



Emerging trends in Airport terminal designs.

Emerging trends in airport terminal designs.

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A proposed research project submitted in partial fulfillment for the degree of Bachelor of Architecture,

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Declaration.

This thesis is my original work and has not been submitted for the award of a degree or any other academic qualification in this or any other University.

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This thesis is submitted in the 2018-2019 academic year in partial fulfillment of the examination board's requirement for the award of the degree of Bachelor of Architecture of the University of Nairobi.

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Signature: _____ Date: _____



To the kid whose ambition is greater than his clan.

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Glory and honor to Him who is able to do, immeasurably more, for all we ask and imagine, according to His power, I can count on.

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Abstract.

Over the years, the aviation industry has experienced rapid growth throughout its inception making air travel a mass culture of our society. The increase in demand of air travel has prompted to the construction of new airports, renovation of old ones and expansion of existing terminals in order to handle the growth of passengers, to help protect the environment and to better connect airports with other transport facilities. The resulting effect is the emergence of new architectural design concept approaches that are aimed at meeting consumer needs and prevailing market trends. However, great emphasis on the emerging concept has threatened the identity or legibility of the airport terminal. Therefore, this study will seek to understand the trends in the design of airport terminals and provide a framework that can be employed in building design to support the modern trends in the aviation industry.

This study outlines the findings from airport terminals purposively selected with the emphasis on the nature of the airport terminal, (domestic and international), location (Nairobi), type (passenger building), construction and building technology, the technology used, spatial layout and configuration. The design strategies investigated to be appropriate to the area of study include: The findings show that most of the terminals constructed, renovated or expanded have not adapted to the modern trend or they are in the process without a well-defined framework. Also, the findings show that designers and developers are not keen on improving the comfortability, effectivity, efficiency of the user.



Inception.

1. | Emerging trends in airport terminal designs.

1 Chapter one.

1. INCEPTION.

Over the years since its inception, the act of flying has heightened the symbiotic relationship between continents, states, and cities. It is a story of modernity acted out in space, speed, light, and flight (Bode & Millar, 1997). Traversing further to a wider population, air travel has altered our experience of place and time, widening our sense of geography.

1.1. Background of the Study.

The airport has been rapidly changing. Not long ago, airports were considered little more than infrastructure providers for airlines, started as runways, became a collection of terminals, hangars and control towers. Recently, airports have risen into their own, breaking the mould of existing urban areas. They have re-positioned themselves as an essential part of the travel value chain. Where once the airlines were the key players that 'owned' the passenger experience, airports, are now becoming equal players providing physical, social and cultural travel connections to enrich the quality of the passenger's journey.

According to (Güller Güller architecture urbanism, 2001), the airport planning process is moving from a purely technical planning approach towards an urban planning and design approach. This statement is strengthened by Kasarda, who argues that the spatial and functional core of the airport is the passenger terminal, which has been likened to an urban central square. Urban functions that

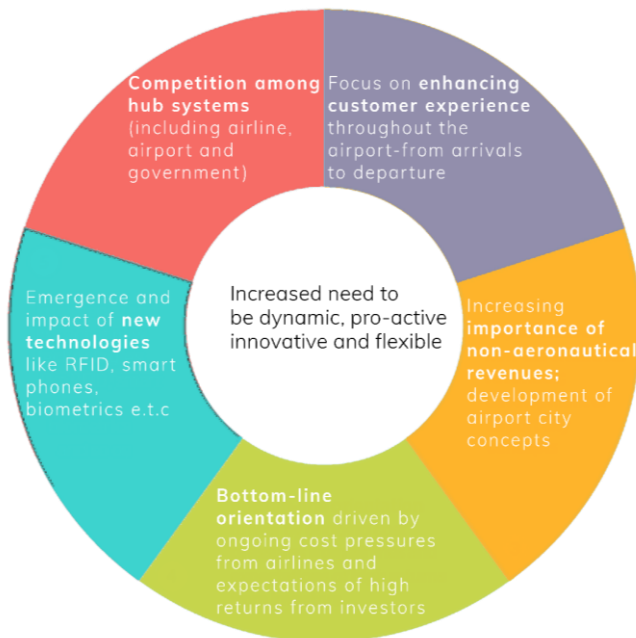


Figure 1.1: Emerging trends in the airport industry.

Source: The future of airports by Hermann and Hazel.

are linked to a city such as transportation corridors and transport interchange, offices, conferences and exhibition complexes, shopping streets and upscale restaurant, themed park and relaxation spaces to mention a few have seen the light of day in planning and design of the passenger terminal. Figure 1.1 shows a summary of the emerging trends in the airport industry.

1.2. Problem Statement.

Herrmann & Hazel, (2012), argues that the intensification of worldwide competition among network carriers for passengers has exponentially increased due to ongoing deregulation corresponded with lowering of prices, expansion of hub and spoke systems and increased importance of global alliance groupings. The competition among the hubs has led to greater access and unprecedented rise in expectation for other services at the airport. This has facilitated the construction, expansion, and renovation of airport terminals.

According to, shopping, leisure, and conference facilities are on high demand, and some are provided on a scale which threatens the identity or legibility of the airport terminal. He also argues that “Many terminals are large buildings where the sense of their interior is often lost. Areas for reading, for reflection, for gazing upon the wider environment are needed. Such space, when it does exist initially, is often filled through time, with the result that the architectural experience is eroded. Not only is the perception of volume lost in the process but the physical means of orientation, structural members, roof-lights, long vistas, glimpses of aircraft, are obscured.”

The design of airport terminals in the 21st Century should be designed as a city in its own right, according to, more towards an urban design approach. Terminals that are planned for or designed

don't have this in mind and ends up been designed haphazardly. According to Rogers, (2010), "... cities, like books, can be read. The streets, the footpath, the square, and the park are the grammar of the city; they provide the structure that enables cities to come to life, and to encourage and accommodate diverse activities, from the quiet and contemplative to the noisy and busy....." When all these factors and functions are ignored, the "city" loses its essence.

The bibliography on the matter of airports moving from being more than a transit hub to a 'city-like' hub is scarce and presents the concepts in a semi-scientific perspective, and sometimes even for publicity purposes. Peneda & Macario, (2011). The author intends to explore the concept of urbanism in terminal design and provide a framework that will add to the wealth of knowledge.

1.3. Aims and Objectives.

- To explore the emerging trends in airport terminal design.
- To analyze the impact of these trends on the spatial arrangement and planning of airport terminals,
- To derive lessons that can be learnt in the design of the airport terminals.

1.4. Research Questions.

- What are the emerging trends in airport terminal design?
- How have the trends impacted the spatial arrangement and planning of airport terminals?

- What are the lessons learnt in designing the 21st-century airport terminals?

1.5. Relevance of the Study.

The statistic represented in figure 1.2 shows the annual growth in global air traffic passenger demand between 2005 and 2018. In 2017, global air traffic passengers demand increased by 8.1 percent on the year before. By 2018, traffic is projected to grow with another seven percent Statista, (2018). In an article published in the Standard newspaper on 14th March 2017, states that “...the country’s aviation is on an upward trajectory, with the total number of passengers last year growing by 11 percent to hit 10 million for the first time ever...”

According to Blow, (1991), the construction of new terminals and redeveloped old ones will be the order of the decade. The construction, renovation, and expansion of airport terminals are occurring at a rapid pace at airports around the world and soon likely to continue in response to future demand for growth and introduction to new aircraft. Locally, JKIA has expanded with the construction of new terminals and a proposal of a second runway. Furthermore, KAA plans to expand other airports locally, such as Wilson airport, Malindi airport, Ukunda airstrip, Kabunde airstrip, etc.

The increasing demand in air travel and the construction of airport terminals creates an opportunity to explore the concept of cities as an emerging trend in the design of airport terminal buildings. This thesis hopes to contribute to the larger debate on the concept of urban design in airport terminals. The author intends to contribute to local interventions that will improve the design of airport terminals in Kenya.

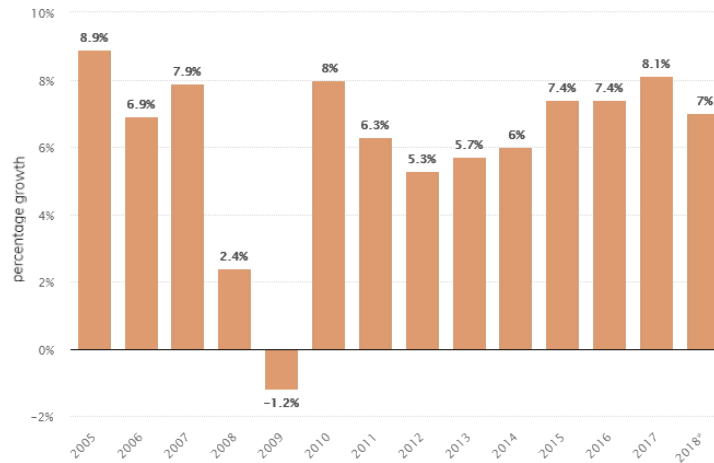


Figure 1.2: Annual growth in global air traffic passenger demand from 2005 to 2018.

Source: www.statista.com/statistics/193533/growth-of-global-air-traffic-passenger-demand.

1.6. Scope and Limitations.

The research to be conducted offers the principals involved in the design of airport passenger terminals and how they have evolved over time. The research will however mostly deal with issues affecting the passenger terminals.

The research is limited to architectural aspects that affect the spatial planning and configuration of spaces. Airport terminals are also as a result of forces of the economy such as capital, airport ownership, politics, business, and operation models. All these are not dealt with as potential influences on the design of terminals in the research.

The author acknowledges that airports are considered as security zones. Access to information and photographs may be impeded by such restrictions, hence hampering the success of this study. Time constraints would limit the study thus the author is limited to airport terminals within Nairobi region.

1.7. Research Approach.

1.7.1. Review of literature on published materials.

The modern airport terminal: New Approaches to Airport Architecture by Brian Edwards (2005). In his book, Edwards gives a comprehensive guide to the planning and design of airport terminals and their facilities, covering all types of airport terminal found globally. He also highlights the environmental and technical issues that the designer has to address, giving examples through a series of case studies.

Airport passenger terminal Planning and design: Guidebook by Landrum and Brown (2010): In this book, Landrum and Brown explore the passenger terminal planning process and provides the important criteria and requirements needed to help address emerging trends and develop potential solutions for the airport passenger terminals.

Workshop on future airport passenger terminals by The Transportation Research Method (1989): The report explores different ways in which the airport-passenger terminal can be planned and designed to achieve efficient future development and operation of the locally owned and operated terminal facilities that make up a major element of the nation's air transportation systems.

From Airport to airport cities by Güller Güller (2003): The book collates and deciphers the evidence of modern processes, based on experiences in Europe's major airport regions. The book also presents a vision of the influence of airports in rearranging landside traffic networks and in reorganizing the territory of the metropolitan area, thus developing a new framework for airport planning on that allows for participation in the shaping of the highly dynamic urban development.

Airport terminals by Christopher J. Blow (1991). The author states the significance of airport terminals and the politics of design in which the architectural quality of the airport terminal is expressed.

Airport Architecture by Chris Uffelen (2010): The book draws examples of contemporary airport architecture from new large-scale airports, smaller airports at remote locations to new terminal buildings and individual new functional areas.

City for people by Gehl (2013): the book talks about urban environments and they are used or could be used. It also outlines methods and tools he uses to reconfigure unworkable cityscapes into the landscapes they should be.

The Future of Airports by Niko Herrmann and Bob Hazel (2012). The article discusses the major trends in the airport industry.

Making a city: Urbanity, vitality, and urban design: by John Montgomery. In this book, Montgomery discusses in detail, the principles that we can apply in making a successful city.

1.7.2. Review of literature on unpublished materials.

Emerging Trends in Planning and Design of Airports by Mahinda Victor (2005).

The Airport Passenger Terminal- A Form in Perpetual Evolution by Kanyi James (2012).

Modal Interchange in Airports by Nyamai Gideon (2009).

Form, image and character of airport buildings and their transformation by Dennis Aaron (2014).

1.7.3. Observation.

The author undertook fieldwork studies of terminal one in Jomo Kenyatta International airport and Wilson Airport that involved photographic surveys and observation for the purposes of this study.

1.7.4. Questionnaires and interview.

The author conducted interviews and questionnaires to the relevant sources within the air transport environment to seek facts and opinions related to the subject under study.

1.8. Organization of Study.

1.8.1. Chapter one.

Chapter one introduces the reader to the subject of study. It provides the background of the study, the nature of problem statement, research questions and objectives. The other inclusive sections are relevance of the study, scope and limitation, and definition of terms.

1.8.2. Chapter two.

This chapter dwells on how the research questions related to the current body of knowledge in theory and practice, where the author will analyze the topic in reference. It involves the analysis and determination of variables that affect the design of airport terminals.

1.8.3. Chapter three.

This chapter dwells on the research methodology where the author collected samples and data that aided in finding a solution to the problem under study.

1.8.4. Chapter four.

This chapter involves analysis and data presentation of two local case studies: JKIA, terminal 1A and existing terminal at Wilson Airport.

1.8.5. Chapter five.

This chapter is the final section of the research paper. It gives an outline of relevant conclusions that came from the area of study. The author will give recommendations applicable to the subject under study.

1.9. Definitions of terms.

Airport city- In principle, the airport city is the more or less dense cluster of operational, airport-related as well as other commercial and business activities on and around the platform. Güller Güller architecture urbanism, (2001).

Airport Interchange- Is the airport stations' functions as a node in the landslide traffic network. It not only serves air traffic passengers and airport employees but also used to interchange between regional and national network. The airport interchange is part of an overall access concept of an airport city. Güller Güller architecture urbanism, (2001).

1.10. Acronyms and abbreviations.

JKIA-Jomo Kenyatta International Airport.

KAA-Kenya Airports Authority.

WWI- World War One.

WWII- World War Two.

ICAO- International Civil Aviation Organization.