THE NEEDS OF ACCESSIBILITY AUDIT IN FACILITIES MANAGEMENT FOR IMPROVING INCLUSIVE ACCESS

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ABSTRACT

Accessibility is not just a technical issue, but it is also a term in which the environment tells whether someone is being included or excluded. An access audit in facilities management is a critical process aimed at evaluating and improving the accessibility of a facility to ensure it is inclusive for all users, including those with disabilities. Thus, this paper examines the needs of accessibility audit in facilities management in an effort to enhance inclusive access within the built environment. Through the extensive review of existing research, this paper identifies the needs and benefits of having accessibility audits in facilities management to promote accessibility for individuals with diverse needs. The findings highlight several key needs of accessibility audit in facilities management to enhance inclusive access in the built environment, including standards compliance, enhancing inclusivity, improving safety and risk management, cost efficiency, and operational efficiency. This paper emphasizes important implications for proactive facilities management approaches in creating an inclusive built

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environment.

INTRODUCTION

A person with severe disabilities is often excluded from social life. This exclusion generates a lot of problems, so the person ends up feeling inferior. Poor support from building developers and designers also caused PWDs exclusions from the mainstreams due to physical barriers in architecture (Abdul Kadir & Jamaludin, 2018). Recently, The Malaysian Bar via Abdul Wahab (2024) revealed and expressed their concerns that PWDs are facing discrimination in education, health, employment, financial services, physical and digital accessibility, sports and political participation.

The facilities management (FM) is an umbrella term which covers a wide range of properties and user-related functions. Besides the aim of FM to optimize the running cost, it also focuses on raising the efficiency and suitability of the management for people, places and processes (Kamaruzzaman & Ahmad Zawawi, 2010). The purpose of facilities management can be simplified as creating an environment where people are safe, comfortable, and productive. Zakaria et al. (2012) added that, in practice, the role of facilities management fully begins after the completion of the construction of a building.

According to the World Health Organization (WHO), improving accessibility of facilities is a key need (WHO, 2011). Accessibility audits can be used for monitoring purposes to understand whether facilities adhere to certain standards (Pinto et al., 2021). An accessibility audit in facilities management is a critical process aimed at evaluating and improving the accessibility of a facility to ensure it is inclusive for all users, including those with disabilities.

LITERATURE REVIEW

Understanding Disability

The social model of disability proposed by Oliver (1986) suggests that disability results from societal barriers rather than an individual's impairment. It argues that an inaccessible environment, such as the absence of a ramp for wheelchair users, disables people more than their physical limitations (Oliver, 1986; Oliver & Barnes, 2010). These barriers restrict access to services and opportunities, leading to poorer health, education, and economic outcomes for disabled individuals (WHO & World Bank, 2011).

WHO (2017), defined that disability is part of being human. Almost everyone will temporarily or permanently experience disability at some point in their lives. Persons with disabilities (PWDs) are persons who have limits in physical, sensory, or cognitive abilities from congenital causes or as a result of trauma, pathology, and older age.

PWDs are grouped into seven different categories which are hearing, visual, speech, physical, learning, mental, and multiple disabilities. In 2022, the WHO estimated that 16% of the world population are PWDs (WHO, 2022). From the latest statistic reported by the Department of Social Welfare in 2021, the highest percentage of PWDs by Category of Disabilities is Physical Disabilities is 37.4% followed by Learning Disabilities, 36.3%. Physical Disabilities can be categorized into four types which are mobility, work tolerance, self-care, and communication.

Understandably, there was a need for a legislation which ensured the rights of persons with disabilities. Thus, Malaysia has passed the Persons with Disabilities Act in 2008. The act affirmed that PWDs have equal access to public facilities, healthcare services, and recreational activities (Kamarudin et al., 2013b). The act also stated the rights of persons with disabilities in the physical environment such as transportation, information, and communication, and not just in the built environment. Furthermore, Malaysia also ratified the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD) in July 2010 which supports the efforts of upholding the rights and social protection of PWDs in Malaysia

(Abdul Wahab, 2024).

Disability therefore involves processes of social exclusion. In a situation of social exclusion, inclusion is intended to minimize differences between citizens (Zhigunova, 2020). A person's environment has a significant impact on his or her experience and severity of disability. Inaccessible environments create barriers that often hinder the full and effective participation of persons with disabilities in society.

Meanwhile, accessibility means a facility for all people, including people with disabilities, to enter, use and leave a building safely and comfortably. Poor accessibility means that the PWDs will experience difficulties in accessing building, and this is a violation of their rights according to the provided laws and regulations (Pinto et al., 2021). This affirms the authors' understanding that accessibility in the built environment involves the design, construction, management and maintenance of buildings that comply with relevant standards, guidelines and regulations.

Universal Design and Inclusive Access

Some people misunderstood that universal design exclusively caters to the needs of PWDs access and facilities in the built environment (Kamarudin et al., 2014). The objective of universal design is not to deny the disability of a group of people, but rather to avoid such attention to their impairments and minimize public tendency to social exclusion (Imrie and Hall, 2001). It is important to adapt to the universal design principles in Malaysia's accessibility system, so that the country is in line with other developed countries which provide accessible technology and meet the needs of all users efficiently (Kadir and Jamaludin, 2012a).

Universal design, in other words, is a principle in designing a building that considers the needs of the different abilities of each person. The purpose is to improve the overall quality of the environment for all as well as to support the autonomy of each person with disabilities.

Inclusive access in the built environment refers to the design and creation of spaces that are accessible, usable, and enjoyable by everyone, regardless of their physical abilities, age, gender, or other characteristics.

Therefore, the design for inclusive access must consider disabled people as end-users, rather than providing disabled access just to comply with the regulations. In addition, Goodall & Pottinger (2010) proposed that inclusive access considerations need to be incorporated from project inception, particularly before the design reaches an architect's drawing board.

Although universal design and inclusive access are both aiming to create environments that can accommodate a wide range of users; however, universal design focuses on creating environments that are accessible to all users from the beginning, rather than requiring alterations later.

Furthermore, Abdul Rahim & Abdullah (2009) emphasised that in many developing countries, the awareness and inclusion of universal design is still in its initial stage where the local authorities have not fully enforced the requirement of providing access to PWDs in the built environment.

The latest Sustainable Development Goals (SDGs) which have been set by the United Nations, (2019), encompass various aspects of inclusive development, including accessibility and equality. By referring to the latest SDGs, the provision of inclusive access in built environment is relevant to the target of SDG 11 – Sustainable Cities and Communities, which aims to make cities and human settlements inclusive, safe, resilient, and sustainable. Among the initiatives which are in line with SDG 11 are to provide transport systems and public spaces that are safe, inclusive, accessible, and sustainable for all, with special attention to the needs of those in vulnerable conditions, women, children, older persons, and persons with disabilities.

To achieve the goals, state governments have their action plan, for example, the government of Penang has published the Accessibility Audit Checklist Compliance Guidelines Based on Universal Design for the Development of Penang and enforced starting 1st June 2021 (Noordin, 2023). These guidelines can also help the accessibility audit team in auditing the facilities and urban environment that can meet the access needs of all groups of individuals from various genders, ethnicities, and backgrounds including children, the elderly, and persons with disabilities.

Facilities Management Audit

A scheduled facilities audit is crucial to understand the state of the current condition of the facility. From the findings of an audit, the facilities management team will have a clearer vision to plan for further maintenance or refurbishment of the facility. The FM audit will give the team an understanding of every part of its operations so that a holistic view of the facilities can be developed and a strategy for continuous improvement can be planned (Whitaker, 1995). The result of an audit offers the management the opportunity to appraise the overall progress being made and seek improvements for increased efficiency and more effective utilization of available resources (Ali & Wan Mohamad, 2009).

Whitaker (1995) suggests that the FM audits should include customer satisfaction, facilities, financial, organization and resource and compliance audits. Each type of FM audits has its purposes, for example, financial audits can determine whether financial operations are properly conducted. The compliance audits should be able to determine the compliance with administrative regulations, statutes, economy, efficiency, and effectiveness while organizational audits are important to encompass the value systems of the organization as a whole.

Currently, the responsibility to conduct the accessibility audit is taken by architects and consultants which are separate from the scope of facilities management. Thus, the idea to add accessibility audit as one of the scopes of FM audits is hoped to aid the facilities managers in understanding the building better as well as the ability to enhance the performance of building and its services.

Accessibility Audit

An accessibility audit in facilities management is a critical process aimed at evaluating and improving the accessibility of a facility to ensure it is inclusive for all users, including those with disabilities. It has been supported by Sawyer & Bright (2007) that an accessibility audit will give a picture of the level of accessibility in a building, identify points of good and bad access, and identify areas of need that are not catered for. It is also the first step in the process of improving accessibility.

Many countries have laws or policies in place that mandate that certain accessibility standards are met in public facilities i.e., Americans with Disabilities Act 1990, UK Equality Act 2010, Brazilian Law on the Inclusive of Persons with Disabilities 2015 (Pinto et al., 2021), Disability Discrimination Act 1995 (Sawyer & Bright, 2007), British Standard BS 8300:2001 and Part M of the Building Regulations, 2004 - amendment June 2005 (Goodall & Pottinger, 2010; Sawyer & Bright, 2007).

However, in October 2010, the Equality Act replaced the Disability Discrimination Act (DDA) 1995. Goodall & Pottinger, (2010) explains that the new Act does not fundamentally alter Part III of the DDA, which since October 2004 has required service providers to take reasonable steps to remove physical barriers to accessing services.

In Malaysia, there are Persons with Disabilities Act 2008 (Act 685), Uniform Building By Law (UBBL) 1984 (Amendment of By-laws 34A in 1990) and Malaysian Standard (MS 1184:2014) Universal Design and Accessibility in the Built Environment – Code of Practice to be complied for the benefits of providing inclusive access. The latest version of Malaysian Standard MS 1184:2014 supersedes MS 1184:2002 – Code of practice on access for disabled persons to public buildings and MS 1331:2003 – Code of practice for access of disabled persons outside buildings.

A study by Kamarudin et al. (2013) highlighted the need for an accessibility audit to be conducted on the existing building stocks and other built environments to identify the spaces and facilities that are not according to the Malaysian Standard requirements.

In addition, Sawyer and Bright (2007), discovered there are a number of reasons for carrying out an audit including legislation, funding conditions, gathering data on buildings for comparison or analysis, checking compliance with certain standards and regulations, company policy on equal opportunities, public relations or company image, conservation by use of historic buildings, pressure from lobby groups and awareness of particular problems.

O'Herlihy (2005) stated that carrying out an access audit will identify several features as the following:

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•The current accessibility of the building or property or site
•Areas of improvement (for example, no accessible car spaces in the car park; or the door in the accessible toilet on the ground floor is incorrectly located and therefore the water-closet is inaccessible)
•Good or bad practice in relation to facilities management that an organisation has in place; positive accessibility features (e.g. counter loop at reception, signage, good use of lighting and colour throughout the building)

Furthermore, The United Nations Women (2020) suggested that an accessibility audit would therefore assess what barriers may exist that reduce access and participation of persons with disabilities, and what measures can be taken to eliminate these barriers regarding the following elements:
i.Buildings, roads, transport systems, outdoor and indoor facilities including schools, offices, hospitals, housing and workplaces
•Within buildings and facilities which may include the width of corridors and doors, space in toilets to accommodate wheelchair or mobility assistive devices and additional adaptations such as handrails and raised toilet seats
•May include standing desks or height-adjustable desks and other assistive devices for persons with chronic pain or muscle diseases in offices
ii.Information and communication, including emergency services
•This may refer to the availability of hearing loops, Sign Language interpreters, alternative prints (Large, Braille) and easy-to-read versions

The evidence from past studies clearly showed that the accessibility audit has benefits such as compliance with legal requirements, enhancing inclusivity, improving safety and risk management, and cost and operational efficiency.

Assessment Criteria of Accessibility Audit

Table 1 shows the assessment criteria in the accessibility audit adapted from (Pinto et al., 2021). The criteria are divided into three sub-scales of accessibility: external, internal and information.

Table 1. Assessment Criteria of Accessibility Audit

Sub-scale of Accessibility	Question (Answer, Yes = 1, No = 0)
Internal	Does the sidewalk have a regular floor, without gaps or holes, with easy displacement for wheelchair users? Does the facility have a floor rug? Does the facility have a non-slip floor? Does the facility have an access ramp? Does the facility have a handrail? Does the facility have wheelchair-accessible door and entrance corridor?
External	Does the facility have adapted restrooms with higher toilets, sink accessories, lower-level soap and paper dispensers, grab bars, door opening out and manoeuvre areas that allow wheelchair circulation? Does the facility have grab bars? Does the facility have a handrail? Does the facility have wheelchair-accessible interior corridors and doors? Does the facility have interior doors adapted for wheelchairs?
Information	Does the facility use international symbols for people with physical, visual and hearing disabilities? Does the facility use signage through texts, drawings, colors or figures (visual) that indicate the environments of the services offered? Does the facility use embossed characters, Braille or embossed figures (tactile)?

Source: Adapted from (Pinto et al., 2021)

The assessment criteria for the accessibility audit that are carried out in Malaysia should refer to the provision of Malaysian Standard (MS 1184:2014) Universal Design and Accessibility in the Built Environment to be complied with. The assessment criteria or audit checklist extracted from MS 1184:2014 could vary depending on the types of buildings and could be customized according to the facilities that should be provided. Table 2 shows a sample of access audit checklists for hospital buildings as suggested by Jaafar et al., (2023).

Table 2. Audit Checklist for Disabled Facilities in Hospital (Adapted from MS 1184:2014)

	Elements	Sub-elements
A	Parking	1. Parking for PWDs are provided at every block of the building 2. The parking space is marked by universal parking signage 3. The parking space is nearby to accessible bays 4. The parking space is free from any obstacles

B	Toilet	1. Toilets for disabled people are available in every department of the hospitals 2. The floor finishes used an anti-slip floor 3. The bathroom area is wide enough to fit the wheelchair 4. The entrance of the toilet is easy to access
C	Ramp	1. Ramps are anti-slip 2. Ramps are free of obstruction
D	Handrail	1. Handrails on the wall are available along the hallway 2. Handrails for stairs are provided continuously 3. Handrails for the ramp are provided on both sides 4. Handrails in the toilet for vision impairment are provided 5. Handrails in the elevator are provided
E	Signage	1. People can readily recognize the signage 2. No obstruction near the signage 3. The signage is marked with the PWDs symbols
F	Tactile Floor	1. Tactile floors for blind people are provided at the entrance

Source: Jaafar et al., (2023)

Accessibility Audit Study in Malaysia

In Malaysia, there are Access Audit Consultants that give special training on accessibility audits, in which the participants are taught the needs of access and facilities in the built environment as well as simulation on how to be in a wheelchair, walking with crutches, etc. The representatives from the PWDs were also invited and involved in accessibility audit training session so that the other participants get a better understanding on accessibility and facilities for the needs of PWDs (Kamarudin et al., 2013).

Several accessibility audits were carried out by researchers in Malaysia. Table 3 summarizes the past studies on accessibility audits in Malaysia.

Table 3. Past Studies on Accessibility Audit in Malaysia

Author, Year	Building Type and Location	Access Audit Elements	Summary of Findings
Jaafar et al., (2023)	Public Hospitals, Kedah	Parking, Toilet, Ramp, Handrail, Signage, Tactile Floor	The level of compliance satisfaction varied
N. Hashim et al., (2020)	Shopping mall, Sunway Pyramid	Disabled Parking, External Pathways, Bus Stop, Main Entrance, Corridors, Reception Counter, Staircase, Disabled Toilet, Prayer Room, Elevators, Benches, Escalators	Satisfactorily Complied

Abd Samad et al., (2019)	Mosques (Kuala Lumpur, Melaka, Kota Kinabalu, Seremban, Putrajaya, Ipoh, Kota Bharu, IIUM Gombak)	Entrance, Ablution Areas, Toilet, Prayer Hall, Internal Pathways	Need for renovation and upgrading
Hooi & Yaacob, (2019)	Heritage Buildings, George Town	Accessible Parking, Entrance, Lift, Toilet, Emergency Exits, Ramps, Pathways	Unsatisfactorily complied and need for access planning
Hashim et al., (2018)	Commercial Complexes, Klang Valley	Obstructions, Street Furniture, Curb Ramps, Pathways, Parking	Satisfactorily Complied
Utaberta et al., (2017)	Masjid Negara, Kuala Lumpur	Parking, Pathways, Entrance, Doors, Floors, Signage, Ramp, Stairs, Lift, Escalator, Toilet, Shower Room	Unsatisfactorily complied and need for renovation
Isa et al., (2016)	ETS Railway Stations, Perak	Disabled Parking, Walkway, Ramp, Main Entrance, Guiding Block/Tactile, Handrail, Wheelchair Special Lane, Staircase, Prayer Room, Disabled Toilet, Signage, Elevator, Escalator	The level of compliance satisfaction varied
Kamarudin et al., (2013)	Local Authority Buildings, Klang Valley	Internal, External (form the external Footpath to the internal Work Surface)	The level of compliance satisfaction varied
Kadir & Jamaludin, (2012b)	Public Buildings, Putrajaya	Internal, External (from the external PWD Parking Space to the internal PWD Restroom)	The level of compliance satisfaction varied
Abdul Rahim & Abdullah, (2009)	Kota Kinabalu Waterfront	Exterior and Interior (from the external PWD Parking Areas to the internal Prayer Room)	Unsatisfactorily complied and need for renovation

Source: Authors, 2024

The research studies in accessibility audits that were conducted by various researchers concluded that there were various levels of satisfaction and compliance depending on the building types and the building itself. The heritage buildings and mosques are among the types of buildings which have unsatisfactorily complied with the legal requirements and need for renovation and access planning.

METHODOLOGY

This paper reviewed relevant published articles obtained from various sources such as established conference papers and journal articles. These articles were thoroughly reviewed, and the contents are mainly the (1)

facilities management audit and (2) studies conducted previously on the application of accessibility audits in Malaysia. There were several keywords used for search strings such as "accessibility audit", "facilities management audit", "inclusive access" and other combination of these keywords.

DISCUSSION

Social Model of Disability

The social model of disability, which emphasizes that disability arises from the interaction between individuals and societal barriers, is highly relevant to this research. This model aligns with Malaysia's ratification of the UNCRPD in 2010, where the commitment is to remove social barriers, including those in the built environment, to enhance inclusivity for Persons with Disabilities (PWDs) (Abdul Wahab, 2024).

In the Malaysian context, despite the enactment of the Persons with Disabilities Act (2008), the implementation of accessible infrastructure across the country varies significantly, as highlighted by studies on accessibility in public hospitals (Jaafar et al., 2023) and heritage buildings (Hooi & Mohd Yaacob, 2019).

Universal Design and Inclusive Access

The principles of universal design aim not only to meet the needs of PWDs but also to create environments that accommodate a wide range of users, aligning with Malaysia's evolving approach to accessibility. The challenges with implementation, show a gap between the concept of universal design and its practical application in Malaysia.

In 2021, the introduction of the Accessibility Audit Checklist in Penang (Noordin, 2023) demonstrates a concrete effort to align with international best practices, such as those outlined in SDG 11. This checklist embodies the principle of universal design by ensuring space are not only accessible to PWDs but to all users, regardless of age, gender, or physical ability.

Facilities Management and Accessibility Audit

The facilities management audit, as articulated by Whitaker (1995), provides a comprehensive approach to understanding and improving the built environment. Facilities management stresses the importance of regular audits to maintain operational efficiency and user satisfaction. By integrating accessibility audits into the broader scope of facilities management, Malaysian institutions can ensure continuous compliance with accessibility standards such as the Malaysian Standard MS 1184:2014.

Incorporating accessibility into facilities management aligns with the findings from past studies, which revealed varying levels of compliance depending on building types and regions (Hooi & Mohd Yaacob, 2019; Jaafar et al., 2023). The accessibility audit also reflects Malaysia's growing commitment to international conventions like the UNCRPD and SDGs, particularly the objectives of making cities and human settlements inclusive and accessible to all by 2030.

Legislation and Compliance Framework in Malaysia

The legislative framework in Malaysia, including the Persons with Disabilities Act 2008 and the Uniform Building By-Law (UBBL) 1984, represents important steps toward ensuring accessible environments. However, as seen in several audits, compliance remains inconsistent across different types of buildings, such as mosques, heritage buildings, and hospitals (Hooi & Mohd Yaacob, 2019; Jaafar et al., 2023; Utaberta et al., 2017).

In this context, the combination of legal mandates and facilities management offers a pathway to improved outcomes. By situating accessibility audits within the broader framework of facilities management, organizations can take a more proactive approach to maintaining and enhancing access, rather than merely responding to regulatory requirements.

Sustainable Development Goals and Malaysian Action

SDG 11, which emphasizes the need for inclusive, safe, and accessible cities, aligns with Malaysia's efforts to create a more inclusive environment. The Penang Accessibility Guidelines (Noordin, 2023) represent an

actionable step towards fulfilling SDG 11's goals at the state level. This initiative shows how global frameworks like the SDGs can influence local policy and practice, pushing the country towards greater inclusivity, especially for PWDs.

The incorporation of universal design and inclusive access into Malaysia's built environment must be understood as part of a larger movement towards sustainability and equality. Accessibility audits, as proposed by various scholars (Kamarudin et al., 2013; Pinto et al., 2021), can serve as practical tools for ensuring that progress is being made towards meeting these global and national goals.

CONCLUSION

The inclusive access has the purpose to ensure that all individuals, including those with disabilities, can fully engage in society without facing barriers in their daily environments. There are many measures which have been taken to ensure that the built environments are constructed as accessible as possible. An accessibility audit is an important tool for facilities management that ensures the built environment is inclusive and accessible to all people, regardless of ability. The outcome of the accessibility audit will enable organisations to comply with legal requirements, improve user experience, increase safety, and demonstrate social responsibility. These efforts are also important to create a more welcoming and inclusive built environment. Regular audits and continuous improvement initiatives in facilities management strategy are essential to ensure accessibility and gain more benefits to all.

In the built environment, the industry players (architects, engineers, designers, facilities managers, etc.) are assigned specific responsibilities. The creation of new barriers will certainly occur if the principle of universal design is ignored and the aim to have inclusive access will not be achieved. Currently, the responsibility to conduct the accessibility audit is taken by architects and consultants, which separates it from the scope of facilities management. It is a big achievement in managing facilities, when the focus is to integrate people, places, processes, and technologies within the built environment, and at the same time improve the quality of life

and the productivity of the businesses and organizations. Therefore, it is recommended that future research should incorporate the scope of auditing the accessibility of facilities as part of facilities management audit, given that accessible facilities and facilities management are closely related and share the same goals.

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AUTHOR CONTRIBUTIONS

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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