounts
	Customer services	Airport contact details, customer services & feedback forms, customer surveys, service quality. achievements & cert.
	Investor relations	Shares info., finance & traffic data, events & presentation, reports & releases (i.e. annual reports & financial statements)
	Human Resource Management	Jobs & career ops, training & personal development, job fairs, apprenticeships & graduate schemes, policy, certification
	Airport planning & development	Airport master plan, expansion & optimisation projects, real estate & area development.
	Sustainability	Environmental, social & economic management (including case studies, management systems & certification)
	Corporate Social Responsibility	Culture (including the arts), education, community, sponsorship

The analysis focuses on airports in Europe for a number of reasons. Europe has a diverse range of airports in terms of size and way in which they are owned and operated. Europe also has a diverse range of countries in terms of Internet penetration. This means that differences in content according to airport size, ownership and operation, and location can be investigated. In addition, a sampling frame of 451 European airports was available from the membership database of Airports Council International (ACI) at the time of conducting this study. The database is publicly available on the Internet and includes links to airport websites from which content analysis could be conducted.

Table 2: Categories for airport characteristics

Characteristics	Categories
Airport size	Group 1 (25 million or more passengers per annum) Group 2 (10 to <25 million passengers per annum) Group 3 (5 to <10 million passengers per annum) Group 4 (<5 million passengers per annum)
Ownership & operation	Publicly owned and operated by an airport operator as part of the administration Publicly owned and operated by a corporatized airport operator Mixed public-private ownership and operated by an airport operator with the public sector owning a majority share Mixed public-private ownership and operated by an airport operator with the private sector owning a majority share Mixed public-private ownership and operated by an airport operator with equal ownership between public and private sectors Publicly or privately owned and operated as a concession or BOT (build operate transfer) project Fully privatised and corporatized airport owner and operator
European region	Northern: (Iceland, Norway, Svalbard & Jan Mayen, Sweden, Denmark, Faroe Islands, Finland, Åland Islands, Ireland, UK, Guernsey, Isle of Man, Jersey, Estonia, Latvia, Lithuania) Western : (Austria, Belgium, France, Germany, Liechtenstein, Luxembourg, Monaco, Netherlands, Switzerland) Southern: (Albania, Andorra, Bosnia & Herzegovina, Croatia, Cyprus, Gibraltar, Greece, Italy, Israel, Kosovo, Macedonia, Malta, Montenegro, Portugal, San Marino, Serbia, Slovenia, Spain, Turkey, Vatican City) Eastern: (Armenia, Belarus, Bulgaria, Czech Republic, Georgia, Hungary, Moldova, Poland, Romania, Russia, Slovakia, Ukraine)

Total terminal passengers at each airport for 2011 were used to create the variable for airport size. Data was sourced from ACI-Europe (2011), airport websites, relevant airport authorities or Air Transport Intelligence (ATI). Passenger data for 2011 was not available for 150 airports so sample size is reduced when using that particular variable. Published data is available on the ownership and operation of ACI's European airports (see ACI-Europe, 2010) and the data from that study was updated by the authors so that it was consistent with when the content analysis was conducted. This was achieved by checking the current status of airport ownership and operation from information available on the respective airport websites, from relevant airport authorities or from ATI. 2011 data on levels of Internet penetration for countries in Europe was taken from Internet World Stats (2012). The categories used for airport characteristics are listed in Table 2.

Pearson's Chi-Square test was conducted to investigate significant differences between the proportions of airports providing content on different types. Pearson's chi-square is a statistical test that is commonly used to investigate whether distributions of categorical variables differ significantly from one another and it does so by comparing differences between observed and expected values, and the extent to which those differences are the result of chance. The test produces a chi-square value (χ^2) and degrees of freedom (*d.f.*). Statistical significance is indicated by the *p* value. A value of less than 0.05 is generally considered by researchers to be an acceptable level of significance and means that the null hypothesis (when there is no significant difference) can be rejected. Similarly, One-Way ANOVA that aims to determine whether or not the observed differences among distributions are significant or perfectly acceptable, given the effects individual differences and errors have on measurement, was used to investigate significant differences in the average number of website pages according to airport characteristics such as geographical region, size and ownership of airports as well as internet penetration in the country that the airport is located in.

There were too few counts for some of the categories of airport size and ownership and operation so categories were reduced during the analysis. For size, group 1 and 2 airports were combined. For ownership and operation, airports were assigned to one of three groups; 'public (admin)' for airports that are publicly owned and operated by an airport operator as part of the administration, 'public (corporation)' for airports that are publicly owned and operated by a corporatized airport operator, and 'private' for remaining airports that are owned or operated by partial or full private interests. Similarly, there were too few counts for many countries so they were grouped into one of four European regions. The classification of countries is based largely on the United Nation's sub-regions of Europe; Northern, Western, Southern and Eastern. Countries are listed under each sub-region in Table 2.

4. Findings

Table 3 lists the top 70 items of content according to the proportion of airports that provide such information on their website. The only content provided by all 451 airports is on 'airlines and destinations served'. This is to be expected given that the main function of a commercial airport is to provide air services to other destinations. The information provided on airlines and destinations is largely for the benefit of potential passengers. Other content relating to passenger services and information feature highly on airport websites including 'getting to/from the airport', 'flight timetables', 'safety and security information (especially on the latest EU security rules at airports)', and 'travel planning support'. These types of information facilitate good customer service and allow airports to disseminate useful information to potential passengers while they are surfing the Internet at home.

The background to this paper (e.g. Twentyman, 2010) mentions that in addition to 'pushing' information to passenger, airports increasingly use their website to sell services directly to customers or support the distribution of services offered by their airlines, travel trade partners and concessionaires. This study finds that 29.5% of airports offer 'travel booking support' (e.g. providing direct or indirect opportunities to book flights, car parking, hotels, car hire, foreign currency, shopping, executive lounge access and fast-track security). This finding is

similar to SITA (2009) which found that 24% of airports use their web presence to sell directly to customers with a further 18% planning to do so by 2010.

The main focus of airport websites is on items of content for B2C communications, especially with passengers. However, there is also a high proportion of airport websites that provide content for aviation-related B2B communications, especially with airlines. For instance, 'conditions of use for aircraft operations', 'terminal infrastructure' and 'regulations, procedures and other information relating to aircraft operations'. Proactive approaches to route development are also present in terms of the provision of 'catchment area information and potential demand' and 'incentive schemes'.

Non-aviation related B2B communications are dominated by two key items of content; 'business centres, facilities and services for meetings, incentives, conferences and events' and 'advertising opportunities at or around the airport'. Other areas such as 'property', 'tenders' and 'consulting' have a presence. However, the proportion of airports that provide content for such areas is relatively low. Corporate communications are also dominated by a few key items of content; 'airport contact details' and 'news and RSS feeds'. It is worth noting the high presence of content on sustainability in terms of 'environmental, social and economic management'. It is also worth noting that 29.3% of airport websites provide 'links to airport social media accounts' such as Twitter, Face book, Blogger, YouTube and Flicker. This corresponds to Halpern (2012) which found that 28% of airports in Europe provide links from their website to airport social media accounts.

Table 4 provides a summary of the proportion of airports that have different categories of content on their website. All of the 451 airports provide at least one item of content on 'passenger services and information', 'aviation-related business areas' and 'corporate communications'. The only main category of content that is not provided by all airports is on 'non-aviation related business areas'. This is especially the case at smaller airports and at airports that are publicly owned or operated (see Table 5), which supports the assumptions made in the background to this paper. There are also significant differences according to region with only 34.8% of airports in Northern Europe and 36.9% airports in Southern Europe providing such information. This compares to 53.1% of airports in Eastern Europe and 82.1% of airports in Western Europe. It should be noted that most of the large airport groups in the sampling frame that are publicly owned and operated by an administration or corporation are located in Northern Europe (e.g. Isavia in Iceland, Avinor in Norway, Swedavia in Sweden, Finavia in Finland) and Southern Europe (e.g. HCAA in Greece, AENA in Spain, ANA in Portugal) so it is likely to be the way in which airports are owned and operated that is most relevant as opposed to the region in which the airport is located.

Table 3: Top 70 items of content according to the proportion of airports that provide such content on their website

Rank	Content	% airports	Rank	Content	% airports
1	Airlines & destinations served	100.0	36	Transit/transfer & flight connections	18.4
2	Airport contact details	99.1	37	Organisation & corporate governance	18.2
3	Getting to/from the airport	90.2	38	Passenger rights	17.5
4	Flight timetables	87.6	39	Flying clubs & flight schools	17.1
5	Safety & security information	83.6	40	Incentive schemes	16.6
6	News & RSS feeds	80.5	41	Airside infrastructure & operational capabilities	16.4
7	Travel planning support	71.0	42	VAT refund	16.4
8	Baggage reclaim & information	66.3	43	Maintenance, passenger & aircraft handling	16.0
9	Shops, food & beverage	59.0	44	Air rescue & fire fighting	15.7
10	Environmental, social & economic management	54.3	45	Airport planning & development	15.1
11	Catchment area information & potential demand	54.3	46	Corporate policy & code of business conduct	14.3
12	Car parking & valet parking	46.6	47	Commercial rental properties	14.2
13	Executive lounges, fast-track & VIP	45.9	48	Health & medical	13.1
14	Internet/Wi-Fi	39.2	49	Check-in	11.8
15	Meeting facilities	37.5	50	Tender opportunities	11.8
16	Special assistance	36.8	51	Sanitation	11.3
17	Customs, immigration & passport control	36.1	52	Customer services & feedback forms	10.9
18	Hotels & car hire	33.0	53	Worship	8.9
19	Travel with children or animals	29.9	54	IT & telecommunication business services	8.4
20	Travel booking support	29.5	55	Community	7.1
21	Links to airport social media accounts	29.3	56	Airport maps	5.8
22	Introduction to the airport	29.0	57	Viewing area & visitor centre	5.1
23	Passenger terminal information	28.8	58	Service quality achievements & certification	3.8
24	Guided tours	26.4	59	Media policy	3.5
25	Conditions of use for aircraft operations	25.3	60	Meeting points	3.3
26	Families & children	25.3	61	Business park	2.9
27	Advertising opportunities at or around the airport	25.1	62	Awards	2.7
28	Finance & traffic data	24.4	63	Specific route or tourism development opportunities	2.7
29	Terminal infrastructure	24.2	64	Culture	2.7
30	Reports & releases	24.2	65	Opinion poll for new or existing routes	2.4
31	Facilities & services for cargo & logistics	22.6	66	Consulting services	2.4
32	Regs, procedures & other info. relating to aircraft ops	21.1	67	SMS flight updates	2.4
33	Jobs & career opportunities	20.8	68	Customer surveys	1.8
34	FAQ's	20.8	69	Sponsorship	1.8
35	Calculator for airport charges	20.6	70	Training & personal development	1.8

Table 4: Proportion of airports providing different categories of content on their website

Main category	% airports	Sub-category	% airports
Passenger services & information	100.0	Flight information	100.0
		Transport & directions	97.8
		Travel information & support	99.3
		Passenger services & facilities	90.9
Aviation related business areas	100.0	Airport charges	41.0
		General Aviation	29.5
		Ground services	18.2
		Technical information	60.3
		Cargo & logistics	22.6
		Market research	56.3
Non-aviation related business areas	46.3	Meeting, conference & events	37.5
		Advertising	25.1
		Consultancy	02.4
		Property	14.6
		Tenders	11.8
		IT & telecommunications	08.4
Corporate communications	100.0	About the airport	46.1
		Media	90.9
		Customer services	99.1
		Investor relations	29.5
		Human Resource Management	21.3
		Airport planning & development	16.0
		Sustainability	54.3
		Corporate Social Responsibility	21.1

Although not included as an item of content in this study, the authors did make a note of airports that offered alternative language options for their website. The proportion of airports is high (90.9%). This demonstrates the international role and importance of airports that communicate with target markets from a range of nationalities.

In terms of the site map analysis, 338 of the 451 airports have a site map on their website that is unique to the individual airport (as opposed to a site map that is for a group of airports or an administration). The average number of pages on airport websites is 52. Airport websites typically offer a hierarchy of information with main pages or sections of content accessible from the homepage (i.e. level 1 headings) and subsequent pages or sections of content accessible from a preceding page or section of content (i.e. level 2, 3 and 4 headings). All of the airports had at least one level 1 heading. 78% had at least one level 2 heading, 48% had at least one level 3 heading, and 12% had at least one level 4 heading. None of the airports had level 5 headings.

Table 5: Proportion of airports providing content on non-aviation related business areas

Airport characteristics	Yes	No	N
Region (N451)			
Northern Europe	34.8	65.2	161
Western Europe	82.1	17.9	84
Southern Europe	36.9	63.1	157
Eastern Europe	53.1	46.9	49
*Pearson's Chi-Square $\chi^2(3)58.4$***			
Size (N405)			
Group 1 & 2	84.2	15.8	38
Group 3	62.2	37.8	37
Group 4	38.2	61.8	330
*Pearson's Chi-Square $\chi^2(2)34.2$***			
Ownership (N451)			
Public (admin)	39.8	60.2	83
Public (corporation)	42.1	57.9	271
Part or full private	63.9	36.1	97
*Pearson's Chi-Square $\chi^2(2)15.5$***			

**Difference is significant at the 0.001 level (2-tailed).

Figure 1 lists the 20 airports with the largest number of pages. Ben Gurion Airport in Israel has the most with 396 pages. London Heathrow Airport in the UK is next with 240 pages, followed by Frankfurt Main Airport in Germany with 233 pages. The high presence of UK airports in the list in Figure 1 is a surprise (11 out of the 20 airports listed) and is not a consequence of sampling bias towards UK airports as only 25 of the 338 airports are located in the UK.

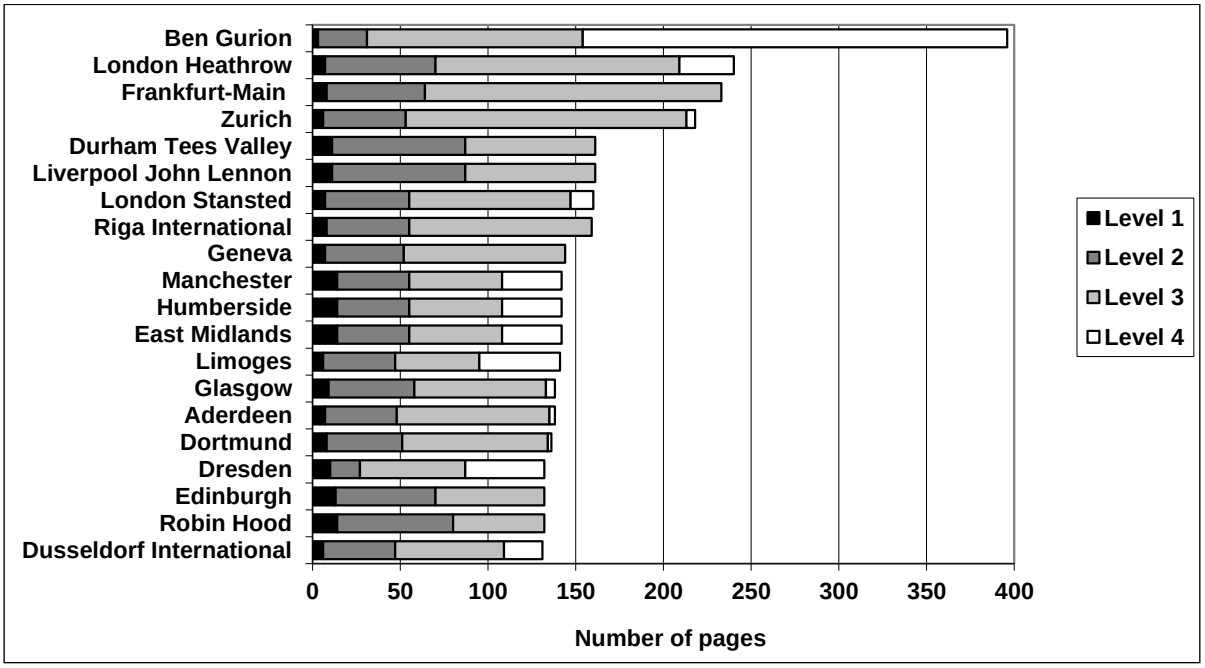

Figure 1: Top 20 airports according to the number of pages on their website

Table 6: Average number of website pages according to airport characteristics

Airport characteristics	N	Average pages	Std dev	Std error	Lower bound	Upper bound
Region (N338)						
Northern Europe	94	61	43.8	4.5	52.0	70.0
Western Europe	84	55	40.2	4.4	46.3	63.7
Southern Europe	111	47	44.7	4.2	38.3	55.1
Eastern Europe	49	41	24.9	3.6	34.0	48.2
One-way ANOVA (F(3,334)=3.4)[*]						
Size (N301)						
Group 1 & 2	32	93	77.5	13.7	65.5	121.3
Group 3	33	75	40.0	7.0	61.0	89.4
Group 4	236	44	29.8	1.9	40.5	57.7
One-way ANOVA (F(2,298)=28.8)[**]						
Ownership (N338)						
Public (admin)	83	38	49.6	5.5	27.1	48.7
Public (corporation)	158	50	29.7	2.4	45.3	54.6
Part or full private	97	67	45.6	4.6	57.8	76.2
One-way ANOVA (F(2,335)=12.1)[**]						
Internet penetration in the country that the airport is located (N338)						
0-40%	23	37	26.7	5.6	25.8	48.9
41-60%	116	44	29.1	2.7	38.7	49.4
61-80%	80	52	49.2	5.5	41.5	63.4
81-100%	119	62	45.2	4.2	53.6	70.0
One-way ANOVA (F(3,334)=4.8)[*]						

[*] Difference is significant at the 0.05 level (2-tailed).
[**] Difference is significant at the 0.001 level (2-tailed).

Table 6 shows the average number of pages according to airport characteristics. The average number of pages is significantly higher at larger airports (i.e. 93 pages for group 1 and 2 airports) compared to smaller airports (i.e. 44 pages for group 4 airports), and airports that are owned and operated by private interests (67 pages) compared to publicly owned airports operated by an administration (38 pages). There are also significant differences by region with an average of 61 pages for airports in Northern Europe compared to 41 pages for airports in Eastern Europe. This may be a consequence of differences between individual countries that may be reflected by the level of Internet penetration in each country because the findings in Table 6 show that the average number of pages is significantly higher at airports that are located in countries with higher levels of Internet penetration.

5. Conclusion

This study investigated four main objectives of contemporary airport websites such as passenger services and information, aviation related business areas, non-aviation related business areas and corporate communications. The findings show that content on passenger services and information has the greatest presence on airport websites. Content on aviation related business areas and corporate communications also has a high presence. Content on non-aviation related business areas has less presence, which is to be expected given that non-aviation related business areas are not a core business function of an airport. The results from Pearson's Chi-Square test appear to confirm that diversification into non-aviation related business areas may be related to airport size or the way in which an airport is owned or operated because the proportion of airports that provide content on non-aviation related business areas is significantly higher at larger airports and at airports that are owned or operated by private interests.

The average number of pages on airport websites is 52, and on a hierarchy of between one to four levels. The results from one-way ANOVA show that the average number of pages is significantly higher at larger airports and at airports that are owned or operated by private interests. Larger airports are likely to have broader and deeper customers compared to smaller airports and may therefore have a greater range and depth of information to communicate. Larger airports may also have a larger budget for investment in information technology and telecommunications. Airports that are owned or operated by private interests may have a greater focus on marketing communications (including via their website). They may also have a larger budget for investment in information technology and telecommunications. Regional differences are also revealed, which may be a consequence of Internet penetration rates in individual countries that determine to some extent how relevant and effective a corporate website is likely to be as a means of communication. The average number of pages is significantly higher at airports in countries that have higher rates of Internet penetration.

The more detailed analysis in the study is limited to European airports and this was due largely to difficulties in accessing comparable data on airport size and corporate governance structure for airports in other world regions. The analysis is also based according to geographical regions of European airports instead of a deeper country by country analysis, for instance, comparison of airport markets in Spain (State owned group) with UK (local-private ownership) and Germany (Local-public ownership). This is a limitation of the study but also an opportunity for future research. Also, the sampling frame of airports in this study is limited to member airports of ACI.

The findings of the study contribute to literature on the online dissemination of information via airport websites and to identify their main objectives such as passenger services and information, aviation related business areas, non-aviation related business areas and corporate communications. It would be interesting for future studies to investigate the full range of activities among airports worldwide, including a comparative analysis according to geographical world region.

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ISBN: 978-82-7962-157-7
ISSN: 0809-9588