
Elucidating the Elements of Islamic Architecture that Contribute to Defining its Identity in the Context to Perceived Environmentally

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Abstract

Objectives: The purpose of this study is to explore the elements of Islamic architecture that contribute to the establishment of a strong connection between individuals and their surroundings, as well as enhancing their perception of the environment and preserving the cultural identity of Islamic architecture. It is important to acknowledge that the various elements of Islamic architecture have the capability to instill a sense of order, harmony, spirituality, identity, and vitality within the environment. This not only creates an aesthetically and emotionally pleasing experience for observers but also emphasizes the importance of understanding the identifying elements of Islamic architecture. Furthermore, this research adopts the metasynthesis approach to investigate the relationship between Islamic architecture and environmental perception.

Methodology: The research methodology used in this study is defined by its purpose and is described as both descriptive and analytical with a survey-based approach. The data collection process involves conducting documentary studies, making field observations, and conducting interviews with 12 experts in the relevant field. In order to analyze the qualitative data and validate the variables extracted from the sources, metasynthesis and inductive coding methods were utilized in the Max Kyuda software during the interpretation of the interviews.

Results: In accordance with the study's objective and theoretical framework, as well as the responses provided by the participants during the interviews, the research components were categorized into seven dimensions: Identity, Social, Functional, Cultural, Environmental, Aesthetic,

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and Physical, as established by Max Kyuda. It is worth mentioning that each of these dimensions further comprises subsets through the process of inductive coding.

Conclusion: The enhancement of architectural design levels such as order, dynamism, and legibility, as well as the incorporation of key elements from Islamic architecture in contemporary cities, should be a vital consideration for architectural designers and urban planners. By assessing the spaces within Islamic architecture, the connection between humans and the environment can be explored and its impact on urban identity and the enhancement of the relationship between Islamic architecture and environmental perception can be discussed.

Keywords: Identity; Architecture; Islamic Architecture; Environmental Perception; Meta-study

1. Introduction

Urbanization is a fast and unprecedented process happening around the world. According to official reports, it is predicted that 68% of the global population will reside in cities by 2060 (Desa, 2018). Thus, urbanization involves the movement of people from rural areas to urban centers, leading to physical transformations in these environments. Urbanization has traditionally been linked to human advancement and progress, but recent studies have highlighted that it can also result in inequalities and significant problems within cities. Presently, we are witnessing the negative impact of urbanization on developed countries, including unfavorable social, economic, and cultural conditions. This awareness prompts individuals and nations to recognize the potential challenges that can arise in their own regions when urbanization occurs without appropriate social support and infrastructure (Kuddus, Tynan, and McBryde, 2020). Urbanization is the process through which cities grow as a result of industrialization, economic development, and an increase in the size and density of urban areas. This, in turn, brings about specific changes in expertise and the labor force within urban areas (Mutatkar, 1995). In contrast, the present generation is confronted with their own set of challenges, one of which involves gaining a better understanding of the widespread impact of the built environment on physical and mental well-being. Consequently, the design of the built environment holds immense potential for addressing many of the pressing concerns that currently affect public spaces in different nations. As a result, the approach towards evaluating the quality of the public environment is shifting from a biomedical standpoint to a more social anthropological perspective, with architects and planners playing critical roles in this transformation (Azzopardi-Muscat et al, 2020). In contrast, it is observed that sustainability issues in landscape architecture and urban design are interconnected and encompass multiple domains. These issues arise as a result of various changes such as demographics, social dynamics, economic factors, environmental factors, and technological advancements. Consequently, they are progressively evolving into intricate and interdisciplinary challenges (Hensel et al., 2020). In addition, in the present time, contemporary architecture functions as a practice that transcends national boundaries within the realms of culture and ideology. Therefore, if architecture represents culture, its representations reflect the aspirations and wants of individuals. Furthermore, the involvement of architecture in the urban globalization strategies strongly reinforces the assertion that the transnational elite connects the state and the globalization of capitalism (Khan, 2018). Islamic architecture encompasses the architectural styles of cultures, regions, or societies that have embraced Islam as an integral part of their social and cultural framework. This term remains valid today, as Islam has consistently maintained its role in shaping architectural development, despite changes in expression over time and space. Islamic architecture reflects spiritual, symbolic, social,

political, functional, behavioral, and formal aspects, and it is through these elements that the influence of Islam can be observed (Rabbat, 2011). Through its architectural manifestations, Islamic culture is depicted as a reflection of civilization and identity. The objective is to achieve an architecture that harmonizes with the cultural and natural environment, while also aligning with modern construction techniques. This includes considerations such as housing, the use of environmentally friendly materials, and safeguarding the rights of both the environment and future generations. Ultimately, the goals of Islamic architecture aim for sustainability by taking into account the environment from social, economic, and climatic perspectives (Alhawty, 2021). Consequently, the contemporary understanding of Islamic architecture has evolved from a conservative interpretation of Sharia law to embrace the concept of "Islamic purification," which integrates architectural principles (Alhawty, 2021; Idham, 2021). Islamic planning principles serve as a foundation for design and architecture, with a focus on privacy within enclosed spaces and the use of high walls. These principles are rooted in cultural trends and are founded upon a human understanding of the world. Furthermore, Islamic architecture showcases distinct stages of planning and unique design, offering a comprehensive perspective on the housing models embraced by Muslims across various geographical settings. However, the lack of awareness regarding Islamic teachings among the present generation of Muslims has resulted in the westernization of home design and spatial orientation (Malik and Mujahid, 2016). Therefore, based on these clarifications, it can be asserted that a dwelling also symbolizes various inhabitants and reflects the specific geographical factors of its locality. Consequently, from the perspective of the occupants, their beliefs and cultural background significantly impact the arrangement, construction materials, and zoning of the house. In this context, Islam exerts a profound impact on the residences of its followers, as evidenced by the presence of Muslim houses that embody Islamic architectural principles (Hasan et al., 2021). Although there exists a wide range of interpretations of Islamic architectural productions, architecture endeavors to incorporate its roots within both the changing and unchanging framework. This is because Islamic architecture possesses a unifying aspect that is expressed through religious values, and its defining characteristics are understood as having a firm identity. Consequently, establishing a connection between these elements serves as a strategy to foster the architectural identity and to analyze contemporary Islamic architectural outcomes through this connection. This allows for the framing and identification of the diverse and numerous products or results that arise within this context (Fanjan and Alboadom, 2023). Thus, it can be inferred that the decline of the Islamic way of life in modern architecture and urban planning in Iran leads to various issues. These issues include the rise of polarization and inequality in urban areas, marginalization problems, significant increase in land prices, resulting in smaller and fragmented plots of land. Additionally, the failure to incorporate key principles of Islamic architecture like introversion and separation between inner and outer neighborhoods due to small residential units further impacts the quality of living spaces and prioritizes minimalism. Moreover, the prevalence of consumerism has become widespread as a result of these factors (Raisi, 2021). However, it is important to remember that perception is a personal process in which sensory experiences are given significance. Through this process, humans are able to establish connections and understand the meanings of objects, sensory experiences, ideas, and imaginations. Additionally, the motivation of an individual and the context in which perception takes place play a crucial role in this phenomenon (Yazdanfar, Heidari, and Aghajari, 2015). In simpler terms, when humans familiarize themselves with their surroundings, they attempt to create order and structure by interpreting and comprehending the connections between their bodies and the urban space. By mentally envisioning and establishing meaningful connections between visual elements, the psychological impact of

human understanding of urban space can be categorized into two groups: understanding the quality of the environment and perceiving its visuals. Therefore, environmental perception can be seen as the act of receiving information to gain an understanding of the relationship between people and their surroundings (Mojedzadeh et al., 2023). Islam encourages a sustainable and uncomplicated approach to residential and physical spaces, making Islamic architecture an ideal model for all types of buildings. This architectural style greatly influences how humans perceive their surroundings by incorporating geometrical elements that create harmonious and balanced spaces. The use of local materials in construction adds cultural and regional identity, enhancing the beauty and tranquility of Islamic buildings while improving human perception of the environment. However, contemporary housing structures often disregard these Islamic principles, leading to limitations. Hence, this article aims to elucidate the key components of Islamic architecture that contribute to environmental perception, employing the metasynthesis approach.

Table 1 The evolution of identity in research sources (Source: Author, 2023)

Year	Author	Description
1960	Lynch	What gives a location its own separate existence result in a unique and distinguishable shape compared to other locations, and serves as a framework for understanding its entirety.
1980	Schulz	Place identity is a prerequisite for human identity. The essence of architecture is determined with reference to this factor
1995	Cullen	He describes identity as the act of acknowledging the unique characteristics of each environment and avoiding the homogeneity and resemblance found in urban environments.
1999	Rappaport et al.	Having a personal identity signifies the contrast in being extroverted. On the other hand, a collective identity implies having common attributes associated with being introverted. Consequently, possessing an identity entails simultaneously possessing distinctiveness and likeness in one's characteristics.
2004	Alexander et al.	They perceive identity as the tangible manifestation of visionary attributes within structures, which serve as the fundamental essence of vitality for each individual, urban setting, edifice, or unspoiled environment. Nevertheless, these entities defy verbal description.
2014	Vale	The construction of national identity in the context of modernity and architectural development.
2022	Al-Mohannadi & Furian	Preserving urban identity involves re-establishing the connection between social sustainability and the architecture of housing, given its socio-cultural nature and its close relationship with urban design theories

The promotion of architectural identity is influenced by cultural factors.

According to Webster's dictionary, identity refers to the similarity and cohesion of all elements that form the tangible existence of an object. On the other hand, in another dictionary, identity is defined as the nature, fundamental quality, and authenticity of an object. Frequently, identity appears to include beliefs that adhere to essentialism, where identity is perceived as permanent and immutable, and certain distinctions are established, although some disparities might be concealed during this process. For instance, the eradication of class and gender differences may occur through the declaration of a national identity. In reality, identities are not homogeneous, as there might be contradictions within them that need to be resolved, and any alterations can only come about on a global and national level in the political domain. These changes do not solely transpire at this level, as the formation of identity also transpires at a more localized and personal level (Woodward, 2018). Consequently, the identity of a place encompasses a fusion of the social and cultural attributes of the respective community, which are manifested in the physical manifestations of urban spaces, shown in Table 1. Moreover, the rapid expansion of modern cities, coupled with the

recent alterations of traditional urban environments, has led to discrepancies between the physical features of urban spaces and their cultural identity. Among these urban areas, public urban spaces serve as domains that are extensively utilized by the public, as they have the potential to foster a shared sense of place within urban society, thereby playing a crucial role in enhancing the social aspects of human existence (Ziyaee, 2018). In urban studies, identity can be understood as the unique characteristics of a place or the combination of people within that place (Ujang, 2012). This implies that urban identity represents the natural, cultural, and man-made elements of a city, as discussed through the concept of place identity. Place identity refers to how a place appears and the common elements that shape people's individual perceptions of that place. The distinctive physical or visual features of a place can also contribute to the understanding of its identity (Carmona, 2021). Conversely, place identity encompasses the emotional and psychological connection between individuals and a specific place, as well as the distinguishing features that establish this connection (Ujang, 2017). The understanding and aspirations of individuals are greatly influenced by their identities, which play a significant role in various aspects of organizational and personal life. Consequently, identities are crucial for comprehending and analyzing the consequences surrounding individuals (Brown, 2015). Numerous research studies highlight that the identity of architectural structures is built upon the elements utilized to represent the culture and customs of a specific location or people (Hynda, Samir-Djemoui, and Mohamed, 2022). Therefore, the importance of identity in urban public spaces cannot be denied. From a social standpoint, identity describes the distinctive qualities of an object, encompassing diverse perspectives and objectives, including personal, social, moral, and even political dimensions (Kaymaz, 2013) shown in Table 2.

Table 2 The evolution of Islamic architecture in research sources (Source: Author, 2023)

Year	Author	Description
1898	Fletcher	The Islamic architectural style is uniquely connected to the religion that influenced its development, and it is designed to foster a cohesive way of life across various regions.
1961	Schuon	Schuon presents an interpretation of true beauty or its comprehension, which can be evaluated through theoretical and intellectual means. The Pythagorean method is employed in the exploration of various symbols within Islamic art.
1979	Papadopoulou	The praise of everyone has been garnered by various artistic elements such as mosaic work, tile work, wall paintings, abstract decorations, and inscriptions in the majority of Islamic buildings.
2008	Hasham Morteza	In order to align the lives of Muslims with the goals and teachings of Islam, the principles of Islam were collected. By adhering to these principles in the early Muslim societies, they were able to establish social and physical environments that were in harmony.
2015	Teimouri	According to respected Islamic scholars in the field, beauty in Islamic art is considered subjective and dependent on perception.
2018	Kadoi	The Islamic world has been presented in museums in Europe and America throughout history.
2023	Nasser Al Arifi	The unique characteristics of Islamic architecture involve giving importance to restoration and creativity, acknowledging the aesthetic significance of Islamic ornamentation, and emphasizing the artistic aspects of deviating from anthropomorphic representation.

Architecture is a manifestation of our principles, asserts Norman Foster, as the manner in which we construct is indicative of our lifestyle. This explains why the indigenous customs and historical strata of the urban environment are incredibly captivating, as each era presents its unique

terminology. Occasionally, delving into the past becomes necessary to extract motivation for the forthcoming era, and at its most impactful, architecture epitomizes our societal principles (Bianco, 2018). Islamic architecture emerged with the rise of Islam and is deeply intertwined with the beliefs, teachings, and practices of the religion. It is both a concept and a tangible expression, and, like any other architectural tradition, it addresses the specific needs of the society it serves, taking into account factors such as climate, geography, and culture. Therefore, Islamic architecture is seen as a revolutionary and enduring phenomenon that reflects the values and principles of its creators. Furthermore, Islamic architecture seamlessly combines creativity, imagination, and technical expertise to fulfill the physical, mental, and spiritual needs of individuals (Omer, 2008). Thus, in line with the objectives of Islam, architecture is considered to be a branch of art rather than engineering, Islamic designs encompass concepts beyond mere decoration, and the utilization of flower motifs along with the absence of figurative and animal motifs stem from the deep-rooted reliance of Muslim artists and architects on nature for inspiration, owing to their religious beliefs. Moreover, Islamic mosques exhibit two distinct attitudes. For instance, the notion of form holds significant controversy in Islamic history. It is possible to analyze and examine form in two distinct categories, with one of them being the square plan - a feature that is commonly found in Iranian art both before and after the advent of Islam. The significance of the square plan can be attributed to the prevalence of the number four amongst Muslims, as the Kaaba itself possesses four corners (Esmaeili, 2014). In contrast, Islamic architecture possesses a distinct aesthetic quality that sets it apart from other architectural styles. This defining characteristic is rooted in Islamic arts, as the architectural heritage reflects the creativity and cultural legacy of the nation throughout its extensive history. The inherited structures of aesthetically appealing architectural designs within Islamic society have withstood the test of time and imposed reverence from the world, acknowledging their suitability for human use (Gamal, Farghlaa, and Nasr, 2021).

Furthermore, the intricate design and embellishments found in the architecture of mosques highlight the significance of Islamic culture as one of the most influential and remarkable civilizations in human history. The incorporation of geometric shapes in architectural structures indicates that Muslim artists were conscious of their work, aiming to capture values that align with their spiritual and ideological needs. Consequently, comprehending the aesthetic worth of Islamic ornamentation and the artistic aspects of architectural decorative elements, such as geometry and botany, can be beneficial for scholars and researchers studying Islamic aesthetics and decorations. Furthermore, the existence of Islamic architecture is closely intertwined with Islamic perceptions of God, humanity, nature, life, death, and the afterlife. Additionally, it illustrates the religion of Islam and the essence of Islamic culture and civilization, as the structures within Islam are constructed to honor the singular creator and master of the cosmos, as well as those who dwell within them. Consequently, nature serves as the foundation for accomplishing mankind's spiritual purpose on earth. In other words, humans are intertwined with nature, as the entire natural surroundings for humans is nature itself. Sustaining nature is synonymous with preserving oneself, while causing harm to nature equates to causing harm to oneself, ultimately signifying a triumph for civilization. It explicitly declares the obligations and responsibilities towards nature (Omer, 2012).

1.1. Environmental Perception

Perception is a subjective matter that relies on the information our five senses gather. Architecture, akin to language, communicates messages. These messages are contained within the physical dimensions of the building and are comprehended in our minds. When this information aligns in our minds, we form a perception of the building. It is important to note that the focus of

perception in architecture primarily lies in the viewer's mind. Architectural literature emphasizes the significance of meaning in architectural works, and when observers decode the message contained within, it is referred to as perception. Different individuals may interpret and derive diverse meanings from a particular work (Pouragadham et al., 2023). Furthermore, perception is shaped by factors such as knowledge, experience, emotions, cognitive variables, and the decisions of the observer. The environment can be comprehended through four cognitive, emotional, interpretative, and value dimensions. Essentially, perception encompasses the object being perceived, and in the case of architecture, it is not confined to solely physical aspects but also encompasses mental aspects that motivate the creation of physical structures. Psychology explores the various factors that impact perception. One such factor is human consciousness, which directly influences the sensory nervous system. Another factor is the individual's circumstances and the environmental conditions they are exposed to throughout their life. These circumstances include aspects like gender, age, education, needs, assumptions, beliefs, and thinking patterns. The environment itself also plays a crucial role in shaping perception, and it is influenced by numerous factors. Consequently, different environments yield different perceptual effects (Ngakan, 2019). Furthermore, Franz Brentano categorizes the concept of human perception into two distinct components. External perception refers to the comprehension of objects through visual observation of physical phenomena, whereas internal perception involves understanding objects through cognitive processing of mental phenomena. In the context of architecture, both internal and external understanding are essential in order to enrich the encounter with the physical and mental aspects of environmental features. The engagement in mental activities inherently entails a certain level of awareness of those activities themselves (Palangi, 2022). As argued by Marin and Lima (2009), the term "environmental perception" possesses a multifaceted and interdisciplinary nature, lacking a universally accepted definition in the realm of biology (Marin and Lima, 2009). On the contrary, Schultz, Shriver, and Tabanico argue that humans have a self-centered connection with nature, with their environmental concerns being primarily related to themselves. This mindset corresponds to a lack of concern for the environment, except for those individuals who view themselves as an integral part of nature. Different individuals can react differently to the same environment. Generally, individuals who have stronger connections to the environments they frequently inhabit contribute more to addressing environmental issues, unlike those who are geographically distant from an environment and only have temporary engagements with it (like park or beach visitors or tourists in natural reserves seeking enjoyment or leisure). This contribution to the problem was observed by Schultz et al in 2004. Hence, the perception of the environment is regarded as a concept of perception utilized in the connection between individuals and society with the environment, being a psychosocial phenomenon where the depiction of the environment relies on the cognitive and emotional processes formed through personal experiences. Conversely, the concept of environmental perception is intricate and linked to the socio-environmental viewpoint. In the case of humans, their interaction with the environment is not solely based on physiological requirements, but also on their needs and desires. Environmental education plays a crucial role in cultivating environmental perception within its cultural influence. In reality, environmental perceptions are seen as a prerequisite for attaining various levels of environmental awareness. The significance of this framework is highlighted for the peaceful coexistence between humans and the environment, advocating a responsible, accurate approach towards nature preservation (Marques et al., 2020).

It can be concluded, after considering this subject, that individuals may have varying interpretations of an object. The architect's understanding of architecture is influenced by their

experience and their ability to comprehend architectural concepts. This understanding is then conveyed through the architect's perception of the form and value present in the architecture they observe. Generally, the characteristics of architecture can be identified by visually examining its constituent elements, and different reactions can be elicited by an object. Many scientific approaches in architectural design indicate that the complexity of architectural design encompasses various activities and aspects. One of these aspects is perception within architectural spaces. Perception allows humans to recognize architectural works based on their experiences. Furthermore, there are generally four dimensions that characterize human perception: cognitive, emotional, interpretive, and value dimensions. These dimensions also highlight the differences in perspective between architects and non-architects. The term "perception" stems from "perceive," which denotes observation, concept, awareness, and knowledge. Theoretically, perception is the process of acquiring information from the human environment, actively engaging with it, integrating it into one's own experiences, and assigning meaning to the acquired information (Ngakan, 2019). Consequently, the process of perception involves the interpretation and comprehension of sensory information obtained from the surroundings, and it is influenced by a range of factors including culture, experience, and context. Moreover, architecture is responsive to ingrained habits rather than our basic needs, which have developed over millennia in the natural world. This evolutionary progression establishes a connection between mankind and their senses, predisposed to seek out faces, fractals, and appreciate bilateral symmetrical arrangements. In fact, studying the impact of architecture on human perception enables us to grasp how public buildings can either foster unity or division and cultivate a sense of community cohesion and identity (Sussman and Ward, 2019). However, identity, in contrast, refers to how we perceive ourselves and our position in society. It is shaped by diverse aspects including culture, religion, language, and history. The connection between perception and identity is intricate and heavily influenced by the cultural and historical environment in which we reside. Moreover, Islamic architecture has undergone transformation throughout the years and has been influenced by factors like the observer's cultural heritage, historical circumstances, and the architectural elements integrated into its design. Therefore, comprehending Islamic architecture is subjective and influenced by the observer's personal background and past encounters (Pandya, 2020). The concept of Islamic architecture's identity is a topic of discussion from two different angles: the visible appearance and shape in public spaces, as well as the deeper reality that lies within. This attribute is not unique to Islamic architecture alone, as all religious architectures possess it. However, the latter perspective holds true significance and legitimacy in terms of "meaning" and serves as a means to preserve, mold, construct, and ultimately enhance urban identity. The identity of Islamic architecture holds great significance and uniqueness, and due to its intangible nature, it cannot be possessed as an "object" (Hojjatollah, 2012). The theoretical framework in Fig 1 has been developed by considering the research background, examining theoretical foundations in Islamic architecture and environmental awareness, recognizing commonalities, and extracting influential components from these two fields.

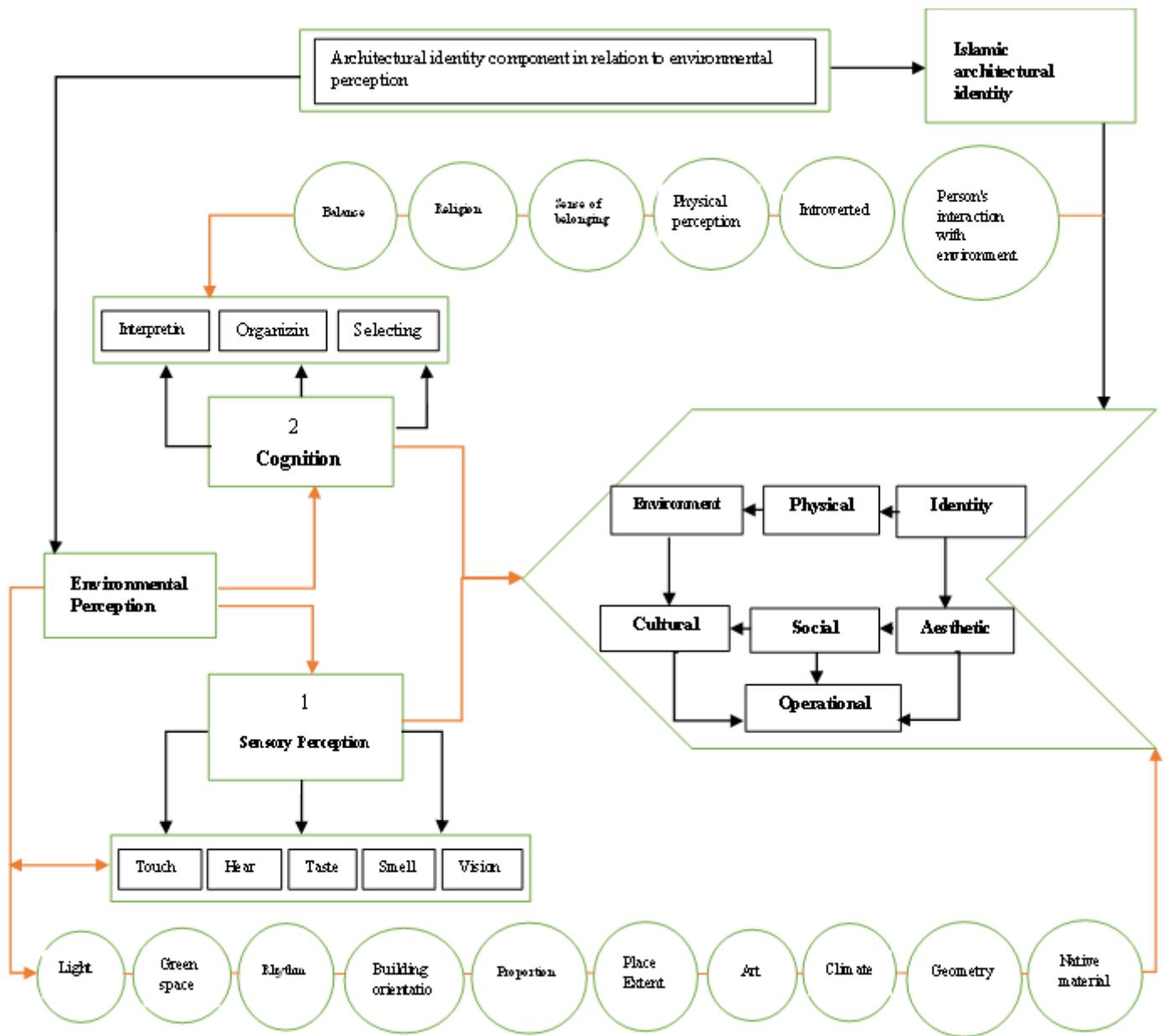


Fig 1 The theoretical framework of the research (Source: Author, 2023)

2. Research Background

Expert researchers initiated the research project by considering the topic and approach, and in the following, we will outline a few theories.

Spahich's publication, "Islamic Architecture from the Perspective of Theoretical Foundations, Spiritual Values and Historical Developments", published in Iran in 2018, aims to elucidate the conceptual and spiritual principles that guide Islamic architecture while highlighting its historical origins. The author goes on to offer comprehensive explanations and illustrative examples in this

domain. Similarly, in 2023, Al-Jamil's article, "Utilizing three-dimensional spatial structures for identifying extraordinary characteristics in architectural objects", presents Islamic architecture as a subject of study concerning human behavior and emotional assessments of spatial encounters within architectural settings.

Talebi authored an article titled "The Potential of Islamic Designs in the Visuals of Modern Islamic Cities" in 2020. The article highlights the significance of Islamic patterns and ornamentation in diverse aspects of Islamic architectural structures. The author emphasizes the need to incorporate elements that possess aesthetic and indigenous qualities in the enhancement of urban landscapes and furnishings, as it fosters a sense of cultural identity and religious heritage among the citizens. The objective of Talebi's article was to explore the potential of Islamic patterns and their impact on the visuals of contemporary Islamic cities. He concluded by stating that the incorporation of Islamic patterns in the urban beautification and graphic design of Islamic cities can effectively convey Islamic concepts and visual identity, considering their visual quality and underlying meanings. According to Dr. Behzad Sidawi's article titled "Knowledge of Islamic Architectural Heritage Vocabulary" published in 2013, the elements of Islamic historical architecture are intentionally designed and constructed to adapt to the physical conditions of individuals, as well as to address environmental, social, physiological, and religious factors. Dr. Sidawi argues that architects should not only comprehend the concealed values within historical elements, but also understand how these values interact and merge within these elements. To achieve this, the architect can gain a proper comprehension of these components and integrate them effectively into their design. The present study introduces a theoretical framework suggesting the examination and understanding of architectural heritage terminology to be integrated into contemporary building designs by architects.

Hillenbrand authored a book named "Islamic Architecture" in 1994. This publication stands out as a fundamental work within the realm of Islamic architecture, delving into the historical aspects, design principles, and societal significance of this architectural style. In contrast, Hoffman scrutinizes the fundamental principles and ideas in environmental perception, including object recognition, attention, and memory, in his 2008 book titled "Perception and the Physical World: Psychological and Philosophical Issues in Perception." Hoffman has utilized mathematical techniques and neural networks in order to elucidate perceptual procedures and has explored philosophical and psychological matters regarding environmental perception. In 1979, Gibson examined the ecological framework in environmental perception in his work "Ecological Approach to Visual Perception". According to Gibson, environmental perception ought to rely not only on sensory information, but also on the actual environment. To explain this, he has introduced a concept called "self-propelled locomotion".

3. Methodology

In this phase of the study, it is important to consider that the research approach is applied with the intention of gathering information and carrying out a descriptive-analytical investigation through surveys. The information collection process entails conducting documentary analysis, making field observations, and conducting interviews with twelve professionals in this particular field. These approaches have been validated and approved by experts. In order to examine the qualitative information and validate the variables obtained from the sources, as well as linking them to the interviews, the Max Kyoda software utilized metasynthesis and inductive coding techniques. It is important to mention that the metasynthesis approach entails reviewing the sources and interviews conducted from a qualitative perspective in order to evaluate existing knowledge and

potentially advance it. The data examined through this method comprises the results of previous naturalistic studies. Ultimately, metasynthesis involves an extensive examination of a phenomenon by synthesizing qualitative discoveries. The conclusions and inferences drawn from the comprehensive review of all relevant articles constitute the interpretations obtained. Consequently, a meta-analysis offers novel insights and understandings that were not previously addressed in the original papers. By employing a systematic approach, metasynthesis enables researchers to uncover fresh and essential concepts and metaphors. This approach aims to generate knowledge and present a holistic overview of the framework (Rouhi-Balasi et al, 2020). This approach allows for a comprehensive comprehension of phenomena by incorporating various settings, participants, and qualitative traditions. Such a synergistic understanding can be beneficial in theory development, as well as in informing practice and policy. By combining multiple qualitative studies, a more profound understanding of the phenomena under investigation can be achieved, contributing to theory development and informing practice and policy (Aguirre, and Bolton, 2014). However, it is important to note that the analysis of the collected data in this research utilized Barso and Sandusky's 7-step method in Fig 2.

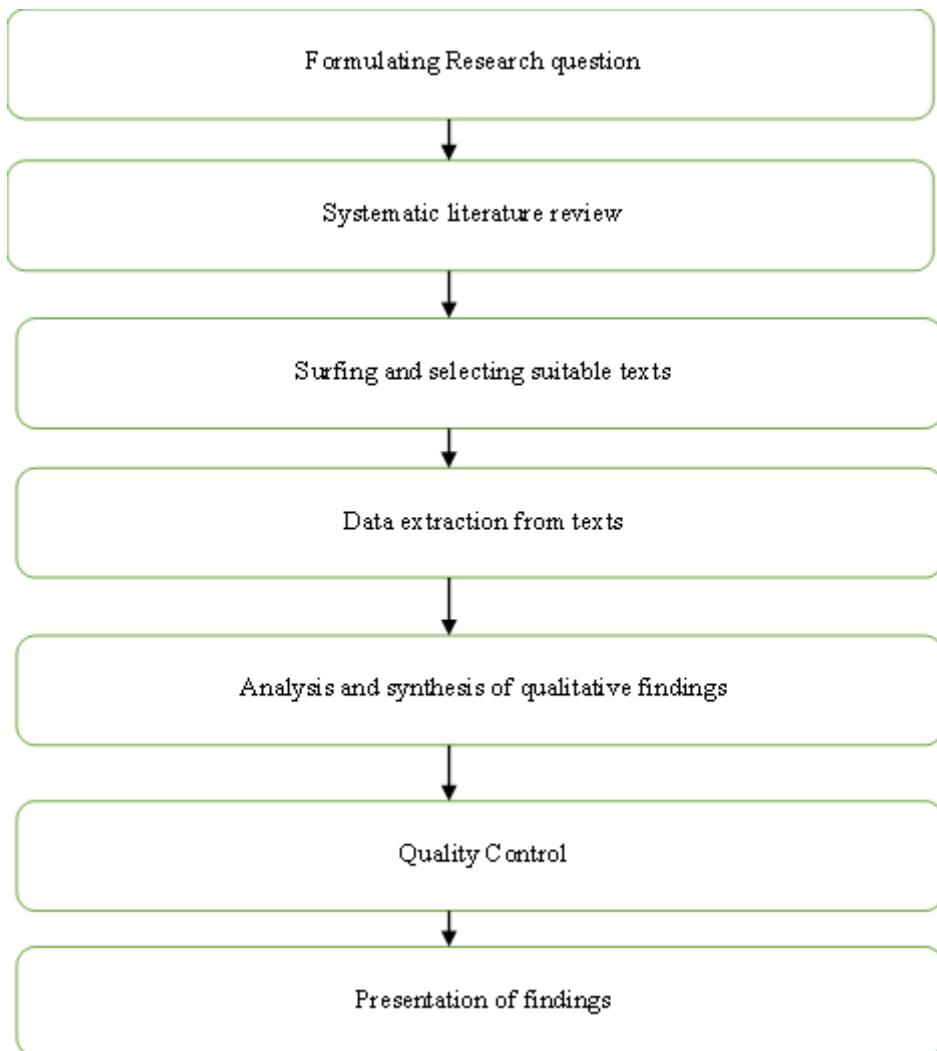


Fig 2 Steps of implementing metasynthesis (Source: Shahmohammadi et al, 2018)

In the initial phase of this study, the focus was on investigating the elements of Islamic architecture that contribute to environmental perception, using the metasynthesis approach. Relevant experts were given a prepared questionnaire to gather their insights. Subsequently, the qualitative data obtained from the Max Kyoda software was analyzed using the meta-composition method, taking into account the content of the interviews conducted. After verifying the results, the research findings were presented in the form of tables, graphs, and outputs generated by Max Kyoda.

Table 3 The first step of hybridization

Indicators	Research questions	Response
what?	What are the factors affecting Islamic architecture?	Identifying factors through research background
who? (Study area)	What is the study area to achieve these factors?	Browsing databases and citation scientific journals of recent years
When? (Time limit)	What period of time were theoretical sources reviewed and searched?	Using secondary data such as interviews
How? (methods of data collection)	How were the research data collected?	

In order to address the research questions, the initial phase involves providing the demographic and descriptive details of the twelve experts who participated in the interview, which is presented in Table 3.

Table 4 Descriptive statistics of interview participants

Variable	Class	Frequency	Frequency percentage
Scale	International	0	0
	National	1	8.3
	Regional	7	58.3
	Local	4	33.3
Field of Study	Architecture	4	33.3
	Urban Design	7	58.3
	Geography	1	8.3
Academic degree	Ph.D.	12	100
Experience	10 – 15 years	2	41.7
	5-10 years	7	41.7
	Less than 10 years	3	16.7
Occupation	University Professor	4	33.3
	Expert	1	8.3
	Counselor	4	33.3
	Design and Execution	2	16.7
	Manager	1	8.3

It is important to note, based on the interviews conducted, and shown in Table 4 and Fig 3, all the participants have obtained a doctorate degree due to the intricate and specialized nature of the subject matter. The majority of them, accounting for 58%, have specialized in urban planning, while 34% have focused on architecture, and the remaining 8% have studied geography. In terms of occupation, the highest percentage, 34%, belongs to university professors in this field, followed closely by consultants at 33%. Design and execution professionals comprise 17% of the participants, while experts and manager make up 8%. The interviewees' professional experience is most commonly within the range of 5-10 years, with 58% reporting this duration. Furthermore, the

majority of their work within this field revolves around regional affairs, constituting 59% of their activities.

Continuing with this topic, it is important to note that the components of these studies can be categorized into seven dimensions - Identity, Social, Functional, Cultural, Environmental, Aesthetic, and Physical. Max Kyuda divided these dimensions into subsets through inductive coding, as shown in Fig 4. These categories specifically address the overlapping aspects of Islamic architecture and environmental perception. Thus, it can be inferred that enhancing the organization, energy, and comprehensibility of architectural design, as well as incorporating key elements of Islamic architecture in contemporary cities, is a significant focal point for architects and urban planners.

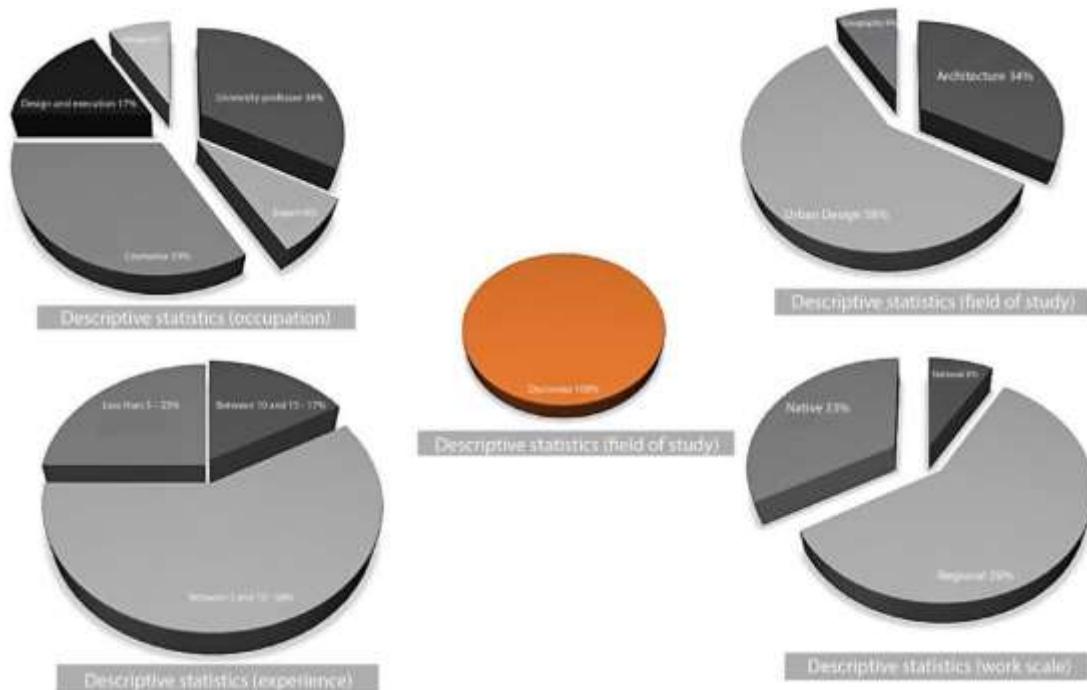


Fig 3 Descriptive statistics of the interviewees (Source: Author, 2023)

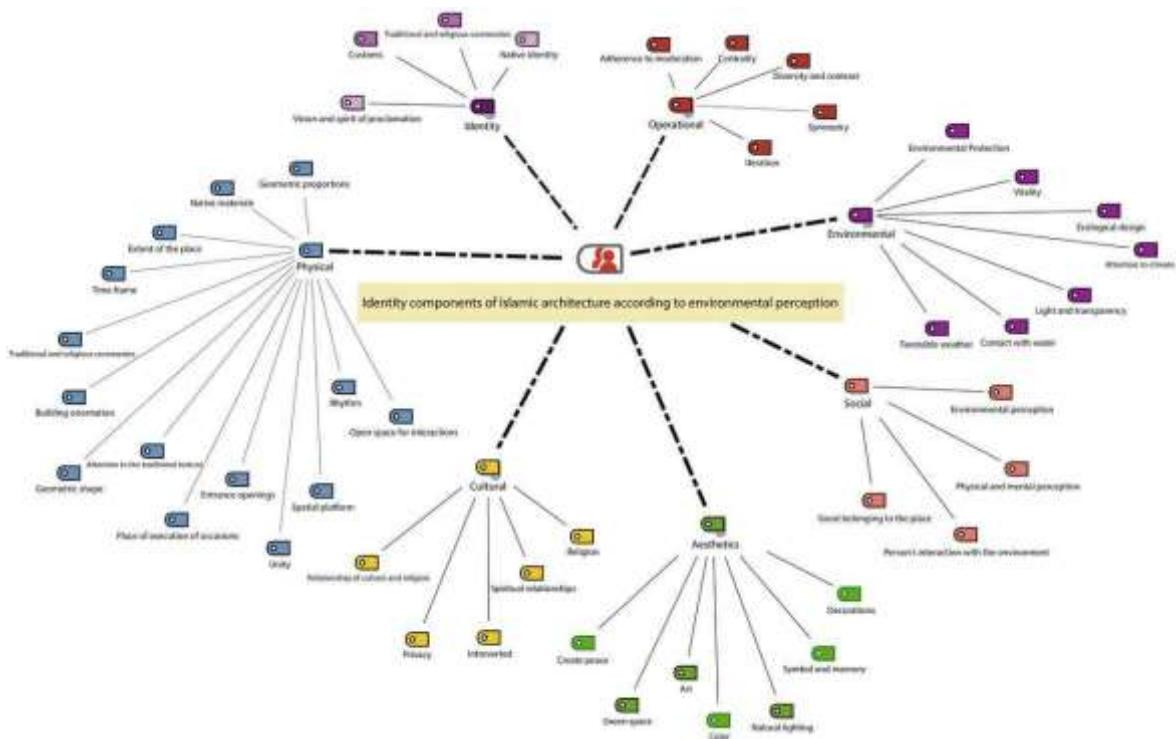
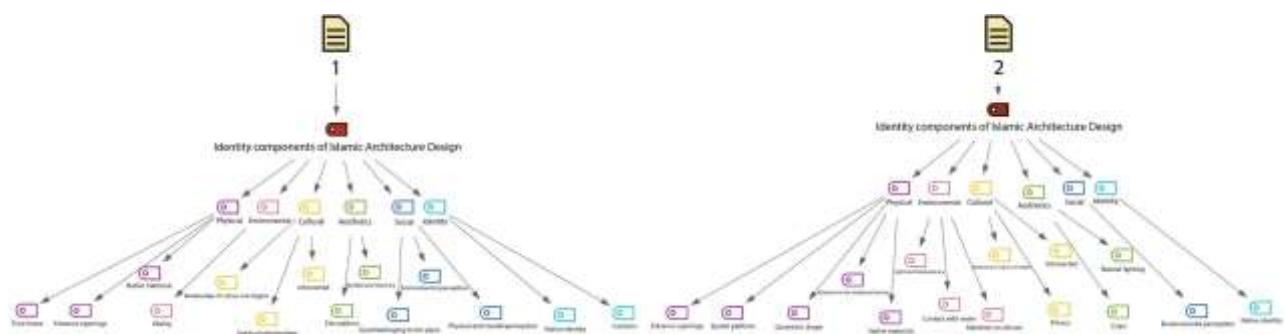
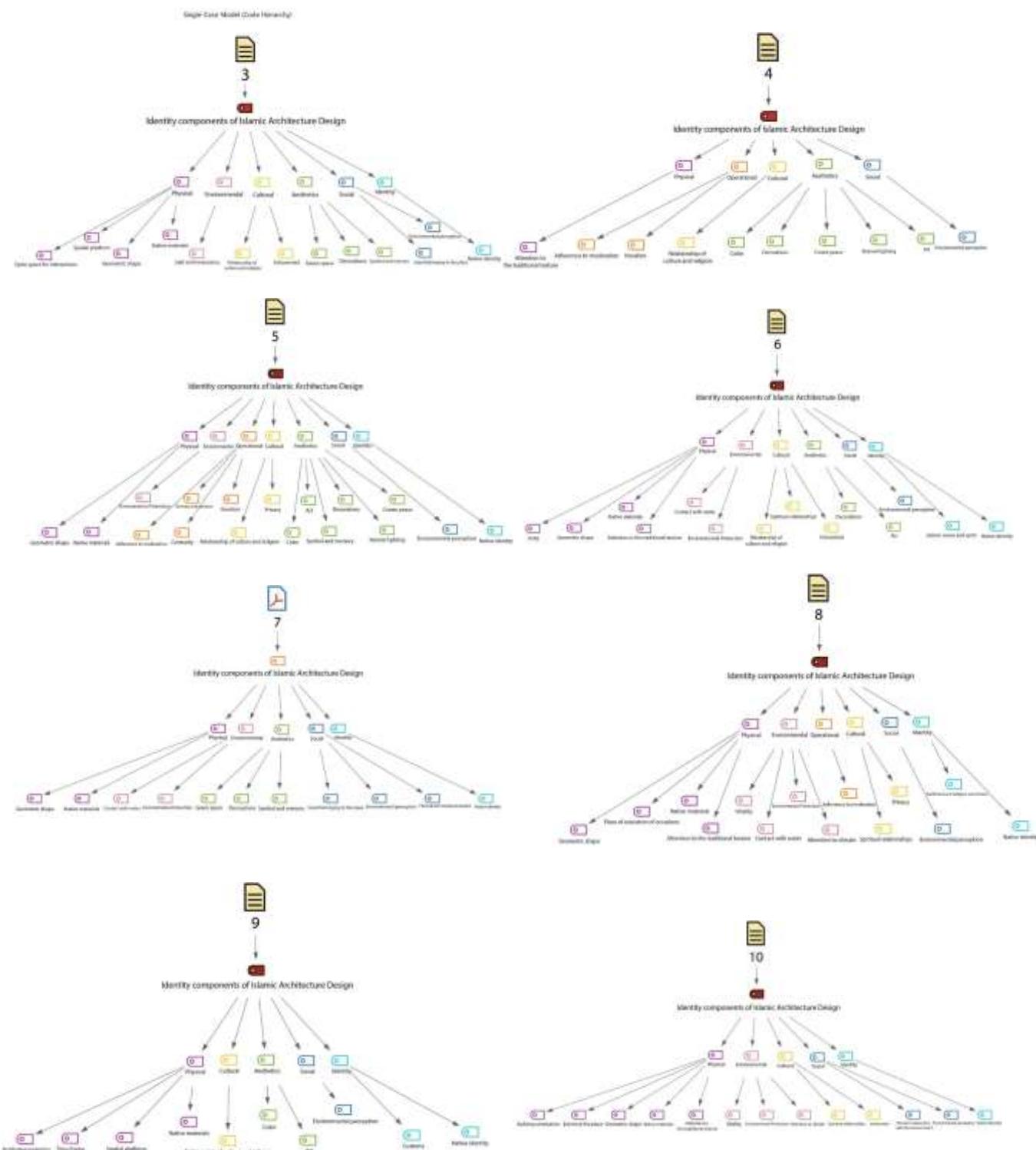


Fig 4 Identity-giving components of Islamic architecture in relation to environmental perception (Source: Author, 2023)

4. Findings

At the start of the research method, the interview analysis for this study, conducted with a group of 12 individuals including experts in this particular field, utilized open coding with Max Kyoda software. It should be emphasized that the qualitative components extracted from the software's results were categorized into seven main dimensions: identity, social, functional, cultural, cognitive aesthetics, environmental, and physical. This categorization was performed individually for each interview, as depicted in Fig 5.





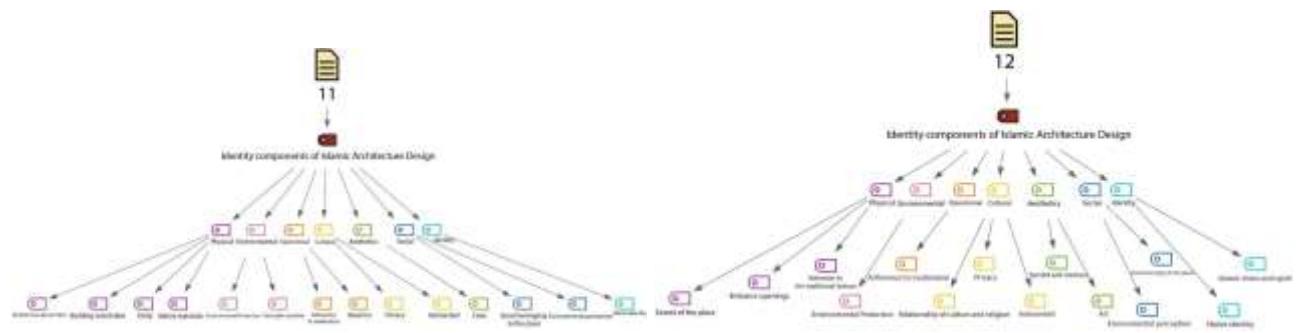


Fig 5 Coding of the conducted interviews (Source: Author, 2023)

5. Dimension of Identity

According to the review of conducted studies and research findings presented in Fig 6 of the Max Kyuda software, perception can be defined as a process wherein sensory information is initially received from the surroundings and subsequently interpreted and influenced by various factors like culture, experience, and context. Perception also encompasses an individual's collection of experiences, emotions, and attitudes towards their environment, and these elements contribute to one's understanding and interpretation of the surrounding environment. Additionally, the architectural design of a space and our perception of it can significantly impact its identity, allowing the designer to establish a distinctive identity by taking into account the audience's perception. Hence, it can be inferred that the perception of the environment can have a significant impact on the establishment of architectural identity. For instance, elements like the shape, color, and texture of a building can influence how it is perceived by the viewers. Conversely, identity is shaped by a multitude of factors including culture, religion, language, and history, and assigning an identity to an architectural creation necessitates considering the audience's perception of that creation. Furthermore, identity is the means by which we define ourselves and our position in the world, and therefore, the architect must possess the ability to instill a distinctive identity through visual, spatial, physical elements, etc. Architecture encompasses the specific and distinct attributes of an architectural creation that sets it apart from others. In addition, individuals tend to develop their Islamic identity by interpreting their own religious convictions and observances. It is crucial to recognize that Islamic identity is a complex notion that impacts various aspects of life such as religion, culture, and society. Consequently, perception plays a significant role in shaping this identity, as it relies on an individual's comprehension and encounters with Islamic teachings. Therefore, people's understanding of their cultural heritage, social interactions, economic conditions, and personal encounters profoundly influence how they perceive and identify with Islam. In contrast, the association between the Islamic viewpoint and ethos and the understanding of the environment is fostered by promoting the indigenous identity, thus motivating individuals to adopt a responsible stance in order to achieve harmony and equilibrium with the natural environment. Consequently, comprehending the connection between environmental perception and local identity becomes crucial and essential. Efforts should be made to establish environments that uphold and reinforce the feeling of cultural identity. These endeavors involve conserving natural landscapes, preserving cultural and traditional symbols, advocating for customs, supporting cultural institutions, and establishing spaces that enhance the connection and sense of belonging to the original culture of a particular area. In conclusion, it is important to note that physical and mental perception pertains to an individual's sensory and cognitive encounter with the constructed

surroundings, while native identity is connected to a person's feeling of being part of a particular cultural or ethnic group or significant location.

5.1. Social Dimension

The close connection between environmental perception and feeling of belonging to a place lies in the fact that people's perception of their surroundings can significantly impact their attachment to a specific location or community. Moreover, for numerous individuals, their sense of belonging to a place is deeply influenced by their historical and religious cultural connections. Therefore, depending on individuals' perception of the natural and constructed environment, environmental perception can either strengthen or undermine this sense of belonging. The experience is distinct. As an illustration, individuals who view their surroundings as aesthetically pleasing, distinct, or exceptional possess a heightened sense of connection to that location. Conversely, those who view their surroundings as mundane, ordinary, or tainted by negative energies might experience a lesser sense of belonging to that environment. Overall, the correlation between one's perception of their environment and their feeling of attachment to a place is complex, influenced by various cultural, social, and personal factors. Furthermore, this element possesses the potential to significantly influence an individual's interaction with their surroundings and exert significant effects on human behavior. In general, the perception of the environment plays a crucial role in shaping human encounters and actions within the physical and social realm. Therefore, comprehending the various factors that impact environmental perception holds significance in order to construct environments that foster human well-being and sustainability. Conversely, environmental perception can also impact an individual's engagement and involvement within a specific location or society. People who experience a sense of belonging to their surroundings are more likely to engage in social events and activities. Conversely, individuals who have a hostile attitude towards their environment are less inclined to participate socially. Additionally, environmental perception can influence how individuals perceive their own role and can impact the formation and preservation of the environment. It is important to note that environmental perception is closely intertwined with the physical and psychological perception of humans. This implies that environmental perception can also impact physical and mental well-being. For instance, exposure to natural environments like forests or environments with historical significance such as traditional architectural homes have been associated with various benefits for physical and mental health. These benefits include reduced stress, improved mood, and increased physical activity.

5.2. Functional Dimension

The importance of the environment and introversion in architecture can also impact the way society and culture perceive the surroundings. Architectural designs that incorporate natural elements and establish a harmonious relationship with the environment can contribute to enhancing the cultural and social significance of nature. Consequently, this can shape people's perception of and appreciation for the natural world and encourage more respectful and sustainable behaviors and attitudes. Islamic architecture has the ability to generate a feeling of unity, equilibrium, and organization within a given space, impacting both the physical and psychological state of an individual. By employing techniques such as manipulating light and shadow, Islamic architecture enhances the perception of depth and spatial dimensions, ultimately resulting in a harmonious and symmetric architectural style. In contrast, repetition plays a significant role in Islamic architecture by establishing a feeling of rhythm and balance in the surroundings. Simultaneously, it serves as a

representation of cultural, local, and religious values. Islamic architecture notably utilizes geometric patterns and calligraphy to accomplish the repetition of these elements. These patterns and designs are often repeated in various sizes and arrangements, contributing to a sense of cohesion and harmony within the environment. Consequently, the repetitive motifs can foster a connection with Islamic cultural and historical values, exemplifying the Islamic emphasis on culture and religion.

5.3. Cultural Dimension

There are several factors that affect how people perceive the environment, including sensory experiences, cultural background, personal preferences, past experiences, and religious beliefs. By analyzing the cultural and religious aspects, it can be inferred that both play a significant role in shaping environmental perception. For instance, cultural and religious practices highlight the significance of environmental preservation, and these values can in turn impact the way individuals interpret and value their natural surroundings. In the realm of architecture, environmental perception plays a significant role in the manifestation and presentation of culture and religion. This implies that an individual, based on their understanding and awareness of the environment, incorporates various concepts such as self-awareness, culture, history, religion, and theology, and utilizes them to express their architectural style, specifically Islamic architecture. However, the connection between culture, religion, environmental perception, and introversion is influenced by a wide array of cultural and social factors. Visual arts within architecture serve as powerful instruments that contribute to comprehending non-verbal communication and act as a representation of culture and religion. Moreover, they possess the ability to convey and convey values, beliefs, and cultural and religious identity effectively. Architecture is employed in various cultures and religions to convey their unique cultural, native and religious identity. These structures frequently incorporate elements like tranquil areas, organic materials, and gentle illumination, establishing an environment conducive to reflection and rest.

5.4. Aesthetic Dimension

After analyzing the correlation between the perception of the environment and its aesthetic components, it can be deduced that these two aspects are intertwined and connected to how individuals encounter and comprehend their surroundings. The perception of the environment entails the manner in which individuals observe and interpret it, encompassing not only a utilitarian function but also an aesthetic dimension that allows us to gather and structure information from our surroundings, granting significance to it. Moreover, beauty plays a crucial role in assigning significance to our mental experiences, triggering attraction and emotional responses towards a particular environment. Additionally, within the realm of environmental perception lies the assessment and comprehension of the visual, auditory, and tangible characteristics of a given space. It is worth noting that aesthetic experiences can greatly differ among individuals due to their personal inclinations, cultural backgrounds, and religious beliefs. Different individuals may have varying preferences when it comes to finding certain landscapes, architectural styles, or urban environments visually appealing.

The aesthetics of an environment can be impacted by various elements, including color, shape, symmetry, texture, harmony, balance, and overall arrangement. Many of these elements are related to its physical dimensions, suggesting that aesthetic and physical aspects mutually affect each other. The well-being, visual comfort, mood, and behavior of individuals can be significantly influenced by the aesthetic aspects of an environment. Furthermore, in a specific society or region, cultural and

social factors and dimensions might also contribute to the development of aesthetic standards and values. By examining the intricate connection between artistic elements and environmental perception, one can ascertain that environmental perception greatly affects people's perception and interpretation of different aspects of architecture, including aesthetics. Additionally, environmental perception encompasses our comprehension of spatial relationships, scale, and proportions within a given environment. It is important to note that environmental perception and aesthetic dimensions are highly subjective and can vary from person to person.

5.5. Environmental Dimension

It is worth noting that the way humans perceive and experience the environments they live in is greatly influenced by those environments. The physical aspects of the environment, such as its natural elements, climate, buildings, and infrastructure, play a role in shaping our sensory and mental experiences. Additionally, the environment provides cues and stimuli that our senses receive, influencing our perception and understanding of our surroundings. However, it is important to acknowledge that each individual's unique perceptual filters and cognitive processes also play a role in how they perceive and interpret the environment. Individuals have subjective opinions and differing perspectives on the environment. Consequently, their environmental perception plays a crucial role in influencing their actions and conduct. As people comprehend and interpret their surroundings, they make decisions and behave accordingly. For instance, upon observing a bustling and cacophonous street, some might opt to stroll along a peaceful side street. Evidently, our comprehension of the environment directs our interactions and ability to adapt to it. Hence, if an individual actively educates themselves and comprehends the historical and cultural value of an urban setting, they can enhance their understanding and connection to that place while also diligently preserving the environment. In many traditional architectural styles, there is a belief that the built environment is connected to nature, and therefore buildings and structures should be designed in a way that complements the surroundings, utilizes local materials, and incorporates the landscape into the design. This approach gives a sense of liveliness and energy to the built environment, fostering a connection with nature and promoting a feeling of well-being and tranquility. Similarly, Islamic architecture embraces both internal and external spaces, utilizing natural light, water, and vegetation to create a beautiful, spiritual, and dynamic environment that upholds cultural, religious, and traditional values. Additionally, the design of buildings is influenced by the surrounding landscape, often leading to constructions on hillsides or the positioning of structures to maximize natural light and ventilation, thus creating a vibrant atmosphere.

5.6. Physical Dimension

Architecture is utilized across various cultures and religions as a method to convey cultural, ancestral, and religious identity. Similarly, in diverse indigenous cultures, architecture signifies the social, cultural, economic, and religious aspects of a specific community. Hence, when geometric elements are integrated into Islamic architecture, they generate spaces that promote positive and harmonious human interaction, ultimately enhancing individuals' perception of their surroundings. Additionally, the use of Islamic art, geometric patterns, and calligraphy in Islamic architecture fosters a profound connection with Islamic culture and tradition. Consequently, the pace of life slows down, enabling individuals to appreciate and embrace their surroundings more deeply. The utilization of geometric forms like circles, squares, and triangles reflects the Islamic emphasis on

mathematics, astronomy, and science. Incorporating these shapes in the architectural landscape can establish a feeling of equilibrium and symmetry. Moreover, employing these shapes can foster a sense of affiliation with Islamic societies' cultural heritage and reinforce their religious identity. Traditional designs in buildings and structures, as well as tall houses, often incorporate geometric shapes like triangles, circles, and squares in native architecture. These shapes reflect the natives' emphasis on the surrounding natural world and can convey a strong connection to traditional cultural values and beliefs. It is important to consider that geometric shapes, such as triangles, squares, and rectangles, are frequently employed in the design of pyramids, temples, and other architectural structures. Hence, geometric forms take on the role of representing and symbolizing Islamic principles and convictions. On the contrary, in architecture, the perception of the environment plays a vital part in conveying culture and religion. This implies that individuals, based on their comprehension and awareness of the surroundings, develop diverse concepts encompassing self-awareness, culture, history, and religion, which they then express through architectural forms. In indigenous societies, architecture often incorporates natural materials like wood and stone as well as designs featuring houses adorned with plants, symbolizing the connection between humanity and the environment. However, culture and religion can have a significant influence on the design and purpose of architectural features. In Islamic architecture, for instance, geometric shapes like circles, squares, and triangles are used in prayer rooms, schools, gardens, and stairs. These shapes serve as symbolic representations of Islamic values and beliefs. Additionally, the design of buildings can also shape individuals' perceptions and interactions with the environment, thereby exerting a profound impact. Similarly, incorporating organic materials and shapes into Islamic architecture can establish a feeling of alignment with the natural world, fostering a stronger bond with Islamic ideologies and beliefs. Alternatively, the embellishments and construction materials employed in Islamic architecture bear great influence in shaping an individual's sense of legibility, belonging, and ease, and furthermore, employing natural and native materials also carries significant advantages in terms of environmental preservation. In summary, by integrating cultural and natural aspects into the surrounding environment and elements of Islamic architecture, the sense of connection with cultural heritage and the natural realm can be enhanced.

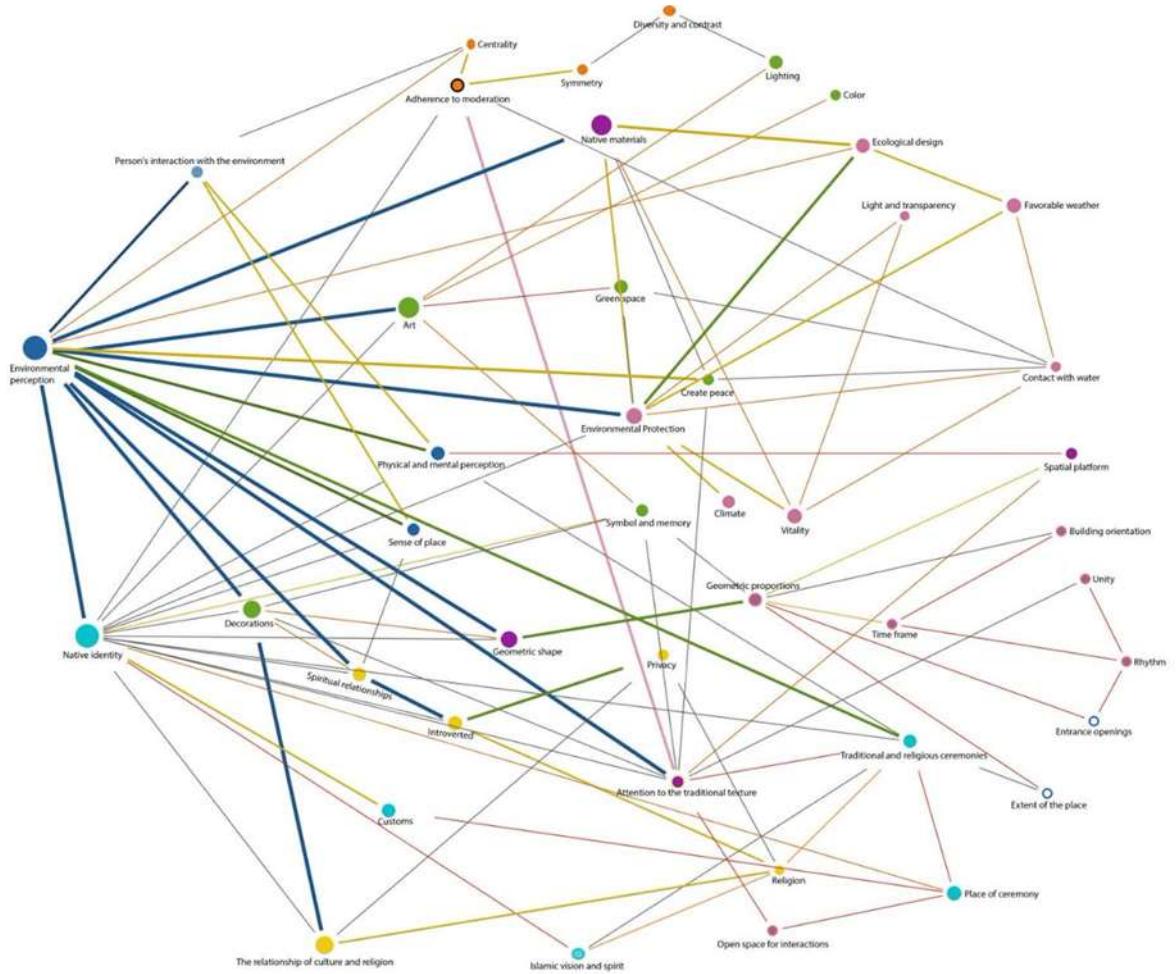


Fig 6 Relationship between the relevant codes in the Max Kyoda software (Source: Author, 2023)

6. Discussion

The main objective of this research is to elucidate the elements of Islamic architecture that contribute to its identity in relation to environmental perception, using the meta-composite approach. The findings demonstrate that the various factors that define Islamic architecture have a significant impact on environmental perception. Therefore, there exists a profound and meaningful connection between the components of Islamic architecture, environmental perception, and identity. Islamic architecture, being a prominent form of architecture worldwide, has evolved over time due to varying circumstances. Consequently, to fully comprehend the diverse concepts of Islamic architecture, it is essential to consult a wide range of sources and possess a comprehensive understanding and accurate interpretation of the cultural and historical aspects associated with this architecture. Additionally, it is important to consider the regional and cultural variations that may lead to different definitions and interpretations of Islamic architecture. In order to enhance the relationship between Islamic architecture, identity, and environmental perception, it is crucial to emphasize the incorporation of Islamic principles and values in architectural practices. Space is a crucial aspect in this kind of architectural style, serving as a prominent design element that

establishes a connection between people and the surrounding environment. This type of architecture encompasses principles like monotheism, justice, privacy, modesty, and social unity, while also incorporating geometric patterns commonly found in temples, mosques, and palaces. Additionally, it involves the usage of elements such as tiling, wall paintings, and brickwork. Applying these models and comprehending these principles and values enable us to execute projects that align with the religious tenets of Islam and express Islamic heritage and ecological consciousness. Through analyzing the findings of this current research in relation to previous studies, it can be deduced that there is a scarcity of available sources regarding Islamic architecture, and furthermore, the shared characteristics of Islamic architecture, architectural identity, and perception have seldom been explored or examined. Consequently, there exists a pronounced deficiency of resources in these particular domains. According to this study, various research projects, including the investigation carried out by Dib et al. (2022), have thoroughly explored the structure, elements, life cycle, and workflow, as well as the solutions facilitating decentralized identity, based on the ten principles of identity. These matters are thoroughly examined, assessed, and compared. In conclusion, the obstacles impeding the transition to a completely decentralized identity model are addressed. Conversely, in a study conducted by Zhang et al. (2018), an image of a street view is utilized to anticipate human perception. Their model demonstrated remarkable precision in forecasting six perceptual factors of individuals, namely safety, vibrancy, attractiveness, prosperity, despondency, and monotony. This model can aid in charting the dispersion of human perception within a city's boundaries, facilitating the development of architectural design principles for newly developed urban areas.

7. Suggestion

It should be emphasized that there are numerous engaging and critical matters within the domains of perception and identity in Islamic architecture that have been overlooked and understudied. Several of these intriguing subjects, which are unfamiliar and distant from the original contexts of constructed cities, are listed below:

- Many studies in the field of Islamic architecture still face challenges and lack coherence when it comes to incorporating climatic considerations and native materials, thereby necessitating a study on the adaptation of standard architectural design principles in this context.
- The study focuses on examining the significance of geometric patterns and Islamic ornaments in how people perceive visuals, as well as exploring how they contribute to the concept of spatial awareness in Islamic architecture. This research is crucial for fostering a sense of connection and attachment to a particular location.
- Exploring the impact of lighting in mosques and Islamic structures on the mental well-being of individuals attending, this field offers intriguing psychological aspects for study.
- Delving into the research and examination of traditional houses found in Islamic cities and analyzing the utilization of both private and public areas within these houses, enhances architectural design to produce homes with a comprehensive design in contemporary times.
- The authors are encouraged to carry out interdisciplinary and comparative research to explore the difficulties faced by modern and postmodern architecture in urban areas, and to propose effective solutions to overcome these challenges in architecture and urban planning.
- A thorough examination of natural elements in how people perceive spiritual significance in specific locations, leading to enhancing the quality of human-body communication. This interdisciplinary approach is an ideal method to evaluate this particular domain.

8. Conclusion

In previous studies, it is important to highlight that the concept and elements of Islamic architecture's identity were examined independently from the components of human perception. However, the correlation between these two domains has not received adequate attention from researchers. By analyzing the spaces within Islamic architecture, it becomes feasible to explore the connection between individuals and their surroundings, as well as the impact it has on urban identity. Additionally, this can foster an enhanced relationship between Islamic architecture and environmental perception. Hence, Islamic architecture has developed in response to environmental perceptions, requirements, and symbolic significance. This leads to a design that suits the climate and provides a distinct symbolical and space-focused design within the cultural and geographical setting. In conclusion, it is important for the government and citizens to safeguard the significant symbolic and spiritual value of the elements and components of Islamic architecture. The examination of the sources and interviews conducted indicated that there is ample opportunity for the resurgence and reintroduction of these aspects considering current architectural trends. Components of Islamic architecture, including mosque architecture and traditional houses, can serve not only functional purposes but also as integral elements representing the identity of an Islamic city. Moreover, they can act as climate regulators embodying wisdom and connecting the past with the present. Conversely, it can be inferred that environmental perception shares a strong correlation with architectural identity and Islamic architecture.

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