Infilling and Architectural Addition and Its Effect on the Integration of the Contemporary City Townscape

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Abstract. The concept of urban infill has been associated with urban renewal policies and crystallized in many themes. Therefore it is considered part of an inclusive vision. The urban infill has been introduced by several researchers with different attitudes, such as (new substances, Interpolation, Urban Intervention, Urban Addition, and Architectural Addition). As a result of the erosion and tattering to which most of the heritage buildings have been exposed, besides, the need to a re-integration in the relations between additions to contemporary products and the extent of their impact on the old building and the traditional context as a whole, The Research Problem emerged through the separation of the urban Townscape of the traditional entity due to developmental interventions and recent additions to the building and the historical context. Consequently, The Research Objectives emerged in order to find out the appropriate mechanisms for infilling and architectural addition when dealing with a traditional building so that we can achieve integration in the urban context between old and new within the contemporary city Townscape. To conduct the research problem, a theoretical framework has been established for the concept of infilling and architectural addition, in addition to emphasizing the relationship between the old and the new buildings to create a continuous architecture with content that reflects its present and belongs to its past. Accordingly, The Research Hypothesis introduced that the success of the mechanisms in creating urban integration between the old and the new, depends on achieving appropriate infill and architecture addition, and on choosing the integrative element (As Bond) between them; the research sample was tested on choosing the location of the Mutassarifiah Building in Baghdad within the new district of Hassan Pasha (Al-Rusafa) in Baghdad Center Design Competition (Rifa’a Al-Jadrji Award for Architecture, 2018) for the proposed winning design projects. The research adopted the analytical scientific method and concluded that the urban infill and the new addition should take into account the existing original form and context to create a balance between them appropriately, and provide an intellectual displacement that reflects the elements of the new era, but without confusion and disturbance.

Keywords. urban infill, architecture addition, integration of the urban Townscape, urban context

1. Introduction
The research attempts to communicate the idea of urban infill and architectural addition through dealing with the traditional building or context when adding a contemporary building or contemporary design treatment, and because traditional buildings are an architectural distinctive cultural heritage, the value of the site must be exploited by providing mechanisms that depend on infill and a new addition suitable for the existing entity Previously (the original) to achieve the research hypothesis, and to the integrative Element (As Bond) between them to achieve integration and balance, so the research presented its structure to clarify the theoretical
framework for the concept of urban infill and addition and how to achieve integration between the old and the new through the townscape for Contemporary city, and its application to test the hypothesis on the mutassarifiah Baghdad building to reach final conclusions.

2. Urban Infill and Architectural Addition

The concept of urban infill has appeared in its modern form among the owners of the Smart Growth and New Urbanism movements, And they confirm that a well-designed infill creates vibrant neighborhoods and cities, so the urban infill strategy lies between the input configurations (added) with the existing configurations to form an integrated townscape that is architecturally and visually (Visual Connection), And that "the word urban infill consists of two parts in + Fill and it has many meanings, but in the field of architecture it is intended to use vacant lands and properties within a built area for further construction or development" [1], on the other hand it is intended to "establish urban components with the goal of filling a vacuum. It is defined within the context" [2].

The urban infill has been introduced by several researchers with different attitudes, such as (new substances, Interpolation, Urban Intervention, Urban Addition, and Architectural Addition), and the concept of additionality dealt with the relationship between the origin and the additive, as most of the problems and chaos that afflict the contemporary urban townscape are because there are new urban entities that have been added to the traditional fabric that appeared at different levels with no The principle of homogeneity and interdependence. The addition would be contrived and intertwined on the context, Brolin pointed out "The additions are the introduction of a kind of homogeneous expression in its dealings with the design of the old building without contradiction with it except rarely and calls for the importance of achieving visual continuity between different buildings in time and style"[3]. Therefore, infill (the new addition) is considered one of the solutions that are used to solve the problems of the city, and through several levels the formation of adding a part to a building or adding a building to a context or adding a building group to an urban fabric depends. "The success of urban infill and its quality depends mainly on a different evaluation Circumstances, as well as professionalism, creativity, sense, and architectural innovation, in order to efficiently apply infill procedures It is necessary to make a division of the quality of the existing surrounding environment in which the infill will be incorporated, and then choose the creative approach that will allow the spelling structure to establish a distinct dialogue with its surroundings" [4].

The directions of urban infill are categorized into: The first direction: "It includes the close association with the surrounding context and the integration of the modern design of the urban infill building (addition) with the visually homogeneous environment by adopting the features and model of that context." The second direction: includes the non-literal connection with the surrounding Context where this direction can mix between old and modern provided that the visual characteristics and personality of the existing surroundings are absorbed. As for the third direction: it includes the emotional contrast between the added buildings and their surrounding Context" [5] As Citted by [6], and that the goal Dictation to put the urban Townscape at the forefront of his priorities.

2-1- Architectural Addition As an Urban Infill and Its Relationship to The Contemporary City Scene:

Achieving appropriate urban infill depends on awareness of the importance of optimal selection for the addition. Where directly affects the context that attempts to create dialogue and relationships between the different elements within a specific location. This is considered the background of assigning the new product and a reference for interpretation for the recipient, as the context "is the art of Weaving of conceptual intellectual duales such as (heritage-contemporary, old-modern, thought-application, the whole-part) Wholeness Multidimensional congruent parts hormonized and discordant With a creative melting pot as a mixture of a conscious, responsive, collective nature and its response is not necessarily perfect or infinite absolute" [7], As Al-Ani pointed out in his study that "contextualism is not merely a reproduction of the old, but the new ability to make relationships with the old"[8], so context can be described as the structure of the connection between the inherited and contemporary (old and new) Through visual and formal relationships and forces that maintain what is fixed and
what is variable and at multiple levels and emphasizes the trends that seek to achieve integration through analyzing and revealing what the new addition needs in order to fit with it and rely on the nature of the context, whether historical or contemporary so that no interruption occurs between context and meaning or between the added and original parts.

2-2- The Integral Element (As Bond) Between Urban Infill (Addition) and Context:
The urban context is a broad environment that interacts according to visual communications, systems and meanings, generating relationships and intellectual and cognitive levels of the place between the context and the recipient or between the old and the new. Therefore, the new additions must be compatible according to a coordinated framework in its elements or its vocabulary with the context (the original), and the term integral Element As Bond "refers to an element or part of one building through which more than one building can be linked in order to reduce the severity of the visual conflict, where several are presented Types of bonds such as bounce, upper edges, cornice, structure: the horizontal and vertical elements that make up the structure, texture, material, These all indicate the complexity and multiple layers present in the design process in terms of introducing a new building to the surrounding context" (Alfirevic & Alfirevic, 2015, p. 28), For Example the entrance of the Louvre Museum to the architect I.M. Pei, the new addition contrasts with the old building, but the "architect" created a kind of formal alignment and made the new addition an element to show the old building through the sharpness (transparency) of the pyramid New to give a distinct visual vision, so the integrative elements linking urban infill (addition) and context (origin) is (Styles, Types, details, shape, materials, texture, height (sky line), scale, colors), which will be taken in consideration of measuring the local Case Study and how to balance them.

3. How to Achieve Urban Integration Between Old and New
The concept of urban integration is related to the balance between preserving the traditional context and meeting contemporary requirements through the interconnection of different branches within various parts in harmony and how to achieve interaction between them, Where the first so-called "Integrated Conservation appeared in the Amsterdam Declaration of 1975 and it is a concept based on the principle of conservation, it must take into account the current social continuity of societies and their contemporary service requirements, and that conservation be one of the goals of urban and regional planning, where this principle is adopted as a basis for policies Urban intervention in European historical centers to define the relationship between new and old in these centers" [9], Therefore, urban integration lies in creating a communicative architecture that carries a meaning that the viewer can interpret correctly without causing chaos or creating visual barriers towards important city landmarks while creating diversity and vitality "when adding to an existing building or a new building, in a way that does not repeat elements the original design in order to add new elements either in the same style or in a similar pattern with reference to the original style, satisfied with the features of the original architectural language, as it aims to achieve a balance between difference and Harmonic" [10], Hariri Pontarini, in his study (City of Toronto) explained proposals on how to respect the local context (neighboring buildings) when adding a new building "If the context surrounding the building to be constructed contains a high building and on the opposite side a low building, the construction of the new building is medium height. and if it is The new addition is a high building within a context that contains high buildings on both sides so the addition is the same height. but if the new addition is in a context that contains a high building separating this addition and the adjacent side is a street with a low building on the adjacent side then the base of the new building will be a low height equal to height of the building on the adjacent side, and that the tower be bounced back from the street with an equal height of the high building. and if the context contains a heritage or historical building, the new building to be added must be withdrawn to the back in order to not affect the scene that the old building contains" [11].Therefore, the state of dialogue between the old and the new is an ongoing process so that there is no intrusion from the new to the old, because the existing context is an integrated system in which the new addition is entered to interact with it and it becomes a more complex system, "where the forces controlling the relationship are represented
by a received value representing the strength of the original and the value An additive representing the addition force and a generated value representing the interaction force of both together to create a new combined identity that expresses new meanings in the urban environment" [12]. And that the infill strategy (the new addition) is not complete without mechanisms, and these mechanisms depend on the link between the old and the new, which is communication or integration, then the research will address the mechanisms of urban integration and its indicators.

**Urban Integration Mechanisms**: This paragraph explains the appropriate mechanisms for the urban infill strategy (new addition), which will analyze the proposed design projects for the local experience according to them:

- **Communication**: It is important in the process of designing and integrating the urban environment and how to create a contemporary heritage architecture related to its past and keeping pace with its age, and that communication does not mean blind imitation of heritage but rather as a source for inspiring ideas and dealing with it as an original reference by generating a type of harmony and achieving balance and respect for its components without Wiping the features of the past and rejecting all urban roots that link man to his society and history, Communication "happen in the event of difference, not in the case of transmission and reproduction, and that the state of difference achieved by departing from the usual departure, and not interruption, the shift occurs in the degree or type of this exit The degree of displacement, communication takes place by maintaining the starting and vision and meaning formulas, and the necessity of renewing the goals by changing the starting rules for the act without hitting the basic formulas upon which it is based and renewing what is and achieving what should be" [13].

- **Harmonic**: It is between two elements or a group of elements that are not similar within the urban context, through the presence of participants among them creates a kind of order away from conflict and incompatibility to lead to one goal within a harmonized format through the harmonization between the components of the elements so that the building’s facades become like one unit connected And continuous, which indicates it is. Therefore, harmony does not mean loss of creative and aesthetic sense and a fall in repetition. Rather, it is a solution to the problems that cities have been exposed to through the appearance of incompatible buildings with the urban context and unplanned positively. It is the result of several circumstances based on experience. Therefore, it is necessary to create a monolithic architecture with others and to enhance urban harmonization in terms of materials, colors, types, style, details, height, and study the state of the fabric adjacent to it and its surroundings, breaking the monotony of the boring skyline, and giving pleasure and attractiveness to it in a harmonious way.

- **Coherence**: it is the coherence of separate units and the achievement of an urban scene visually coherent and the treatment of the elements and their relations with each other in terms of shape, color, scale, texture, it is "the interconnectedness of the parts of the object sensually and morally, as its meaning does not contradict it and does not cost and it reflects the harmony of the building and its freedom from turmoil The contradiction, That is, building durability, coherence, consistency of its elements and its stability, and disintegration is the disruption of the system or the arrangement or harmony which is the description of the structure or structure with spaced parts" [14]. Therefore, there should be communication between the components of the urban context to generate a successful, efficient and livable city, as traditional cities have achieved coherence in their components, unlike modern cities where the disjointed elements suffer from chaos.

- **Interaction**: In other words (Dialogue), it works to synthesize cultures and languages and transfer ideas between two or more contexts by setting up bridges linking different parties, because architecture is a means of communication with the presence of part of the old in the new or vice versa, so interaction is considered "It is the main factor for any desire for development and dialogue exchange between any two intellectual
mediums, because the concept of dialogue works within a communicative framework to move the system of relations between the parties by focusing on bringing them together in order to create a common medium for what is already different" [15]. The reason that contemporary cities are exposed to failure to achieve integration and harmony with the urban context and the failure to achieve temporal, spatial and visual continuity because of their dependence on the tradition of a strange language is incompatible with neighborhoods, which led to the loss of dialogue and interaction between the old and the new, because dialogue is of fundamental value that takes place between two or more parties by exchanging signals between them.

**Indicators of urban integration:** This paragraph explains the types, characteristics, levels, and formulas of urban integration, as follows: Firstly, types of urban integration: there are many types of integration (but they are outside the framework of the research). Therefore, the research will address visual integration, which consists of a large system of relationships at the minor and major level. Leonard R. Bachman pointed out in his treatises," Visual Integration is the participation of the structural components to form the urban image" [16]. Secondly, "Visual integration characteristics: include visual properties at the major level: they include scale, skyline, the solidarity of the blocks, repetition. visual properties at the minor level: they include size, the boundaries (the external form of the blocks), details (elements), materials, Style, color, texture. Thirdly, the levels of visual integration: this includes the major level: the level of the urban townscape of the street. the minor level: the level of buildings within the street.

**Table 1:** Explaining the abstract of the vocabulary of the theoretical framework and its possible values / Source: Authors

| The main word | Secondary vocabulary | Detailed vocabulary | Possible values |
|---------------|----------------------|---------------------|-----------------|
| Communication | Coherence | Interaction | Coherence and consistency of elements within the urban context |
| Urban Integration Mechanisms | Visual integration | Visual integration | Creating a contemporary heritage architecture linked to its past and keeping pace with its age |
| | visual properties at the major level | | Achieving a harmonious architectural product so that the modern complements the old |
| | visual properties at the minor level | | Coherence |
| | the major level | | the level of the urban townscape of the street |
| | the minor level | | the level of buildings within the street |
| Urban integration between old and new | Formulas that achieve visual integration | Integration within the engineering unit | Simple regular forms, central organization, network organization |
| Visual integration characteristics | | Integration within harmonious pluralism | Rhythmic, continuous, proportional |

Fourthly, formulas that achieve visual integration: it includes integration within the engineering unit and includes simple regular forms, central organization, network organization. integration within harmonious pluralism: and includes rhythmic, continuous, and proportionate" [17]. We conclude from the above that the research presented a theoretical framework through which the most important mechanisms appropriate for urban infill projects were identified (mechanisms
of urban integration) and awareness of choosing the integrative component between what is old and what is contemporary in terms of styles, types, details, shape, materials, texture, height (SkyLine), Scale, Colors, and the research concluded that the vocabulary of the theoretical framework and possible values of urban integration are extracted as indicators to be relied upon in measuring the local case study (Table 1).

4. Local Case Study - Competition For the Development of a Mutassarifiah Building

The mutassarifiah District of Baghdad is located within an ancient residential locality (Hasan Pasha Quarter-114) and is surrounded by important streets such as Al-Rasheed Street and Al-Mutanabi Street, in addition to the presence of the Al-Qishla Cultural Center, the Abbasid Palace, Al-Mustansiriya School and many governmental and administrative headquarters (Figure 1). "A mosque belonging to the Abbasid era was being built at the site. A good woman in the Ottoman era renewed its construction, but the governor Medhat Pasha converted it to the Rashidiyya School in 1869 and the Faculty of Law occupied it in 1896 (Figure 2). But the building was subject to deterioration and fall, so it was rebuilt and a new building was added to it to become the headquarters of the Baghdad Brigade in 1934, after which it was occupied by the Capital Secretariat, and the building is built of bricks with an interface that combined the high local craftsmanship in the building with the bricks and some European classical monuments in the façade, it originated In Baghdad and from the twenties to the forties of the twentieth century, architectural styles distinguished by the unique synthesis between the European Art Deco features and the modernized European classical features and molded them with a local framework and were built with the local craftsmanship of Baghdad" [18]. And it was called several names (Al-Multaqa Building) (Governorate Building), the height of its outer walls reaches 8m (Figure 3), and one of the most important reasons for choosing the mutassarifiah building came as a result of exposure to many experiences of urban infill, whether for a social or functional need that was not studied according to mechanisms or Certain strategies, the building underwent a partial rehabilitation by the Directorate of the Rusafa Municipality in 2014 while preserving the external walls of the building and became a place for cultural events, in 2018 the building was chosen in an architectural competition (Rifa’a Al-Jadrji Award for Architecture) and was aimed at transforming this site from a building not currently used to Baghdad Design Center with a Maintaining the front facade of the building compulsorily and making it part of the new design as an important memorial to the history of Baghdad, while the side facades were optional, and the research was based on the analysis of the building’s facade within this competition (adding new details to old details) for the first three winning proposed design projects and analyzing them According to the mechanisms of urban integration and according to the design determinants (the integrative elements that link them together) to reach the most appropriate proposal that achieves good infill with the old building within the contemporary city scene.
5. Adopted Method
The research relied on the analytical scientific method and the Mutassarifiah Baghdad Building was chosen as a case study within the Baghdad Center Design Competition (Rifa’a Al-Jadrji Award for Architecture 2018). This competition came to revive the building and preserve it and awareness of its importance, so the three proposed design projects that won in terms of the idea will be analyzed Design and in accordance with the mechanisms of urban integration, and preparing a questionair that was built on the basis of the theoretical framework indicators and then the stages of analysis and conclusion, and the research of the three projects will be numbered as follows:

5.1. Analysis of proposed design projects in terms of design idea and mechanisms of civilization integration

The First project: A1: Winner 1: RCP2-293
Concept: The idea of the project is to restore urban monuments in the form of new complexes by highlighting the importance of the outer wall and merging it with the new design, creating an urban life in the interior courtyard of the project and designing it in semi-public spaces on three sides in a flexible and adaptable way (occupied by a cafe, exhibition spaces and workshops), And the facade was covered with trees to create a dramatic situation for the recipient to remind him of the events he had suffered in the past, and which as a result of this ruin became a vacuum within the dense urban fabric to be used as a public space for parties and festivals (Figure 4).

The Analysis According to The Mechanisms of Urban Integration: The analysis of the first design proposal came in a way that achieves communication and compatibility (integration with the external borders of the original form) within a harmonious and familiar framework with the old building, and integrated functional solutions that are appropriate in making this place the center of Baghdad for design and a distinct meeting point, while maintaining The traditional front end as an outer shell surrounding the new design.

The second project A2: Winner 2: RCP2 - 305
Concept: The idea of the project is to propose a memorial garden (as an open space that contradicts the dense urban fabric by not containing spaces). Underground spaces can create an urban cave for social gatherings, and the presence of the water element as a symbol of Mesopotamian civilization (Figure 5).

The Analysis According to The Mechanisms of Urban Integration: The analysis of the second design proposal came up with a basic idea of how to achieve communication with the past at the level of the plan and to preserve the internal space and strengthen it with a garden in the shape of (ziggurat of Ur) and use the gradients to go underground, so the designer wanted to create a green space in a modern way And innovative with the presence of water as an active ingredient, but there was no new addition at the level of the urban townscape (the façade of the old heritage building).

The Third project A3: Winner 3: RCP2-182
Concept: The main idea of the project is a forest of tall palm trees to provide shade and shelter from the scorching heat and as a result of using this building as a meeting point for people and not containing the dense urban fabric and such types of open spaces so the designer personified this idea by creating a solid structure of glass stands Behind the front facade is raised above it, and a group of six steel columns was used, creating one tall structure and the Curtain Walls system through the connectors (Figure 6).

Analysis according to the mechanisms of urban integration: The analysis of the third design proposal created a state of dialogue and interaction between something and its opposite (between the new addition and the old building) in terms of details or the building material (such as glass and steel) that differ from the building material of the old building (the bricks) and achieving a visual connection between them by transparent glass between the blocks and their impact on the façade of the old building in a modern and innovative way.
5.2 Questionnaire

- The questionnaire was built after the completion of the theoretical framework and its questions were prepared based on the final indicators of urban integration. The research in selecting a sample was based on a group of specialists (architects, planners and engineers in other specializations) and its number (42 samples), then analyzed the results of the questionnaire to find out The most appropriate project for the infill and architectural addition strategy from the point of view of the specialists.

- Measurement Results: The questions of the questionnaire were adopted on the table of indicators of the theoretical framework for the three proposed projects and clarifies (Scheme 1) the results of these questions, so the first question: Does it achieve communication with the old building by creating a contemporary heritage architecture related to its past and keeping pace with its age? The First Project A1 their number reached 26 with a percentage of 54.2%, The second project A2 numbered 12 by 25%, while the third project A3 numbered 10, with a ratio of 20.8%. As for the second question: Does it achieve harmony with the old building through achieving a modern architectural product that complements the old one? The first project A1 numbered 23 by 46%, and the second project A2 numbered 11 by 22%, while the third project A3 numbered 16 by 32%. The third question: Is coherence in its elements achieving the old building within the urban context? The first project A1 numbered 15 by 28.8%, and the second project A2 numbered 21 by 40.4%, while the third project A3 numbered 16 by 30.8%. The fourth question: Is it achieving an interaction with the old building by creating a dialogue between them? The first project A1 numbered 16 by 30.2%, and the second project A2 numbered 20 by 37.7%, while the third project A3 numbered 17 by 32.1%. Fifth question: Can it achieve visual integration through its structural components that share the formation of the general urban image with the old building? The first project A1 numbered 26 by 49.1%, and the second project A2 numbered 14 by 26.4%, while the third project A3 reached 13 by 24.5%. The sixth question: Does it achieve visual integration at the Major level in terms of (scale, skyline, the solidarity of the blocks, and the repetition with the old building? The first project A1 numbered 19 by 38.2%, the second project A2 numbered 19 by 38.2%, and the third project A3 numbered 16 by 29.6%. The Seventh Question: Is visual integration achieved on The Minor level in terms of (size, borders, details, materials, styles, color, texture) with the old building? The first project A1 numbered 16 by 29.1%, the second project A2 numbered 17 by 30.9%, and the third project A3 numbered 22 by 40%. The eighth Question: Is visual integration achieved at the level of the urban townscape of the street? The first project A1 numbered 22 by 44%, the second project A2 numbered 11 by 22%, the third project A3 numbered 17 by 34%. The Ninth question: Is visual integration achieved at the level of buildings within the street? The first project A1
numbered 23 by 46%, the second project A2 numbered 9 by 18%, the third project A3 numbered 18 by 36%. The tenth question: Is there an Visual integration within the engineering unit? The first project A1 numbered 23 by 41.8%, the second project A2 numbered 14 by 25.5%, the third project A3 numbered 18 by 32.7%. The eleventh question: Is it achieving visual integration within the harmonious pluralism? The first project A1 numbered 15 by 28.8%, the second project A2 numbered 18 by 34.6%, the third project A3 numbered 19 by 36.5%. Through the form of measuring the table of indicators of the theoretical framework and by relying on the results of the questionnaire the knowledge of the most appropriate project in achieving urban integration between old and new (Table 2).

![Scheme 1](image1)

**Scheme 1.** Shows the percentages of the three proposed design projects / Source: Authors

The results showed by means of a form measuring the indicators of the theoretical framework for the three proposed design projects (Table 2 above) that the first project A1: Winner 1: 293 is the most appropriate in terms of achieving urban integration between the old (Al-Mutasarifiyah building) and the new (addition) with a rate of 39.16%. The third A3: Winner 3: 182 with a ratio of 31.82, and the second project, A2: Winner 2: 305 with a ratio of 29.02, as shown in (Scheme 2). Thus, the first condition of the research hypothesis is established.

![Scheme 2](image2)

**Scheme 2.** illustrates the project best suited to achieving urban integration / Source: Authors

|        | A1 : Winner 1 : 293 | A2 : Winner 2 : 305 | A3 : Winner 3 : 182 |
|--------|--------------------|--------------------|--------------------|
| Percentage | 39.16             | 29.02              | 31.82              |
Table 2. Measurement form for a table of indicators for the theoretical framework for the three proposed projects / Source: Authors

| The main word | Secondary vocabulary | Detailed vocabulary | Possible values | A1 | A2 | A3 |
|---------------|----------------------|---------------------|----------------|----|----|----|
| Urban Integration Mechanisms | Communication | Creating a contemporary heritage architecture linked to its past and keeping pace with its age | 26 | 4.55 | 12 | 2.10 | 10 | 1.75 |
| | harmony | Achieving a harmonious architectural product so that the modern complements the old | 23 | 4.02 | 11 | 1.92 | 16 | 2.80 |
| | Coherence | Coherence and consistency of elements within the urban context | 15 | 2.62 | 21 | 3.67 | 16 | 2.80 |
| | Interaction | Create a dialogue between two or more parties and exchange signals between them. | 16 | 2.80 | 20 | 3.50 | 17 | 2.97 |
| Types of urban integration | Visual integration | Structural components to form the general urban image | 26 | 4.55 | 14 | 2.45 | 13 | 2.27 |
| | visual properties at the major level | scale, skyline, the solidarity of the blocks, repetition | 19 | 3.32 | 19 | 3.32 | 16 | 2.80 |
| | visual properties at the minor level | size, the boundaries (the external form of the blocks), details (elements), materials, Style, color, texture | 16 | 2.80 | 17 | 2.97 | 22 | 2.85 |
| | the levels of visual integration | the level of the urban townscape of the street | 22 | 3.85 | 11 | 1.92 | 17 | 2.97 |
| | the minor level | the level of buildings within the street | 23 | 4.02 | 9 | 1.57 | 18 | 3.15 |
| Formulas that achieve visual integration | Integration within the engineering unit | Simple regular forms, central organization, network organization | 23 | 4.02 | 14 | 2.45 | 18 | 3.15 |
| | Integration within harmonious pluralism | Rhythmic, continuous, proportional | 15 | 2.62 | 18 | 3.15 | 19 | 3.32 |
| | Total | | 39.16 | 29.02 | 31.82 |

As for the second condition of the research hypothesis, its fulfillment depends on the choice of the integrative component linking the old building and the new addition, which are design determinants such as (styles, types, details, shape, materials, texture, height (skyline), scale, and colors) to achieve integration between them (Table 3) The weight of each individual measurement indicates a degree, and then the percentage of the proposed design projects is calculated and the measurement results show that the first project A1 achieves 88.8%, followed by the second project A2 with a rate of 33.3% and the third project A3 by 22.2% and thus the Research Objectives was achieved By finding the appropriate mechanisms for infilling and architectural addition when dealing with a traditional building so that we can achieve integration in the urban context between old and new within the contemporary city Townscape.
Table 3. Shows the integrative elements linking the old building and the new addition to each project Source: Authors

| Old Building | A1: WINNER 1: RCP2 - 293 | A2: WINNER 2: RCP2 - 305 | A3: WINNER 3: RCP2 - 182 |
|--------------|---------------------------|---------------------------|---------------------------|
| Styles       | 8                         | 3                         | 2                         |
| Types        | 88.8%                     | 33.3%                     | 22.2%                     |
| Details      |                           |                           |                           |
| Form         |                           |                           |                           |
| Materials    |                           |                           |                           |
| Texture      |                           |                           |                           |
| Skyline      |                           |                           |                           |
| Scale        |                           |                           |                           |
| Colors       |                           |                           |                           |
| Bond Between Old and New | 88.8%                     | 33.3%                     | 22.2%                     |

6. Conclusions and Recommendations

- Urban infill (the new addition) is one of the solutions that are used to solve the problems of the city to deal with the old building and create a state of compatibility and Visual Connection between them.
- Visual compatibility is achieved through the correlation of the new architectural product (addition) with the old building or the urban context (the original), which in turn leads to achieving mental compatibility to obtain an integrated view of the contemporary urban scene and creating an environment of perceived nature that the recipient responds through positive dialogue that increases a bond between the building and the context, and between the building and the receiver.
- To achieve cohesion between the old and the new, there must be diversity at the level of elements and relationships, and the construction of a physically coherent visual structure compatible with each other and with the whole, despite the different time periods of the buildings, but that does not prevent the existence of the difference and distinct creativity of each building, provided that consideration is given to metaphor Some features of similarity and creation of new types enhance visual taste in visual characteristics with the old building or context, and achieve harmony between them.
- The research tested the indicators of the theoretical framework, which includes mechanisms, types, characteristics, levels, and formulas of urban integration between the old and the new through the questionnaire of a group of experts (architects, planners and engineers) and then analyzed the results to choose the most appropriate proposal for the application of the infill strategy and architectural addition.
- The results of the questionnaire indicated that the first project A1 is considered the most appropriate in terms of applying the infill strategy and architectural addition at the level of the contemporary city scene and the extent of its suitability and compatibility with the facade of the old building, followed by the third project A3, and then the second project A2.
- The research recommends in turn, to enhance urban harmony by choosing an integrative component linking the old and the new in terms of styles, types, details, shape, materials, texture, height (skyline), scale, colors, with the necessity to study the condition of the adjacent fabric Surrounding it and breaking the monotony of the sky line to add fun and
excitement, the first project A1 is considered the most appropriate in terms of the presence of the integrative elements linking it with the old building, followed by the second project A2 and then the third project A3.

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