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The effect of space flexibility and building orientation on grade-B office building occupancy rate in Kampala City

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Abstract

This paper focused on linking the influence of the specifics of building services orientation and space flexibility on the occupancy dynamics of Grade-B office buildings.

The paper employed a cross-sectional design, backed with qualitative and quantitative research approaches, on a sample size of 115 respondents including tenants (70), property managers/owners (40), and real estate experts (05). Data collection was through questionnaires and interview guides. Quantitative analysis was done through univariate and bivariate methods buttressed by the use of MS Excel, MS. Word and STATA version 15. The qualitative component employed thematic analysis.

The findings indicate a significant relationship between occupancy length and the sufficiency of rentable space to meet business needs. Buildings with bigger rentable spaces had higher occupancy. Lastly, the majority (82.9%) of the tenants could not customize their rentable spaces according to their needs due to restrictions from landlords and property managers, leading to their high mobility. We recommend attention to the design and layout of parking spaces commensurate to the building's capacity and local regulations and ensuring flexibility of floor plans during building designs. A well-designed building with convenient road accessibility, ample parking, attractive amenities, and tenant-focused design can better retain tenants, leading to better building performance.

Keywords: office blocks; building orientation; design; occupancy rate

Introduction

Globally, building orientations and service provision of the buildings are fundamental aspects to consider in sustaining occupancies. Orientation and building views are often considered as an “iconic edifice” that always beautify the skyline of cities and play a significant role in the economic growth of urban centres (Akhimien et al., 2017). Such aspects of the building view, directly impact on the business transacted by the occupants as they determine the convenience of both the tenants and business clients. Eventually, they will have a direct influence on the return on investment.

Over the recent past, the Kampala CBD has faced a reduction in the number of inquiries and interest in office space for letting particularly for grade-B office spaces (Knightfrank, 2021, Mubiru and Naturinda, 2023a). This led to a 3% drop in occupancy of Grade-B office buildings from 84% in H1 2020 to 81% in H1 2021. Grade-B office buildings often face challenges in maintaining high occupancy rates due to the competition from newer, more modern and better located buildings (Block, 2011). One factor that may contribute to lower occupancy rates is the building orientation, which can affect the indoor environment, energy efficiency, accessibility, manoeuvring, and overall appeal of the building. However, there is limited research on the specific effects of building orientation on occupancy rates of Grade-B office buildings.

Current studies have focused on the impact of building orientation on energy efficiency, thermal comfort, lighting, performance and ventilation (Aini and Nadia, 2019, Gonçalves et al., 2021,

Kaminska, 2020). Additionally, Choi and Storr (2019) identified a relationship between rent increase and tenant retention in commercial real estate. The authors, however, did not cover an in-depth analysis and correlation of particular building orientation variables on building occupancy, especially in the context of Kampala city. Therefore, this study aims to investigate the effect of building orientation on occupancy performance of Grade-B office buildings. This is with a view to providing insights into how building design can impact the market performance of these buildings. Such performance can likely be achieved through sustained occupancy arising from the fit for purpose spaces and flexible occupancies.

In addition to the paper aim, several lines of assumption were adopted. These include there is no significant association between the length of stay and the flexibility of rentable space; There is no significant association between occupancy length and access systems to the building; There is no significant association between occupancy length and whether it is difficult or not to access the building from the main road; and, there is no significant association between occupancy length and availability of parking space.

Building orientation and flexibility occupation of Grade-B Office Space -a theoretical perspective

The understanding of the concept of building orientation is multi-faceted. Building Orientation means the way a building is positioned or sited in respect to its surroundings (Gehl, 2011), and may be referred to as front-to-front, where the primary façade faces the primary façade of an adjacent building, or side-to-side or back-to-back (Shepperson, 2009, Al-Temeemi, 1995). In this way, it comprises the arrangement of different parts of a building in a specific direction so as to maximize certain aspects of its surroundings. Such aspects may include street appeal (Carmona et al., 2018), capturing scenic views (Sullivan and Meyer, 2016), or for drainage considerations (Schmitt et al., 2004) among others. Building orientation may further incorporate the layout/size of the rentable space (Kendall and Teicher, 2010), accessibility from the road (Martínez and Viegas, 2009), flexibility of the rentable spaces (Khamkanya and Sloan, 2009, Vimpari et al., 2014), accessibility within the different parts of the building (Mubiru and Naturinda, 2023a), and size/capacity of parking spaces to offer tenants for increased satisfaction and productivity.

Segmenting into building orientation of office buildings is important for this paper that emphasizes the occupancy performance of buildings. This is because orientation components of buildings have links in influencing occupant satisfaction, willingness to pay and tenancy renewals. The designs and orientations of office buildings can be determined by a number of speculative and corporate factors by individuals and firms predicted to be future tenants (Duarte et al., 2013). The orientations are thus determined by user type, such as investment banks, professional firms, or high-tech companies who normally dictate the floor size, concept and marketable location of the building (Kohn and Katz, 2002).

Occupancy performance, especially for office buildings can manifest in various forms. For instance, it can be determined by vacancy rates. This signifies the number of dwelling units which are vacant on a specified date expressed as a percentage of all units standing on that date (Pedersen and Delgadillo, 2007, Theobald, 2001). Basing on the preceding thus, the length of occupancy will signify the amount of time that a certain tenant occupies a given office space. Such a period commences when a unit gets occupied by a tenant and ends when the room becomes vacant (either

because an occupant moves out of an existing unit or because the unit enters the market). Vacant rooms are unoccupied units available for rent (Schmitt, 2000).

The quality of Grade-B office buildings is slightly lower than that of Grade-A. Such spaces are occupied by companies and organizations that seek offices in a quality building but are unable or unwilling to pay high rental rates charged by Grade-A offices. The common factor contributing to a building being considered Grade-B is its age (Dermisi and McDonald, 2010). Grade-B office buildings are thus usually older than their Grade-A counterparts. Oftentimes, a Grade-B office building was originally Grade-A but has been downgraded due to age and deterioration. These properties typically have good amenities, management companies and tenants, and can even be brought up to Grade-A standards with common area renovations and amenity upgrades and rental rates for Grade-B buildings lower than Grade-A. The buildings themselves are usually considered average, and the rental rates they draw are average for their markets (BOMA, 2022, Case and Shiller, 2003).

Generally, Grade-B offices are a grade below Grade-A, and slightly older buildings than Grade-A with good management, quality tenants, good building finishes, good quality systems (not at Grade-A level). They are often well maintained with average rental rates and usually targeted by occupants planning renovations to restore them to Grade-A. The distinguishing factor between a Grade-A and grade-B building is the quality and variety of amenities and building finishes (Katz and Gupta, 2014). These office spaces compete for a wide range of users that want average rental rates for their market areas (Peltier, 2001). Tenants who occupy Grade-B buildings don't need to be in the middle of the action, nor do they require an outward display of prestige. Instead, they want to provide employees with a comfortable, modern workspace. Typical tenants include companies that value function over form, and are in fields like IT, creative services, and call centres.

To fit a Grade-B office definition, amenities would need to include, but aren't limited to on-site parking, security, conference rooms, bike storage, cafeteria-style or café dining, and shared outdoor spaces. Thus, improving the workplace quality, security, flexibility of space and cheap ample parking space are important for lengthy occupancy periods and more tenancy renewals (King et al., 2017).

Literature Review

The issue of flexibility of building orientation, energy consumption, sustenance of occupancy trends and tenant satisfaction have attracted considerable attention from scholars over the last ten years. A study by Kim. (2021) investigated the impact of building orientation on the energy consumption and occupancy rates of commercial buildings in Seoul, South Korea. Similar experiences have been observed in Italy (Bellia et al., 2013), Hongkong (Leng et al., 2020), and some sub-Saharan African cities (Nematchoua et al., 2020). In this way, commonly the buildings with adequate orientation to natural ventilation and shading likely claim lower energy consumption and improved indoor environmental quality. Eventually, if such expectations are met, it leads to increased tenant satisfaction and higher occupancy rates. Similarly, Geng et al. (2019) and Zuhaib et al. (2018) indicated that buildings with good orientation to natural ventilation, shading, and daylight had better indoor environmental quality and occupant satisfaction. Such would impact on increasing tenant retention and higher occupancy rates and the other way round.

Whatever its size or type, the office building is a complex building type and is affected by many forces. Such forces can eventually impact on the quality of its occupancy based on how the occupants perceive the flexibility of the provided spaces. Akhimien et al. (2017) noted that the important role of the office is to provide accommodation for tenants, visitors and equipment, at same time facilitating office activities. As such, the design and orientation of the office has a great effect on the fulfilment of the building's primary performance expectation.

The need for office buildings to have more flexible spaces, adaptable office equipment and materials, built in services etc. is beginning to be a standard practice in the tropics and in developing countries. This is because the electricity often may not be constant and sufficient to run most office buildings. Therefore, the need to make office building design environmentally friendly is highly emphasized with the provision of alternate lighting solutions, proper ventilation system in buildings in case of power outage, incorporating open-office plans for increased office space flexibility (Zhang et al., 2013).

A study by Belafi et al. (2021) investigated the impact of building orientation on the sustenance of occupancy performance of commercial buildings in hot climates. The study found that buildings with good orientation to natural light and ventilation had higher and sustained occupancy rates and lower energy consumption, as well as improved indoor environmental quality. The study noted that building orientation was particularly important in hot climates, where cooling loads can be high. Similar sentiments were observed in China (Miao et al., 2020).

Baum and Crosby (2019) studied the determinants of lease length in commercial property markets and found that tenant characteristics, lease terms, and property characteristics are significant factors. Furthermore, the longer leases are more likely to be signed by tenants with higher credit ratings and firms with longer operating histories (Giambona et al., 2008). Additionally, shorter leases are more common in properties with higher vacancy rates and in locations with weaker economic conditions. This suggests that property managers should consider the factors that influence lease length in order to maximize occupancy performance.

On the other hand, Gujral et al. (2020) indicated that the length of leases with high-quality tenants can determine the value of commercial real estate and provide a stable source of rental income. However, it is important to note that, shorter leases with high-quality tenants can provide flexibility and allow for rent increases when market conditions stabilize. These views suggest that property managers should carefully consider lease structure in order to maximize occupancy performance. Such sentiments are shared also by Devine and Kok (2015) who observes that, tenants are more likely to renew their leases if they have greater control over the design of their space and if the lease terms are flexible. These findings suggest that property managers should consider allowing for flexible lease terms in order to retain tenants and maximize occupancy performance.

Considering tenant turnovers, and satisfaction, several scholars have attributed them to several factors. James III (2007) has hinged satisfaction to the performance of the building and its amenities. In this way, building quality, accessibility, and property management are significant factors in tenant satisfaction and retention. Additionally, Mubiru and Naturinda (2021) hinged satisfaction to the level of complaint responses by the landlords, whereas Mubiru and Naturinda (2023b) connect this to the distribution and quality of access systems in the buildings.

Existing literature on commercial property occupancy in Uganda has correlated the length of tenancies and possible negotiations. Deininger and Castagnini (2006) indicates that, in Kampala, the average length of tenancy in commercial properties is approximately 2.5 years. Additionally, it is possible for tenants who have been in buildings for longer than 3 years to be more likely to negotiate for lower rent or better lease terms. This suggests that longer lengths of occupancy may lead to increased bargaining power for tenants. Additionally, tenants prioritize factors such as location, accessibility, and security when choosing a rental space (Haraldsson and Håkansson, 2023) especially for office properties. However, the authors so far have not analysed deeply how the occupancy and the choices of the tenants to sustain and renew their tenancies are pushed by the orientation attributes and layout flexibility of the Grade-B offices.

Therefore, the flexibility of space can have a significant impact on the occupancy rates of office buildings. Flexibility allows for the efficient use of space and can accommodate changing tenant needs and preferences, leading to increased tenant satisfaction and improved occupancy rates. The flexibility of buildings may come in different forms. These include building views regarding the main access routes, location of access systems, distribution and capacity of parking space, accessibility and distribution of the working spaces, and the general adjustment in cases of possible changes in use. The flexibility in design, including the ability to accommodate remote working and social distancing, could increase tenant satisfaction and lead to higher and sustained occupancy rates (Hassanain et al., 2018). On the other hand, buildings with inflexible designs could suffer from decreased demand and lower occupancy rates.

Key lessons have been gathered from the reviewed literature that form a basis for study of this paper's aim, issue and variables in the context of Kampala city. The literature reviewed has emphasised the committing to longer leases as a key ingredient for Grade-B office buildings' performance. Thus, property managers should carefully consider lease structure to maximise occupancy performance.

Methods

This paper employed a cross-sectional research design, with aid of a mixture of qualitative and quantitative approaches of descriptive statistics. A cross-sectional study is a type of observational study that analyses data from a population, or a representative subset, at a specific point in time (Lee and Chia, 1994). Thus, cross-sectional designs are used in preliminary and exploratory studies to allow researchers to gather information, summarize, present and interpret for the purpose of clarification (Kothari, 2019). The researchers adopted this research design because this study fits within the provisions of descriptive cross-sectional research designs, and yet, the study seeks to collect data at a given point in time, summarize it, present and interpret findings to answer a specific research aim. The study was conducted using primary data obtained from study participants through objective human observation, experiences shared through interviews and served questionnaires. Furthermore, and guided by secondary data concerning property occupancy statistics and price patterns obtained from property management companies' reports, Uganda Bureau of Statistics (UBOS) reports, among other reliable sources to make valid inferences.

For purposes of this paper, the main target respondents were the sitting tenants/occupants and property managers of Grade-B offices, at Luwum street- Kampala city. The focus area of this study

was, Grade-B office spaces along Luwum Street, Kampala city. The selection of the case study area was majorly based on the existence of a sufficient number of Grade-B office buildings, especially those that are professionally managed. Luwum Street is located in the central division of the Kampala capital city authority. It spots a variety of commercial high-rise buildings, many of which boasted of the attributes that were relevant for this study. For instance, the linear patterns along access routes and their orderly sequence helped selection through a systematic sampling.

In addition to observation, the tools used for data collection were questionnaires and structured interviews for the tenants and property managers/building owners respectively. The in-depth interviews were used to supplement the data collection from real estate experts who comprised the key informant respondents. The questionnaires were pre-tested on a sample of 10 respondents selected from three selected grade B offices in the study area, using convenience sampling. In this, the validity was measured using the Content Validity Index method to indicate the degree to which the questionnaire corresponds to the concept it is designed to measure. Content Validity Index was determined using the formula below:

$$CVI = K/N.$$

Where, **CVI** = Content Validity Index, **K** = Number of questions considered relevant/ suitable, **N** = Total number of questions.

Rejection Criteria

Reject the instrument is $CVI \leq 0.5$. If CVI is greater than or equal to 0.5, the items in the instrument at acceptable level of significance was accepted (Lawshe, 1975). The Cronbach's alpha was used to determine the internal consistence (Cronbach, 1951).

Sampling strategy

A systematic sampling technique was pivotal in aiding the selection of the sample buildings. The office buildings along Luwum street in Kampala central Division had a consistent distribution pattern. The buildings' distribution along the Luwum street and others in defined patterns behind the main tributaries, yet with no significantly divergent patterns made the selection through systematic sampling relevant. The selection was made for every third high-rise office building along the Luwum street stretch. Eventually, seven (07) buildings were selected, and from each ten (10) tenants purposively selected. Purposive sampling was also used in selecting the key informants who included seven (07) property managers or landlords managing the sampled buildings. The choice between property managers and/or landlords depended on who was willing to respond to the study questions and their ability to elaborate management dynamics of the managed buildings. Finally, thirty-eight (38) other real estate professionals, including real estate agents and valuers were also selected for interview. These were purposively selected for possessing important knowledge of the Kampala property market and sharing their experience regarding how the buildings' orientations have influenced the occupancy trends and the property market.

Table 1: Sample Distribution

Category	Sample size	Information needed
Tenants	70	Building design, tenancy renewal prospects, inclusivity of the lettable space.
Property experts	38	Inclusivity of the orientation design
Property Managers/Landlords	07	Tenant turnovers Preferences of certain building portions Complaints on space allocation

Source: Authors' construct, (2023)

The target population comprised of 115 participants that combined 70 tenants (ten from each of the seven sampled buildings), 07 landlords /property managers and 38 property experts (Table 1). Seventy (70) structured questionnaires were administered with tenants, and the responses from landlords /property managers and the real estate experts were gathered through structured and in-depth interviews. During selection, we ensured that a respondent was picked on different floors to limit the monotony of responses and experiences, given the differing means in which occupants appreciate the services provided by the buildings.

Data analysis

Data from questionnaires was entered using Microsoft Office Excel from where it was cleaned and coded. The clean data was exported to STATA Version 15 from which analysis was done. The univariate data analysis provided by descriptive statistics presented using frequency tables, bar graphs and pie charts. Data was also analysed through bivariate analysis. This is analysis of two variables at a time to establish any relationships/associations. This was presented using two-way tables (cross-tabulations) for two categorical variables, correlation analysis for two continuous variables and Analysis of variance (ANOVA) for cases where one variable is continuous and the other is categorical. ANOVA tests for equality of means. The testing of the hypothesis further followed a one-tail test. Confidentiality was maintained to protect the respondents. Furthermore, the questionnaire didn't disclose details of rental property for the issue of privacy and secrecy.

Findings

This paper aimed to analyse how space flexibility and building orientation play a key role in sustaining occupancy of Grade-B office buildings. The analysed data in this section exhibits the various experiences of the occupants, those in charge of the buildings and from the property experts in Kampala city regarding the study aim and variables. The findings of this paper are thematically categorised into four sections. These include accessibility and manoeuvring within the buildings, Access from the road, Size of rental space, Parking space, Flexibility of space.

Descriptive Statistics for rentable space, parking space and occupancy performance

The study compiled descriptive statistics for the quantitative variables of 07 property managers interviewed and presented in Table 2 below.

Table 2: Statistics for rentable space, parking space and occupancy performance

Variable	Mean	Std. Dev.	Min	Max
Occupancy rate	27.1	22.3	4.2	100
Total Size of rentable space	668.6	293.2	159	1169
Number of parking spaces	95.5	53.6	24	199
Number of floors	4.2	1.8	2	8
Number of rooms	15.3	6.3	6	28
Number of vacant rooms	3.4	1.8	1	6
Average length of occupancy	5	2.1	1	8
Average rental income	1,420,000	368,856.88	850,000	2,500,000

Source: Author Construct, (2023)

From Table 2, average occupancy rate of the sampled buildings stood at 27.1% with a standard deviation of 22.3 while the lowest occupancy rate was 4.2, and the highest occupancy rate was 100%. The average rental income is Uganda shillings 1,420,000 (USD. 379), where the most expensive rental space is Uganda shillings 2,500,000 (USD. 667), while the cheapest room is Uganda shillings 850,000 (USD. 227). The average rental size is 668.6 square feet with a standard deviation of 293.2sqft, the smallest office space is 159 square feet while the biggest is 1169 square feet. Also, the average number of parking spaces is 95 vehicle spaces with the smallest accommodating 24 vehicles while the biggest accommodating 199 vehicles. The parking spaces include both underground parking, open space parking and rooftop parking spaces.

On average, every building had 4 floors and 15 rooms with the shortest and biggest buildings having 2 floors and 28 rooms respectively. Furthermore, the average number of vacant rooms per building is approximately 3 rooms with the highest number of vacant rooms being 6 rooms. The average length of occupancy is 5 years. Some tenants have stayed as short a minimum of 1 year while some other have been tenants for 8 years.

Accessibility and manoeuvring within the buildings.

The type, location and distribution of the different access systems are key ingredients in the orientation attributes of high-rise office buildings. Such vertical access systems may include stairs, lifts/elevators and ramps. They are key in determining the tenants' occupancy of the premises, as their locational orientations in a way is likely to influence tenant comfort and sustained occupancy (Mubiru and Naturinda, 2021). For this reason, tenants were asked the type of access systems that the buildings they occupied had and their responses are as shown in Figure 1 below.

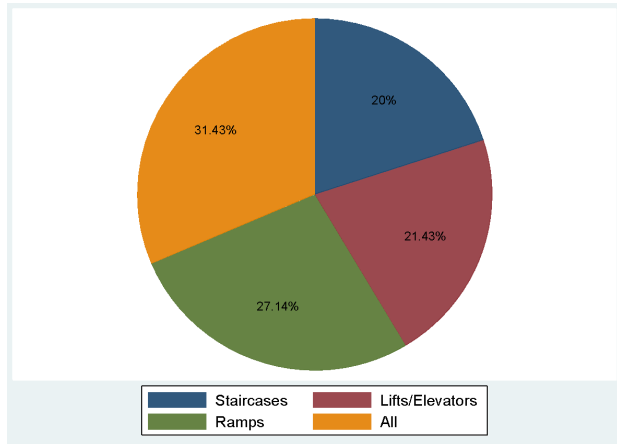


Figure 1: Type of access system.

Source: Authors' survey, 2023

In addition to the illustrated statistics in Figure 1, the tenants' perceptions were driven by the actual locations of the buildings' access systems, as such influenced their comfort in their stay. From the statistics gathered, 70% of the tenants were mindful of the locational distribution of the access systems and they would be key to their sustained occupancy. Such sentiments were shared by (Abisuga et al., 2020) who further indicated that such tenant expectations can be sorted by post-occupancy feedback which may at times necessitate reorientation of such systems to ease comfortable access.

Length of occupancy and plans to renew tenancies

The current length of building occupancy, and the intention of the tenants to renew their tenancies/occupancy are fundamental to note in this study. Such components would signal the tenant satisfaction with the different aspects of the building (Mohd Nor et al., 2020, Mubiru and Naturinda, 2023a), including the orientation and facility distribution of the office premises.

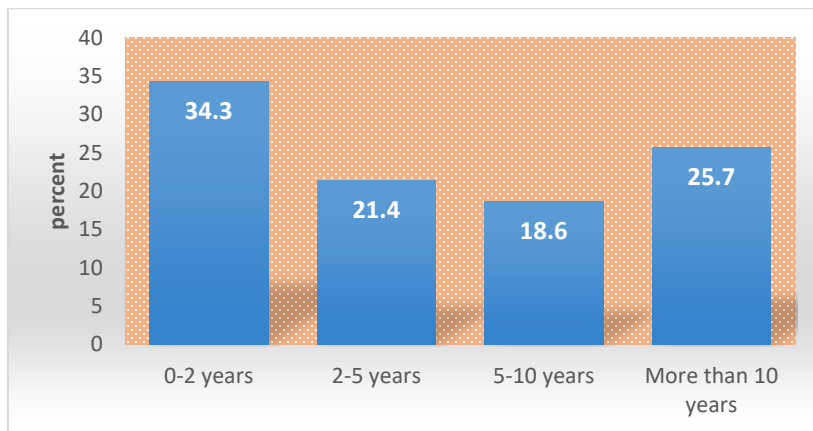


Figure 2: Tenants' length of occupancy

Upon inquiry from the tenants as per their length of stay, the results established varying tenancies and intentions for stay. Most of the tenants (34.3%) occupied their spaces between 0-2 years

followed by those who had occupied their current office spaces for a period of more than 10 years with 25.7%. When asked how long more the tenants planned to occupy their rentable space in the building, most of the tenants (32.9%) indicated that they are planning to remain in the current buildings for a period of between 0-2 years. The least number of tenants (10) representing 14.3% only planned to spend more than 10 years in their current spaces.

In addition, the findings revealed that the majority of the tenants (60%) were not willing to renew their tenancy agreements upon expiration of their current terms. However, the tenants noted that if given incentives like parking fee reductions, free toilet facilities for their clients, freedom to customize their spaces, enough parking spaces, and extensions in rent arrears, they could get encouraged to renew their tenancy agreements.

Influence of orientation of access systems on the occupancy rates The study analyzed the length of occupancy against the orientation of access systems and the accessibility of the buildings, to establish whether there were any relationships. Cross tabulation was conducted where the two variables under comparison were both categorical and a two-way table with measures of association was given as the out and interpreted to reject or accept the null hypothesis of no association. In cases where one of the two variables under investigation was quantitative against occupancy length, an analysis of variance was conducted to compare means of the different factor variables and presented in ANOVA tables.

For tenant continued stay in the Grade-B office buildings, continued manoeuvrability had to be ensured for all types of users. What remained unclear, in the context of Kampala city was whether the particular orientation of the internal access systems would influence tenant sustained occupancy. The results are presented in Table 2, and interpreted in the section below.

Table 3: Cross-tabulation of occupancy rates and orientation of access systems to the building.

Occupancy length	Orientation of access systems to the building					
	Ramps	Staircases	Lifts/Elevators	All	Total	
0-2 years	3	8	1	9	21	Prob = 0.0183
2-5 years	6	2	8	2	18	
5-10 years	3	3	3	6	15	
More than 10 years	7	1	3	5	16	
Total	19	14	15	22	70	

Source: Author Construct, (2023)

The probability value of 0.0183 is significant at 5% level of significance. This implies that there is a significant association between length of occupancy and the distribution/orientation of access systems to the office buildings. This implies that the nature or type of access system in place such as ramps, staircases, lifts or elevators may not suffice. For user satisfaction evidenced in

committing to longer occupancy, the distribution/orientation of the internal vertical access systems was key. This observation with Adnan and Daud (2010) in Kuala Lumpur city and Appel-Meulenbroek (2008) in Eindhoven.

However, in addition to the accessibility orientation within the buildings, the orientation and accessibility in terms of the main road was a key point to consider with potential of influencing tenant occupancy sustainability of the Grade-B offices. As Table 4 illustrates, its influence deviated from the earlier influence of in-building access systems.

Table 4: Influence of difficulties accessing the building from the road on the occupancy length

Occupancy length	Difficulties accessing the building		
	NO	YES	Total
0-2 years	12	9	21
2-5 years	9	9	18
5-10 years	9	6	15
More than 10 years	7	9	16
Total	37	33	70

Prob = 0.7883

Source: Author Construct, (2023)

From the output in Table 4, the probability value of 0.788 led to the acceptance of the null hypothesis. Therefore, no association was found to exist between length of occupancy and difficulties in accessing the building from the main road. This observation is a deviation from the observation for in-building accessibility systems. Implying that whether it was difficult to access the building, this did not influence the length of occupancy reported by the tenants. Studies which had found a significant correlation were linked to retail, commercial and residential properties (Hamer, 2018, Ibem et al., 2015, Nourian et al., 2018).

Occupancy rates and flexibility of rentable space

For office and commercial use of the Grade-B office buildings, many users desire flexible workspaces. This study thus considered flexibility as a key component of building orientation as illustrated in Table 5.

Table 5: whether the flexibility of the lettable space influenced tenant occupancy

Occupancy length	Have you been able to customize your space according to your needs		
	NO	YES	Total
0-2 years	21	2	23
2-5 years	12	6	18
5-10 years	3	9	12
More than 10 years	3	14	17
Total	39	31	70

Source: Author Construct, (2023)

The data found a significant association between length of occupancy and flexibility of rentable space. This is because the p-value of 0.0264 is less than the p-value associated with the 5% level of significance that led to the rejection of the null hypothesis of no association. Furthermore, it was apparent from the responses obtained from property managers that flexibility to reorient the spaces was often embedded in the tenancy agreements and largely depended on the amount of space and length of tenancy one was negotiating for. Eventually, tenants with bigger spaces enjoyed more allowance to reorient their space, guaranteeing their comfort and intention to stay longer in the let premises. This observation is compliant with that of Antunes Batista da Silva et al. (2022) who linked it with rent sustainability and Halvitigali et al. (2019) who linked it with encouragement of co-working.

Furthermore, from the interviews held, 62.5% of the managers indicated plans to make rentable space more flexible while, 52.5% of the property managers have restrictions on how tenants can use the rentable space available and provide incentives to their tenants in form of allowances for modification of their rooms for tenants who sign longer leases. On the other hand, 47.5% did not have any restrictions on how tenants should use their spaces and do not provide any benefits or incentives. Most of the managers have plans to change length of occupancy terms (55%) while 45% of the managers do not have plans to change the length of occupancy terms in the future. All in all, the flexibility and planning flexible spaces was more assured where property managers/landlords were responsive to the needs of the current and prospective tenants.

The Occupancy length vs the size and distribution of parking space

The building accommodation of the parking for all types of users was a fundamental component which users hinged on the orientation components that eventually impact on tenant occupancy. The size, distribution and possibility of manoeuvrability are key sources of complaints from building users, and in a way may influence mobility of tenants (Audu et al., 2018, Adnan and Daud, 2010). So it was vital for this aspect of building orientation to be correlated and check its influence to building occupancy trends as illustrated in Table 6:

Table 6: Influence of orientation of parking spaces on occupancy length

Occupancy length	Is there parking space for your business needs, employees and clients		
	NO	YES	Total
0-2 years	13	8	21
2-5 years	10	8	18
5-10 years	4	11	15
More than 10 years	9	7	16
Total	36	34	70

Prob = 0.1811

Source: Author Construct, (2023)

The p-value of 0.1811 is not significant at 5% level of significance. Thus, we fail to reject the null hypothesis of no association. Therefore, there is no significant association between occupancy length and availability of parking space. Thus, much as there were occasional complaints from tenants as recorded by the property managers/landlords, they were often no sufficient to singly influence tenants’ refusal to renew their tenancies.

The preceding notwithstanding, the property managers were asked whether there were any traffic concerns or challenges that their tenants face while accessing the buildings from the road, especially concerning manoeuvring through the space, lack of assurance of the available space, and sometimes total failure to obtain space. The study revealed that majority of the tenants (57.5%) face challenges while accessing the buildings from the access road. Majority (85%) of these property managers have parking spaces and the parking fee is part of the rent paid by tenants. While only 15% of the property managers charge a parking fee as a service charge over and above the rent paid.

Key Building orientation considerations to tenant sustainability by key informants

In addition to the tenant responses, this paper triangulated from the key informants especially property managers and real estate experts, weighing the four building orientation variables in their influence to tenant occupancy and sustainability. The four variables include road accessibility, parking space, access systems, parking space and flexibility of the working space (Table 8).

Table 8: Key Building orientation considerations to tenant sustainability by key informants

Building orientation indicator	Yes	No
Road accessibility	46.9%	53.1%
Parking space	53.9%	47.1%
Internal Access systems	100%	0
Flexibility of the working spaces	17.1%	82.9%
Average	55%	46%

Source: Author Construct, (2023)

From the key informant responses, internal building access systems were considered fundamental in influencing the tenant occupancies. This was followed by the parking space, road accessibility and lastly the flexibility of the working space. This implies that, the Grade-B office tenants prioritised the comfort of their immediate environment (inside the building) more than the external views and orientation. Furthermore, the flexibility of the working spaces were largely prioritised by long term tenants who also preferred to negotiate bigger spaces. Such types of tenants comprised the minority, and it was not an immediate priority for most of the Grade-B tenants. Therefore, much as sufficient literature advocates for better values from the adoption of flexible office spaces (De Paoli et al., 2013, Hassanain, 2006, Göçer et al., 2018), it remains a preserve for Grade-A blocks and rather still far-fetched for grade-B office blocks, especially in the context of Kampala city.

Conclusion

This paper has weighed the various building orientation attributes, and how they influence the occupancy trends of Grade-B office buildings, within the context of Kampala City-Uganda. The key focus attributes are the distribution of access systems, accessibility from the roads, flexibility of the lettable space, size, location and availability of parking space. From the findings, the average space occupied is 429.571 which is common for typical Grade-B office buildings occupants. Most buildings (31.4%) use staircases, ramps, lifts and elevators. There is a significant relationship between length of occupancy and access systems to the building implying that, the nature or type of access system in place such as ramps, staircases, lifts or elevators have an effect on the length of occupancy by tenants.

However, no association was found to exist between length of occupancy and difficulties in accessing the building from main road. Implying that the difficulty (if any) experienced in accessing the buildings, could not directly have an effect on the length of occupancy reported by the tenants, and their choice to stay or leave the premises.

Therefore, the influence of particular aspects of building orientation to the sustainability of Grade-B office building tenancies remains a debatable one. The degree to which each aspect/variable influences the comfort of tenants can be considered on a case-by-case basis. But the common denominator lies in the internal orientation attributes of the building, especially the access systems and the space sizes. Probably, it is because that is the space where the tenants spend most of their working time. For the external orientation attributes, much as they are not significant, their locations are normally associated with tenant and user complaints which for sustainability of occupancy rates, should not be ignored by the property managers/landlords. By carefully considering these factors during the design and planning stages, building owners and developers can optimize the building's attractiveness, convenience, and financial performance.

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References

- ABISUGA, A. O., WANG, C. C. & SUNINDIJO, R. Y. 2020. Facility managers' responses to user post-occupancy feedback: A conceptual framework. *Facilities*, 38, 481-499.
- ADNAN, Y. M. & DAUD, M. N. 2010. Factors Influencing Office Building Occupation Decision by Tenants in Kuala Lumpur City Centre-a Delphi Study. *Journal of Design and Built Environment*, 6.
- AINI, Q. & NADIA, N. The performance of ventilation in internal buildings affected by differences of building orientation. IOP Conference Series: Materials Science and Engineering, 2019. IOP Publishing, 012001.
- AKHIMIEN, A., ADAMOLEKUN, A. & ISIWELE, A. 2017. Adaptability and Sustainability of Office Buildings. *J. Civ. Environ. Eng*, 4, 80-99.
- AL-TEMEEMI, A.-S. 1995. Climatic design techniques for reducing cooling energy consumption in Kuwaiti houses. *Energy and Buildings*, 23, 41-48.
- ANTUNES BATISTA DA SILVA, F., LIU, N. & HUTCHISON, N. 2022. Flexible workspace providers as tenants: an analysis of the rental prices in the London market. *Journal of Property Investment & Finance*, 40, 448-464.
- APPEL-MEULENBROEK, R. 2008. Managing “keep” factors of office tenants to raise satisfaction and loyalty. *Property Management*, 26, 43-55.
- AUDU, A. F., AKINLABI, A. J. & IDRIS, O. B. 2018. Examination of Tenants' Satisfaction with Services provided in Commercial Properties in Ibadan, Nigeria. *An international Journal of Scientific and Research Publications* 8 (2), 157-177.
- BELLHOUSE, D. 2005. Systematic sampling methods. *Encyclopedia of Biostatistics*, 8.
- BELLIA, L., DE FALCO, F. & MINICHELLO, F. 2013. Effects of solar shading devices on energy requirements of standalone office buildings for Italian climates. *Applied Thermal Engineering*, 54, 190-201.
- BLOCK, R. L. 2011. *Investing in REITs: real estate investment trusts*, John Wiley & Sons.
- BOMA, B. O. A. M. A. I. 2022. Boma. *Boma Webste* [Online]. Available: <http://www.boma.org/officebuildingclassification/default.aspx>.
- CARMONA, M., GABRIELI, T., HICKMAN, R., LAOPOULOU, T. & LIVINGSTONE, N. 2018. Street appeal: The value of street improvements. *Progress in Planning*, 126, 1-51.

- CASE, K. E. & SHILLER, R. J. 2003. Is there a bubble in the housing market? *Brookings papers on economic activity*, 2003, 299-362.
- CHOI, S. G. & STORR, V. H. 2019. A culture of rent seeking. *Public Choice*, 181, 101-126.
- CRONBACH, L. J. 1951. Coefficient alpha and the internal structure of tests. *psychometrika*, 16, 297-334.
- DE PAOLI, D., ARGE, K. & BLAKSTAD, S. H. 2013. Creating business value with open space flexible offices. *Journal of Corporate Real Estate*, 15, 181-193.
- DEININGER, K. & CASTAGNINI, R. 2006. Incidence and impact of land conflict in Uganda. *Journal of Economic Behavior & Organization*, 60, 321-345.
- DERMISI, S. & MCDONALD, J. 2010. Selling prices/sq. ft. of office buildings in down town Chicago—How much is it worth to be an old but Class A building? *Journal of Real Estate Research*, 32, 1-22.
- DEVINE, A. & KOK, N. 2015. Green certification and building performance: Implications for tangibles and intangibles. *The Journal of Portfolio Management*, 41, 151-163.
- DUARTE, C., VAN DEN WYMELENBERG, K. & RIEGER, C. 2013. Revealing occupancy patterns in an office building through the use of occupancy sensor data. *Energy and buildings*, 67, 587-595.
- GEHL, J. 2011. Life between buildings.
- GENG, Y., JI, W., WANG, Z., LIN, B. & ZHU, Y. 2019. A review of operating performance in green buildings: Energy use, indoor environmental quality and occupant satisfaction. *Energy and Buildings*, 183, 500-514.
- GIAMBONA, E., HARDING, J. P. & SIRMANS, C. 2008. Explaining the variation in REIT capital structure: the role of asset liquidation value. *Real Estate Economics*, 36, 111-137.
- GÖÇER, Ö., GÖÇER, K., ERGÖZ KARAHAN, E. & İLHAN OYGÜR, I. 2018. Exploring mobility & workplace choice in a flexible office through post-occupancy evaluation. *Ergonomics*, 61, 226-242.
- GONÇALVES, M., NOVAIS, R. M., SENFF, L., CARVALHEIRAS, J. & LABRINCHA, J. A. 2021. PCM-containing bi-layered alkali-activated materials: A novel and sustainable route to regulate the temperature and humidity fluctuations inside buildings. *Building and Environment*, 205, 108281.
- GUJRAL, V., PALTER, R., SANGHVI, A. & VICKERY, B. 2020. Commercial real estate must do more than merely adapt to coronavirus. *McKinsey & Company*.
- HALVITIGALI, D., ANTONIADES, H. & EVES, C. 2019. The rise of coworking and their implications on traditional leasing models. *Pacific Rim Real Estate Society Inc.*

- HAMER, A. J. 2018. Accessible habitat and wetland structure drive occupancy dynamics of a threatened amphibian across a peri-urban landscape. *Landscape and Urban Planning*, 178, 228-237.
- HARALDSSON, A. & HÅKANSSON, E. 2023. Factors influencing corporate office relocation A comparison of three Gothenburg business districts.
- HASSANAIN, M. A. 2006. Factors affecting the development of flexible workplace facilities. *Journal of Corporate Real Estate*, 8, 213-220.
- HASSANAIN, M. A., ALNUAIMI, A. K. & SANANI-ANIBIRE, M. O. 2018. Post occupancy evaluation of a flexible workplace facility in Saudi Arabia. *Journal of Facilities Management*.
- IBEM, E. O., ADUWO, E. B. & AYO-VAUGHAN, E. K. 2015. Assessment of the sustainability of public housing projects in Ogun State, Nigeria: A post occupancy evaluation approach. *Mediterranean Journal of Social Sciences*, 6, 523.
- IGWENAGU, C. 2016. *Fundamentals of research methodology and data collection*, LAP Lambert Academic Publishing.
- JAMES III, R. N. 2007. Multifamily housing characteristics and tenant satisfaction. *Journal of Performance of Constructed Facilities*, 21, 472-480.
- KAMINSKA, A. 2020. Impact of Building Orientation on Daylight Availability and Energy Savings Potential in an Academic Classroom. *Energies*, 13, 4916.
- KATZ, O. & GUPTA, K. 2014. *The tale of two markets: a comparison of performance between Class A properties in secondary markets and Class B properties in primary markets*. Massachusetts Institute of Technology.
- KENDALL, S. H. & TEICHER, J. 2010. *Residential open building*, Routledge.
- KHAMKANYA, T. & SLOAN, B. 2009. Flexible working in Scottish local authority property: Moving on to the highest flexibility level. *International Journal of Strategic Property Management*, 13, 37-52.
- KIM., J. 2021. *Empirical analysis of building energy consumption and urban form in a large city: A case of Seoul, South Korea*. *Energy and Buildings*., Seoul, South Korea.,
- KING, R., ORLOFF, M., VIRSILAS, T. & PANDE, T. 2017. *Confronting the urban housing crisis in the global south: Adequate, secure, and affordable housing*, World Resources Institute Washington, DC.
- KNIGHTFRANK 2021. H2 2020 Kampala Market Performance Review and H1 2021 Outlook. Kampala.
- KOHN, A. E. & KATZ, P. 2002. *Building type basics for office buildings*, John Wiley & Sons.
- KOTHARI, C. 2019. *Research Methodology: Methods and Techniques*, New Delhi, New Age International(P) Limited.

- LAWSHE, C. H. 1975. A quantitative approach to content validity. *Personnel psychology*, 28, 563-575.
- LEE, J. & CHIA, K. 1994. Use of the prevalence ratio v the prevalence odds ratio as a measure of risk in cross sectional studies. *Occupational and Environmental Medicine*, 51, 841.
- LENG, H., CHEN, X., MA, Y., WONG, N. H. & MING, T. 2020. Urban morphology and building heating energy consumption: Evidence from Harbin, a severe cold region city. *Energy and Buildings*, 224, 110143.
- MARTÍNEZ, L. M. & VIEGAS, J. M. 2009. Effects of transportation accessibility on residential property values: Hedonic Price Model in the Lisbon, Portugal, metropolitan area. *Transportation Research Record*, 2115, 127-137.
- MIAO, C., YU, S., HU, Y., BU, R., QI, L., HE, X. & CHEN, W. 2020. How the morphology of urban street canyons affects suspended particulate matter concentration at the pedestrian level: An in-situ investigation. *Sustainable Cities and Society*, 55, 102042.
- MOHD NOR, U. S., WAN ABD AZIZ, W. N. A. & AL SADAT ZYED, Z. 2020. Tenants' satisfaction in high residential buildings. *Built Environment Journal (BEJ)*, 17, 41-58.
- MUBIRU, M. & NATURINDA, C. 2021. Tenants' Experiences Regarding Satisfaction with Existing Complaint Handling Mechanisms in Landlord Managed Apartments in Kampala. *Asian Journal of Science and Technology*, 12, 11762-11769.
- MUBIRU, M. B. & NATURINDA, J. M. 2023. Quality assurance measures of access systems for tenant retention in high-rise office buildings in Kampala, Uganda. Experiences from building users. *Facilities*, ahead-of-print.
- NEMATCHOUA, M. K., OROSA, J. A., BURATTI, C., OBONYO, E., RIM, D., RICCIARDI, P. & REITER, S. 2020. Comparative analysis of bioclimatic zones, energy consumption, CO2 emission and life cycle cost of residential and commercial buildings located in a tropical region: A case study of the big island of Madagascar. *Energy*, 202, 117754.
- NOURIAN, P., REZVANI, S., VALECKAITE, K. & SARIYILDIZ, S. 2018. Modelling walking and cycling accessibility and mobility: The effect of network configuration and occupancy on spatial dynamics of active mobility. *Smart and Sustainable Built Environment*, 7, 101-116.
- PEDERSEN, C. & DELGADILLO, L. 2007. Residential Mortgage Default in Low-and High-Minority Census Tracts. *Family and Consumer Sciences Research Journal*, 35, 374-391.
- PELTIER, S. S. E. 2001. *Analysis of the supply of serviced office space*. Massachusetts Institute of Technology.
- SCHMITT, R. C. 2000. Mobility, Turnover, and Vacancy rates. *Land economics*, 33, 261-264.
- SCHMITT, T. G., THOMAS, M. & ETTRICH, N. 2004. Analysis and modeling of flooding in urban drainage systems. *Journal of hydrology*, 299, 300-311.

SHEPPERSON, M. 2009. Planning for the sun: urban forms as a Mesopotamian response to the sun. *World archaeology*, 41, 363-378.

SULLIVAN, R. G. & MEYER, M. E. 2016. Environmental reviews and case studies: The national park service visual resource inventory: Capturing the historic and cultural values of scenic views. *Environmental Practice*, 18, 166-179.

THEOBALD, D. M. 2001. Land-use dynamics beyond the American urban fringe. *Geographical Review*, 91, 544-564.

VIMPARI, J., KAJANDER, J.-K. & JUNNILA, S. 2014. Valuing flexibility in a retrofit investment. *Journal of Corporate Real Estate*, 16, 3-21.

ZHANG, S., TEIZER, J., LEE, J.-K., EASTMAN, C. M. & VENUGOPAL, M. 2013. Building information modeling (BIM) and safety: Automatic safety checking of construction models and schedules. *Automation in construction*, 29, 183-195.

ZUHAIB, S., MANTON, R., GRIFFIN, C., HAJDUKIEWICZ, M., KEANE, M. M. & GOGGINS, J. 2018. An Indoor Environmental Quality (IEQ) assessment of a partially-retrofitted university building. *Building and Environment*, 139, 69-85.