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The Role of References Transformations in Architecture Design Creativity

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Abstract

This research aims to demonstrate the effect of the method adopted by the architectural designer to employ the reference in generating the architectural product, which may be an imitative product or an innovative product. The field of study focuses on the references and design methods that influence the nature of architectural production and imitation and innovation in architecture. In the midst of this confusion in the design output of contemporary architecture, the problem of this research emerges in exploring the references that generate imitational outputs and the references that generate innovative outputs in architecture. To achieve this, the study has set two objectives: The first is what is the reference for generating the design concept? The second is what is the method that the designer relies on towards the reference to generate the design concept? The study adopted the qualitative analysis approach of building shapes to achieve the first objective and the qualitative inferential approach using the pre-structured interview method with a selected number of architectural experts to verify the second objective. The results of the study were summarized as follows: The most widely used methods for generating traditional ideas for architectural production is the imitation method, which relies on imitate and replicating references from within the field of architecture, while the metaphor method is used to generate innovative ideas for architectural production, which relies on abstracting and modifying references from outside the field of architecture.

Keywords: *Architectural Design, Design Concept, Reference Design, Transformation, Imitation, Creativity.*

Introduction

The research is based on a realistic vision presented in architectural design in an attempt to identify the references from which the architectural designer draws his innovative design concepts and explores the design method that the designer relies on towards this reference to build his intellectual vision, which is represented by the research problem of this study.Architectural design is the product of a combination of pure artistic creativity and technical innovation of the objective and scientific minds of the architect. Comprehensive creativity in architecture is the product of the simultaneous interaction between multiple components that include many tangible and intangible artistic and scientific variables, as well as intuitive and logical variables (Kheirollahi, 2012).

On the intellectual side, the architectural design process is considered a complex intellectual process, carried out by the architect in order to reach a distinguished architectural production that achieves the architectural requirements for the aspects of architectural work. The generation of the concept is the starting point for any design project and the transition from the stage of collecting, analyzing and presenting information to the beginning of the design launch and embodying concepts and developing solutions. It directs the design process in general and intervenes in all elements and stages of the design process, and at all levels of the design process (Cambridge Dictionary, 2025).

Therefore, the structure of this research was determined in four parts: The first part included an introduction to the design references to generate design concepts and a discussion of previous studies on the research topic to extract the research problem.The theoretical framework and research methodology were included in the second part, while the third part included the applied study. The

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research concluded with a discussion of the results and the presentation of the conclusions and recommendations for the research in the fourth part

The Technical Definition Of The Concept :In the field of scientific knowledge, George Sand and his colleague define it as “the mental image that the individual forms of sensory perceptions,” meaning that the individual has a mental image of sensory perceptions that are similar in some properties, which is known as a concept. While Edgar Juncker and his colleague define it as “logical structural relationships of a group of information between which there are relationships and which are the result of the individual’s own imagination and logical judgments,” they are mental structures that make the facts within the concept meaningful.

In the field of architecture: McGinty defines the concept as a special way through which the requirements of the program, the context, and the beliefs can be combined together, i.e. combining different elements of the design into a compatible whole that enables the architect to direct his capabilities towards the most important part of the design. Al-Najidi defines the architectural concept as the vision that the designer tries to reflect during the architectural work, stressing that the focal point of the work lies in this vision and explaining that “the concept is a concept of a great degree of breadth that can be expressed in some form about everything that is necessary or important in the design problem” and that the design concept achieves its eloquence by expressing the comprehensiveness of the design context’s vocabulary in a brief and indirect manner, according to contemporary architectural proposals , as its comprehensiveness stems from its horizontal horizon – which exhausts all vocabulary – and its vertical dimension which exhausts the depths of the specificities of these vocabulary (Husain, 2008).

Procedural Definition Of The Design Concept : The mental image is the result of intensive and creative efforts through which the vocabulary and aspects of the design situation are collected in a structure that represents what is latent in these vocabulary, and it includes purposes and meanings that are conveyed directly or indirectly if the product is intended to be influential and creative.

Methods Of Generating Design Concept:

Linguistic Definition Of The Methods :Methods is the plural of method and is defined by the British dictionary (Cambridge Dictionary, 2025) as a way of doing something, often involving a system or plan (Cambridge Dictionary, 2025).

The Technical Definition of the Methods

Methods in scientific research: It means the style that the researcher follows in order to detail a specific topic related to a certain specialization, and that style differs completely from one researcher to another according to the intellectual or material components available to him, as well as according to the type of scientific research, and in the end the goal is to reach specific evidence and proofs through which the researcher can establish clear results (Gregory2013 و).

Methods in architecture: a broad term that reflects a set of basic rules and techniques for achieving the final form of the architectural work and realizing the beauty and artistic and human value it carries.

Procedural Definition of the Methods

These are the means that the architect relies on to transform his vision into a tangible design. These methods work together to achieve the architect’s vision, and often overlap. These methods vary and include:

- Primary methods: uniqueness, insertion, abstraction, complexity, metaphor.
- Secondary methods: conflict, departure from the norm, harmony, imitation, etc.

Theoretical Framework

These are the methods that work to transform the concept into a physical form and product within its surroundings. These methods vary and include the primary and secondary according to the classification and employment of the designer in producing the form. These methods can be intertwined, or one of them produces the other, where the effect is mutual sometimes and the goal is what determines the priority and importance of these methods. In general, the most important of these methods are: uniqueness, intrusion, abstraction, complexity, and metaphor. These represent the basic methods that the architect resorts to to produce the architectural form within its surroundings and adjacencies. These methods are linked to other multiple methods, including conflict, departure from the

norm, harmony, compatibility, imitation, imitation, and other contradictions, pluralism, and surprise. The secondary methods, which deal in more detail with the product and its components, can be the ones employed to obtain the primary method, the general characteristic of the product within its surroundings, or vice versa, sometimes according to need. For example, the contradiction of opposites may give the quality of complexity and uniqueness, or the contradiction may occur through insertion, abstraction or metaphor, which makes the methods intertwined and diverse (Gouda and El Samahy, 2024, pp. 383-407). By reviewing previous studies related to design methods and their impact on the nature of architectural production, the levels of application and classification of methods were reached, which are as follows:

Levels of application of design methods in generating the design concept: Applying the method at the level of the general principle.,Applying the method at the level of the plan,Applying the method at the level of the interface,

Applying the method at the level of the elements.

Design methods are classified into: primary design methods - secondary design methods.

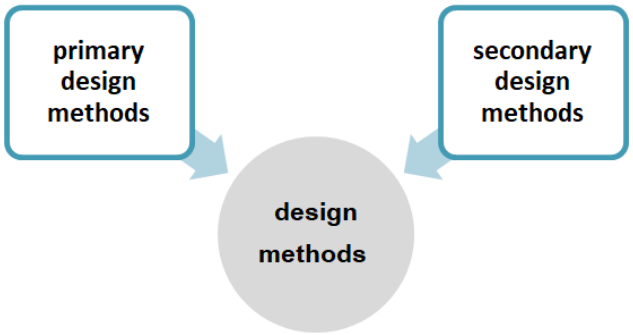

Figure 1. Classification of Methods for Generating Design Concepts

Source [Researcher]

The Main Design Methods in Generating Design Concepts Are

● Metaphor: It refers to allowing quoting from certain formal models such as drawings or sculptures while maintaining respect for the original effect and quality. Form models are determined with a fixed probability and then modified and changed without losing the connection to the original source, whether from a previous building or from nature or historical elements or arts and literature. The use of this method aims to interact with the audience's memory and to associate with the symbols and meanings taken from the reference sources (Saeed and Khalas, 2019). This approach includes evoking a high intrinsic or symbolic value and shows interaction with the sources from which it is borrowed. It focuses on linking the quotation to the original and transforming it in an abstract way to add a new character and enrich the meaning. Antoniades classified metaphor into: Intangible Metaphors: When the metaphorical starting point is a concept, concept, human condition, or a specific characteristic (such as individuality, nature, society, and culture) Tangible Metaphors: When the metaphorical starting point stems entirely from a visual or material characteristic (such as a dwelling as a castle or a temple roof as the sky). Combined Metaphors: When the conceptual and visual components overlap as a starting point and the conceptual components become the basis for exploring the advantages, characteristics, and basics of specific visual forms (Lucchini, 2023, pp.111-130).

● Revival: This method is based on the process of searching for a continuous language with heritage, as it aims to present contemporary architecture that mimics Islamic heritage architecture, relying on the architectural heritage that still maintains its heritage characteristics as a source for architectural formations and formulations. The architectural thought of this trend is influenced by the character and its concept, especially at the local level. The architectural heritage is considered the main tributary of this approach, as it is called the heritage approach. Revival represents an integrated system and architectural formulation (Gharipour, 2011, pp.199-205).

● Pickling and Renewal : Pickling is based on collecting heritage vocabulary from different historical stages within an innovative formative framework. The architect's vision and picking perspective may differ. He may imagine it as a collection of different formative vocabulary governed only by tangible formative relationships and the logic of sensory beauty. Some may consider it as a

collection of formative vocabulary with consideration of the cultural connotation conveyed from each formative vocabulary and its suitability to contemporary cultural reality. It represents the selection of an element or detail and making formal changes to it (Feisal, 2009).

● Abstraction: It means formal abstraction in the context of art and architecture, as artistic abstraction is considered to be a departure from representing nature and focusing on extracting the formal essence through artistic means such as shape, line and color. Abstraction is understood as a process of abbreviation and reduction, where a group of things are replaced with the least possible vocabulary, focusing on common characteristics. In architecture, abstraction is one of the methods for understanding and producing form, as it refers to dealing with the original formal elements through modification, change and simplification, focusing on the essence of formal significance. Abstraction is used in the event that there is more than one source for producing the form in order to achieve abbreviation and eloquence. Abstraction overlaps with the method of metaphor, as each of them can complement the other to produce the form. This includes deconstruction and reconfiguration, where the elements are divided and new ways are searched for to link them into a new system and structure. The designer's imagination plays a major role in this process, as it contributes to creating new concepts to find an innovative form. It attempts to reformulate the governing concepts of Islamic heritage, whether they are formal, visual, functional or social, in a modern way that is compatible with the times and with the conscious application of advanced technology. The architect may take from the heritage the general architectural formation and reformulate the formative vocabulary in a new contemporary abstract vision, not restoring the heritage spatial vocabulary, as the analytical approach calls it. At the level of the concept and the level of the element, and stripping the element of its formal characteristics and changing them (Alsuhbani and Al-Mudajji, 2017, pp.49-68).

● Imitation (similarity, imitation): It is often in the case of inspiration from the nature that surrounds the architect. The concept of imitation in this case depends on the artistic creator's understanding of his world and his perception of the elements of his creativity and the required harmony between these elements. Bio-imitation is known as imitation or inspiration from nature to find solutions to human problems. Organic imitation is one of the modern patterns that depend on the ecosystem as a basis for simulating the design and determining the path for an concept derived from a specific element or form. Bio-thinking is a method that seeks to consult nature in all stages of design, from determining the scope to creativity and to evaluation. Simulating living nature is the process in which the structure, function, form and principles of biological systems are studied and abstracted, and then the basic concepts and rules are extracted from them to arrive at design solutions (Chayaamor-Heil, 2023, pp.202-223). Direct reproduction of the material vocabulary of heritage and symbolic and moral inspiration from the structure of heritage, which is based on induction and analysis of local conditions and contemporary cultural data of that time, and then deriving concepts that are selectively compatible with local conditions to produce an architectural style that does not necessarily reproduce the abstract symbolic elements of heritage by trying to adapt heritage to express the current era and its tools and requirements in a way that is compatible with local conditions and data, both fixed and changing (Esmail, 2022, pp.23-53).

● Parting: The architect's response to the stimulus is completely different from the nature of the stimulus because the important thing in this case is not imitated or quoted from it (Nouby, 20006).

● Uniqueness: It is a concept that expresses a special feature or set of characteristics that distinguish something from a philosophical point of view. Uniqueness reflects the unique identity and individual life of the thing. Uniqueness can be the result of distinction or difference, and this distinction can be qualitative or quantitative. In the urban context and urban formation, distinction represents the focus on a specific element to be more attractive and distinctive than other elements. This can be achieved through: (the intellectual source that inspires the form - manipulation of size and scale - use of building materials and finishes - attention to location, signature, vertical and horizontal direction - coordination of the formal form of the general product or the elements of the form - consideration of function and ease of access The characteristic of uniqueness is linked to the concept of creativity, as creativity reflects seriousness and value, and shows distinction and difference and is linked to moral and material concepts such as value and significance. Maintaining uniqueness represents a challenge, as it is sometimes difficult to maintain something as unique, as uniqueness can be within multiple levels, such as the intellectual level, the formal level, the constructional level, the compositional level, and the functional level.

● Complexity: In terms of meaning, it includes ambiguity, vagueness, and tension. It is a state of composition and overlap of a group of elements that leads to enrichment within It is linked according to relationships that may be clear or ambiguous. Complexity may be at the level of the part or at the level

of the whole (detailed or general). It is also a method for excitement and suspense. Diversity and variety are often the reason for its occurrence. This may happen through combining contradictions and opposites or by intellectual, functional, or formal intrusion, or all of them. It is necessary that complexity not be an end, but rather complexity for the sake of the goals that are mentioned (multiplicity, ambiguity, etc.). Thus, it is a method for dealing with formal references and sources (Medhat and Ali, 2024).

- Intercalation: It is a method for introducing a form or element that is foreign to the context.
- Displacement of concepts: It is a method for deviating from the rule and challenging the imitational use to search for a meaning that contradicts the basic meaning. This is Eisenman's strategy, as he used a classical rule and worked to modify it (by moving, adding, dividing, separating, linking, deleting, changing the network and direction, adapting, or modifying), i.e. modifying the basic system to generate a new system and deviating from the norm (Eisenman and Harrison, 2008).

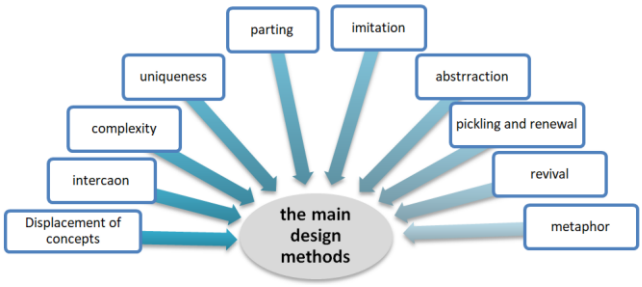

Figure 2. Classification of the Main Design Concept Generation Methods

Source [Researcher]

Secondary design methods: include:

- Formal treatments of basic geometric shapes, including general and special secondary methods (Тюрікова, 2021)
- One of the methods (methods) for generating design concepts is the relationships between elements (Abu Ghazaleh and Ali, 2015)
- Formation by the association of blocks When two blocks that differ in geometric shape or direction collide and penetrate each other's borders, both of them will compete for dominance and control. In this case (Von Meiss, 2013).

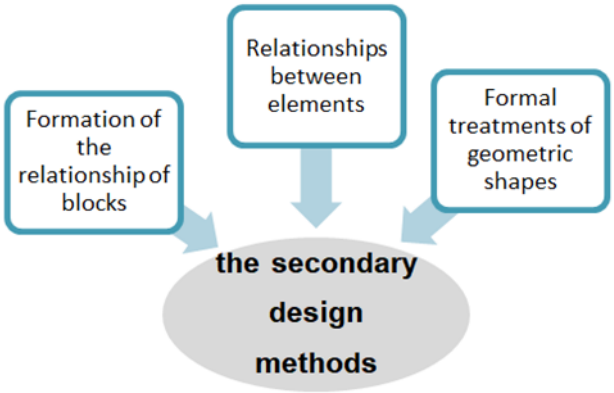

Figure 3. The Secondary Methods for Generating Design Concept

Source [Researcher].

Research Methodology

According to Ponta in his book "Architecture and Its Interpretation: A Study of Expressive Systems in Architecture," there are three sources for interpreting architecture and art. The first is introspection, which relies on our innate or acquired senses. The second is field studies, which include personal interviews, questionnaires, and other methods. The third is textual study, which involves analyzing the literature documenting the reactions of specialists and the general public alike to the environment and

the works in question. He then poses the question: Which is better, field studies or textual analysis? For the purpose of interpreting any architectural or artistic work, he recommends adopting a descriptive (neutral) approach rather than a prescriptive approach (based on a particular school or theory), taking into account the meaning of this work in reality for people and focusing on the collective, accepted aspects, rather than personal opinions (Snodgrass and Coyne, 2013). The research methodology is based on introspection, by deriving design references through expert reviews, whether through written texts, statements, direct interviews, or what was stated in the writings of some architects who spoke about the role of references in their work, as well as the methods from which they derived their innovative ideas. In addition, we utilized an analysis of these architectural works and the opinions of some theorists about them to attempt to link the ideas presented by the architects and how they were applied in these works. Following the introspective approach by deducing design references through reviewing designers, whether through written texts, statements, direct interviews with experts, or what was stated in the writings of some architects who spoke about the role of references in their work, as well as the methods from which they derived their innovative concepts, in addition to using the analysis of those architectural works and the opinions of some theorists about them to try to link the thought put forward by the architects and how to apply it in those works.

Measurement methods and tools were adopted through:Expert interviews, Questionnaire, Observation, Documents (Alkasar and Yahya, 2023).

Research Hypotheses:

- The design reference affects the nature of the architectural product between imitation and innovation.

- The nature of the architectural product is affected by the design method adopted by the designer and the transformations that occur to the design concept references.

The Purpose of the Research:

Reaching the relationship that shows the effect of the design method by which the reference is employed to produce an innovative creative product or to produce a imitational product.

Research Objectives

● Classification of references for generating design concepts in architecture and explaining their impact on the nature of the architectural product.

● Classification of design methods adopted in employing the reference to generate the design concept and explaining their impact on the nature of the architectural product.

Research Gap:

By reviewing and discussing previous studies, it became clear that previous studies referred to the references that inspire architecture, but they ignored the influence of the reference on the nature of the architectural product. Is it imitational or innovative? It also referred to the design methods, but it ignored the effect of the method that the designer relies on in employing the reference to generate the product on the nature of the architectural product: imitation or innovative?

Research Problem:

What is the impact of the design method adopted by the designer in employing the reference to generate the architectural product, which may be a imitational product or an innovative product?

Practical Framework:

A study sample of 12 buildings in northern, central and southern Iraq was taken, namely the Nineveh Governorate building, the Great Mosque building in Mosul, the Shawwaf Building complex, the Central Library building, the Ashur Mall building, the Central Bank of Iraq building, the General Secretariat Council building in Baghdad, the Martyr's Monument, the Unknown Soldier Monument, the Palm Trunk Stadium and the Downtown Complex in Erbil. The General Secretariat Council building in Baghdad was analyzed and interviews with experts and designers were used to collect dataThe qualitative methodology was adopted in data analysis. [21], which was analyzed qualitatively

Table 1. Research Samples for A Group of Contemporary Iraqi Architectural Buildings [Researcher].

Picture of building	Location	Year of construction	Designer	Contemporary Iraqi buildings
	Mosul city	2023-2007	Imad Al-Bakri Dr. Hafez Abd Yahya Dr. Khaled Gamal	**NinevehGovernorate building**
	Mosul city	2014- mid-nineties	Dr. Laith Al-Naimi Emad Al-Bakri Hassan Al-Sanjari	**Great Mosque of Nineveh**
	Mosul city	2000and rehabilitation2022	Dr.HassanAlSanjari Dr.Hatem Hazem Dr. Saba Ibrahim	**Al Shawaf Building Complex**
	Mosul city	2014-1999	Dr. Turki Dr. Hatem Hazem Al-Sufi Dr. Ahmed Al-Omari	**Assyrian Library**
	Mosul city	2023	Qusay Sharif	**Ashur Mall**
	Baghdad	2011	Manhal AlHaboubi	**General Secretariat Council Building**
	Baghdad	2012	Zaha Hadid	**Central Bank building**
	Baghdad	1983	Sculptor Ismail Fattah al-Turk and architect Saman Asaad Kamal	**Martyr's Monument**
	Baghdad	1983	Khaled Al-Rahhal	**Tomb of the Unknown Soldier**
	Basra city	2009	architecture 360	**Palm Trunk Stadium**
	Basra city	2010	Dewan architectures	**Basra Cultural Center**
	Basra city	2003	Muthanna Al-Bayati	**Down town**

Results

The results shown in the table 2 (for the study models showed that 30% of the methods for the models under study are metaphor, 7.5% of them are the method of revival, 12.5% of them are the method of abstraction, 5% of them are the method of picking up and renewal, 25% of them are the method of imitation, 10% of them are the method of singularity, 7.5% of them are the method of insertion, and 2.5% of them are the method of displacement of concepts.

Table2. The Result of the Practical Study, Source [Researchers]

		Design methods									
		Displacement	Insertion	Uniqueness	Separation	Complexity	Imitation	Coupling and	Abstraction	Revival	Metaphor
1	Nineveh Governorate building						●		●		●
2	Great Mosque of Nineveh						●				●
3	Al Shawaf Building Complex						●	●		●	●
4	Assyrian Library						●		●		●
5	Ashur Mall						●				●
6	General Secretariat Council Building		●						●	●	●
7	Central Bank building		●	●			●				●
8	Martyr's Monument	●		●			●				●
9	Tomb of the Unknown Palm Trunk Stadium Soldier		●	●					●		●
10	Palm Trunk Stadium						●				●
11	Basra Cultural Center						●		●		●
12	Down town			●			●	●		●	●
		1	**3**	**4**	**0**	**0**	**10**	**2**	**5**	**3**	**12**
		40									

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The results shown in the table 2 (for the study models showed that 40.7% of the models under study are the field of application of the design method, 50% of them are formal

treatment, 36.4% of them are the relationship between the elements, and 27.3% of them are the formation by linking the masses. 59.3% of the models under study are the level of application of the method, 34.4% of them are at the level of element repetition, 21.9% of them are at the level of materials, 31.3% of them are at the level of scale, and 12.5% of them are at the level of geometric proportions.

Table . The Result of the Practical Study, Source [Researchers]

		the level of application of the design method			the level of application of the design method			
		geometric proportions repetition	Scale repetition	merialat repetition	element repetition	formation by linking masses	the relationship between elements	formal treatment of geometric shapes
1	Nineveh Governorate building			●	●	●		●
2	Great Mosque of Nineveh	●	●	●	●		●	●
3	Al Shawaf Building Complex		●	●	●		●	●
4	Assyrian Library	●	●		●		●	●
5	Ashur Mall	●	●		●		●	●
6	General Secretariat Council Building		●		●	●	●	●
7	Central Bank building		●		●		●	●
8	Martyr's Monument		●					●
9	Tomb of the Unknown Soldier		●	●	●			●
10	Palm Trunk Stadium		●	●	●		●	●
11	Basra Cultural Center	●		●	●			●
12	Down town		●	●	●	●	●	
		4	**10**	**7**	**11**	**3**	**8**	**11**
		21			**33**			
		54						

Conclusions

The methods employed in the study models are among the main methods, and the borrowing method has achieved the highest value and the most proportion, due to the diversity of levels of its employment in designing ideas for architectural production. It is followed by the simulation method, as it is a method employed in generating ideas for architectural production of various types. In contrast, the complexity and separation methods did not achieve any value in the study models. As for the field of application of the methods, the field of formal treatment achieved the highest value, while the field of formation by linking masses achieved the lowest value. At the level of applying the methods, the application of the design method at the level of element repetition achieved the highest value, while the application of the design method at the level of geometric proportions achieved the lowest value. The design methods, their field of application, and their levels of application have a clear impact on the

nature of the architectural product, as they are either employed to generate a traditional architectural product or employed to generate an innovative architectural product.

Recommendations

Through this research, we recommend employing the mechanism of borrowing with design references from outside the field of architecture to create an innovative architectural product, as the results show that the mechanism of borrowing is the most used in the study samples, with the implementation of formal treatments such as modification and abstraction on the design reference. As for the mechanism of simulation, it is employed to create a traditional architectural product that may be for the purposes of preserving heritage with design references from within the field of architecture, or this mechanism may be employed to simulate nature and the behavior of living organisms to create an innovative architectural product with design references from outside the field of architecture.

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