The Extent of Inclusive Design from Indonesian Architects' Perspective

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ARTICLE INFO	ABSTRACT

The importance of inclusive design, acknowledged in SDGs 10 and 11, aims to ensure leaving no one behind in developing and improving the built environment. However, in reality, especially in developing countries, the built environments often fail of adequately accommodating those with special needs. Some studies highlighted the missing link between research and discussions about inclusive design and its implementation within the built environment. Given architects' pivotal role in shaping the built environment, it becomes imperative to investigate their perspectives on inclusive design throughout the design process and in the final product. This research provides a preliminary study exploring the concept of inclusive design through the lens of Indonesian architects. Involving questionnaires as the primary tool for data collection, this research assesses the comprehension of inclusive design, their application in the design process, and the level of user involvement as an important part of inclusive design. Secondary sources such as previous research, reports, and news articles were utilized to contextualize the discourse surrounding inclusive design in Indonesia. The collected data were analyzed using quantitative data coding, which is weighted in the sum of the frequency of occurrence based on the mentioned aspects of assessment. The findings reveal that most Indonesian architects are aware of, understand, and apply inclusive design in their architectural practices. However, they tend to focus on physical rather than equally accommodate physical and psychological matters. They have involved users in their design process, although their consistency needs to be enhanced. The challenge they face in utilizing this concept needs to be positioned as an asset. Then, while Indonesian architects recognize the importance of inclusive design, deeper comprehension and integration into the design process still need to be further developed.

1. Introduction

It is known that the built environment has always been closely related to its users and actors in the capacity of designers. Designing built environments requires precise or specific considerations,

especially regarding user activities, to make them user-specific (Lang & Moleski, 2010). This understanding aligns with goal 10 of SDGs, emphasizing how the built environment should be socially responsible and inclusive and consider the needs of all members of society (Mossin et al., 2020). It also covers accessibility as a core of functionality and respect for local culture and needs. Goal 11 of SDGs supports this understanding by making city settlements inclusive, safe, healthy, resilient, and environmentally sustainable (Mossin et al., 2020). Both goals show the gravity of ensuring that no one is left behind in the fabrication and improvement of the built environment. To accommodate this, the concept of inclusive design is recognized as one of the solutions. The British Standards Institute (Keates, 2005) defines inclusive design as the design of mainstream products and/or services accessible to and usable by as many people as reasonably possible without special adaptation or specialized design. The planning and implementation of the inclusive design concept cannot be separated from its actors. The actors or stakeholders involved include the government and decision-makers, planners and designers, and NGOs. Then, this design continues to develop in terms of knowledge, awareness, and discussion, especially from the actors' perspective.

Scientific or academic studies have already discussed about inclusive design in Indonesia. Existing studies show that the scope of these design discussions in Indonesia covers some empirical studies: evaluation of the built environment, design proposals (projects in architecture school), government regulations, and reports. Built environment evaluation and design proposal research conducted in Surabaya shows the reality of implementing an accessible design in public spaces due to the lack of user involvement (Hayati & Faqih, 2013). Another evaluative research conducted in Malang shows that public facilities are mostly inaccessible (Thohari, 2014). Similarly, Solo shows the minimum visit of people with disabilities (PwDs) to public spaces and urban parks due to a lack of inclusive design instruments like ramps and guiding blocks (Rifai et al., 2018). Reflecting on these conditions, legal and formal regulations have been established to ensure the presence of this design. One is the building ease requirements by the Minister of Public Works and Housing of the Republic of Indonesia (PUPR) Regulation Number 14/PRT/M/2017 of 2017. This regulation is based on the concern that every building user has the same right to access and carry out their activities in buildings and an environment that is safe, comfortable, easy, and independent. However, a report from The SMERU Research Institute (An independent institution for research and public policy studies) shows that Indonesia has not succeeded in implementing inclusive development, including in the design and development of the built environment (Hastuti et al., 2020).

The inclusive design has some criteria: it involves all members of society (Mossin et al., 2020), accommodates user-specific (Lang & Moleski, 2010) and every aspect of human needs (Mossin et al., 2020), and without specialized design (Keates, 2005). In Indonesia, this design mainly focuses on PwDs as user groups and emphasizes the physical accessibility of the built environment (Hayati & Faqih, 2013; Rifai et al., 2018; Thohari, 2014). This condition shows the missing link between studies and discussions about this design and its implementation in the Indonesian context, which happened partly because of the actors' roles, one of whom was the architect. This raises questions about how the architect addresses this issue. Research on the architect's point of view on inclusive design issues in Indonesia is still minimal to non-existent. The perception and attitude of the architect towards inclusive design will show how he/she implements it in his/her practice. Thus, this preliminary research aims to explore the concept of inclusive design from the perspective of Indonesian architects. This research, theoretically, enriches the discussion of inclusive design in Indonesian architectural practice. Meanwhile, the practical contribution covers the development of an understanding of inclusive design that students, educators, researchers, and architects can use.

1.1 Inclusive Design

The concept of inclusive design can be identified by its development, which has gone from being physical based to incorporating both physical and psychological matter. The conception of modern architectural form and the built environment was raised based on Le Corbusier's 'standard fit' design (Imrie, 2017). It is proposed as the specificity of architecture, which depicts the pure form of the body in ideal-typical terms. This term of the body has become problematic within architecture's theories and practice, leading to the traditional conception of disability. The term's consideration is only to the individual physiological disorders, reductionist or impairment, such as mobility impaired and 'wheelchair-bound' (Imrie & Hall, 2001), and merely identified as physical-based by some stakeholders (Zallio & Clarkson, 2021). However, in reality, through understanding the concept of disabling situations, there are not only permanent impairments in mental and physical abilities but also temporary ones, such as becoming pregnant (Heylighen et al., 2017). It is not only physical but also social and attitudinal barriers that prevent all user groups from being able to experience the built environment in the same manner (Imrie & Hall, 2001). This understanding leads to the expansion and the shift of perspective on the concept of inclusive design. Based on Lang & Moleski (2010), this design should accommodate both psychological and physiological needs in aiming for the comfortableness of the users and degree of equilibrium in addressing inequality. The recent notion of inclusive design embraces sociological and behavioral aspects of the users, including the sensory and cognitive needs, understanding of users' behavior, and how they socialize (Zallio & Clarkson, 2021).

The concept of inclusive design cannot be separated from the various considerations for which it needs to be fulfilled. This concept is inspired by diverse user groups' spatial experiences (Van der Linden et al., 2016). Therefore, the built environment must be designed for users of all abilities and across their lifespan (Nasar & Evans-Cowley, 2007), inclusive and emancipatory rather than exclusive and oppressive (Imrie, 2017). This understanding also aligns with the barrier-free design concept, which advocates the same accessibility for everyone and degree of fit, which concerns the relevance of precise design for each specific user (Lang & Moleski, 2010). The backgrounds and needs of human beings are very diverse, as do their mental and physical capability (Harahap et al., 2019; Van der Linden et al., 2016) become the basis of this concept.

1.2 Architects and Inclusive Design

As designers, architects have some roles in implementing inclusive design. Architects, collaborating with other stakeholders, have the creator capacity in the buildings and built environments' design (Burr & Jones, 2010). As Imrie and Hall (Imrie & Hall, 2001) stated, architects are the key actors that influence the building design and users' experience within it due to their understanding of the importance of various user groups during the design processes. Architects also offer the clients new possibilities and raise their awareness (Lang & Moleski, 2010). In the case of inclusive design, architects advocate for designs that accentuate societal equality (Mulligan et al., 2018) and accommodate the diversity of backgrounds and needs of human beings (Harahap et al., 2019). Therefore, architects' ability to identify user needs and their competence to produce design solutions that respond to these needs in context is crucial. Imrie & Hall (2001) refer to this as "professional's sensitivity," on which the inclusive design profoundly relies on to understand the development context and knowledge of the building requirements for the diversity of human abilities and conditions. This is in line with fundamental ethical behaviour among design professionals, especially architects, in recognizing and taking responsibility for their design's effect on users' lives (Heylighen et al., 2017).

It is known that architects have faced the challenge of executing inclusive design based on their understanding of it, which affect how they position it in their design practice. The inclusive design

requirement can be perceived as a constraint to their creative efforts (Lang & Moleski, 2010) or misaligned with the architectural aesthetic (Mulligan et al., 2018). Such perspectives' results in inclusive design as an afterthought where the architect retrofits its features into their design afterward to fulfil requirements and make some users miss out on the aesthetic experience of the building (Mulligan et al., 2018). This shows that the architects do not prioritize inclusive design in their agenda (Heylighen et al., 2017). The fact that users with special needs are merely occasional also becomes the reason (Imrie & Hall, 2001). On the other hand, this design can be seen as a potential broader understanding of user experience (Van der Linden et al., 2016) that can contribute to the architectural merit of a building (Mulligan et al., 2018). So, the architect's attitude and value should not exclude the user from the built environment (Imrie & Hall, 2001).

However, like the other stakeholders, architects' awareness of inclusive design varies in sufficiency and depth. Some scholars have acknowledged the contrasting phenomenon of the architect's understanding of inclusive design and the reason behind it. Zallio & Clarkson (2021) observed this as two categories of stakeholders' understanding towards inclusive design: the poorly-informed stakeholders and the well-informed stakeholders (Figure 1). The poorly-informed stakeholders tend to be focused on physical accessibility, referring to the Disability Discrimination Act. Meanwhile, well-informed stakeholders see this design as something that can benefit clients and occupants, guarantees an elevated baseline of access, and becomes a gold standard for their business and an example for others. According to Heylighen et al. (2017), poorly-informed stakeholders also tend to fail to respond to the broader relevance of various users. They focus on the accessibility of people using a wheelchair and are rarely aware of cognitive and sensory inclusion and accessibility. In addition, they consider this design as an additional cost and a regulatory obligation. This aligns with the perception that users with special needs are merely occasional users of the built environment, so it is not necessary to design the environment based on their needs (Imrie & Hall, 2001). In contrast, well-informed stakeholders see inclusive design as something that can be beneficial for clients and occupants, guarantees an elevated baseline of access, and becomes a gold standard for their business and an example for others (Zallio & Clarkson, 2021).
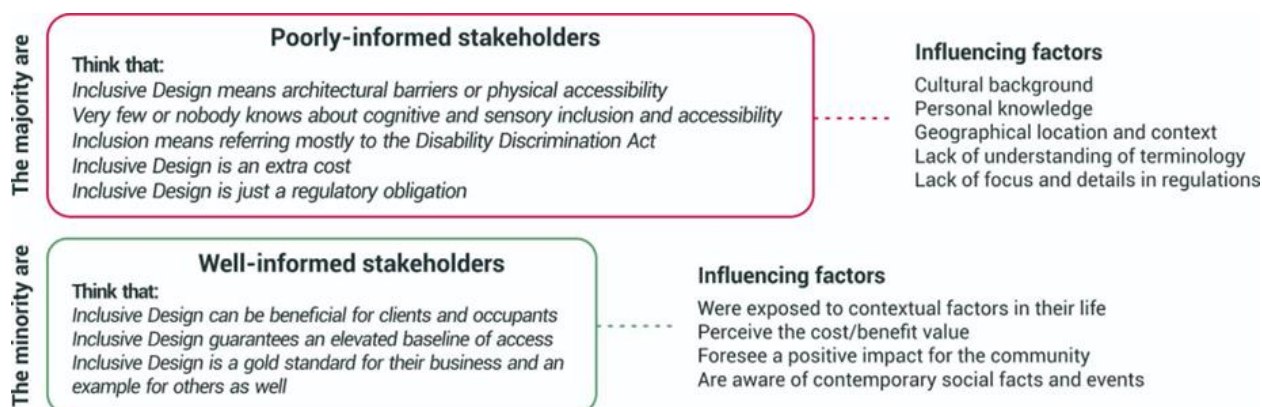

Fig. 1. Stakeholders based on their knowledge about inclusive design (Zallio & Clarkson, 2021)

This difference in information and awareness is influenced by many factors. Van der Linden et al. (2016) highlights the accessibility of inclusive design-related information related to the form and contents as one of the concerning factors. Information about this design is abstract (lacks further exploration and inspirational value), text-based (long-winded document forms), and too academic and authoritarian, which is considered unfriendly to designers, hence lessening its helpfulness in architectural practice. Thus, the information should provide experiential data and intangible aspects from the users, presented in quick and easy visual forms (Heylighen et al., 2017), such as diagrams (Goldsmith, 2000).

Architects' perspectives about inclusive design will drive the design process and the resulting built environment. Their attitude and values should not exclude the user from the built environment (Imrie & Hall, 2001) and will be shown in how they implement the inclusive concept. For some, inclusive design requirements are perceived as constraints to their creative efforts (Lang & Moleski, 2010) or misaligned with the architectural aesthetic (Mulligan et al., 2018). Such perspective results in inclusive design as an afterthought where the architects retrofit its features into their design afterward to fulfill requirements and make some users miss out on the aesthetic experience of the building (Mulligan et al., 2018). This also depicts how architects do not put inclusive design as a priority in their design agenda (Heylighen et al., 2017). For some others, inclusive design can be seen as a potential broader understanding of user experience (Van der Linden et al., 2016) that can contribute to the architectural merit of a building (Mulligan et al., 2018). This way, inclusive design becomes an integral part of architectural design, encouraging experience equality for all user groups.

Inclusive designs are often realized through an evidence-based design process where previous studies, research, or existing regulations are used as a basis for making design decisions (Maisel et al., 2017). However, in inclusive design, the process is equally essential to the outcome (Imrie & Hall, 2001). Therefore, user involvement in the inclusive design process becomes an aspect that needs to be considered. The involvement of users in the inclusive design process, valuing their opinion as users/experts can provide information and consultations for architects based on their first-hand experience of the built environment (Heylighen et al., 2017; Van der Linden et al., 2016). In design disciplines like product design and interaction design, it is common to involve users in a user testing process where they can use and interact directly with the product's full-size prototype. However, due to the scale of the projects, architects rarely make full-size prototypes where users can test the experience of the architecture. Hence, architects seem to be less familiar with direct user involvement compared to, e.g., product designers (Van der Linden et al., 2016). Moreover, architects are more likely to interact with the commissioners who often do not represent the end-user of the building and perceive them as the only client, overlooking that end-users are also clients (Mulligan et al., 2018; Zallio & Clarkson, 2021). Nevertheless, this does not necessarily mean that user involvement in the design process in architectural practice is an unusual scene. McMillan & Thomas shows how user involvement through participatory design and simulation using an architectural model gives notable benefits to the inclusive design process of The Ramp House (Mcmillan & Thomas, 2017). This case shows one of the most common ways in which architects interact with their users, where the buildings are represented by 'prototypes' in the form of physical models (maquette), digital 3D models, or drawings & images, all of which are created to depict the spatial experience and architectural expression of the building as accurately as possible. User involvement in inclusive design provides in-depth insight into how particular user groups interact with and experience the designed built environment which is required in inclusive design (Heylighen et al., 2017). It also plays a significant role in encouraging a sense of esteem by giving the feeling of importance to the users (Lang & Moleski, 2010), depicting society's stereotyped pejorative conceptions for them. Furthermore, it results in a more bottom-up approach with the users participating during the design process rather than a top-down approach where the users act merely as the receiver of the design output. Hence, the resulting built environment can better respond to the needs and context and offer comfortableness and spatial experiences for various users that exceed technical standards.

1.3 Inclusive Design in Indonesian Context

It has been discussed that the architect has an important role in inclusive design as a built environment designer. However, there has not been much discussion about their perspective and involvement in this design in Indonesia. Various reports show that NGOs like The SMERU Research Institute, ARKOM Indonesia, Kota Kita, and Rujak Center for Urban Studies are concerned and visibly

engaged with the issue of inclusive design. Moreover, when reporting about the actors of inclusive design, The SMERU Research Institute does not imply the role of the architect or any other design practitioners (Hastuti, et al., 2020). This NGO merely includes them as "private parties."

Bintaro Design District (BDD), an annual architectural event in Indonesia, raised inclusivity as its theme in 2019. According to archify.com (Archify, 2019), the curatorial team highlights the gap in design perception in broader society as the theme's background. Indonesia's main society still understands that "good design" is dedicated or can be said to be exclusive to certain users. As participants of BDD 2019, some Indonesian architects gave their opinions about inclusive design to whiteboardjournal.com. From the perspective of Hermawan Tanzil, design is supposed to be not only about enhancing living space and the environment but also about the economy (Sabrina, 2019). Andi Rahmat stated that architecture should be comfortably accessible to people with special needs and must be supported by accessibility regulations (Sabrina, 2019). He also stresses that the government's role in creating inclusivity among these users needs to be more proactive, and some rules have gaps in implementation details. Ahmad Djuhara argued that inclusivity is related to designed public environments (Sabrina, 2019). He added that the government tends not to involve architects in public facility design. These phenomena arise based on the complexity of the regulation that involves the architect or the private sector in government projects. Budi Pradono defines inclusive design as involving or inviting everyone to participate, regardless of status (Warastri, 2019). Further research on society's understanding of "good architectural design" is needed so that design inclusivity can reach every level of society, as Andria Ricardo and Yurike Safanayong stated (Sabrina, 2019). However, the ideas presented and discussed in BDD 2019 only represent a portion of architects in Indonesia and did not yet depict how these ideas about inclusive design are applied in architectural practice.
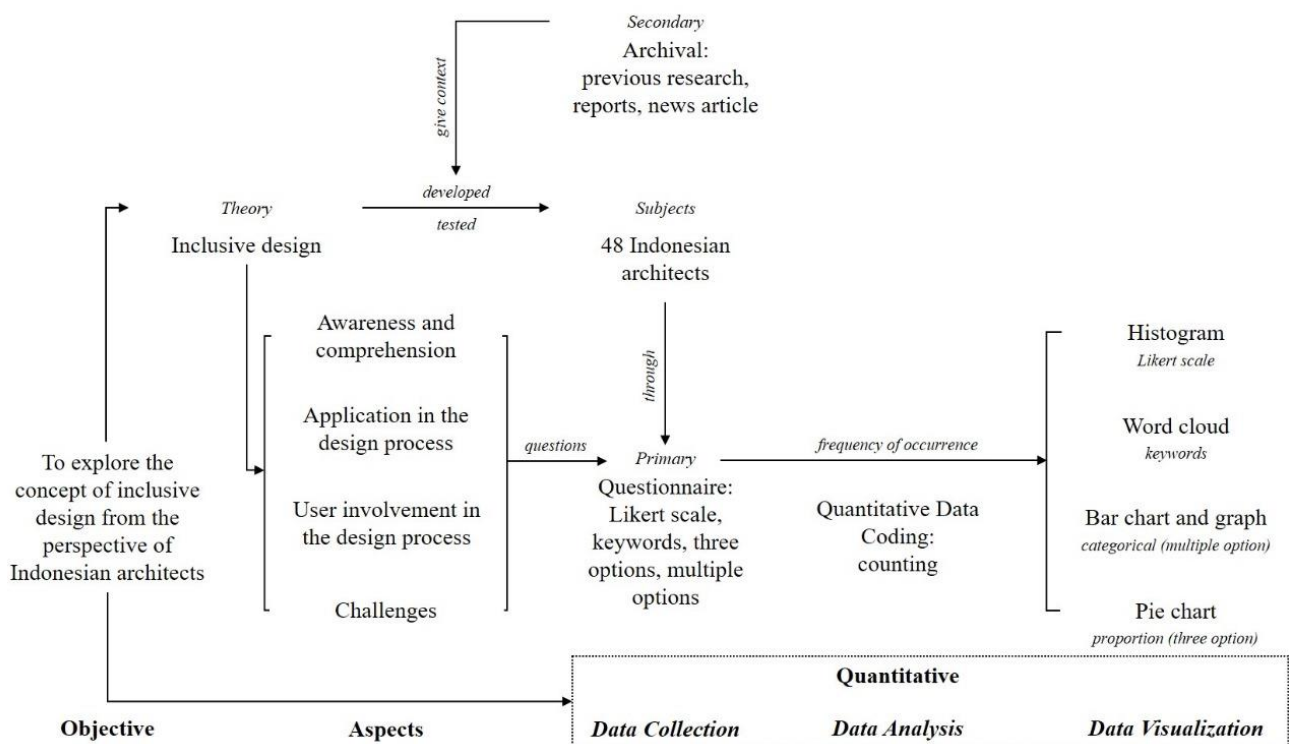
2. Methodology

Fig. 2. Research Methodology

The objective of this preliminary research can be achieved through the quantitative method. According to (Niezabitowska, 2018), this method aids in developing and testing general theories on the research subject, which leads to the frequency of occurrence of a given aspect in the weight of the sum. In this research, the theories related to inclusive design are derived into some aspects: awareness and comprehension, application in the design process, user involvement in the design process, and challenges. These aspects are then questioned through the questionnaire research tool for primary data collection. Previous research, reports, and news articles are employed as secondary data to give the context of inclusive design in Indonesian architectural practices. This preliminary research encompassed a sample size of 48 respondents, which are Indonesian architects, delineated as follows (Figure 3 and 4). Among the respondents, 11 possessed the Indonesian Architect Registration Certificate (STRA), while 37 did not (Figure 5). The relative novelty of statutory regulations governing architectural practice in Indonesia accounts for the prevalence of unregistered architects or those in the process of becoming registered architects. The questionnaire outcome is analyzed through quantitative data coding by assigning numerical values. The data is then displayed through several visualizations: a histogram to present the frequency of the Likert scale and a word cloud to portray the frequency of keywords. A bar chart and graph to depict the frequency of categorical data and a pie chart to display the numerical proportion are also utilized to present the perspective of Indonesian architects toward inclusive design. All explanations regarding the research methodology can be seen in Figure 2.
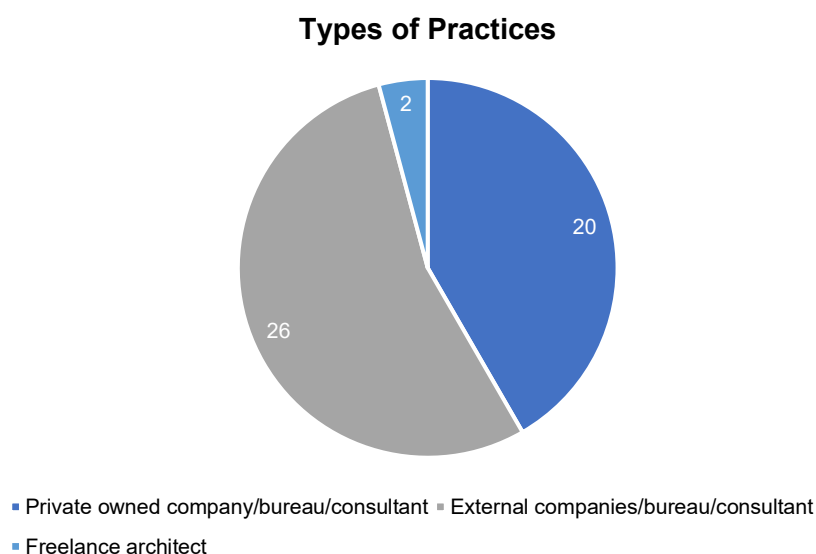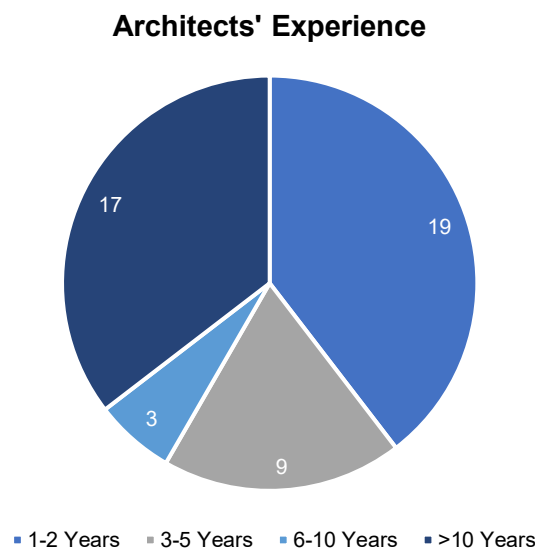
Types of Practices

- Private owned company/bureau/consultant - External companies/bureau/consultant
- Freelance architect

Fig. 3. Respondent's Types of Practices

Architects' Experience

■ 1-2 Years ■ 3-5 Years ■ 6-10 Years ■ >10 Years

Fig. 4. Respondent's Experience

Architects' License Status

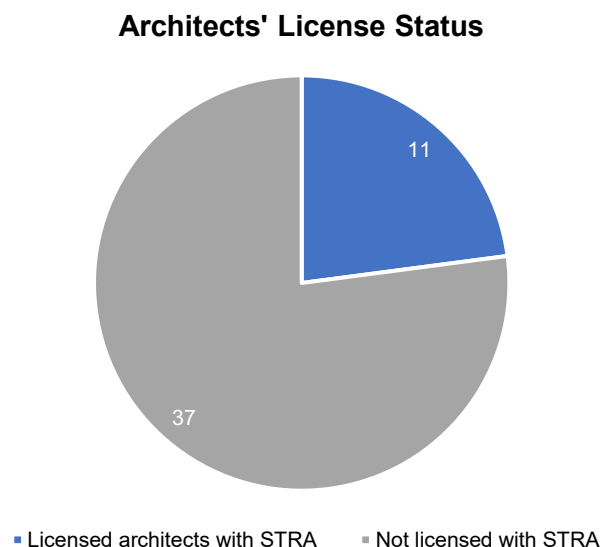■ Licensed architects with STRA ■ Not licensed with STRA

Fig. 5. Respondent's Architect's License Status

3. Results and Discussions

3.1 Awareness and Comprehension

This section explains Indonesian architects' comprehension of inclusive design, including their sureness, priorities, considerations, and sources of knowledge. In response to the question assessing their understanding of inclusive design, most architects, comprising 37 respondents, expressed confidence in their knowledge of the concept. Conversely, 11 architects admitted hesitations regarding comprehending the concept. When asked to rate their understanding on a Likert scale of 1 (minimal) to 6 (comprehensive), 30 architects stated that they know, while 18 said their knowledge is minimal. The breakdown is 1 respondent at level 1, 4 at level 2, 13 at level 3, 21 at level 4, 8 at level 5, and 1 at level 6. This data illustrates varying levels of familiarity with inclusive design among the respondents (Figure 6).
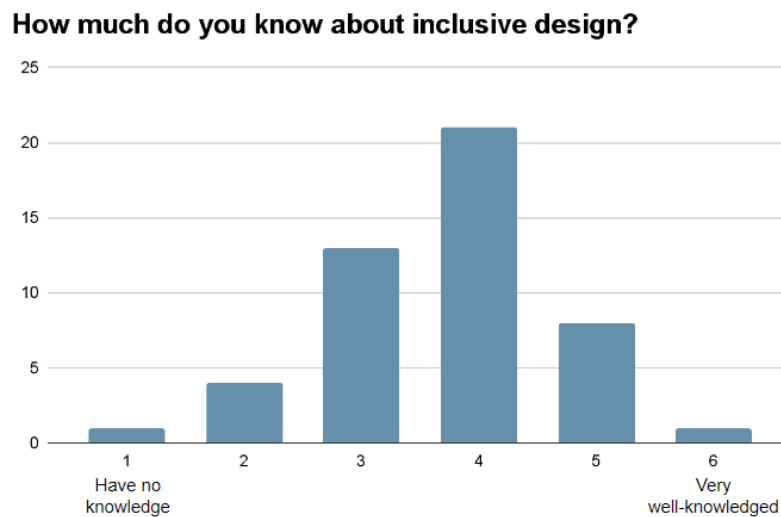
Fig. 6. Self-reported Level of Understanding about Inclusive Design

Analysis of a word cloud generated from the questionnaire probing architects' perspectives on inclusive design provides insight into their priorities and considerations (Figure 7). The findings reveal that architects prioritize accessibility, equality, and safety as fundamental principles in inclusive design. It also shows the attention given to technical solutions such as ramps, handrails, and guiding blocks to enhance accessibility. Moreover, the word cloud highlights architects' acknowledgment of user-centered design principles, recognizing user groups' diverse needs and conditions, including People with Disabilities (PwDs), the elderly, and children.

Fig. 7. Architects' Keywords on Inclusive Design

The questionnaire also investigated the primary sources from which architects acquired knowledge about inclusive design. Among the respondents, the most frequently cited sources were theories and literature on inclusive design, followed closely by precedents demonstrating the application of inclusive design. Additionally, insights from clients or users were deemed valuable sources of knowledge. Regulatory guidelines were also significant sources of information. These regulations are Minister of PUPR Regulation Number 30/PRT/M/2006, outlining technical guidelines for facilities and accessibility in buildings, and Minister of PUPR Regulation Number 14/PRT/M/2017, specifying requirements for building facilities. Moreover, opinions from experts and guidance from principal architects were reported as influential sources contributing to architects' understanding of inclusive

design. This highlights the diverse range of sources architects rely on to inform their knowledge of inclusive design (Figure 8). This also can be seen as text-based, which refers to literature and regulations, and empirical-based, which relates to precedents and the opinions of users, experts, and principal architects.

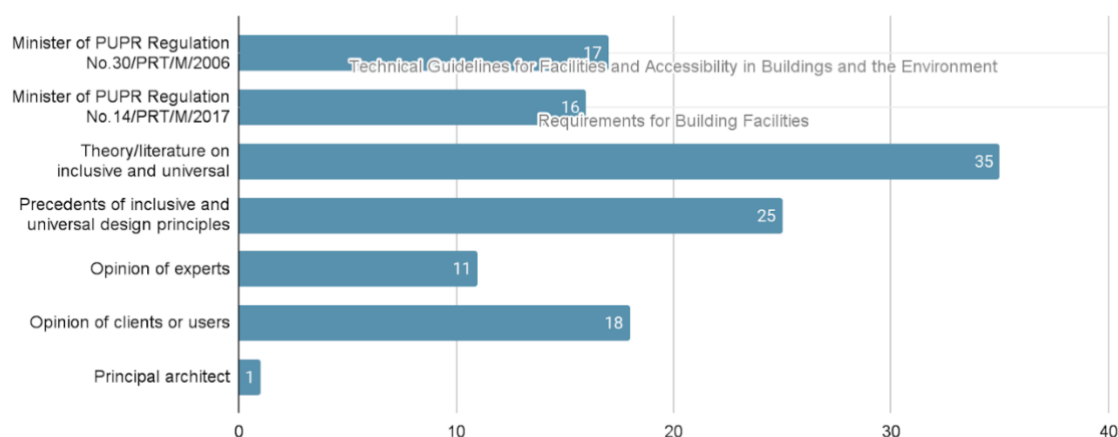### Where did you get your knowledge about inclusive design principles?

Fig. 8. Sources of Knowledge about Inclusive Design

Figure 6 shows the Indonesian architects' confidence in understanding inclusive design, which is elucidated through their priorities and considerations (Figure 7) and based on various sources of knowledge, as portrayed in Figure 8. Most of them understand this concept, and even though their priority is still physical-based, they have already considered diverse users' backgrounds and needs. According to Zallio and Clarkson's (2021) categorization, this phenomenon confirms that Indonesian architects are poorly-informed stakeholders regarding inclusive design, which still focuses on physical accessibility. Meanwhile, Indonesian architects' consideration aligns with Van der Linden et al. (2016) and Nasar and Evans-Cowley's (2007) argument that the built environment should accommodate diverse user groups' abilities and spatials. Regarding the source of information, Indonesian architects tend to utilize text-based sources, which, based on Van der Linden et al. (2016), lessens its helpfulness in architectural practice. So, Indonesian architects' awareness and comprehension have not yet fulfilled the notion of accommodating both physical and psychological matters, as mentioned by Imrie and Hall (2001), Lang and Moleski (2010), and Zallio and Clarkson (2021).

3.2 Application of Inclusive Design in the Design Process

This section describes Indonesian architects' application of inclusive design, including their sureness, motivations, and preferences of responded user groups and project types. Responding to inquiries regarding applying inclusive design in their architectural practice (Figure 9), the majority (72.9%) of respondents answered affirmatively. In comparison, 25% were unsure, and 2.1% admitted never having applied inclusive design.

During your work as an architect, have you ever applied the principles of inclusive design in your designs?
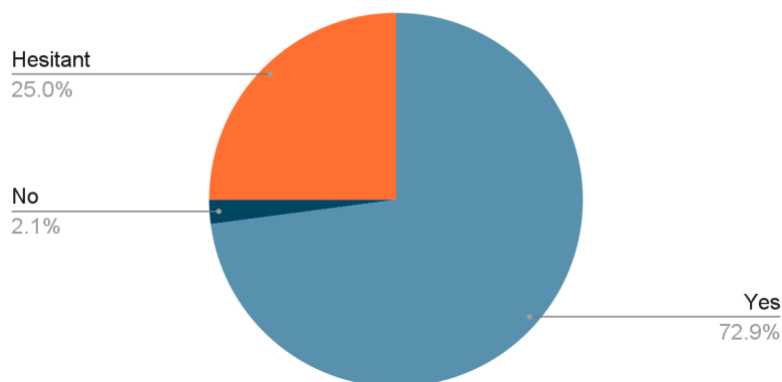

Fig. 9. The Application of Inclusive Design in Architectural Practice

The respondents also showed various motivations for implementing inclusive design (Figure 10). Principal among these was the imperative to conform to governmental regulations, suggesting a compliance-driven approach to design. Additionally, architects cited the prioritization of inclusive design as a professional imperative, along with requests from clients seeking inclusive solutions for their projects. Furthermore, the adaptation of designs to cater to the end users' needs and the anticipation of future possibilities emerged as significant factors driving the incorporation of inclusive design. This nuanced understanding of architects' motivations underscores the multifaceted considerations guiding the implementation of inclusive design within their architectural practice.

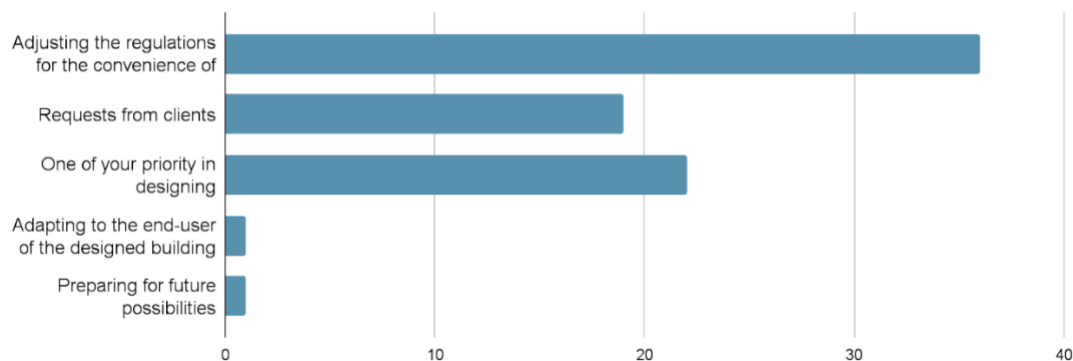**What are your reasons for implementing inclusive design principles in your designs?**

Fig. 10. Motivations for Implementing Inclusive Design in Architectural Practice

The questionnaire then asks Indonesian architects to rate their priorities regarding the following aspects. The regulations outlined by the Minister of PUPR Regulation Number 14/PRT/M/2017 delineate certain user groups, including the elderly, children, people with disabilities (PwDs), and pregnant women, need to be considered in building requirements. Based on this matter, when asked about their user group priorities (priority 1 to 4) in applying inclusive design to architectural practice, the result is depicted in Figure 11. Most architects put people with disabilities as their first priority, followed by the elderly, pregnant women, and children.
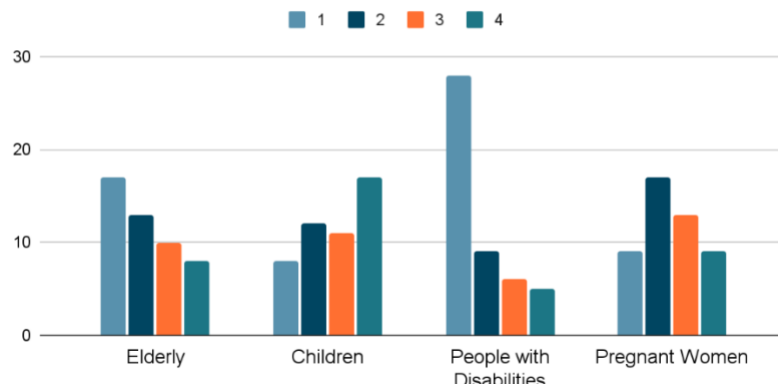
Fig. 11. User Group Priorities in The Application of Inclusive Design in Architectural Practice

Subsequently, the respondents were prompted to specify their prioritization (priority 1 to 6) within the category of people with disabilities (Figure 12). The architects predominantly prioritized blind and visually impaired individuals, followed by those with physical disabilities, brain injuries, hearing impairments, mental disabilities, and intellectual disabilities, in descending order.
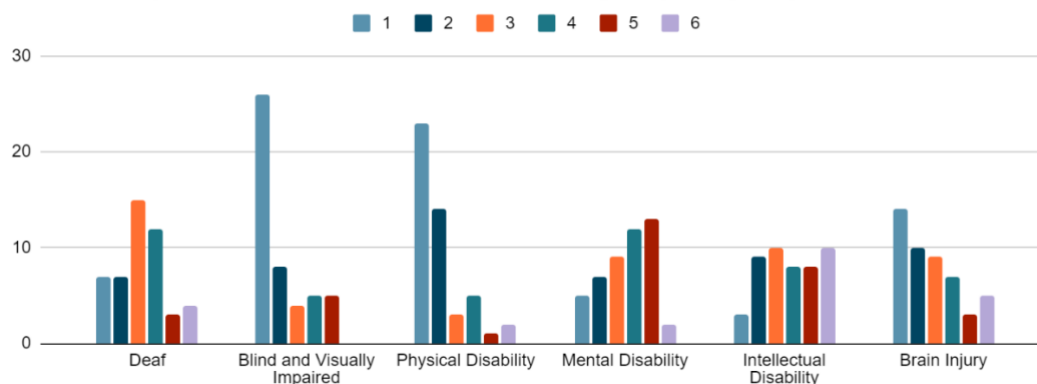

Fig. 12. User Group Priorities within People with Disabilities

When queried about the types of built environments where they believe inclusive design should be prioritized (priority 1 to 8), the result is portrayed in Figure 13. The architects identified public facilities and healthcare facilities as the foremost priorities, followed by outdoor spaces and landscapes, educational facilities, commercial buildings, private residences, tourist attractions, and government buildings, in decreasing order of preference.
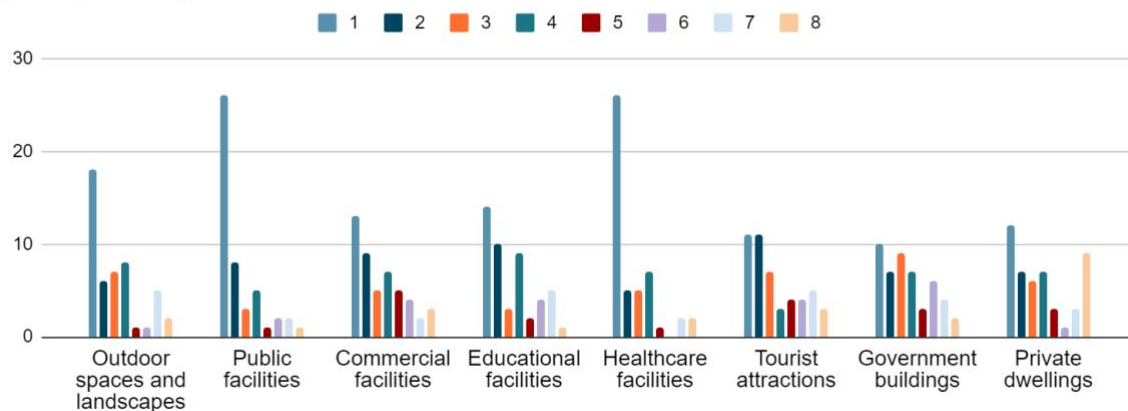
Fig. 13. Built Environment Priorities in Implementation of Inclusive Design

Figure 9 represents the Indonesian architects' confidence in employing inclusive design, described through their motivations (Figure 10) and priority regarding the user group (Figures 11 and 12) and project type (Figure 13). Most of them are sure to apply this concept, although their main reason is to adjust the regulations. They also tend to respond to the user group based on physical disability. Based on Zallio and Clarkson's (2021) categorization, Indonesian architects' motivation and priority inclination ratify them as poorly-informed stakeholders respecting inclusive design. These architects' view of this concept as a regulatory obligation and physical accessibility aligns with the argument of Heylighen et al. (2017). In contrast, the other architects' motivations, which are this concept as a personal priority and requested by the client, align with the roles the architect should take, which some scholars have mentioned as follows. The architect should be able to advocate societal equality design (Mulligan et al., 2018), which serves the broader human backgrounds and needs (Harahap et al., 2019), and show professional sensitivity (Imrie & Hall, 2001). Indonesian architects' certainty of applying this concept also aligns with these scholars' statements. So, it is worth noting that even Indonesian architects have not made the equilibrium between the physical and psychological matters, as mentioned by previous scholars (Imrie & Hall, 2001; Lang & Moleski, 2010; Zallio & Clarkson, 2021), but they have considered the temporary impairment as mentioned by Heylighen et al., 2017.

3.3 User Involvement in the Design Process

This section elucidates Indonesian architects' attitudes toward involving users in inclusive design, including their perspectives, sureness, and how and in what stages they involve users. When assessing the importance of active user involvement in the inclusive design process, the respondents indicated a varied spectrum of perspectives (Figure 14). On a Likert scale ranging from 1 (insignificance) to 6 (high importance), 45 architects stated that it is important, while only two architects said it is not that important. The data breakdown follows. The majority of respondents (18) rated active user involvement as highly important (level 6), followed by 16 respondents who rated it as very important (level 5), 11 respondents considered it moderately important (level 4). In contrast, two respondents considered it as somewhat important (level 3), only one respondent considered it of minor importance (level 2), and none rated it as unimportant (level 1).
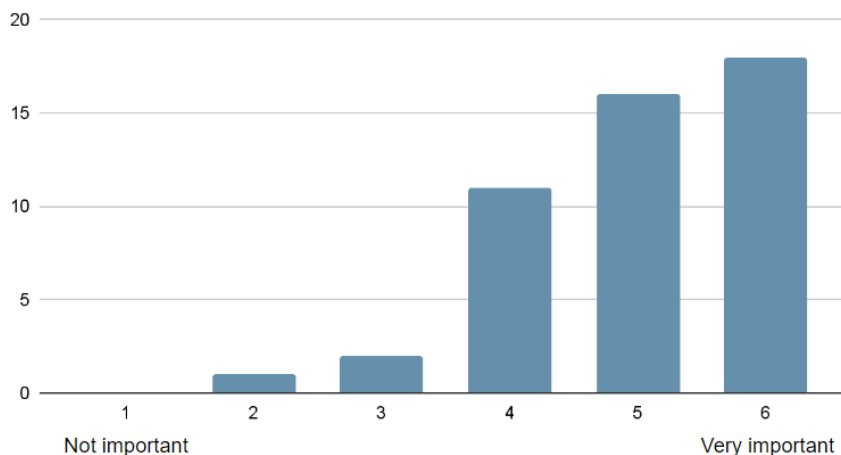
Fig. 14. The Perspective about The Importance of User Involvement in Inclusive Design Process

The respondents also showcased diverse practices regarding the extent of user involvement in their inclusive design process (Figure 15). Most respondents (43.7%) admitted to rarely involve users in their design process, 39.6% stated that they do it consistently, while 16.7% stated that they never actively involve users in their architectural practice.
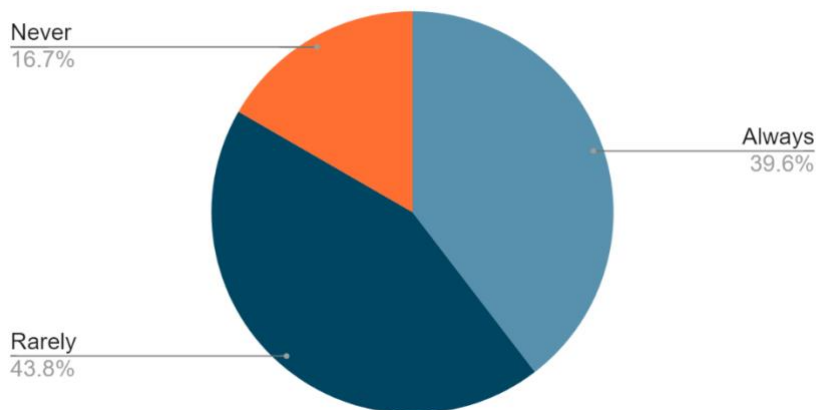

Fig. 15. User Involvement in Inclusive Design Process

The architects also provided insights reflecting various stages at which users are actively involved in their architectural practice (Figure 16). The pre-design stage emerged as the most common phase for user involvement, with 32 respondents actively engaging users during this stage, closely followed by the design concept stage, involving 30 respondents. Design development and technical drawing (DED) stages also saw significant user involvement, with 23 and 14 respondents, respectively. However, user involvement decreased during the procurement of executors of construction work and periodic supervision stages, with only 5 and 8 respondents. Notably, a minority of respondents (6) reported involving users across all stages of the architectural practice.

If you involve users in the process of designing an inclusive architecture, at what stage do you do this?
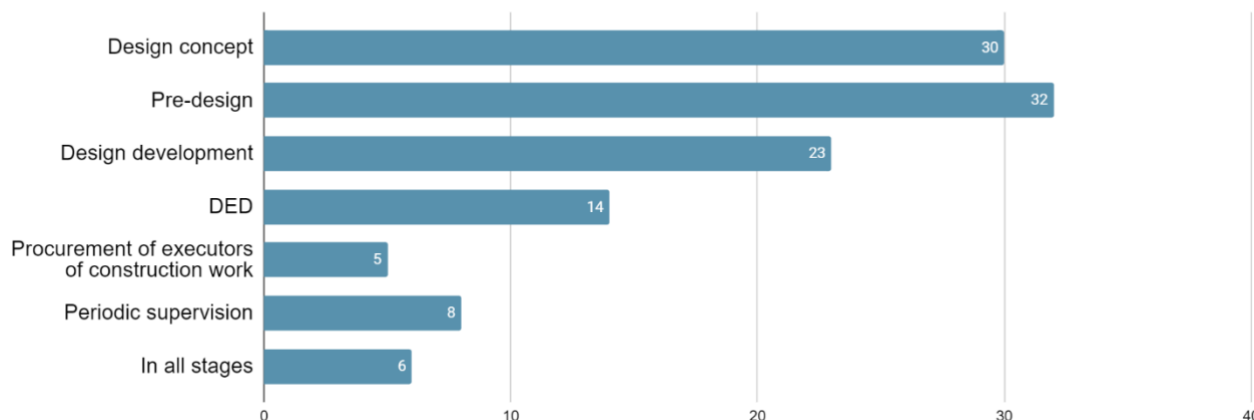

Fig. 16. Stages at Which Users are Actively Involved

When examining how users are involved in the inclusive design process, respondents outlined diverse methods of engagement (Figure 17). The most prevalent approach, cited by 37 respondents, involves direct discussions with users or clients to inform design decisions collaboratively. Additionally, 30 respondents reported submitting plans for user/client approval, indicating a consultative approach to ensure alignment with user preferences. A considerable minority (14 respondents) employs simulation techniques to allow users to experience and provide feedback on design concepts. Only one respondent admitted to not involving users in the design process, suggesting a rare deviation from user-centered design practices within the surveyed cohort.

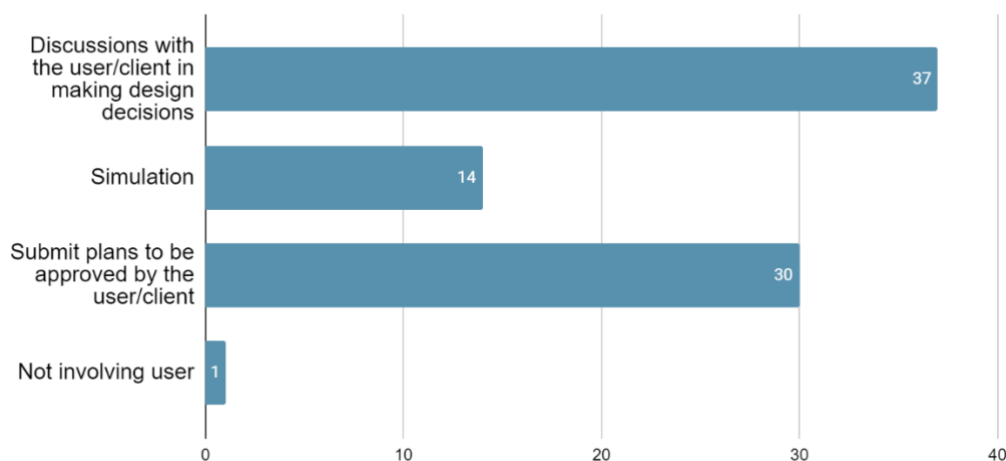**How do you involve users in your inclusive architectural design process?**

Fig. 17. Methods of User Involvement

Figure 14 displays the Indonesian architects' perspective on involving users in their inclusive design process, elucidated through their confidence (Figure 15) and preference for design stages (Figure 16) and the methods (Figure 17). Most of them agree that it is essential to involve users, although their implementation tends not to be that consistent. The preliminary stage of the design process and interactive communication with users becomes their inclination to respect user involvement in their inclusive design process. Indonesian architects' perspectives align with the statements of Heylighen et al. (2017) and Van der Linden et al. (2016), in which users' involvement in the inclusive design process shows the attitude of valuing users' opinions. In contrast, Van der Linden

et al. (2016) identified the not-that-consistent phenomenon of architects as some architects being less familiar with direct user involvement. It can be indicated that Indonesian architects' tendency to implement user involvement in the design process aligns with McMillan and Thomas' (2017) project of The Ramp Houses, which occurs in the early stage. However, the simulation application has not yet become their preferred choice. In contrast, their direct engagement with users aligns with Lang and Moleski's (2010) argument that this encourages a sense of esteem by providing the feeling of importance. So, Indonesian architects' attitudes regarding user involvement in the design process can be discovered even if the implementation consistency needs to be increased. This phenomenon shows the intention not to exclude users from the built environment, as Imrie and Hall (2001) argued.

3.4 Challenges in Applying Inclusive Design within Architectural Practices

The inclusive design process entails a complexity of various negotiations, as highlighted by respondents. They were also asked to express the challenges they face in implementing inclusive design in their architectural practices (Figure 18). A significant portion of architects (33 respondents) reported negotiating with clients' requirements, highlighting the pivotal role of client preferences in shaping design outcomes. Similarly, negotiating with cost considerations emerged as a prevalent aspect, also cited by 33 respondents, underscoring the inherent tension between design aspirations and budgetary constraints. Negotiating with architects' creativity was also deemed essential by 20 respondents, reflecting the delicate balance between innovative design solutions and practical feasibility. Additionally, negotiations with building regulations, including green building standards, were emphasized by 14 respondents, indicating the imperative of compliance with regulatory frameworks. Negotiations concerning building requirements, such as site conditions and building area, were reported by a smaller subset of architects (3 respondents). In comparison, negotiations with fellow colleague architects were noted by five respondents, highlighting the collaborative nature of architectural practice.
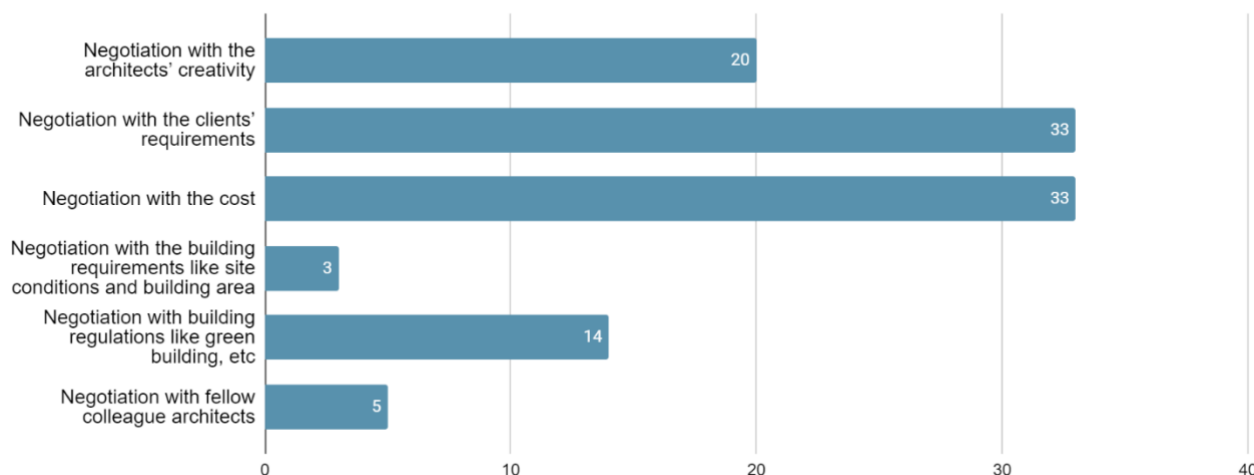

Fig. 18. Challenges in Implementation of Inclusive Design in Architectural Practice

Figure 18 represents the challenges that Indonesian architects face in utilizing inclusive design. Implementing this concept inevitably requires some negotiations, which limits their efforts. As mentioned, negotiation with the client is one of those. Based on Heylighen et al. (2017) and Van der Linden et al. (2016), this is supposed to become the information and consultation for architects. The cost consideration challenge aligns with Heylighen et al. (2017), which argues that inclusive design is an additional cost. The challenge of creativity negotiation is also worth noting, which aligns with Lang

and Moleski's (2010) statement that inclusive design is perceived as a constraint to creative effort. This leads to misalignment with the architectural aesthetic, as Mulligan et al. (2018) mentioned. In contrast, as Van der Linden et al. (2016) and Mulligan et al. (2018) argued, inclusive design should be seen as a potential broader understanding of user experience, which contributes to the architectural merit of a building. So, Indonesian architects can maximize this concept as a strength rather than a challenge.

4. Conclusions

This preliminary research aims to explore the concept of inclusive design by examining the frequency of occurrence of Indonesian architects' perspectives and attitudes toward some aspects. The aspects are derived into two: the understanding of inclusive design and the architect as the designer of this concept. The first aspect discusses the development from physical-based to physical-psychological-based and the basis of consideration. This shows that different circumstances require different responses to reach the precise design for a specific user, not generalized. The second aspect comprises debating the architect's role, the challenge and position, the understanding and the reason behind it, and user involvement in the design process. This presents that with the architect's higher awareness, inclusive design can be perceived as an opportunity in architectural design. The concept then provides novel spatial experiences for users with various abilities and conditions while eradicating the built environment's physical, social, and attitudinal barriers. It also accommodates user involvement, which is also valued as a crucial part. The inclusive design encourages a bottom-up approach where users are not merely acting as the passive receivers of the designed environment but rather provide resourceful information focusing on how they experience and interact with the built environment.

This research response to the research objective presents the findings in four major discussions developed and tested on 48 Indonesian architects. The aspects are awareness and comprehension, application of inclusive design in the design process, user involvement in the design process, and challenges in applying this concept within architectural practice. Overall, the result identifies that Indonesian architects have implemented the concept of inclusive design with diverse perspectives and attitudes. Although there are some drawbacks, they have elucidated the following. The first and second aspects discover Indonesian architects who still need to fulfil the equilibrium between physical and psychological matters in their understanding and application. This finding aligns with the mentioned phenomenon in Indonesian architectural practice, which still emphasizes physical accessibility. The third aspect recognizes that the consistency of Indonesian architects' attitudes toward user involvement still needs to be improved. The fourth aspect indicates that inclusive design is still positioned as a challenge, which needs effort to be negotiated by Indonesian architects.

Due to the nature of this preliminary research, which is quantitative, these four discussions need future empirical research. This research only covers the effort to put the discussion about the concept of inclusive design back into Indonesian architectural practice quantitatively by depicting the numerical value of Indonesian architects' responses. Conducting qualitative research to explore Indonesian architects' perspectives and attitudes toward inclusive design enables grasping their insight qualitatively and deeply, including recognizing new terms regarding this concept. These new terms will become a valuable asset in discovering the concept of inclusive design in Indonesian architectural practices. Furthermore, further research is also needed to determine the conditions of collaboration between stakeholders involved in implementing inclusive design. This is based on the fact that the architect is not the sole player in executing this concept.

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