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Impact of Logic in Architectural Design Process on Architecture Identity

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Abstract:

The research deals with the concept of logic as a design approach that affects the architecture identity. The research question is: "Does logic in architectural design process affect the architecture identity?". By reviewing many studies that have dealt with the concept of logic in the architectural design process, it became clear that they did not shed light on this complex relationship between it and the architecture identity. Hence, the research problem arose and the gap emerged, which is the lack of scientific knowledge of the relationship between logic as a design method and the concept of architectural identity. The research aims to answer the question by clarifying this relationship to know the extent of the relationship between the variables by building a theoretical framework that explains the logic in the architectural design process and the architecture identity, in addition to conducting a practical study that includes a graphic analysis of architectural models in the city of Dohuk - Iraqi Kurdistan. The research methodology included the following: determining the architectural design variables extracted from the theoretical framework (basic geometric shapes, monomorphic or unified shape, ornaments and manufactured details, smooth finishes, pattern repetition, orthogonal grid, golden ratio, new manufactured materials, compatible binary colors, and continuous or strip windows) in addition to determining the research sample**,** measurement method**,** statistical and graphic analysis of variables. The results showed that there is a tendency towards logical and rational architecture by focusing on the use of the aforementioned vocabulary in the stages of the design process. These variables also varied in the intensity of their impact on the identity of architecture, and this indicates the difference in the intensity of their effectiveness in achieving this. The conclusion shows how the use of these variables and the focus on them in the logical stages of the architectural design process (analysis, synthesis, and evaluation) negatively affects the failure to highlight the identity and character of architecture through the production of buildings devoid of architectural meanings and connotations lacking local and cultural identity and regional distinction.

Keywords: Logic, Design Method, Design Process, Architecture Identity.

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الملخص:

تناول البحث مفهوم المنطق كمنهج تصميمي مؤثر على هوية العمارة ، و السؤال البحثي "هل يؤثر المنطق في عملية التصميم المعماري على هوية العمارة؟". من خلال مراجعة العديد من الدراسات التي تناولت مفهوم المنطق في عملية التصميم المعماري تبين أنها لم تسلط الضوء على هذه العلاقة المعقدة بينه وبين هوية العمارة ، ومن هنا نشأت مشكلة البحث وبرزت الفجوة وهي نقص المعرفة العلمية لعلاقة المنطق كمنهج تصميمي بمفهوم هوية العمارة . يهدف البحث الإجابة على السؤال من خلال توضيح هذه العلاقة لمعرفة مدى ارتباط المتغيرات ببعضها عن طريق بناء إطار نظري يوضح المنطق في عملية التصميم المعماري وهوية العمارة ، بجانب إجراء دراسة عملية تتضمن تحليل كرافيكي لنماذج معمارية في مدينة دهوك – كردستان العراق . تضمنت منهجية البحث ما يلي : تحديد المفردات التصميمية المعمارية المستخرجة من الاطار النظري (الأشكال الهندسية الأساسية، الشكل الأحادي أو الموحد،الحليات والتفاصيل المصنعة، الأنهاءات الملساء ، تكرار النمط ، الشبكة المتعامدة ، النسبة الذهبية ، المواد الجديدة المصنعة ، الألوان الثنائية المتوافقة ، النوافذ المستمرة او الشريطية) بالأضافة الى تحديد عينة البحث، طريقة القياس، التحليل الأحصائي و الكرافيكي للمتغيرات . بينت النتائج ان هناك نزعة تجاه العمارة المنطقية والعقلانية من خلال التركيز على استخدام المفردات السابقة في مراحل عملية التصميم ، كما ان تلك المتغيرات تباينت في شدة تأثيرها على هوية العمارة و هذا يؤشر الأختلاف في شدة فاعليتها في تحقيق ذلك. الاستنتاج يبين كيف يؤثر استخدام تلك المتغيرات و التركيز عليها في المراحل المنطقية لعملية التصميم المعماري (التحليل والتركيب والتقييم) سلبا على عدم ابرازهوية العمارة و شخصيتها من خلال انتاج ابنية مجردة من المعاني والمدلولات المعمارية تفتقر الى الهوية المحلية والثقافية والتمايز الأقليمي .

الكلمات المفتاحية: المنطق، أسلوب التصميم، عملية التصميم، الهوية المعمارية.

پوختە:

توێژینەوەکە باس لە چەمکی لۆژیک دەکات وەک ڕێبازێکی دیزاین کە کاریگەری لەسەر ناسنامەی تەلارسازی هەیە. پرسیاری توێژینەوەکە ئەوەیە: "ئایا لۆژیک لە پرۆسەی دیزاینی تەلارسازیدا کاریگەری لەسەر ناسنامەی تەلارسازی هەیە؟". بە پێداچوونەوە بە زۆرێک لە لێکۆڵینەوەکان کە باسیان لە چەمکی لۆژیک کردووە لە پرۆسەی دیزاینی تەلارسازیدا، ئەوە ڕوون بووەوە کە ڕووناکییان نەخستە سەر ئەم پەیوەندییە ئاڵۆزەی نێوان ئەو و ناسنامەی تەلارسازی. لێرەوە کێشەی توێژینەوەکە سەریهەڵدا و بۆشاییەکە سەریهەڵدا، کە بریتییە لە نەبوونی زانیاری زانستی لەسەر پەیوەندی نێوان لۆژیک وەک میتۆدی دیزاین و چەمکی شوناسی تەلارسازی. ئامانجی لێکۆڵینەوەکە وەڵامی پرسیارەکە بداتەوە بە ڕوونکردنەوەی ئەم پەیوەندییە بۆ زانینی ڕێژەی پەیوەندی نێوان گۆڕاوەکان بە بنیاتنانی چوارچێوەیەکی تیۆری کە لۆژیکی ناو پرۆسەی دیزاینی تەلارسازی و ناسنامەی تەلارسازی ڕوون دەکاتەوە، ئەمە جگە لە ئەنجامدانی لێکۆڵینەوەیەکی کردەیی کە بریتییە لە ئا شیکاری گرافیکی مۆدێلی تەلارسازی لە شاری دهوک - کوردستانی عێراق. شێوازی توێژینەوەکە ئەمانەی خوارەوەی لەخۆگرتبوو: دیاریکردنی وشەسازی دیزاینی تەلارسازی کە لە چوارچێوەی تیۆری دەرهێنراوە (شێوە ئەندازەییە بنەڕەتییەکان ، شێوەی یەکجۆر یان یەکگرتوو ، ڕازاندنەوە و وردەکارییە دروستکراوەکان ، تەواوکردنی نەرم ، دووبارەکردنەوەی نەخش ، تۆری ڕاستگۆ ، ڕێژەی زێڕین ، کەرەستەی دروستکراوی نوێ ، دووانەیی گونجاو ڕەنگەکان ، پەنجەرەی بەردەوام یان شریت) جگە لە... دیاریکردنی نمونەی توێژینەوە ، شێوازی پێوانە ، شیکاری ئاماری و گرافیکی گۆڕاوەکان. ئەنجامەکان دەریانخست کە مەیلێک بەرەو تەلارسازی لۆژیکی و عەقڵانی هەیە بە گرنگیدان بە بەکارهێنانی ئەو وشەسازییەی کە پێشتر باسمان کرد لە قۆناغەکانی پرۆسەی دیزایندا. هەروەها ئەم وشەسازییە لە چڕی کاریگەرییەکانیان لەسەر ناسنامەی تەلارسازی جیاواز بووە و ئەمەش ئاماژەیە بۆ جیاوازی چڕی کاریگەرییان لە بەدەستهێنانی ئەمەدا. لە ئەنجامدا کورتەیەک باس لەوە دەکات کە چۆن بەکارهێنانی ئەم گۆڕاوەکان و گرنگیدان بەوان لە قۆناغە لۆژیکیەکانی پرۆسەی دیزاینی تەلارسازیدا (شیکاری، کۆکردنەوە و هەڵسەنگاندن) کاریگەری نەرێنی لەسەر شکستهێنان لە تیشک خستنە سەر شوناس و سیمای تەلارسازی لە ڕێگەی بەرهەمهێنانی بینا بێبەشەکانەوە هەیە مانا و واتا تەلارسازییەکان کە ناسنامەی ناوخۆیی و کولتووری و جیاوازی ناوچەییان نییە.

کلیلە وشە: لۆژیک، شێوازی دیزاین، پرۆسەی دیزاین، ناسنامەی تەلارسازی.

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1. Introduction

Logic, design methods and strategic thinking play a major role in developing innovative design solutions for many architects. Many studies have been written on design methods, these studies analyze, evaluate and suggest alternative methods to creative problem solving to help designers understand their approach and offer new alternatives to achieve solutions, (Wardah & Khalil, 2016, p.2). New methods tend to have two main features in common. One is that they formalize certain design process, and the other is that they externalize design thinking. Formalizing a process typically expands the way a design problem is approached and widens the range of potential solutions being explored. It promotes and empowers the exploration of alternatives beyond the initial solution that is considered. This is also connected to another fundamental aspect of design methods, which is the externalization of design thinking, aiming to transfer ideas and mental processes from mind to the diagrams and charts commonly used in design methodologies. (Cross, 2000, pp.47-48). From the 1950s to the 1960s, there was a great effort in various fields to develop design methods that could deal with the complexity and uncertainty inherent in design problems in the context of technological development. The trend of rationalization in design methods culminated in the Design Methods Conferences, held in England, under the coordination of researchers from a wide range of disciplines. The essence of the design methods developed in the 1960s was based on dividing the process into well-defined steps. These steps can be broadly described as follows: understanding and defining the problem, gathering information, analyzing information, developing alternative solution concepts, evaluating alternatives and selecting the solution(s), testing and implementing them. Their foundations lie in the idea of the Cartesian method of understanding the problem before reducing its complexity, in order to be able to address the problem (Linden & et al, 2011, p.3). The initial phase relied on the utilization of scientific, logical, and methodical approaches. Subsequently, in the early 1970s, the second phase shifted focus from striving for improvements and the absolute authority of the designer (particularly in addressing "hard problems"), towards acknowledging satisfactory or suitable solutions (Simon 1969 introduced the concept of "satisfaction") and initiating a participative "dialectical" process wherein designers collaborate with the "owners" of the issue (clients, customers, users, society). The third phase, emerging in the 1990s, could be a blend of the first two; or, following the model suggested by Cross (1989), could be based on an understanding of the "reciprocal" nature (Archer, 1979) of the problem and solution in design (De Vries & et al, 1993, p.17).

All these studies addressed the concept of logic as a scientific and rational method in design focusing on the practical and functional aspect of architecture without addressing the effects and results of this method on other aspects (aesthetic, symbolic and sensory) of architecture, including the identity of architecture.

2. Literature Review

Reviewing and debating earlier architectural studies is important because they were chosen based on how they handled the idea of logic in architectural design and architectural identity. This is relevant to the research topic because the earlier studies did not address the issues raised by the study.

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Studies Related to Design Methods:

- Gregory, Sydney. A. (1966). The Design method; offers a comprehensive overview of the different approaches used to define design, encompasses the majority of the designer's activities, and offers a largely cohesive framework for thinking about the designer's work. This study offers an analytical approach to the design process, a review of previous work and ideas on the subject, and an assessment of methodological techniques, with room for further scholarly investigation.

- Alexander, Christopher (1973). Notes on the synthesis of form; Alexander demonstrates how, given a problem, it is possible to eliminate preexisting ideas and develop new ones that, based on the problem's structure, accurately correspond to the subsystems of the adaptation process. In order to give the new concepts a form, the designer must treat each of these subsystems as a distinct subproblem. Because of the process, the form will be accurate, non-arbitrary, and well-suited to its context. This approach is fully developed in a lengthy appendix, which contains the mathematics behind it, most of which is based on set theory.

- Broadbent, Geoffrey (1988). Design in Architecture: architecture and the human sciences; Broadbent's method relies upon four distinct ways of generating design form which he called, 'pragmatic', 'iconic', 'analogical' and 'canonic' methods. Broadbent suggests a complete design method could find the designer using all four of his tactics in an ordered and organized way, and then selecting from amongst the solutions produced.

- Mitchell, William J. (1990). The Logic of Architecture: Design, Computation, and Cognition is a comprehensive, systematic, and up-to-date treatment of the logical foundations of design thinking. It provides a detailed discussion of architectural form languages, their definition through formal grammars, their interpretation, and their role in structuring design thinking. In particular, Mitchell shows how the range of possible graphical compositions in the design world can be defined through formal grammars.

- Jones, John C. (1992). Design Methods: examines various viewpoints regarding the designer and design techniques. The methods concentrate on the creative processes if we see the designer as a "black box," producing creative solutions without being able to articulate or explain how these solutions came about. Seeing the designer as a glass box, where every stage of the process is comprehensible, explicable, and communicated, is the opposite extreme. The third extreme is to think of the designer as a self-organizing system with the ability to search for ideas and solutions, while evaluating its own processes.

- Lawson, Bryan (2005). How Designers Think: The Design Process Demystified; focuses on the foundations of the cognitive school in cognitive psychology in explaining the processes that occur in the designer's mind when he completes the design tasks, and that the design work establishes a number of internal and external determinants that form the basis for the solution. Lawson establishes on this consideration a model of the design problem in which the rule consists of four controls: 1st-Root determinants, 2nd - Practical determinants. 3rd - Formal determinants, 4th - Symbolic determinants.

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- Cross, Nigel (2023). Design Thinking: The study, which focuses on what designers actually do, is comprised of a number of in-depth case studies featuring the creations of renowned and accomplished designers, developed with comparison and commentary in between. The scope of design is reflected in the coverage, which ranges from engineering to architecture, consumer goods to communications, and solo to cooperative and team-based design. The study's foundation is the progression of design proficiency from novice to expert.

Studies Related to Architecture & Identity:

- Abel, Chris (2000). Architecture and Identity: drawing on his background as a teacher and critic on four continents, as well as his interests in cybernetics, philosophy, the new humanities, and development planning, to address the topic from a variety of disciplinary perspectives. As a result, a distinctive worldwide viewpoint on how modern architecture is evolving at the start of the new millennium is produced. It provides groundbreaking insights on a range of subjects, including the effects of information technology on the creation of personalized architecture, the interplay between tradition and innovation, the potential for global environmental culture, and the regional and international forces influencing Asian cities and architecture.

- Yilmaz, Meltem. (2006). Architectural identity and local community: The study discusses the impact of culture on architectural identity and the impact of globalization on architecture, where culture is defined as the entirety of shared values, beliefs, symbol systems, schemas, and other information that is acquired and passed down through social interaction among groups of people. The study of architecture in a vernacular and cultural sense is becoming increasingly urgent due to the effects of globalization on rural economies, the speed at which people are urbanizing, and the unprecedented magnitude of housing issues that the world's population is facing in the twenty-first century.

- Watson, Georgia B. and Bentley, Ian, (2007). Identity through Design: explores the concepts of identity and place-making and how they are essential components of the design process. Based on several case studies from Prague, Mexico, Malaysia, and Boston, the writers talk about various design strategies to define and clarify intricately linked ideas. - An understanding of current discussions regarding how place identity is influenced by design is provided by the study. Through international case studies, students will gain a practical understanding of the various creative design approaches that can be applied to place development, as well as an understanding of the processes that shape place identity and the role that designers play in these processes.

- Tran, Jennifer (2010). Static Illusions: Architectural Identity, Meaning and History: Explores architectural identity, meaning, and history - drawing on social and poststructuralist notions of meaning as a theoretical framework for analyzing the historical and culturally mutable nature of built form, and critically assesses traditional notions of architectural identity. Considering “identity” as a combination of meaning and value by which built form is characterized or defined, the first section of this study critically analyzes specific ideas and practices in the fields of building design, heritage conservation, history, and architectural literature that typically approach architectural identity as a fixed entity.

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- Ettehad, Sh., Azeri, A.R. and Kari, Gh. (2014). The Role of Culture in Promoting Architectural Identity: This descriptive article makes the assumption that architecture is a comprehensive symbol of human culture and uses document analysis and library research to examine how culture shape's architectural identity. Following a reexamination of the definitions of culture, identity, architecture, and their interplay, a number of historical Iranian buildings from various eras were examined as case studies. The most significant signs and traits of every country and historical era that reveal the context of human existence at any given time are art and architecture.

Although the concept of logic as a rational method is influential in the architectural design process as well as in the architectural product, it has been shown through previous research that dealt with both the subject of logic in architectural design and architectural identity, that it did not shed light on the relationship between them directly in a practical study to know the effect of logic in architectural design on architectural identity. Therefore, the research seeks to investigate this relationship. Also, from the above, the concept of logic in architectural design is opposite to the identity of architecture, so the focus will be on the variables of logic in architectural design to know the type of impact on the identity of architecture.

3. The Logic of Design

Logic is the study of arguments, standards for differentiating between persuasive and non-persuasive arguments, and procedures for using those standards. (Gregory, 2017, p. 3). Modern architectural design theory has been influenced to some extent by Karl Popper's philosophy. Its effect has been essentially negative, but this effect stems from misinterpretation just as much as from Popper's failings. It is necessary to make distinctions between logic, empirical science, and design, just as Popper does between the three. To base design theory on models that are inappropriate for logic and science is a big mistake. Logic deals with forms that are abstract. Science studies the forms that already exist. Design creates new shapes. A design hypothesis differs from a scientific hypothesis. (Langer, 1953, p268). It is important to distinguish between logical and design propositions. The misconceptions regarding value-free claims and design hypotheses that can be tested scientifically are the result of the widespread confusion surrounding these topics. Popper's constrictive interpretation of probability theory, scientific theories, and logical forms is partially to blame for this. Popper's theory is incompatible with any attempt to apply the concepts of inductive logic, (Popper, 1961, pp35-36). One should not confuse a logical claim with a design proposal. The misconceptions regarding value-free ideas and scientifically testable design hypotheses stem from the widespread confusion surrounding these issues. This is partially because of Popper's constrictive interpretation of probability theory, scientific theories, and logical forms. Popper's theory 'directly contradicts any attempt to apply the concepts of inductive logic, (Popper, 1961, pp35-36). Popper argues that common scientific theories are universal assertions, such as "all Y is Z," and can thus be disproved by a single counterfactual. It is this falsifiability, not any inductive support or degree of probability determined from the data, that distinguishes it as scientific. Lastly, in a well-known manner, Popper disapproves of any subjective theory of probability that does not rely on an objective frequency statement to inform our "rational beliefs." This is the data that underpins our beliefs. However, the primary reasoning process in design is synthetic rather than analytical and has an inductive core. Peirce proceeds to construct two additional forms of reasoning by reversing the three

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claims, as illustrated in Figure (1). The two new approaches do not lead to a logical conclusion. Both are artificial and entail imaginative leaps in the sense of Whitehead's theoretical reasoning (Cross, 1984, p266,267). Similar to Sherlock Holmes' ideal world, rule (the motive) and the results (evidence) work together in A1 to prove the case (accused guilty) beyond all reasonable doubt, but in the absence of logical assurance. More commonly, in A2, the shaded portion of x indicates the degree of unsupported x≤ y, indicating a shadow of doubt. A3 is an additional option. In this case, the motive and the evidence just do not align: The shaded area, x, is not connected to y (Cross, 1984, p268).

Whereas a hypothesis in science is a general principle derived from particular events and observations, a hypothesis in design is a specific instance created from a general notion and specific data. Although the term "hypothesis" originally referred to a specific instance of a general proposition, it is now frequently used in science to refer to a provisional generalization regarding a group of cases (this is its Popperian sense), (Cross, 1984, pp268-269).

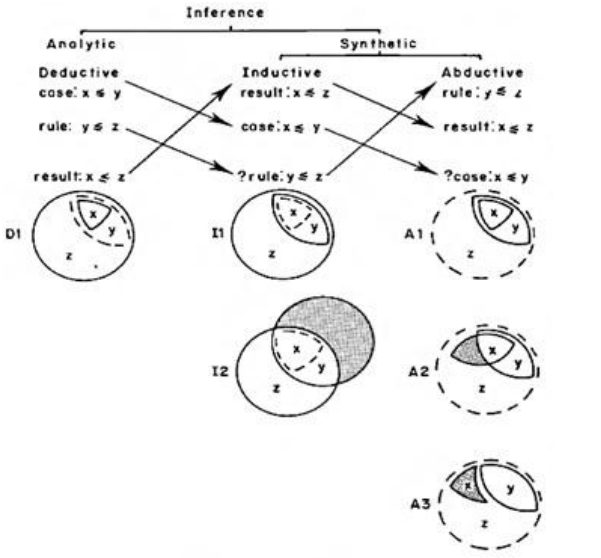

Fig.1. Peirce's three modes of inference (Cross, 1984, p268).

4. Design Thinking

Zeisel showed that design process includes three modes of thought: Imagination, Presentation and Testing with two types of information: Heuristic Catalyzed information with Corpus Knowledge for Checking goes in a spiral manner with the progress of design act, and is done through a series from the matching of concepts with creative transitions, and designer's responsibility deepens, successively, with the progression of the task's time, as shown in Figure (2), (Zeisel, 1984, p13).

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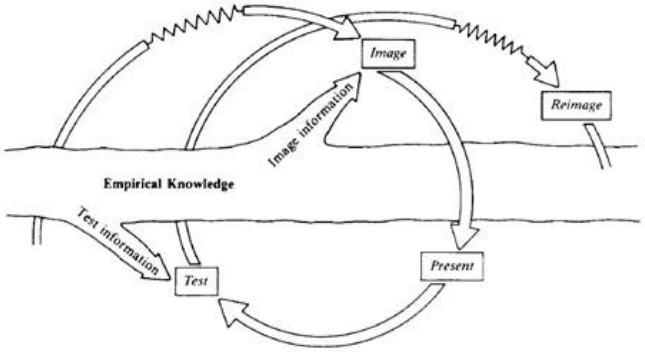

Fig.2. Spiral designs development (Zeisel,1984, p10)

The overall design process is convergent, but it will contain periods of deliberate divergence as shown in Figure (3). Convergent thinkers are usually good at detail design, at evaluation and at selecting the most appropriate or feasible proposal from a range of options. Divergent thinkers are usually good at "concept design" and at the generation of a wide range of alternatives. Clearly, successful design requires both types of thinking. Regretfully, only convergent thinking is often encouraged and developed in engineering (and other) education. Psychologists have also identified other types of thinking styles, which may also be significant for design and how design strategies are organized. The difference between serialist and holistic thinking styles seems to be one of the most significant thinking style dichotomies. A serialist thinker follows a straight path through the task, attempting to avoid any detours, prefers to move forward in small, logical steps, and attempts to get every point clear or decision made before moving on to the next. When thinking holistically, one tends to take a much broader approach, using and assembling information that isn't always logically connected and frequently working out of order. The difference between lateral and linear thinking has also been mentioned in relation to thinking styles. While lateral thinking requires being open to seeing and moving toward new lines of thought, linear thinking moves swiftly and effectively toward an intended goal but may lead to becoming stuck in a rut. (Cross, 2000, p.186,187). Many problems are not solved by the usual methods and need strategies that depend on originality and flexibility of thinking, and getting rid of convergent thinking, which often depends on issues that do not tolerate a plurality of solutions, and the introduction of divergent thinking. Throughout much of the literature on productive thought we find a variety of closely related binary divisions between, on the one hand, rational and logical processes and, on the other hand, intuitive and imaginative processes, (Lawson, 2005, p.142).

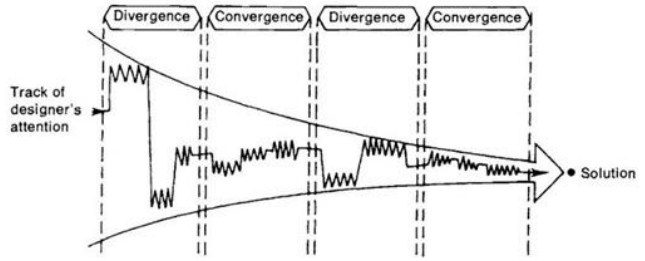

Fig. 3. Despite having periods of both convergence and divergence, the overall design process is convergent. (Cross, 2000, pp.186,187).

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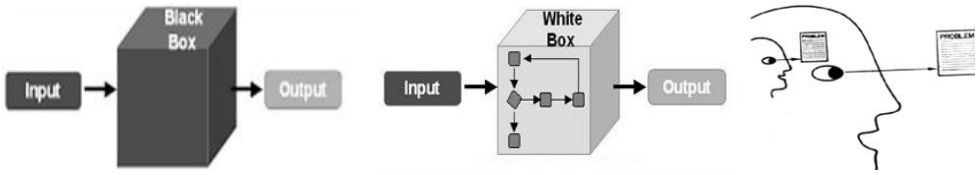
5. Architectural Design Methods

The word method, as described by Jones, refers to a specific way characterized by regularity and clarity that can be relied on with high confidence, and contains a set of rules and procedures that are used for the purpose of arriving at solutions to a specific problem, (Jones,1992, p6). Using a design method can help with specific problem classes, such as matching a product to a situation to provide satisfaction, (Gregory, 1966, p. 3). A design method is, in a sense, any recognizable approach to working in the context of designing. The design-by-drawing method is the most widely used design technique. That is to say, the primary tool used by most designers in their design process is drawing. Therefore, any processes, strategies, tools, or "tools" for designing can be considered design methods. They stand for several different types of tasks that the designer may employ and incorporate into a larger design process. There has been a significant increase in new, unconventional procedures that are more commonly grouped together under the name of design methods, even though some design methods can be the traditional and standard procedures of design, like drawing. (Cross, 2000, p.46). Two somewhat different schools of thought were studied in relation to design approaches: the first adopted the concept of intuition, while the other adopted the concept of reason. Three approaches to architectural design were distinguished by Christopher Jones (1992) in his book Design Methods. The designer is first presented as a mystery: As seen from a creative perspective, the design emerges from the unclear creative leap, as seen in Figure (4.a). Second: conceived as a glass box: As seen in Figure (4.b), the design is the outcome of a logically sound process. Third: the self-organizing system that is the designer: As seen in Figure, from a control perspective, design is the result of a strategy and a design process. (4.c).



a b c

Fig.4.a Black box Method, the designer's thinking is ambiguous (Researcher).

b. Glass box Method, the designer's thinking is clear and logical (Researcher).

c. Designer as a system that organizes itself (Jones,1992, p55)

6. Rational Architecture

The goal of finding the most logical solution to design problems was the common intellectual stance of the rationalist architectural movement of the first half of the 20th century. While it included a component of functionalism, it covered a broader range of issues related to philosophy, politics, society, economy, style, and symbolism. Rationalism's theoretical underpinnings have a long history that predates architectural theory itself. In his book De Architectura, Vitruvius had already demonstrated that architecture is a science that is understandable through reason. (Lampugnani, 1986, p275). Twentieth-century Rationalism derived less from a special, unified theoretical work as from a

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common belief that the most varied problems posed by the real world could be resolved by reason (Shirzad, 1999, p118,119). Despite strong opposition, rationalism initially emerged as an artistic movement before swiftly developing into a comprehensive, cohesive style with a distinct language of forms. Above all, the Bauhaus was the place where early 20th-century avant-garde trends came together like a crucible, enriching rationalist architecture. Structures composed of the relatively new materials steel, concrete, and glass had clear, closed, and mostly white painted surfaces, with precisely cut openings, large expanses of glazing, and rectangular volumes; homes were planned with hygiene in mind, ground plans were rationalized and dissolved into "flowing space continua," and the division of internal and external space was to a large extent maintained. (Lampugnani, 1986, p275,276). The year 1927 is considered an important year for this trend and its prosperity through the issuance of the first architectural document of the pioneers of the avant-garde on the occasion of the holding of the first residential exhibition, Die-Whung, which was supervised by the Dodger Friend Foundation in Weissenhof in a suburb of Stuttgart in Germany, where the residential district Weissenhof-Siedlung was built. This exhibition featured a fusion of abstract and cubism from French and German schools into one cohesive style. During a momentous occasion at the 1927 Weissenhof exhibition, they were united in their forms and intentions before the world. The show houses created by architects such as Gropius, Oud, Mies, Le Corbusier, and others were so similar in concept that Alfred H. Barr had to coin the term "international style" to characterize it. (Banham, 1975, p35). Where the new architecture that appeared in the exhibition proved that it had a uniform by which it could be distinguished, which in turn meant joining the idea of the Function. The pioneers were given complete freedom in choosing their designs while keeping one common factor, which is that all residential homes should appear with flat roofs and avoid decorating. Most of the housing units that were built appeared as suitable models for mass production. The element of standardization has been employed in some of the models of residential homes, which reinforced the idea of repeating the model on a wider scale and with high economic efficiency, as is the case in the models of housing units of the architects Van Der Rohe, Mies, and Gropius, where the idea of employing the iron structure was adopted according to a grid system using prefabricated sections in the walls and windows. This approach in itself represented a rational statement for the idea of using prefabricated parts, (Shirzad, 1999, p128-129). In terms of style, the new architecture is characterized by explicitness and simplicity, and its spaces have unified characteristics in all directions. Its forms are abstract, pure, undistinguished parts or a deaf box. It is linked to the aesthetics of the machine. It is characterized by explicit logic in the paths of movement, technology and construction, against metaphors, against historical allusions, against humor, and against symbolism, (Banham, 1989, p9).

7. Architectural Identity

The question of identity is crucial in all fields, including architecture. Inquiries such as "Where do we belong? We are who we are. "Where are we going? " Can take many different forms and be associated with different nations, cultures, or religions. There will be more discussion on the compelling idea that architecture reflects a culture. It's a viewpoint that both inspires and discourages the greatest architects from going back to their origins. Both architecture and the arts express the human identity. Humanity has always demonstrated a commitment to its artistic heritage. Therefore, it can be claimed that every civilization or ethnic group has produced unique architecture throughout

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history that is in line with their culture. Identity is a word that refers to Hu's nature, character, and existence. (Ettehad & et al, 2014, p. 411). Identifying: What is it? First of all, it is a procedure rather than a "found" item. It could be compared to the path that civilization takes across time. The culture or identity of that civilization is represented by the trail... Second, since identity is a process, it cannot be created. By addressing what we believe to be our true issues, we grow as people... Thirdly, identity is not something that is self-aware. (Correa, 1983, p.10). "Identity" is a notoriously loose concept. As James Donald points out, "'Identity' is one of the most overused but least considered terms in the lexicon of contemporary humanities and social sciences". We do not consider this looseness to be a weakness, but rather a major factor in the term's value. According to Paul Gilroy, the sheer diversity of concepts distilled into the concept of identity and the vast array of topics it can be applied to encourage imaginative connections between subjects and viewpoints that are not typically linked, (Watson, 2007, pp. 2,3). Cultural and social aspects of man-made formations are included in the category of environmental characteristics, in addition to geographical formations. Due to the interaction between human-made formations and lifestyles, these characteristics lead to changes in public social life. A system's identity is defined by this process taken as a whole. (HACIHASANOÖLU & ÖRER, 1998, p. 52). The built environment acts as an important tool to reflect identity. Architecture and the built environment are key elements of the transmission of cultural identities from one generation to the next, (AKŞEHIR, 2003, p. 13). The Factors Affecting Architectural Identity: Culture, Place, Technology, Local community, and Symbols & Meanings

There are several strategies employed by architects to express cultural identity in their work. Four design strategies are suggested by Broadbent (1973). Two more strategies are added; symbolic and metaphoric, to complete the range of the identified strategies (Mahgoub,2007, p167);

1. Pragmatic design strategy utilizes the inherited features of traditional architecture and strives to reproduce them as they were in the past. It applies direct copy and paste practices to use complete examples or elements from traditional architecture.
2. Iconic design strategy strives to reproduce the image of traditional architecture by using its elements and vocabularies to produce new building types and functions.
3. Analogic design strategy aims to produce architecture that resembles traditional architecture without direct copying and pasting of its elements.
4. Canonic design strategy endeavors to form cultural identity by applying the principles of traditional architecture without copying its elements and shapes.
5. Symbolic design strategy focuses on reinterpreting the principles and elements of traditional architecture and avoids any copying and pasting of elements and shapes.

Metaphoric design strategy attempts intentionally to depart from being associated with traditional architecture and to create dramatic experiences of contemporary cultural identity.

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8. Materials and Method

The research will apply the analytical method to selected samples and cases for the purpose of testing the research hypothesis, which is that "Logic in Architectural Design affects the Architecture Identity" and test the relationship between Logic in Architectural Design and Architecture Identity, the main goals of research. The research method includes the following sequential practical steps: a- Research variables. b- Research sample design. c- Research method of measurement. d- Statistical & Graphical analysis of variables.

a. Research variables

The variables related to logic in architectural design are identified and extracted from the theoretical framework for the purpose of testing them practically (logic in architectural design as an independent variable - architectural identity as a dependent variable). Theoretical studies focus on the connection of logic in architectural design with a set of main variables, which in turn is linked to a set of secondary Variables, as in Table (1).

Table 1: Identification and categorization of the Logic in architectural design variable's **(Researcher)**

No	Category	Variables
1	Architectural form	Using basic geometric shapes
		Using Monomorphic or unifying shapes
2	Decoration and Ornaments	The use of prefabricated simple architectural inscriptions and details
		The absence of decoration in the surfaces (walls and ceilings) or the use of smooth finishes
3	Architectural style	Adopting the repetition of Pattern or International Style.
		Adopting the orthogonal grid method at the level of plans and elevations.
4	Standardization	Design according to the Golden Ratios.
5	Building materials	Focusing on new industrial materials (steel, glass, aluminum, plastic.... etc.).
6	Color	Use a compatible binary color (white and gray, for example)
7	Architectural openings	Using continuous openings.

b. Sample design & scope of research (Data Collection)

A purposive sample was chosen from the research community because probability or random sampling does not suit the requirements of the study. The selected sample can meet the research requirements and also help the researcher answer the research question. It is a group of teachers from the Department of Architecture in several universities in the Kurdistan region- Iraq. A purposive Case studies (architectural projects) were also selected from the governorate of Duhok, with four projects in a probability manner that includes the following classifications (administrative - residential –

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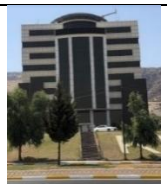
commercial- Service) constructed between the years 2000-2024, to conduct graphic analysis. This type of sample (project) is useful to study because it is prominent as architecture and it is possible to limit them to their classification and select them within the study cases, and it is also not repeated as often as other projects as in Table (2).

Table 2 –Selected case studies for practical application (Researcher)

Case No.	Name	Classification	Location	Year	Site	Elevation
1	Duhok Court	Administrative	Duhok	2013		
2	Dabin Apartment Tower	Residential	Duhok	2016		
3	KIB Bank	Commercial	Duhok	2014		
4	Duhok Municipality	Service	Duhok	2012		

c. The research method of measurement

The method of measurement proposed in the study depends on the qualitative scale through the questionnaire form (Appendix1) that was prepared by the researcher for this purpose, which depends on the logic variables extracted from the theoretical framework to clarify the impact of logic in architectural design on architectural identity. For the purpose of testing it, the proposed form was presented to a group of architecture lecturers in many departments within the universities of the region and they were asked to answer it. The intensity question is used to measure the strength of a respondent's feeling or attitude on a particular topic. In this search, Likert method has been chosen for measuring psychological trends, where this method is valid to measure various topics which are clearly limited to a select number of terms dealing with the psychological tendency to be measured. The people under test should clarify whether Level of agreement very high or very low on each word of phrases, see Table (3), they get to the following degrees in the following case, (AL-Daheen, 1994, p69):

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Table 3 – Likert Interval Scale (Researcher after Likert)

Trend	Very low	Low	Average	High	Very High
Scale Degree	1	2	3	4	5
Mean Range	1.00 - 1.80	1.81 – 2.60	2.61 – 3.40	3.41 – 4.20	4.21 – 5.00
Difference	0.79	0.79	0.79	0.79	0.80

On this basis, a high degree indicates a high effect of the Logic in Architectural Design on Architecture Identity and a low degree indicates low effect of the Logic in Architectural Design on Architecture Identity. The degree that each phrase obtained is calculated by finding the mean $\bar{X}$ which depends on the values of standard categories and its frequencies. The value of (X) lies between (1) and (5) according to the indicated grading standard, (AL-Sulaivany, 2011, pp130,131). Another proposed method of measurement depends on the graphic analysis prepared by the researcher, as the variables of the theoretical study related to logic in architectural design (independent variable) will also be tested by analyzing the selected architectural projects (Case studies) graphically to determine the extent to which these vocabularies are achieved in each of them and the extent of their impact on the architectural identity (dependent variable). See Table (7), (Appendix2), (Appendix3), (Appendix4).

d. Statistical analysis of variables

Data and responses were collected, and to extract the results, a digital and graphical analysis method was used to process the data statistically using computer programs SPSS v26. The following statistical tools are used, (Yousif & Khalil, 2019, p647):

- Relative Frequency to measure the spread range of variable within the sample
- Arithmetic means to measure the central tendency at confidence level 95% to know if the average response degree reached the medium degree 3, less or more than that.
- Standard deviation to determine the degree of dispersion from the mean.
- Analysis of variance Anova to calculate correlation coefficients of each sub variable.

A- Questionnaire Analysis & Results (Analysis of Independent Variable)

All retrieved questionnaire forms have analyzed, and the results of variables (Using Geometric shapes X1- Use of Monomorphic shapes X2 - Use of Prefabricated details X3 - Using Smooth finishes X4 - Adopt Repetition of pattern X5- Using Orthogonal grid X6- Follow Golden Ratios X7- Focusing on industrial material X8 - Use of Compatible binary color X9- Using continuous wide openings X10) have obtained and represented according to the following charts and tables:

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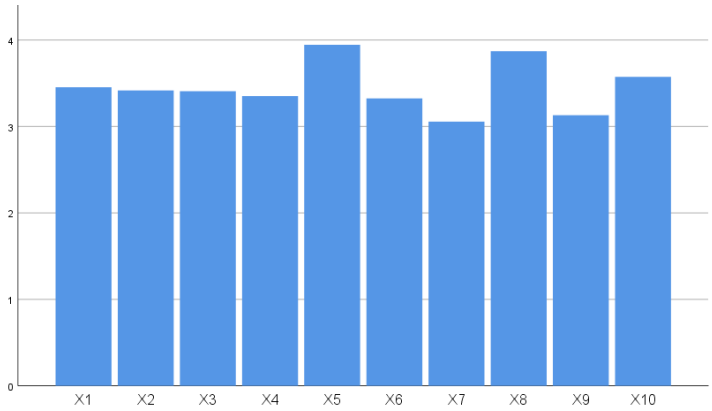

Fig.6. Variables means Bar chart of responses to Logic in Architectural Design X-General (Researcher)

Table 4 – Special Statistics showing the result of the value of Mean, Median, Std. Deviation, Variance and Sum of the Logic variable (Researcher)

	N		Mean	Median	Std. Deviation	Variance	Sum
	Valid	Missing					
X1	108	0	3.45	4.00	1.226	1.503	373
X2	108	0	3.42	3.50	1.161	1.348	369
X3	108	0	3.41	4.00	1.136	1.290	368
X4	108	0	3.35	3.00	1.026	1.053	362
X5	108	0	3.94	4.00	1.066	1.137	426
X6	108	0	3.32	3.00	.936	.875	359
X7	108	0	3.06	3.00	1.229	1.511	330
X8	108	0	3.87	4.00	1.145	1.310	418
X9	108	0	3.13	3.00	1.095	1.198	338
X10	108	0	3.57	4.00	1.052	1.107	386

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Table 5 – General Statistics showing the result of the value of Mean, Std. Deviation, Variance and Sum of the Logic variable (Researcher)

Logic in Architectural Design X

N	Valid	10
	Missing	0
Mean		3.4520
Std. Deviation		.28181
Variance		.079
Sum		34.52

B- Case Studies Analysis & Results

A graphic analysis of selected case studies will be carried out with regard to the variables extracted from the theoretical framework for practical application. In practical application, these variables represent an analysis of the external appearance of the project or case, as they serve as a definition of what architecture is, and also represent the direct and immediate reflection that the recipient receives regarding the distinctive visual characteristics of the identity of the architecture or building as in Table (6). For the purpose of unifying the scale in statistical analyses, the results obtained from the graphical analysis of case studies will be converted into Likert values as in Table (7).

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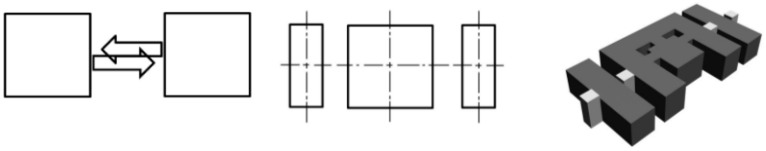
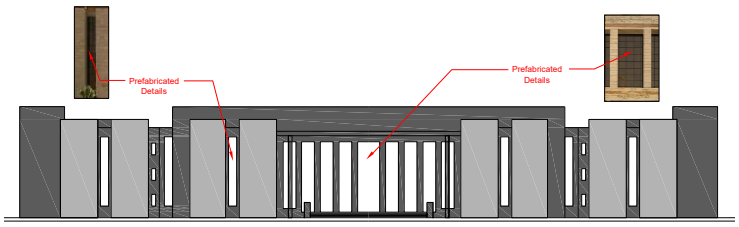
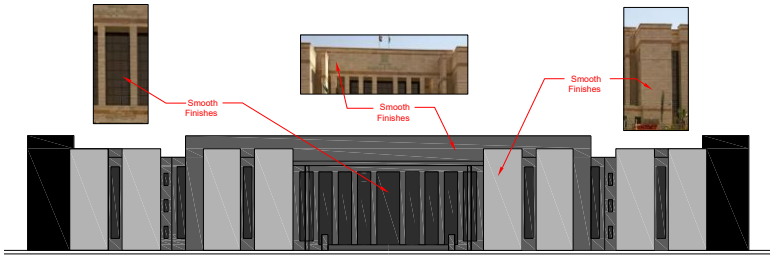
Table 6- Graphical Analysis of Logic in architectural design (researcher)			
Case 1: Presidency of the Duhok Court of Appeal			
Project Information			
Building Type	Administrative	Name & Function	Duhok Court
Location	Iraq-Duhok	Year	2013
Pictures			


Site Elevation

No	Main Indicat	Sub Indicat	Graphical Analysis	Evaluation
1	Architectural Form	Using basic geometric	 Rectangle Top View	A
2	Architectural Form	Using monomorphic or	 Face-to-face Contact 3D View	A
3	Decoration and Ornaments	Prefabricated Details		B
4	Decoration and Ornaments	Smooth Finishes		E

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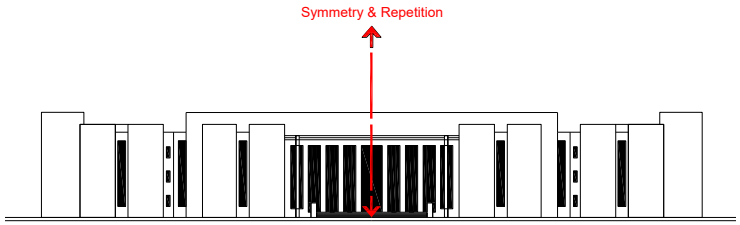
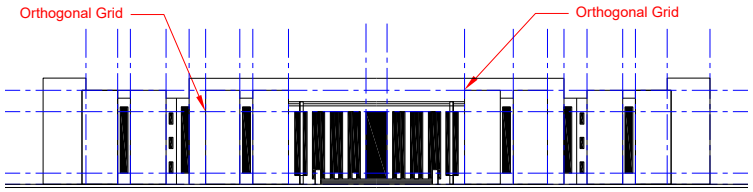
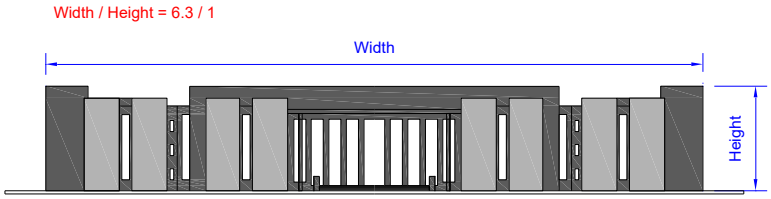
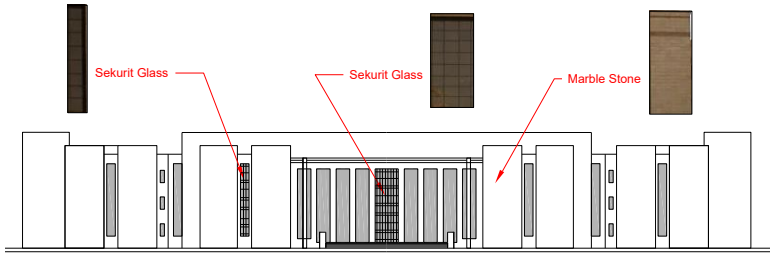
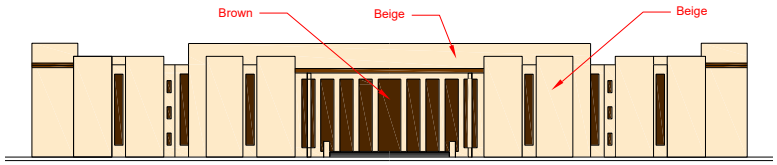
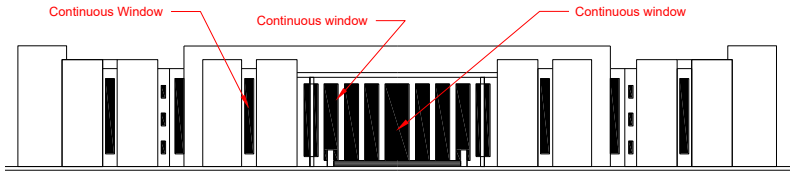
5	Architectural style	Pattern		A
6	Architectural style	Orthogonal Grid In		A
7	Standardization	Golden Ratio Elevation(1.6		E
8	Building materials	Industrial materials		B
9	Color	Compatible binary		A
10	Architectural Openings	Continuous openings		B
Possible Value degree: A = 5, B = 4, C = 3, D = 2, E = 1				

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Table 7- Results of Graphical Case studies analysis (Researcher)

No	Variables of Logic in Architectural Design	code	Case 1	Case 2	Case 3	Case 4
1	Using Geometric shapes	Y1	5	5	5	4
2	Use of Monomorphic shapes	Y2	5	5	3	4
3	Use of Prefabricated details	Y3	4	4	5	5
4	Using Smooth finishes	Y4	1	4	4	4
5	Adopt Repetition of pattern	Y5	5	5	5	5
6	Using Orthogonal grid	Y6	5	5	5	4
7	Follow Golden Ratios	Y7	1	1	1	1
8	Focusing on industrial material	Y8	4	5	5	5
9	Use of Compatible binary color	Y9	5	1	4	3
10	Using continuous wide openings	Y10	4	3	5	5

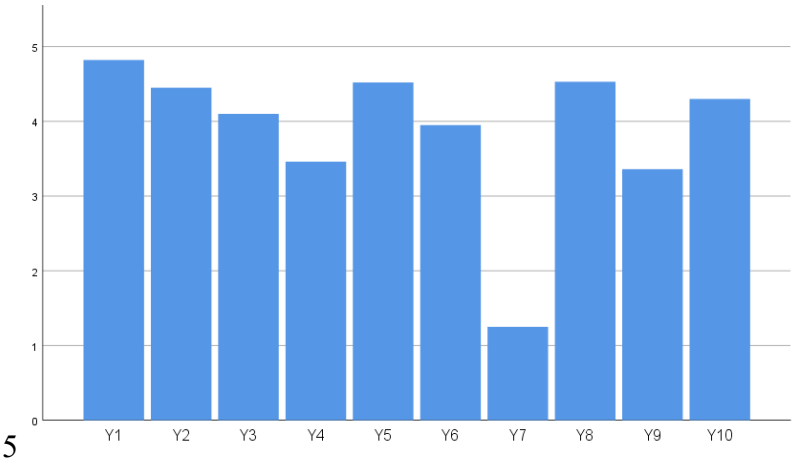

Fig.7. Variables means Bar chart of responses to Logic in Architectural Design Y -General (Researcher)

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Table 8 – Special Statistics showing the results of the value of Mean, Median, Std. Deviation, Variance and Sum of the Independent variable (Researcher)

	N						
	Valid	Missing	Mean	Median	Std. Deviation	Variance	Sum
Y1	4	0	4.8250	4.8250	.10408	.011	19.30
Y2	4	0	4.4500	4.4750	.34881	.122	17.80
Y3	4	0	4.1000	4.1250	.14720	.022	16.40
Y4	4	0	3.4625	4.0000	1.14555	1.312	13.85
Y5	4	0	4.5250	4.5250	.22546	.051	18.10
Y6	4	0	3.9500	3.9750	.14720	.022	15.80
Y7	4	0	1.2500	1.2000	.21602	.047	5.00
Y8	4	0	4.5375	4.8750	.69207	.479	18.15
Y9	4	0	3.3625	3.7500	1.31617	1.732	13.45
Y10	4	0	4.3000	4.5750	.72226	.522	17.20

Table 9 – General Statistics showing the results of the value of Mean, Std. Deviation, Variance and Sum of the Independent variable

(Researcher)

Logic in Architectural Design Y

N	Valid	10
	Missing	0
Mean		3.8740
Std. Deviation		1.03460
Variance		1.070
Sum		38.74

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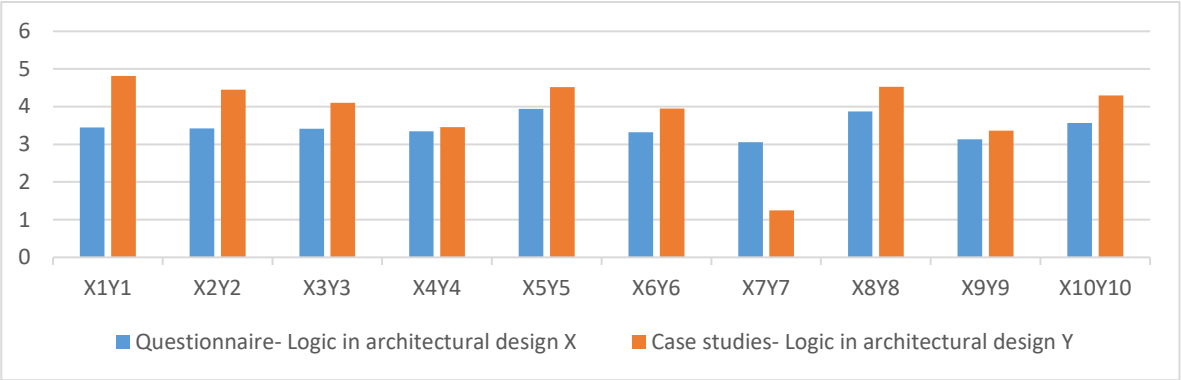

Fig. 8. Bar chart showing Logic variables means comparison of questionnaire & case studies (Researcher)

Table 10 – Pearson Correlation between Questionnaire & case studies of Logic variable -General (Researcher)

Correlations		Questionnaire- Logic in Architectural Design X	Case studies- Logic in Architectural Design Y
Questionnaire- Logic in Architectural Design X	Pearson Correlation	1	.700*
	Sig. (2-tailed)		.024
	N	10	10
Case studies- Logic in Architectural Design Y	Pearson Correlation	.700*	1
	Sig. (2-tailed)	.024	
	N	10	10

*. Correlation is significant at the 0.05 level (2-tailed).

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Table 11 –Analysis of variance "ANOVA[a] "Result -General (Researcher)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.717	1	4.717	7.676	.024[b]
	Residual	4.916	8	.615		
	Total	9.634	9			

a. Dependent Variable: Architecture Identity

b. Predictors: (Constant), Logic in Architectural Design

Table 12 – Result of regression coefficient -General (Researcher)

	Unstandardized Coefficients		Standardized Coefficients		
Model	B	Std. Error	Beta	t	Sig.
(Constant)	-4.994	3.210		-1.556	.158
Logic in Architectural Design	2.569	.927	.700	2.771	.024

a. Dependent Variable: Architecture Identity

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9. Results and Discussion

1. Results discussion related to Questionnaire Form

Logic in Architectural Design had been measured depending on questionnaire data which contained a scale of lecturers' attitude to know their opinions about variables on the study are calculated as a percentage of the number of respondents for each paragraph of the total sample to test the secondary hypothesis.

- Results related Logic in Architectural Design X

- The results shown in Fig. (6), Table. (4) indicate that Mean X1 for the independent variable = 3.45 with 10 %, Mean X2 for the independent variable = 3.42 with 10 %, Mean X3 for the independent variable = 3.41 with 10 %, Mean X4 for independent variable = 3.35 with 10 %, Mean X5 for independent variable = 3.94 with 10 %, Mean X6 for the independent variable = 3.32 with 10 %, Mean X7 for the independent variable = 3.06 with 10 %, Mean X8 for the independent variable = 3.87 with 10 %, Mean X9 for independent variable = 3.13 with 10 %, Mean X10 for independent variable = 3.57 with 10%.
- The results shown in Table (6) indicate that Mean X for the independent variable = 3.45 with 100 %, Std. Deviation = 0.281, Variance = 0. 079, Sum= 34.52.

2. Results discussion related to Case Studies

Logic in Architectural Design had been measured depending on a Case studies graphic analysis which contained a scale attitude by researcher to know response about variables, and are calculated as a percentage response for each paragraph of the total sample to test the secondary hypothesis. To verify the validity of the main hypothesis is tested by calculating the arithmetic mean of all (10) statements on the scale. As mentioned previously, the values close to (5) indicated positive for the vocabulary and opposite when the value approaching of (1), as in Table (3).

- Results related Logic in Architectural Design Y

- The results shown in Fig. (7), Table. (9) indicate that Mean Y1 for the Dependent variable= 4.82 with 10 %, Mean Y2 for the Dependent variable = 4.45 with 10 %, Mean Y3 for the Dependent variable = 4.10 with 10 %, Mean Y4 for the Dependent variable = 3.46 with 10 %, Mean Y5 for the Dependent variable = 4.52 with 10 %, Mean Y6 for the Dependent variable = 3.95 with 10 %, Mean Y7 for the Dependent variable = 1.25 with 10 %, Mean Y8 for the Dependent variable = 4.53 with 10 %, Mean Y9 for the Dependent variable = 3.36 with 10 %, Mean Y10 for the Dependent variable = 4.30 with 10 %.
- The results shown in Table (19) indicate that Mean Y for the Dependent variable = 3.87 with 100 %, Std. Deviation = 1.034, Variance = 1.070, Sum= 38.74.

3. Results related to Architectural Design & Architectural Identity

The results of Correlation between Independent & Dependent variable shown in Table. (12) indicate that Pearson Correlation value = 0.700*and Sig. (2-tailed) = 0. 024.The results of Analysis of Variance (ANOVA) of Independent & Dependent variable, shown in Table. (13) indicate that F

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value = 7.676 and Sig. = 0.024. The results of Linear Regression Analysis of Independent & Dependent variable, shown in Table. (14) indicate that t value = 2.771 and Sig. = 0.024.

10. Conclusion

Through the results obtained, the following conclusions were reached:

a- There is a clear direction for architectural designers towards rational architecture (as the questionnaire and graphical analysis results showed) by focusing on the use of logical variables in design.

b- Most of the variables related to logic in architectural design had impact on the identity of architecture through the results obtained in both practical tests of study, and thus the validity of the main hypothesis of the research was achieved.

c- The logic in architectural design affects the identity of architecture, through producing buildings without meanings that lack the local and cultural identity and lack regional distinction. That is, the focus on logical variables and logical methods in architectural design directly affects not highlighting the identity of architecture.

d- The variables related to logic in architectural design varied in the strength of its influence on the identity of architecture, and this indicates the difference in its effectiveness in achieving this. Some variables indicated greater effectiveness than other variables, and thus the validity of the secondary hypothesis of the research was proven.

e- The use of the variable of geometric shapes, monomorphic or unified shape instead of a variety of shapes, adopting the repetition of the pattern or international style, the variable of focus on the use of new industrial materials such as steel, glass, concrete, plastic, aluminum...etc. and using continuous wide openings, were among the variables most influential in not highlighting the identity of architecture, that is, they had a high values of logic effect on buildings with architectural identity.

f- Design according to the golden ratio in elevations or not has little impact on highlighting the identity of architecture depending on the questionnaire and graphical analysis results.

- Because the study relied on graphical analysis of the chosen models, analysis of the relative frequency of design characteristics, and tabular data representation, it was able to achieve better results than those studies mentioned in the research.

- Conflicts of Interest: the authors declare that there is no conflict of interest regarding the publication of this paper.

- The funding statement: the research did not receive any specific grant from funding agencies in the commercial, public, or not for profit sectors.

- The Statement of Data Availability: The article and its supplemental materials contain data that back up the study's conclusions.

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References

[1] Abel, C.(2000). Architecture and Identity: Responses to Cultural and Technological Change. 2nd ed. New York: Architectural Press.
[2] Alexander, C. (1973). Notes on the synthesis of form. London: Oxford University Press.

[3] Aksehir, T. S. (2003). A Study on Architectural Elements of Space Identity:Atakule. Published M.Sc. Thesis, Bilkent University,

Ankara. https://core.ac.uk/download/pdf/52939707.pdf

[4] AL-Daheen, H. A. (1994). The influence of Design Factors on Students Behavior in Universities Central Libraries. Unpublished

M.Sc. Thesis, University of Technology, Bagdad, Iraq.

[5] Al-Sulaivany, H. A. (2011). The Effect of University Buildings Characteristics on Students Behavior. Unpublished M.Sc. Thesis,

University of Duhok, Iraq.

[6] Broadbent, G. (1988). Design in Architecture: Architecture and the Human Sciences. 4th ed. New York: John Wiley & Sons Ltd.

[7] Banham, R. (1975). Age of the Masters: a personal view of modern architecture. New York: Harper & Row Publishers.

[8] Banham, R. (1989). Age of the Masters: a personal view of modern architecture. Translated into Arabic by Suad Abd Ali. Baghdad

Dar Al-Ma'moun for translation and publishing.

[9 Cross, N. (2023). Design thinking: Understanding how designers think and work .2nd ed. London: Bloomsbury Publishing Plc.

[10] Cross, N. (2000). Engineering design methods: strategies for product design. 3rd ed. England: John Wiley & Sons Ltd.

[11] Cross, N. (1984). Developments in design methodology. New York: John Wiley & Sons Ltd.

[12] Correa, C. (1983). Quest for identity. Proceedings of the Seminar: Exploring Architecture in Islamic Cultures1, Architecture and

Identity. Singapore. Published for the Aga Khan Award for Architecture by Concept Media Pte Ltd.

[13] De Vries, M.J., Cross, N. and Grant, D.P. (1993). Design Methodology and Relationships with Science. Dordrecht: Published by

Kluwer Academic Publishers.

DOI: http://dx.doi.org/10.25098/9.1.27

[14] Ettehad, Sh., Azeri, A.R. and Kari, Gh. (2014). The Role of Culture in Promoting Architectural Identity. European Online Journal

of Natural and Social Sciences. Vol.3, No.4. https://european-science.com/eojnss_proc/article/viewFile/4181/1903.%C2%A02003

[15] Gregory, S. A. (1966). The Design Method. New York: Springer Science + Business Media, LLC.

[16] Gregory, P. A. (2017). Formal Logic. Ontario: Broadview press.

[17] Hacihasanoglu, O. and Orer, G. (1998). Architectural and Urban Identities of Istanbul. Open House International. Vol. 23, No.1.

https://www.researchgate.net/publication/387998350_Architectural_and_urban_identites_of_Istanbul_-Open_House_International

[18] Jones, J. C. (1992). Design Methods. 2nd ed. New York: john Wiley & Sons, Inc.

[19] Lampugnani, V. (1986). Encyclopedia of 20th-century Architecture. New York: Published by Harry N. Abrams, Incorporated.

[20] Lawson, B. (2005). How Designers Think: The Design Process Demystified. 4th ed. Oxford: Architectural Press.

[21] Linden, J. C., Lacerda, A. P. and Aguiar, J. P. (2011). The evolution of design methods. In 9th International Conference of the

European Academy of Design at: Porto (Portugal).

[22] Langer, S. K. (1953). An Introduction to Symbolic logic. New York: Dover.

[23] Mitchell, W. J. (1990). The Logic of Architecture: Design, Computation, and Cognition. London: MIT press.

[24] Popper, K. (1961). The Logic of Scientific Discovery. New York: Scientific Editions.

[25] Shirzad, S. (1999). Modern Architectural Movements: International Style in Architecture. Beirut: Published by Arabic foundation

for Studies & Publishing.

[26] Tran, J. (2010). Static Illusions: Architectural Identity, Meaning and History. Perth: Curtin University.

[27] Watson, G. B. and Bentley, I. (2007). Identity by Design. USA: Architectural Press.

[28] Abowardah, E. S. and Khalil, O. M. (2016). Design process and strategic thinking in architecture. In Proceedings of 2nd

International Conference on Architecture, Structure and Civil Engineering (ICASCE). London.

DOI: http://dx.doi.org/10.25098/9.1.27

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[29] Yilmaz, M. (2006). Architectural Identity and Local Community. Ekistics and the new habitat. Vol. 73, No. 436/441. DOI:

https://doi.org/10.53910/26531313-E200673436-441109

[30] Yousif, H. A. and Khalil, K. F. (2019). Impact of Talent Structure on Architectural Design Excellence. International Journal of

Civil Engineering and Technology (IJCIET). Volume 10, Issue 03. Article Id - IJCIET_10_03_064

[31] Zeisel, J. (1984). Inquiry by Design: Tools for Environment Behavior Research. Cambridge: Cambridge University Press.

Appendix 1

Questionnaire

Duhok University - College of Engineering Department of Architectural Engineering

The Impact of Logic in Architectural Design process on Architecture Identity: Duhok City Case Study

Researcher: Hawar Abdullah Yousif

- Purpose of the questionnaire:

The questionnaire aims to find out the impact of adopting logical ideas of a systematic nature in the academic studies within the design process on the architectural products and projects in terms of local and regional architectural identity. In other words, research seeks to explore the relationship of the main and secondary variables of logic in architectural design to the architectural identity, and to measure the impact of this variables on the identity of architecture.

- Information about the person being surveyed:

Name	University	College and department	Qualification	Years of architectural teaching	E-mail

- General Notes:

1- Please answer all the statements in the form, otherwise the form is considered incomplete and does not fulfill its intended purpose.

2- Read each statement carefully.

3- Mark (√) in front of one of the options that represent your point of view.

- Definitions:

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- Rational (logical) architecture: cancels the meaning of the building and emphasizes that architecture is a science that can be understood rationally or is architecture based on science in the first place and cancels history and simulating ancient traditions and beliefs, that is, it is based on abstraction and neglects to focus on the architectural form.... It also considers architecture as a rational building approach that is defined by building materials, purpose, and function of the building. Rational architecture emphasizes the use of geometric shapes and ideal proportions and sizes, i.e. the rational architectural building is designed to house a specific function and not for aesthetic reasons. Rational architecture has been associated with function, industry or technology.

- Architectural identity: It means creating meaning in architecture (the building and architectural space) through historical, local and religious symbols, models, and metaphors.... etc, to achieve belonging, connection, spatial and cultural attachment to the individual, society and the nation.

1- In your opinion, to what extent does the use of the following vocabulary related to logic in architectural design affects the lack of highlighting the identity of architecture?

No.	Category	Variables	very high	high	average	low	very low
a	Secondary vocabulary	Using basic geometric shapes and avoiding organic shapes					
b		Using Monomorphic or unifying shapes instead of a variety of shapes					
c	Notes:						

2- What is the effect of the decoration and the following architectural details on not highlighting the architectural identity?

No.	Category	Variables	very high	high	average	low	very low
a	Secondary vocabulary	The use of prefabricated simple architectural inscriptions and details instead of manual manufacturing					
b		The absence of decoration in the surfaces (walls and ceilings) or the use of smooth finishes instead of rough finishes.					

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c	Notes:

3- What is the percentage of the influence of the following logical vocabulary in the design on not highlighting the identity of architecture?

No.	Category	Variables	very high	high	average	low	very low
a	Secondary vocabulary	Adopting the repetition of the International Style.					
b		Adopting the orthogonal grid method at the level of plans and elevations					
c	Notes:						

4- Do you think that standardization and rational calibration mainly affect the failure to highlight the identity of architecture?

No.	Category	Variables	very high	high	average	low	very low
a	Secondary vocabulary	Design according to the Golden Ratios					
b	Notes:						

5- To what extent does the use of modern materials in architecture affect the failure to highlight the architectural identity?

No.	Category	Variables	very high	high	average	low	very low
a	Secondary vocabulary	Focusing on new industrial materials (steel, glass, aluminum, plastic....etc).					
b	Notes:						

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6-To what extent does the use of color in its following terms in rational buildings affect the failure to highlight the architectural identity?

No.	Category	Variables	very high	high	average	low	very low
a	Secondary vocabulary	Use a compatible binary color (white and gray, for example) instead of stark contrasting colors					
b	Notes:						

7- Within what scope does the design of the openings in the logical design affect the lack of highlighting the identity of architecture?

No.	Category	Variables	very high	high	average	low	very low
a	Secondary vocabulary	Using continuous wide openings					
b	Notes:						

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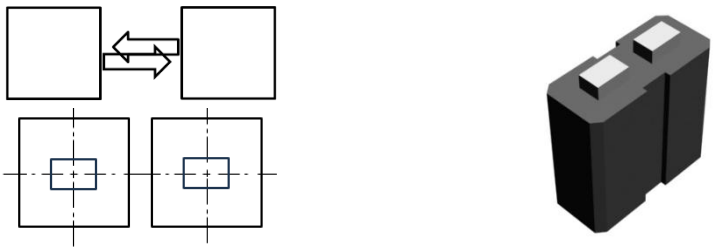
Appendix 2

Graphical Analysis of Logic in architectural design (researcher)			
Case 2: Dabin Apartment Tower at Duhok			
Project Information			
Building Type	Residential	Name & Function	Dabin Apartment Tower
Location	Iraq-Duhok	Year	2016
Pictures			


Site Elevation

No	Main Indicat	Sub Indicat	Graphical Analysis	Evaluation
1	Architectural Form	Using basic geometric shapes	 Rectangle Top View	A
2	Architectural Form	Using monomorphic or unifying shapes.	 Face-to-face Contact 3D View	A

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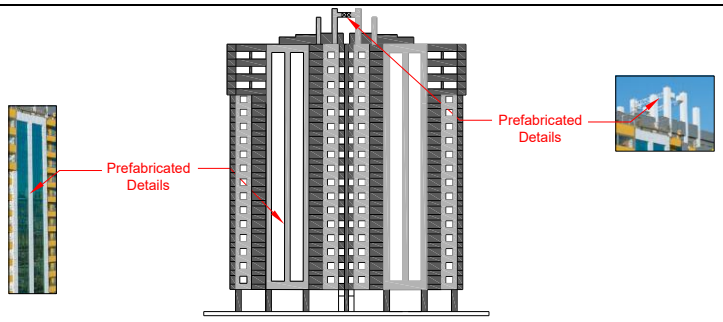
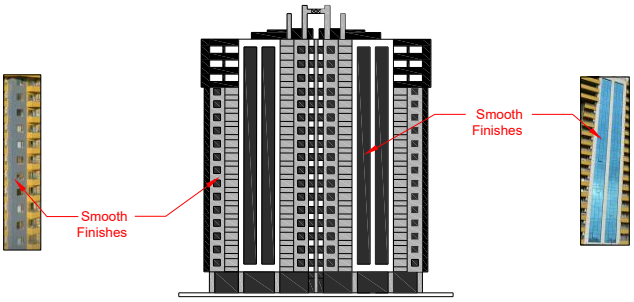
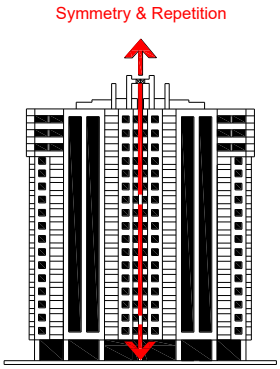
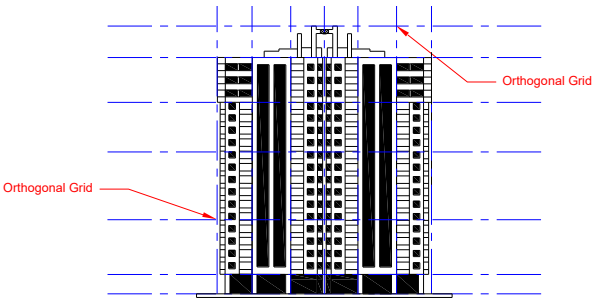
3	Decoration and Ornaments	Prefabricated Details		B
4	Decoration and Ornaments	Smooth Finishes		B
5	Architectural style	Pattern		A
6	Architectural style	Orthogonal Grid In Elevation		A

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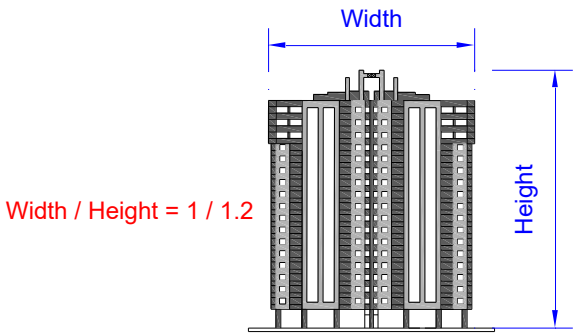
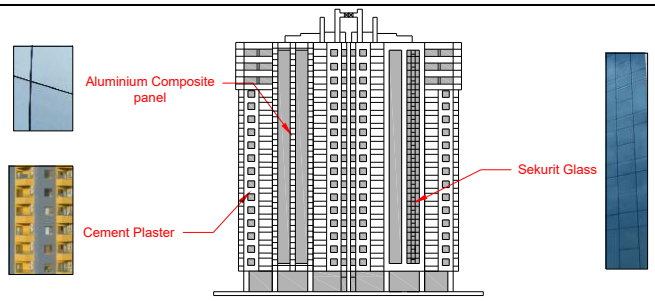
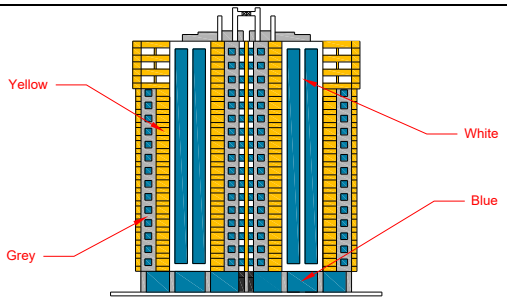
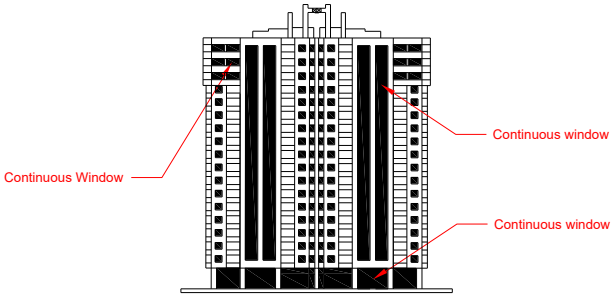
7	Standardization	Golden Ratio Elevation(1.618)		E
8	Building materials	Industrial materials		A
9	Color	Compatible binary color		E
10	Architectural Openings	Continuous openings		C
Possible Value degree: A = 5, B = 4, C = 3, D = 2, E = 1				

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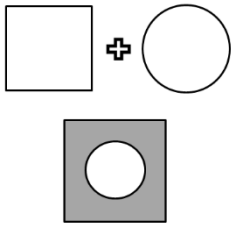
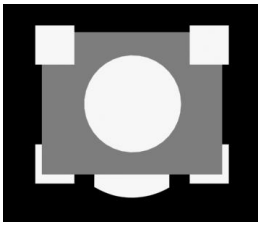
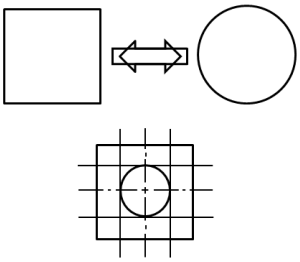
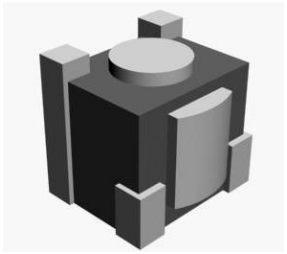
Appendix 3

Graphical Analysis of Logic in architectural design (researcher)			
Case 3: Kurdistan International Bank at Duhok			
Project Information			
Building Type	Commercial	Name & Function	KIB Bank
Location	Iraq-Duhok	Year	2014
Pictures			


Site Elevation

No	Main Indicat	Sub Indicat	Graphical Analysis	Evaluation
1	Architectural Form	Using basic geometric shapes	  Square and Circle Top View	A
2	Architectural Form	Using monomorphic or unifying shapes.	  Interlocking Volumes 3D View	C

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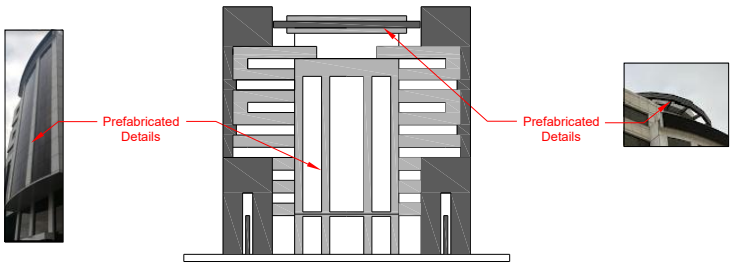
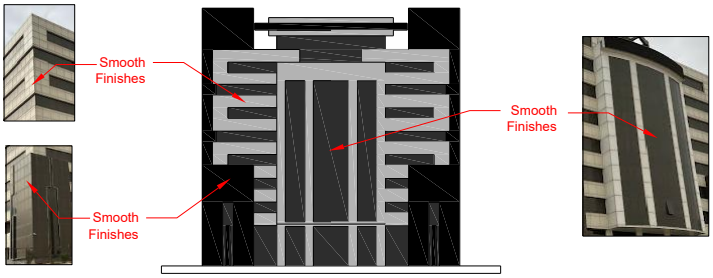
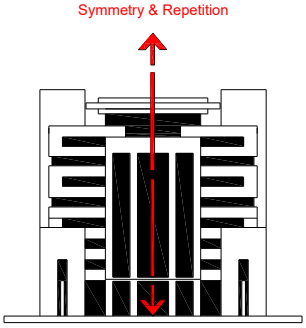
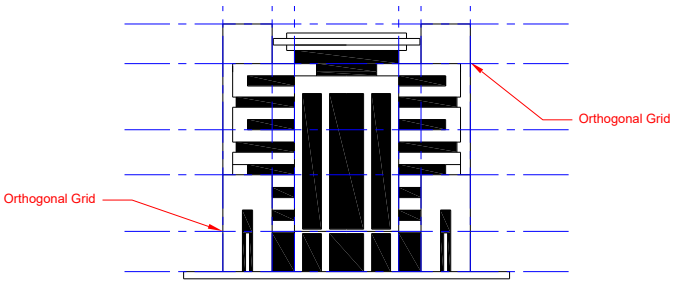
3	Decoration and Ornaments	Prefabricated Details		A
4	Decoration and Ornaments	Smooth Finishes		B
5	Architectural style	Pattern		A
6	Architectural style	Orthogonal Grid In Elevation		A

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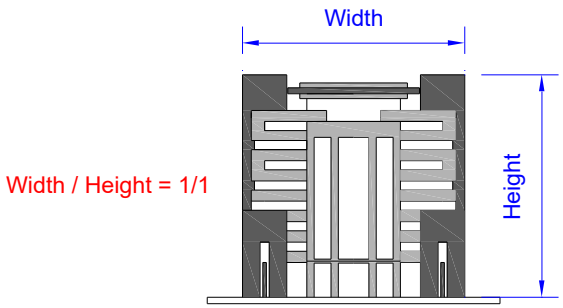
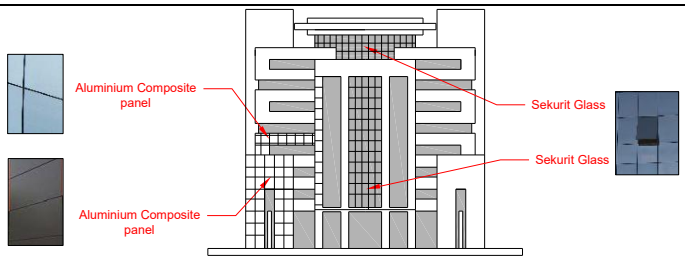
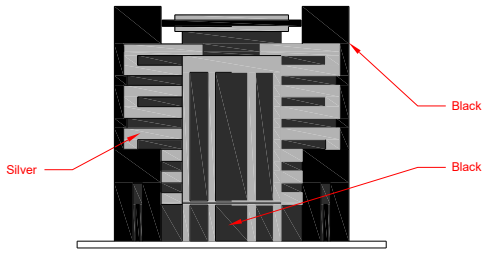
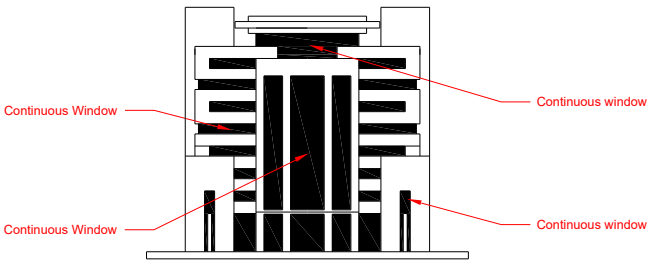
7	Standardization	Golden Ratio Elevation(1.618)		E
8	Building materials	Industrial materials		A
9	Color	Compatible binary color		B
10	Architectural Openings	Continuous openings		A
Possible Value degree: A = 5, B = 4, C = 3, D = 2, E = 1				

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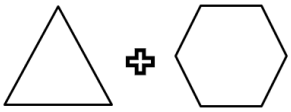
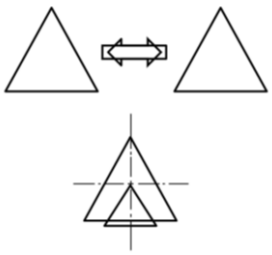
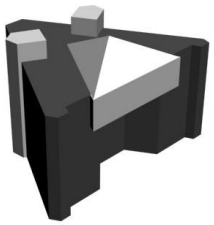
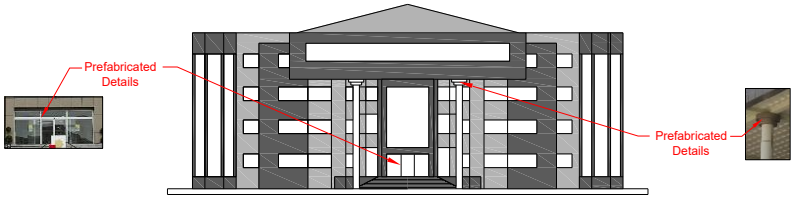
Appendix 4

Graphical Analysis of Logic in architectural design (researcher)			
Case 4: Directorate General of Municipalities at Duhok			
Project Information			
Building Type	Service	Name & Function	Duhok Municipality
Location	Iraq-Duhok	Year	2012
Pictures			


Site Elevation

No	Main Indicat	Sub Indicat	Graphical Analysis	Evaluation
1	Architectural Form	Using basic geometric shapes	  Triangle and polygon Top View	B
2	Architectural Form	Using monomorphic or	  Interlocking Volumes 3D View	B
3	Decoration and Ornaments	Prefabricated Details		A

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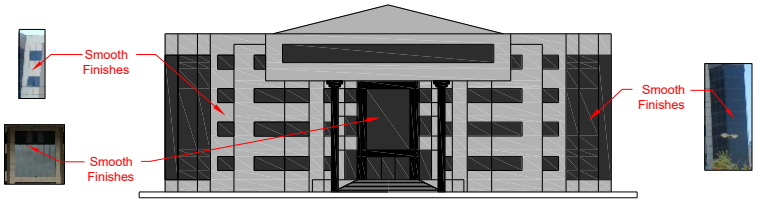
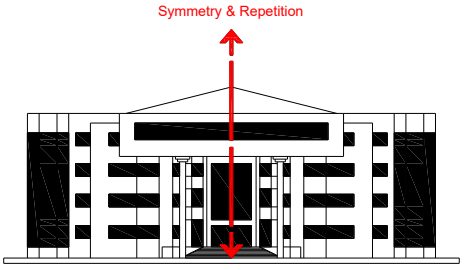
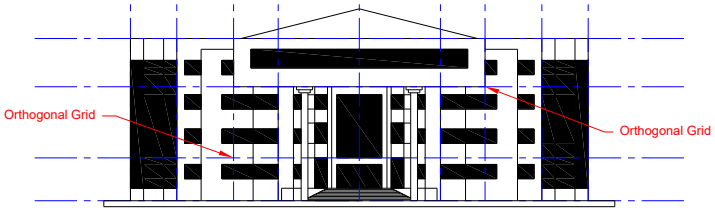
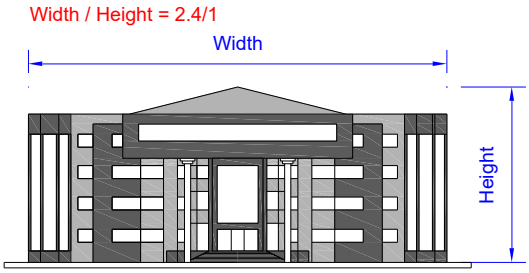
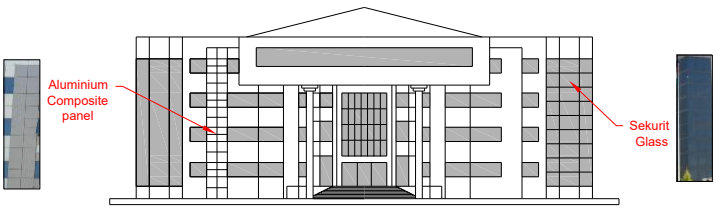
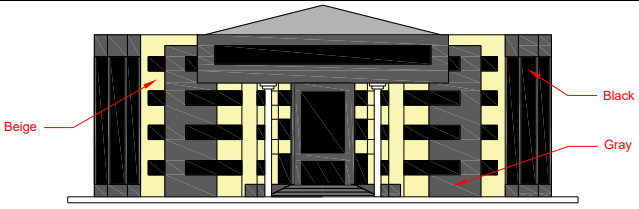
4	Decoration and	Smooth Finishes		B
5	Architectural style	Pattern		A
6	Architectural style	Orthogonal Grid In Elevation		B
7	Standardization	Golden Ratio Elevation(1.618)		E
8	Building materials	Industrial materials		A
9	Color	Compatible binary color		C

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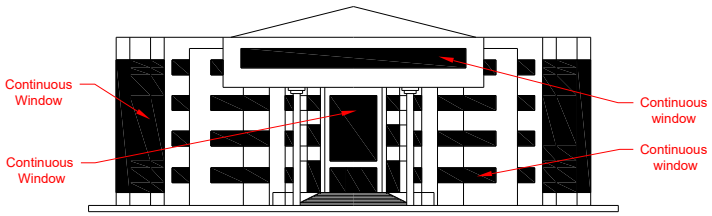
10	Architectural Openings	Continuous openings		A
Possible Value degree: A = 5, B = 4, C = 3, D = 2, E = 1				

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