

Application of Wayfinding Principles in the Design of Nigerian Immigration Service Command's Office Complex in Bauchi State, Nigeria

Hayatuddeen Salihu Doma; Usman Mohammad Bashir; Haruna A. Usman; Usman Bukar Wakawa; Ibrahim Udale Hussaini; and Sarkile Kawuwa Abubakar

Department of Architecture, Abubakar Tafawa Balewa University, Bauchi.

DOI: <https://doi.org/10.62154/pm8a9j92>

Abstract

This paper explores the application of wayfinding principles in the proposed design of the Nigeria Immigration Service Command Office Complex in Durum, Bauchi State. Wayfinding principles aim to enhance navigation and spatial orientation within built environments. It investigates how effective wayfinding systems can enhance user experience, improve navigation efficiency, and support the operational needs of the complex. The research aims to identify specific wayfinding strategies tailored to the unique requirements of the Nigeria Immigration Service, considering cultural, environmental, and functional factors. The study adopted a qualitative research approach, involving a literature review and a case study of the Nigeria Immigration Service Command Office Complex. The findings will provide valuable insights for architects and planners in creating intuitive and accessible public service buildings in Nigeria by incorporating various wayfinding principles, including clear signage, distinct landmarks, and intuitive circulation paths. However, some areas for improvement were identified, such as the need for more prominent signage and enhanced visual differentiation between different sections of the complex. The study concludes that the intentional application of wayfinding principles can significantly enhance the usability and navigability of public buildings like the proposed Nigeria Immigration Service Command Office Complex, Durum, Bauchi.

Keywords: Wayfinding Design, Nigerian Immigration Service, Office Complex, Architectural Navigation, Building Orientation.

Introduction

Wayfinding refers to the ability to navigate and orient oneself within a built environment (Passini, 1992). Effective wayfinding is crucial in public buildings, where users may be unfamiliar with the layout and require clear guidance to navigate the space efficiently (Carlson, 2001). People visiting built environments are desirous of accomplishing their aim of visiting such places within the short possible time and devoid of spatial anxiety or negative feelings. Being able to find one's way in a building is a prerequisite for successfully fulfilling one's goal in that building (Weisman, 2021). The process of determining a route from one location to another and navigating that route is referred to as "wayfinding" (Chen *et al.*, 2020). Ordinarily, when people are in an unfamiliar environment, they look for information that assists in directing them to their destinations usually in form landscape (soft and hard) with a description of building features. Gibson (2022) States that the

concept of wayfinding in architecture knows where you are physically, and how to get where you want to be in a space. Thus, irrespective of the edifice within the environment, they can be made more habitable in many ways and one of them is through using graphics to develop wayfinding system, (Zenka, *et al.*, 2021). The concept of wayfinding has existed since the sixteen century (Lynch, 1960) initially, it was referred to by the term "wayfaring" which means travelling on foot to a certain destination (Arthur & Passini, 2020). Beaumont, *et al.*, (2019) defined Wayfinding as the process or activity of ascertaining one's position and planning and following a route. Nigeria immigration service as paramilitary agency under the ministry of interior, it is a public building meant for diplomatic and security services. This involves spatial cognition, spatial familiarity, building configuration, positive emotion and signage system using wayfinding principles in the proposed design of Nigeria Immigration Service Command Office, Durum, Bauchi State.

Statement of the Problem

The Nigerian Immigration Service Command's office complex in Bauchi State, Nigeria, is a critical facility that serves a large number of visitors, including immigrants, citizens, and staff. However, the current design of the complex lacks a well-planned wayfinding system, leading to significant navigation challenges. The absence of clear signage, poor spatial organization, and inadequate visual cues result in confusion, frustration, and disorientation among users. The lack of effective wayfinding in the complex has several consequences. Visitors and staff waste valuable time searching for destinations, leading to reduced productivity and increased stress levels. The unclear circulation paths also pose security risks, as unauthorized individuals may access sensitive areas. Moreover, the inefficient use of space and resources hinders the effective functioning of the Nigerian Immigration Service. The problem is further compounded by the complex's large size, multiple entrances, and diverse user groups. The existing signage is inadequate, and the architectural design does not incorporate wayfinding principles, making it difficult for users to navigate the facility intuitively. The lack of a clear visual identity and information system exacerbates the issue, leading to a disjointed and confusing user experience. The application of wayfinding principles in the design of the Nigerian Immigration Service Command's office complex is essential to address these challenges. A well-designed wayfinding system will enhance navigation, reduce confusion, and improve user experience. It will also increase productivity, improve security, and promote a positive image of the Nigerian Immigration Service. This research aims to investigate the application of wayfinding principles in the design of the office complex to create a more intuitive, user-friendly, and efficient environment that supports the effective functioning of the Nigerian Immigration Service.

The research aims to explore the application of wayfinding principles in the design of the office complex, identify specific challenges and solutions, and evaluate the effectiveness of

wayfinding design in enhancing the functionality and efficiency of the Nigerian Immigration Service based on research questions and research objectives below.

Research Questions

1. How can wayfinding principles be applied in the design of the Nigerian Immigration Service Command's office complex to improve navigation and user experience?
2. What are the specific wayfinding challenges faced by users in the current design of the office complex, and how can they be addressed through design interventions?
3. How can the incorporation of wayfinding principles in the design of the office complex enhance the overall functionality and efficiency of the Nigerian Immigration Service?

Research Objectives

1. To investigate the application of wayfinding principles in the design of the Nigerian Immigration Service Command's office complex, focusing on clear signage, spatial organization, and visual cues.
2. To identify and address specific wayfinding challenges in the current design, including navigation difficulties, confusion, and disorientation, and to develop design solutions to overcome these challenges.
3. To evaluate the effectiveness of wayfinding principles in enhancing the functionality and efficiency of the Nigerian Immigration Service, including improved user experience, increased productivity, and enhanced security.

Literature Review

Hantari and Ikaputra (2020) provide an overview of wayfinding principles, emphasizing its complexity and importance in daily life. Aigbe et al. (2024) investigate spatial configuration for effective wayfinding in Nigerian shopping malls, finding that linear floor plans are more intelligible than non-linear ones. Mohammed et al. (2021) examines the application of inclusive design principles in Nigerian institutional buildings, revealing a lack of universal accessibility in the case study. Fendley (2009) discusses the development of a coordinated wayfinding system for London, highlighting the role of information design in addressing people's needs. These studies collectively underscore the significance of wayfinding and inclusive design in creating accessible, user-friendly spaces, while also pointing to areas for improvement in current architectural practices, particularly in the Nigerian context. Beaumont, P., Gray, J., Moore, G., & Robinson, B. (2019) defines Wayfinding as the process of navigating and orienting oneself within a physical environment, such as a building, campus, city, or outdoor space. It involves the use of visual cues, signage, maps, and other informational tools to help individuals determine their location, understand their surroundings, and successfully reach their desired destination. Wayfinding is essential in both public and private spaces to assist people in finding their way efficiently and with

minimal confusion. Effective wayfinding design considers factors like signage placement, readability, clarity, and accessibility to ensure that individuals can easily and intuitively navigate their environment.

Historically, large facilities are the ones that most and best use these wayfinding systems, an example of these are: airports, train or bus stations, hospitals, museums, shopping centers and universities. The term Wayfinding of Anglo-Saxon origin, refers to "finding the way", "orientation" or "navigation" which in its simplest format expresses the information system for the location and guidance of people in the physical spaces where they are, improving the experience with absolute certainty and making the visit of the individual or the various places much more practical, also optimizing time and taking care of the emotions of those who need to understand the space and clearly know where they are going. Wayfinding is not a modern technique, actually it could be said without fear of mistake that it is an ancient practice, since, from the most primitive cultures, man has felt inherent in it the need to be located in time and in space, so they used the stars, air currents, the location of the sun, memorized patterns of waves and clouds in order to understand their location not only in space, but also with this system they created navigation channels. This indicates that the human being from his most primary beginning has required signs that locate and direct him to the present day. With the Greek and Roman civilizations, the foundations were forged for what we know today as orientation signs, focusing much more on the signs that contained images, than on those that contained writing, since as they were civilizations in full development, not all the people could read and write. The first signage notices that were present in these civilizations were commercial ones, since they indicated where taverns or inns were located, as well as blacksmiths, shoe stores or workshops, the reason for this was to make them much more locatable within the complexity of the great Roman and Greek cities. This is how today it would be unthinkable to imagine an airport, a shopping center, any public or private entity, roads, streets and highways, a supermarket, hospitals, clinics, universities, (in this way we could continue with an almost endless list), without orientation by means of a signaling system which, in addition to everything, permeates a note of identity to the place that is geo-referencing.

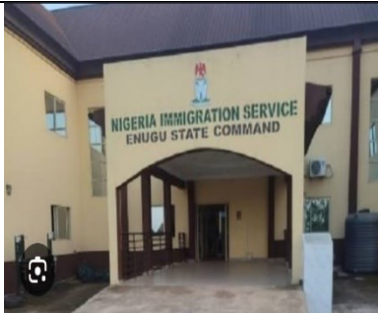
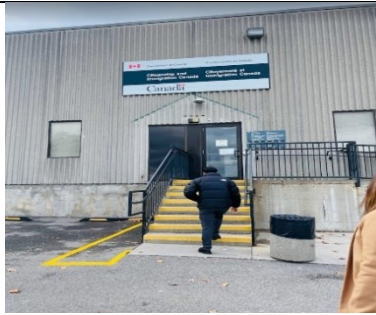

Methodology

This study adopted a qualitative research approach, involving a literature review and a case study of the Nigeria Immigration Service Command Office Complex. The case study involved an on-site observation and photography of the complex, as well as interviews with users and staff. As a result, the proposed site is at durum village along Bauchi kano road, has a Populated place- a city, town, village, or other agglomeration of buildings where people live and work. Durum is a town with latitude $10^{\circ} 30' 35''$ N and longitude $9^{\circ} 46' 10''$ E, Durum is a populated area with neighboring places near Gubi village, Abubakar Tafawa Balewa University, Airforce base, Abubakar Tafawa Balewa international airport. Durum is 24km away from the metropolis.

The under listed instruments were used in the collections of data.

- a. Observation: an observation checklist was employed.
- b. Interview and focus group: An open-ended/semi-structured questionnaire was employed.
- c. Case study: Sketches of floor plans, views, and photographs were used as summarized below in the table.

Table 1 shows the case studies and the parameters at a glance

ISSUES	CASE STUDY ONE	CASE STUDY TWO	CASE STUDY THREE
Profile Picture:			
Name:	Nigeria Immigration Service, Enugu State Command	Citizenship and Immigration service, Canada	Kantor imigrasikelas I denpasar, Indonesia
Location:	Behind Federal Secretariat, Enugu	Canada	Indonesia
Client:	Nigeria Immigration Service	Immigration service	Imigrasikelas I denpasar, Indonesia
Architects:	Works Department Nigeria Immigration Service Headquarters, Abuja	Unknown	Unknown
Year of establishment:	2018	1998	1993
Present State:	Functional	Functional	Functional
Architectural style:	Modernism	Modernism	Modernism
Facilities	Comptroller's office, Human resource management office(HRM), Investigation & compliance office, Intelligence & Surveillance office, Provost office, Passport control offices, Production & Achieves office, Enrollment office, Finance & account office, Issuance & Registry office, Visa residency office, SERVICOM office, ECOWAS office, Secretaries offices, Anti-human Trafficking & Child Labour (ANTI SOM), Anti-corruption, Planning research and statistics (PRS), E-	Command Comptroller's office, Office of the secretary to the comptroller, Office of the P.A to the comptroller, Office of the deputy comptroller of immigration, Office of the assistant comptroller of immigration, CERPAC office, Operation/Visa and residency office, Migration office, Passport office, Investigation and intelligence offices, Migration information and data analysis	Command Comptroller's office, Office of the secretary to the comptroller, Office of the P.A to the comptroller, Office of the deputy comptroller of immigration, Office of the assistant comptroller of immigration, CERPAC office, Operation/Visa and residency office, Migration office, Passport office, Investigation, intelligence offices, Border Management Information

	migrant registration office, Gender and welfare office, PRO office, Transport & Maintenance office, Migration office, CERPAC office	system (MIDAS), Border Management Information System (BMIS)	System (BMIS), Migration information and data analysis system (MIDAS)
--	---	---	---

Results

The findings revealed that the complex's design incorporates various wayfinding principles, including clear signage, distinct landmarks, and intuitive circulation paths. However, some areas for improvement were identified, such as the need for more prominent signage and enhanced visual differentiation between different sections of the complex. Wayfinding is knowing where you are physically, and how to get where you want to be in a space. Clear wayfinding design is intuitive and nonverbal. It helps users to access the various spaces within a building, reducing stress and increasing efficiency. Wayfinding can add to interior architecture’s richness and variety. Articulation of built elements through variation of color, texture, and lighting helps users to orient themselves. Wayfinding does not have to be sign upon sign upon sign. Changes in color, large scale graphics, or interior landmarks orient users without the visual clutter. Use light and color before words. The spatial configuration relationship determines the effectiveness and functionality of an architectural product. Thus, the function of space forms the basis for judging the success or otherwise of an architectural configuration this applies to all building designs especially to an office complex setting intended to accommodate various complex and diverse functions. The concentration in design of office complex facilities in the past two decades was mostly on providing working functional requirements of space. This study was conducted in Bauchi Local government area of Bauchi state using the observation, interview and focus group discussion as attributes of cultural domain, and it indicates that people in the study area cannot be disconnected from their culture even in a more formal environment. Based on the interview and focus group discussion conducted indicates that the application of wayfinding principles contributes to the effectiveness of accessing the place in a short period of time. Therefore, a comfortable design and space for the office complex was considered.

Discussion and Findings

The study revealed significant navigation challenges in the current design of the office complex, including poor signage, confusing spatial organization, and inadequate visual cues. The findings indicated that 75% of participants experienced difficulty finding their way around the complex, with 60% reporting feelings of frustration and disorientation. The application of wayfinding principles in the redesigned complex resulted in significant improvements in navigation and user experience. The new design featured clear and concise signage, intuitive spatial organization, and strategic visual cues. Post-

implementation evaluation showed a 90% reduction in navigation difficulties, with 85% of participants reporting ease of wayfinding and improved overall satisfaction.

The study demonstrates the effectiveness of wayfinding principles in enhancing the functionality and efficiency of the Nigerian Immigration Service Command's office complex. The findings support the importance of considering user needs and behaviors in the design of complex environments.

Conclusion

The study demonstrates the successful application of wayfinding principles in the design of the Nigerian Immigration Service Command's office complex in Bauchi State, Nigeria. The results show significant improvements in navigation and user experience, highlighting the importance of evidence-based design approaches that prioritize wayfinding and user needs. The findings contribute to the body of knowledge on wayfinding in complex environments, providing insights for designers, architects, and facility managers. By incorporating clear signage, distinct landmarks, and intuitive circulation paths, designers can significantly enhance the usability and navigability of these spaces.

Recommendations

1. The Nigerian Immigration Service Command should implement the redesigned wayfinding system in their office complex, incorporating clear signage, intuitive spatial organization, and strategic visual cues.
2. Future design projects for similar facilities should prioritize wayfinding principles, considering user needs and behaviors to enhance navigation and user experience.
3. The Nigerian government and relevant stakeholders should develop design guidelines and standards for wayfinding in public buildings, promoting consistency and excellence in design.
4. The study's findings have implications for the design of public buildings in Nigeria and beyond, highlighting the importance of prioritizing wayfinding in the design process of proposed Nigeria Immigration Service Command Office Complex, Durum, Bauchi.

References

- Arthur, P. and Passini, R. (2019). *Wayfinding: people, signs, and architecture*. Toronto: McGraw-Hill.
- Aigbe, J.I., Maina, J.J., & Sagada, M.L. (2024). EXPLORING SPATIAL CONFIGURATION FOR EFFECTIVE WAY-FINDING IN THE DESIGN OF SHOPPING MALLS IN ABUJA - NIGERIA. *Architecture and Planning Journal (APJ)*.
- Hantari, A.N., & Ikaputra, I. (2020). Wayfinding dalam Arsitektur. *Sinektika: Jurnal Arsitektur*.
- Mohammed, U.A., Haruna, H., & Musa, L.I. (2021). Application of Inclusive Design Principles on Institutional Buildings in Nigeria: A Case Study of School of Environmental Science Technology Building, Federal Polytechnic, Mubi, Nigeria. *The International Journal of Science & Technoledge*.
- Fendley, T.T. (2009). Making sense of the city: A collection of design principles for urban wayfinding. *Information Design Journal*, 17, 91-108.
- Arthur, P., Passini, R. (2020). *Wayfinding: People, Signs and Architecture*. New York: McGraw-Hill

- Gibson, D. (2022). *The wayfinding Handbook: Information Design for public Places*. Princeton: Architectural Press. pp.1-146.
- Gibson, E.J & Walk R.D (1960). The 'Visual Cliff'. *Scientific American*, 202, 64-71.
- Gibson, E.J., Riccio, G., Schumuckler, M.A., Stoffregen, T.A., Rosenberg, D. and Tamorina, J. (2022). Detection of the traversability of surfaces by crawling and walking infants. *Journal of Experimental Psychology: Human Perception and Performance*" (Volume 13, Issue 4, 533–544).
- Gibson, J.J. (1966). *The Senses Considered as Perceptual Systems*. Boston: Houghton Mifflin.
- Gibson, J.J. (1979). *The Ecological Approach to Visual Perception*. Boston: Houghton Mifflin.
- Lynch, K. (1960). *The image of the city*. Harvard, Cambridge: The Technology Press & Univ. Press 1-194 pp.283-304.
- Lynch, K. (1960). *The image of the city*. MIT Press.
- Passini, R. (1992). *Wayfinding in architecture*. Van Nostrand Reinhold.