

Trends and Influential Factors in Shaping Tomorrow's Workplace in Malaysia

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ABSTRACT

The design and function of high-rise office buildings have evolved over the past century to accommodate changing working lifestyles and trends. Technological advancements and the recent pandemic have further influenced workplace dynamics, leading to challenges such as redundant office spaces. Despite the productivity of remote work, office environments foster human connection and collaboration, which are crucial for innovation. Ensuring sustainability in high-rise offices demands adaptation to evolving work trends through future office designs. This study examines the evolution of high-rise offices in Malaysia, exploring factors influencing workplace trends and identifying emerging design concepts. Using qualitative methods, including literature review and case studies in Kuala Lumpur, the findings underscore a transition towards versatile, user-centric environments in Kuala Lumpur's high-rise buildings, driven by the city's ambition as a global financial hub. Holistic approaches addressing social, physical, and economic factors are essential for navigating challenges and opportunities in this evolving landscape. In addition, integrating advanced technologies and community-centric environments into office design is crucial for creating future-proof workspaces. Ultimately, the findings could inspire practical and creative designs for promoting productivity and a human-centred workplace within high-rise offices.

1.0 INTRODUCTION

Older office buildings in the Klang Valley are struggling to attract occupants due to a preference among owners and tenants for newer developments, compounded by the continuous construction of new office buildings and the migration of companies from older properties. Concurrently, the workplace is undergoing a profound transformation fueled by technological advancements, shifting organisational dynamics, and evolving cultural norms (Berruti et al., 2022; Haan, 2023).

The COVID-19 pandemic has significantly accelerated the adoption of remote work practices, as highlighted in the World Economic Forum's Future of Jobs Report 2020, which noted that up to 44% of the workforce could transition to remote settings (Krylova et al., 2021). This transition underscores the urgent need for organisations to adapt swiftly to virtual work environments. The shift to remote work presents both opportunities, such as increased flexibility and access to a broader talent pool, and challenges, including ensuring effective communication and maintaining team cohesion. Understanding and effectively managing this transition is essential for organisations to remain competitive, retain talent, and optimise operational efficiency in a changing global economy.

Amidst this whirlwind of change, traditional office spaces stand on the brink of significant evolution. Technological breakthroughs have unlocked newfound potential, allowing individuals to transcend conventional office boundaries. This paradigm shift heralds the advent of virtual offices and telecommuting, offering unprecedented flexibility to employees. A seminal study by IBM examining various work venues—virtual offices, home offices, and traditional spaces—yielded invaluable insights into their impacts on professional and personal realms (Hill et al., 2003; Niebuhr et al., 2022).

Despite extensive research on remote work and technological advancements, a notable gap exists in understanding how these trends specifically influence high-rise office buildings in Malaysia. This study explores the relationship between high-rise office buildings and the evolving needs of Malaysia's modern workforce by discerning and analysing emerging trends and influential factors shaping tomorrow's workplace. By scrutinising the evolutionary trajectory of high-rise office buildings within the Malaysian context, the study seeks to identify key factors influencing working dynamics, workplace environments, and office design. Furthermore, the study anticipates transformative shifts in working culture, workplace configurations, and office design aesthetics, offering valuable insights to inform strategic decision-making and facilitate effective organisational adaptation.

This paper also discusses broader trends and factors impacting the Malaysian workplace. These include the integration of advanced technologies, the rise of remote work, changes in organisational behaviour, and the increasing importance of sustainable practices. These elements provide a comprehensive overview of how Malaysia's workplace landscape is evolving and what this means for the future of work in the country.

2.0 LITERATURE REVIEW

2.1. High-Rise Development in Malaysia

The development of high-rise office buildings in Malaysia reflects the nation's economic growth and the changing dynamics of the workplace environment. Following Malaysia's independence, there was a notable surge in tall office building construction, indicating the demand for contemporary infrastructure to support businesses and government operations (Khan et al., 2014).

The transition from standalone structures to mixed-use developments, exemplified by projects like TRX 106 and Merdeka 118, has redefined urban landscapes, promoting community engagement and optimising land utilisation. These integrated developments address the need for office space and contribute to city sustainability by reducing commuting distances and fostering walkability (PAGE, 2016).

In response to Malaysia's emergence as an international business hub, sustainable design principles have gained prominence in the evolution of high-rise office buildings. Developers and architects prioritise energy efficiency, water conservation, and green spaces, resulting in structures that cater to evolving workplace trends and environmental concerns (Al-Kodmany, 2018).

This shift towards sustainability benefits the environment and enhances the well-being of occupants, fostering healthier and more liveable high-rise environments (Johnson, 2015). Despite oversupply challenges,

Kuala Lumpur continues to experience a surge in high-rise office buildings, reflecting sustained demand for premium office spaces amidst rapid urbanisation (Al-Kodmany, 2012; Johnson, 2015; Barlow & Gann, 1995).

Global companies, recognising the importance of sustainability, prefer green building-certified real estate, signalling a commitment to environmentally friendly practices in construction and operation (Yau et al., 2014). Understanding the factors driving the evolution of high-rise office buildings in Malaysia and identifying emerging trends in workplace design is crucial for informing future development strategies and promoting sustainable urban growth.

2.2. Future Office Needs and Expectations

Working remotely from home offices offers predominantly positive effects on both work-related factors and personal life. Eliminating daily commutes allows individuals to save time, which can be allocated to household chores, unlike the challenges faced by those working from virtual offices. However, it is crucial to recognise the potential difficulties in maintaining a work-life balance for virtual office workers, given the blurred boundaries between their professional and personal responsibilities. The flexibility of a virtual office can make it challenging to effectively separate work and personal life, potentially leading to increased work-related stress and reduced well-being (Hill et al., 2003; Stea et al., 2015).

Hassanain (2010) emphasises that many organisations overlook crucial factors such as work environment settings, planning methodologies, and innovative technologies when providing office space. Aligning the office workplace with these considerations can enhance staff attraction and retention, elevating organisational value. Moreover, integrating these factors can enhance management effectiveness, user satisfaction, and productivity levels within the workplace. The study by Danna and Griffin (1999) further discusses the multitude of individual and organisational consequences stemming from varying employee health and well-being levels. Employee behaviours under workplace pressure can lead to various health issues while simultaneously impacting organisations' financial health and profitability.

de Waal and Linthorst's (2020) study highlights organisational traits and long-term orientation, reflecting evolving expectations for future management skills. Organisations should adopt open, flexible structures, embrace agile working methods, and foster collaboration and innovation to remain competitive. Additionally, the study underscores the significance of values, purpose, and corporate culture in driving high performance. Leaders must also demonstrate tech-savviness to adapt to changing business landscapes. In parallel, Ambrosat and Grünwald (2023) suggest that strategic foresight is crucial for organisations to align with ongoing societal and economic transformations.

The response to increased remote work post-COVID-19 has led to a surge in flexible and activity-based office solutions. Forooraghi et al. (2023) recommend designing office spaces tailored to employees' work patterns, introducing adaptable workstations, and considering office layout prior to relocation for seamless transitions. Enhancing functionality through strategic design and clear guidelines and meeting evolving needs in hybrid work settings, including hybrid meeting rooms and teleconferencing spaces, further supports effective workplace adaptation. Aligning with this, Haapakangas et al. (2023) suggest that incorporating user-centric and participative methods into the design and implementation of Activity-Based Offices ensures comprehensive consideration of user needs. Monitoring workspace utilisation and gathering feedback from employees facilitate the identification of obstacles to flexible workspace usage.

3.0 METHODOLOGY

The research applied the qualitative method through a comprehensive literature review and analysis of existing literature and a case study, as illustrated in Figure 1. The research framework was designed based on three stages, which are highlighted below.

3.1. First Stage – Establishing The Inquiry Framework

Before commencing the literature review, an inquiry framework was established using a set of guiding questions outlined in Table 1. This framework structures the investigation into the historical context and development trends of high-rise office buildings in Malaysia and identifies key factors influencing working, workplace and office design. These guiding questions, drawn from current news and issues, form the

foundation for organising the literature review process and ensuring a structured exploration of relevant themes and concepts.

Table 1. The guiding questions (Source: Author)

| No. | The Guiding Questions | Criterion-Guided Inquiry |
|-----|---|-------------------------------------|
| 1 | What are the challenges of high-rise office buildings today? | ● Issues and challenges |
| 2 | How do high-rise office buildings in Malaysia evolve throughout the years? | ● High-rise evolution |
| 3 | How do Malaysians work, and what contributes to Malaysia's working lifestyles, habits and trends? | ● User needs ● Work productivity |
| 4 | Why is there still a need for work in the office? | ● User needs ● Work productivity |
| 5 | What are the relevant theories on office well-being and work productivity? | ● Well-being |
| 6 | What are the relevant theories on office well-being and work productivity? | ● Well-being ● Work productivity |
| 7 | How would 'working' in future high-rise buildings be? | ● Future-proof |

3.2. Second Stage – Comprehensive Literature Review

a) Criteria for Literature Review

Objective 1 is to gain insights into the historical evolution and development trends of high-rise office buildings in Malaysia. In achieving this objective, the literature review is guided by specific criteria:

- High-rise building definition as per the standards set forth by the Council on Tall Buildings and Urban Habitat (CTBUH).
- Consideration of building occupancy types and functions, with a particular emphasis on high-rise office buildings.
- Location specificity focuses on high-rise office developments in Kuala Lumpur, Malaysia, given its status as the capital city with high-density high-rise office buildings.

Objective 2 is to identify key factors that influence working dynamics, workplace environments, and office design practices. The literature review for this objective is guided by the inquiry framework, comprising the following four criteria:

- Future-proofing strategies in office design and management to address evolving workplace needs and technological advancements.
- Consideration of well-being factors impacting occupants within high-rise office environments, including physical, psychological, and social aspects.
- Factors contributing to enhanced work productivity include ergonomic design principles, spatial layout, and environmental considerations.
- User needs and preferences in office design and functionality, including flexibility, accessibility, and amenities.

b) Sampling Strategy

A purposive sampling approach was employed to select scholarly articles, reports, and publications offering insights into the historical context and contemporary dynamics of high-rise office buildings and workplace design practices, focusing on the four criteria – future-proof, well-being, work productivity and user needs. Purposive sampling is used to ensure the selection of literature and data sources aligned with the research objectives and criteria for inclusion.

c) Data Collection and Analysis

The literature review involved a comprehensive search of scholarly articles, reports, books, and relevant publications related to high-rise office buildings, work environments, workplace dynamics, and office design. Academic databases, such as PubMed, Scopus, Web of Science, and Google Scholar, were searched to identify pertinent literature.

Research Methodology Framework

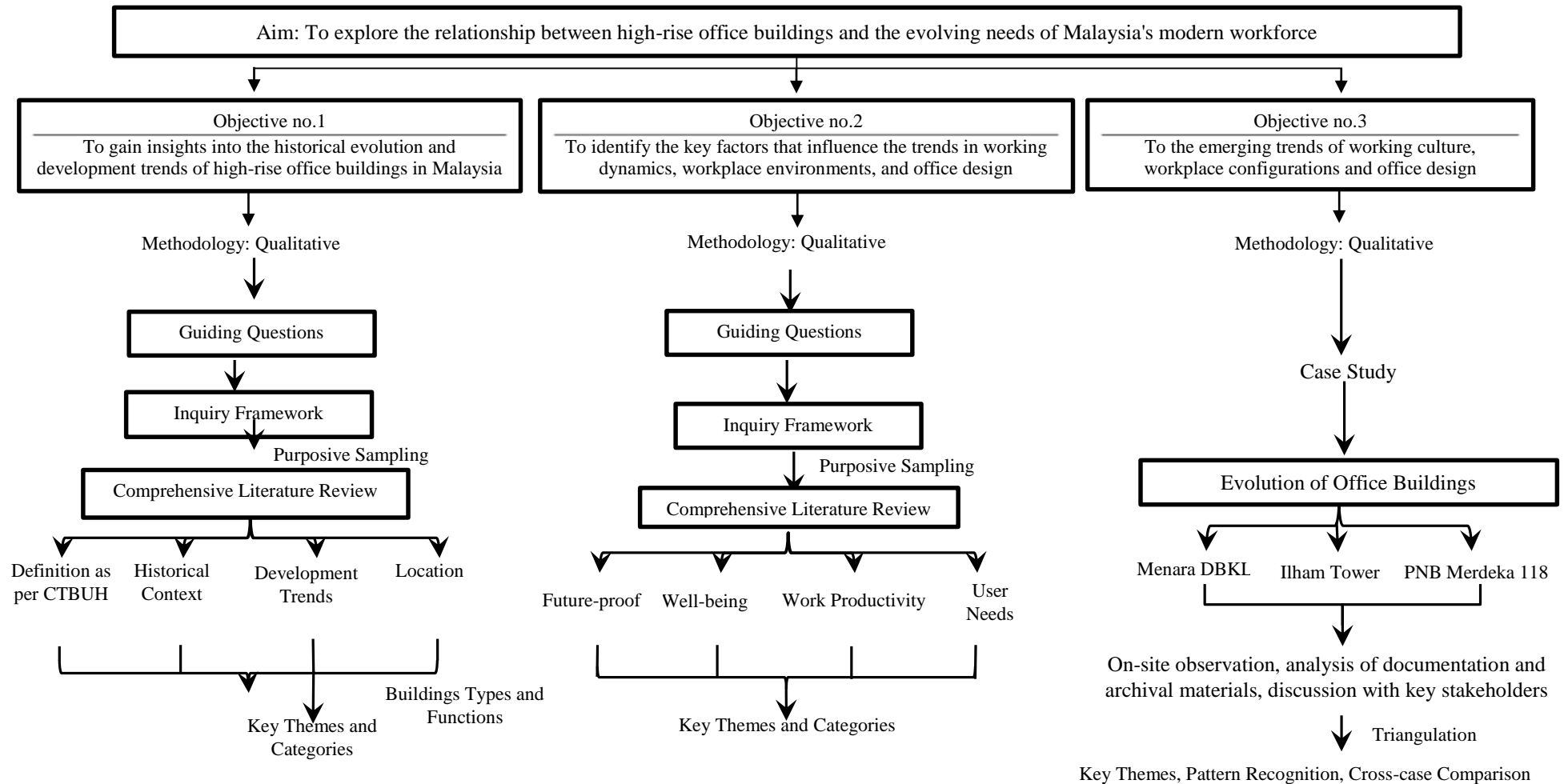


Figure 1. The research methodology framework.
(Source: Author)

Data collection encompassed reviewing and analysing literature about the historical evolution of high-rise office buildings in Malaysia and the factors influencing work environment, workplace dynamics, and office design. Relevant articles and publications were selected based on their alignment with the established criteria for each research objective. Content analysis techniques, including thematic coding and categorisation, were employed to identify recurring themes, trends, and critical insights within the literature.

d) Synthesis and Interpretation

The findings from the literature review were synthesised and interpreted to provide a comprehensive understanding of the historical context and development trends of high-rise office buildings in Malaysia. Factors influencing working dynamics, workplace environments, and office design practices were identified and analysed within the established criteria. The synthesis process involved integrating diverse perspectives and theoretical frameworks to elucidate underlying patterns and relationships within the literature.

3.3. Third Stage – Case Study Analysis

Following the comprehensive literature review, a case study approach was employed to explore further and contextualise the historical evolution and contemporary dynamics of high-rise office buildings in Malaysia. Menara DBKL 1, Ilham Tower and PNB Merdeka 118 were selected as case study sites based on their relevance to research objective no. 1 and their representation of different stages in the evolution timeline of high-rise office buildings in Malaysia.

The selection of case study buildings was guided by their historical significance, architectural innovation, and representation of key developmental stages in the evolution of high-rise office buildings in Malaysia. These buildings were chosen to reflect diverse design philosophies, spatial configurations, and workplace environments, providing a rich and multifaceted lens for analysis.

a) Parameters for Case Study Analysis

The parameters for case study analysis were derived from the factors identified in research objective no. 2, encompassing aspects related to future-proof, well-being, work productivity, and user needs in office design. These parameters served as a framework for assessing and evaluating the performance, functionality, and user experience of each case study building.

b) Data Collection and Analysis

Data collection methods for the case studies included on-site observations, documentation of architectural features and spatial layouts, interviews with key stakeholders, and analysis of relevant documentation and archival materials. Multiple data sources were triangulated to provide a comprehensive understanding of each case study building and its contextual significance within the broader landscape of high-rise office development in Malaysia.

The data obtained from the case studies were analysed using key themes analysis, pattern recognition, and cross-case comparisons. Thematic coding was employed to identify recurring themes, trends, and critical insights within the data, while cross-case comparisons facilitated the exploration of similarities and differences across the case study buildings.

c) Justification for Three Case Studies

The selection of three case studies for in-depth investigation was guided by the representation criteria outlined in research objective no. 1 and the need to capture different stages in the evolution timeline of high-rise office buildings in Malaysia.

The case studies were selected to represent a diverse range of architectural styles, design philosophies, and developmental trajectories within the context of high-rise office buildings in Malaysia. Each case study building embodies unique characteristics and historical significance, offering valuable insights into the region's evolution of high-rise office architecture and workplace design practices.

By strategically selecting case study buildings that span different stages in the evolution timeline of high-rise office buildings, it captures the dynamic nature of architectural innovation, urban development, and societal changes shaping the built environment in Malaysia. The selected case studies serve as historical markers, illustrating the progression and transformation of high-rise office architecture over time.

Limiting the case studies to three facilitates a more profound exploration of each building's historical context, design principles, and user experiences. This narrower focus allows for an in-depth examination of intricate details and contextual nuances that might be overlooked in broader comparative studies, thereby enhancing the depth and richness of the analysis.

3.4. Research Limitations

The scope of the study is limited to analysing existing literature and may not encompass the entirety of industry practices or stakeholder perspectives regarding high-rise office buildings and workplace design in Malaysia. In the case study context, constraints on data access and participant availability could affect how findings are interpreted and the generalisability of results. Additionally, during the case study at PNB Merdeka 118, the building was nearing completion or still under construction, with the fit-out office not yet visible.

4.0 FINDINGS AND DISCUSSION

4.1. The Evolution of High-Rise Office Buildings in Malaysia

The evolution of high-rise office buildings in Malaysia is prominently depicted by Kuala Lumpur's skyline, spanning three phases: the 'early years' (1945 to the 1980s), the 'economic boom' (1990s to 2010s), and the 'rise' phase marking Kuala Lumpur's ascent as a 'global player' (2010 to present), as shown in Table 2.

In the early years, the city skyline was dominated by single-purpose and single-occupancy office buildings housing governmental and financial institutions. Towards the latter part of this phase, a transition to multi-occupancy buildings or multi-tenants emerged, with single-occupancy structures accounting for 71.4% and multi-occupancy buildings for 28.6% of the landscape.

In the following phase, multi-purpose and multi-occupancy began to surface, blending offices with retail and amenities for multiple tenants. This shift is evident in the rise of multi-occupancy buildings, which increased by 19.7%, accounting for 48.3% of the occupancy type distribution. Before iconic structures like the Petronas Twin Towers, high-rise buildings were scattered across Kuala Lumpur, reflecting its dynamic growth (see Figure 2). The construction of the Petronas Twin Towers in 1993 transformed the skyline, symbolising Malaysia's economic progress and commitment to sustainability (Ibrahim & Leong, 2015; Al-Kodmany, 2012; Deng, 2022; Mohamad et al., 2021). High-rise development increased to 52.9% in the post-twin tower (see Figure 3), with office typology comprising 70% of this growth.

The rise of high-rise development in this era aligns with Malaysia's urban spatial transformation in the 1990s, driven by international division demands and multinational companies (IDE, n.d.), improving technology, and global city competition. Re-branding high-rise buildings reshapes the city's image (Yusoff et al., 2014).

In the current "Rise" phase, Kuala Lumpur solidifies its position as a leading global player. Projects like PNB Merdeka 118 and the TRX Exchange epitomise the city's ambition to be a recognised global financial and business hub, embodying power, independence, and stability. High-rise buildings now predominantly feature multi-purpose and multi-occupancy designs, integrating offices, retail, residences, and hospitality. Building occupancy types have shifted significantly, with 92.7% multi-occupancy and 7.3% single-occupancy, showcasing the city's focus on urban adaptability and versatility.

4.2. The Influencing Factors and Emerging Trends of Working, Workplace and Office Design in Malaysia

The study identifies nine key categories through an in-depth literature review guided by the criterion-guided inquiries. These categories encompass factors influencing trends in working environments, office design, and workplace dynamics: high-rise office issues, building typology, the evolution of work, the evolution of workspaces, work culture, work behaviour, work productivity and efficiency, future-proof design, and innovative programmes, outlined in Figure 4. These factors form the foundation for a comparative analysis involving Menara DBKL 1, Ilham Tower, and PNB Merdeka 118. Through this comparison, diverse strategies and approaches to address contemporary challenges and opportunities are explored, offering valuable insights into the future trajectory of workplace evolution.

Table 2. High-rise buildings evolution and building occupancy type distribution in Malaysia.
(Source: Author)

| Phase 1 | Phase 2 | Phase 3 |
|--|--|--|
| <p>Early years (Single Occupancy Office Building)</p> | <p>Economics Development (Emergence of multi-occupancy)</p> | <p>The Rise (The rise of multi-occupancy)</p> |
| <p>Nation Building and Administration (1945 - 1980s)</p>  <p>Malaysia House of Parliament Location: Jalan Parlimen Completion: 1959 Function: Parliamentary Hall Floors: 17 Height: 77m / 252.6ft source: Malaysia Tourism (xxx)</p>  <p>Menara Tabung Haji Location: Jalan Tun Razak Completion: 1984 Function: Office Floors: 38 Height: 151.8m / 498ft Source: Malaysia Gazetter (XXX)</p> | <p>Economic Boom (1990 - 2010s)</p>  <p>Menara ExxonMobil Location: Persiaran KLCC Completion: 1996 Function: Office Floors: 30 Height: 125m / 410ft source: Two Hundred Percent (xxx)</p>  <p>Petronas Twin Towers Location: Jalan Ampang Completion: 1998 Function: Office Floors: 88 Height: 451.9m / 1483ft Source: CTBUH (XXX)</p> | <p>Global Stage Player (2010 - Present)</p>  <p>Image: TheBIM Exchange 106 Location: Lingkaran TRX Completion: 2019 Function: Office Floors: 95 Height: 453.6m / 1488ft source: TheBIM (xxx)</p>  <p>PNB Merdeka 118 Location: Jalan Hang Jebat Completion: 2023 Function: Office Floors: 118 Height: 678.9m / 2227ft Source: Fender Katsalidis (XXX)</p> |
| <p>Building Occupancy Type Distribution (1945-1980s)</p>  | <p>Building Occupancy Type Distribution (1990-2000s)</p>  | <p>Building Occupancy Type Distribution (2010-Present)</p>  |

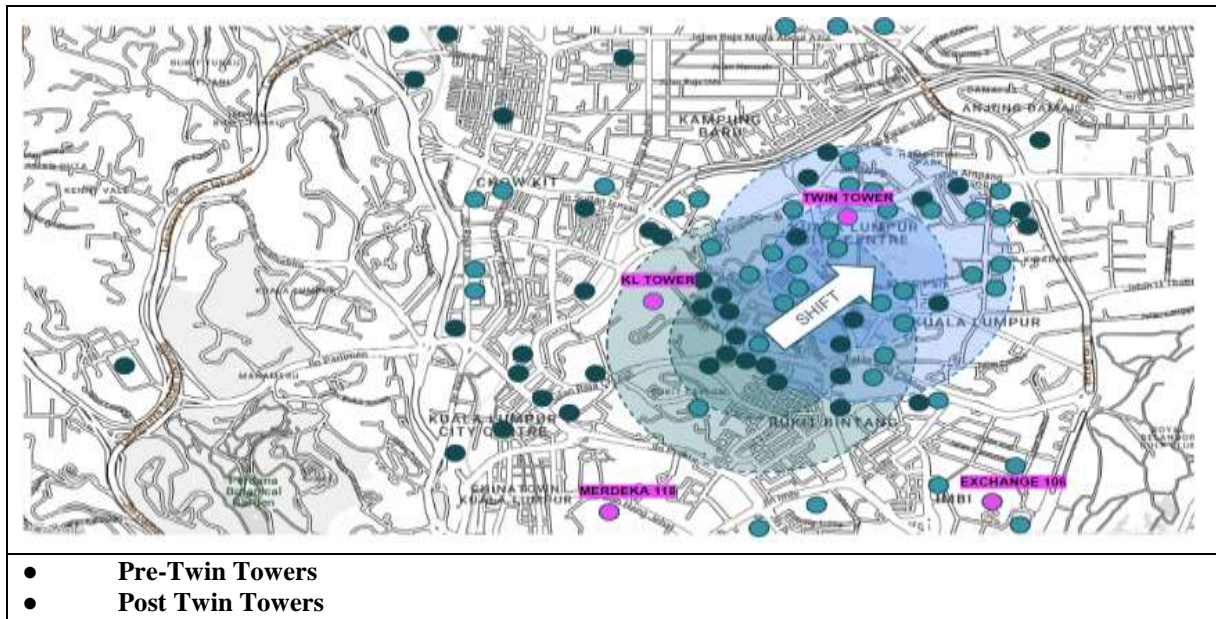


Figure 2. The supply shift of high-rise buildings in Kuala Lumpur.
(Source: Author)

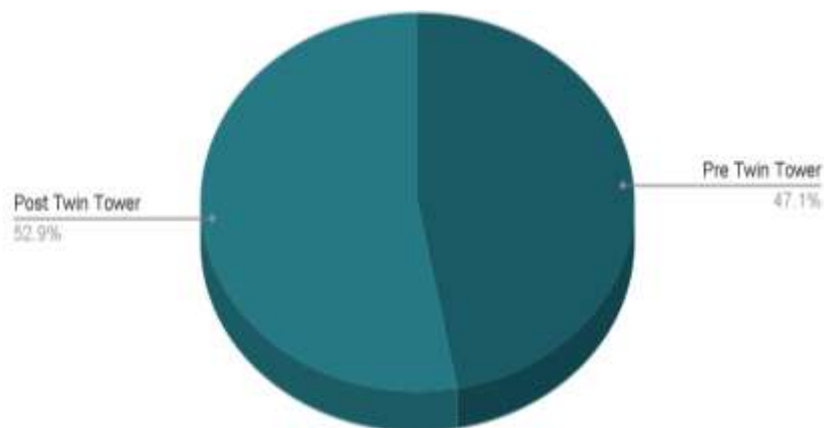


Figure 3. The high-rise buildings distribution between Pre-Twin Tower and Post Twin Tower Era in Kuala Lumpur.
(Source: Author)

4.2.1. High-Rise Office Issues

The high-rise office issues are categorised into five domains — Social, Physical, Mental, Environmental, and Economic — each presenting unique challenges, illustrated through case studies of Menara DBKL 1, Ilham Tower, and PNB Merdeka 118.

Menara DBKL 1 exemplifies concerns regarding layout segregation, potentially limiting social interaction and collaboration among occupants. Muzaffar (2020) underscores the adverse effects of such segregation, emphasising the importance of social cohesion within high-rise office environments, aligning with the concerns raised in this study. By acknowledging the reduced collaboration resulting from layout segregation, Menara DBKL 1 has initiated renovations in their office spaces. While individual workstations remain prevalent, collaborative areas such as discussion zones and spacious pantries are strategically placed to foster social interactions, underscoring the need to balance environmental considerations with social impacts, as noted by Shafii and Othman (2004).

In contrast, Ilham Tower and PNB Merdeka 118 primarily confront challenges related to safety, security, accessibility, and mobility. PNB Merdeka 118 also grapples with community integration concerns. Scott (1998) emphasises that safety and security in high-rise buildings significantly affect occupants' well-being and satisfaction. Furthermore, accessibility and mobility issues may hinder smooth movement within the buildings, potentially causing operational inefficiencies and safety risks (Ibrahim, 2007).

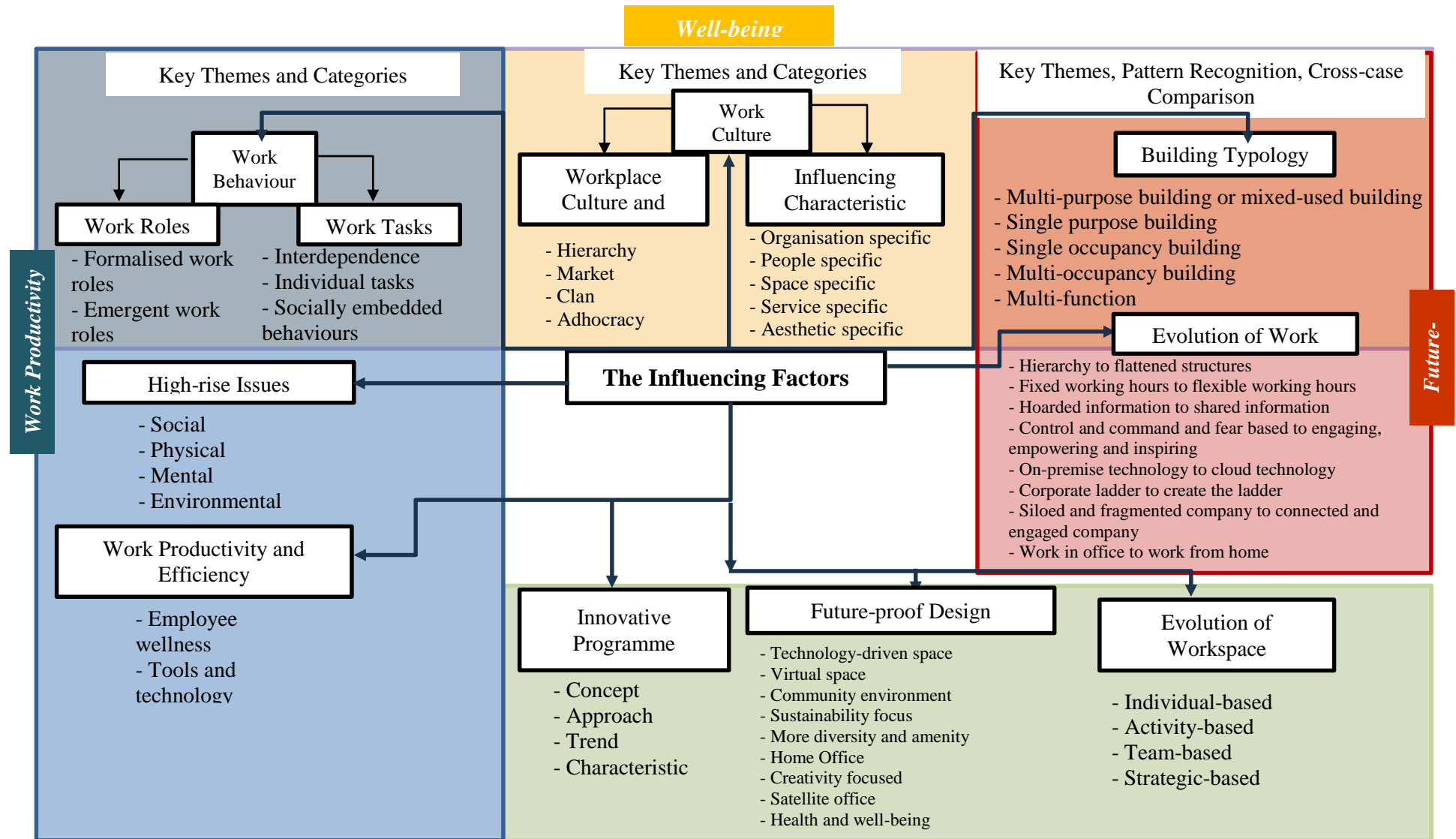


Figure 4. The influencing factors (Source: Author)

Menara DBKL 1, Ilham Tower, and PNB Merdeka 118 encounter building maintenance, image projection, and structural integrity challenges. High vacancy rates and negative public perceptions toward high-rise offices significantly affect the feasibility and sustainability of these buildings. The choice between reusing or renovating existing structures for sustainability must consider environmental and social impacts (Shafii and Othman, 2004). PNB Merdeka 118, with its remarkable height and scale, faces additional physical concerns regarding its towering stature and structural integrity. The architectural prominence of such skyscrapers demands rigorous maintenance protocols to ensure public safety and preserve the building's reputation.

Concerns regarding mental well-being are prevalent across Menara DBKL 1, Ilham Tower, and PNB Merdeka 118. The lack of greenery and limited exposure to natural sunlight within office spaces can adversely affect occupants' mental health and productivity (Ward et al., 2019). The towering height and scale of PNB Merdeka 118 may intensify feelings of isolation and claustrophobia among occupants, emphasising the importance of integrating biophilic design elements and access to natural light in high-rise settings. The presence of natural elements within the workspace, particularly during prolonged isolation periods like pandemics, significantly impacts the mental well-being of individuals in tall buildings (Ward et al., 2019).

Menara DBKL 1 highlights concerns regarding energy consumption, emphasising the importance of adopting sustainable practices to mitigate ecological impact. This concern aligns with research by Lomberra et al. (2010) and Shafii and Othman (2004), which underscore the urgent need for sustainable practices in the construction industry, including implementing energy-efficient technologies and environmentally friendly materials. This proactive approach is mirrored in Ilham Tower and PNB Merdeka 118, where energy efficiency measures are prioritised to reduce carbon emissions and address the urban heat island effect.

Economic viability is pivotal for high-rise projects in Kuala Lumpur. While Menara DBKL 1 contends with challenges tied to its single-purpose nature, Ilham Tower and PNB Merdeka 118 grapple with issues concerning occupancy rates, tenant mix, and investment returns. The prevalence of high-end tenancies and market competition significantly shape these ventures' financial sustainability and prosperity. Disparities in access for SMEs and broader implications for urban migration and commuter stress underscore the intricate interplay between high-rise development, sustainability, and urban living quality (Udoekanem & Ighalo, 2016).

4.2.2. Building Typology

The study categorises building typology into four primary categories, each emphasising unique architectural and functional features. According to CTBUH Height Criteria, a single-function tall building dedicates 85 percent or more of its total height to a single purpose, while a mixed-use tall building incorporates two or more functions, each occupying a significant portion of the tower's space. Occupancy within these buildings can be single or multi-tenancy.

Menara DBKL 1 embodies the essence of a single-purpose administrative office building meticulously designed to meet the specific operational needs of the Kuala Lumpur Municipality. The building layout prioritises efficiency, with various administrative departments housed to streamline processes and workflows.

In contrast, Ilham Tower and PNB Merdeka 118 represent multi-purpose mixed-use buildings embracing a contemporary approach to urban development by integrating diverse functions, tenants, and occupancies within a unified complex (see Figure 5). Both buildings benefit from multi-tenant space (Catalano, 2019), with PNB and Maybank as core tenants in PNB Merdeka 118.

PNB Merdeka 118, in particular, stands out as a larger-scale mixed-use development compared to Ilham Tower. It incorporates commercial, residential, hospitality, and recreational facilities to establish a self-contained urban environment (see Figure 6). The scale and diversity of PNB Merdeka 118's mixed-use offerings elevate its status as a landmark development in Kuala Lumpur, aligning with Richard Florida's concept of the "creative class" (2003) and its role in driving urban revitalisation and economic growth.

The comparison of building typologies among Menara DBKL 1, Ilham Tower, and PNB Merdeka 118 highlights the dynamic evolution of urban architecture and development strategies. While Menara DBKL 1 fulfils specific organisational needs, Ilham Tower and PNB Merdeka 118 embrace a more inclusive and integrated approach to urban living and working environments.

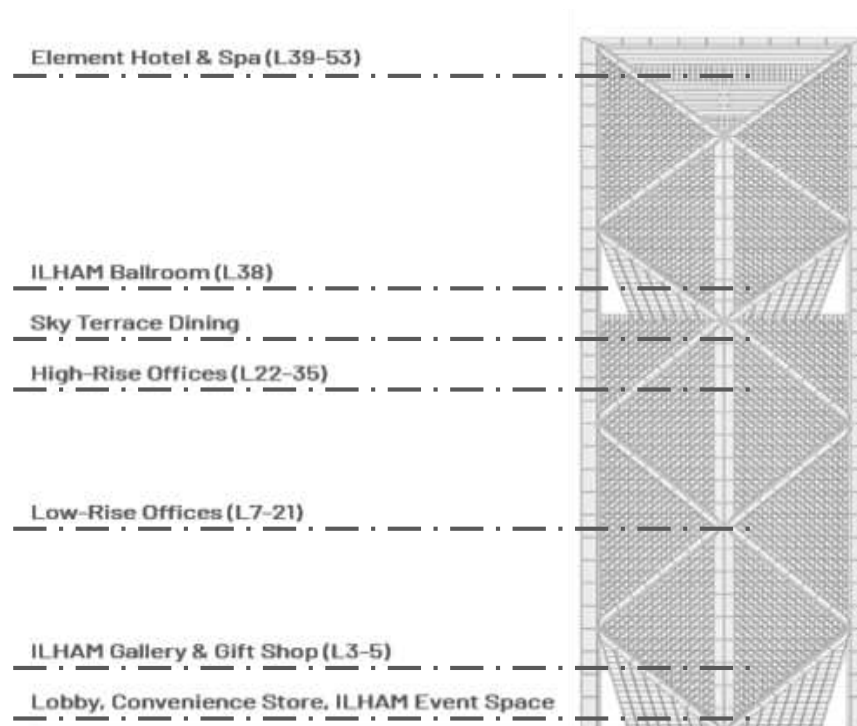


Figure 5. Building programme in Ilham Tower
(Source: <https://www.fosterandpartners.com/projects/ilham-tower>)



Figure 6. Mixed-use development in PNB Merdeka 118
(Source: <https://fkaustralia.com/project/merdeka-118/>)

4.2.3. The Evolution of Work

Modern workspaces are changing in eight ways, moving away from traditional hierarchies to embrace technology and mobile work culture, as illustrated in Figure 4.

Following these transformations, Menara DBKL 1's operational dynamics maintain rigid hierarchies akin to traditional organisational structures, characterised by centralised decision-making and clear role delineation, as echoed by Dieffenbacher (2023). In contrast, while maintaining hierarchical frameworks, Ilham Tower and PNB Merdeka 118 prioritise collaboration and flexibility, fostering flattened structures conducive to decentralised decision-making and cross-functional teamwork, as highlighted by Burt (2000).

Table 3. Cross-comparison of the evolution of work between Menara DBKL 1, Ilham Tower and PNB Merdeka 118 (Source: Author)

| Evolution of Work | Menara DBKL 1 | Ilham Tower | PNB Merdeka 118 |
|----------------------------------|---------------|-------------|-----------------|
| Hierarchy | ✓ | ✓ | ✓ |
| Flatten structure | - | ✓ | ✓ |
| Fixed working hours | ✓ | ✓ | ✓ |
| Flexible working hours | - | ✓ | ✓ |
| Hoarded information | ✓ | - | ✓ |
| Shared information | - | ✓ | ✓ |
| Command & control and fear-based | ✓ | - | ✓ |
| Engaging, empowering & inspiring | - | ✓ | ✓ |
| On-premises technology | ✓ | ✓ | ✓ |
| Cloud technology | ✓ | ✓ | ✓ |
| Corporate ladder | ✓ | - | ✓ |
| Create the ladder | - | ✓ | ✓ |
| Siloed and fragmented company | ✓ | - | - |
| Connected and engaged company | - | ✓ | ✓ |
| Work in office | ✓ | ✓ | ✓ |
| Work from home | ✓ | ✓ | ✓ |

While Menara DBKL 1 maintains fixed working hours that adhere to conventional norms in task scheduling and employee availability, Ilham Tower and PNB Merdeka 118 blend fixed hours with flexible scheduling to accommodate diverse employee needs. By recognising the significance of work-life balance, these modern environments afford employees greater autonomy in managing their time (Allen et al., 2013).

Menara DBKL 1 tends to compartmentalise information, resulting in isolated departments within the organisation. This tendency is often driven by the company's policy, reinforcing barriers between teams and limiting the flow of knowledge (Nelson, 1992). In contrast, Ilham Tower and PNB Merdeka 118 prioritise transparency and shared knowledge, employing technology and efficient communication channels to break down silos and encourage cross-functional collaboration (Wenger et al., 2002).

Management within establishments like Menara DBKL 1 and PNB Merdeka 118 has typically favoured control-oriented methods, marked by an authority, compliance, and apprehension culture (Uddin and Hossain, 2015). Conversely, modern workplaces exemplified by Ilham Tower prioritise employee engagement and empowerment, fostering participation, autonomy, and accountability (Spreitzer, 1995).

At Menara DBKL 1, workplaces traditionally relied on on-premises technology, managing software and hardware resources locally within the organisation. In contrast, contemporary environments like Ilham Tower and PNB Merdeka 118 utilise cloud technology for improved accessibility and flexibility, enabling remote access to data and applications, fostering collaboration and streamlining workflows across various locations (Dillon et al., 2010).

The career progression in traditional settings follows a predetermined corporate ladder, offering limited opportunities for individual growth and development (Price, 1916). Conversely, modern workplaces like Ilham Tower and PNB Merdeka 118 encourage employees to carve their unique career paths, providing avenues for skill enhancement, mentorship, and lateral movement. This approach fosters employee engagement and retention and cultivates a culture of continuous learning and adaptability (Arthur, 1994).

Traditional companies operate within siloed structures, isolating departments and teams and obstructing collaboration and innovation (Waddel et al., 2013). Conversely, modern workplaces prioritise connectedness and engagement, fostering collaboration and purpose-driven cultures. Organisations like Ilham Tower and PNB Merdeka 118 utilise technology and cross-functional teams to dissolve silos, promote knowledge sharing, and align efforts toward common objectives.

Embracing remote work boosts employee satisfaction, autonomy, and task efficiency while reducing commuting stress and environmental impact (Bloom et al., 2015). Organisations like Ilham Tower and PNB Merdeka 118 foster trust and empowerment by providing remote work flexibility, leading to increased engagement and performance. With advancing technology, remote work becomes increasingly feasible and advantageous, shaping the future of work in the digital age.

4.2.4. The Evolution of Workspace

Research by Sargent et al. (2017) delineates three primary workspace paradigms: individual-based, activity-based, and team-based as depicted in Table 4. The individual-based model, prevalent in the 1980s-1990s, featured private offices, cubicles, and open-plan layouts. The 2000s-2010s witnessed a transition to activity-based workspaces (ABW), which emphasised activity-based working and co-working spaces, aiming to enhance productivity and collaboration (Wohlers et al., 2019) by providing diverse settings for tasks. From 2010-2020, the focus shifted to team-based setups, incorporating neighbourhood choice environments, serviced and managed offices, and agile arrangements. Beyond these paradigms, current anticipations revolve around strategic-based approaches, envisioning maker spaces, accommodating mobile occupants, and immersive environments as the forthcoming frontier.

Table 4. Workspace paradigms (Source: Sargent et al., 2017).

| Period | Typology | Workspace |
|---------------|------------------|--|
| 1980S - 1990s | Individual-Based | <ul style="list-style-type: none"> ● Private Offices ● Cubicles ● Open Plan |
| 2000S - 2010S | Activity-Based | <ul style="list-style-type: none"> ● Activity-Based Working (ABW) ● Co-Working |
| 2010-2020 | Team-Based | <ul style="list-style-type: none"> ● Neighbourhood Choice Environment (NCE) ● Serviced Office ● Managed Office ● Agile |
| The future | Strategic-Based | <ul style="list-style-type: none"> ● Maker Environments, ● Mobile Occupants ● Immersive Environment |

Workspaces at Menara DBKL 1, Ilham Tower, and PNB Merdeka 118 showcase the evolution of office design. Menara DBKL 1 represents the traditional individual-based model, aligned with Frederick Taylor's principles of Scientific Management (Taylor et al., 1919). Private offices and cubicles dominate, emphasising order and efficiency (see Figure 7). However, critiques by Nelson (1992) and Uddin et al. (2015) suggest that this rigid structure may hinder collaboration and innovation, possibly dampening employee engagement and creativity.



MENARA DBKL 1
(Source: Author)



ILHAM TOWER
(Source: Author)



PNB MERDEKA 118
(Source: <https://merdeka118.com/gallery/photos/photo-gallery/office/>)

Figure 7. Private offices and cubicles at Menara DBKL 1 and collaborative workspace at Ilham Tower and PNB Merdeka 118. (Source: Author)

In contrast, Ilham Tower and PNB Merdeka 118 embrace activity-based and team-based approaches, departing from traditional hierarchical models toward more dynamic and collaborative work environments (Sargent et al., 2017). Implementing activity-based arrangements in all three buildings underscores employee autonomy and flexibility, aligning with modern management practices (Waddel et al., 2013). This transition, supported by Wohlers et al. (2019), seeks to boost employee productivity and foster collaboration by providing diverse work environments suited to different tasks.

Moreover, integrating team-based elements within Ilham Tower and PNB Merdeka 118 underscores a strategic emphasis on promoting collaboration and innovation. These buildings prioritise employee engagement and creativity by facilitating cross-functional teams and collaborative workspaces, aligning with modern management paradigms

(Spreitzer, 1995). The shift towards team-based approaches reflects a broader trend towards adaptive and collaborative work environments, as organisations recognise the value of leveraging collective intelligence and diverse perspectives to drive innovation and productivity.

However, the absence of strategic-based approaches in these buildings suggests a potential area for future exploration and innovation. Strategic-based workspaces, envisioned by Sargent et al. (2017), offer promising avenues for integrating emerging technologies and accommodating evolving work patterns, such as maker spaces and immersive environments. By embracing strategic-based approaches, organisations can leverage cutting-edge technologies and innovative designs to create immersive and adaptive work environments that optimise employee engagement and creativity.

Table 5. Cross-comparison of the evolution of workspace between Menara DBKL 1, Ilham Tower and PNB Merdeka 118 (Source: Author)

| Evolution of Workspace | Menara DBKL 1 | Ilham Tower | PNB Merdeka 118 |
|------------------------|---------------|-------------|-----------------|
| • Individual-based | ✓ | - | - |
| • Activity-based | ✓ | ✓ | ✓ |
| • Team-based | - | ✓ | ✓ |
| • Strategic-based | - | - | - |

4.2.5. Work Culture

Grounded in theoretical frameworks articulated by Awad & Saad (2013), Taylor et al. (1919), and Schein (2010), this study unveils the intricate interplay between workplace culture and layout, shedding light on their profound implications for organisational dynamics and employee well-being. Exploring office space design about organisational culture, guided by insights from Cameron and Quinn (2006), as cited by Nanayakkara and Wilkinson (2021), provides a deliberate alignment between spatial configurations and prevailing cultural paradigms—Hierarchy, Market, Clan, or Adhocracy. Each cultural archetype defines the characteristics of organisational culture and influences workplace layout, drawing on organisation-specific traits, people-specific characteristics, space-specific features, service-specific considerations, and aesthetic-specific elements (see Figure 4).

Menara DBKL 1 and PNB Merdeka 118 are characterised by a strong hierarchy culture, where the organisation is structured around clearly defined levels of authority and formalised procedures, indicating a significant and pervasive influence. Conversely, Ilham Tower presents a contrasting dynamic due to its diverse tenant base, embodying a more open and collaborative work environment. Here, the prevailing hierarchy culture tends to be moderate to minor in its influence, suggesting a noticeable but not dominant impact, or a minimal and less noticeable influence, respectively.

The market culture, predominant in Ilham Tower and strong in PNB Merdeka 118, emphasises competition and results-driven approaches, significantly influencing workplace dynamics and employee interactions (Schein, 2010). The clan culture ranges from minor to moderate in Menara DBKL 1, moderate to strong in Ilham Tower, and moderate in PNB Merdeka 118. This indicates a varying level of focus on community and shared values, from minimal to significant, positively influencing collaboration and team cohesion (Schein, 2010).

Ilham Tower exhibits a moderate to strong adhocracy culture, indicating a noticeable to significant emphasis on innovation and flexibility, while PNB Merdeka 118 has a moderate adhocracy culture, promoting a noticeable innovation and flexibility in their workspace design and fostering a dynamic and adaptive work environment (Schein, 2010).

Organisational-specific characteristics, such as leadership styles, structure, and communication channels, significantly shape workplace culture across all three establishments. The strong influence of organisation-specific characteristics in Menara DBKL 1 and PNB Merdeka 118 reflects their adherence to traditional hierarchical models and centralised decision-making processes, indicating a significant and pervasive influence.

People-specific characteristics, including employee demographics, values, and social dynamics, contribute to moderate to strong cultural influences in Ilham Tower and strong in PNB Merdeka 118. The strong emphasis on people-specific characteristics in PNB Merdeka 118 underscores its commitment to fostering a supportive and inclusive work environment, prioritising employee well-being and engagement.

Space-specific characteristics, such as workspace design, layout, and functionality, are moderate in Menara DBKL 1 and strong in Ilham Tower and PNB Merdeka 118, reflecting a high level of commitment and integration into the workplace environment to enhance productivity and collaboration.

Service-specific characteristics, encompassing technology integration, amenities, and support services, are moderate to strong in Ilham Tower, indicating a noticeable investment, and strong in PNB Merdeka 118, indicating a significant investment in providing comprehensive and user-centric services to support employee needs and enhance workplace satisfaction.

The influence of aesthetic-specific characteristics, including interior design and ambiance, is moderate in Menara DBKL 1 and strong in Ilham Tower and PNB Merdeka 118. This strong emphasis on aesthetics underscores the organisations' commitment to creating visually appealing and inspiring workspaces that foster creativity, well-being, and a positive work environment.

Aligning workspace design with organisational culture is paramount for promoting efficiency and productivity in contemporary work environments (Nanayakkara and Wilkinson, 2021). The contrast between positive and toxic work environments, as outlined by Nigam (2015) and Rasool et al. (2021), underscores the importance of cultivating a culture that prioritises employee well-being.

Table 6. Cross-comparison of work culture between Menara DBKL 1, Ilham Tower and PNB Merdeka 118.
(Source: Author)

| Work Culture | Menara DBKL 1 | Ilham Tower | PNB Merdeka 118 |
|---|---|--------------------------------------|-----------------|
| • Hierarchy culture | ✓ Strong | ✓ Moderate to minor | ✓ Strong |
| • Market culture | - | ✓ Moderate to strong | ✓ Strong |
| • Clan culture | ✓ Minor to moderate | ✓ Moderate to strong | ✓ Moderate |
| • Adhocracy culture | - | ✓ Moderate to strong | ✓ Moderate |
| Influencing Factors | | | |
| • Organisation specific characteristics | ✓ Strong | ✓ Moderate to strong | ✓ Strong |
| • People specific characteristics | ✓ Moderate | ✓ Moderate to strong | ✓ Strong |
| • Space specific characteristics | ✓ Moderate | ✓ Strong | ✓ Strong |
| • Service specific characteristics | ✓ Moderate - According to Department | ✓ Moderate to strong - Customised | ✓ Strong |
| • Aesthetic specific characteristics | ✓ Moderate | ✓ Strong | ✓ Strong |

4.2.6. Work Behaviour

Analysing high-rise office environments in Kuala Lumpur reveals notable differences in work behaviour, particularly in work roles and tasks, as reflected in Table 7.

Table 7. Cross-comparison of work behaviour between Menara DBKL 1, Ilham Tower and PNB Merdeka 118.
(Source: Author)

| Work Behaviour | Menara DBKL 1 | Ilham Tower | PNB Merdeka 118 |
|--------------------------------|------------------------|-------------------------|-----------------|
| Work Roles | | | |
| • Formalised work roles | ✓ Strong | ✓ Moderate | ✓ Strong |
| • Emergent work roles | ✓ Minor to moderate | ✓ Moderate to strong | ✓ Moderate |
| Work Tasks | | | |
| • Interdependence | ✓ Moderate | ✓ Strong | ✓ Strong |
| • Individual tasks | ✓ Strong | ✓ Moderate | ✓ Moderate |
| • Socially embedded behaviours | ✓ Strong | ✓ Moderate to strong | ✓ Strong |

Concerning work roles, Menara DBKL 1 and PNB Merdeka 118 prioritise formalised work roles, showcasing predefined responsibilities and hierarchical structures within organisations. This strong emphasis underscores traditional

organisational frameworks, promoting efficiency and order, which aligns with insights from Taylor et al. (1919). In contrast, Ilham Tower adopts a more moderate approach to formalised work roles, embracing flexible organisational structures and departing from rigid hierarchies. This indicates a noticeable but not dominant emphasis on formalised roles, allowing for more adaptability and flexibility within the organisational structure.

Moreover, the prevalence of emergent work roles, especially evident in Ilham Tower compared to Menara DBKL 1 and PNB Merdeka 118, highlights the level of adaptability and collaboration nurtured within modern work environments, echoing the need for workplace flexibility and organisational adaptability. However, the study by Putnam et al. (2013) also underscores the importance of addressing the inherent tensions within workplace flexibility, such as variable versus fixed arrangements and supportive versus unsupportive work climates, to ensure that emergent work roles are effectively supported and integrated into organisational practices.

Regarding work tasks, the strong emphasis on interdependence in Ilham Tower and PNB Merdeka 118 reflects a significant collaborative culture, fostering teamwork and coordination. This is consistent with the trend towards open and flexible workspaces outlined by Wagner and Watch (2017). Conversely, Menara DBKL 1 exhibits a more moderate approach to interdependence, suggesting a balance between collaborative efforts and individual responsibilities, reflecting the need for diverse work arrangements.

In terms of individual tasks, Menara DBKL 1 prioritises clear task assignments and delineated responsibilities, consistent with its traditional organisational structures and efficiency focus. Ilham Tower and PNB Merdeka 118 adopt a more moderate stance towards individual tasks by balancing autonomy and collaboration in line with evolving work demands and the importance of employee empowerment.

The emphasis on socially embedded behaviours, particularly in Menara DBKL 1 and PNB Merdeka 118, underscores the significance of interpersonal interactions and collaborative efforts in driving organisational performance and employee satisfaction. This reflects the importance of workplace culture and employee relations highlighted by Schein (2010).

Examining work roles and tasks at Menara DBKL 1, Ilham Tower, and PNB Merdeka 118 reveals the complex interaction between organisational structures, workplace culture, and employee behaviour. Each site demonstrates distinct approaches to formalised and emergent roles, task interdependence, and individual assignments, reflecting its organisational values and management strategies.

4.2.7. Work Productivity and Efficiency

In contemporary organisational settings, boosting productivity and efficiency is vital for sustainable growth and competitiveness. Singh et al. (2000) outlines economic production principles, highlighting the dynamic relationship between output and input, particularly in manufacturing sectors. Olsson (2008) also differentiates between efficiency and effectiveness, emphasising the complexity of productivity enhancement endeavours.

This study delineates the nuanced interplay between work productivity and efficiency, emphasising three pivotal factors: employee wellness, tools and technology utilisation, and workspace ergonomics.

a) Employee Wellness

Mokhonoana (2023) underscores the transformative effect of prioritising employee well-being in high-rise offices like Kuala Lumpur. Integrating mental and physical wellness initiatives into office design and policies creates a conducive work environment, balancing work-life dynamics, reducing stress, and boosting job satisfaction. Shuck (2013) further emphasises the significant impact of workplace climate on employee well-being and productivity, urging organisations to foster supportive cultures that promote personal growth and development.

Isham et al. (2021) illuminate the complex link between labour productivity and worker well-being, cautioning about the negative impacts of productivity-driven approaches on employee health and happiness. The study advocates for a shift in economic metrics towards holistic well-being and quality-of-life indicators, especially in service-oriented sectors.

Menara DBKL 1's inclusion of healthcare and fitness facilities, such as an on-site clinic and gymnasium, showcases its dedication to employee well-being. These amenities foster a supportive environment, enhancing employee satisfaction and productivity. Likewise, Ilham Tower's emphasis on adaptable workspaces and social areas resonates with Mokhonoana's (2023) focus on mental and physical wellness initiatives, fostering a positive workplace atmosphere.

Furthermore, PNB Merdeka 118's WELL certification acknowledges its focus on wellness and sustainability in workplace design, echoing sentiments by Mokhonoana (2023), Shuck (2013), and Isham et al. (2021). This certification highlights its commitment to employee health and happiness through integrated wellness initiatives in its design and policies, fostering a supportive work environment for enhanced well-being and productivity.

The initiatives by Menara DBKL 1, Ilham Tower, and PNB Merdeka 118 highlight organisations' focus on prioritising employee well-being, acknowledging it as fundamental in modern workplaces. These initiatives emphasise the vital link

between employee wellness and organisational success, stressing the need for a supportive, health-conscious workplace culture.

b) Tools and Technology

Cutting-edge technologies such as Artificial Intelligence (AI), Augmented Reality (AR), and holographic technology are now essential in modern offices, evolving from trends to necessities. While integrating these technologies maintains business competitiveness, Branson (2018) and Richardson (2021) stress the need to balance their use with human connection to ensure sustained productivity and well-being in the workplace.

Richardson's study highlights the fluid nature of modern office environments, where digital technologies redefine work operations beyond fixed spatial divisions. Office software plays a significant role in defining productive activity, prioritising the representation of work over the physical location. These technologies enable flexible arrangements that coordinate activities, transcending traditional organisational boundaries.

However, while platformisation facilitates new work coordination methods, concerns emerge regarding how platform companies assess and manage employee value and working conditions. This highlights the intricate relationship between technology, physical space, and work organisation, influencing each other in multifaceted ways.

Menara DBKL 1, Ilham Tower, and PNB Merdeka 118 leverage digital tools and software for communication, collaboration, and task management, reflecting technological advancements. Ilham Tower and PNB Merdeka 118 boast Grade A and MSC-compliant offices with cutting-edge technology infrastructure, including high-speed internet, advanced communication systems and integrated IT solutions. PNB Merdeka also stands out for its Smart Integration System. Both buildings offer flexible workspaces, agile office layouts involving hot desking options, shared workspaces, and versatile meeting areas equipped with technology to accommodate various work styles, aligning with Branson (2018) and Richardson (2021), who stress the need to balance technology with human connection through the interplay between technology, physical space, and work organisation.

c) Workplace Ergonomics

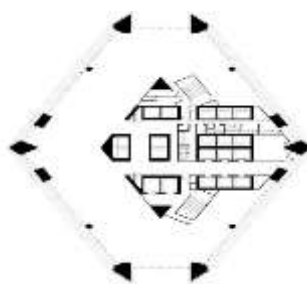
Digitalisation has transformed work environments, prompting a shift from fixed to flexible office designs, necessitating a re-evaluation of workplace ergonomics. Chandwani et al. (2019) stress that inadequate work environments and poor ergonomic design, including mismatched furniture, increase the risk of work-related musculoskeletal disorders (WRMSDs) among employees.

Chandra et al. (2009) anticipate a surge in flexible offices starting in 2020, driven by increased mobility and remote work trends. Traditional office setups must adapt by integrating versatile and ergonomic furnishing systems. Menara DBKL 1 has undergone progressive upgrades to meet evolving needs in recent years. While Ilham Tower and PNB Merdeka embrace open-space layouts to accommodate flexible and agile workspaces (see figure 8), Menara DBKL 1 maintains a traditional layout while integrating modern collaborative spaces and upgraded workstation furniture.

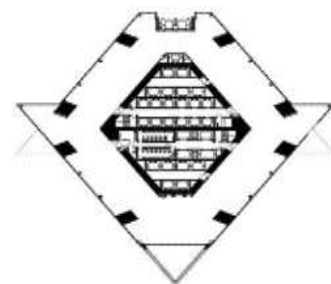
Koirala and Nepal (2022) highlight the importance of ergonomic practices in the workplace, covering physical factors, work design, and social dynamics. To adhere to ergonomic standards, offices must invest in state-of-the-art technology to enhance employee comfort and well-being. This commitment to ergonomic principles is evident in PNB Merdeka 118, where the organisation has prioritised cutting-edge furniture, workstation design, and ergonomic tools to support its workforce.



MENARA DBKL 1
(Source: Author)



ILHAM TOWER
(Source: Author)



MERDEKA 118
(Source: <https://merdeka118.com/gallery/photos/photo-gallery/office>)

Figure 8. Renovation plan in Menara DBKL 1 and column less layout in Ilham Tower and PNB Merdeka 118.
(Source: Author)

4.2.8. Future-Proof Design

Integrating advanced technologies, virtual spaces, community-centric environments, and sustainability measures in workplace design ensures the creation of future-proof work environments.

Leveraging IoT devices, AI-driven tools, and virtual collaboration platforms enhances operational efficiency and adaptability to emerging trends (Danaher, 2016; Davenport & Bean, 2017, as cited in Griep, 2021). This aligns with the paradigm shift towards algorithmic management, necessitating organisations to prioritise AI integration, data analytics, and cybersecurity (Radu, 2023). Moreover, virtual spaces redefine office environments, enabling seamless remote collaboration and connectivity (Dwivedi et al., 2022). The Metaverse office exemplifies this evolution, offering immersive experiences that transcend traditional video calls (Dwivedi et al., 2022).

In specific case studies, Menara DBKL 1, Ilham Tower, and PNB Merdeka 118 showcase technology-driven design's transformative impact on high-rise building development for sustainability and user-centricity. Menara DBKL 1 focuses on modern security and energy efficiency technology, aiming for Energy Management Gold Standard ratings (AEMAS). Ilham Tower achieves LEED certification through integrated building controls for sustainability. PNB Merdeka 118 integrates smart building technologies, AI-driven predictive maintenance, and advanced security features, earning triple platinum certification for sustainability.

These buildings embody key trends in smart building technology, leveraging sensor technology, building management systems, and IoT connectivity for adaptability and performance (CTBUH, 2019). Their approaches showcase a comprehensive understanding of the interconnectedness between technology, sustainability, and user experience in shaping the future of workplace design.

In addition to advanced technologies, cultivating a community-centric workplace fosters resilience and adaptability amid changing organisational dynamics. Inclusive office spaces with flexible designs and dedicated collaboration areas nurture a culture of collaboration, creativity, inclusivity, and belonging. This environment, guided by ecological systems theory (Yang and Sanborn, 2021), boosts employee commitment, increasing productivity and performance (Radu, 2023; Zhenjing et al., 2022).

Sustainable office design reduces environmental impact and future-proofs workplaces, promoting employee well-being and long-term ecological sustainability. Employee needs encompass three dimensions: physical, functional, and psychological, including climate control, communication, privacy, and health (Fauth and Pieper, 2022).

The COVID-19 pandemic accelerated the adoption of remote work. Although it provides flexibility, it blurs personal and professional boundaries, affecting motivation and well-being (Aleem et al., 2023; Blaszczyk et al., 2023). Balancing work arrangements is vital for effectiveness and well-being.

In response to evolving dynamics, Menara DBKL 1 was recently renovated to meet changing needs. While preserving traditional individual-based workspaces for hierarchical organisational structures, the focus shifted to integrating social spaces for active discussions and collaboration. Similarly, updates at Ilham Tower and PNB Merdeka 118 prioritise flexible, collaborative areas, balancing privacy with collaborative work culture.

Ilham Tower's designer pantry doubles as a workspace and central hub for discussions and collaboration (see figure 9). While flexible spaces are integrated, individual rooms for top executives ensure confidentiality, with full-height transparent glass partitions promoting openness and accessibility. Moreover, PNB Merdeka 118 transcends mere collaboration, integrating a dynamic work-life balance through an 'ecosystem' featuring activities and programs harmonising work, leisure, entertainment, and green spaces.



MENARA DBKL 1
(Source: Author)



ILHAM TOWER
(Source: Author)



MERDEKA 118
(Source: <https://merdeka118.com/gallery/photos/photo-gallery/office>)

Figure 9. Large pantry area at Menara DBKL 1, designer pantry at Ilham Tower and green office spaces at PNB Merdeka 118.

These efforts represent a notable shift towards fostering collaboration, flexibility, and work-life balance in contemporary workspace design, underscoring organisations' efforts to bolster employee engagement and enhance organisational performance. By cultivating environments conducive to productivity, creativity, and employee satisfaction, organisations strive to optimise their workforce's potential and overall effectiveness.

4.2.9. Innovative Programme

According to Wagner and Watch (2017), innovative workplace programs are structured initiatives or projects that actively foster creativity, generate fresh ideas, and implement novel approaches to enhance different facets of the work environment. This perspective aligns with three emerging concepts: playful, healthy, and participative, each with distinct approaches, trends, and characteristic components (see Table 8).

In their study, Bakker et al. (2020) highlight playful work design as an emerging concept, suggesting that employees can incorporate elements of fun and competition into their tasks. This can be achieved through two approaches: a top-down strategy, where organisations support playful work design with knowledge, coaching, and professional consultation, and a bottom-up approach, where employees proactively introduce challenges into tasks (Scharp et al., 2022).

Table 8. Innovative programme components.
(Source: Author)

| EMERGING CONCEPT | APPROACH | TREND | CHARACTERISTIC |
|------------------|---|---|---|
| Playful | Innovative space - Incorporating playful elements into innovative space arrangements. | Revaluing face-to-face communication – Creating spontaneous interactions, team-building activities, and collaborative problem-solving sessions. | Co-working space – Create spaces that allow exploration of new ideas, experimentation with different approaches, and collaborate on innovative projects in a dynamic and supportive setting. |
| | Smart workplace - Leveraging technology solutions such as gamification elements, interactive displays, and virtual collaboration tools. | Future tech integration - Integrating future technologies to create immersive experiences through innovative tools and platforms such as virtual reality and augmented reality. | |
| Healthy Active | Building programme - Incorporating features that promote physical activity and well-being, such as ergonomic furniture, accessible staircases, and open layouts that encourage movement throughout the workplace. Additionally, policies can be implemented that support active transportation. | Open collaboration with nature - Incorporating natural elements into the workplace environment. | Innovation centre - Designing spaces that promote movement, such as standing desks, walking paths, and active meeting rooms, to encourage employees to incorporate physical activity into their daily routines. |
| | Organisational desires – Organisations create a supportive environment that prioritises physical activity and encourages employees to engage in active behaviours inside and outside the workplace. | Revaluing face-to-face communication - Designing collaborative spaces that facilitate in-person meetings and team discussions can encourage physical activity and foster a sense of community within the workplace. | |

| | | | |
|---------------|--|---|--|
| Participative | Organisational desires – Organisations create structures and processes that encourage and support employee participation in decision-making, problem-solving, and innovation initiatives. | Open collaboration with nature - Creating inclusive and inviting workspaces that encourage communication, collaboration, and idea-sharing among employees. Incorporating natural elements into the workplace, such as biophilic design elements and outdoor meeting spaces to foster a sense of connection and enhances participative work practices. | Co-working space - Designing shared workspaces with collaborative tools, interactive technology, and flexible seating arrangements can foster a culture of teamwork and empower employees to contribute their ideas and expertise to collective efforts. |
| | Design for multiple occasions (flexible arrangements) - Designing spaces with adaptable furniture, movable partitions, and multipurpose areas can support a dynamic and inclusive work environment conducive to participative practices. | Revaluing face-to-face communication - Designing spaces prioritising face-to-face communication, such as communal areas and collaborative zones, to promote engagement and foster a culture of openness and inclusivity. | |

Moreover, Dishon-Berkovits et al. (2023) discovered that incorporating fun, though not competition, is especially beneficial for maintaining work engagement and improving performance, particularly when individuals face increased boredom in their job roles. This assertion is supported by Liu et al. (2023), who observed that employees with a strong inclination towards experiencing flow reported increased levels of flow and creativity when engaging in work tasks with a playful design approach.

Another emerging concept of an innovative programme is active design. Engelen (2020) notes that while active design strategies aim to reduce sedentary behaviour by promoting standing during the workday, the strategies may not be sufficient on their own and should encompass broader dimensions, including physical, social, cultural, and political aspects. Ali and Mustafa's study (2023) in Erbil city governmental offices indicates that building layout significantly influences occupants' physical activity, yet employees tend towards sedentary behaviour due to the lack of built environment quality. Enhancing built environment quality through active design strategies can boost workplace physical activity and enhance employee health.

Employee participation enhances workplace empowerment by involving employees in decision-making processes. Mohsen and Nazari's research (2020) at Afghanistan International Bank indicates a positive link between employee participation and job satisfaction. Parasuraman (2007) outlines various forms of participation, from direct involvement in problem-solving teams and face-to-face communications to indirect participation through workers' committees and collective bargaining. Verma (2017) highlights benefits such as improved communication and collaboration, fostering a sense of ownership among employees. However, employee participation may slow decision-making, affecting responses to dynamic environments. Effective management and thoughtful consideration are essential to maximise its benefits while addressing potential drawbacks.

The interpretations of playful, active, and participative elements at Menara DBKL 1, Ilham Tower, and PNB Merdeka 118 differ from direct heavy gamification tactics seen in environments like the Google Office or solely relying on staircase interventions. These buildings adopt a multifaceted approach, each defining its unique essence of playful, active, and participative elements.

Recent renovations at Menara DBKL incorporate interactive displays along corridors, transforming the office space (see figure 10). Small lounges introduced after the reception area and pantry serve as chill-out zones, promoting collaboration and employee participation. This design encourages movement throughout the workspace, departing from the traditional confinement to individual workstations. In Ilham Tower, extensive pantries serve as versatile spaces, lounges and collaborative areas conducive to interactions and teamwork (see figure 11). This multifunctional approach fosters employee engagement and collaboration, creating a dynamic work environment.

PNB Merdeka 118 adopts a dynamic workspace organisation, integrating diverse designs, adaptable seating arrangements, and lush greenery throughout (see figure 12). This aligns with trends emphasising open collaboration and nature connection (Wagner and Watch, 2017). The versatile layout allows easy transitions between casual and formal settings, facilitating breaks, discussions, and fluid movement. Green elements enhance office ambience and staff well-being, fostering productivity and a stimulating work environment.



Figure 10. Interactive displays along corridor at Menara DBKL 1.
(Source: Author)



Figure 11. Extensive pantry at Ilham Tower.
(Source: Author)



Figure 12. Dynamic workplace in PNB Merdeka 118.
(Source: <https://merdeka118.com/gallery/photos/photo-gallery/office/>)

Design strategies in Menara DBKL 1, Ilham Tower, and PNB Merdeka 118 align with recent studies (Bakker et al., 2020), emphasising fun and competition in work tasks and active design principles to reduce sedentary behaviour (Engelen, 2020; Ali & Mustafa, 2023). Additionally, these designs prioritise employee participation in decision-making, consistent with studies by Mohsen and Nazari (2020), Parasuraman (2007), and Verma (2017). However, Parasuraman (2007) suggests that heightened employee participation may hinder responses to dynamic environments, presenting a potential contradiction.

5.0 CONCLUSION AND RECOMMENDATIONS

The evolution of urban architecture and workplace dynamics in Kuala Lumpur's high-rise buildings, notably Menara DBKL 1, Ilham Tower, and PNB Merdeka 118, underscores a dynamic shift towards versatile, integrated, collaborative, and user-centric environments. These buildings symbolise the city's ambition to establish itself as a global financial and business hub while adeptly adapting to evolving work cultures and technological advancements. The evolution of these buildings highlights key trends in workplace design, emphasising the importance of holistic approaches to work productivity, employee well-being, user needs, and creating future-proof environments.

The intricate connection between workplace culture and layout within these high-rise establishments varies significantly, influenced by organisational culture, management philosophies, technological infrastructure, market competition, and industry regulations. While Menara DBKL 1 adheres to traditional hierarchical structures, Ilham Tower and PNB Merdeka 118 champion collaborative and flexible cultures, which is evident in their innovative workspace designs.

Understanding work behaviour and productivity dynamics is paramount for organisational success. Prioritising employee wellness, leveraging advanced tools and technology, and promoting ergonomic work environments are crucial strategies to enhance productivity and efficiency in the digital age.

Moreover, integrating advanced technologies, community-centric environments, and innovative workplace programs into office design is essential for creating future-proof work environments that foster creativity, engagement, and well-being.

Based on these insights, the following recommendations are proposed:

- Embrace flexible work cultures and foster collaboration and transparency.
- Empower employees by leveraging technology and encouraging continuous learning.
- Balance individual and collaborative tasks to optimise productivity.
- Invest in a positive work culture that promotes innovation and adaptability.
- Foster community-centric environments that prioritise employee well-being.
- Balance work arrangements to accommodate evolving needs.
- Align workspace design with organisational culture to enhance employee engagement.
- Create visually appealing workspaces that inspire creativity and collaboration.

Furthermore, further research is warranted to explore strategic-based approaches in high-rise office buildings. Integrating emerging technologies and accommodating evolving work patterns, such as maker spaces and immersive environments, offers promising opportunities to enhance workplace effectiveness and employee well-being. Future studies could explore deeper into these areas to uncover their full potential in optimising organisational performance and employee satisfaction.

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