

The Role of Functional Diversity of Urban Synergy In Creative Placemaking In Urban Centers

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ABSTRACT

The concept of urban synergy emerged as a response to the challenges facing urban city centers in light of rapid urban development, contemporary challenges, and the continuous changes affecting cities. One of the most important of these challenges is the loss of the defining features of their urban centers, which once gave them their unique identity as vital urban elements, and the concept's relation to placemaking. Accordingly, the research problem was identified as a lack of knowledge about the functional diversity of urban synergy and its relationship to creative placemaking in urban centers within a contemporary vision. In light of this problem, the research objective was set to uncover the role of functional diversity of urban synergy in creative placemaking within urban centers, aiming to rediscover the potential of these centers, along with the role of synergy characteristics in enhancing the quality of the urban core. Thus, the challenge of creating creative places with functional diversity has become an urgent necessity for establishing distinctive, cohesive, and socially and culturally synergistic urban environments- enhancing social participation and forming a contemporary city with an effective, synergistic urban center that meets the needs of society. The research identifies the functional diversity index to be tested on a selected research sample within the center of Samawah City using GIS applications. The results show that urban synergy contributes effectively to enhancing the concept of creative placemaking in urban centers through the functional diversity index, leading to more effective urban centers and the creation of a synergistic urban structure.

Keywords: Urban synergy, Urban centers, Placemaking, Creative place, Functional diversity.

1. INTRODUCTION

City centers were places of complex relationships within the city structure that constantly influenced one another. However, due to rapid urbanization, development, population growth, and technological advancement at unprecedented rates, many existing urban issues worsened, and new challenges emerged. This led to the need for contemporary urban solutions at different levels of synergy in urban centers through the concept of placemaking oriented around the urban structure (**Stipic, 2018; Derlatka, 2017**).

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The research raised a question about the impact of urban synergy on the structure of urban centers. Synergy is concentrated in many spatial relationships that arise within the urban structure. It is a coordinated action within the structure of urban centers aimed at enhancing functional diversity and the synergy of the urban fabric. This synergy acquires a social dimension, especially in marginalized and neglected communities, as the concept of urban synergy is linked to mutual synergistic relationships resulting from the interconnection of urban blocks with one another, making the entire urban city centers greater than the sum of their parts when acting separately (**Meijers, 2005; Larson, 2010**). These parts, which belong together in an integrated way, are supported, and the result is greater than the sum of the parts within the urban context. The impact of urban synergy in any system means the total potential of the elements, whose ability and influence are always greater than the impact and capacity of each element separately, as the whole is understood as an integrated synergistic relationship that aims to enhance positive synergy in urban centers. Urban synergy is the interaction between the elements of the structure within urban centers through the relationship between individuals and the surrounding structure (neighborhoods, infrastructure) and the diversity of activities within the center, such as holding cultural and artistic festivals or heritage markets, in addition to effective accessibility to the urban center. Urban synergy focuses on the main goal through the mutual interaction between the diverse urban uses within urban centers and their relationship to creative placemaking. Urban synergy is functional diversity through effective interaction to form a synergistic urban community in a way that achieves a significant positive impact on the users of a specific area (**Seamon, 2018; Stipcic, 2018; Vankova et al., 2018**).

Synergy in urban centers is achieved through several characteristics, including the connection to the urban structure, whether through spatial or functional links, ease of access, and improving its connection to the rest of the urban center and beyond through an effective public transportation system. It also includes transforming the urban structure through the diversity of uses that reflect the identity of the community, and returning streets to pedestrians to make them urban, safe, and flexible to improve the quality of that urban structure, create synergistic urban centers, generate a sense of urban security, increase livability, and lay the foundations for an integrated and comprehensive strategy to support urban growth, (**Mikhailov, 1990; Blazy, 2019; Razem and Ghanem, 2021**). In addition to the fact that urban synergy achieves multiple concepts, including the concept of creative placemaking through the functional diversity index, the essence of urban synergy is the interaction between individuals and the structure by linking the urban fabric, local culture, and the needs of contemporary society in a way that achieves the creation of a creative and synergistic place, (**Nazir, 2011; Kent, 2022**). This is the focus of the current study. It aims to explore the role of functional diversity in enhancing urban synergy to support creative placemaking in urban centers. The study seeks to identify how the interaction of diverse urban functions contributes to the development of vibrant and effective urban environments. It also aims to evaluate the potential of functional diversity as a key indicator in measuring and promoting urban synergy to support contemporary placemaking strategies.

2. THE RELATIONSHIP OF URBAN SYNERGY AND PLACE-MAKING

Some previous studies clarified the concept of urban synergy and its relationship with placemaking. A study has proposed (**Mumford, 1919; Haken, 1979**) that several ideas were proposed within the concept of urban synergy, calling for the creation of diverse and



synergistic urban communities that combine housing, work, and services, instead of the separation between residential, industrial, and commercial areas. This contributes to creating creative and cultural solutions and leads to results greater than individual parts. In addition, it includes designing city centers in a way that encourages social interaction, directs urban design toward more humanization and a more active social life, and aligns the vision of designers with the actual needs of the population.

The study showed, **(Jacobs, 1961; Hillier, 2007; Fuller, 1979)**, Urban synergy within the concept of functional diversity in the structure of urban centers, as it remains active continuously during the day and night, especially in streets and urban areas, to achieve urban synergy instead of separating them into different areas and avoiding the focus on a single function, aiming to create synergistic urban structures. In addition, it includes the establishment of urban neighborhoods with high movement density and a sense of urban security in places within urban centers to ensure the quality of those places. Urban neighborhoods are within short urban blocks to enhance access to neighborhoods with other functions, as short urban blocks contribute to achieving better spatial synergy than large blocks. The city center is clearly defined through the synergy among its components and the values of connectivity between them.

The study showed, **(Al-salam and Sabry, 2019; Keleg, 2020)**, The concept of creative placemaking is a multi-faceted approach to designing urban centers and enhancing the connection between community members and places through accessible participatory activities to improve community identity and focus on creating urban areas that are suitable for people and meet their needs. The concept of creative placemaking identifies the paths that represent the lives of residents in a way that ultimately leads to humanizing the structure in urban centers. The concept of creative placemaking is not based on the physical dimensions of space, but also focuses on the social dimensions, as it goes beyond the mere physical relationships between blocks and space to become more functionally diverse.

Previous studies focused on the role of functional diversity of synergy in the structure of urban centers, in addition to the importance of the concept of creative placemaking in those centers. Accordingly, the research problem is derived by focusing on the knowledge gap regarding the relationship between the concept of functional diversity of synergy and creative placemaking in urban centers.

3. THE ROLE OF URBAN SYNERGY CHARACTERISTICS IN CREATING A CREATIVE PLACE-MAKING

Urban synergy is an effective tool for achieving placemaking in urban centers. Its characteristics are considered among the urban solutions that make the concept of creative placemaking tangible on the ground through the design of urban centers. This research will focus on one of the most prominent characteristics of urban synergy, which is functional diversity, as follows:

Functional Diversity: The diversity of uses in urban centers is one of the elements of their development and sustainability. Creative placemaking within centers is achieved through the horizontal and vertical diversification of uses and by using activities throughout the day in a way that suits the diversity of society and improves place management, allowing for the practice of activities and the organization of events by diverse groups of community members (such as weekly markets, entertainment shows, and art festivals), **(Kent, 2022; Al-Hinkawi and Akef, 2018)**. High-density mixed-use plays an important role in achieving creative placemaking, as it reduces the distance to access services and activities and expands



the options for multiple modes of transportation (Al-Khfaji and Al-Shouk, 2016). The creative placemaking approach works to enhance functional diversity, increase social interaction, and creatively repurpose unused spaces by rehabilitating important heritage areas and buildings instead of demolishing them. This also includes urban city center projects such as rehabilitating projects that enhance mixed use in streets, spaces, and public buildings in a way that preserves the synergy of the urban center, as diversity is a necessary factor for the synergy of city centers (Al-Khfaji and Al-Shouk, 2016; Hoppenbrouwer and Louw, 2005).

The research focused on the role of synergy through the diversity of activities in creating creative places in urban centers, as this type gives priority to people within the urban structure to design areas that inspire and enhance social interaction. It discusses creative planning methods that involve the community in decision-making, and urban synergy recognizes the importance of community participation in planning and developing urban centers, as the input and feedback of community members are crucial to ensure that these centers respond to their needs and desires. The importance of creative placemaking emerges as a process aimed at transforming places into vibrant spaces capable of attracting people and stimulating social activity by integrating the functional dimension with the human dimension of the urban fabric. Studies have shown that achieving urban synergy is a necessary step to enhance the process of creative placemaking, as it contributes to effectively connecting urban elements and gives urban spaces flexibility in use (Al-Khfaji and Al-Shouk, 2016). Fig.1. shows the relationship between urban synergy and creative placemaking in urban centers.

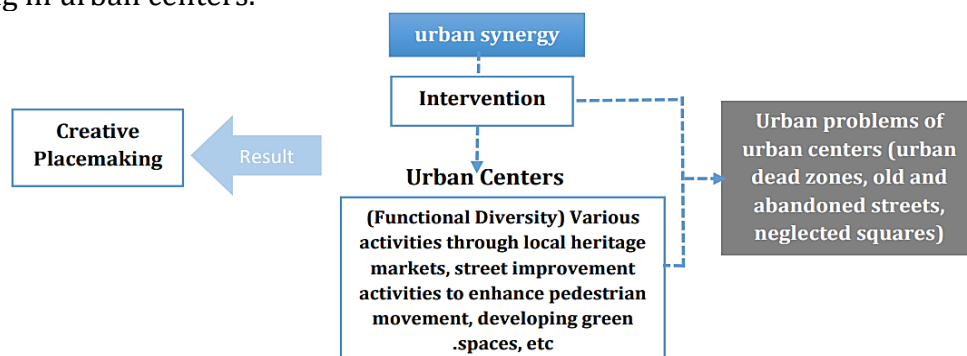


Figure 1 shows the relationship between urban synergy and creative placemaking in urban centers.

The role of functional diversity in synergy in creative placemaking is through the contribution of individuals to the urban and social characteristics of the city related to arts and cultural activities. Creative placemaking encourages the wide distribution of diverse events and their integration within neighborhoods in a way that enhances accessibility within different places in urban centers (James and Archana, 2019).

The functional diversity of the synergy aims to create a creative place by infusing the arts. Creative placemaking is achieved by incorporating arts, culture, and creative thinking into all aspects of the urban structure through various projects and activities, such as projects that revolve around and focus on arts and culture, like (public art) and art performances. It includes many diverse activities such as cultural and entertainment events and major art festivals, in addition to projects based on cultural and creative thinking, such as museums and heritage, and historical buildings, in a way that adds vitality and enhances spatial connectivity within the structure of urban centers (Mark, 2015; Lukic, 2020).

The impact of creative placemaking can be at a local level or at a larger scale in areas with higher influence, such as city centers and major nodes, when the importance of the project or activity increases and attracts visitors from neighboring areas. This creates a level of impact that includes the entire city in a comprehensive community development process based on art and gains in livability and functional diversity (Al-salam and Sabry, 2019; Weingardt, 2006).

The functional diversity of synergy plays an important role in creative placemaking through the rehabilitation of vacant places and unused spaces (by converting them into recreational areas or artistic and cultural exhibitions), enhancing urban safety and livability to support safer urban cities and their ability to attract people to the streets, and by connecting the urban fabric to its surroundings through the rehabilitation of deteriorated and unused structures into developed urban structures within urban centers, which are closely linked to spatial belonging and the synergy of the urban fabric. Functional diversity contributes to creative placemaking through value-producing activities and events within the urban fabric, as the key to successful urban fabric lies in its active and vibrant streets and how activities are distributed. Creative placemaking is an important aspect of designing urban centers that creates synergistic urban communities and enhances the ability to establish a diverse urban fabric of high value and quality, as shown in Fig. 2.

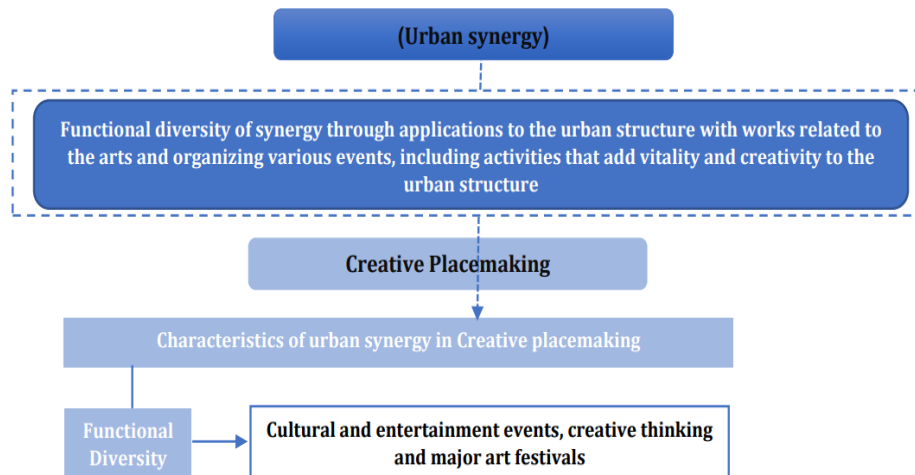


Figure 2. The relationship between the Functional Diversity Index and creative placemaking in urban centers.

4. METHODS AND TECHNIQUES

The research methodology focuses on measuring the functional diversity index and its relationship to creative placemaking, using measurement tools and techniques through the GIS program, in addition to observation and documentation to study the research samples within the center of Samawah City.

4.1 Case Study

The research samples were selected in the city center of Samawah in Al-Muthanna Governorate. The study areas are located within the Old Qasbah and the Western Second Area in the center of Samawah City:

- The research samples were chosen as case studies due to their geographical location, as they are among the oldest areas in Samawah in terms of origin, and because they are considered the commercial center of the city.

- This part (the research samples) of the Samawah city center holds special importance because it possesses a cultural and architectural heritage that represents a part of the city and carries its history for decades, as it contains old popular markets and historical landmarks. It is considered a vibrant and active part of the heart of Samawah and has a high population density.
- The urban fabric of the area has undergone morphological changes, which led to a shortage of public spaces and green areas, deterioration of infrastructure, and the degradation of building conditions due to the change in land uses, which affected the nature and character of the area.
- The research samples include diverse land uses, with most of the uses concentrated in the central area, and these uses are connected to streets and alleys that are distributed and graded in an organically flowing manner.

4.2 Data Collection

Two methods were followed in collecting data related to the research topic:

- The researcher conducted a field survey of the study area and relied on site observations through field visits to measure the functional diversity index at different periods.
- Preparing detailed plans based on corrected satellite images of the area.

As for the data processing method, specialized computer programs were used to analyze the urban structure within the urban context in an integrated manner.

This included analysis using Geographic Information Systems (ArcGIS 10.8) for the study areas to measure the functional diversity index of the research samples, loading the satellite image into the GIS system, and drawing the boundaries of the study areas based on the administrative boundaries approved by the Urban Planning Department for the study areas. The spatial data was entered to design a geographic distribution map of the activities specific to each area, as shown in **Fig. 3**.

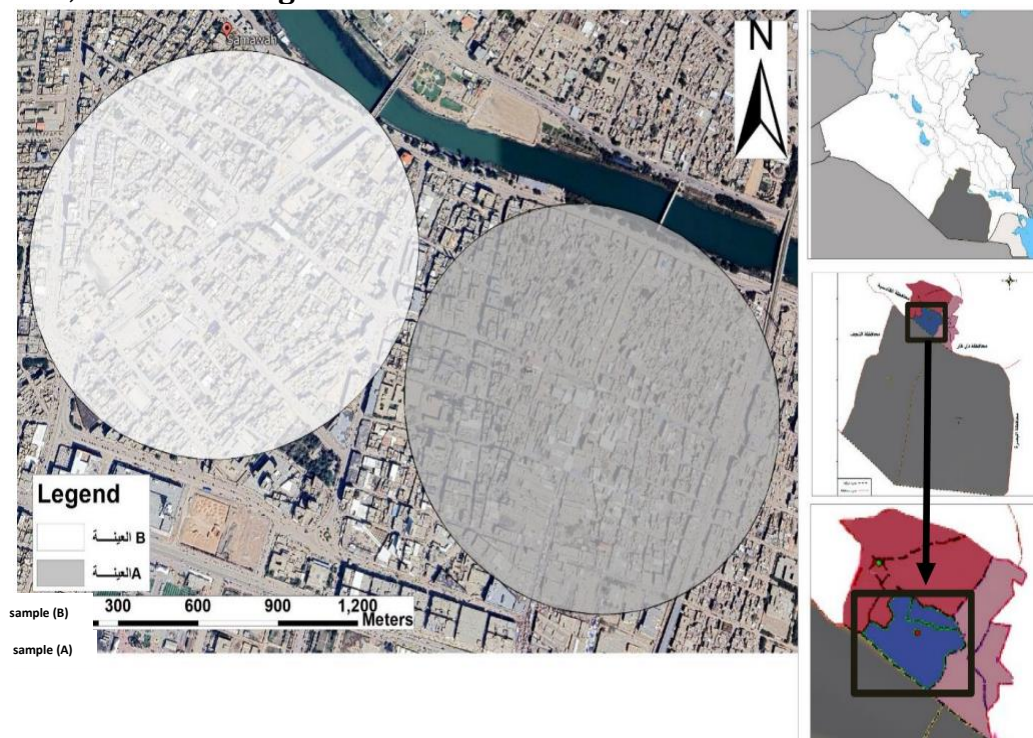


Figure 3. The research samples (A-B) with a radius of 400.

5. RESULTS AND DISCUSSION

Functional Diversity Index Measurement: The diversity of land uses in any geographical area varies according to spatial factors. These uses differ in type, and their spatial distribution also varies depending on the characteristics of different parts of the region. Land use is functionally based on the variety of activities it supports, and the variation in use depends on the available resources and the techniques applied (Al-Mayali, 2023). Some previous studies have examined and measured the functional diversity index by linking it to the effectiveness of activities and their distribution within the urban structure through observation, to determine the diversity of functions around each area. However, this research focuses on measuring the functional diversity index as a tool for creative placemaking, as it has not been analyzed in this manner in previous literature. The index contributes to the distribution and overlap of functions to enhance the creation of a creative place and support the synergy of the urban center. A comparison is conducted between two samples that differ in structure and activity (an old area versus a modern area), allowing for an actual assessment of the impact of functional diversity in activating creative placemaking across different urban contexts, and enabling a quantitative and spatial reading of place, rather than relying solely on visual description. To study the functional diversity of the selected research samples, specialized maps are developed for each area using the GIS program, where the area and proportion of each urban land use type are calculated. The results are then analyzed to clarify the impact of functional diversity on achieving urban synergy and creative placemaking within the research samples, as shown in **Fig. 4** (Sample (A)):



Figure 4. The land use distribution plan for sample (A) with a radius of 400 for the year 2024.

5.1 Analysis of the Functional Diversity Index for Sample (A)

By studying the land uses of sample (A) for the current situation of the region for the year 2024, The field study data showed that the dominant land use is commercial, given that the old Qasbah is the commercial hub and the beating heart of Samawah City, as commercial use in the city is closely and directly linked to the lives of the residents. This connection stems from the importance of daily activities and what they reflect on the development of communities in various urban aspects. The area is considered a central business district due



to the very high land value and the intense competition for occupancy. As for residential use, it came in second place among urban land uses due to the gradual transformation of these dwellings into commercial use, which dominates the area and includes mixed-use (warehouses and workshops), as shown in **Fig.4** and **Table 1**.

Table 1. The area and percentage of land uses for sample (A) according to the current situation for the year 2024.

s	usage	Area(hectare)	Usage rate(%)
1	commercial	16.6	43.1
2	residential	5.99	15.6
3	administrative	0.32	0.83
4	healthy	0.62	1.61
5	cultural	0.14	0.36
6	industrial	0.42	1.09
7	religious	0.32	0.83
8	educational	0.61	1.58
9	Vacant lands	0.88	2.28
10	mixed	3.33	8.65
11	parking	0.17	0.44
12	Roads and paths	8.8	22.8
13	Green and open areas	0.32	0.83
The total		38.5	100

The concept of creative placemaking was achieved due to the functional diversity of Sample (A), as no isolated use is observed without the participation of other uses. This is due to the complexities of the area, as it is part of the Samawah city center and has a distinctive architectural and cultural heritage, in addition to the various morphological transformations the area, in general, and the study area, in particular, has undergone. Moreover, the study area did not develop as a commercial center but was also an important residential area. The residential areas were converted into commercial use, which led to a shift in the land use pattern to mixed-use, including a combination of residential, commercial, administrative, educational, cultural, religious, and recreational uses. This diversity specifically serves the center of Samawah City, where services are distributed in a balanced manner, and attractive places for people exist, represented by the markets and commercial streets in Sample (A), which act as attraction points for the area. This achieves an urban connection between individuals and activities, effectively contributing to enhancing creative placemaking and creating active places. The essence of creative placemaking lies in transforming urban spaces into lively, interactive places that respond to the needs of society. Sample (A) is active and more attractive to individuals in a way that enhances daily movement and social interaction. Creative placemaking is achieved in this sample through the Abdul Latif Al-Jablawi. Cultural House, located in the heart of Samawah, is within an area of cohesive urban fabric. The building is characterized by its cultural function, which depends on repurposing a heritage building as a center for literary and artistic activities. Events such as poetry evenings, seminars, and art performances are held there, making it a point of attraction. The location of the building, along with its traditional architectural features such as shanashil, arches, and wooden carvings, contributed to strengthening its spatial identity and linking it to the collective memory of the city. The project reflects creative placemaking through the

preservation and reuse of the heritage building instead of demolishing it, which helped achieve urban synergy by combining the cultural and social dimensions within the place. (Mohsen, 2023). As shown in the Fig. 5.

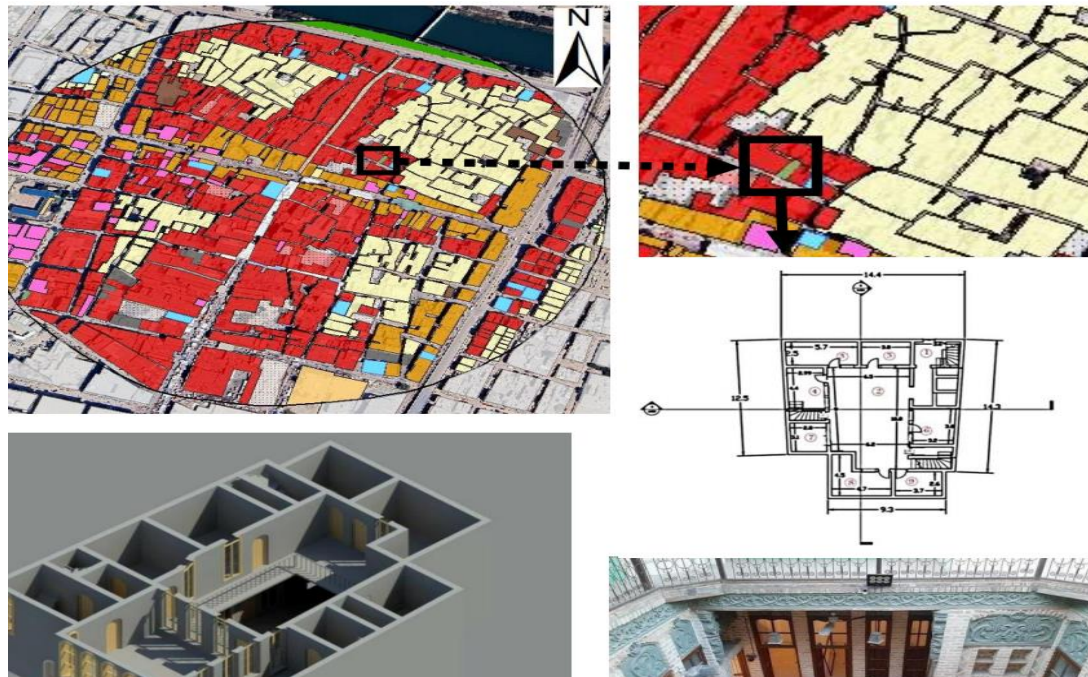


Figure 5. The creation of the creative place for sample (A).

The Parliament Café is one of the examples of creative placemaking in Sample (A). It is a heritage site that has been rehabilitated to function as a café and cultural forum within the fabric of the old citadel (Aqd Al-Haddadeen) in the city of Samawah. The café hosts various cultural and social events, which enhance the functional diversity of the place and encourage social bonds and interaction among the city's residents. The café is characterized by simple architectural elements that reflect the local character, such as the wooden ceiling covered with mats, and pictures and heritage materials that document events and figures from the city's history. These features have contributed to strengthening the sense of belonging, as the café is considered a place for gathering and discussion, which reinforces its role as a supporting element of urban synergy in the social and spatial structure, in a way that achieves creative placemaking for the city. (Hammoud, 2024), as shown in Fig. 6.

Abdul Latif Al-Jablawi House, as observed, is the most representative model of the creative placemaking standard, as it attracts various groups from inside and outside the city, especially during public cultural events such as poetry evenings and art exhibitions. Its central location within the city's fabric and its connection to the local cultural memory have made it a point of attraction for people from outside the city, while the Parliament Café is characterized by a local character closer to the nearby community, despite its symbolic

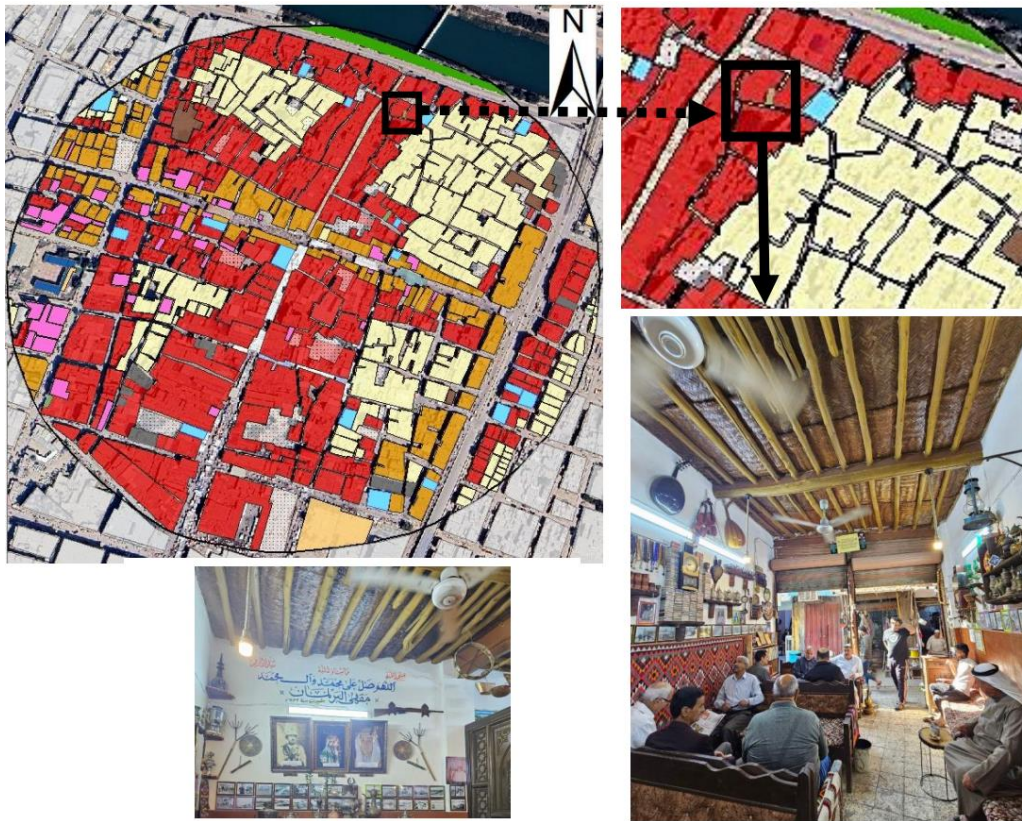


Figure 6. The creation of the creative place for sample (A).

5.2 Analysis of the Functional Diversity Index for Sample (B)

The creative placemaking was achieved in this sample at the Samawah Central Library, which is distinguished by its building inspired by a clay tablet inscribed with cuneiform script, and is considered a distinctive artistic piece. The library consists of two buildings: one with five floors, each floor made up of halls, and the other with three floors containing halls dedicated to research and studies. It also includes a cinema, a theatre for adults and children, and various workshops and shows for seminars and conferences. Four of them are distributed among reading halls and diverse art exhibitions showcasing talents in drawing, decoration, calligraphy, handicrafts, and folk crafts that reflect the reality of the city and its ancient heritage. It also includes books and scientific materials in addition to administrative rooms. The library is adjacent to Sawa Cultural Street, where books are displayed and art shows are held, thus achieving urban synergy in the area. (satar, 2024) as shown in Fig. 8. The research samples showed a set of characteristics that effectively contributed to enhancing functional diversity and thereby supporting creative placemaking. Among the most prominent are the flexibility of the urban fabric, which allowed functional transformations such as converting residential units into commercial uses without disrupting the urban structure; the adjacency and interweaving of urban activities within short distances, which strengthened functional connectivity and facilitated the diversity of uses within the same fabric the presence of heritage landmarks within the urban fabric that formed attraction points for revitalizing surrounding areas; as well as the diversity of building functions and the possibility of adapting them, which allowed the accommodation of new functions without the need for rebuilding or radical architectural interventions.

Together, these elements helped create an urban fabric capable of diversity, which directly reflects on supporting interaction within the urban center and makes creative placemaking a feasible and tangible experience.



Figure 7. The land use distribution plan for sample (B) with a radius of 400 for the year 2024.

Table 2. The area and percentage of land uses for sample (B) according to the current situation for the year 2024.

s	usage	Area(hectare)	Usage rate(%)
1	commercial	5.6	14.6
2	residential	16.1	41.8
3	administrative	0.66	1.71
4	healthy	0.17	0.44
5	cultural	0.25	0.64
6	religious	0.15	0.38
7	educational	0.98	2.54
8	Vacant lands	0.77	2
9	mixed	0.62	1.61
10	parking	0.28	0.72
11	Roads and paths	11.1	28.8
12	Green and open areas	1.83	4.76
The total		38.5	100



Figure 8. shows the creation of the creative place for sample (B).

6. CONCLUSIONS

- The functional diversity index is one of the key factors that directly influence the effectiveness of creative placemaking within the urban fabric of city centers, and its impact on those centers, enhancing their potential and increasing their urban value. This creates an interconnected urban structure in which elements and activities work synergistically. The results of the research, both theoretical and applied, have produced a clear approach to the relationship between the functional diversity index and creative placemaking.
- The concept of creative placemaking works with urban synergy as a positive influence that drives the urban structure through functional diversity and increasing the flexibility of city centers and their ability to adapt to changes and high densities, and to continuously attract people to them as places visited day and night, along with the rehabilitation of heritage buildings to enhance urban identity and serve as a model for people's connection to place. Urban synergy contributes to the creation of diverse, creative urban places to reimagine the surrounding urban structure and repurpose it to form a unique identity for the place and the community.
- Creative placemaking is achieved when there is functional diversity (mixed use), as the integration of various activities allows for the creation of a vibrant urban structure within the urban center that is used continuously throughout the day, leading to the achievement of urban synergy that supports the creation of active places.
- The analysis results show that commercial and cultural uses were the most influential in achieving creative placemaking in both samples, especially in Sample A. Commercial uses, particularly those located along streets and markets, contributed to creating continuous activity throughout the day, while cultural uses such as heritage buildings and artistic activities enhanced identity and social interaction. The presence of mixed-use buildings



that combine residential and commercial functions also played an important role by ensuring functional integration and attracting diverse groups of users.

- The results demonstrate the importance of repurposing heritage buildings for cultural and social uses to enhance creative placemaking, through the adoption of the Functional Diversity Index as an urban evaluation tool in the development of urban centers.

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Credit Authorship Contribution Statement

Nour Hassan contributed significantly to the development of the research methodology, as well as the analysis of the research samples. Sally Fakhry Khalaf also provided significant support in formulating, analyzing, and validating the study results and provided critical insights during the preparation and editing of the manuscript.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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دور التنوع الوظيفي للتأزر الحضري في صناعة المكان الابداعي بالمراكز الحضرية

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الخلاصة

ظهر مفهوم التأزر الحضري كرد فعل لما تواجه مراكز المدن الحضرية في ظل التطور الحضري السريع والتحديات المعاصرة والتغيرات المستمرة للمدن من أهمها، إفتقاد مراكزها الحضرية لمعالمها المحددة التي كانت تضيي عليها المعنى الخاص بها كعنصر عمراني حيوي وعلاقة المفهوم بصناعة المكان. وبذلك تحددت مشكلة البحث بنقص المعرفة حول التنوع الوظيفي للتأزر الحضري وعلاقته بصناعة المكان الابداعي في المراكز الحضرية وفق رؤية معاصرة، وفي ضوء تلك المشكلة تحدد هدف البحث بالكشف عن دور التنوع الوظيفي للتأزر الحضري في صناعة المكان الابداعي بالمراكز الحضرية لأعادة اكتشاف امكانات تلك المراكز فضلا عن دور خصائص التأزر الحضري بشكل تعزز من جودة المركز الحضري، وبالتالي أصبح التحدي المتمثل في صناعة أماكن ابداعية ذات تنوع وظيفي ضرورة ملحة لبيئات حضرية مميزة متماسكة ومتأزرة اجتماعيا و ثقافيا لتعزز المشاركة الاجتماعية ولتكون مدينة معاصرة ذات مركز حضري متأزر فعال يلبي حاجات المجتمع، فيحدد البحث مؤشر التنوع الوظيفي لأختبارها على عينة بحثية منتخبة ضمن مركز مدينة السماوة بالاعتماد على تطبيقات (GIS). فتوضح النتائج أن التأزر الحضري يساهم بشكل فعال في تعزيز مفهوم صناعة المكان الابداعي بالمراكز الحضرية من خلال مؤشر التنوع الوظيفي مما يؤدي الى مراكز حضرية فعالة وخلق بنية حضرية متأزرة.

الكلمات المفتاحية: التأزر الحضري، المراكز الحضرية، صناعة المكان، المكان الإبداعي، التنوع الوظيفي.