The Impact of Modern Buildings

on Traditional Urban Environments

and Urban Identity

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تأثير المباني الحديثة
على البيئات العمرانية التقليدية والهوية الحضرية

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Abstract

Contemporary cities face significant challenges in integrating modern buildings into traditional urban environments while preserving urban identity. This study focuses on the relationship between modern architecture and urban heritage. The research problem revolves around how modern buildings affect urban identity in traditional areas, and whether they can interact positively with the urban context without distorting its traditional character.

The study aims to analyze this impact by examining a range of global examples using architectural indicators such as visual integration, spatial integration, material harmony, urban scale, accessibility, and environmental impact. A three-point scale (weak, partial, excellent) was applied to assess each indicator, and correlation analysis was used to examine the relationships between these various indicators.

The results revealed a strong correlation between visual integration and material harmony, indicating that buildings with better visual integration with the traditional environment often use materials that align with the traditional context. Additionally, there was a strong relationship between spatial integration and urban scale, meaning that buildings with good spatial integration are generally compatible in terms of volume and height with neighboring traditional structures. However, the study found a weak relationship between accessibility and environmental impact, suggesting that the ease of access to buildings does not necessarily correlate with their environmental sustainability.

The study concludes that modern buildings face significant challenges in balancing innovation and respecting traditional urban identity, with a need to enhance environmental sustainability for a more positive long-term impact.

Keywords: Modern buildings, Traditional urban environments, Urban identity, Visual integration, Spatial integration, Material harmony, Environmental impact.

المستخلص

تواجه المدن المعاصرة تحديًا كبيرًا في دمج المباني الحديثة ضمن البيئات العمرانية التقليدية مع الحفاظ على الهوية الحضرية. تشكل هذه العلاقة بين العمارة الحديثة والتراث العمراني محور الاهتمام في هذا البحث. تتمحور مشكلة البحث حول كيفية تأثير الأبنية الحديثة على الهوية الحضرية في المناطق التقليدية، وما إذا كانت قادرة على التفاعل بشكل إيجابي مع السياق الحضري دون تشويه طابعه التقليدي.

تهدف الدراسة إلى تحليل هذا التأثير من خلال دراسة مجموعة من الأمثلة العالمية باستخدام مجموعة من المؤشرات المعمارية مثل التكامل البصري، التكامل المكاني، الانسجام المادي، النطاق الحضري، الوصولية، والتأثير البيئي. تم تطبيق المقياس الثلاثي (ضعيف، جزئي، ممتاز) لتقييم كل مؤشر، مع استخدام معامل الارتباط لتحليل العلاقات المتبادلة بين المؤشرات المختلفة.

أظهرت النتائج أن هناك ارتباطًا قويًا بين التكامل البصري والانسجام المادي، مما يعني أن المباني التي تتمتع بتكامل بصري أفضل مع البيئة التقليدية غالبًا ما تستخدم مواد تتناسب مع السياق التقليدي. كما تبين وجود علاقة قوية بين التكامل المكاني والنطاق الحضري، حيث كانت المباني التي تتميز بتكامل مكاني جيد متوافقة حجميًا وارتفاعيًا مع المباني التقليدية المجاورة. ومع ذلك، كشفت الدراسة عن علاقة ضعيفة بين الوصولية والتأثير البيئي، مما يعني أن كفاءة الوصول إلى المباني لا ترتبط بمستوى الاستدامة البيئية. خلص البحث إلى أن المباني الحديثة تواجه تحديات كبيرة في تحقيق توازن بين الابتكار واحترام الهوية الحضرية التقليدية، مع الحاجة إلى تعزيز الاستدامة البيئية لتحقيق تأثير إيجابي طويل الأمد.

الكلمات المفتاحية: المباني الحديثة، البيئات الحضرية التقليدية، الهوية الحضرية، التكامل البصري، التكامل المكاني، التناغم المادي و التأثيرالبيئي

1 - Introduction

The relationship between modern buildings and traditional urban environments is one of the most critical issues facing contemporary cities. With rapid urban expansion and the continuous rise of modern architecture, it has become essential to study how these buildings affect the traditional urban context and urban identity. Architecture plays a crucial role in shaping the cultural identity of communities, and therefore, the interaction between modern structures and traditional environments raises important questions about how these buildings can be integrated without distorting the original urban character. The main challenge in this context is achieving a balance between architectural innovation and respect for urban heritage. Modern buildings often aim to present bold, technologically advanced designs, but these can sometimes clash with the surrounding traditional context. Therefore, there is a growing need to use scientific criteria to measure the impact of these buildings on the surrounding environment in terms of aesthetics, spatial relationships, materials, and environmental factors. This study is based on an analysis of global examples of modern buildings integrated into traditional urban environments, using a set of architectural indicators developed to measure the various impacts of these buildings. These indicators include visual integration, which measures how well the modern building fits aesthetically with the traditional environment; spatial integration, which considers the building's effect on the flow of movement and use of public spaces; material harmony, assessing the compatibility of the materials used in the modern building with those in the surrounding traditional architecture; urban scale, examining how well the size and height of the modern building align with neighboring structures; accessibility, measuring how easily people can access

the building; and environmental impact, assessing the building's sustainability in terms of materials used and energy-efficient technologies. The study uses correlation analysis to understand the relationships between these indicators using the SPSS statistical program. By doing so, it aims to provide clear insights into how successful or unsuccessful modern buildings are in integrating with the traditional urban context. The findings of this study will contribute to a deeper understanding of how modern architecture affects urban identity in traditional environments, paving the way for developing design strategies that balance innovation with respect for urban heritage.

2-Theoretical Framework: Key Axes of the Study

2-1 Modern Architecture and its Impact on Urban Identity

Modern architecture plays a crucial role in shaping the urban identity of contemporary cities, especially in areas with a strong traditional architectural heritage. Modern buildings often feature materials and designs like glass and steel, which raise questions about how these contemporary structures affect the traditional urban identity. Achieving a balance between innovation and respecting architectural heritage requires special attention from architects and urban planners (Frampton, 2015). Research shows that innovations that consider traditional elements, such as using local materials, significantly contribute to enhancing local identity, while neglecting these aspects creates a visual and cultural disconnect between residents and their surroundings (Curtis, 2017). Blending modernity and heritage is essential to ensure the continuation of cultural identity in traditional areas while simultaneously promoting urban development that aligns with current needs (Jones, 2020).

2-2 Visual Integration in Modern Buildings

Visual integration is a key element for the success of modern buildings in harmonizing with traditional environments. This concept focuses on how the modern building interacts with its urban surroundings in terms of form, color, and materials. Studies emphasize that a lack of visual coherence between modern and traditional buildings can deteriorate the overall visual identity of the city (Smith, 2018). Modern buildings need to use materials and colors that are consistent with the city's traditional character, ensuring successful visual integration (Jones, 2020). Buildings that achieve this integration help enhance the city's visual identity without negatively affecting its architectural heritage (Anderson, 2019). Therefore, visual integration becomes a powerful tool in maintaining balance between modern designs and historical architectural identity.

2-3 Spatial Integration and Interaction with the Urban Scale

Spatial integration refers to how well modern buildings blend with the natural flow of movement within public spaces and their surrounding environment. Buildings that achieve good spatial integration improve pedestrian experiences and facilitate movement between different city spaces (Roberts, 2021). Studies show that modern buildings that fail to achieve this integration create isolation or disrupt the flow of movement, which negatively affects social interaction and the use of public spaces (Hall, 2020). Conversely, buildings that respect urban flows contribute to improving accessibility and achieving spatial harmony that complements the traditional urban fabric, leading to effective spatial integration (Smith, 2019). This axis is crucial in determining how well a modern building integrates with a traditional environment without disrupting urban cohesion.

2-4 Environmental Sustainability and the Impact of Modern Buildings

With increasing awareness of environmental sustainability, it has become essential for modern buildings to adopt sustainable construction techniques and environmentally friendly materials. Environmental preservation is a core part of modern architectural design, especially in traditional environments that rely on natural building materials with lower energy consumption (Green, 2018). Research advocates for the use of techniques like solar energy, natural ventilation, and lighting systems, which help reduce environmental impact and achieve long-term sustainability (Miller, 2019). Cities that adopt such techniques in their modern buildings contribute to creating sustainable urban environments, enhancing their appeal while minimizing negative environmental effects on the surrounding areas (White, 2020).

2-5 Social Analysis and Interaction with the Traditional Environment

Modern architectural design has a direct influence on social behavior and interaction within public spaces, particularly in traditional environments. Researchers emphasize that buildings that consider the social context contribute to enhancing social interaction and the effective use of public spaces (Brown, 2021). Buildings that fail to achieve this alignment lead to feelings of isolation and a loss of belonging among local residents (Davis, 2020). On the other hand, buildings that incorporate open, flexible public spaces encourage community gatherings and interaction, thereby strengthening social relationships within the city (Roberts, 2019). Social interaction is one of the key factors that ensure the continued vitality of traditional environments.

2-6 Table of Indicators

Table 1 Provides a summary of the key architectural indicators derived from the theoretical framework, as prepared by the researchers.

Indicator	Description
Visual Integration	**This indicator measures how well a modern building aligns with the surrounding traditional urban environment in terms of form and materials. It focuses on the aesthetic harmony between the new design and the historical buildings around it.**
Spatial Integration	**This evaluates the impact of the modern building on the flow of movement and transportation in the surrounding area. It examines how the building design influences paths, movement, and transitions within the urban context.**
Material Compatibility	**Refers to the extent to which the materials used in the modern construction match those used in nearby traditional structures. It considers the harmony between the old and new materials, such as stone or glass.**
Urban Scale	**Focuses on the proportion of the modern building in relation to the surrounding traditional structures. It analyzes whether the new design fits the urban scale without overshadowing existing views and buildings.**
Accessibility	**Indicates how easy it is for visitors and residents to access the modern building. This includes analyzing transportation methods, available routes, and the convenience of reaching the site from main city areas.**
Environmental Impact	**This indicator assesses the building's effect on the surrounding environment in terms of sustainable materials used and energy efficiency. It examines how well the design minimizes the consumption of natural resources and energy.**

3- Case Study

This practical study aims to analyze selected examples of modern buildings integrated into traditional urban environments. The focus will be on specific architectural indicators such as **visual integration, spatial integration, material compatibility, urban scale, accessibility**, and environmental impact. These indicators will help assess how these modern structures affect their historical surroundings, measuring their harmony or contrast with the cultural and spatial identity of the cities they inhabit.

The study analyzes five key examples, such as **the Louvre Pyramid** in Paris and **The Shard** skyscraper in London. For each, the indicators will be applied to measure aspects of design and interaction with the surrounding environment. Additionally, correlation analysis will be used to understand the relationships between these indicators and how they influence each other. The ultimate goal is to arrive at precise conclusions about the impact of modern architecture on traditional cities and whether these structures enhance or clash with the identity of the space.

The results will offer fresh insights into how modern design can succeed or fail in traditional urban contexts, contributing to a balanced dialogue between modernization and cultural preservation.

3-1 The Louvre Pyramid (Paris, France)

- **Visual Integration**: The Louvre Pyramid presents a striking contrast with the traditional stone buildings that surround it, featuring a sleek, glass design. Despite this stark difference, the pyramid adds a contemporary aesthetic that does not overshadow the historical significance of the area, achieving a "partial" visual

integration. The pyramid stands as an independent modern element, while enhancing the overall visibility of the Louvre museum (Frampton, 1985).

- **Spatial Integration**: The pyramid serves as a central, underground entrance, facilitating the flow of visitors into the museum and achieving "good" spatial integration. Its low-profile structure doesn't obstruct movement in the courtyard but enhances it, making it a flexible point of interaction within the urban space (Buchanan, 2010).

- **Material Compatibility**: The pyramid's use of glass and steel results in "partial" material harmony. While these modern materials differ from the limestone of the surrounding historical buildings, they create a distinct yet aesthetically intriguing juxtaposition (Buchanan, 2010).

- **Urban Scale**: In terms of height and mass, the pyramid does not dominate its surroundings, making it perfectly aligned with the urban scale of the historic area. Its low design allows the older structures to remain the visual focal points (Frampton, 1985).

- **Accessibility**: The Louvre Pyramid was designed as a new primary entrance, significantly enhancing ease of access to the museum. The accessibility is rated as "excellent," as the design promotes smooth circulation and interaction with both the museum and its outdoor spaces (Frampton, 1985).

- **Environmental Impact**: The pyramid's design incorporates natural lighting for the interior spaces, reducing energy consumption. However, it is rated as "partially sustainable" due to the use of non-eco-friendly materials like glass and steel (Buchanan, 2010). Figure 1
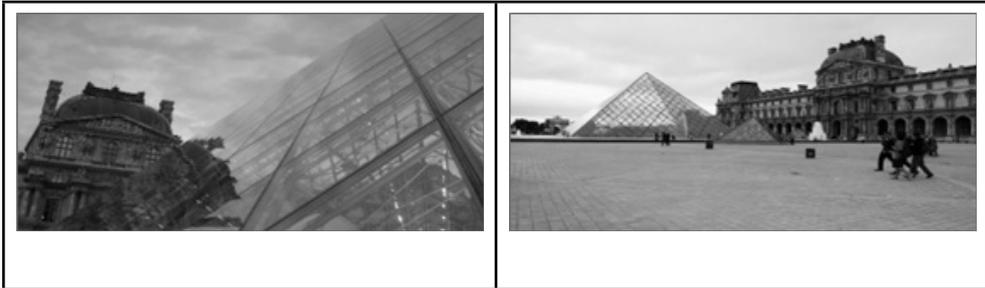
Figure. 1. The Louvre Pyramid (Paris, France)
https://www.archdaily.com/88705/ad-classics-le-grande-louvre-i-m-pei

3-2 The Shard (London, United Kingdom)

- **Visual Integration**: The Shard's towering glass façade and contemporary design starkly contrast with the historical buildings that surround it. This significant difference makes it visually "disconnected" from its traditional surroundings. The modern architecture of The Shard dominates the skyline rather than blending with the surrounding structures (Sudjic, 2006).

- **Spatial Integration**: The Shard's location near London Bridge station enhances the flow of people in and out of the area, making it an important part of the city's transport network. However, it doesn't fully integrate with the traditional spatial network around it, thus being spatially "partially integrated" (McNeill, 2009).

- **Material Harmony**: The use of glass and steel in The Shard's construction stands in stark contrast to the brick and stone used in neighboring historical buildings, creating a "weak" material harmony (Sudjic, 2006).

- **Urban Scale**: Due to its significant height, The Shard dwarfs the surrounding traditional buildings, making it "inconsistent" with the local urban scale (McNeill, 2009).

- **Accessibility**: Despite its visual disconnect, The Shard benefits from excellent accessibility thanks to its prime location near London Bridge Station, earning it a high rating for ease of access (Sudjic, 2006).

- **Environmental Impact**: The Shard incorporates modern energy-efficient technologies such as double glazing to enhance natural lighting and reduce energy consumption, giving it a "partial sustainability" rating (McNeill, 2009) Figure 2.

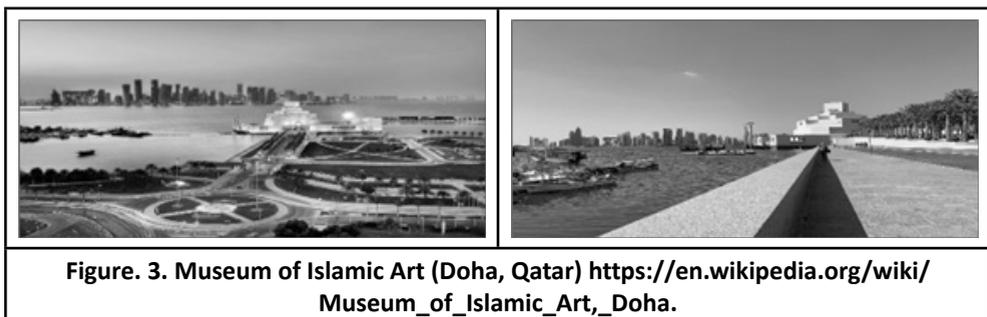**Figure. 2. The Shard (London, United Kingdom)**
https://en.wikipedia.org/wiki/The_Shard

3-3 Museum of Islamic Art (Doha, Qatar)

- **Visual Integration**: The Museum of Islamic Art achieves an ideal balance between modern architecture and traditional Islamic elements, earning it a "fully integrated" rating for visual harmony. The design successfully blends Islamic motifs and modern geometric simplicity, making it harmonize beautifully with its surrounding environment (Holod, 1995).

- **Spatial Integration**: The museum's central location on the Doha Corniche enhances the flow of movement, as it is carefully designed to direct visitors effortlessly towards the museum. Its prime location makes it "excellent" in terms of spatial integration (Craig, 2012).

- **Material Harmony**: The use of materials like limestone aligns perfectly with the surrounding traditional environment, giving the museum an "excellent" rating for material harmony with the local context (Holod, 1995).

- **Urban Scale**: The museum's size and scale are perfectly proportioned to fit with the surrounding buildings and natural landscapes, making it "fully in scale" with the urban context (Craig, 2012).

- **Accessibility**: With its ideal location and thoughtful design, the museum offers high accessibility for tourists and local visitors alike, contributing to its "excellent" rating for accessibility (Holod, 1995).

- **Environmental Impact**: The museum incorporates sustainable techniques, such as maximizing natural light and using environmentally friendly building materials, leading to a rating of "fully sustainable" in terms of environmental impact (Craig, 2012). Figure 3

Figure. 3. Museum of Islamic Art (Doha, Qatar) https://en.wikipedia.org/wiki/ Museum_of_Islamic_Art,_Doha.

3-4 MAXXI Museum (Rome, Italy)

- **Visual Integration**: Designed by Zaha Hadid in 2010, the MAXXI Museum features bold curves and a daring design that stands in contrast to the traditional Roman fabric. In terms of visual integration, it is rated "partially integrated," as it introduces a modern artistic element that enhances contemporary design without heavily clashing with the traditional surroundings (Betsky, 2013).

- **Spatial Integration**: The building's design supports the flow of movement around the museum, with wide corridors and interactive spaces. Its spatial integration is rated as "good," as its architectural layout effectively guides visitors through both the indoor and outdoor cultural areas (Schumacher, 2011).

- **Material Harmony**: The use of glass and concrete contrasts sharply with the traditional Roman materials of stone and brick, resulting in a "partially integrated" rating for material harmony. While the modern materials create a striking difference, they offer a unique juxtaposition to the historic environment (Betsky, 2013).

- **Urban Scale**: The building remains proportionate to its urban surroundings in terms of height and size, but its external shape stands out, earning it a "partially in scale" rating with the urban context (Schumacher, 2011).

- **Accessibility**: The museum benefits from excellent accessibility due to its proximity to various forms of public transportation in Rome, giving it a "good" rating for accessibility (Betsky, 2013).

- **Environmental Impact**: MAXXI employs modern technologies aimed at reducing energy consumption and promoting sustainability. Therefore, its environmental impact is evaluated as "partially sustainable" (Schumacher, 2011). Figure 4

Figure. 4. MAXXI Museum (Rome, Italy)
https://en.wikipedia.org/wiki/MAXXI

3-5 Apple Store (Milan, Italy)

- **Visual Integration**: The Apple Store, designed by Norman Foster in 2018, sits in Milan's Piazza Liberty. Its sleek glass design creates a visual balance between modernity and the historical buildings surrounding the square, earning it a rating of "partially integrated" in terms of visual harmony. The store's minimalist aesthetic blends with, but does not fully match, the surrounding architecture (Lipman, 2020).

- **Spatial Integration**: The store's design enhances the flow of movement smoothly within the historic square, guiding visitors seamlessly toward open spaces and entrances. Its spatial integration is rated "excellent" due to its ability to maximize the available space and improve navigation for the public (Norman Foster Foundation, 2019).

- **Material Harmony**: The use of glass in the store's design contrasts with the traditional stone used in surrounding buildings, resulting in a "partially integrated" rating for material harmony. The difference between materials creates a dynamic visual effect but also highlights a divide between modern and historic elements (Lipman, 2020).

- **Urban Scale**: The store's size and height are perfectly aligned with the traditional scale of the square, making it fully integrated into the urban context (Norman Foster Foundation, 2019).

- **Accessibility**: Centrally located in Milan, the store offers excellent accessibility to both locals and tourists, with multiple transportation options available, giving it a rating of "excellent" for accessibility (Lipman, 2020).

- **Environmental Impact**: The Apple Store incorporates sustainable technologies, such as double-glazed glass and natural lighting, earning it a "high" rating for environmental impact due to its energy-efficient design (Norman Foster Foundation, 2019). Figure 5

Figure. 5. Apple Store (Milan, Italy)
https://www.aureliotomasso.com/en/apple-store-milan/

4- Measurement Indicators

This practical study aims to evaluate the success of modern buildings integrated into traditional urban environments by applying six main architectural indicators: visual integration, spatial integration, material harmony, urban scale, accessibility, and environmental impact. The study selects five diverse global architectural examples and assesses their performance using a three-point scale (1-3), where:

- 3 represents "fully achieved,"
- 2 indicates "partially achieved,"
- 1 means "weakly achieved" or not achieved at all.

The goal is to analyze these buildings based on these architectural indicators to determine how modern architecture influences the cultural and urban identity of surrounding areas and provide insights on whether these buildings enhance or disrupt the traditional character of the cities. Table 2 illustrated the above three-point scale for the above five examples.

Table 2 Analysis of the five examples according to architectural indicators, using the three-point scale. as prepared by the researchers.

Example	Visual Integration	Spatial Integration	Material Harmony	Urban Scale	Accessibility	Environmental Impact
Louvre Pyramid (Paris, France)	2	3	2	3	3	2
The Shard (London, UK)	1	2	1	1	3	2
Islamic Art Museum (Doha, Qatar)	3	3	3	3	3	3
MAXXI Museum (Rome, Italy)	2	2	2	2	2	2
Apple Store (Milan, Italy)	2	3	2	3	3	3

5- Results of the Practical Study

The architectural indicators (visual integration, spatial integration, material harmony, urban scale, accessibility, and environmental impact) for modern buildings integrated into traditional urban environments were analyzed in Table 3 using the three-point scale. To statistically analyze the results, the data will be entered into SPSS. Means and standard deviations will be calculated for each indicator, providing an overview of how these buildings perform across each criterion.

Additionally, correlation analysis will be conducted to measure the relationship between the different indicators. This analysis aims to determine how each indicator influences the others and understand the interplay between these factors. The analysis will offer valuable insights into how modern architectural design affects the traditional urban context, helping to assess the extent to which these buildings integrate with their surroundings. These results will deepen the understanding of how modern architecture impacts the cultural and environmental identity of cities.

The same Table summarizes the performance of five modern buildings based on six architectural indicators. Each indicator's minimum, maximum, sum, mean, and standard deviation are provided to assess the extent to which these buildings achieve the desired integration with their traditional urban settings.

Table 3 Descriptive Statistics for architectural integration indicators in modern buildings within traditional urban environments. as prepared by the researchers.

Indicator	N	Minimum	Maximum	Sum	Mean	Std. Deviation
Visual Integration	5	1.00	3.00	10.00	2.0000	0.70711
Spatial Integration	5	2.00	3.00	13.00	2.6000	0.54772
Material Harmony	5	1.00	3.00	10.00	2.0000	0.70711
Urban Scale	5	1.00	3.00	12.00	2.4000	0.89443
Accessibility	5	2.00	3.00	14.00	2.8000	0.44721
Environmental Impact	5	2.00	3.00	12.00	2.4000	0.54772

This data provides insights into how well these modern structures align with traditional urban settings. For example, accessibility scores the highest mean (2.80), indicating that these buildings are generally accessible to the public, while both visual integration and material harmony score lower averages (2.00), suggesting challenges in aligning modern designs with traditional aesthetics and materials.

6- Discussion of the Results

6.1 - Visual Integration (Figure. 6)

The visual integration index reflects how well modern buildings align aesthetically with their traditional surroundings. The study found that 60% of the buildings achieved "partial" visual integration, combining contemporary elements like glass and steel with the surrounding traditional style but without fully matching the local aesthetic. Conversely, 20% of the buildings achieved "excellent" visual integration by using materials and designs that completely harmonize with their traditional environment. However, another

20% demonstrated "poor" integration, where modern styles clashed with the traditional surroundings.

These findings indicate a wide variation in how modern buildings interact with their urban settings, with the challenge of balancing innovation and maintaining harmony with the traditional architectural context remaining significant in many cases.

6.2 - Spatial Integration (Figure. 7)

Spatial integration measures how well modern buildings fit into existing movement flows and public spaces. The results showed that 60% of modern buildings achieved "excellent" spatial integration, significantly enhancing the movement of people and their interaction with the surrounding public spaces. However, 40% achieved "partial" integration, improving movement but not fully interacting with the urban environment.

This indicates that while most modern buildings in this study consider their interaction with the surrounding public and urban spaces, there are still cases where improvements are needed for better spatial integration.

6.3 - Material Harmony (Figure. 8)

The material harmony index assesses how well the materials used in modern buildings align with those in the surrounding traditional architecture. According to the findings, 60% of the buildings achieved "partial" material harmony, using a mix of modern and traditional materials, though not entirely aligning. An additional 20% achieved "excellent" harmony, using materials that perfectly match the surrounding context. However, 20% of the buildings displayed "poor" harmony, relying

predominantly on modern materials that do not blend well with their traditional environment.

These results show that while many modern buildings attempt to balance modern and traditional materials, achieving full harmony with the surrounding traditional context remains a challenge in some cases.

6.4 - Urban Scale (Figure. 9)

The urban scale index examines the compatibility of modern buildings with the surrounding urban context in terms of size, height, and proportions. The findings revealed that 60% of the buildings achieved "excellent" urban scale integration, fully aligning with the traditional urban environment. Meanwhile, 20% achieved "partial" integration, blending in some aspects but facing challenges in proportion. Another 20% scored "poor" for not matching the surrounding urban scale, leading to visual imbalances.

This highlights that while most modern buildings are carefully designed to fit within their urban context, some buildings struggle to match the size and height of the surrounding area, posing challenges for designers to balance innovation with traditional urban scales.

6.5 - Accessibility (Figure. 10)

The accessibility index reflects how easy it is for visitors and residents to access the modern buildings within the urban environment. According to the analysis, 80% of the buildings scored "excellent" for accessibility, demonstrating effective design and locations that make them easily accessible through public transport and pathways. In contrast, 20% scored "partial," indicating some challenges in accessibility due to infrastructure

limitations. No building scored "poor" for accessibility, meaning all buildings provide reasonable levels of access.

This distribution suggests that while most modern buildings are designed for easy access, some areas still need improvements, particularly in regions with limited infrastructure.

6.6 - Environmental Impact (Figure. 11)

The environmental impact index assesses the sustainability of modern buildings based on the materials and technologies used. The data shows that 60% of buildings achieved "partial" environmental impact, adopting some sustainable practices but not achieving full sustainability. On the other hand, 40% received an "excellent" rating, using sustainable technologies and materials like renewable energy systems and environmentally friendly building materials. None of the buildings in the study were rated as "poor," suggesting that all the buildings exhibit a reasonable level of environmental consciousness.

These results indicate that while most modern buildings incorporate sustainable practices, there is still room for improvement to achieve complete environmental sustainability. Environmental sustainability is an essential consideration in modern architecture, but more efforts are needed to enhance the performance of some buildings in this regard.
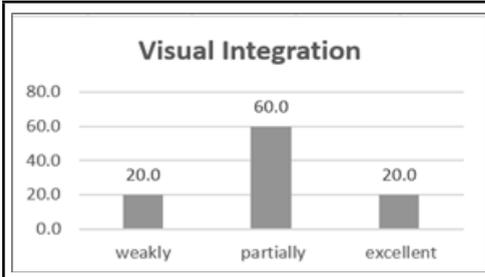
Visual Integration

weakly 20.0 | partially 60.0 | excellent 20.0

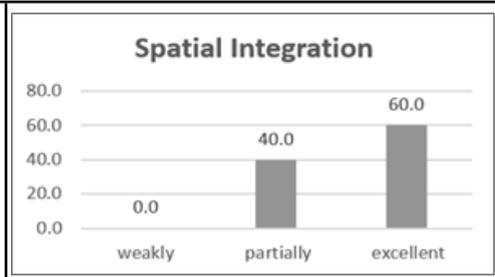Figure. 6 illustrates the results of the visual integration index for the samples. as prepared by the researchers.

Spatial Integration

weakly 0.0 | partially 40.0 | excellent 60.0

Figure. 7displays the results of the spatial integration index for the samples. as prepared by the researchers.

Material Harmony

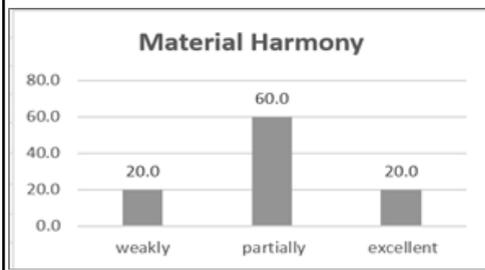weakly 20.0 | partially 60.0 | excellent 20.0

Figure. 8 shows the results of the material harmony index for the samples. as prepared by the researchers.

Urban Scale

weakly 20.0 | partially 20.0 | excellent 60.0
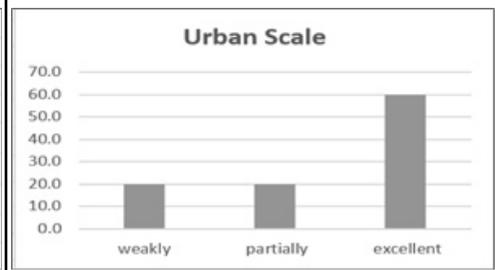
Figure. 9 demonstrates the results of the urban scale index for the samples. as prepared by the researchers.
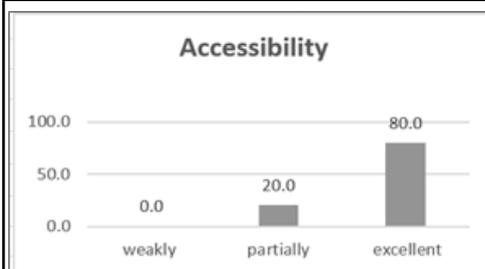
Accessibility

weakly 0.0 | partially 20.0 | excellent 80.0

Figure. 10 highlights the results of the accessibility index for the samples. as prepared by the researchers.

Environmental Impact
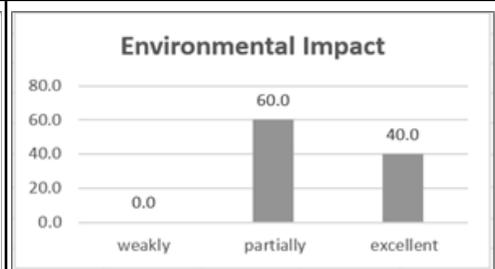
weakly 0.0 | partially 60.0 | excellent 40.0

Figure. 11 reveals the results of the environmental impact index for the samples. as prepared by the researchers.

7- Correlation Analysis

The Pearson Correlation analysis presented in Table (4) and Figure (12), provides insights into the relationships between the architectural indicators used in the study, including visual integration, spatial integration, material harmony, urban scale, accessibility, and environmental impact. These correlations allow for an understanding of how each of these indicators interacts and influences the others.

Table (4): Correlation Coefficients Among Architectural Indicators in Modern Buildings within Traditional Urban Environments, as prepared by the researchers.

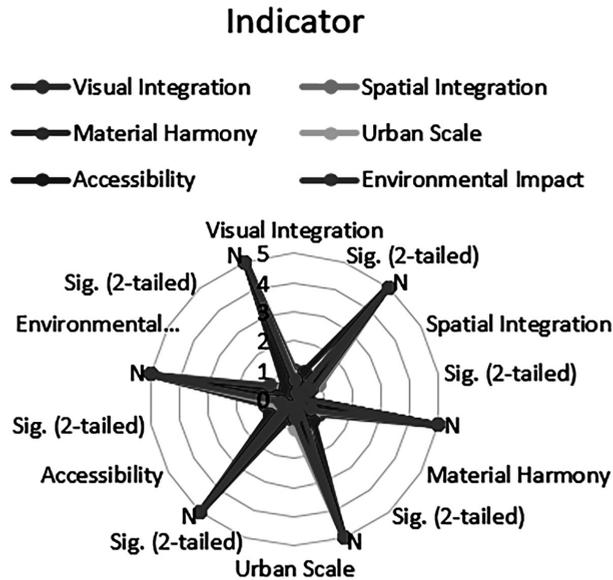| Indicator	Visual Integration	Spatial Integration	Material Harmony	Urban Scale	Accessibility	Environmental Impact
Visual Integration	1.000	0.645	1.000**	0.791	0.000	0.645
Sig. (2-tailed)		0.239	0.000	0.111	1.000	0.239
N	5	5	5	5	5	5
Spatial Integration	0.645	1.000	0.645	0.919*	0.612	0.667
Sig. (2-tailed)	0.239		0.239	0.028	0.272	0.219
N	5	5	5	5	5	5
Material Harmony	1.000**	0.645	1.000	0.791	0.000	0.645
Sig. (2-tailed)	0.000	0.239		0.111	1.000	0.239
N	5	5	5	5	5	5
Urban Scale	0.791	0.919*	0.791	1.000	0.250	0.612
Sig. (2-tailed)	0.111	0.028	0.111		0.685	0.272
N	5	5	5	5	5	5
Accessibility	0.000	0.612	0.000	0.250	1.000	0.408
Sig. (2-tailed)	1.000	0.272	1.000	0.685		0.495
N	5	5	5	5	5	5
Environmental Impact	0.645	0.667	0.645	0.612	0.408	1.000
Sig. (2-tailed)	0.239	0.219	0.239	0.272	0.495	
N	5	5	5	5	5	5

Indicator

Figure. 12 "Radar Chart illustrating correlation relationships between architectural indicators: visual integration, spatial integration, material harmony, urban scale, accessibility, and environmental impact." as prepared by the researchers

8- Key Relationships Between Indicators

1. Visual Integration and Material Harmony: The table shows that the correlation coefficient between visual integration and material harmony is 1.000, indicating a perfect and very strong relationship between the two indicators. This means that any change in visual integration will directly affect material harmony, and vice versa.

2. Spatial Integration and Urban Scale: There is a strong correlation between spatial integration and urban scale (0.919 with Sig = 0.028), indicating a positive relationship. This suggests that buildings with strong spatial integration tend to be proportionate within the urban context.

3. Spatial Integration and Material Harmony: The correlation between spatial integration and material harmony is 0.645, suggesting a moderate relationship. This implies that while spatially integrated buildings often harmonize with materials used in the environment, the relationship isn't extremely strong.

4. Accessibility and Environmental Impact: The correlation between accessibility and environmental impact is 0.408, indicating a weak relationship. This suggests that ease of access to a building doesn't necessarily correlate with its level of environmental sustainability.

9- Summary of Practical Study Findings

1. Visual Integration and Material Harmony are Strongly Related: There is a significant connection between visual integration and material harmony. Designs that blend well visually with the surrounding traditional environment also tend to use materials that complement the local context. This strong correlation (1.000) suggests that improving visual integration will directly enhance material harmony.

2. Spatial Integration and Urban Scale are Positively Related: The strong correlation (0.919) between these two indicators shows that buildings that are well integrated spatially are also proportionate in size and height within their surroundings, indicating a harmonious relationship between movement flow and scale.

3. Moderate Relationship Between Spatial Integration and Material Harmony: The correlation (0.645) indicates a medium-strength connection. Some spatially well-integrated buildings may not necessarily achieve full material harmony with their surroundings.

4. Weak Relationship Between Accessibility and Environmental Impact: The correlation (0.408) suggests that while buildings may be easy to access, this doesn't necessarily correlate with a high degree of environmental sustainability.

5. Visual Integration Plays a Significant Role in Overall Design Success: The relationship between visual integration and other indicators, like material harmony and spatial integration, shows that aesthetics play a crucial role in determining the success of architectural designs.

6. Challenges in Balancing Urban Scale and Material Harmony: While spatial integration and urban scale have a positive relationship, some buildings that achieve this balance may not fully harmonize with materials in their environment, indicating a challenge in this area.

7. Environmental Impact is Partially Related to Spatial Integration: The correlation (0.612) between environmental impact and spatial integration suggests that buildings with good spatial integration may also adopt some sustainability practices, but this isn't always the case.

8. Most Buildings in the Study Exhibit Excellent Accessibility: Results indicate that 80% of the buildings have excellent accessibility, demonstrating the importance of location and design in ensuring easy access.

9. Need for Improvement in Spatial Integration: Since 40% of the buildings only achieved partial spatial integration, there is a need for some buildings to improve their design to enhance movement flow and interaction with the surrounding urban environment.

10. Challenges in Achieving Full Environmental Sustainability: Although 40% of the buildings excel in environmental sustainability, 60% still rely on less sustainable techniques, suggesting a need for further improvements in this area.

10 -Conclusions

- Balance in Architectural Design is Essential: Modern buildings should strike a balance between innovation and maintaining the cultural and historical identity of urban areas, which enhances the city's sustainability.

- Visual and Material Harmony is Key: Buildings that incorporate local materials and achieve visual harmony with the traditional environment help foster integration into the urban fabric and reinforce the city's visual identity.

- Spatial Integration Improves Functionality: High-quality spatial integration in buildings enhances the flow of movement and social interaction, contributing to increased urban cohesion and improved connectivity between different areas.

- Environmental Sustainability Remains a Challenge: While some modern buildings adopt sustainable techniques, achieving full environmental sustainability continues to be a challenge, requiring ongoing improvements.

- Coexistence Between Modern and Traditional Architecture is Possible: Modern architecture can successfully integrate into traditional urban landscapes if designed thoughtfully, with consideration of the historical and cultural elements of the area.

- Preservation of Cultural Heritage is Vital: Architects should aim to preserve cultural heritage through designs that strengthen local identity and connect the present with the past in an integrated manner.

- Enhancing Urban Design Discussions: This research provides a deeper understanding of how to balance innovation with respect for urban heritage, contributing to better urban planning.

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