Functional transparency in digital architecture

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Abstract: Digital architecture plays an important role within the relationship of form to function or in terms of thought and philosophy where it was able to participate in presenting a new knowledge structure for the limits that the designer formulates in the architectural space, with providing modern technology updates such as smart materials and transparent materials. The transparent materials and transparency became important parts of the formal and functional application, providing new solutions for architectural construction and a feature of contemporary production. Many previous studies and research focused on the role of transparency in formal design but neglected its reflection on the transparency of the function itself, as well as its functional importance to digital architecture and this is the main research problem, the research was divided into two main axes: building a cognitive base by reviewing previous studies that dealt with the concept of transparency in order to extract the theoretical framework indicators, applying them, and choosing the research hypothesis by studying a group of global buildings using modern techniques in the functional solutions, leading to a set of conclusions and recommendations that could make it clear that seek a number of designs that affected the creativity of transparent architectural components by imparting a new concept of transparency, as it represented a model for the borders that the human drew in the place and the human relationship with those boundaries, the transparency stands out as one of the challenges that has imposed itself on the entire architectural scene by achieving flexibility and responsiveness with the support of humanitarian activities to meet the career program and achieving flexibility through the use of space for multiple functions by manipulating spaces using transparent space to create creative and dynamic borders and thresholds.

1. Introduction
Any age is related to new principles and approaches that lead these principles to develop new formulas and concepts in design and application at all levels. The age of technology that we are dealing with imposes on us sustainability as a new principle that calls for preserving the environment and not consuming its materials and resources, at the same time and with technical, scientific and cultural development, transparency appears in its various levels, whether explicit or mental, to become a gateway to dealing with sustainability in design, so new solutions concerning the contents and general shape of space are proposed to change it and its features and tend to deal with the fourth dimension of space, i.e. movement, and at the same time we find that the transparency is not a new entrance in the design, but how many of the solutions that have emerged out of this architecture is the entrance. However, by virtue of the evolution of the era, it demonstrates new formulations of solutions, and at the same time, shows developed solutions that have not shown an example before.

Accordingly, the aim of the research was to uncover formulations of transparency solutions in the functional design as an entry point to deal with the principle of sustainability, assuming that the entrance to transparency is not a new entry, but its rules appear in heritage architecture. At the end of the
research, the hypothesis is established and the relationship between the new architecture and transparency appears to achieve the principle of sustainability, in addition to the appearance of new and developed formulations for them. The researcher always recommends revealing new entrances in the field of architecture, whether internal or external, as an attempt to control the movement of technical and intellectual development and keep pace with movement and stimulate the spirit of innovation. Hence the research problem was formulated “The need for clear and specific knowledge in defining the concept of transparency in digital architecture at the level of functional design in the products of local and global architecture.” The research objective came to determine the importance of transparency in digital architecture at the level of functional design and converting spaces into flexible, streamlined spaces in the products of local and global architecture. The research methodology came as “Building a holistic theoretical framework for the concept of transparency in digital architecture at the level of functional design in the products of local and global architecture, and the development of a measurement tool for the achieved transparency as a method for design and its impact on the architectural function and how it is applied to architecture and its impact on the production of shapes, structures and architectural functions.

The research has taken the descriptive analytical approach in building a theoretical framework that can be adopted as an analytical system to study and extrapolate functional transparency through four axes; The first axis deals with the concept of the function in architecture, subjecting to the most important theories and opinions behind its production, which develops the difference in the motives and the reasons involved in their composition. As for the second axis, it aims to complete the analytical system in the investigation of what the concept of transparency possesses of multiple meanings and what the term means in the midst of the formation of functional effectiveness, which the researchers concluded in defining them based on the difference of architectural propositions in the theoretical and practical reality, and from which the third axis is coming, in which research is designed, and then the fourth axis to analyze the application results and conclusions.

2. The conceptual framework for the concept of the function in architecture (The first axis)

Standardization, flexibility, and transparency are the prominent keywords in modern architecture that have also provided subjects for reinterpretation and reproduction in many discussions of concepts such as “form” and “function” in architecture. This study is a study of a number of different interpretations examining the complex relationship between the concept of functional transparency. The aim of this study is to propose a project for a “multi-functional hall” that has the potential to expand its boundaries in the future, in terms of physical and conceptual terms, and discuss “design tools” that will guide the steps of transformations in the process of architectural production. In this context, the investigation is concerned with the production of a flexible, unstable and unspecified building, focusing on the concepts of “space transformation” and “continuous change”, which can be redesigned and re-created with regard to possible future transitions in the program. Consequently, architectural production is defined as just a “step” or “early snapshot”, controlled by design tools that indicate solutions to permanent transformation always as conditions change.

2.1 Functional in architecture:
The function is the benefit, the reason and justification for the existence of the architectural work and is the first and the most important influences on the architectural form. The first fundamental principle in functional theory, which was launched by “Louis Sullivan”, is “the form follows the function”. In fact, sound logical thinking must lead to that, so the shape must be a result of achieving the functions, as the surfaces that make up the architectural form are nothing but levels that define spaces that have the functions for which they were created, and therefore the evaluation of the architectural form is not correct unless it is based on the link between the form and the function that created and led to it, as the function is the motive which evacuated the shape, and the success of the form is due to its submitted service (1).

- "Functions are looking for their forms and forms are the outward appearance of internal needs," says Louis Sullivan.
Le Corbusier says: "The house should be a machine to live in." He just wants to emphasize the important role of the function in producing life-related architecture.

We can say that the function imposes on the form general of conditions on the architectural form.

**Functional theory in architecture:** It is a scientific and intellectual theory that governs business from the point of view of performance and efficiency and governs the validity of the shapes to the extent of their suitability for this performance, in that it is a primary principle that is almost intuitive because the condition of interest is the original motivation for the existence of buildings, and the human being differs in particular from all other natural beings in that he has many aspects in his understanding of a solution to many problems in the theoretical basis of functional architecture. Among the principles of functional architecture: focus on benefit, focus on durability and beauty, which is the outcome of achieving benefit and durability, and focus on the concept of space and open space and the continuous space. Historically, the roots of the functional theory is with the beginning of the 20th century, but theoretically, its roots go back to the middle of the 19th century, as it was considered one of the most important architectural trends of the French school of thought that appeared at the beginning of the 19th century and lasted until the middle of it, so the functional theory is considered a natural extension of it that has continued and kept pace with the development of architecture to this day (2).

In the aftermath of World War I, the development of modern postwar architecture is closely related to the rapid growth of construction technology. The transition of the building towards the industrial method in producing synthetic elements and employing the impressive successes of this industry such as the ability to roof wide spaces, and obtain cantilevers of great dimensions, in addition to producing a wide range of finishing materials, etc. ... all of these are very favorable for the functional trend, that trend that relied mainly on constructional successes and the use of manufactured building materials. The engineering investigations carried out by the famous Italian engineer P.L. Nervi (1979-1891) in the field of spacious space roofing; his work on reinforced concrete and his distinguished discoveries in this field, considered this one of the important works that contributed to providing modern architecture with contemporary methods and materials. In his remarkable constructional achievement of the roofing of the Great Hall in the exhibition "Toronto", the span of the constructional span reached a distance of 94.85 meters, which earned the entirety of the structural installation of the building lightness and beauty, unheard of in previous construction for centuries. Thanks to the rational employment of the advantages of structural installation in buildings and the presentation of an outward appearance, wide interior spaces were obtained without intermediate pillars, which are appropriately aligned with the peculiarity of the technological processes taking place within the space.

The systems of work and manufacture of pre-structural elements in the atmosphere of factories played an important role to be reckoned with in the field of the progress of modern architectural thought. These elements included the production of panels and surfaces manufactured of various materials, and included the implementation and manufacture of structural frame systems in place in those laboratories and workshops. The spread of the building manufacturing style and its structural elements led to the necessity of simplifying the architectural forms, and moving towards the use of the Standard Module System (3). All of which played an important role in enriching the processors and contributed to the development of modern architecture, especially functional trend. In fact, the first decade, following the Second World War, saw the consolidation of the stream of functionalism influentially in the architectural scene.

The "Mays" has paid increased attention to the issues of standardization of the structural elements in the educational process, and has shown great concern in dealing with the means of assembling those elements; believing that the utmost simplicity that can be achieved for each structural element, and the lowest number of measured models, will facilitate the process of manufacturing construction. This process, which has been observed, is a prerequisite for the success of the design project. The "functionalism" of the 1920s promoted a lot the thesis that the architectural form of the building is determined by the job and the purpose that that building was built for, but that "Mess van der Roe" reached in the post-World War II era a completely different and opposite conviction of that thesis, as it is acknowledged that the modern building may transform variously and various functions, and therefore there is no necessity leading to the necessity of changing the structure of the building in order to change its function; hence the architecture sought to create a new training system called (comprehensive spaces) that is able to accommodate the changes of the changing job and preserve the potential of the building and its shape. Of course, the "Miss" in this design approach, has taken into account that the realization of the concept of "universal spaces" a design should be within the limits of the functions.
of a homogeneous and convergent, did not seek to smash the differences Altaablogih Typology of the quality of buildings.

In 1940, Mays receives a new building design contract for the Illinois Institute of Technology’s colleges, but the implementation of those designs was postponed to the end of the war. In this project, the main creative ideas of the architecture were embodied. The plan is very simple and is based on a modular network, in which the wide uses of standardization are demonstrated: standardization of the structural elements that constitute the main construction system and which in the end gives the building aesthetic value, in addition to the clarity of the design idea for each building from Buildings of the complex. In the building of the Department of Architecture at the Illinois Institute, which was called the "crown hall" and which was completed in 1956, the concept of "comprehensive space" was employed as one of the main ideas forming the formative solution, as the building is covered with a roof carried by steel girders exposed to the outside, which allowed access to space A spacious hall with dimensions of 36.5 x 64 m, with a height of about 10 meters, and completely devoid of central pillars; the hall space can be divided into spaces of various capacities by using movable partitions that do not reach the level of the ceiling of the hall. Glazing the walls of the entire building (use tinted windows for the lower part of it) as well as the smooth surfaces of floors and ceilings contribute to enhancing the sense of the unity of the designed space and strengthening its overwhelming presence in the design solution. The technological complex of Illinois has aroused great interest in the global architectural circles due to the novelty of the chosen form that implies minimal simplicity, the simplicity that represented the presence of new aesthetic values, stemming mainly from the methods and standards of modern building technology, as shown in Figure (1) (4).

Figure 1. crown hall - https://www.google.com/url?sa=i&source=images

Figure 2. crown hall - https://www.google.com/url?sa=i&source=images
Seagram's multi-storey administrative building in New York, designed by "Mies van der Roe" in association with "Philip Johnson" in 1954-1958, is of significant importance in the progress and development of modern architectural ideas. In fact, this building has received an increased attention that is realistically proportional to the event of its appearance. Mays was able to achieve in the architecture of this origin one of his most important design proposals known as "flexible design", that thesis he worked on a lot from an early date during his studies and plans for the idea of the administrative building. The talk, in the twenties, which is based on an idea based on fixing the location of the elevator unit, sanitation and other services on each floor of the building, while giving the possibility to change and alter the quality of the other spaces remaining on each floor, with the help of mobile partitions (5).

From the foregoing, it is clear that not only should buildings and houses be designed around the purpose of the job, but architecture should also be used as a means to create a better physical world and a better life for people in their broadest sense with the goal of "creating a new man and a new society" as the global movement and ideas of modernist architecture became widely known. Among architects, functional architecture emerged.

2.1.1 The relationship between the architectural components
The linkage between jobs is an important process in order to determine the final voids and the forms of these voids, so what defines the correlation of spaces and places them in architectural blocks is their functional relationship, it is an essential and important aspect that determines the extent of the integrity of the building and its movement on the one hand, and the connection of shapes on the other hand, that the easy linking in the relationships between the architectural components leads to ease in use and to identifying common functions that can be in direct or indirect relationship with each other, as these relationships lead to a separation in business and Jobs and this which leads to the convenience of the public and the You will use the ease of movement, movement and service between the various voids. These relations also lead to placing each job at a certain height, as the separation between the floors also begins and the opening between them. More generally, the linking relationships between the architectural components determine the relationship of opening and closing in the architectural blocks. In terms of form (6).
• In the direct relationship, the following is determined: merging the voids with each other horizontally or vertically - merging the internal space with the outer space, which causes an opening in the interface and is one of the important things in the formation and architectural formation of the facade - the voids are formed from simple cutouts and configurations in the internal voids.

• In the semi-direct relationship is determined: glass and transparent elements are placed in the facades and between the voids - the walls, doors and windows are placed and are important formations in the internal and external architectural configurations and in the facade.

• In the indirect relationship, the following is determined: The corridors and doors are set and they facilitate the movement of the human being whenever they are more clear and are affected in the mass formations of voids - The linking relationships between jobs or the relationship of separation and division give distinct importance to some spaces and spaces, especially with regard to public spaces or areas of interest to the public such as Entry hall _ restaurant lounge _ sitting link _ gyms… etc.

These spaces and spaces take great care by designers to make them attractive areas, and they become active and increase the work of formations, decorations, decoration, and colorful lighting, and expand the spaces. These blanks become open and comprehensive, and these important spaces must be allocated to these spaces and jobs in the building according to their importance and according to the number of individuals that absorb them, that the linking relationships give us the grouping of jobs with each other according to their importance and according to their relationship with the residents and the public, so we see that it is necessary to separate between public or semi-private spaces Special spaces, and this chapter determines the movement of users to it. In public places movement and activity increase and the number of users increases, and it is more related to the external space. Whereas the likeness is general or the likeness is private, the relationship with the external space or adjacent spaces is less and the percentage of users decreases, while the private spaces are completely closed and have privacy and are far from noise and noise and the number of users is few, for this reason the vacuum has a great privacy such as the blanks of the sick family or bathrooms ... etc. (3)

3. The second axis: functional transparency in architecture:

The concept of transparency has emerged as one of the important concepts that describe the characteristics of the cultural product of the twentieth century and up to the twenty-first century .. Including the artistic and architectural product, and the concept of transparency in architecture has been associated with an intellectual development of civilizations and their social, political and economic concepts ... etc. In addition to the physical and technical development in discovering new mechanisms to achieve The concept with its formal properties. In terms of intellectual development, the important discoveries and cultural and social renaissance from the Renaissance to the present day, which is liberalization and democracy, and the affirmation of the human ability to achieve great accomplishments, have had an important impact on the development of the concept of transparency. Drawing the concept of transparency in architecture (7). Within the research path, a focus was placed on internal functional transparency. The focus of functional design focuses not on creating comfortable and attractive internal spaces only, but on reducing potential negative impacts in such a thousand. Raghat. (8) It became an entry point for this need to resort to a principle called transparency. Sustainability and digital architecture is the new dress worn by the era of informatics, as it has influenced the shape and spirit of architecture and design through new concepts that may translate into content with features and standards. It appears in an era that takes care of generalizing something and expanding its circle to include the whole or the world and transferring it from limited to infinite so that it exceeds the political borders of countries and unleashes the frontiers of economy, culture, arts and communication to move and flow across the world along the length and width of the vast space of the globe (9). And that is within the framework of one system on the basis of a triangle of ribs: economics, knowledge, scientific and technological progress, and the information age also focused on the necessity of dealing through the principle of transparency. Did these trends and the principle of transparency impose new internal gaps worth noting to be dealt with? Do these blanks have special dealings? What are the new standards for dealing with the internal vacuum in the context of sustainability and transparency? (10).
Sustained design: Sustained design is the design that hopes to link technology, economics, and beauty standards associated with shaping, proportions, scale, texture, shadow, and light. Edmund N. Bacon said in "The design of cities 1974": Design is the relationship between mass and space, i.e. formation. Texture, materials, lighting, shadows and color are the interrelated things that give value and personality to the interior and exterior and depend on the designer's skills. It is at the same time a balance between a person’s needs without ignoring the health aspect and environmental treatments (11) natural, especially treatments associated with function, natural lighting and ventilation, that the material foundations in sustainable architectural formation and its development were a strong basis for promoting the concept of transparency in architecture and that integration between thought and matter has led to the promotion of new symbolic concepts of the concept of transparency, such as clarity, reflection, ambiguity and arousal of memories, as well as functional and climatic aspects. Thus, intellectual and formal mechanisms have emerged to achieve this concept, namely:

- Formality mechanisms: optical formations, spatial formations, space interference.
- Moral mechanisms: symbolism, suggestive, interpretation

3.1 Concept of transparency in design output: The different architectural studies of the architectural productions show the importance of the formal aspects related to the optical properties in addition to the moral aspects of the concept of transparency. Brown's arguments touched on the relationship between architectural product and cubic art through the overlap of layers or spaces and their transparency by drawing on cubic art and trying to reflect them on the site through two or three dimensions. The Alley Gallery project design project was highlighted within a constructed urban fabric that defined transparency in the physical form through the degree of internal communication with the outside through the overlap of layers at a level, so the methodology used in the design through the spread of the optical areas overlapped and in order to achieve new readings of the spaces resulting from the differences and interference between the space parts and thus means pluralism in the mean Namufhom transparency on the horizontal design (12).

Transparency as a fundamental factor in functional sustainability: Transparency is a philosophy that is not new that has been built on the basis of contemporary architecture and a club in which modern-day architects and artists intertwine with nature and the openness of the interior on the outside, and the transparency of the element, but rather reaches the mental transparency that the researcher calls the absolute transparency that It leads to the execution of the mass and its fading, and this may end up in a structure without form or space, which is the Dutch architectural "Reem Kolas" where the building is not possible and unexpected, it employs high technology - which goes beyond the technology of building materials and construction systems - at its best in order to build a building that does not T Luxury with all the architectural traditions of historical architecture are very liberal about everything linked specific base. This of course has led to unusual visual spaces. (5) This transparency emerged by applying the principle of vacuum sustainability through all of its concepts. Transparency can be classified as follows:
First / explicit transparency: There are multiple levels of transparent transparency to accommodate one-way transparency and two-way transparency, then transparent surfaces. As transparency through the material of glass in a unified form means access to natural lighting, protection from external rain, and protection for heat leakage from the inside to the outside, and this was the way to use glass in the Old Testament, and this is what did not require access to complete transparency or large areas of transparent openings, the purpose is specific. The possibilities are limited. As for transparency in two directions, it is intended to deal with the external nature and reveal who is inside to the outside. This means reaching the high purity of the glass material in addition to reaching the largest area of it and the industrial progress of the glass material has achieved this goal since the last century. At ten, and this appeared to us in the Palace of Versailles, France in 1670 AD.

Transparency is also an extension of a curriculum that modern architecture has long attempted to enrich, so we find an extension of Mizvan Derwa's work, which reveals that he is one of the first users of multiple glass layers in his buildings, and this is an affirmation of the interest in environmental control since modern architecture and the impact of technical progress in changing the features of this customary control that was limited to Heavy casings and large openings. The principle of transparency appeared in the second half of the twentieth century in the German-speaking countries during the building biology movement and it adopts a scientific approach containing a holistic view where the relationship between people and Buildings where the building is compared to a living organism that represents the third layer of the human being, which achieves its insulation and protection, as the clothes are the ones that represent the second layer of skin. The goal of this architectural movement was to design buildings that satisfy the human physiological and spiritual needs alike, as the building with its elements, colors, and even odors must interact and harmonize with both the residents and the surrounding environment (13).

Second / Absolute Transparency: Absolute transparency is a philosophy that has been discussed since the 1960s under the name of deconstruction by the French philosopher Jacques Derrida, and many philosophers such as Rosac-Smith-Franken Stein have discussed it, so some analysts or critics develop some perceptions or concepts that explain the image of deconstruction as an accident. It distorts the features of something and causes it to deviate from its reality. It is a science or culture that searches beyond nature - at the level of all sciences or arts, and it is also a culture of contrast. This has become a principle and needs mental freedom that the right to property meets, so with this principle the mind is displaced to what is the basis of reality and beyond reality and life to the greatest extent (14) and this case is called virtual reality (alternative or imaginary case), which is more like The virtual place (which is the virtual space on the computer.) Analysts are likening virtual reality to the special strategy for treating the patient, as everyone who establishes a hospital, medication, or special techniques to get the patient to a cured state are all strategies for treatment or changing the situation from one case to another. Of transparency vocabulary Influencing the internal vacuum shape represented by the means of virtual reality, the elements moving in the vacuum, the lines and curved levels. Virtual reality appears to change the course of the age and is a cause of the transformation boom which makes the architecture be driven towards the digital stream. It can be reached through some devices that inspire nature and these are The devices in the computer and the stereo scope are opposed to these devices complementary to full coexistence, such as devices for sound or sensation of heat. These means did not appear evidence in the traditional architecture, it is a technology of modern times. (15)

3.2 Latest trends in contemporary architecture: There are many elements that contributed to the definition of current architecture that helped revolutionize the way we deal with architectural design today, namely: loss in general, the individual reference of the designer. As in the artistic field, where the director tends to create collective artworks, and even in the field of architecture products now are essentially an expression of a collective effort, which is made by teams consisting of different skills that surround the central architectural personality attributed to him the overall design idea. One of the methods used is transparency, which means the interconnection between different skills. It occurs at an early stage in the creative process, and work is created through communication. Which becomes an essential element in the architectural thing, both from the verb in which it is born and also from the goal that is required of that very thing when it is achieved in place. In fact, what most designers want to achieve is the property of transparency, which can lead to "communication with The outside
world, "if not physically fulfilled, express it at least in a theoretical manner. Transparency in terms of the connection between the architectural structure and the human being, between the subject and place and between the container and the cultures contained, in other words between architecture and the complexity of the context. Communication changes the boundaries of the regions, physical, ideological, social and cultural. It stems from a mixture of different cultures and architectural traditions, mixing languages in terms of content and even perception of space. From the encounter of these different languages, and from the revolution of the information society, a new approach is emerging to visualize the architectural space that is no longer built on the foundations and concepts of Euclidean space. (16) Digital Revolution: This revolution should not be underestimated in the transformation of the contemporary architectural language that introduced (from the early 1980s) the possibility of using specialized software for design (such as computer aided architectural design), which helped fundamentally change the architectural design stage. These discussions had sparked in the past — sometimes without foundation, the effect that software could have on how architecture was created ... They feared that such technical measures of drawing in the long run could lead to huge losses in the language and identity of architecture. And also in the same design ability.
The advancement of nanotechnology: Another element that should be considered in the scope of architecture is the advancement of technology and the structural development of the building's exterior cladding. Using new materials that were not in mind, as an architectural use, new ways to "deal with" traditional materials are explored, suitable for new aesthetic and environmental requirements. Innovations come up with new shapes, even in the project's most daring assumptions. Many companies specializing in modular systems and units allow the production of panels for the exterior cover of facades, which are like a thin veneer, it is now familiar with the language of architecture, the use of the term "leather" from the building, it is the high technology of the materials that make up that "leather" allows to effectively separate the environment. The exterior from that of the interior gives functional flexibility in functional design, so the current architecture scene has become contradictory, rich and surprising. The architecture calls for continuous comparison with other means of expression and communication and for mixing patterns of modern technologies aimed at increasing respect for the environment and assumes improvements in In ecosystems such as thermal insulation and exploitation of alternative energy sources, there is a growing interest in building materials.
Dynamic architecture: An open architecture of a dynamic concept of time, which takes a more attentive character to the ocean. It combines different and distant patterns, sometimes in one architectural rationale, but also looking at local cultural traditions. Sometimes she seems to have completely independent languages, and she wants to show the contradiction deliberately. The enormous potential offered by modern technology provides scenarios that have not ceased from experience, and this prevents the study and analysis of trends. Compounding the analysis, architects are constantly trying to find new items. Some names emerge for architects representing the current architectural scene: Frank Gehry, Zaha Hadid, Renzo Piano, Mario Botta, Norman Foster, Santiago Calatrava and others, and technological progress has changed the functions of the facades unlike the past no longer has its old concept related to beauty and isolation from the outside ocean, and on Architects must respond to the environment and future expectations of it in order to fit these expectations (17). Coupled with the achievement of this level of transparency, there are some explicit approaches or approaches that are represented in the free horizontal projection, transparent structural elements within the internal space and publicity. T complementary transparent.
The free horizontal projection is the feeling of roominess is a psychological comfort (18). It increases by increasing the brightness of the flats, especially those that reflect more light and directed lighting voids that are perceived to be larger. Accordingly, the main entrance to deal with the widening space that deals with light has become the design of the horizontal projection free of structural elements, and this necessitated the use of different structural systems based on free tiles that do not need to place dense columns in it, and at the same time it was necessary to search on smart construction methods To reduce the columns for carrying tiles from their ends or ends in a place outside the projection, or they may be adjacent to it and at its edge, so as not to disturb the functions of the projection and make it free and versatile and not obstruct the visual vision, and the design of a free space always requires the architect to familiarize with the systems of structures Structural and the maximum free space it can
cover without penetrating it. (19) Tensioned structural supports are the best way to achieve maximum transparency for the methods of loading the tiles raised from their ends. Which has had the internal reward as it performed the function of the inevitable plastic component of its concealment and must be dealt with in terms of the complementary elements. Examples appear to us in both the City Hall building in London and the Hyper Green multifunction tower in France for the architect Jacques Frer and the World Square building in China (Figure 6), (7), (8).

Moving elements in a vacuum: movement appeared in the building when the idea of applied doors and ceilings that changed the shape of the place in addition to deletion and openness appeared. But in the current era, designers resorted to the use of smart materials that simulate the fourth dimension in a vacuum and that represents the movement, as these materials respond Negative and positive energy, and references indicate that smart materials (20) is a new term for materials with variable properties that can change their shapes, sizes, or colors in response to physical or chemical effects such as lighting, temperature, or interference of electrical forces. These materials are considered functional materials.

Figure 6. Some stills, City Hall, London, 2005

Figure 7. horizontal projection and some shots of the 2006 Hyper Green Tower Building. This multi-functional building in France for the architect Jacques Frer, where it shows the use of the central battery to achieve the transparency of the horizontal projection, as well as the external tensile supports for the tiles of internal performance.

Figure 8. Some snapshots of China's global Synostel Square building. Snapshots show the actual return and realization of new creation elements in the form of a vacuum.
Curved lines and levels: The straight line represents the tensile values between two points, the most important characteristic of which is direction. The horizontal line gives a sense of balance and stability and the vertical line is a reference to balance and the forces of gravity. Touching the curve gives a sense of energy and growth. (8) The moderation and balance in the use of lines in design gives a good level of excitement in addition to breadth. This is achieved by the multi-curved lines that appeared in the modern era that affected the job and formulated it in its new form. Figure (9). (21)

Figure 9. interior clips of the Estonia National Museum, Estonian national museum, 2005

The building, with its elements, colors, and even its smells, must interact and harmonize with each of the residents and the surrounding environment, and this until it transcends and reaches this transparency to its fullest extent, where mental transparency and dealing with the element and design through a metaphysical approach, where the distance from the familiar and the approach of everything that is abnormal from Al Qaeda, with the help of great technical progress.

4. The third axis: Previous studies
After the two axes were presented in the previous concepts related to the job and transparency from specific aspects of the research, it will be in this axis to complete the presentation of specialized studies for the purpose of benefiting from them with the previous axes in the design of the research and will be clarified through the following scheme:

| The study | What the study touched upon | The study | What the study touched upon | The study | What the study touched upon |
|-----------|-----------------------------|-----------|-----------------------------|-----------|-----------------------------|
| The proposals of Abdul Karim Hassan 2008 | I focused on open architectural design "is that design liberated as much as possible from the deaf walls that extend from floors to ceilings, or replace them with light transparent or semi-transparent partitions aiming at: •Do not hinder the visual communication of the spaces, •Do not prevent penetration of natural light or ventilation into the building's voids | Emphasis on the architect theory, Miss Van Druh, called "Universal Space" or "one room theory", and he achieved great success in his facades due to its extreme simplicity, beautiful architectural proportions, and frank construction. |
Theses of the war 2013

Theses (war) proposed the definition of modernity as “a continuous creation, a problematic vision, and an incomplete experience. It is a critical attitude towards the self, the truth and the intellect, which allows a departure from references and models or breaking frameworks and templates, always seeking to build new possibilities of thought, saying and action, and this is what witnesses With the process of philosophical modernity: from Descartes until the present time, we find that the relationship of the mind with itself and with its systems and products is a critical relationship in the first place where modern architecture adopted the transparency of the form of meaning through the principle of form follows the function. That is, the shape is transparent and reflects its functional meaning, as architecture emphasized Modern on stripped of the meanings that T. Mlha buildings which appeared as signs of the meanings of direct and specific use of simplicity, repetition and abstract shapes.

Scott \ 1951’s treatises

The proposals emphasized the concept of transparency by proposing the nature of the approved materials to achieve transparency in the three-dimensional or two-dimensional configurations, as it indicates that it is not necessary to use areas of transparent materials to obtain the concept, as it is possible to use semi-transparent or opaque materials to achieve the same visual effect through overlays. The classes also emphasized that "the practice of many modernity architects represented in replacing the walls and partitions with other transparent glass to reach a higher level of space organization represented by the perspective of continuous space and unified psychologically and optically".

Al-Baghdadi’s Theses / 2004

Al-Baghdadi’s proposals include revealing the ambiguity surrounding the relationship between transparency as a design tool and the extent to which the phenomenon of visual illusion is realized in its real size in the commercial inner space, and thus through: The proposals suggested the possibility of achieving transparent continuity, for example, by adopting a transparent optical barrier that separates spaces such as the use of glass or the like.

Make sure that the open projection is that projection that is liberated as much as possible from the deaf walls that extend from the floors to the ceilings, or replace them with light transparent or semi-transparent partitions, do not hinder the visual communication of the spaces.

The propositions refer to the concept of transparency through space organization (two-dimensional and three-dimensional) and the expression of the concept through the glass to generate many visual.

It is clear that Al-Baghdadi’s proposals provided an appropriate theoretical basis on the concept of transparency through: The concept of the joint and its effect on the concept of transparency, Transparency mechanisms, Levels of transparency, How to achieve transparency.
He pointed out that: "Any enlargement in the apparent size of the inner space using the transparent factor is one of the most influencing factors on our visual sense, because it does not reflect a sense of capacitance through a specific shape or static intimation, but rather provides images" and scenes with three dimensions that increase the depth of the perceived scene, and in what achieves the state of delusions, as the employment of this transparent factor through the articual openings, thus these joints act as a traveling feeling of closure or the so-called space containment and turn it into a high transparency that generates a visual sense of not cutting the vision and continuity."

The presentations focused on introducing a new methodology for crafting architectural elements and their relationship with each other through the creation of overlapping optical spaces and to achieve readings, new for spaces resulting from the differences and interference between the space parts through, the concept of transparency exists.

It is noticed from the questioning of the various architectural studies that dealt with the concept of transparency in its propositions, whether they proposed the concept implicitly or in a specialized manner, but the apparent lack of concept proposals as a design strategy related to specific functions, therefore the research problem that can be identified with:

The cognitive deficiency in the role of transparency in the formal design and its reflection on the transparency of the job for digital architecture. As for the research goal: it is represented in two axes: the first: defining a theoretical framework for the concept of functional transparency in architecture, and the second: defining a comprehensive and clear theoretical framework on the concept of transparency as a functional feature, and exploring the mechanisms to achieve it in the products contemporary architecture. Crystallization of the theoretical framework vocabulary has been reached by relying on the indicators that appeared in the previous axes in addition to the indicators that appeared in the discussion of architectural propositions, and so the vocabulary of the theoretical framework can be presented in its final form according to the following vocabulary: (factors affecting the concept of transparency - the level of achieving transparency - degrees of achieving transparency Functional).

| The main items | The secondary items | The variables | The possible items |
|----------------|---------------------|---------------|-------------------|
| Factors influencing the transparency concept | Transparency objective | Achieving formal beauty | Solving functional problems |
| | | Weakness of the building | |
| | | the shift | |
| | | Lightness | |
| | | Continuity | |
| Functional transparency | | |

Table 2. Theoretical framework table:
limitation

Clarity of space relations

Transparency

Achieve visual pleasure

Function

Achieve sensory communication

Visual

Achieve expressive physical form

The meaning of functional transparency

Clarity

Directness

Honesty

Mechanisms to achieve functional transparency

Space regulation mechanism

New tectonic visualizations

Dynamic mechanism

Functional configurations

Kinetic tension

Interference mechanism

Optical interference between spaces

Connecting formal words to continu-ous relationships

Suggestions for different surfaces

Visual interference

The supporting elements are represented by the inner partitions

Continuous and open spaces and unified space

Continuity

Flexibility mechanism

Streamlines or surfaces flow

Asymmetric open plan

Levels of achieving functional transparency

Within coordination relationships

Space organization relationship

Floors

Plans

Sections

Streamlined relationship

Openness

Extension

Continuity

Linear regulation relationship

Movement

Horizontal direction

Vertical direction

Collective organizational relationship

Flexibility

Scalability

Understand the changes

5. The Application:
After proposing studies that dealt directly and indirectly with the research topic and extracting the vocabulary of the theoretical framework for the research problem in the previous chapter thereof, the stage of determining the basic requirements for the application stage of contemporary architectural products comes, these requirements include the election of the vocabulary adopted for practical application and then put forward the general and specific assumptions of the research problem. Explain and clarify methods of measuring variables, collecting information, and specifying samples to be applied. Reasons for choosing the vocabulary holistic vocabulary and its association with the process of functional design, the effect of those vocabulary directly on the architectural output, most studies addressed these vocabulary as sources for creating the architectural output, those vocabulary contains detailed values and indicators that ensure ease of measurement and accuracy.
As for the research hypotheses, they were represented by [the factors affecting the concept of transparency and transparency of contemporary architectural production vary according to the variables of the concept determinants through its purpose and function in addition to the determinants of its meaning (clarity, openness, openness, continuity). The mechanisms for achieving the concept of functional transparency in contemporary architectural product vary according to the different components of these mechanisms in terms of being a streamlined mechanism, a flexible mechanism, a space organization mechanism, a dynamic mechanism, and an overlapping mechanism and a dynamic representation mechanism.

6. Samples description:
1-multi-function hall in central academy of fine arts- china- 2018
This multifunctional hall is located in the middle of the architectural complex of the Central Academy of Fine Arts, and was always one of the largest one-story interiors in the academy, before the renovation, the School History Museum was, but the original interior space was too old to be used in modern teaching. On the occasion of the academy’s first centenary in 2018, a series of adjustments were made on campus, then this architecture turned into a multi-functional hall, which is now used as an art gallery hall for daily education, and at the same time, it can be a place to hold various activities, such as Large meetings and presentations for teachers and students. Designers used folding panels in some parts of the walls to provide a coherent viewing space. Previous doors and windows were hidden inside the walls. The aluminum grilled ceiling in the inner hall contains lighting, air conditioning, firefighting, audio devices, etc., where some adjustable lighting columns have been installed with smart control. The brightness and height of industrial equipment can be adjusted according to changing functions When the hall acts as exhibition venue, the track lighting poles can be lowered to a height of 3 meters to ensure the lighting can be manually controlled and adjusted according to the location of the display sections. When using the hall for meeting and performance, lighting poles can provide dynamic changes and create a specific atmosphere. The scenes area is mainly used for displaying partitions and storing movable furniture, and part of it has been converted into a VIP lounge that continues to be used as a folding wall surface. All facilities and equipment in this regeneration have been hidden within the full materials to show a clean and brief spatial view. When this space becomes multifunctional it adopts the continuity, transparency and smart technology of materials to serve the multifunctional.

Figure 10. multi-function hall in central academy of fine arts
https://www.architonic.com/en

Figure 11. multi-function hall in central academy of fine arts
https://www.architonic.com/en
2-the hub zurich co-working space for social innovators: construction started- 2011
We face multiple crises in the global economic, social and environmental fields, and innovative solutions are needed to tackle many challenges at hand. Hub is designed to facilitate these solutions by creating a global network of collaborative spaces where entrepreneurs and social creators come together to fulfill their ideas for a sustainable society. Already in 22 cities and more than 60 young adults worldwide, The Hub provides a flexible workspace, meetings and events to create a social innovation environment.

People from every profession, background, and culture are united with one thing - imagination and motivation to pursue adventurous ideas for a "radically better world." These are the people who see and do things differently, driven by their passion for entrepreneurship to create true value. The hub became the place they call home. Space to empower social innovation. The place where the change goes to work. Hub Zürich is centrally located in parentheses of the beautiful "IM VIADUKT", with a total area of 400 square meters. It allows two separate brackets for two distinct Hub environments: a flexible workspace where things are done in a focused atmosphere and a noisy interaction space where people can meet, learn and communicate. The interior space is solved by two different spatial devices that organize the program accordingly: a wall unit that connects two different areas of the workspace, a footstool for the informal meeting, and a general display that questions the space as an interior view inside arcs volts. More photos of HUB Zurich on Flickr.

Figure 12. The Hub Zurich Co-Working Space for Social Innovators
https://www.pinterest.com

Figure. 13. The Hub Zurich Co-Working Space for Social Innovators
https://www.pinterest.com

3-we architecture unveils pixelated pop-up architecture office at blox copenhagen- 2018
We architecture has unveiled its 'we' showroom at blox copenhagen, the new gathering point for danish architecture, design and new ideas. blox gallery consists of a stairs exhibition that displays "the next wave of danish architecture - narrated and transmitted by a number of talented and distinguished young danish architectural firms." the “pixel fixing” process uses the steps of the blox gallery for stairs to create an integrated workstation and exhibition of the company’s projects, presented through forms, presentations, graphics, drawings, etc.

the idea of the exhibition centered on the community, displaying the true and direct view of how the architects worked by moving part of their office temporarily into the structure. the pop-up studio is an attempt to present architecture as being honest and open, offering "a true insight into our daily lives and an opportunity to meet our architects at work."
for us, society is a center for architecture, creative processes and the work environment alike. The office should feel like an open-minded home, where they are all equally welcome. Here a comfortable and enjoyable energy reigns, going beyond our final architectural product - energy we want to share.

Where he provided smart solutions for the job, using transparency and vertical separation of offices, Blox, designed by OMA and Eileen Van Loon, has opened its doors as the headquarters of the Danish Center for Architecture. The 28,000 square meter scheme contains exhibition spaces, offices and shared workspaces, creating a confrontation between the water fronts, Kierkegaard's Square and the city.

Figure 14. We Architecture unveils pixelated pop-up architecture office at Blox Copenhagen
https://www.archdaily.com

Adobe Headquarters Renovation / Gensler - San Jose, United States - 2017
Adobe's corporate headquarters is the physical extension of the company's brand, representing the company's creativity and innovations. Conveying Adobe's belief that its employees are their greatest, the renovated vertical campus aims to foster collaboration and creativity for all Adobe employees through an open and vibrant work environment. New open workspaces, and many meeting/meeting areas, including a listed meeting space with bleaching places and "living rooms", outside collaboration areas, creative conference rooms and amenities, allow employees to communicate in multiple ways. As the largest technology company in downtown San Jose, the residence is designed to honor the city's past and present. The city's agricultural past is celebrated with artistic installation that creates the famous "A" from Adobe from horticultural boxes from local sources. The specially designed rooftop trellis creates an outdoor space that attracts employees out to dedicated meetings or cocktails with the city skyline as a backdrop. Home-made carpets, furniture and decorative pieces showcases artists and community makers. Adobe's focus on creativity, innovation, and society has focused on the design approach - vibrant and quiet use of colors everywhere, minimal finishes in every space, fusion of curated art, home-made furnishings, and environmentally sustainable materials - restoration in an area that represents the company, the brand's visibility and headquarters The next generation of innovative workplace.

Figure 15. /https://www.archdaily.com / Adobe Headquarters Renovation / Gensler)
The new open and interactive library is a model for future local libraries that serve their communities as a springboard for life journeys. The library is a social condenser of Daegu, a welcoming place for both elderly and young people freeing the mind, breaking social hierarchies and creating new social relationships while developing new talents. The library is a space to access information and exchange ideas. The new Smart Library is a hub for information, lifelong learning, entertainment, and social and cultural activities. The building also functions as a community cultural center where local initiatives are accommodated by exhibitions, lectures and other means. Locals can absorb and produce ideas in a fun environment that fosters creativity. So amenities that add a new and informal dimension to the library are included. The ground floor café provides a place where information can be absorbed and discussed in an informal setting.

Figure 16. /https://www.archdaily.com / Adobe Headquarters Renovation / Gensler)

5- daegu gosan public library- international competition - mountain view, united states-2013
The new open and interactive library is a model for future local libraries that serve their communities as a springboard for life journeys. The library is a social condenser of Daegu, a welcoming place for both elderly and young people freeing the mind, breaking social hierarchies and creating new social relationships while developing new talents. The library is a space to access information and exchange ideas. The new Smart Library is a hub for information, lifelong learning, entertainment, and social and cultural activities. The building also functions as a community cultural center where local initiatives are accommodated by exhibitions, lectures and other means. Locals can absorb and produce ideas in a fun environment that fosters creativity. So amenities that add a new and informal dimension to the library are included. The ground floor café provides a place where information can be absorbed and discussed in an informal setting.

Figure 17. /https://www.archdaily.com / Daegu Gosan Public Library

Figure 18. /https://www.archdaily.com / Daegu Gosan Public Library)
measurement method: This paragraph includes defining the method of measuring the set of variables at the levels related to the theoretical framework vocabulary with a type of measurement method that depends on the direct descriptive analytical measurement method based on direct reference to the table according to the selected samples by relying on the signal [●] indicating the value of the variable and indicating the sign [ ○] Not validated if the values are recorded in the table of variables. In this case, the data is analyzed by calculating the percentage of each variable according to the model of thinking:

\[ M_i=\frac{x_i}{\text{sum } x_i}\times 100 \]  

The variable can be a major in the functional transparency approach, according to the number of signals it gets, which determines the percentage value if it indicates:
- It is key when he gets a [5-10] signal, which means [50% -100%].
- It is secondary when it gets a [0-5] signal, which ratio is [0% -49%].

The measurement form for the application of the samples can be clarified according to the vocabulary of the theoretical framework elected as shown in Table [2-1] as follows:

| The main items | The secondary items | The variables | The possible items | 1 | 2 | 3 | 4 | 5 | The achieved values for items |
|----------------|---------------------|---------------|-------------------|---|---|---|---|---|-------------------------------|
| Factors influencing the transparency concept | Functional transparency objective | Transparence limitation | Achieving formal beauty | ● | ● | ● | ○ | ● | |
|  |  |  | Solving functional problems | ○ | ● | ● | ● | | |
|  |  |  | Weakness of the building | ● | ● | ● | ○ | ○ | |
|  |  |  | the shift | ● | ○ | ● | ● | | |
|  |  |  | Lightness | ○ | ○ | ● | ● | | |
|  |  |  | Continuity | ● | ● | ● | ● | | |
|  |  |  | Clarity of space relations | ● | ● | ● | | | |
|  |  |  | Transparenct function | Achieve visual pleasure | sensory | ○ | ● | ○ | ● | |
|  |  |  |  | Visual | ● | ● | ● | ● | | |
|  |  |  |  | Physical | ○ | ○ | ● | ● | | |
|  |  |  |  | Achieve communication | expressive | ○ | ● | ○ | ○ | |
|  |  |  |  | formal | ○ | ○ | ● | ● | | |
| The meaning of functional transparency | Clarity | ● | ○ | ● | ○ | |
|  | Directness | ○ | ● | ○ | ● | ● | |
|  | Honesty | ○ | ● | ○ | ● | |
| Transparency | | | | |
|---|---|---|---|---|
| The percentages attained for each sample | 53% | 66% | 60% | 73% |
| **Mechanisms to achieve functional transparency** | | | | |
| Space regulation mechanism | Optical interference between spaces | ● | ● | ● | ○ | ● |
| | New tectonic visualizations | ● | ● | ● | ● | |
| Dynamic mechanism | Functional configurations | | | | |
| | With engineering units | ● | ○ | ● | ● | ○ |
| | With organic units | ○ | ○ | ○ | ○ | |
| Kinetic tension | Connecting formal words to continuous relationships | ● | ● | ● | ○ | ● |
| | Bring the shape back to balance in an innovative way | ● | ○ | ● | ● | |
| Suggestions for different surfaces | Continuous change | ○ | ● | ○ | ● |
| | Static balance | ● | ○ | ○ | ● | ● |
| **Interference mechanism** | | | | |
| Visual interference | ○ | ● | ● | ○ | ● |
| The supporting elements are represented by the inner partitions | ● | ○ | ● | ● | ○ |
| Continuous and open spaces and unified space | ● | ● | ● | ○ | ● |
| Continuity | ● | ● | ● | ● | ● |
| **Flexibility mechanism** | | | | |
| Streamlines or surfaces flow | ○ | ● | ● | ● | |
| Asymmetric open plan | ○ | ● | ● | ○ | ● |
| The percentages attained for each sample | 64% | 64% | 64% | 50% | 71% |
| **Levels of achieving functional transparency** | | | | |
| Within coordination relationships | Space organization relationship | Floors | ○ | ● | ○ | ○ | ● |
| | | Plans | ● | ○ | ● | ○ | ● |
| | | Sections | ○ | ● | ● | ○ | ● |
| | Streamlined relationship | Openness | ● | ● | ● | ○ | ● |
| | | Extension | ○ | ● | ● | ● | ● |
| | | Continuity | ● | ● | ● | ● | ● |
| | Linear regulation relationship | Movement | ○ | ● | ● | ● | ● |
| | | Horizontal direction | ● | ○ | ● | ○ | ● |
| | | Vertical direction | ○ | ● | ● | ○ | ● |
| | Collective organizational relationship | Flexibility | ● | ● | ● | ● | ● |
| | | Scalability | ○ | ● | ● | ○ | ● |
| | | Understand the changes | ● | ● | ● | ● | ● |
| The percentages attained for each sample | 50% | 75% | 75% | 50% | 75% |
After drawing the results of the application on the selected projects, the results related to contemporary architectural production will be analyzed in general and within the scope of the selected vocabulary for this axis of the application.

The results of the application in the five architectural projects selected for the axis of application showed the diversity of factors affecting the concept of transparency for architectural production in general, and a percentage scale was used. And that the factors affecting transparency is to achieve functional effectiveness, which is at the highest value (63%), in terms of the goal of lightness, the goal of continuity and the goal of delicacy of formation, transformation and clarity of space relations for each of them, where the different factors affecting the concept of functional transparency in contemporary architectural output in terms of goal setting, functions and location. In addition to the specific meaning and its focus in achieving beauty, shape, lightness, and communication function, where transparency is evident in the horizontal plans and interfaces and indicates many meanings such as frankness, clarity and continuity. The results showed on the level of the singularities mechanisms to achieve functional transparency that the flexibility and streamlining mechanism is the one adopted in the inclusion of the architectural output, where the singularity achieved in the samples by 62%, which means the multiplicity of mechanisms to achieve transparency in the architectural output and through the apparent interdependence and continuity directly as a visual function or moral function.

The results of the application on the projects selected for architectural production in this axis showed that the levels of achieving the functional agreement at the level of functional organization were either within the level of 2d or 3d and achieved at a rate of 56%, which means multiple levels of achieving levels of transparency in the architectural output and from the analysis of the results of the three vocabulary. The ratio is close, which indicates its work together to achieve the highest level of job satisfaction at the level of space organization of various projects affected by digital and smart materials to achieve the highest level of social sustainability and psychological satisfaction among people.

![Figure 20](image.png)

**Figure 20.** Shows the values of the degree of achievement of the relative functional transparency of the architectural product

7. Conclusions

- Transparency is represented by (it is a feature that employs many goals, functions and meanings to achieve lightness, formal beauty, communication and communication and is related to many meanings such as frankness and clarity).
- The concept of transparency was distinguished by a close relationship with digital architecture, as it harmonizes the two attributes, and communication between the parties concerned and represents the application of what can be applied from the material and intellectual technology of the age. The current era
- Transparency is present in the past in design confined (between mass and space, inside and outside) and it is possible that the purpose of its existence is not a sure principle but the sure reason for its existence is to create a comfortable internal space for the user pervaded by natural lighting as sustainable environmental treatments. That is, the relationship between the old and the modern is always clear, as any development must be based on established old rules.
- The functional vacuum resulting from the overlap of the job and the vacuum became subject to the fourth dimension and movement through several effects, including the use of smart materials that respond to environmental changes,
Globalization and technology interventions influence the determinants of job void. The relationship between transparency and employment becomes only a confirmation of the fourth dimension and the mental image of it, and industrial intelligence becomes the true means to activate the relationship between transparency and sustainability.

The results of the application proved that transparency has an important relationship with job sustainability through achieving the requirements and principles of sustainable design, especially the following:
- Design by dealing with negative energy.
- Sustainable design does not have a specific shape or style but is in itself a philosophy for sustainability.
- Paying attention to the psychological criteria of the place user.
- Interacting with the surrounding nature.
- Dealing with artistic creativity.

The diversity of levels that clarify functional transparency in contemporary architectural output. In the event that these levels exist, the rates of achievement in contemporary architectural output will vary between two-dimensional and three-dimensional levels.

Variation of transparency functions in contemporary architectural output, where the physical function is achieved through apparent interdependence and continuity directly as a visual function or moral function.

8. Recommendations:
- There is a relationship between transparency and sustainability in the framework of functional design and this relationship led to changing some internal concepts of space and made it responsive to movement, i.e. the fourth dimension of space and then the space became dynamic, which in turn became a fun, interesting and sustainable space that does not lose energy nor deplete much of it as well as it It responds to negative energy. From this standpoint, the researcher always recommends revealing new entrances in the field of digital architecture, whether internal or external, as an attempt to control the movement of technical and intellectual development, keep pace with traffic, and stimulate the spirit of innovation.
- It may be necessary to study new interventions on the digitally designed space and study the extent of its relationship to the old to facilitate the knowledge of what has been found and what has developed.
- For the sustainability of the vacuum, the basic components of the vacuum, such as walls, ceilings and floors, must be addressed to provide a sense of space, continuity and flexibility.
- The research recommends the necessity to delve deeper into other cognitive fields in which the concept of transparency has been clearly articulated, especially in the technological field to invest the characteristics of its secondary and sub-variables from those fields and reflect them on architecture.

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