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RETHINKING LEFTOVER SPACES WITH THE NEW DIGITALIZED PARTICIPATORY DESIGN METHOD

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Abstract
Leftover spaces are urban areas that have not been designed or have lost their current function and fallen into disuse. The primary condition for reevaluating these areas is to define their use cycle, both physically and socially. The actors who best define these urban leftover areas are the users, rather than the designers or managers. In this context, user participation, as a form of democratic action, is now important in terms of determining the value of these spaces and creating a roadmap for regeneration. However, in today's fast-changing metropolitan cities, traditional user participation methods remain limited and inefficient in terms of the space-time relationship. This study questions user participation in defining and reevaluating urban leftover spaces using digital methods, in a comparative manner with traditional methods. The main purpose is to propose a new potential contribution to the weaknesses of the traditional method by rethinking these processes through a digital mapping-based model. The method of the study consists of three stages. In the first step, the traditional processes of the user participatory design approach were examined through literature analysis, and an organizational schema was determined. In the second step, the analysis methods of the literature studies using the ARCGIS program, which is a digital geographic mapping system, were explored. The possible conflicts of this digital method with the traditional schema determined in the user-participatory design organization were examined. In the last step, the benefits and drawbacks of traditional and digital methods were revealed through a comparative SWOT analysis. The important conclusions of the study evaluate the role of urban users and the contribution of the role-playing method in the reevaluation of leftover spaces. In summary, this new digitalized model provides faster feedback on instant urban changes, contributes to social sustainability by creating an equal and transparent participatory behavior policy, increases the potential for these areas to be noticed and visible, and contributes to urban memory by creating a multi-layered archive for the changing space-time-subject relationship. On the other hand, there are potential threats to this new digital method, including the loss of an eye-level scale when looking at the area, rapid consumption, and the destruction of the sense of belonging to the area by involving non-local users in the design process. These are considered the most significant threats.

Key Words: *Urban Leftover Spaces, Participatory Design Method, Digitalized Participation Approach, ARCGIS, Urban Actors*

1. Introduction: Analyses on the Concept of Leftover Spaces

The concept of "leftover" is defined as the remaining part of something after it is used or spent. From an urban perspective, this concept generally refers to empty spaces that have not been designed, have been forgotten, excluded, or left aside. In the literature, it is found that this concept is related to different concepts such as ruined regions, abandoned areas, dead areas, consumption areas, lost spaces, empty spaces, undefined areas, and unused spaces. It is very important to distinguish these concepts from each other in terms of the effects they create and how they impact their environment to identify the approach to these areas.

Considering the related key concepts, it can be observed that Lefebvre describes the places that cannot renew themselves and therefore cannot transform in a city that constantly renews itself as ruins [1]. In urban centers that have acquired an identity in cycles of sustainability, these ruined areas, which damage physical communication and disrupt social connections, are often left vacant and become derelict due to political sanctions and coercion. Depending on the erosion of social movements, these spaces turn into places that are merely passed through and fall into disuse [2]. In 1999, Urry mentions that these spaces are formed with an economic concern beyond political policies and that tourism policies fueled by sociocultural productions become consumption spaces that emerge due to imbalanced consumption habits [3]. Habermas, with a more human-oriented approach, emphasizes that these areas are fundamentally a problem of alienation and uses the concept of urban placelessness to define them [4]. In a similar vein, Löw refers to the imbalanced position

of the subject in the public space and the fact that functional spaces become exclusive rather than inclusive and defines these spaces as lost spaces [5]. On the other hand, to emphasize the potential of these spaces, Calixto and Brito refer to them as unused spaces that are not occupied in any way [6]. Beyond a preference for use, these spaces can also be defined as abandoned areas that have lost their users and thus their source of production due to social, economic, or physical reasons [7]. Based on all these conceptual analyses, it can be said that the main source of the formation of these areas, which are left derelict or abandoned for use in the city, stems from problems based on the insufficient or incorrect establishment of the subject-space relationship.

Within this confusion of concepts, Lynch's description of a space left over from a used space in 1990 is important [8]. This is because leftover spaces, which are mostly typologically evaluated as under bridges, courtyards of old buildings, passageways in the city, entrance squares of old factories, doorways, or passages squeezed between two buildings, can be seen as excluded parts of an urban system that is still in use (Figure 1). These spaces, defined as nobody's space or free space with these characteristics, also possess the potential to form alternative public realms.

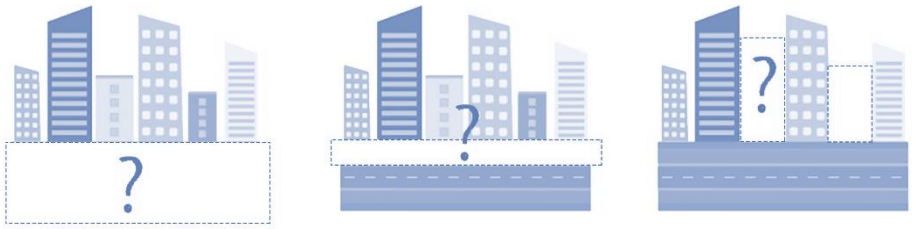

Fig. 1. Leftover City Fragments

To unlock the potential of leftover spaces in cities, it is necessary to define these spaces accurately and analyze how they were formed. Recognizing the existence of these areas in the city on a social scale is the primary condition for their regeneration. This awareness can only be achieved by fostering collective participation and making democratic decisions through a user participatory model. However, in rapidly growing metropolitan cities that constantly expand in scale and complexity due to population growth, the ever-changing user profiles and demands, unconscious responses to the increasing need for functional space, and new regulations hinder the formation of sustainable participation awareness. In today's crowded and multi-sensory metropolitan cities of the information era, new digital interfaces have emerged to broaden the scope of participation and foster shared concerns.

The main focus of this study is to explore the potential contributions, risks, obstacles, and threats of using geographical mapping information systems as a tool in the user participatory design model. In this context, the actors involved in the user participatory design method are identified, and the organizational scheme of the process is examined. The communication phases of this traditional scheme are reimagined using the ARCGIS program, a digital-based geographical mapping system, and a comparative SWOT analysis is conducted to question the traditional and digital methods. The ultimate goal is to propose a new potential contribution that addresses the weaknesses of the traditional method by rethinking the leftover spaces in cities (Figure 2).

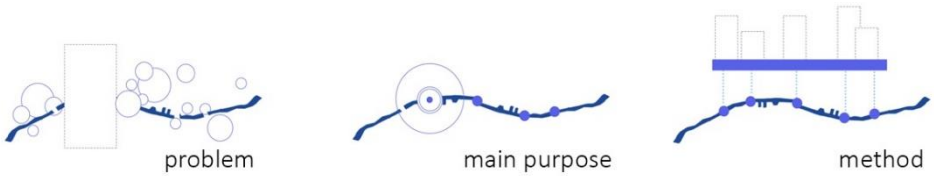

Fig. 2. Framework Diagram (a) problem; (b) main purpose; (c) method

2. Identifying Urban Actors of Residual Spaces

Urban spaces are areas where social life activities take place in a continuous order. Beyond the ongoing practices that occur in a continuous flow, these spaces hold memories, bring together diverse voices, and foster a sense of belonging to a community. They contribute to the construction of collective consciousness. According to Norberg Schulz, urban spaces are created through the design of a space that caters to the needs of the urban user, who is the subject [9]. Similarly, Bachelard suggests that these spaces emerge as a result of the subject's interaction with the place [10]. This perspective grants urban spaces a subjective evaluative ability. Additionally, Bachelard's view can be supported by Deleuze and Guattari's analogy of spaces to machines, which argues that spatial production depends on the interaction between the subject and the space [11]. Lefebvre, on the other hand, considers the subject as a prerequisite for space production [12].

According to Lefebvre, the urban subject, which is the main driving force behind the creation and maintenance of urban spaces, assumes the roles of user, designer, and manager in the organizational structure of today's metropolitan cities (Figure 3). Although designers and managers, who appear as dominant actors in space organization, are also urban users, the decisions they make may not reflect collective representation unless they represent a significant majority. Collaborative decision-making mechanisms involving a sufficient majority of urban users are often limited and inadequate. Therefore, ensuring equal participation of all actors in the design and decision-making processes, empowering users, leads to the creation of more socially sustainable cities.

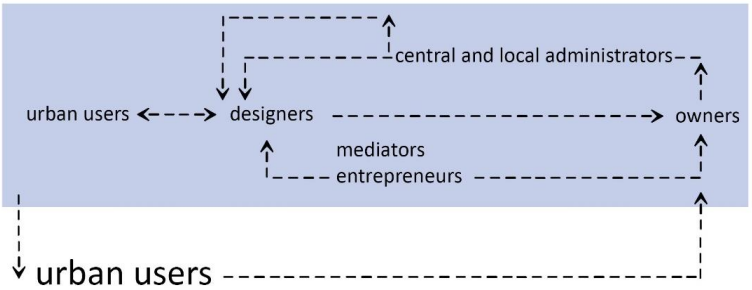

Fig. 3. Relationship Diagram of Urban Actors

3. Method

The methodology of this study is primarily planned to consist of three stages. In the first stage, the literature on the user participatory design approach was reviewed. The reasons for employing this method, its constituent processes, the involved actors, and how it has evolved over time were examined in the analyzed studies. Based on the findings, a comprehensive relationship diagram illustrating the organization of the participatory design method was constructed. The second step focuses on explaining the operational principles of geographical mapping systems, taking advantage of their widespread usage and easy accessibility in the digitization of the traditional method. As an example, the ARCGIS program, a geographical mapping system, was selected. Lastly, the potential conflicts and contradictions between the digital method and the traditional scheme are analyzed. A comparative SWOT analysis is conducted to evaluate both the traditional and proposed digital models as alternative approaches.

3.1. User Participatory Design Approaches in the Context of Leftover Spaces

Leftover urban spaces are components of a system that operates for a period of time before coming to a halt and stagnating. However, the changes occurring in these areas do not follow a linear trajectory but rather a cyclical one. Throughout the processes before and after interventions in these areas, both the area itself and the user within it undergo constant changes while decision mechanisms are at work (Figure 4). Within this cycle of change, it is crucial to adopt a majoritarian approach to ensure that the decisions made are both prompt and site-specific.

In this phase of the study, the literature has been reviewed to understand the role of participatory design as a democratic method for reconsidering and reevaluating leftover spaces. Participation denotes a state of involvement and consent in a process. The participating subject plays an active role in actions that generate added value [13]. In the field of architecture, the increased active involvement of users in the design process has become widespread, especially since the 1960s, with the recognition that space is not only a physical

object but also a sociocultural phenomenon. This process has highlighted the need for the subject, as a user of space, to assume a more active role in the practice of design and thinking [14]. Through this role, the subject's engagement with the challenges posed by evolving urban areas enables the outcomes of change to be adaptable to the city by considering all processes holistically (Figure 5).

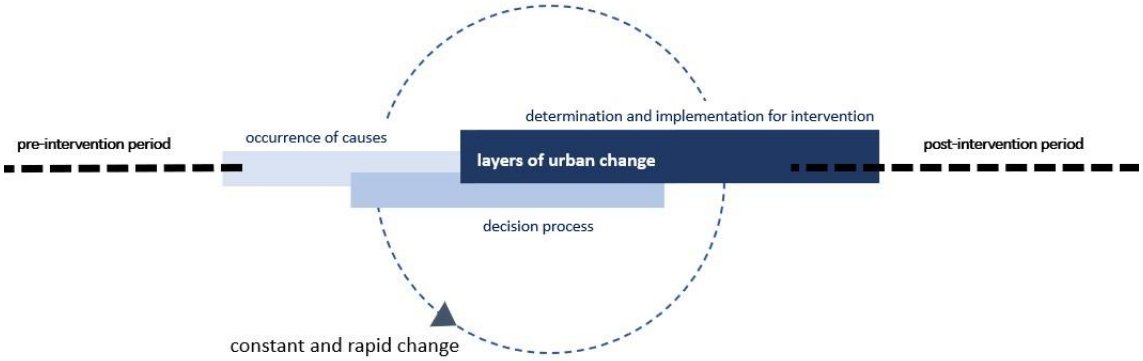

Fig. 4. Intervention Stages in Urban Change Processes

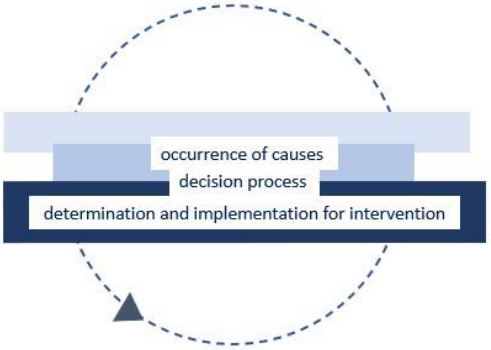

Fig. 5. Intervention Stages in Urban Change Processes with Participatory Design Approach

Regardless of the scale of the subject or area under evaluation, the roles assigned to the user, designer, and management groups in the participatory design method display an attitude that can be developed and modified based on existing experiences [15]. In the traditional representation, the user becomes the object of study, the researcher observes the user and gathers information, the designer reports on the process, and the manager provides the necessary environment and funding to bring all groups together. However, these roles can be interchanged among the user, designer, researcher, and manager [16].

The organizational chart of the traditional process can be summarized as consisting of four main steps, as presented in the model proposed by Hacıalibeyoğlu in 2013, based on Sanoff's theoretical studies and Cherulnik's research on environmental behavior (Figure 6). The first step, the decision-making process, begins with creating suitable environments and conditions. In this process, the participants are identified, the approaches relevant to the field are determined, and preliminary reports are prepared. The second step, the design process, is directly influenced by the preliminary interviews conducted in the first step. However, throughout the design process, the initial analyses are supported by surveys, focused interviews, and workshops. User participation reevaluates each stage, from creating awareness of the area to the development of the project. The third step involves implementing the outputs of the design process. This phase is almost detached from the user, as any issues that arise during the process are directly resolved by the designer. The last step, the usage process, needs to be periodically reimagined throughout the lifespan of the designed object/structure/area. User feedback determines the frequency of revitalization periods and serves as the primary source of information. In this context, the traditional method follows a cyclical approach [14].

In terms of its contribution to the field, it can be said that the participatory design method constructed through this framework establishes a process that continuously evolves and provides feedback by discussing design alternatives, as opposed to a linear and result-oriented design process. Additionally, it establishes an urban communication scheme that minimizes tension between professional knowledge and user demands, is directly connected to time and changes, strengthens a sense of belonging, preserves urban experiences, and fosters awareness.

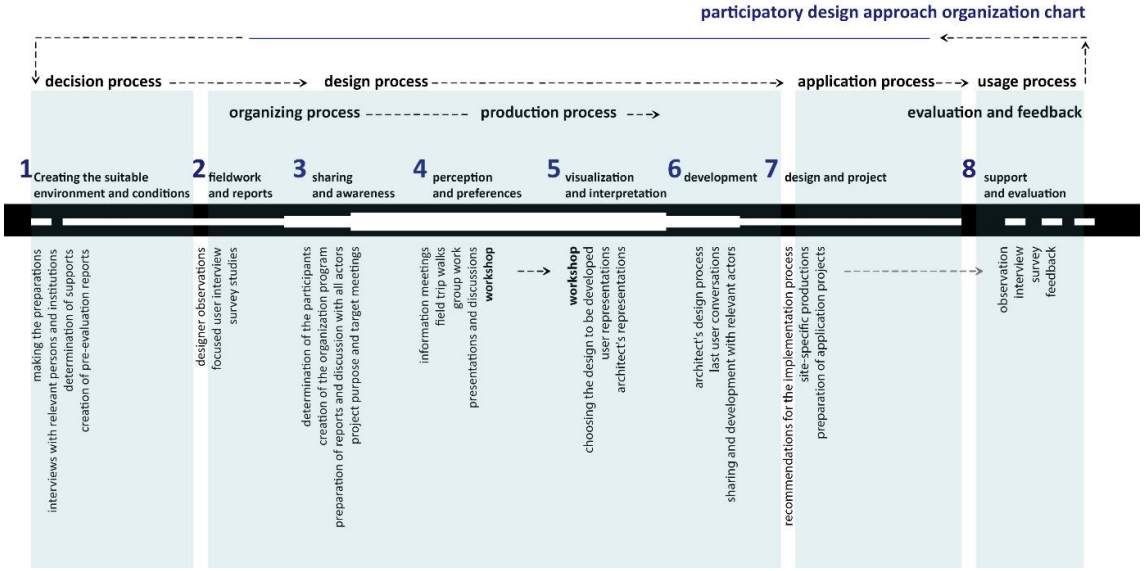

Fig. 6. Traditional Participatory Design Approach Chart [14] (Adapted from Hacıalibeyoğlu, 2013)

3.2. Understanding the Working Discipline of ARCGIS Program as a Geographical Mapping System

It is believed that utilizing digitalized geographical mapping system programs would be beneficial in proposing a new model for accessibility, which is considered the main source of weaknesses in the traditional organization scheme used in participatory design approaches. At this stage of the study, understanding the working principles of these programs is crucial to identify potential conflicts with the user participatory design method.

In this study, ArcGIS is chosen as a sample among the widely used programs in digital geographical mapping systems. ArcGIS is a digital mapping and analysis platform developed to visualize data of an area and make informed decisions based on the analysis results [17]. The process of evaluating the analyzed area within the program begins by identifying and marking the problems on the maps. To identify the problems, physical and socio-cultural analyses of the area are converted into numerical data and processed using Excel program. The evaluation tables obtained by transferring the Excel data to the ArcGIS program create a database. This database is continuously updated throughout the entire process. With up-to-date data that can be tracked and redesigned according to current requirements, the program provides predictions based on ongoing changes and supports the user in determining priorities (Figure 7).

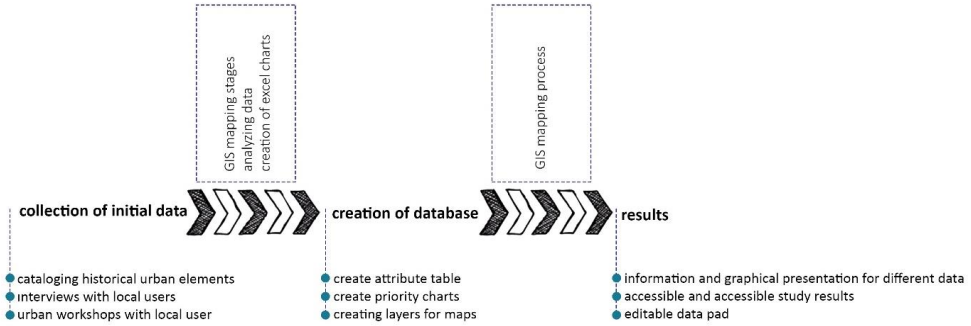

Fig. 7. ArcGIS Program Operation Process Diagram

There are no significant differences in transferring real spaces in the city to the virtual environment using ArcGIS software compared to a typical architectural analysis process. Therefore, there are no major concerns about the accuracy of the results obtained. In comparison to the traditional method, the problems, potentials, and threats discovered in the analyzed areas are overlapped with the points marked on the maps at different time periods. This layering creates time-space and cause-effect graphs of the city's changes. The main advantage of this digital method, compared to traditional paper-based analyses, is that the obtained data can be easily and quickly followed by various urban actors (Figure 8).



Fig. 8. User Interface Diagrams of ArcGIS Program

In this context, the new method is expected to enable the creation of simultaneous urban awareness for different areas. The real-time analysis of potential situations can provide urban users with perspectives not only within a specific area but also on other interconnected scales. Moreover, this method of utilization is crucial in terms of shaping public opinion and determining the goals and needs of a constantly changing city. It also offers advantages in addressing security vulnerabilities, identifying physical needs, and implementing necessary measures to combat criminal networks [18].

3.3. Rethinking the Traditional Organization Chart in a Digital Way

The proposed model for rethinking leftover spaces through the participatory design method aims to enhance user participation and inclusion in the redesign process. To ensure effective user participation, it is important to address the challenges of defining leftover spaces as areas that do not belong to anyone and to incorporate adequate user representation and timely involvement.

Considering the fast-paced and densely populated nature of modern metropolises, achieving meaningful user participation that represents the majority becomes crucial. Incorporating the digitalized lifestyle of the information age into participatory design processes is seen as a valuable approach to addressing these challenges and developing solutions.

The final phase of the study brings together the steps of the traditional participatory design approach and the fundamental principles of the ARCGIS program. The resulting model is not linear but simultaneous, with each step informing and feeding into the others. This allows users to have a voice at every stage while ensuring the continuous progress of the work by the designer and manager groups. Establishing a database for systematic evaluation of the collected information, particularly in decision-making processes, forms the basis for subsequent steps.

In the digitalized process, the creation of a suitable environment and conditions becomes an integrated part of each action in the decision-making and design processes. This fosters early user awareness and ensures accessibility for all actors (users, designers, and managers) at all times. The design and

implementation processes, which are influenced by the decision-making processes, are shared with the participating user and manager at regular intervals through open channels. Unlike the traditional model, the digital model allows for sharing and voting on design visuals, user control over material choices, transparency in tender and procurement processes, and user participation in implementation processes. This approach may also contribute to the use of local materials and the creation of regional employment opportunities.

By continuing to use the same interface after the completion of the design, the designer can gain instant insights about the area without long waiting periods. The layered graph of user feedback, collected at short intervals over an extended period, can serve as a sense of ownership and belonging to the designed area. Consequently, the area will be constantly updated within the larger context of the city (Figure 9).

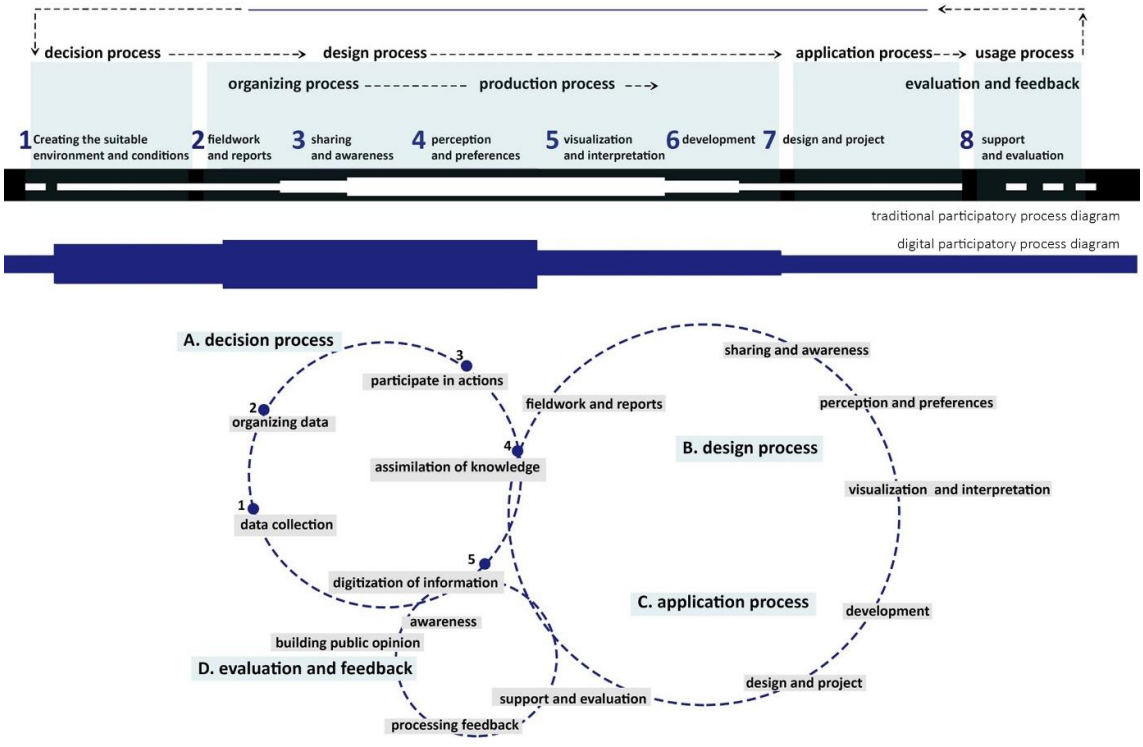

Fig. 9. Participatory Design Approach Chart Rethought by Digitalization

4. Findings

The SWOT analysis of the proposed new digital model for re-evaluating leftover spaces through participatory design reveals several strengths, weaknesses, opportunities, and threats:

Strengths:

1. Rapid recognition of changes and quick feedback: The digital model enables swift identification of changes in the field and obtaining prompt feedback on problems, allowing for a more up-to-date approach compared to the traditional method.

2. Flexible working hours and unlimited spatial boundaries: The digital platform transcends physical boundaries, enabling flexible working hours and reaching a wider population, leading to more objective results.

3. Enhanced user profiling: Through social networks and survey responses, the digital model allows for better recognition of target groups, facilitating faster and more accurate suggestions during the design phase and minimizing feedback in the decision-making process.

4. Contribution to social sustainability: The proposed model promotes equal, transparent, participatory, and democratic policies, making it accessible to all participants and fostering social sustainability.

Weaknesses:

1. Profile limitation: Digital platforms are predominantly used by specific age and income groups, potentially limiting the user profile for research field studies. Efforts should be made to protect the rights of children and the elderly.

2. Vulnerability to fake profiles: Digital channels are susceptible to the creation of fake user profiles, potentially compromising the decision-making processes with repeated responses from the same user groups.

3. Influence of external participants: The digital model may allow participation from individuals outside the regional user group, which can disrupt the evaluation of the area based on its own criteria.

Opportunities:

1. Archiving and viewing work: The digital model enables the archiving and viewing of work not only by managers and designers but also by users and participants, providing a permanent record for future reference.

2. Time and cost savings: The permanent archive of work can save time and costs in re-evaluating the same area in subsequent processes.

Threats:

1. Perceived scale and perspective: Digital interfaces often provide a two-dimensional, top-view mapping system, potentially affecting the perception of scale and leaving out the eye-level experience of the city.

2. Rapid consumption of new areas: The ability of digital processes to keep up with rapid changes may accelerate re-evaluation processes, potentially leading to the rapid consumption of new areas with implemented decisions.

3. Provocation and qualitative evaluation: Digital processes can be susceptible to provocation, necessitating well-designed and well-explained user interfaces to qualitatively evaluate the received feedback, particularly in decision-making processes.

Overall, the proposed digital model offers advantages in terms of real-time awareness, wider reach, enhanced user profiling, and social sustainability. However, limitations regarding user profiles, vulnerability to fake profiles, external influences, and potential challenges in scale perception and rapid consumption should be carefully addressed to ensure the effectiveness and reliability of the digital participatory design method.

5. Evaluations and Conclusions

Urban areas serve as the memory spaces of cities, much like attics or cellar rooms in houses. These spaces accumulate unused objects and store memories that are often overlooked and considered of secondary importance. The remaining parts of public spaces, formed by the layering of different urban identities, cultures, and functions, become the abandoned, ruined, and ghostly spaces of cities. Within the scope of this study, Lynch's definition of "parts of an ongoing system that belong to no one" resonates with the idea of leftover attic rooms. These areas, through which everyone passes but no one owns or protects, gradually turn into cancerous cells that spread over time and erode the urban identity.

In this regard, it is evident that these areas need to be reimagined and revitalized within the city. Actions undertaken in this context should be conducted transparently and fairly, considering sociocultural and economic changes in the reorganization of physical functions, while avoiding gentrification that excludes certain segments. One of the most effective methods to achieve this democratic condition is the user participatory design method, allowing the city's own users to determine the spatial needs. Moreover, this method contributes to the creation of social awareness in protecting the spaces that "belong to no one." However, for the process to proceed efficiently, user selections must possess both regional characteristics and represent wider masses in terms of number and quality.

Digital mapping systems have started to be utilized in today's metropolitan cities, contributing to the understanding and transformation of residual spaces. While they have not yet been widely employed throughout the entire design process from beginning to end, these systems play a significant role, especially in the context of residual spaces. Nonetheless, they also entail certain risks, threats, and obstacles.

Rethinking user participatory design approaches in a digital manner is believed to enhance urban memory due to its convenience, accessibility, permanence, and capacity to bring people together. The disappearance

of physical boundaries in these spaces will make them equally accessible to everyone, enabling them to be more easily recognized and open to change for both the city and its users. However, as we are in an era of rapid change, it remains uncertain whether virtualized real spaces will facilitate social movement and communication or isolate and desensitize individuals, leading to the decline of interactive publicness. Considering the future applications of the proposed method, it is crucial to accurately identify and continuously update the risks and threats associated with the widespread use of these systems, managing them through a user participatory system process.

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