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"Balancing Function and Comfort: Space Circulation as a Core Design Strategy in Contemporary Hotel Architecture"

[1]Olushola David Oladimeji,[2]Owabumowa IyioluwaSamuel,
[3]Dr. (ARC) C. O. Odefadehan, [4]Dr. Anthony Obaribirin
[1,2]*Department of Architecture, College of Postgraduate Studies,*
Caleb University, Imota, Lagos State, Nigeria.

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ABSTRACT
This study explores how strategic spatial circulation enhances both functional efficiency and user comfort in four-star hotel architecture, using a proposed hotel in Eko Atlantic City, Lagos, as the focal case. The research applies a mixed-methods approach that combines surveys, interviews, and case studiesto analyze how circulation design intersects with accessibility and guest experience. Key case studies include Radisson Blu Anchorage (Lagos), Ibom Icon Hotel (Uyo), and Scandic Continental Hotel (Stockholm), revealing patterns and challenges in circulation planning across different contexts. Findings show that while hotel designers often prioritize aesthetics and amenities, effective circulation is critical to operational flow and guest satisfaction, especially for users with limited mobility. The paper concludes by proposing context-responsive design strategies that balance luxury, accessibility, and intuitive navigation, contributing to more inclusive and efficient hospitality architecture in emerging urban developments

Keywords: Space Circulation, Accessibility, Hotel Design, User Comfort, Inclusive Architecture, Eko Atlantic City, Hospitality Planning, Universal Design, Four-Star Hotels, Nigeria

I. INTRODUCTION

The global hospitality industry is undergoing a fundamental shift from aesthetic-driven architecture to inclusive, performance-oriented design strategies that prioritize functionality and user comfort. As tourism, business travel, and urban development expand in many developing economies, there is a growing demand for hotel environments that balance luxury, accessibility, and efficient spatial planning (UNWTO, 2022). In Nigeria, particularly in rapidly evolving urban districts like Eko Atlantic City, the design of four-star hotels must respond not only to international standards but also to local infrastructural, social, and climatic realities (Adeyemi, 2019).

Hotel design transcends stylistic expression, it functions as a framework for comfort, navigation, and service efficiency. Among the critical architectural concerns in hospitality environments is space circulation, the logical and physical movement through spaces that connect public, private, and service areas. Effective circulation reduces congestion, supports accessibility for all users, and enhances the operational flow of staff and services (Lawson, 2001; Neufert&Neufert, 2012). However, in many Nigerian hotel developments, circulation is often overlooked or poorly integrated, leading to disjointed guest experiences, safety concerns, and operational inefficiencies (Onifade & Adegbite, 2021).

In Nigeria, many mid-to-high-tier hotels still face challenges related to poor spatial organization, inadequate signage, and inefficient flow between public and private spaces (Adewale & Ogunleye, 2021). Studies have shown that hotel guests value not only the aesthetics of a space but also its ease of navigation and comfort during use (Olusola & Salami, 2020). These issues are particularly pressing in growing hospitality hubs like Lagos, Abuja, and Port Harcourt, where user expectations are rising alongside tourism and business travel.

Eko Atlantic City, Lagos as an ambitious, privately funded coastal city built on reclaimed land from the Atlantic Ocean presents a unique opportunity for forward-thinking architectural intervention. Billed as West Africa's future

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economic hub, the city is being designed with sustainability, resilience, and innovation in mind (South Energyx Nigeria Ltd., 2020). A proposed four-star hotel within this urban context demands architectural solutions that not only meet functional requirements but also elevate the user experience through well-considered spatial planning and universal design strategies (Steinfeld & Maisel, 2012).

This article presents findings from a mixed-methods study that examined circulation, accessibility, and comfort in three case study hotels; Radisson Blu Anchorage Hotel (Lagos), Ibom Icon Hotel & Golf Resort (Uyo), and the Scandic Continental Hotel (Stockholm). Through fieldwork, interviews, and literature analysis, the study identifies key spatial and comfort-related challenges in hotel environments and offers design strategies that prioritize circulation as a central design principle. By focusing on circulation as more than just movement, this paper positions it as a critical determinant of both guest satisfaction and architectural success in contemporary hotel design (Creswell, 2014; Adebayo &Oyebanji, 2019).

1.1 Aim & Objective

Aim:

To design a four-star hotel that emphasizes universal accessibility, efficient space circulation, and guest comfort through context-responsive and functional architectural planning suitable for urban settings.

Objectives:

i. To investigate the fundamental design principles and operational requirements of four-star hotels in Nigeria..
ii. To explore the integration of accessibility standards and universal design principles within hotel spatial layouts and circulation pathways.
iii. To analyze existing hotel case studies to extract insights on effective spatial organization and user-centered design.
iv. To identify key site criteria and propose an architectural design that enhances the experience of both able-bodied and physically challenged users.
v. To develop architectural strategies that harmonize aesthetic appeal, functional efficiency, and sustainability in hotel design.

II. LITERATURE REVIEW

2.1 Hotel Typology and Circulation Design

Hotel buildings fall under the broader category of hospitality typology, characterized by spaces designed for temporary lodging, leisure, and services. Within this category, four-star hotels represent a balance between luxury and affordability, often featuring high-end amenities, moderate scale, and international service standards (Hotelstars Union, 2022). A critical yet under-emphasized component of this typology is spatial circulation which is defined as the planned movement of people through and between spaces in a building (Ching, 2014). Circulation influences the functionality, flow, and user perception of space, and is especially vital in hotels where guests, staff, and services must interact within a seamless spatial experience.

Lawson (2001) emphasizes that circulation is not only about physical access but also about psychological orientation on how intuitive and stress-free space navigation is. For large-scale public buildings like hotels, circulation zones include lobbies, corridors, elevators, staircases, service paths, and auxiliary zones, which must be designed to accommodate both high traffic and accessibility requirements. Ineffective circulation often results in congestion, guest disorientation, and reduced operational efficiency (Arthur & Passini, 1992; Amusan, Kolawole, & Adewunmi, 2018).

2.2 Accessibility and Universal Design

Accessibility, as a core principle of universal design, refers to the creation of environments that can be used by all people regardless of age, ability, or circumstance (Steinfeld & Maisel, 2012). The Americans with Disabilities Act (ADA, 2010) and British Standard BS8300 (2018) outline detailed architectural requirements for accessible design, including dimensions for ramps, elevator systems, tactile guides, and clear signage. Yet in many developing contexts like Nigeria, these standards are either poorly implemented or entirely absent from building plans (Bello & Adebayo, 2020).

Accessibility in hotel design goes beyond compliance. It fosters inclusivity, supports aging populations, and enhances the guest experience for everyone, especially persons with temporary or permanent disabilities (Olaniyan & Dada, 2020). According to Jones and Lockwood (2004), integrating accessibility from the early design phase leads to more efficient space use and prevents costly retrofits.

2.3 User Comfort in Hotel Environments

User comfort in hotels includes thermal comfort, acoustic control, lighting quality, air

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circulation, and psychological well-being. These elements are heavily influenced by spatial arrangement and environmental performance (Kolarevic&Malkawi, 2005). Studies show that natural light, ventilation, and noise insulation significantly improve satisfaction levels, particularly in accommodation zones such as guest rooms and lounges (Zagreus et al., 2004).

Furthermore, hospitality architecture is increasingly measured not only by visual impact but by how well it supports the physical and emotional needs of its users (Curtis, 1996). A hotel's comfort level plays a central role in guest retention, reviews, and profitability, making it a vital design consideration.

2.4 Gaps in Existing Literature

While several studies examine hotel satisfaction and environmental quality, limited research directly links space circulation to user comfort, especially in four-star hotel typologies in Sub-Saharan Africa. Most research focuses on either general hospitality design or public accessibility issues but not on circulation planning as a driver of inclusive comfort (Adebayo &Oyebanji, 2019; Olaniyan & Dada, 2020). Moreover, foreign case studies often dominate literature, offering limited adaptability to local urban, cultural, or economic conditions.

III. METHODOLOGY

3.1 Research Philosophy and Approach

This study adopts a pragmatist research philosophy, supporting both qualitative and quantitative approaches in analyzing the real-world implications of hotel design. Pragmatism is particularly suitable for architectural research where both subjective user experiences and objective design parameters must be addressed (Saunders, Lewis, & Thornhill, 2019). A mixed-methods approach was applied, integrating fieldwork, questionnaires, interviews, and case study analysis to investigate accessibility, circulation, and comfort in four-star hotel architecture (Creswell, 2014).

3.2 Research Design

A descriptive and exploratory design guided the study, aiming to uncover how circulation strategies affect both user experience and operational efficiency in hotels. The study focused on three core themes:

- Accessibility integration
- Spatial circulation efficiency
- Guest-centered comfort

These were explored through the triangulation of expert input, user feedback, and architectural observations.

3.3 Case Study Selection

Three hotels were selected for comparative analysis:

- Radisson Blu Anchorage, Lagos (urban, waterfront, international standard)
- Ibom Icon Hotel & Golf Resort, Uyo (sprawling, tropical, eco-integrated)
- Scandic Continental Hotel, Stockholm (European standard, high accessibility and circulation logic)

These case studies provided a rich spectrum of circulation solutions across different spatial, environmental, and cultural contexts. The approach followed Yin's (2018) structure for embedded case study analysis.

3.4 Sampling and Participants

A purposive sampling method was adopted to select professionals and users with direct experience in hotel design and operations or real-life hotel use. The sample was expanded to increase the breadth and statistical relevance of the study.

- 40 Architects were selected based on their experience designing or consulting on hospitality projects in Nigeria.
- 20 Hotel Managers were chosen from operational four-star hotels across Lagos.
- 150 Hotel Guests were selected based on recent stays in four-star hotels, including 20 persons with physical disabilities and 25 elderly guests.

This diverse participant pool of 210 respondents enhanced the validity of findings by combining expert knowledge with lived guest experience.

3.5 Data Collection Instruments

Primary Data

- Semi-structured interviews were conducted with the 40 architects and 20 hotel managers to gain insights into design intent, operational feedback, and accessibility strategies.
- Structured questionnaires were administered to 150 hotel guests to assess real-world experiences related to comfort, navigation, and spatial usability.
- On-site observations were carried out in selected hotels to analyze zoning, wayfinding,

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vertical/horizontal movement systems, and the presence of universal design features.

3.6 Operational Variables

The study focused on three key variables measured across both qualitative and quantitative dimensions:

- Accessibility: measured by the presence and quality of accessible entrances, ramps, lifts, signage, and adapted rooms.
- Space Circulation: assessed based on zoning clarity, user flow, ease of navigation, presence of bottlenecks, and wayfinding support.
- User Comfort: evaluated through guest responses on factors such as room spaciousness, ventilation, lighting, acoustics, and general ease of movement.

These variables were analyzed comparatively across user groups (guests vs professionals) to uncover alignment or disparity between design intent and user experience.

3.7 Ethical Considerations

The research followed ethical standards regarding human subject participation. All respondents were provided with consent forms outlining the purpose of the study, anonymity of responses, and their right to withdraw. No identifying data was collected. Institutional research approval was obtained before commencement of fieldwork (Bryman, 2016).

IV. FINDINGS AND DISCUSSION

4.1 Overview

This section presents and interprets the data collected from 210 participants, comprising 40 architects, 20 hotel managers, and 150 guests. The analysis is aligned with the study's core objectives: assessing accessibility integration, evaluating space circulation, and exploring user comfort. Data is drawn from interviews, surveys, and site observations, and is organized thematically under the three central research variables. Where applicable, findings are compared across respondent groups to uncover patterns and design gaps.

4.2 Accessibility in Hotel Architecture

Survey Results:

- 92% of architects reported incorporating accessible features like ramps, wide doors, elevators, and adapted restrooms into their hotel designs.
- 85% of hotel managers confirmed their facilities have accessible rooms or mobility aids (e.g., ramps, elevators with handrails).
- However, only 41% of hotel guests reported that accessibility features were obvious or easy to use during their stay.
- Among guests with disabilities, only 28% rated accessibility as "good" or "very good."

Observation Notes:

- In many hotels, accessible routes were obstructed by furniture, lacked signage, or were poorly maintained.
- Ramps often did not meet ergonomic slope standards, and elevators lacked tactile indicators or audible signals.

Design Implication: Accessibility is acknowledged during the design phase but suffers from poor implementation and operational follow-up. A stronger feedback loop between architects and hotel managers is needed to ensure that accessibility standards are maintained beyond handover.

Recommendation: Introduce multi-sensory wayfinding (visual, tactile, and auditory cues), ensure ramps and lifts meet ADA and BS8300 standards, and train staff in inclusive guest engagement (Steinfeld & Maisel, 2012; Bello & Adebayo, 2020).

4.3 Circulation and Spatial Efficiency

Survey Results:

- 88% of guests found it easy to move between hotel zones (e.g., lobby to rooms).
- However, 56% mentioned experiencing confusion in areas with poor signage or unclear zoning.
- 70% of architects stated they prioritize zoning logic in hotel layouts (e.g., separating public, private, and service zones).
- 12 out of 20 managers said that congestion during check-ins or conferences is a recurring issue.

Design Observations:

- Hotels with centralized lobbies and multiple elevator cores had smoother vertical/horizontal movement.
- Circulation conflicts (e.g., guest paths crossing service routes) were observed in older hotel designs.

Design Implication: Circulation layout significantly affects guest comfort and staff workflow. Even in well-zoned buildings, lack of

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clear visual hierarchy and signage causes disorientation.

Recommendation: Integrate visual zoning elements like floor material changes, lighting cues, and landmark nodes to define movement paths. Employ color-coded signage and digital navigation aids (Arthur & Passini, 1992; Amusan et al., 2018).

4.4 User Comfort Perception

Top Guest Comfort Factors (from 150 guests):

Comfort Factor	Mentioned By
Good ventilation	81%
Natural lighting	66%
Acoustic quietness	59%
Spacious rooms	48%
Comfortable furniture	45%
Clear wayfinding	36%

Table 1;Guest Comfort Factors (from 150 guests)

Average comfort rating (out of 5):

- Guests: 4.1
- Architects (design priority): 4.7
- Managers (service delivery): 4.3

Design Implication: Guests value environmental qualitylight, ventilation, acousticsover aesthetics alone. Comfort must be embedded in spatial proportion, material selection, and passive design strategies (Kolarevic&Malkawi, 2005; Zagreus et al., 2004).

Recommendation: Use passive ventilation and daylighting systems (light shelves, clerestories), enhance sound insulation between rooms and communal zones, and provide adjustable lighting and HVAC controls in guest rooms.

4.5 Summary Visualization

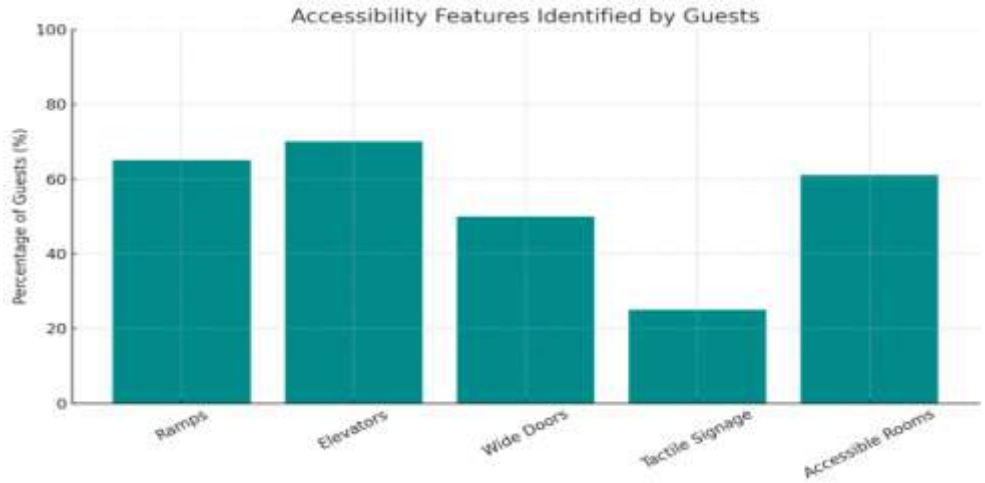


Figure 1;Accessibility Features Identified by Guests (Bar Chart)

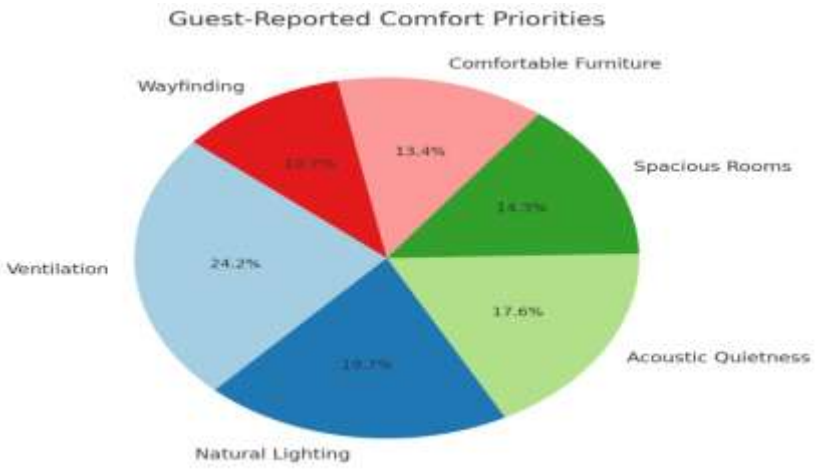


Figure 2;Guest-Reported Comfort Priorities (Pie Chart)

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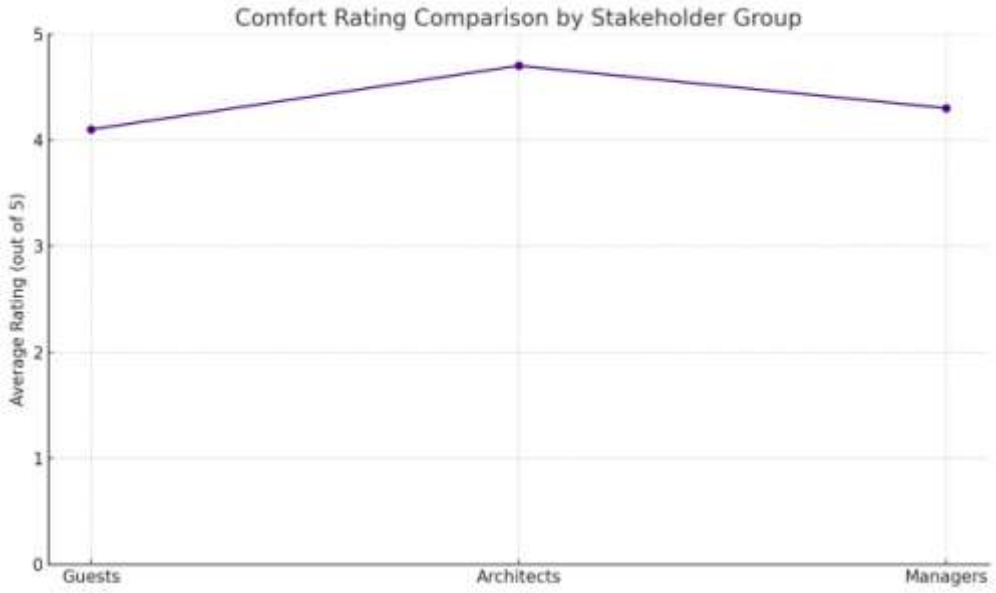


Figure 3;Comfort Rating Comparison by Stakeholder Group (Line Graph)

V. CONCLUSION

This study explored how spatial circulation, accessibility, and user comfort can be strategically integrated into four-star hotel design in Nigeria, with a proposed project in Eko Atlantic City as a contextual reference. Drawing from a robust mixed-methods approachincluding insights from 40 architects, 20 hotel managers, and 150 hotel guests. The research uncovered critical links between movement logic, inclusivity, and environmental satisfaction in hospitality architecture.

Findings revealed that although many designers prioritize accessibility and circulation during the planning phase, their implementation is often diluted by operational inefficiencies or aesthetic overrides (Bello & Adebayo, 2020; Onifade & Adegbite, 2021). Circulation conflicts and inadequate wayfinding still persist in several hotel environments, especially during peak periods or in facilities lacking clear zoning. Similarly, while guests value comfort highly with specialregard to ventilation, lighting, and spatial openness These needs are not always met uniformly across facilities, often due to cost-cutting or poor design follow-through (Zagreus et al., 2004; Kolarevic & Malkawi, 2005).

The study emphasizes that space circulation is not a secondary design concern, but rather a core functional and experiential strategy that shapes guest satisfaction and operational efficiency. In hotel architectureparticularly in emerging urban centers like Eko Atlantic, there is a growing need to blend aesthetics with performance through thoughtful planning, universal design, and adaptive comfort strategies (Steinfeld & Maisel, 2012).

To that end, the following recommendations are advanced for future hotel projects:

1. Integrate universal design early in the design process to prevent retrofitting and ensure accessibility is seamless rather than add-on.
2. Use circulation zoning as an organizing principle, clearly separating public, semi-public, private, and service areas.
3. Enhance wayfinding through color-coded signage, lighting, tactile cues, and visual landmarks to reduce cognitive load and improve guest autonomy.
4. Prioritize passive comfort systems such as natural ventilation, daylighting, and acoustic buffering in guest and public areas.
5. Ensure post-construction feedback loops between designers, facility managers, and users to refine spatial performance over time.

Ultimately, this research contributes to the growing discourse on inclusive hospitality design in Sub-Saharan Africa and provides a reference framework for context-sensitive, user-centered hotel planning in fast-growing urban environments.

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