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Digital public participation: reflections on the future of Taksim square

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ABSTRACT

The growing complexity of urban development has required the development of new and more capable strategies. In addition, there are demands for an enhanced role in urban planning from an increasingly powerful citizenry. Since current public participation methods are ineffective at gathering useful information regarding sustainable urban development, new data-sourcing techniques that learn directly from the experiences and preferences of citizens are required. This has led to greater interest in new digital public participation methods, such as the use of online geo-questionnaires with mapping capabilities, which can be tailored to local contexts and allow large groups to engage and have their views represented. This paper explores the role of Digital Public Participation Tools (DPPTs) to foster public participation in urban design practices through an empirical study of Taksim Square, a major center of Istanbul. The conceptual results of this research illustrate how digital public participation tools may be effectively integrated into urban design practices, while the empirical findings reveal the possible input of digital public participation tools in achieving a participatory approach towards urban design.

1. INTRODUCTION

Participation allows concerned or interested parties to express their opinions by including them throughout the planning process. It also gives them the right to influence decisions affecting them, increases their representation, increases the efficiency of the services they receive, and enables them to gain control over their own lives (Cornwall, 2008). According to Sanoff (2006), most community members want to be involved in decisions that affect their lives; however, in many cases, the level of current population growth and the dynamics of urbanization make it difficult for every citizen to actively participate in the decision-making process (Sanoff, 2006). In the twenty-first century, cities around the world are faced with the responsibility of responding to constantly growing populations, changing economic conditions, new technologies, and a changing climate. To meet these challenges, new methods have become necessary to replace increasingly unsuited traditional planning practices.

In urban planning and design, the current practices follow rational planning paradigms that promote economic growth with a particular focus on physical development. These are closed systems that cause significant losses of both resources and time, and also separate the planning process from society (Ataöv, 2013). In addition, the majority of these practices are either non-participatory or have only varying degrees of tokenism (Arnstein, 1969).

Although participation mechanisms for different functions in urban planning and design are generally established with one-way information and consultation or two-way dialogues, there is also a consensus that the seeking of new rights or the sharing of existing ones can add a new creative and collaborative dimension while increasing resources (Tekeli, 2009). Thus, with the participation mechanisms in which local values and resources are mobilized, more balanced use of public resources, increased creativity and social development, and the development of better city plans can be ensured. Such urban planning and designing practices are

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concerned with community development and local governance, the communication and interaction between a government and its citizens, and the future of cities (Tayebi, 2013).

Traditionally, public participation is achieved through a variety of face-to-face methods such as workshops, focus groups, and community meetings. Although these traditional methods are essential parts of the planning process and are still valid today, Digital Public Participation Tools (DPPTs) allow new opportunities to be introduced and developed. When compared to traditional participation processes, these tools provide greater opportunities for citizen participation and can be used to inform, learn, express opinions, and engage in the decision-making process. Moreover, public spaces of nearly every type have changed in form and have started to shift away from physical to digital platforms, making DPPTs even more attractive.

It is not yet clear if information and communication technologies are sufficient to increase public participation, or if participatory planning approaches are applicable for cities, especially those in developing regions. However, there are several opportunities for DPPTs to be used as a means to inform the public more quickly about planning and decision-making processes. Digital tools are useful for consensus building because they eliminate many time and space constraints (Afzalan & Muller, 2014), and participants may be able to express themselves easily in a digital platform (Afzalan & Muller, 2018). They also facilitate the collection of ideas from a large part of the community (Seltzer & Mahmoudi, 2012), and allow for various levels and degrees of public participation (Ertiö, 2015; Falco & Kleinhans, 2018).

This paper queries the use of DPPTs as participation mechanisms in urban planning and design processes through an empirical study conducted to rethink the future of Taksim Square in Istanbul. It uses a participatory method by offering a digital venue within which the common experiences of the users of this busy, important square can be expressed. In this study, a geo-questionnaire developed according to PPGIS methodology (Kahila & Kyttä, 2009) was used to gain preferences, opinions, and insights from citizens concerning the use and organization of Taksim Square. It is intended to reveal possible inputs for the design of a participatory mechanism for urban design through the gathering and sharing of useful information.

Urban squares are the most important public spaces that helped shape the identity of entire cities. Apart from functional roles such as gathering citizens together for various reasons and activities, they have symbolic meanings. The squares are the meeting areas of differences and diversity. They reflect collective memory as places where ceremonies, celebrations, and various collective activities are held and demands are expressed by citizens. With these features, they have a unique position in the city. Briefly, squares with its multidimensional and layered accumulation are the place of representation of democracy. Therefore, designing urban squares as both public and open spaces requires more attention and public participation.

The decision-making processes of urban planning and design for such major and culturally important city squares have an importance at the local, national, and even global scales, and should, therefore, be open to all opinions, regardless of location, gender, age, and identity. For this reason, it has been considered appropriate to offer everyone the right to participate through an online questionnaire on social media without limiting the profile of the participants. Despite the digital divide which means a risk of excluding some groups from participatory processes, the advantages that online technologies have for the participatory design approach remains. In this context a research question addressed by this study: What are the benefits of digital participation approach in the design process on urban design quality?

2. LITERATURE REVIEW

The literature review of this research provides background information regarding the public participation approach by considering the effect of emerging information and communication technologies (ICTs). It is an examination of the opportunities and challenges of participatory practices while examining the capability of digital tools in facilitating greater public participation. In addition to the theoretical focus on the objectives of participation, the opportunities and challenges of ICT-based methods such as PPGIS have discussed as there is a need for detailed research into the effectiveness and usability of such tools in planning processes.

2.1. Digital Public Participation in Urban Design

Participatory urban design is a social and political practice based on the inclusion of citizens' needs and opinions regarding spatial decisions and encourages differing degrees of citizen participation throughout the various stages of the planning process. A better understanding of digital public participation in urban design, therefore, requires a theoretical background in the roots of the public participation concept, the opportunities and challenges of DPPTs, and the level of their current usage.

2.1.1. Public participation

Although the concept of public participation has many different definitions, it has widely acknowledged foundations. First of all, public participation is seen as a way to increase the legitimacy and accountability of democratic institutions by including individuals directly into decisions that affect their lives (Cornwall, 2008). Secondly, it is believed that involving people in local decision-making processes and bringing together a common purpose or interest will empower communities and help build social cohesion (Blake et al., 2008). Thirdly, public participation is seen as a tool to improve public services and deliver them in a more appropriate and more efficient manner (Parker, 2007).

Urban planning studies have emphasized the importance of participatory methods since the late 1960s and have been reflected in practice since the 1970s (Tekeli, 2009). Initially, community awareness in

the1960s ensured the direct involvement of the public in decisions regarding their physical environment, and their growing sense of social responsibility resulted in the creation of a new movement (Sanoff, 2006). During this period, social movements focused on urban practices and the social inequalities they created and allowed people to demand the right to participate in decision-making processes (Castells, 1983; Fainstein, 2005). Following this reorganization, many design and planning experts were drawn away from the traditional approach, and since the mid-20th century, spatial planning has shifted towards a framework intended to achieve greater social consensus on the desired future (Kaiser & Godschalk, 1995). It has, therefore, become critical to tackling the adverse effects of urbanization, defend the rights of citizens, and develop methods to ensure broader public participation in urban planning and design (Sanoff, 2006). To achieve this, planning theories such as advocacy planning (Davidoff, 1965), communicative planning (Sager, 1994; Innes, 1995), and collaborative planning (Healey, 1997) have been proposed and developed.

In urban planning, public participation can be provided at different levels and is defined according to the point in the urban planning process at which it occurs – from data collection to decision making and implementation. According to the model developed by Arnstein (1969), the relative strength of the citizen is connected to the number of rungs on the decision-making ladder; it also defines different levels of participation by dividing them into eight degrees from manipulation (non-participation) to citizen control (full participation). His work, which is still relevant today, asserts that most public participation practices still stand at the bottom of the ladder (Cornwall, 2008).

Technological developments have led to changes in public participation, and many new forms of participation have been made possible by developments in communication and information technologies (Graeff, 2014). In the 21st century, online communication and digital tools have gained popularity as they can provide venues in which people can learn, express their ideas, and debate. Therefore, the general public has the chance to more easily participate in decisions that affect them and their habitat. However, despite the opportunities for a more participatory urban design approach, there remains a digital divide that risks excluding some groups from this process (Batorski, 2014).

Studies have identified the levels of public participation in organizational – primarily governmental – activities through the use of digital technologies (Ertiö, 2015; McMillan, 2002). Tambouris et al. (2008) developed a classification for digital public participation based on that of the International Association for Public Participation (IAP2) (2007), and Macintosh (2004) developed participation levels for digital public participation based on a concept from the Organization for Economic Co-operation and Development (OECD, 2001). The table given down there compares these levels and classifications, both with each other and especially with those established by Arnstein. According to this comparison, there are four levels of participation, each with an increasing degree of interaction (Table 1).

Table 1. The comparison of different approaches for participation levels

Arnstein (1969)	OECD (2001)	IAP2 (2007)	Tambouris et al. (2008)	Macintosh (2004)	Participation levels
Citizen control	-	Empower	E-empowerment	-	Final decision-making in the hands of the public
Delegated power	Active participation	Collaborate	E-collaborating	E-empowerment	Two-way interactions that allow the public to influence the formulation of policy
Partnership					
Placation	Consultation	Involve	E-involving	E-engaging	Two-way communication between the public and the administration that enables meaningful contributions
Consultation		Consult	E-consulting		
Informing	Information	Inform	E-informing	E-enabling	One-way communication from the administration to the public

Public participation in urban planning has four main objectives, and the levels of participation mentioned in Table 1 serve these purposes. These are respectively:

- One-way communication from the administration to the public (McMillan, 2002) for the purpose of providing information to the public and facilitating their collaboration to create an inclusive planning process (Quick & Feldman, 2011).
- Two-way communication between the public and the administration that enables meaningful contributions (McMillan, 2002, Tambouris et al., 2008) for the purpose of negotiation and gathering people together to resolve conflicts through consensus-building techniques (Margerum, 2002).
- Two-way interactions that allow the public to influence the formulation of policy (Bovaird & Loeffler, 2012) for the purpose of collecting information about local issues and learning from local knowledge (Corburn, 2005).
- Final decision-making in the hands of the public (Tambouris et al., 2008) for the purpose of engaging and supporting the community to create mobility and local action (Praharaj al., 2017).

2.1.2. Digital public participation: opportunities and challenges

Habermas (1992) idealizes the public sphere as a critical and egalitarian discussion area in which citizens can make their claims and share their ideas. According to this concept, the public sphere was created to gather individuals together to discuss issues based around a "common interest." The concept of the public sphere in the 21st century is best defined by the reduction of its physical existence and its subsequent transfer to the digital realm. Digital technologies, upon which this new public space is built, bring together different parts of society in a virtual environment and have completely transformed the communication system. Thus, human interactions and forms of socialization have changed, and new information and communication technologies now have the power to organize society. Volkmer (2003) acknowledges that the current public sphere was shaped by information and communication technologies, and further argues that public space on a global scale is now possible. According to Castells (1983), communication networks complement the public sphere, and these

networks comprise an interactive public space in which ideas can circulate. These information and communication networks play crucial roles in the shaping of a new public sphere in which public debate moves from a national setting to one that is global.

Emerging information and communication technologies redefine and transform boundaries (Trenz, 2009). They contribute to political communication by introducing a new symbolic order, strengthening the participatory and interactional aspects of the public sphere, and everyone is able to participate in the political process and contribute to problem solving through their use. However, participation without attendance in the decision-making process remains only symbolic participation, and there are criticisms of the claim that these new technologies offer a truly democratic public sphere that provides equal access and participation opportunities. Sparks (2004) suggests that access is increasing, but not all groups are able to use the necessary technology.

The most common barriers to participation are: not knowing how to participate, lack of time, child care responsibilities, the scheduling of participation opportunities, the location of meetings, and difficulties of access (Blake et al., 2008; Afzalan & Muller, 2018). The spread of digital platforms can help to overcome these difficulties as they make it easier to inform the public about planning and decision-making processes and achieve more comprehensive participation. However, apart from their usefulness when it comes to giving information, it is not always possible to say that digital tools are always effective in establishing two-way communication (Ertiö, 2015).

A lack of self-confidence and an unawareness of the right to participate in participation are also regarded as significant constraints (ANSA-EAP, 2010). This is particularly true when the administration of the participants cannot occur in a transparent and supportive manner (Locke et al., 2003). Research suggests that digital technologies often give more power and authority in the planning process to communities that are wealthy but ignore marginalized groups (Graham, 2002). However, this is not a unique situation as it is possible to observe the same issue across all types of participation venues. Blakey et al. (2006) state that some groups also face additional discrimination, which is a deterrent to their participation.

Other criticisms are that some social groups do not have access to communication technologies due to socio-economic factors such as income or race, and even if they have access, they cannot use the necessary technology due to age, attitude, or skill (Praharaj et al., 2017). However, studies have shown that familiarity with smartphones has increased the overall abilities of people to access and use digital platforms (Ertiö, 2015).

Nevertheless, increasing digital literacy does not always encourage participation (Ertiö, 2015; Praharaj et al., 2017). Lack of trust in local decision-making processes can often restrict participation (Blake et al., 2008). In this regard, individuals are concerned that their opinions will not be taken into consideration, and they believe that their contribution will not yield any worthwhile results.

People may be encouraged to express themselves more efficiently in a digital platform. However, such an open venue can create noise and conflict in discussions, and face-to-face interactions are still considered to be more critical for the creation of a strong consensus (Afzalan & Muller, 2018). Digital tools can, therefore, be best used to allow participants to discuss their ideas online, and to arrange face-to-face interviews (Hampton, 2007).

Although digital tools are thought to be more effective for consensus building because they eliminate time and space constraints (Afzalan & Muller, 2014), research shows that time and space constraints are largely psychological and/or used as an excuse not to participate. In addition, public participation clearly remains affected by the unequal distribution of power and resources and the structural inequalities prevailing in many societies (ANSA-EAP, 2010).

Another key area for digital tools is their ability to facilitate the collection of ideas from a large part of the community. This can include alternatives, evaluations, and data that can be analyzed more easily (Seltzer & Mahmoudi, 2012). However, this point is not without weaknesses. For example, the information provided can be manipulated by the planner or misused (Longueville et al., 2010) due to a lack of technical infrastructure or staff to correctly conduct an analysis (Afzalan & Muller, 2018). In addition to any organizational shortcomings, the reliability of the acquired knowledge can also be controversial. Situations such as whether it represents a meaningful part of society, or if anonymous participants were given the opportunity to participate in the process (Allwinkle & Cruickshank, 2011) constitute questions regarding the reliability of the information (Ertiö, 2015). In short, the trust given to the collected data itself and the methods of analysis remain dependent on the quality of both the organization conducting the process and the nature of the participants (Afzalan & Muller, 2018).

2.1.3. Digital public participation tools: geographic information systems

One of the digital tools that can be used to support existing data sources with ideas from the local community is Geographic Information Systems (GIS). The integration of a bottom-up approach to GIS allows local people to contribute to the existing database directly. Several studies have shown that Public Participation Geographic Information System (PPGIS) tools can be used to enhance collaboration between urban planners and local people, and collect data in a variety of contexts ranging from environmental management to urban design (Jankowski et al., 2016; Kahila & Kyttä, 2009; Brown & Kyttä, 2014). In addition to PPGIS, volunteered geographical information (Goodchild, 2007); geo-questionnaires (Kahila & Kyttä, 2009); crowdsourcing (Howe, 2006); and geo-participation (Perkins, 2007) are also significant concepts that have been developed within the scope of digital public participation.

In 21st century urban planning, there has been an emphasis on the potential of meaningful geographic data acquired by geospatial technologies and spatially explicit

social media (Czepkiewicz et al., 2016). With the emergence of user-friendly mapping interfaces associated with GIS, the spatial awareness and mapping abilities of citizens have increased significantly. People now use street maps and satellite imagery through popular mapping interfaces such as Google Maps, Google Street View and Google Earth, not only to view or to find a location but also to provide maps and content generated by the user through voluntary geographic information (VGI) (Goodchild, 2007; Ghose, 2017).

Common mapping provides democratic opportunities for citizens to articulate their claims and expectations through social, economic, political, or aesthetic content, and importance is given to the community or local mapping produced collaboratively by those with local knowledge (Perkins, 2007). However, community mapping occurs much less frequently in practice, and it has not provided as much democratization as expected. More recently, it has been mostly used in public participatory GIS research (Omsrud & Craglia, 2003; Ghose, 2017).

PPGIS and VGI tools have allowed the "crowdsourcing" of spatial data generated by an online community (Sui et al., 2013). Crowdsourcing mapping applications may provide a bridge between administrations, planners, various institutions, and the wider citizenry (Czepkiewicz et al., 2016). These tools also have the potential to represent a form of crowd wisdom (Brown & Kyttä, 2014), both by gathering data from many participants and also by providing an open-access platform.

Technological advances have led to the development of web-based GIS management systems designed for such purposes. One of these methods, developed according to PPGIS methodology, is the use of location-based surveys that allow participants to respond to survey questions related to geographic features (Jankowski et al. 2016). The geo-questionnaire has been practiced in areas such as urban planning (Czepkiewicz et al., 2017; Bąkowska, 2016; Jankowski et al., 2016; Kahila-Tani et al., 2016), sustainable urban mobility (Czepkiewicz et al., 2016), the citizen-centric decision-making process and citizen engagement (Kahila-Tani et al., 2016, Bąkowska et al., 2016; Czepkiewicz et al., 2017; Degbelo et al., 2016; Jankowski et al., 2016), citizen design (Mueller et al., 2018), e-governance (Kingston, 2007), and urban green infrastructure planning (Rall et al., 2019; Møller et al., 2019).

In urban design and planning studies, the usefulness of PPGIS is evaluated in terms of cost, ease of data provision, responsiveness to the needs of communities and organizations, longevity and stability, and ability to support cooperation between stakeholders (Ghose, 2017). According to Czepkiewicz et al. (2016), it is possible to divide such practices into two groups according to both their objectives and their scope: public participation in decision-making processes and location-based social research.

3. METHOD

This study uses empirical evidence to reveal the possible inputs of DPPTs to a participatory urban design approach for Taksim Square. The conceptual results and the empirical findings illustrate how DPPTs may be integrated into urban design process in order to increase the effectiveness and efficiency of participatory urban design practices.

3.1. Case study: Reflections on The Future of Taksim Square

Taksim Square is situated in the Beyoğlu district of Istanbul (Figure 1). It is located at an intersection of several major transportation networks, accommodates urban service areas and other public functions, and has huge pedestrian flow-through. It is one of the city's most prominent attractions due to its many places of entertainment and culture, restaurants, shops, hotels, public transportation modes and its surrounded historical settlements, such as Talimhane, Cihangir, Tophane, Gümüşsuyu, and Galata. It has a settled place in the city's collective memory, and the many political and social events that it has witnessed have given it a considerable symbolic meaning in economic, socio-cultural, and spatial contexts (Figure 1)

Figure 1. Location of the study area in İstanbul

From the beginning of the modernity project of the Republic to today, Taksim Square has been in the center of the conflict, especially the production of different groups of discourse in the public sphere as the stage where Turkey's cultural and ideological discourses are represented. Taksim Square which has been ideological since its construction, has shaped by the ideologies of the governments.

Taksim Square, which has witnessed historical events and undergone many socio-cultural and spatial changes in the historical process; has an essential place in the memory of the citizens, in terms of urban landscape and architecture, as well as social and political. Essential physical and social transformations such as the Taksim Square Republic Monument, the opening of the Talimhane District, the opening of Tarlabaşı Boulevard, the demolition of the Topçu Barracks, and establishing Gezi Park which started with the declaration of the Republic; continued with the Taksim 360 project, pedestrianization project, reconstruction of Atatürk Cultural Center and Taksim Mosque project in the 21st

century within the scope of new meanings and ideologies (Figure 2). Recently, the right of individuals to transform Taksim Square is also in the foreground through participatory approaches such as square design competitions, events, workshops etc.

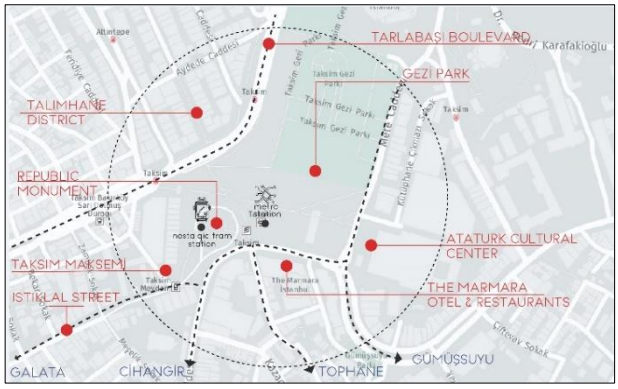

Figure 2. Urban identity elements of Taksim Square.

Taksim Square is a public space that reflects the ideological representations and transformations of every period, and an open space that brings the city dwellers together with their daily needs. The feelings and opinions, needs, and expectations of the society regarding the identity, images, and functionality of the square obtained within the scope of the research shows how the square should change between this day and its future. In this context, this case study includes an examination of the possible participatory inputs of DPPTs for the future of Taksim Square.

3.2. Data and Methodology

The method for this study was developed according to PPGIS methodology (Kahila & Kyttä, 2009), as this has proved a useful means of gathering preferences, opinions, and insights from citizens. An online geo-questionnaire was designed to elicit opinions and preferences for the future of the square and to identify any present concerns. The geo-questionnaire is a map-based survey established through Esri Survey123 and advertised on social media. Data in the geo-questionnaire were made available for download in different formats such as Excel or Shapefile for integration with GIS.

In addition to the evaluation and analysis of the data, the most significant step is sharing the results with society. Hence, an online map was produced to provide a collective opportunity for people to shape the future of Taksim Square and to create new data sources. Online mapping makes it easier to share the results of research with potential audiences. Online research maps often contain static images that allow viewers to understand the results more easily, and they offer several advantages for subsequent presentation-type research (Roth, 2013). It is becoming increasingly common for researchers to use multiple (spatial) data inputs, and that these are an outstanding output for incorporation into future research (Borgman, 2007). For this study, the data gathered by the online questionnaire tool were transferred to an online mapping platform to create a map that allows both the viewing and crowdsourcing of data.

3.3. Data Collection and GIS Integration

An online geo-questionnaire was used to gather useful information concerning the use and organization of space from the public to reflect the future of Taksim Square. The online survey form consisted of both open-ended and closed-ended questions and boxes for participants to add comments while answering open-ended questions.

The participants were asked to use a URL link published on social media to access the online questionnaire from any standard browser without the necessity for additional software. The participation did not require specialized skills apart from a familiarity with browsing through online documents and generally being online.

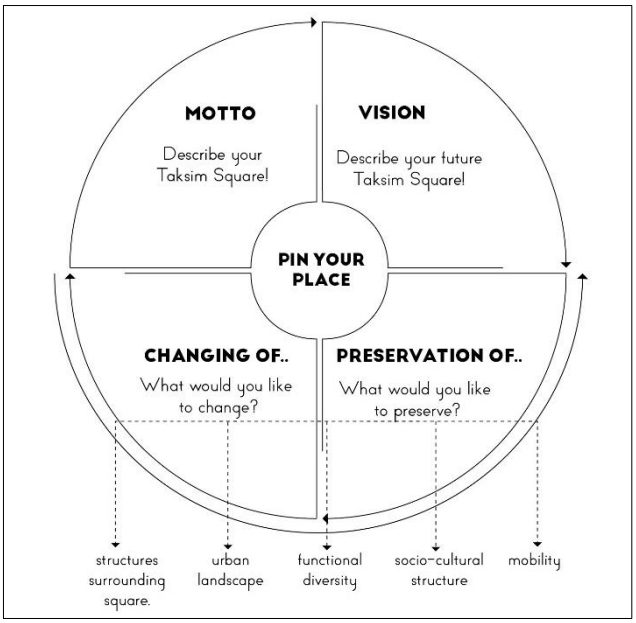

Figure 3. The layout of the questionnaire

The questionnaire was organized around five main sections (Figure 3). Firstly, the participants were asked for vision and motto sentences to express their perceptions and aspirations. Motto reveals how today's Taksim Square is perceived by the participants and what it has meanings for the participants. On the other hand, the vision reflects how participants imagine Taksim Square in the future and their expectations (Figure 4).

In this context, secondly, multi-choice questions were used to take the opinions and expectations of participants regarding the preservation of, and changes to, the square. After the participants selected one of the five essential issues identified as structures surrounding square, urban landscape, functional diversity, socio-cultural structure, mobility as the most important issue, they were asked to explain their ideas about change or preservation (Figure 4).

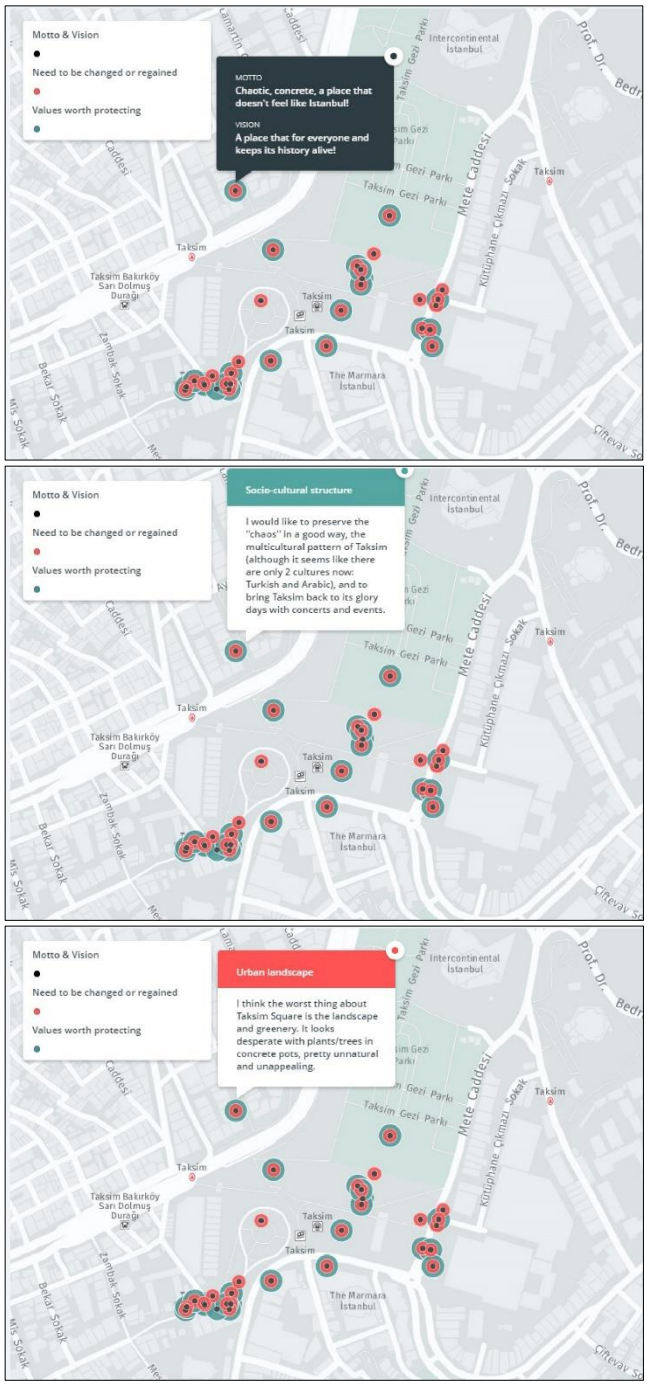

Figure 4. (a) Map of "motto and vision (top)", (b) Map of "values worth protecting (middle)", and (c) Map of "need to be changed or regained (middle)"

Last but not least, participants were asked to pin where they feel a sense of belonging, or where they feel epitomizes the character of Taksim Square. The survey results were visualized through the geographic coordinates of these points. It was examined why these points stand out, the distribution and trend of the sense of spatial belonging in Taksim Square, with an analysis to be carried out from the points participants identified in this context. Although each answer could be claimed to play a significant role in reflecting the future of the square, it is better if they are evaluated cumulatively.

[*](https://tusezen.carto.com/builder/bf3b5faa-b0ed-43be-875e-1f294b141704/embed)

4. RESULTS AND DISCUSSION

The results of this study are presented both as a conceptual background and as empirical findings.

4.1. Evaluation and Results of the Case Study

This case study of Taksim Square uses data acquired from 35 participants who are between 24 and 60 years old. The frequency of being in Taksim Square of participants varies as every day, 3-4 times a week, 1-2 times a week, 1-2 times a month, or once a year. The data obtained from the 35 participants creates a basis for future studies by presenting a methodology for gathering data. Moreover, meaningful results have emerged for this case study area, primarily determining on which subject and at which locations urban design interventions are most needed for Taksim Square.

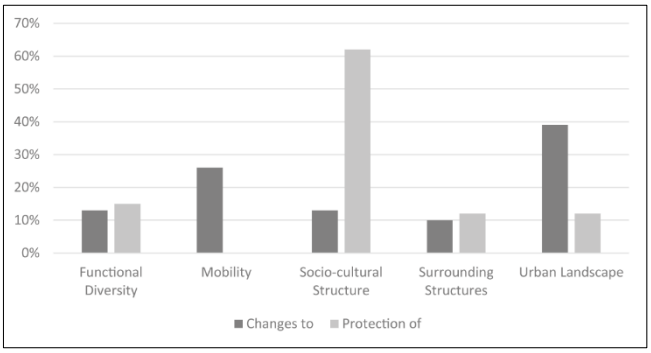

Figure 5. The issues in which urban design interventions are primarily needed for Taksim Square

It is important for urban planners to receive ideas and insights from citizens in order to understand their perceptions, aspirations, and expectations, and to identify the issues in which urban design interventions are primarily needed. According to the results of this study, priority issues that the participants favor changes to Taksim Square are associated with urban landscape (36%), mobility (26%), socio-cultural structure (13%), functional diversity (13%), and surrounding structure (12%). The issue of change in Taksim Square points to a need for spatial reorganization along the lines of urban landscape and mobility. According to the results of the survey, 26% of the participants expressed a desire for spatial improvements to increase orientation and pedestrian comfort in the square. In addition, 36% desired an attractive public space with an emphasis on the freedom to use the square for various recreational purposes such as waiting, meeting, and resting (Figure 5).

The common concern expressed regarding Taksim Square is the feeling of being lost. This issue has been expressed in different words as "a chaotic, complex, undefined or bare concrete". Participants unhappy with the current socio-cultural structure emphasized problems of social alienation and urban security. Challenges in this context have been identified as obstacles to be solved by rethinking urban mobility, urban landscape, and overall usage in and around the square.

Due to the fact that the square is at located at an intersection of several major transportation networks, and has huge pedestrian flow-through, metro and tram stops have come to the fore as preferred places to wait and meet. However, the most important problem expressed by the participants is that the square turns into an area to pass by. It is expected to be integrative rather than being used to just pass by. The creation of functional diversity that promotes diverse spatial uses, socio-cultural life, and social integration is demanded by the participants of the survey.

In addition, participants were asked to pin the place where they most feel a sense of belonging. The spatial distribution of the sense of belonging in Taksim Square was analyzed through these points (Figure 6). This was intended to elicit those locations where urban design interventions are primarily needed. These pins symbolize local values, which are essential to determine the perceptual boundaries of the square and to learn at which place each participant positions themselves in the square and at which places such spatial belonging is felt to be strong. Instead of implementing an urban design intervention to redevelop problem places, repairing and returning fundamental local values to the public will provide a more practical solution for a complex urban area such as Taksim Square.

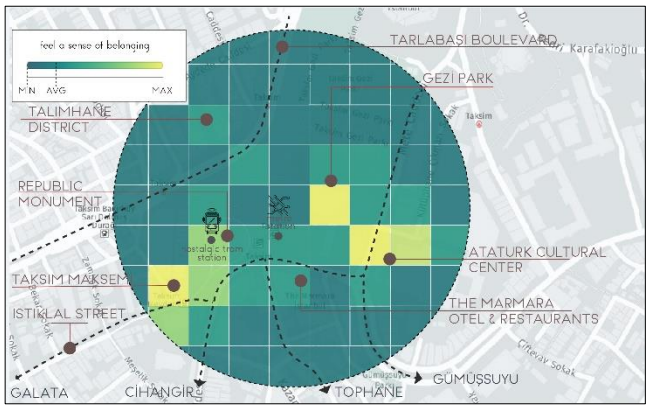

Figure 6. Map of "feel a sense of belonging, or where they feel epitomizes the character of Taksim Square"

There is a substantial social structure and everyday routine within the square that people want to continue experiencing, and as can be understood from the detailed answers to the geo-questionnaire in this study, the desire to preserve its socio-cultural structure is also a means to preserve the memory of Taksim Square itself. Other responses regarding preservation are also aimed at maintaining the memory and identity of the square, and these center on issues of its urban landscape (Gezi Park), surrounding structures (historical buildings), and functional diversity (functions integrated with the identity of the square). Atatürk Cultural Center, Gezi Park, Republic Monument, Marmara Hotel and the entrance of Istiklal Street where historical water structure (su maksemi) and street-food bufes are located, are places where the sense of belonging is high (Figure 6). These places are very important for the daily practices and collective memory of the society as well as their symbolic importance such as transference Taksim Square's history and identity to future generations. People frequently use these locations as meeting places for various purposes. In this sense, the importance it has is emphasized by the participants in the sense that it gives freedom to be both a social and a political individual.

Briefly, throughout history, city squares have played a role in the daily practices of urban societies and bear witness to the social changes they undergo by retaining the spatial, functional, and semantic traces of all these transformations. Due to its location, Taksim Square has played a binding role between the old and new central business districts of Istanbul, and it has long been a major entertainment, trade, and cultural center. It has gained and preserved its social and political importance at a higher level than that given only by its spatial context. Due to its crucial and symbolic importance in terms of Istanbul's urban memory and identity, Taksim Square has also been a target of urban transformation practices since its establishment. According to the results of this case study, the preservation and transference to future generations of Taksim's historical narrative and the collective memory of its last few decades are considered crucial.

4.2. Discussions and Results of The Conceptual Background

Due to their rapid urbanization, cities are constantly changing in their social, economic, and political contexts. City centers are often the first urban spaces to be affected by the negative externalities produced by this process. Thus, cities that have lost their identity and heart are in danger of being considered no longer livable. To counteract this, urban planners and designers are constantly striving to regain the vitality of urban centers and redevelop them *for* all and *with* all.

Participatory urban planning and design approaches based on social upheavals against top-down decision-making have been discussed in many countries since the 1960s. The movements that promoted the participatory approach were a symbol of the search for a solution by city professionals struggling against unfavorable urban conditions. Their purpose was to encourage citizens and provide them with a voice in matters regarding their daily life and environment. By definition, public spaces must be open to everyone, and if they are designed to be truly inclusive, they will produce a sense of belonging; if not, they are in danger of becoming little more than a collection of undefined and incomprehensible gaps.

Emerging information and communication technologies have brought a different approach to the design, analysis, and perception of public space and technology-based tools enable these areas to become interaction- and experience-rich environments by taking on new forms. Recently, several urban studies have pointed out the necessity of new paradigms, policies, strategies, and models for the planning, urban design, and architecture of public spaces.

Citizens with a broader awareness of social, economic, and spatial developments and changes through new media often demand more participation in decision-making processes. In addition, many urban

actors, such as businesses, non-governmental organizations, and local government departments, face increasing requests for participatory mechanisms. Enabling this is now much more possible as policymakers and urban planners are supported by a range of new technologies in their efforts to improve organizational capacity, social justice, and increased quality of life. The connectivity of various actors has been increased, information and the spread of data has been facilitated, and new network opportunities have been introduced that eliminate the constraints of both time and space.

Despite the abundance of information and greatly increased levels of interaction, this conducive environment still has limitations that can lead to the exclusion of different voices and opinions. In this context, unfair internet access and digital literacy, as well as the socio-political and cultural-political context of its use, should not be ignored when discussing the possible democratic effects of digital tools (Van Dijk J, 2012).This study is an attempt to use empirical evidence to examine the effectiveness and efficiency of these tools in facilitating greater public participation in urban design practices.

One of the purposes of public participation is to provide information to the public and to facilitate collaboration for an inclusive planning process (Quick & Feldman, 2011). DPPTs have been used to demonstrate their capabilities with regard to the latter, but reaching wider audiences should become a critical aim. To achieve this, a more effective advertising policy should be followed in the digital environment, and integration with different processes, or methods fed from traditional participation models, should be provided. In this study, an online map has been produced to provide an anonymous information flow that allows users to both inform and be informed.

As negotiation and gathering people together to resolve conflicts through consensus building techniques (Margerum, 2002) is important, by revealing the scope of ideas regarding Taksim Square, the results of this study will provide input to both the urban design and planning disciplines.

Another purpose of public participation is to collect information about local issues and to learn from local knowledge (Corburn, 2005). People tend to express their ideas more easily in digital environments, and in this study, a digital venue was created to facilitate the gathering of local information. However, using DPPTs carries a risk of information pollution, and specialized information on how to interpret the raw data and use it in practice remains insufficient. Within the scope of this case study, while the closed-ended answers were evaluated by statistical methods, the detailed answers to the open-ended questions were also taken into consideration. The online map showed only the clear-cut answers and gave any statistical data without comment.

Lastly, digital media, and especially social media, support the community to create mobility or give information regarding local actions (Praharaj et al., 2017). In this study, social media was used only to inform people, but not to provide a participation mechanism for mobilizing society. It is recommended that a method is integrated into the process by which the research results constitute inputs into urban design practice.

Information and communication technologies provide several new opportunities for people to inform, to learn, to express opinions, to listen, to discuss, and to participate in decision-making processes. However, participation without attendance means that it remains merely symbolic, and a public debate based on freedom of expression should clearly show all comments and include feedback from management. Consequently, it is necessary that these communication tools ensure class equality, the representation of different identities, and the participation of the public. According to Jenkins (2006), the practices offered by ICTs can only become widespread if digital tools are tailored to the local culture since connectivity and interaction are features of technology, while participation is a characteristic of culture. It is essential to note that technological change has meant that public participation has evolved through complex communication, interaction, and visibility processes that have economic, global, social, and cultural dimensions (Jenkins, 2001). Urban planners and designers need to play a more active role in participatory democracy and social change in order to achieve their goals of reducing the problems of discrimination and reducing poverty, racism, and income inequality (Sanoff, 2000).

5. CONCLUSION

DPPTs attract significant attention among local governments, non-governmental organizations, and various collective initiatives because they can be used to ensure a degree of public participation and are a means of gathering local information. In addition, DPPTs have the potential to provide answers to issues that reduce the efficiency of existing participatory applications as they include tools specifically designed to support participatory planning and decision-making process. Many of the current problems in this area arise from factors that limit the engagement capacity of all actors in the planning process, from experts to members of the local community. Finally, DPPTs offer next-generation engagement, the potential to remove some practical obstacles to participatory planning, and a response to the administrative challenges faced by those in the field.

Despite the advantages offered by DPPTs, there are still several barriers to participation; these include lack of awareness regarding the importance of participation, insecurity about the attendance process, lack of time, the location of meetings, and difficulties of access. By using digital platforms, it is possible to partly overcome these challenges. It is easier to inform the public about planning and decision-making processes, and it becomes possible to involve a wider range of participants, primarily through online platforms. However, it is not always possible to say that DPPTs are effective in establishing two-way communication.

New technologies offer new possibilities for both individual and collective actions, but this may also be a source of social exclusion and social polarization. Not only are the tools and capabilities that technology offers essential but also the organizational capacity and culture

of communities using the technology. Therefore, in order to ensure participation in urban design, it is necessary to investigate situations where participation is low, and access is hindered, and to suggest a tailored DPPT in response. The obstacles to ensuring participation are not only due to society. They can also be due to the adaptation capacity of the managing entity. It is not easy to practice bottom-up governance in any geography that is more accustomed to the hierarchical model. Therefore, it is vital to identify the tools that will facilitate the adaptation process for all actors and lead them to an overall solution.

The empirical findings of this research reveal the possible inputs of DPPTs to a participatory urban design approach to Taksim Square. This case study offers a methodology for gathering useful information at the local level and provides meaningful results for the future of the Taksim Square design process.

In this study, online mapping tools, and a geo-questionnaire based on GIS technology were used to engage participants, to gather useful data, to inform people, and to share the raw data. In addition, the conceptual results illustrate how DPPTs may be integrated into urban design practices effectively. The use of DPPTs as a participation mechanism in the decision-making processes of urban planning and design has been examined, both from the results of the case study and also from its conceptual background. Accordingly, DPPTs have been shown to effectively serve the main objectives of participatory urban planning and design, but how they are implemented remains highly relevant. It may be necessary to integrate a participatory mechanism designed to combine DPPTs with traditional methods and processes such as face-to-face participation. In this context, inclusiveness, and the medium of the digital participation tool, frames how local data is evaluated and reflected in practical practices, and how the possible inputs of DPPTs can be integrated into urban design and planning processes.

This subject still has many questions that need to be addressed. In particular: (i) What are the restrictions on integrating the inputs of DPPTs into urban design and planning practice? (ii) What are the factors affecting the success or failure of public participation in combating exclusion? (iii) How can the appropriate digital participation tool for the culture of any society be determined?

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