

Designing a Storytelling Approach for Online Civic Engagement Tools

by

Özge Genç



A Thesis Submitted to the

Graduate School of Social Sciences and Humanities
in Partial Fulfillment of the Requirements for the Degree of
Master of Arts **in** Design, Technology & Society

Koç University

October 2016

Koc University
Graduate School of Social Sciences and Humanities

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Özge Genç

and have found that it is complete and satisfactory in all respects,
and that any and all revisions required by the final
examining committee have been made.

Committee Members:

Assoc. Prof. Asım Evren Yantaç

Assoc. Prof. Şebnem Timur Öğüt

Assoc. Prof. Murat Ergin

Asst. Prof. Ergin Bulut

Asst. Prof. Aykut Coşkun

Date:

Abstract

Throughout the years, the online civic engagement tools have been gaining importance and bigger roles in improving the quality of everyday life. Petition based or awareness-raising campaigns have spread to the masses via social media tools. Some local governments started providing online local engagement tools to their citizens and some civic communities built their own tools. Either way, civic participation in governing, debates about local issues and the need for online civic engagement support will be increasing. Today, citizens discuss, debate, propose solutions about their city. However, there is still need for more engaging interactive civic tools for more effective, informative and inclusive discussions. While civic engagement tools have been developing in terms of user numbers by improved social media use or inclusion of geographical information systems for location based spotting of the discussion, a more integrated user centered design oriented approach is in need. This thesis presents and discusses a storytelling-based concept for online civic engagement. With this study the integration of location based urban information, social media use and the storytelling concept that brings together content from different sources, were explored to design a more effective interactive tool. The research approach was exploratory and user centered design methods were applied. As a result, a location based storytelling application for a better civic engagement experience is proposed.

Keywords

Civic engagement, location based data, storytelling, interactive information design, concept creation, collective efficacy.

Özet

Yıllar geçtikçe çevrimiçi sivil katılım araçları önem kazanmakta ve günlük hayatın kalitesini artırmada daha da büyük rol oynamaktadır. Farkındalık kampanyaları ya da imza kampanyaları kitlelere sosyal medya aracılığıyla yayılmaktadır. Bazı yerel yönetimler vatandaşlarına çevrimiçi yerel katılım araçları sağlarken, bazı sivil toplumlar örgütleri de kendi araçlarını kurmuştur. Her iki durumda da, yönetime ve yerel sorunlarla ilgili tartışmalara sivil katılım yükselecek ve çevrimiçi sivil katılımın desteğine olan ihtiyaç artacaktır. Günümüzde, vatandaşlar şehirleri hakkında müzakere ve münakaşa edip, ilgili çözümler sunmaktadır. Ne var ki daha verimli, bilgilendirici ve kapsamlı tartışmalar için etkileşimli sivil katılım araçlarına hala ihtiyaç duyulmaktadır. Sivil katılım araçlarının, sosyal medya kullanımıyla artan kullanıcı sayısı veya tartışmanın konum odaklı tespiti amacıyla dahil edilen coğrafi bilgi sistemleri açısından gelişmesi, beraberinde daha entegre ve insan odaklı bir tasarım yaklaşımının ihtiyacını getirmiştir. Bu tez, çevrimiçi sivil katılıma elverişli hikaye anlatımına dayalı bir konsepti sunmakta ve tartışmaktadır. Bu çalışmayla birlikte, konum odaklı kentsel bilgilerin entegrasyonu, sosyal medya kullanımı ve farklı kaynaklardan içerikleri bir araya getiren hikaye anlatımı daha verimli bir etkileşim aracı tasarlamak için araştırılmıştır. Araştırmada keşifçi ve kullanıcı odaklı tasarım metodlarının uygulandığı bir yaklaşım izlenmiştir. Sonuç olarak, daha üstün bir sivil katılım deneyimi için, konum odaklı hikaye anlatan bir uygulama önerilmiştir.

Anahtar Sözcükler

Sivil katılım, konum tabanlı veri, hikaye anlatma, etkileşimli bilgi tasarımı, kavram yaratma.

Acknowledgements

First of all, I would like to express my gratitude to my advisor Asım Evren Yantaç for his unique guidance and endless support. He helped me to realize my ideas and supported me to forge my own path during this study. Without his support this thesis would not have been accomplished.

I would also thank to Oğuzhan Özcan who created a design and research environment in KUAR. Ahmet Börütecene, Ahmet Güzererler, Oğuz Turan Buruk, Mehmet Aydın Baytaş, Doğa Çorlu, Güncel Kırlangıç, Selman Yüçetürk, Çağlar Genç, Muhammet Ramoğlu, Ece İşmen are whom I had special time in KUAR for two years with their memorable friendships.

I would like to thank Hüseyin Kuşçu for his support on prototyping, Yağmur Gökçe and Cansu Sayıcı for their support on the user research stage.

Throughout my thesis process Damla Çay and Eren Güleç have always been with me. Without their endless support, motivation and inspiration this process would not have been finished.

Finally, I thank to my family for their lifetime support.

The work presented in this thesis has been supported by SEED, Koç University Funding.

List of Figures

Figure 1- This figure presents the research environment of the study.	5
Figure 2 – Screens from bmore.ihollaback.org, nextistanbul.com, spacehive.com, walkanomics.com.....	11
Figure 3 – Screens from Neighborland.com, citizeninvestor, dosomething.org	12
Figure 4 – The study plan, relations between each stage and outputs for methods used.....	15
Figure 5 – Tabletop game setup	27
Figure 6 – Tabletop game action cards.	28
Figure 7 – Tabletop game study.....	29
Figure 8 – Post Istanbul Mental Model Map.....	30
Figure 9 – Post Istanbul flowchart.	32
Figure 10 – Wireframe for the Post Istanbul, spatio-temporal data screen.....	33
Figure 11 – Timeline design.....	34
Figure 12 – Wireframe for the Post Istanbul post detail screen.....	34
Figure 13 – Post Istanbul, interface design study.....	36
Figure 14 – Post Istanbul, spatio-temporal data visualization interface.....	36
Figure 15 – Post Istanbul, user post detail interface.....	37

Definition of Terms

Civic engagement: Carpini defines civic engagement as; “individual and collective actions designed to identify and address issues of public concern” (Delli Carpini, 2000).

Cognitive Walkthrough: Cognitive walkthrough is a method that evaluates whether the order of cues and prompts in a system reflect the way people cognitively process tasks and anticipate “next steps” of a system (Hanington and Martin, 2012).

Collective efficacy: Collective efficacy is associated with the dynamics of being a group and it is related to the individuals’ enthusiasm to solve local problems.

User requirements: User requirements are basically the users’ perspective. They are associated with the required features from the users’ perspective (Courage and Baxter, 2005).

Location-Based Data: A data type that is related to a specific location.

Personas: Personas consolidate archetypal descriptions of user behavior patterns into representative profiles, to humanize design focus, test scenarios, and aid design communication (Hanington and Martin, 2012).

Spatio-Temporal Data: A data type that is related to a specific time and location.

Table of Contents

1. INTRODUCTION	2
1.1. MOTIVATION	2
1.2. AIM	3
1.3. RESEARCH QUESTIONS	4
1.4. HYPOTHESIS AND EXPECTED CONTRIBUTION	4
1.5. RESEARCH ENVIRONMENT AND SCOPE	5
1.6. THESIS OUTLINE	6
2. BACKGROUND AND RELATED WORK	7
2.1. CIVIC ENGAGEMENT AND ONLINE STORYTELLING	7
2.2. LOCATION BASED INFORMATION	8
2.3. LOCATION BASED CIVIC ENGAGEMENT TOOLS	10
2.4. DISCUSSION	12
3. METHOD	13
3.1. USER RESEARCH	13
3.2. IDEATION AND DESIGN	14
3.3. PROTOTYPING	14
4. THE STUDY	15
4.1. USER RESEARCH	15
4.1.1. DESKTOP RESEARCH	15
4.1.2. PERSONA CREATION:	16
4.1.3. USER REQUIREMENTS/ IN-DEPTH INTERVIEWS:	20
4.2. IDEATION AND DESIGN	23
4.2.1. CATEGORIZATION OF REQUIREMENTS	24
4.2.2. CONCEPT CREATION/CASES	25
4.2.3. TABLE TOP GAME / INFORMATION ARCHITECTURE	26
4.3. THE ONLINE CIVIC ENGAGEMENT TOOL: POST ISTANBUL	29
4.3.1. INFORMATION ARCHITECTURE	30
4.3.2. NAVIGATION AND INTERACTION	31
4.3.3. USER INTERFACE DESIGN	33
4.3.4. VALIDATION OF CONCEPT	35
5. CONCLUSION	41
5.1. DISCUSSION	41
5.2. LIMITATIONS	44
5.3. FUTURE WORK	44
6. BIBLIOGRAPHY	45
7. APPENDICES	48
7.1. IN-DEPTH INTERVIEWS OUTLINE	48
7.2. PUBLICATIONS FROM THE THESIS STUDY	50

1. Introduction

Online civic engagement tools have been beneficial to citizens and cities for years. Before the online applications, civic organizations were spreading their activities through traditional media techniques. However, with the help of social media a much broader audience can reach the content. Civic engagement concept is generally associated with improved quality of life. Today we use several mobile online applications to improve the quality of everyday life. Some examples of these applications are urban traffic applications to assist decision-making process, health applications to improve our health, online city guides to have some quality and peaceful time, or e-commerce applications to save time. Above all, we constantly keep telling our own stories via our social media accounts. If somebody has similar experiences with ours, he/she reacts and helps improving our stories. Otherwise, if the ideas do not match, we usually argue on the issues. Eventually our experiences, ideas, and perspectives evolve with the help of such connections. Stories tell us about life more than we expect. In this thesis, my aim is to explore how an online storytelling concept can be employed in an online civic engagement tool. The primary aim of this study is to identify and consolidate the user needs and design requirements of a story-telling and location based online civic engagement tool. Information design and prototyping methods were applied to validate the user needs found through this research study. By using human centered design methods, I tried to explore the community needs in relation to civic engagement. For this reason, this study presents details of and reflection on my attempts at understanding user needs for designing a purposeful service to support civic engagement.

1.1. Motivation

For the past decade, we started sharing our experiences and stories through social media with other people. As we generate online content for the others and ourselves, the online experiences and stories are becoming a complex stack of data. We repeatedly share, like, dislike, comment on or see stories in an online context. With this culture, we can only see a rapid information flood on mobile phones, tablets and personal computers. News breaking posts are becoming more and more important, thus we lose our connection with our real surroundings. Here location based systems give us another perspective about our surroundings, the cities and the world we live in. They are clearly fostering the quality of lives in which we can make quick and helpful decisions, organize our agenda and explore our

environment in a deeper way through location based systems in our daily life. These systems have significant effects on diverse areas such as city planning, crisis management, journalism, social networking, entertainment, work and personal life.

With this perspective, participatory location-based systems might be helpful tools to understand urban facts, issues and community needs. Designing a location based urban data system with an appropriate information architecture, has two effective aspects:

- (1) Firstly urban actors may easily comprehend and explore complex stacks of unstructured, geo-tagged data related to their physical environment,
- (2) Secondly, online citizen engagement tools have positive effects on social and political engagement (Weber et al., 2003), (Conroy and Gordon, 2004).

In this thesis, I present the design process of an online storytelling tool to support citizen engagement. I intend to understand community needs on a participatory location based citizen engagement tool and contribute to human-centered design literature about the design of these systems.

1.2. Aim

The aim of this thesis is to make use of and evaluate several different user research methods and explore the design space of interactive tools for civic engagement. My ambition with this study is to understand civic communities' needs for location based urban systems and design an appropriate interaction model. I endeavor to find beneficial solutions for urban data architecture. For this purpose, I intend to take a closer look at online storytelling concepts and real life engagement by applying human-centered design methods. Thus I believe that focusing on the processes such as, decision-making, sharing experiences, exploring the environment, and generating design ideas can be an appropriate design approach. Through this approach beneficial interactions can be designed for fostering the quality of life and civic engagement.

1.3. Research Questions

With above perspective, I started the process by defining research questions. The main research questions for this thesis are the following:

- How can communities in civic life be supported with the help of a location based web application?
- What are the user requirements and needs for an interactive location based citizen engagement application?
- How can we design an appropriate information architecture and interaction model for a location based citizen engagement tool?
- How can we associate online storytelling with location based citizen engagement applications?

1.4. Hypothesis and Expected Contribution

Building up on these research questions, I have set up the main hypothesis as: "If a citizen engagement tool represents the information with a spatio-temporal-based approach,

- a. People will more likely to share their ideas, stories with their community.
- b. And people will more likely to get involved in their local issues."

To research about this hypothesis, I conducted an extensive user research to find out who the users are, what they need, how their mental model works; came up with an information architecture and interaction model to fulfill the intention; built a prototype of the system; and evaluated the study with user studies. The main hypothesis is based on the following sub-hypothesis:

- c. A location based system would trigger a better discussion environment with improved awareness within the city;

The contributions of this thesis are the following.

- Insights derived from the user research phase of the study will be a contribution on information and interaction design of civic engagement applications.
- Ideation and design solutions on integration of spatio-temporal data and online storytelling data may arise for future research of civic engagement applications.

1.5. Research Environment and Scope

This section defines the thesis research environment, scope of the study, what is considered and what is left outside the scope. In general, the main research environment of this study is the relation between community and media from the interaction design perspective. If we take a closer look at the environment, this interaction design oriented research study is associated with collective efficacy, citizen engagement, storytelling networks, location based systems and human-centered design. We based our study on the related literature.

Within this research environment, the scope of the study consists of (a) pursuing the user needs for citizen engagement applications, (b) ideating and developing concepts for online storytelling tools pertaining to civic engagement, (c) obtaining appropriate information architecture models for citizen engagement applications. Meanwhile, we exclude the following topics from the study; encompassing all user profiles in other words all the actors of city, developing a working database, census and sensor data, designing alternative data visualizations examples and techniques, assessing and measuring the effects of the tool on civic engagement. While these are very valuable steps for an online citizen engagement tool, this needs an extensive long-term study. This study concentrates more on the fundamentals of the system which are the user needs, concept, information architecture and interaction model which can later be supported with real data, novel data visualization methods and aim for all types of users in a city. The study is focused on Istanbul as a case study, due to the fact that it is one of the most important metropolitan cities in the world. On the other hand, there is significant number of civic activities in the city. We endeavor to support the communities in the city by the help of interaction design.

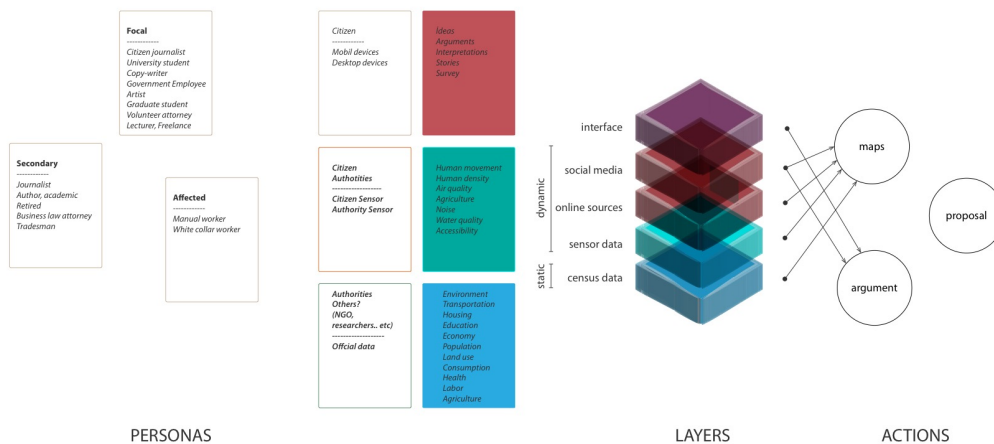


Figure 1- This figure presents the research environment of the study.

1.6. Thesis Outline

The thesis starts with summarizing the motivation, aim, research questions and scope in the introduction part (Part1) which is followed by the background section (Part 2) which reports about the theoretical background and state-of-the-art in the domain. Later on, I explain the methods (Part 3) used in the thesis. Part 4, "The Study" presents the end result, the application, and findings of the study. Finally, I discuss the overall concept and findings throughout the research in the Conclusion (Part 5).



2. Background and Related Work

This study is mainly associated with civic engagement and storytelling concepts. My aim is to combine online storytelling and location-based information to produce more effective and usable design solutions for better civic engagement. In this chapter, you will be read the literature review of related concepts and existing examples that are related to this study.

2.1. Civic Engagement and Online Storytelling

According to the main orientation of the research, civic engagement concepts are pertaining to improving the quality of life. Before summarizing literature about the location-based information studies and existing examples in the literature, I took a closer look to the definition of civic engagement.

In communication literature civic engagement has various definitions (Adler & Goggin, 2005). Some scholars define civic engagement as a community service (Diller, 2001, p. 21), a collective action ((Van Benschoten, 2001), (Diller, 2001, p. 21)), a political involvement (Diller, 2001, p. 7), and a social change (Crowley, 2007). Michael Della Caprini defines civic engagement as follows:

Individual and collective actions designed to identify and address issues of public concern. Civic engagement can take many forms, from individual voluntarism to organizational involvement to electoral participation. It can include efforts to directly address an issue, work with others in a community to solve a problem or interact with the institutions of representative democracy. Civic engagement encompasses a range of specific activities such as working in a soup kitchen, serving on a neighborhood association, writing a letter to an elected official or voting. Indeed, an underlying principle of our approach is that an engaged citizen should have the ability, agency and opportunity to move comfortably among these various types of civic acts. (apa.org)

Caprini's comprehensive definition informs more about the understanding of the citizen engagement concept. Adler and Goggin have proposed another definition for civic engagement according to their investigation about early definitions of the concept. This definition is as follows:

Civic engagement describes how an active citizen participates in the life of a community in order to improve conditions for others or to help shape the community's future. (Adler, Richard & Goggin, 2005)

In this thesis, we consider civic engagement with the following perspective:

Metamorphosis project (Kim and Ball-Rokeach, 2006) reveals the three aspects of civic engagement as: (a) neighborhood belonging, (b) collective efficacy and (c) civic participation. Neighborhood belonging is associated with two elements, people's feeling about their neighbors and how people interact with their neighbors. Collective efficacy is associated with the dynamics of being a group and it is related to the individuals' enthusiasm to solve local problems. Kim and Ball-Rokeach relate storytelling as a major factor of collective efficacy. Civic participation is connected to citizens' actions on social and political issues, such as participating in a cause, being connected with the local governments and voting in elections.

Scholars remark storytelling as a fundamental factor for communication and human experience. Through storytelling people can easily interact with their environment and understand the conditions of society. Storytelling is an essential factor for being a part of community (Anderson, 1993) and eventually is a key factor for building, shaping and changing the community. Additionally, storytelling is a concept that we can understand people's behaviors on agency (Ganz, 2001).

I decided to apply storytelling concept in an online environment according to literature review that had been done on civic engagement concepts. As I found out from the literature these two concepts (storytelling and civic engagement) are highly related with each other. With this perspective this study would contribute to interaction design studies that are oriented to enhancing civic engagement.

2.2. Location Based Information

Throughout the last 50 years, location based data has been elaborately investigated by scholars under the field of Geographical Information Systems (GIS). This field has discovered the importance of spatial information analysis (Maguire et al., 1991). Subsequent to this concept, making explanations and predictions related to spatial information have become simpler (Clarke, 1997). On the other hand, public knowledge has become an important issue to identify the needs of locals (Elwood, 2008). With the help of volunteered geographic

information (VGI) (Goodchild, 2007; Sui, 2008), GIS has been shifted to a more democratic approach. This is because VGI methods provide an environment where the public can be much more engaged with the production of collaborative geographical knowledge. Interactive online instruments such as Google Maps and Open Street Map create open access for the public to build and share their own maps.

While location-based applications are becoming widespread, users' needs grow and become diverse. A variety of personas use these systems and a huge number of information layers appear on maps. This situation reveals the need for studies on geographic information visualization techniques. Moreover, new contexts of usage such as mobile phones, big screens or dual screens create challenges in both visualization techniques and interaction models. One of the most commonly seen participatory geographic information visualization technique is attaching pins on the maps (Ushahidi Crisis Maps; Global Transition to a New Economy). Color-coding, using attributes of visual elements, such as circles, squares, lines, using textures, and 3D modeling are other ways of representing geographic information on map (Roth et al., 2010; Fifa Development Globe).

An important issue in location-based information visualization studies is the lack of public participation in the evaluation process of visualization techniques. One of the instruments of public participation in design is cultural probe method. Cultural probes are a range of physical objects that participants interact with. These objects help us to understand user needs and behaviors. Probes can be notebooks, postcards or maps (Gaver et al., 1999). A cultural probe can even be a wearable prototype where direct user feedback is collected, like a wearable recorder to collect city sounds (Gaye et al., 2004). Some geographical visualization techniques were evaluated by conducting user studies (Dockerty et al., 2006; Lange, 2001; Appleton and Lovett, 2003). In addition, some researchers have done collaborative geographical visualization sessions to design much more usable systems (Brewer et al., 2000). The geographic visualization topics are variable and complex and the use of technology changes quickly. For that reason we believe that those sustainable methods for learning about user mental models and user needs, as well as the need for public engagement to the visualization process is crucial. GIS tools, such as Arc View, have been dominantly used in the field of participatory GIS. These tools would be effective in order to visualize geospatial information but there would also be several usability problems due to the similarities of these kinds of software.

The studies show that location based media applications are useful to improve our life quality and they provide detailed information about our environment. Especially in the crisis situations having location-based information is extremely beneficial to minimize the potential catastrophes. On the other hand, I found out that participatory location based information generation is an opportunity for online civic engagement applications.

2.3. Location Based Civic Engagement Tools

Today people tell their stories in different forms. In the past we had a stronger relation with face-to-face interactions. Now with the help of technology we can easily share our stories and have immediate responses from other people. Online storytelling is a significant action in our daily life. Through social media platforms such as facebook, twitter, instagram and other online tools we have quick access to stories of people, neighborhoods, countries and eventually stories of world. There are other online storytelling platforms that are designed for specific requirements. For example, iHollaback.org is a special online storytelling platform to end harassment in public space (Dimond et al., 2013). It is a platform that people can share their street stories online. Next Istanbul project is a part of Next Hamburg project that is a crowdsourcing online platform for shaping cities collaboratively. People can share their ideas about the city vision. With the help of project team some ideas are realized. The environment of project consists of citizens (ideas, visions wishes), editorial team, experts (for technical information and comments), decision makers, supporters and sponsors (<http://www.nexthamburg.de/en/what-is-nexthamburg/>).

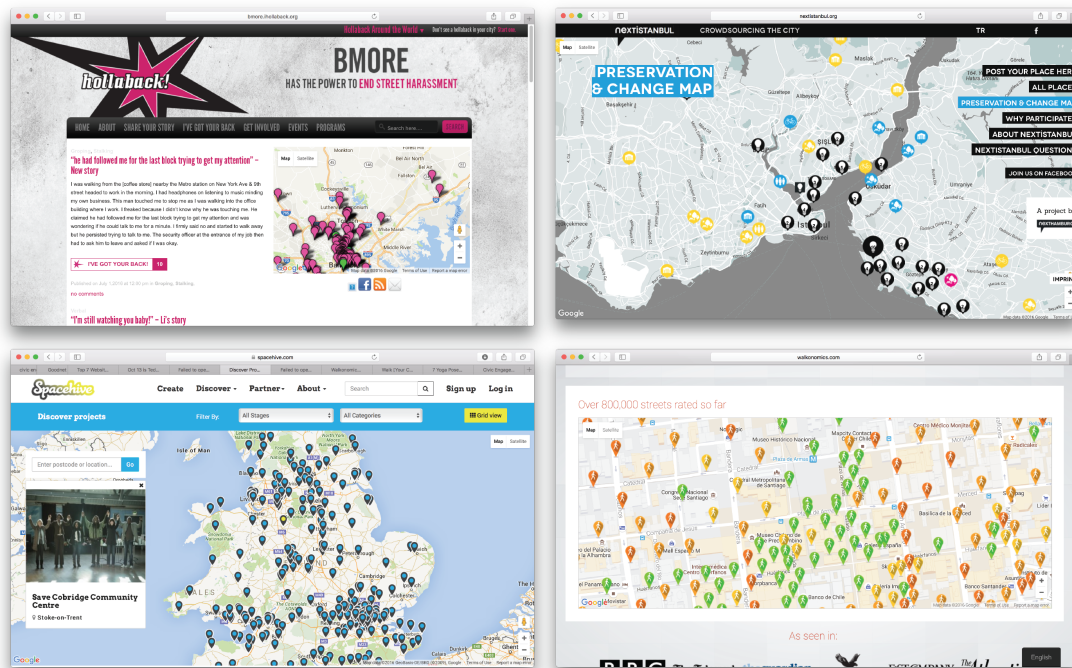


Figure 2 – Screens from bmore.ihollaback.org, nextistanbul.com, spacehive.com, walkonomics.com

Neighbor Land is an online platform to help citizens for improving their neighborhood (Figure 2). The project area is Brooklyn, NY. People share their ideas about neighborhood with a simple interface. Those ideas can also be projects with the help of local supporters (<https://neighborland.com/home>). Space Hive is an online crowd-funding platform for civic projects based in UK. The platform has over 800 funded projects; most of the projects are related to public space improvements. Citizeninvestor is another crowd funding and civic engagement platform for social change. Everyone can add project and ideas about civic life to the website (<http://www.citizeninvestor.com/ideas>). Walkonomics is a worldwide location based crowdsourcing platform. The aim of the project is to map walkable routes in the streets. Users can add and rate the walkability of the streets my using the website and mobile applications. SpeakUpAustin is a portal for public opinion. Through this website user can open discussions, create ideas and comment. Additionally, they can support and rate the discussions along with the ideas about civic life in Austin. Furthermore, citizens can be informed about the ongoing projects in the city (<http://speakupaustin.org>). The Center for Urban Pedagogy designed a toolkit for envisioning development. The center executed several workshops to inform citizens about affordable housing. They designed a location based data visualization website as a part of the study (<http://envisioningdevelopment.net/map/>). This interactive map provides information about affordable housing in New York City. The global and well know civic engagement platforms that are originated from creating causes and

campaigns such as Change.org, Causes.com and Avaaz.org should also be included in this list. All in all, I have considered the functions and design approaches of all the remarkable examples mentioned above which are online platforms to support civic engagement.

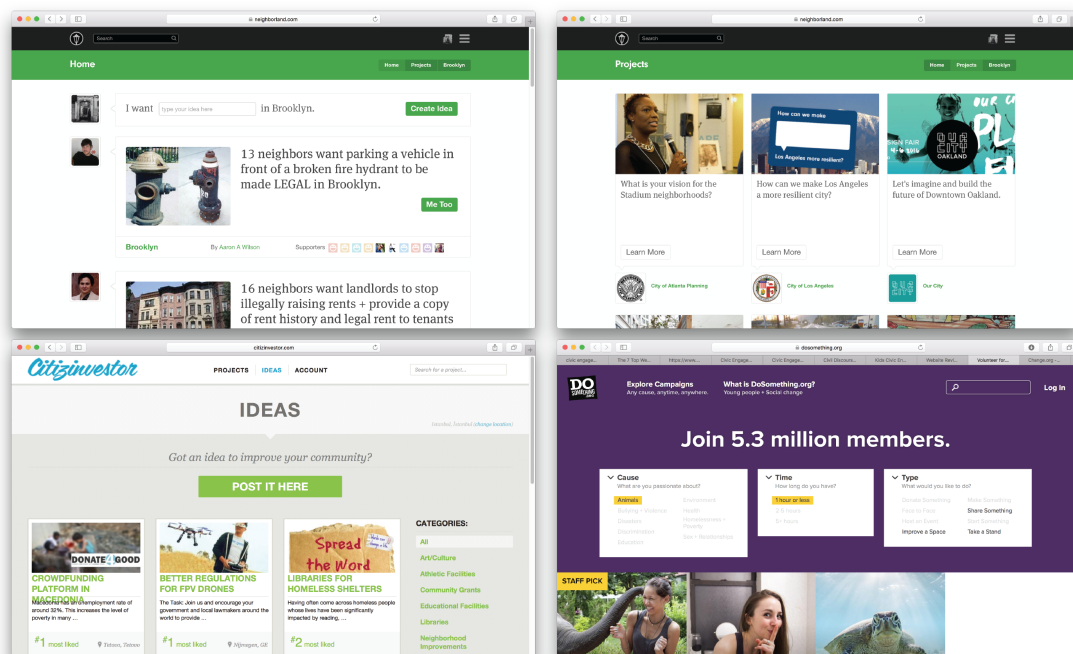


Figure 3 – Screens from Neighborland.com, citizeninvestor, dosomething.org

2.4. Discussion

According to scholars (Gil de Zúñiga, Jung and Valenzuela, 2012; Shah, Kwak, and Holbert, 2001) online tools for civic engagement can support the real life civic engagement. Through social media and other platforms citizens are able to access and share social experiences as well as political ones. For a better future civic life, these interactive tools have important roles because of their accessibility and effects on our social life. From this stance more studies should be done on designing online civic engagement tools. The public has used aforementioned example for some while. As a consequence, these systems should be designed deriving from the public needs and requirements. Thus, in this thesis, I aim to design a storytelling tool while making use of human centered design approaches. Meanwhile, I also believe that civic engagement tools require much more spatial and temporal data integration into their information architecture in order to elaborately understand and discuss the urban issues and facts. In the next chapters, I will present details of the design approach, concept and process of the proposed tool.

3. Method

In this chapter I will explain the research methods and process I followed throughout the study to explore the design of a civic engagement tool. Basically, I followed the research through design approach and developed an online storytelling tool for Istanbul. I chose Istanbul as the study area because Istanbul is a rapidly growing city in the last decades. For that reason Istanbul requires varying solutions for daily life issues such as transportation, human mobility, housing, social rights violation, urban transformation, unemployment, and migration. From this stance Istanbul is a convenient city to conduct a design study on integration of new media and civic engagement.

3.1. User Research

The holistic design process builds up on a strong user research for which I made use of desktop research, persona creation and semi-structured in-depth interviews with the urban actors matching the personas.

- a. Desktop research: In this section I started to collect and observe community websites and social media accounts. I focused on gathering information from active communities that have actions on civic life in Istanbul. The aim of this section is to find user needs, understand and determine the research field. The observed web instruments and actions will be presented in the next chapter.
- b. Persona Creations: Through the findings from desktop research I started to create personas. The aim of this section is to designate the past observations and make a clear pathway for future in-depth interviews. First I applied persona cards method and create 5 different personas. Second I prioritized the personas as focal, secondary, affected and exclusionary. The details of persona study will be presented in the next chapter.
- c. Semi structured In-depth Interviews: I conducted semi structured in-depth interviews with 17 participants. The aim of the interviews is to understand users' civic engagement status and analyze the communication tools that they are using in the engagement process. On the other hand, I determined several use cases, online tool concepts and user needs. The details of interviews will be presented in the next chapter.

3.2. Ideation and Design

Ideation and Design phase consists of two sections.

- a. Concept creation: Through the analysis of interviews I started to create a concept and interaction scenarios. As a result, an urban data based storytelling tool has arisen as Post Istanbul. The details of concept will be presented in the next chapter.
- b. Tabletop Game: While I was creating the information architecture of the online tool, I designed a tabletop game in order to validate the concept, interaction model and information architecture. With the help of the game I determined the functions and built the prototype.

3.3. Prototyping

- a. Prototype: Post Istanbul website is designed and developed as an output of the study. At the end of the user research I developed a concept for online storytelling. The aim of the prototype is to combine location and time data with stories. The details of the website will be presented in the next chapter.
- b. Validation of Concept (Cognitive Walkthrough): After the implementation of Post Istanbul prototype, a user centered design method, cognitive walkthrough, was employed to validate the concept. The aim of the study is to understand the attitudes of potential users on the existing concept. I interviewed with 5 people throughout the process.

4. The Study

This chapter describes the details of user research, ideation and design, prototyping and user feedback phases of study.

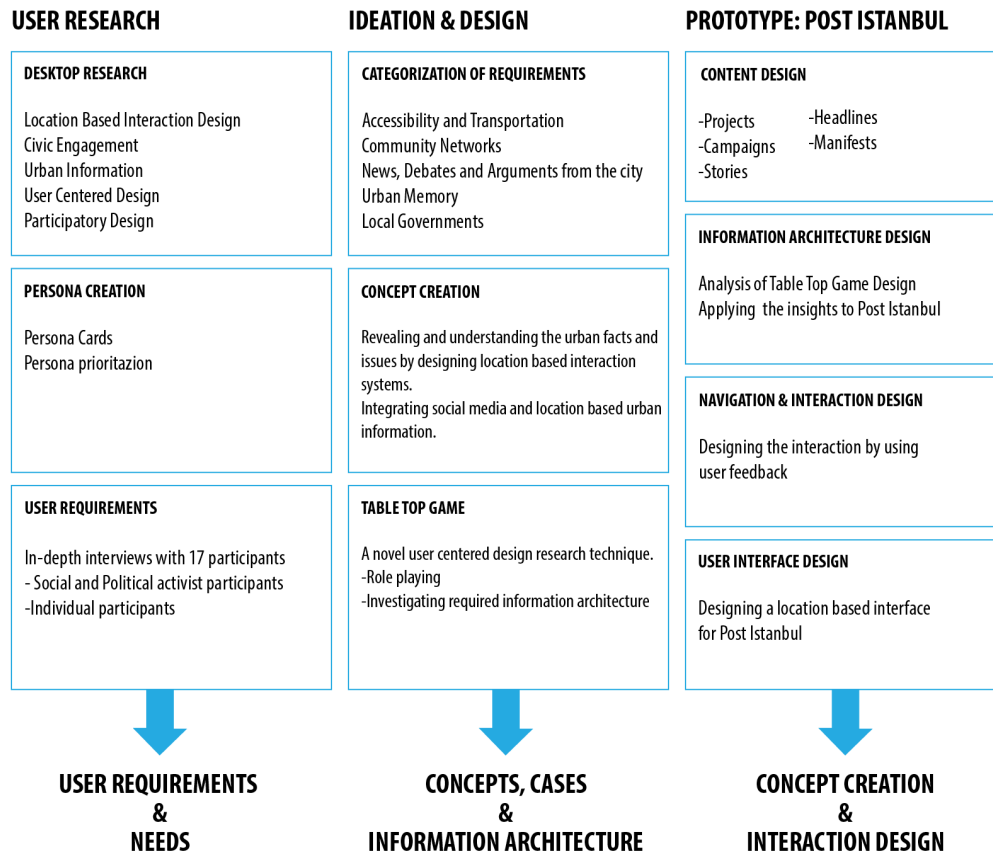


Figure 4 – The study plan, relations between each stage and outputs for methods used.

4.1. User Research

User research stage consists of three parts. These parts are; Desktop Research, Persona Creation and User Requirements. The main output of this stage is the identification of the user requirements and needs for an online civic engagement concept.

4.1.1. Desktop Research

As a starting point to my study I created a list of websites, social media groups, non-governmental organizations and opinion leaders' social media accounts that are related to

civic engagement and storytelling. I mostly focused on finding Istanbul based web sources and considered that the organizations, groups and individuals are active actors in civic life such as; environmental, social and political activists. The collection of sources comprises varying fields and topics. Some of the sources and their related topics are the following: A neighborhood Facebook group which is a special opinion-sharing group, is one source. Users share their opinions and stories that are related to their neighborhood. The discussion topics are generally related to public space, housing and urban transformation. Another example is a blog, which comprises urban transformation facts and issues in Istanbul. Other examples are individual social media accounts and interactions of these accounts. In addition to these, I also observed the interactions such as commenting and rating on the news websites.

Insights and Discussion

I classified the user profiles through the observations of web sources. The generic user profiles are based on the users' jobs and interests that I confronted during my desktop research. The generic user profiles are the followings; environmental activist, journalist, white collar, university student and non-governmental organization officer.

4.1.2. Persona Creation:

Before developing an online storytelling tool concept, I planned to execute a field study to understand user need and requirements. In order to access appropriate participants for the field study, I decided to apply the persona creation method. Persona creation is a user centered design technique. Personas have been used in varying design disciplines such as interaction design, industrial design, user experience design and graphic design. Basically persona is a representative character of a user group (Putnam et al., 2009). A persona implies the needs, requirements, attitudes and behaviors of a user group. Persona creation is beneficial when dealing with diverse user groups.

The aim of this part is to understand how the potential user groups generate and react to location based data in their daily life moreover, what kind of tools they are using when generating location based data. These questions have driven the study to investigate the potential user groups. As a starting point I used persona cards method. I applied persona cards method to five generic user groups (environmental activist, journalist, white collar, university

student and non-governmental organization officer). Examples of persona cards are the following:

- As a Journalist

I want to see social and political events in the city related to their locations.

So that I can directly go to the location, prepare and share the news.

- As an Environmental Activist

I want to see the environmental damage and causes.

So that I can draw people's attention to the problems.

- As a University student

I want to see my social media content, news and other people's ideas all together with their related locations

So that I can easily get in touch with my friends and I can understand the relations of issues.

- As a NGO officer

I want to see the up to date events in the city and know about the activities of other organizations.

So that I can easily organize activities, create new networks and open arguments.

- As a White collar - Engineer

I want to see and analyze location based information.

So that I can create new online applications and disseminate my work.

After this method, I precisely categorized the personas according to their functions in the study. I used persona prioritization technique, which is proposed by Olsen (Olsen, 2004). The prioritization consists of four elements which are; focal, secondary, affected and exclusionary. Personas consist of name, age, profession, education, motivation, social media usage and environmental factors. This manner provided me a guide to access the interviewees properly.

Focal Personas

EREN – 25, Volunteer journalist, Professional photographer

He has a fine arts degree. He is bored about the conventional media and wants to generate his own report. Now he is an active citizen in the city. When he encounters with social or political protests on the street he always shares videos and images on his social media accounts. He is a professional technology user and very good at researching on the internet. He uses a smartphone.

BERKAY – 23, University student

He lives apart from his family. He is a fan of Beşiktaş football team; he never misses the matches. Almost every weekend he socializes with his friends and goes out for parties. After the Gezi movement he has been much more responsible on political and social issues. He uses a smartphone. He checks his social media accounts along 2 hours in his daily life. He does not self-censor his social media accounts, he shares what he thinks.

ASLI – 30, Copy writer

She has a literature degree. She is an active member of animal rights and environmental activism organizations. She regularly visits animal shelters in the city and try to find homes for stray animals. She uses social media to find homes to the stray animals and to be informed about the environmental issues.

GAMZE – 30, Government employee

She has an economics degree. She has a son. Her areas of interests are cinema, literature and contemporary dance. She spends her leisure time with her family and friends. She usually goes concerts and performances. She uses social media to share art and culture, events and contents. She checks weekly online city guides for interesting events in the city.

ZEYNEP – 35, Artist

She has a PHD degree in art. She produces artworks in the context of politics and social inequality. For her attempts to bring artists together, she utilizes social media. She usually shares her own ideas on her social media accounts and sometimes she shares influential posts.

DOĞA – 27, Researcher

He is a PhD candidate in history. He is interested in trade union organizations. He voluntarily works in several trade union organizations. He writes reports for these organizations. He

usually visits other cities to observe trade union's activities. He always shares his observations and ideas on his social media accounts.

NEVIN – 38, Lawyer

She helps people as a volunteer lawyer in social events. She works with unions as a counsel. On her social media accounts, she shares insights from the cases that she tracks.

Secondary Personas

ALPER – 40, Investigative reporter

His research areas are social rights and environmental destruction. He tracks and reports big cases all over the country. He always uses social media to know much deeper about issues. He contacts with his colleagues through private social media groups. They share their knowledge on these groups.

ELA – 33, Academician

Her areas of interest are city and art. She is an active member of civic organizations which campaign urban life. She follows both mainstream and eccentric channels on social media. She usually shares her ideas and interpretations about the national agenda. Through her posts on social media she tries to encourage people to share their opinion.

AYSEL – 55, Retired

She has a high school degree. She spends her time by doing crafts at home. Besides that, she is politically active in her neighborhood. She reads the newspapers online. She uses social media as a source of information. She rarely shares some critical things on her social media accounts.

Affected Personas

ADEM – 30, Serviceman

He has high school degree. He uses social media but rarely shares his personal experiences. He cannot follow the national agenda because of long working hours.

ZEHRA – 45, Small business owner

She has a small restaurant in the city. She uses social media to share her business experiences and personal experiences.

Exclusionary Personas

Exclusionary personas are the people who do not use social media or have no access to the internet.

Insights and Discussion

With the help of persona creation process; firstly, I defined the outline of the in-depth interviews' questions. Secondly, I explored the user profiles elaborately. For example, before the persona creation study, I had been focusing on merely political and social activists and communities. However, I have discovered the potential of individual social media users that are not a part of a political or social community. Thereby I designed a more comprehensive study in terms of city actors.

4.1.3. User Requirements/ In-depth Interviews:

After the persona creation process I designed and executed semi-structured in-depth interviews with 17 interviewees. The aim of the interviews was to understand user requirements for the storytelling application. More specifically I contemplated the following issues, how do they join a discussion in their social life and on social media, social media usage status; types of applications they use, purpose of use, how do they relate to local issues and problems?

I used personas in order to find interviewees. I reached first 4-5 people in Istanbul by observing their social media accounts and their online visible activities such as blogging and reporting on local issues. After that I used snowball-sampling method to reach the rest of interviews. I contacted them via email. 6 out of 17 interviewees were women. The age range of interviewees is 25 to 40. All interviewees are active internet and social media users. Facebook was the most used social media application among interviewees. Twitter and Instagram were the following second and third applications that frequently used by interviewees. Moreover, interviewees defined WhatsApp as a social media application. The

educational background of interviewees is minimum college degree. 10 out of 17 interviewees were member of an organization such as trade union, political and social non-governmental organizations, recreational organizations, ecological cycling group, local civic participation initiative, lesbian, gay, bisexual, and transgender rights organization, and architectural organization of social problems. The interviews lasted about 90 minutes each. Some questions that were asked to the interviewees are the followings. The entire interview outline can be found in the appendices.

1) In which environment you get into an argument on social or political issues?
(Family/Friends) On what topics and how frequent?

a) Who starts the arguments usually?

b) How do you define the people that you may get into an argument? Which characteristics lead you to do that?

c) Do you prefer to be alone or with a group while making an argument?

2) Which issues about the city are you interested in, broadly?

3) Are you a member of a union, non-governmental organization, political party or group, sports or recreation organization?

a) For how long?

b) What is your position?

c) If you are a member of an organization, do you follow it via internet?

4) On what purposes do you use the internet in terms of this context?

Interviewee	Age	Occupation	Education	Civic engagement
I_1	30	Journalist	Philosophy	Health Org.
I_2	33	Researcher	Sociology	Social Rights
I_3	31	Floral Designer	Political Science	Individual
I_4	-	Urban Sociologist	Social and Political Science	Social Rights
I_5	33	Translator, Marketing Director	Communication	Individual
I_6	-	Academician	Economy	Urban, Social Rights
I_7	30	Research Assistant, Interaction Designer	Graphic Design	Individual
I_8	28	Architect	Architecture	Architectural Org.
I_9	25	Master Student	Education	LGBT Org.
I_10	33	Movie Maker	Industrial Design	Urban, Social Rights
I_11	30	NGO Project Coordinator	Mechanical Engineering	Urban, Social Rights
I_12	30	Interaction Designer	Communication Design	Individual
I_13	33	NGO Researcher	Political Science	Social Rights
I_14	26	University Student	Communication Design	Individual
I_15	31	Academician	Computer Engineering	Individual
I_16	28	Illustrator	Graphic Design	Individual
I_17	38	Market Researcher	Industrial Engineering	Ecological Org.

Table 1 – In-depth interview participants.

Insights and Discussion

Some interviewees implied that they act differently in social media than real life. They do not need to self-censor themselves. They can directly react and comment on issue and sometimes they excessively use anonymity to express themselves. The purposes of using the social media applications are different. For example, some interviewees defined Facebook much more persona application than Twitter. While they are using Facebook to contact with their close friends and relatives, they use Twitter to express their opinions and share ideas on social and political issues. According to some interviewees social media is an opportunity to meet new and influential people easily than real life. A disadvantage of social media is being unable to access old posts and the beginning of arguments immediately, especially on Twitter. Twitter does not provide proper information architecture to the users. Most of the interviewees share their opinions and get into an argument by using private message applications, such as WhatsApp or Facebook message groups. Most of the time an argument starts with social media content, a member shares a link in the group and the other people react to the content. This argument and opinion sharing process sometimes works similarly in real life. An interviewee explains her real life experience as “When I meet with my friends at a café, after sometime someone can immediately open his/her mobile and show us a notable content from social media. This can be an internet meme, an inspirational artwork or something from political agenda. And we often share our opinions about the content...”.

Two interviewees stated that they often share photos and their opinions on social media when they face violation of public space; they are specifically interested in sidewalk occupations. Some interviewees use social media to make daily decisions. For example, they check venues and events when they want to go out. The activist group members use social media to access news articles about their neighborhood and to know about events in the city. As a result of the interviews, I deducted a set of user requirements and cases. After that, I categorized the items, which will be presented in the next section.

4.2. Ideation and Design

Throughout the ideation and design process, the aim was to determine the concept and information architecture. To do this, first I categorized the requirements, then I modified the elements of concept, and finally I applied a game design to reveal the information architecture.

4.2.1. Categorization of requirements

From the findings of the interviews, I categorized the requirements, problems and cases according to their topics. The topics are the following:

Accessibility and Transportation: Bicycle path occupations. Sidewalk occupations. Transportation solutions for families with children. Visualization of walking routes within the city. Overlapped maps of transportation and events. Detailed traffic maps that provide side streets' data.

Community Networks: Maps that provide bicycle routes and bring cyclers together in the city. The locations of people who share their bicycles with others and have the ability to repair bicycles. Maps that facilitate LGBT individuals to find accommodation in the city. Maps that visualize the focus of violation against LGBT individuals. An application that can support and bring together foreigners who live in the city. Civic engagement solutions to support adaptation of Syrian refugees to the city. An application for bird watching. An application for people who fight against cancer to share their experiences and to get community support.

News, Debates and Arguments from the City: An application that provides agenda according to their related locations. A platform that presents news from civic city organizations. Up-to-date gentrification maps. Detailed maps of urban transformation in the city. Maps of self-build neighborhoods in the city. Discourse visualization of active city actors. An archive that makes the architectural needs of educational institutions visible. In which part of the city is civic engagement being higher than the others? What are the most debated topics in architecture and urbanism in global and locals?

Urban Memory: The historical flow of symbolic spaces in the city. Emotion maps of the city that consist of photographs, audio and video records. Maps of public spaces that visualize human circulation, sound and density. Mapping the abandoned or empty places.

Local Governments: An easy way to bring complaints to the municipalities and the other local governments. An online and easy-to-use guide for citizens that provides information of civic engagement to the local governments.

Insights and Discussion

According to the in-depth interviews, the above-mentioned categorization was revealed. The majority of the requirements were under the topics of Community Networks and News,

Debates and Arguments from the city. At this point, I envisioned that people should be supported by more flexible tools to share their experiences. In other words, these requirements were matching with storytelling concept according to insights from the previous studies that had been done.

4.2.2. Concept Creation/Cases

With the help of above-mentioned categorization, an online storytelling application concept has been revealed. According to interviewees, knowing and learning more about their local surroundings is an important issue. They want to easily access different kinds of information about the city where they live. Both individuals' and organization members' needs are alike. Exploring and knowing much more about issues, conflicts, agenda and facts about their environment is beneficial for civic engagement.

Despite the above facts, the existing social media applications and other information sources are limited in capturing a comprehensive view, because of their quick nature. Most of the feedback we gathered, implies the need for different kinds of maps. People may want to see urban information on a map-based digital environment. I believe that this issue is noteworthy to investigate and ideate. Through different kinds of mapping topics, we can have a better understanding of what is happening in the city we live in and how to engage with our environment, which is necessary for a democratic, equal and participatory society.

The online storytelling tool I suggest, has three different parts: (1) Location based urban information will be gathered from different kinds of sources such as online sources, sensor data, census data and social media data. (2) This information will be filtered according to their topics and they will become functions. (3) The filtered information will be seen, commented on and created as stories, experiences, ideas, maps, and arguments mapped according to their location data.

I prepared a list of topics by examining the user requirements list that have presented in the previous section. The topics of concept are **housing, public space, employment, manufacturing, transportation, education, health, social rights, arts and culture, environment and politics.**

After having a draft list of topics I contemplated the potential functions of the tool. When I was designing the functions, I used the interviews' notes. I reconsidered what people do when

they face a situation about local issues. For example, what a resident would do when he/she sees a sidewalk occupation in his/her neighborhood? I listed the feedback from the interviewees and the main functions have become apparent. These functions are; **see, share, discover, propose, disseminate, collect**. Thereby the main features of concept have been designed. After that I designed a new user study to validate the existing concept, content and interaction structure of the tool. The aim of the new study was to design the information architecture tool with participants and see how they intuitively use the functions (see, share, discover, propose, disseminate, collect) with the content (housing, public space, employment, manufacturing, transportation, education, health, social rights, arts and culture, environment and politics).

4.2.3. Table top game / Information architecture

To build comprehensive information architecture for the online civic engagement tool based on the findings from the previous studies, I decided to design a custom tabletop game. With the game, a limited environment to the participants that are consistent with the existing idea is presented. I conducted 3 game sessions with the participation of 14 players in total and one observer in each session while I've moderating all of the sessions. All the players actively use social media in their daily lives. 4 out of 14 players were graduate students, 4 of them were academicians, 3 of them were self-employed, 1 of them was a communication designer and 1 of them was an urban planner. In the beginning of each session, I presented the aim of my research and informed players about the aim of the tabletop game. Sessions were played around a table (Figure 4). In the center of the table, we placed an empty Istanbul map in order to motivate the players to make discussions on the map. We collected a series of real events that were related to both public and private city life, such as a large fire of a historical building, social movements, and new regulations on public transport.

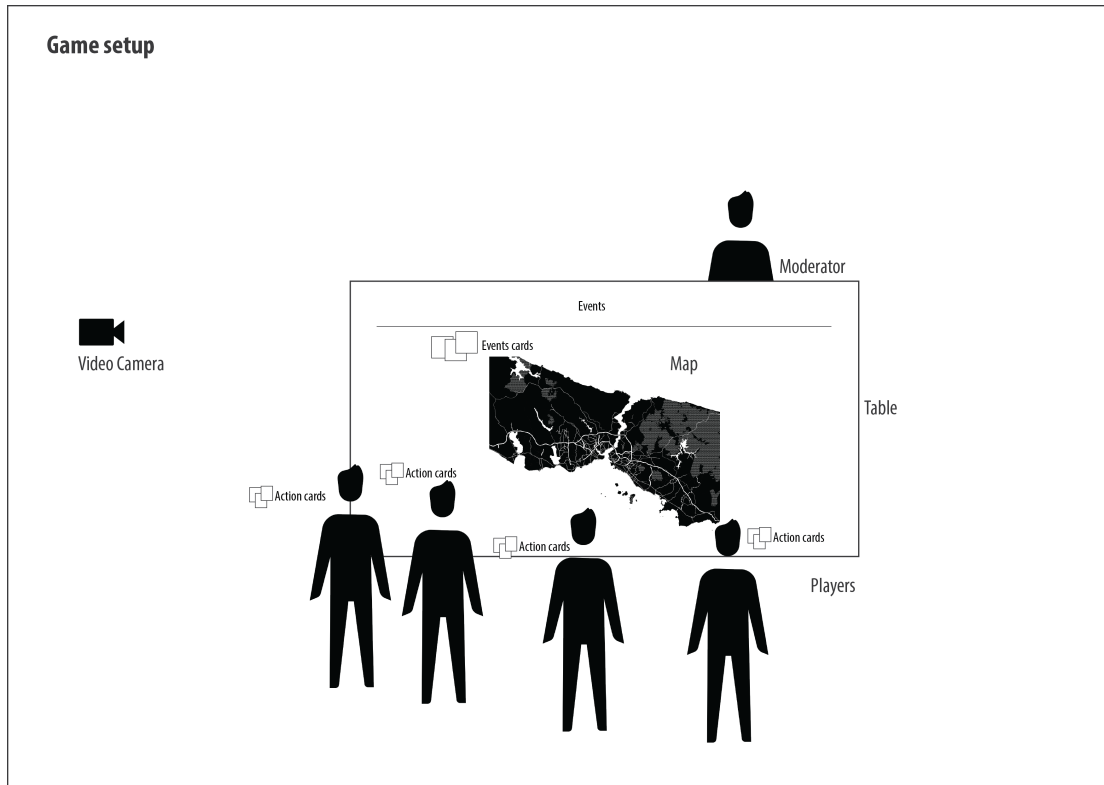


Figure 5 – Tabletop game setup

On each game, we opened 10 event cards one by one and gave five discussion minutes to the players. Each player had a set of action cards and they were asked to use those cards based on their preference to react to the event in turns. The action cards were built based on a previous in-depth interview study that we had conducted with 17 participants. The cards were; see, share, discover, disseminate, archive, create, interpret, argument, story, map, idea, report, group, petition, crowd funding and two jokers (Figure 5). Within 5 minutes for each event, players discussed and conducted their actions on the situation. On the action cards are two options for authorship. Players either may write their names on the action card or select the anonymous option. During the games, one observer took notes on players' actions. After discussing their ideas and actions, they noted down and placed the card on the related space on the map. At the end of each session we evaluated the game with the players. We took pictures of the map and the post cards and evaluated where, and using which actions they acted upon each event happening in the city, and how they respond to previous users' actions. We looked for the most frequent and popular actions, how people used them and what kind of orders different actions had in between (Figure 6).

ACTION CARDS

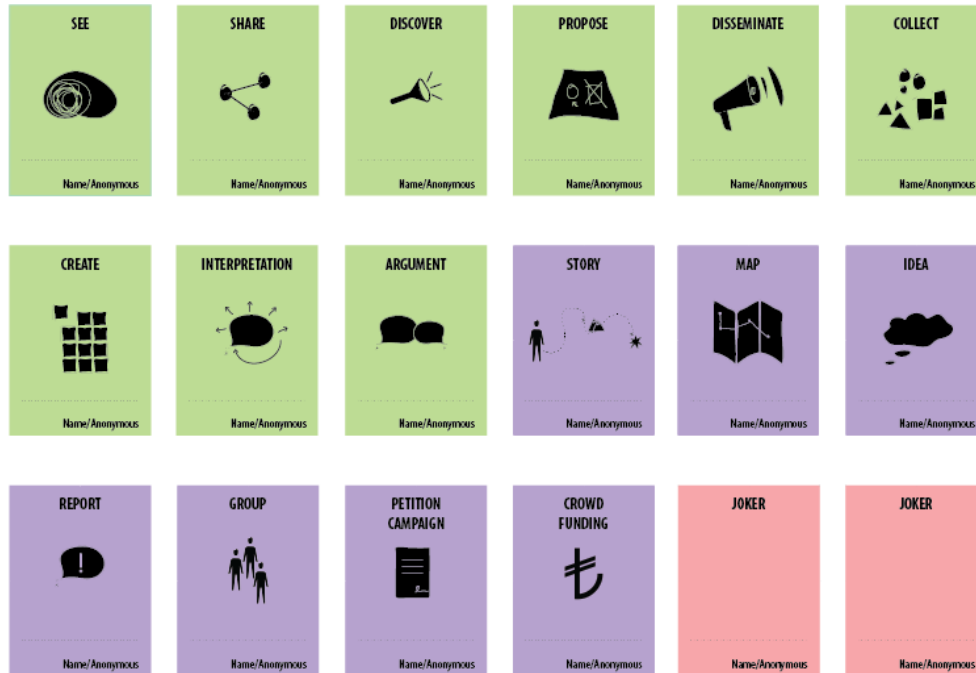


Figure 6 – Tabletop game action cards.

Insights and Discussion

Analyzing the game session data has revealed an interaction pattern. The most frequently used 3 action cards were share, disseminate, and discover. According to the game sessions, I collected a proper set of topics. These topics are projects, campaigns, stories, headlines and manifests. These topics have been the main points of the information architecture of the tool. Location oriented interaction model validated so I decided to design location information according to four levels. These levels are local, regional, national and global. The tabletop game sessions provided a deeper understanding on interaction models. Through this method I designed a prototype for an online storytelling tool by applying the interaction pattern obtained from the games. At the end of the concept creation phase I decided to find a name for the storytelling tool. I imagined a storytelling tool which functions as a citizen journalism tool and an open platform for citizens. Moreover, it is a comprehensive urban data source. After considerations I chose “Post Istanbul” as a name for the storytelling tool.



Figure 7 – Tabletop game study.

4.3. The Online Civic Engagement Tool: Post Istanbul

In this section I will present the details of the end result of the research through design study outcome: Post Istanbul. The prototype was designed as a web application. We developed a limited prototype in which sensor data, census data and other online sources are not included. Users can add posts by using the web application. Firstly, I will explain the interaction method of the tool. Secondly I will explain the information architecture of the tool and lastly I will share the details of user interface design. The information architecture, navigation and interaction were built by using the outputs of in depth interviews and the tabletop game. This structure would be improved by future study. I decided to limit the functions according to the user research insights on account of my initial aim, which is to produce a conceptual work on storytelling and civic engagement relations in online contexts.

4.3.1. Information Architecture

In this section I will present the details of each item in the tool. A mental map of Post Istanbul is in the figure 7.

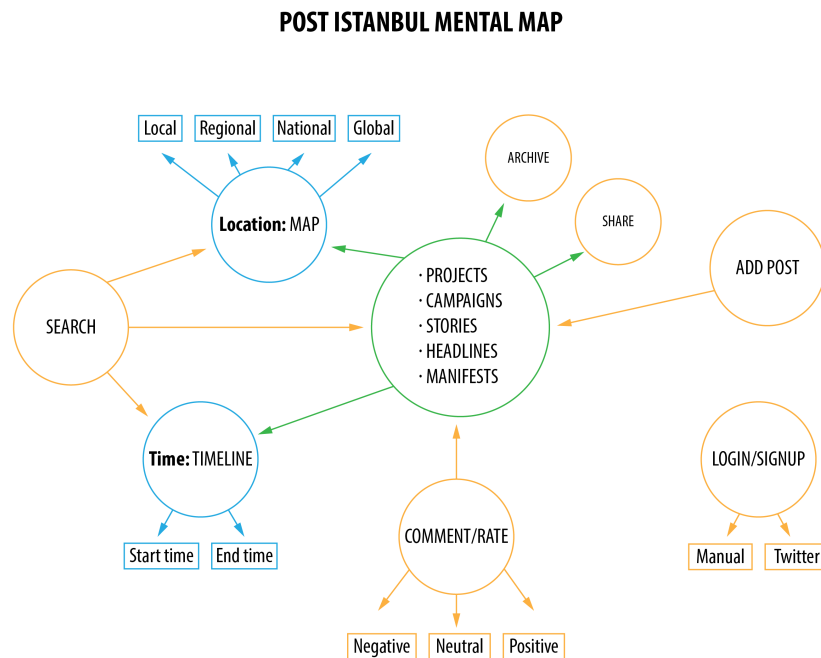


Figure 8 – Post Istanbul Mental Model Map.

Location: The map of the tool has 4 levels, which are, local, regional, national and global. The map is centered according to the local location of the user when he/she accesses the website.

Time: Timeline indicates the start and end of the posts in the website archive. User can filter the posts according to time by using timeline.

Post Types: Posts are the main items of the website. They can be displayed as a group or individually according to their locations. There are five different kinds of post types available in the website.

- **Projects:** This post type is related to micro and macro urban related projects that are executed by authorities and private sector. Besides, users can add their own personal projects that are related to the city. Some examples of this are urban transformation projects and health system projects.

- **Campaigns:** This post type covers urban campaigns that are executed by individuals and organizations. Users can start a petition, crowd funding or social enterprise campaigns by using Post Istanbul. Some examples of this are protection of stray animals and petition campaign to fight against social right violation.
- **Stories:** Stories are highly related to personal and community experiences that are held in the city. Some examples of this are personal and social history along with the meaning of symbolic spaces in the city.
- **Headlines:** Headlines are the trending topics of Twitter.
- **Manifests:** Manifests work as a recording system. If some occasions are repeatedly occurring in a location or they are critical to a certain neighborhood, they can be added under the manifests section. Some examples of this are rough roads and wastes problems.

4.3.2. Navigation and Interaction

Hereby, I explain the information flow, navigation structure (Figure 8), and interaction model of Post Istanbul. The system content can be browsed or searched using several different tools, and can be interacted with actions such as posting, sharing, archiving.

Navigation: Search and browse features are the two main elements of navigation model of Post Istanbul. Users can search within the content or can browse using the timeline, map or post types.

Search: Users can access the location and topic information with the search option of the website. Furthermore, actors and hashtags can be accessed from the search option.

Browse: Post types are designed as toggle on the website. Thus they work as filters and more than one post type can be selected at a time. This allows for comparison of different post types.

POST ISTANBUL SITEMAP

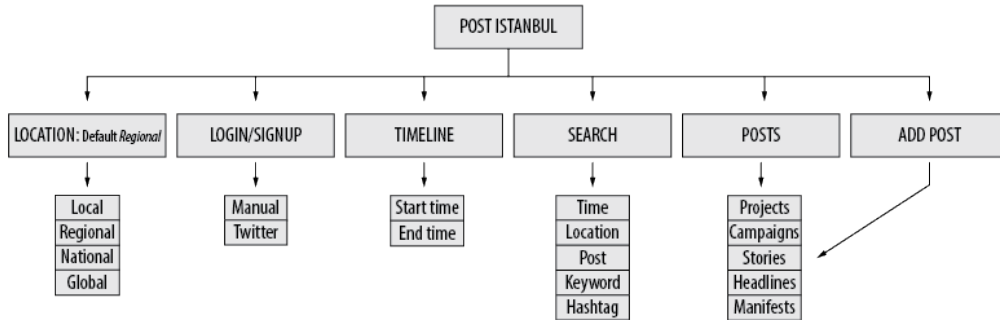


Figure 9 – Post Istanbul flowchart.

Map zoom: The four geographical levels (local, regional, national, global) are presented by using a circular zoom tool. Through this element the posts from the different locations can be displayed on the map. This tool has been designed so that

Add Post: Users can sign up to the website manually or through their Twitter account. The flow of adding a post is as follows: selecting the location from the map, selecting the post type, entering post title, entering the actors that are related to the post, entering the related themes with hashtags, uploading photos and videos, entering the date range, entering the text of the post, selecting open or close comment option, selecting the option of Twitter share. Before publishing, the user can preview the post and if necessary, archive the post.

Share: Users can share the post to Twitter.

Archive: Users can archive the posts in their website account.

Comment and Rate: Users can add their positive, negative or neutral comments and rates on posts.

4.3.3. User Interface Design

Once the information architecture, navigation and interaction design processes were structured, I designed a mock up for Post Istanbul's user interface. While the information ranges widely from projects to campaigns based on the concept that I have created, users can interact with the content with time or location based navigation models based on their preference. In order to be able to provide an easy, yet effective interaction, I designed a smooth and intuitive look&feel for the interface. Designing the interface, I made use of patterns from existing examples listed in in the literature review chapter. The interface of Post Istanbul consists of three main elements. These elements are map, timeline and posts. Among these different models, the map at the background on the welcome screen that provides location-based navigation is a major method. From the very beginning of the project, I intended to use a map-based interface due to its ability to build a strong link with the real physical existence of the city, which was validated by participants through the user studies. The sub elements are search function, map zoom tool and post display. Below, I provide the details of interface design.

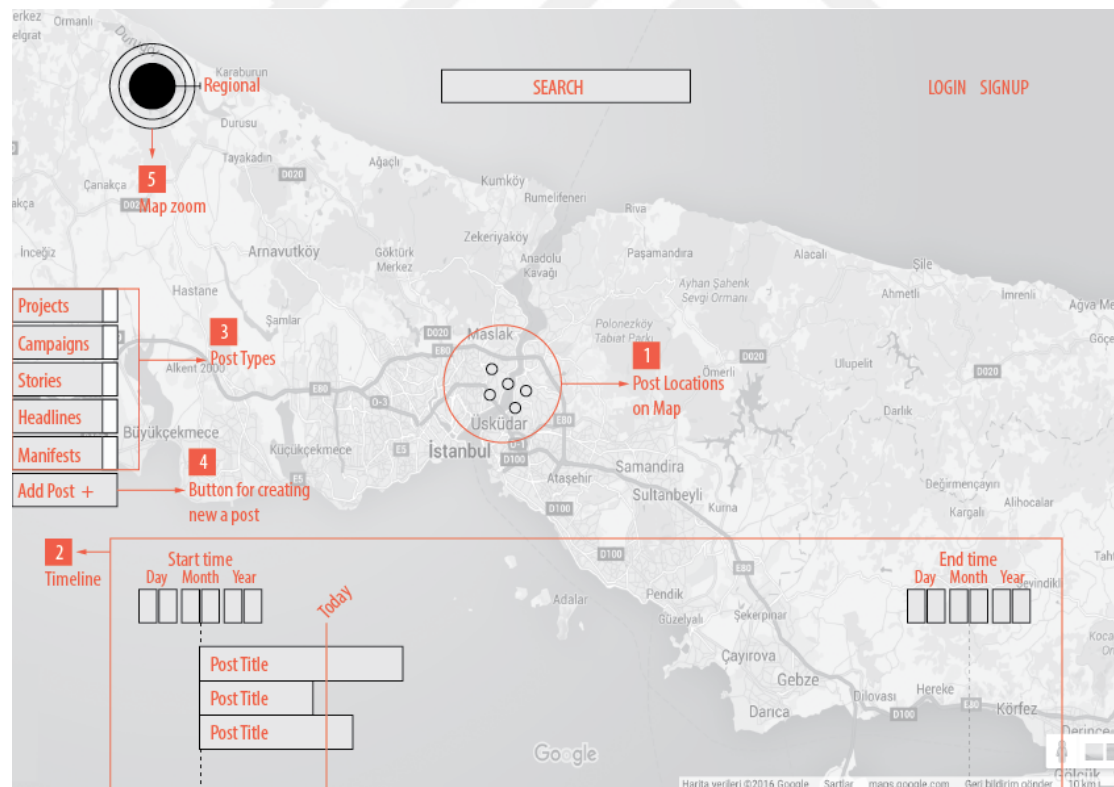


Figure 10 – Wireframe for the Post Istanbul, spatio-temporal data screen.

Map: When a user accesses the website, a geographical map of an existing region is displayed. In our case, this region is Istanbul. The map we use in the prototype is based on Google Maps.

Circles appear on the map when a post is available in that location. Each circle has a solid color code that indicates what type of post it is.

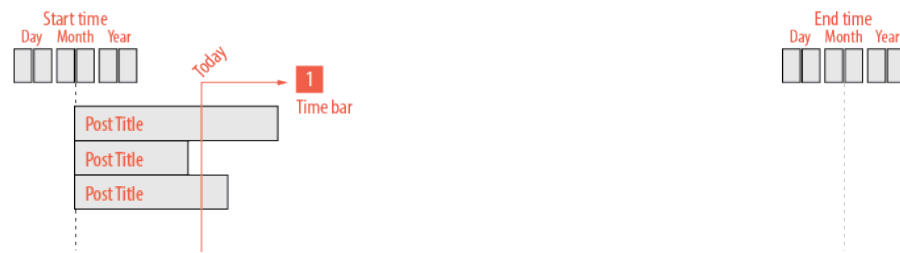


Figure 11 – Timeline design.

Timeline: Timeline allows the user to browse post type in a time-based manner. Post titles on the timeline are links to their related page. A time bar indicates the present time. An editable starting and ending time areas can be used to select a specific time interval.

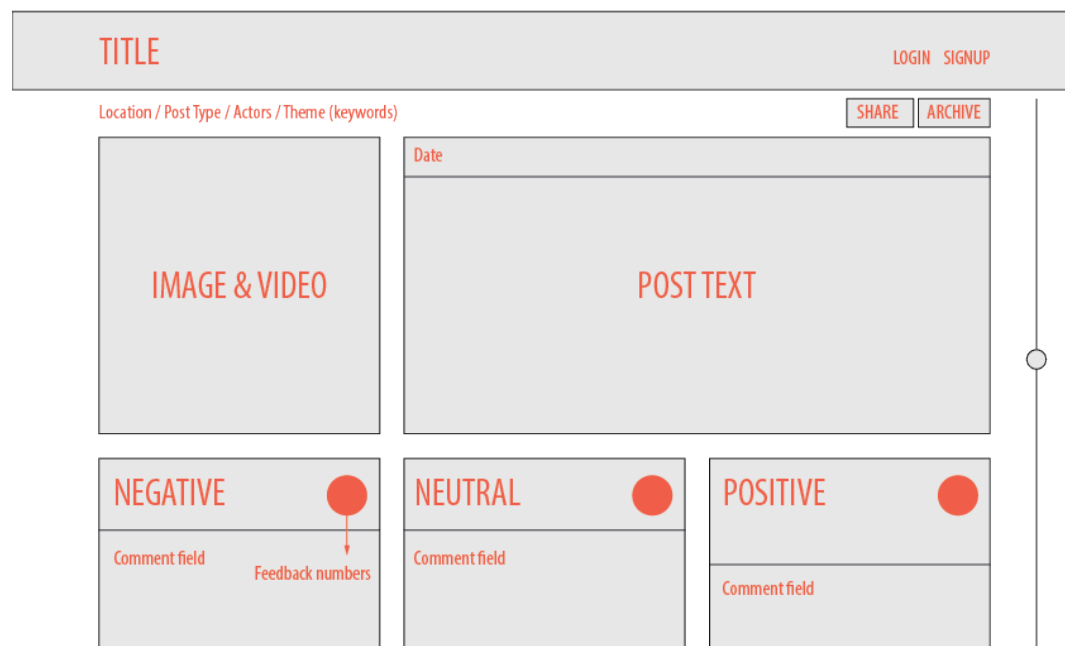


Figure 12 – Wireframe for the Post Istanbul post detail screen.

Posts: As I mentioned earlier, posts are displayed on the map as circles and on the timeline as post titles. On the left side of the interface, post types work as toggles. By using these buttons, the related content can be visible or invisible on the map and timeline.

Search: Users can access the location and topic with the search option of website. Furthermore, actors and hashtags can be accessed from the search option.

Map zoom: The four geographical levels (local, regional, national, global) are explored by using a circular zoom tool. Through this element, the posts from different locations can be displayed on the map.

Post display: Through clicking either the post titles on the timeline or the circles on the map, a post display can be accessed.

4.3.4. Validation of Concept

Based on the findings from the user research conducted, the information architecture, navigation and interaction models, and the interface has been designed. The main intention for each of these has been to provide an effective tool for citizen engagement in which users can create stories, ideas about the city, and discuss about these ideas basing their statements on real data that can browsed by time or location. The next step within the research process has been to validate these outputs of the study by building a functional prototype of the system and collecting user feedback. Here in this section, we summarize the prototype building and user feedback collection stages.

Prototype: Parallel to the design process, a prototype of the system has been developed. This prototype has been built using Google Maps system for the map, JSon for database communication, and HTML 5 for the user interface. A special content management system working at the background has been developed for providing user input and content management. Users can also link their Twitter accounts for which Twitter APIs have been used.



Figure 13 – Post Istanbul, interface design study

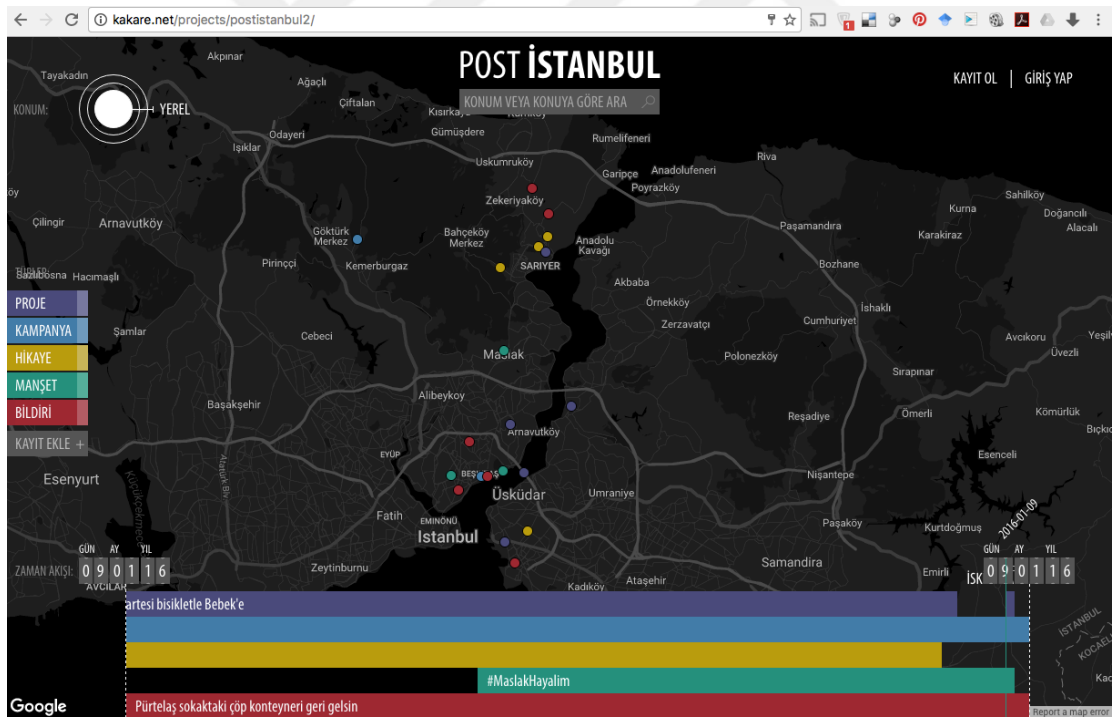


Figure 14 – Post Istanbul, spatio-temporal data visualization interface.

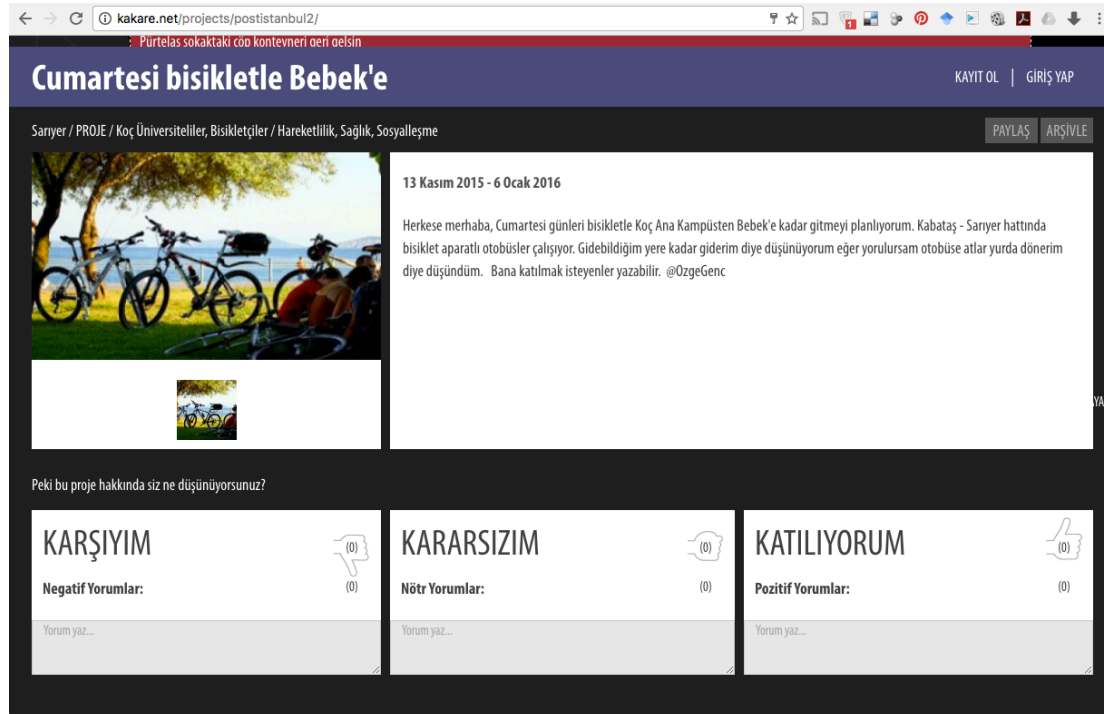


Figure 15 – Post Istanbul, user post detail interface.

Cognitive Walkthrough: As a final stage for collecting brief user feedback about the design outputs, I interviewed with 5 people in order to validate the concept of Post Istanbul. First I explained the concept and let the participants take a short look on the prototype. After they got familiar with the application, I started asking a set of questions. The questions that were asked to the participants are the following:

1. Are the features of the application self-explanatory at first sight?
2. Are the titles of post types obvious?
3. Does the location based interface support discussion and does it motive you to use the application?
4. What would the advantages of seeing location-based stories from different people be?
5. Could you add a new post?
6. Would you use this application in daily life? If yes, what would your purpose be? If not, what would the reason be?
7. If you compare this application with the text and list-based applications such as change.org, what would the purposes of use be?
8. Do you have any suggestions to the existing concept?

Insights and Discussion

I hereby, summarize some answers from the participants for each of the above listed questions and my observations during the interviews.

1. Are the features of the application self-explanatory at first sight?

The main features of the application are self-explanatory according to the five participants, except for the timeline. The timeline is not self-explanatory for three out of five participants. They mostly focused on post types and the map view. In my opinion, the timeline is not visible enough due to the layout design. The location of the timeline can be changed or can be differentiated by using color and transparency. On the other hand, one participant mentioned that she is much more familiar with the vertical timelines on social media.

2. Are the titles of post types obvious?

Projects, Campaigns and Stories titles are obvious and understandable according to the five participants. Headlines and Manifests titles are not clear for all five participants. They all interpreted the meanings of these two titles. Headlines title is not associated with trending topics; it is much more related with the big events according to the participants. Manifests title is somewhat more understandable but still not clear. They mentioned that it is reminiscent of political manifests. According to the feedbacks from the participants, the Headlines title should be changed to Trends and Manifests to Report or Notice.

3. Does the location based interface support discussion and does it motive you to use the application?

According to the five participants, the location-based interface is motivating them to use the application. If they see a number of circles around a particular area, it would seem as an intriguing circumstance. Two out of five participants mentioned that the location-based interface would provide engagement with their neighborhoods, because the concept presents local data. When they use Facebook or Twitter, the accessible content is not as close by as Post Istanbul, it is not easy to access the local content.

4. What would the advantages of seeing location-based stories from different people be?

Two participants mentioned that it would be an opportunity to meet people with similar interests, problems or motivation. Thus the local problems would be solved collectively and new communities would be revealed in the city. Seeing different stories would support their decision making process especially when moving to a new neighborhood. Moreover, location based stories would provide insights about the socioeconomic and sociocultural status of different communities within the city. These stories would cause a feeling of social belonging to the local habitat and trigger individuals to tell their own stories.

5. Could you add a new post?

Three out of five participants added new stories to Post Istanbul. One participant added a new manifest and one participant added a new campaign to the application. All the post types were added easily to the system. The option of sharing on Twitter was useful for the participants. They all found the flow of adding a new post fitting for the concept.

6. Would you use this application in daily life? If yes, what would your purpose be? If not, what would the reason be?

All five participants mentioned that they would use this application in their daily life. They stated that the application would help them know more about the causes of social and political activities in their neighborhood as well as granting ease of access to civic engagement activities in the city. Additionally, the participants would use Post Istanbul to report the malfunction in public space and to share personal experiences in order to inform other people in the neighborhood. .

7. If you compare this application with the text and list-based applications such as change.org, what would the purposes of use be?

According to one participant, Post Istanbul is more exploratory than text and list based applications. Three participants mentioned that if they look for local issues and problems they would prefer Post Istanbul as well. On the other hand, text and list based applications are easier to utilize for big events and global issues. One participant stated that Post Istanbul would provide an opportunity to track social events such as campaigns or protests from start till the end.

8. Do you have any suggestions to the existing concept?

Participants said they wished they could comment with photos. They also wanted a list-based interface for ease of use in certain situations. Moreover, they asked for more information on the demographics and suggested that it be displayed on the map. Lastly, they mentioned that a Facebook connection could be preferable as well.

According to the feedback from the participants, the design concept of Post Istanbul is partially coherent and easy to understand. The most important insight from the validation study is that Post Istanbul would motivate the users to share their own stories and it would indirectly affect civic engagement by revealing local issues and problems.



5. Conclusion

In this chapter, I will first revisit the research questions and hypotheses of the study. Afterwards, I will provide the possible future studies that have come up from the existing study.

5.1. Discussion

The aim of this study was to explore and understand the user needs in online civic engagement tools and to produce an interactive media design solution for civic engagement in the city. With this aim in mind, the main research questions and the answers that I obtained through this study are the following:

- How can communities in civic life be supported with the help of a location-based web application?

According to the user centered research methods that I have applied in the study, such as in-depth interviews and tabletop game design, both individuals and civic engagement communities need to have broader information about their environment. Most of the individuals do not come across the community activities easily. Communities have trouble broadcasting their activities and campaigns to the public. Through an online story telling tool these two groups can be mingled. Thus both can share their stories and be aware of their activities in the city. An online storytelling tool would be supportive for real life civic engagement. This is because the more people see the stories from their neighborhood; the more they will be aware of their local issues.

- What are the user requirements and needs for an interactive location based citizen engagement application?

As I mentioned above, users (either individuals or communities) need to know about their civic engagement activities in the city. A holistic view of urban facts and issues, such as environmental concerns, transportation problems or social rights violations, are required to be shown to the users. Designing a web application that comprises open feedback and sharing system can meet this requirement. The application must be connected with the current social media applications in order to make content more accessible and flexible.

- How can we design an appropriate information architecture and interaction model for a location based citizen engagement tool?

The insights derived from the tabletop game study has the key role in order to build appropriate information architecture for an online story telling application that is customized for civic engagement. Throughout the study, I have obtained the functions and feature specifications by observing participants and analyzing their behavior. The actions that had been done by the participant were the most important elements of future information design. The main structure of Post Istanbul that consists of projects, campaigns, stories, headlines and manifests titles were derived from the participants' actions and comments during the game sessions. After that, the analyses of game sessions provided the related functions such as share and comment. Thus I obtained the final proposed information architecture. Moreover, the language of the applications had been verified with the help of the tabletop game design.

- How can we associate online storytelling with location based citizen engagement applications?

Both the in-depth interviews and the tabletop game study showed that story telling concept was a notable insight. All interviewees mentioned that they are usually influenced by other people's stories and sometimes these stories have a trigger effect on themselves to share their own stories. Aside from that, there are prominent studies on relation with storytelling and civic engagement in the literature. As I inferred from my own studies and from the current literature that if people are encouraged to tell their stories, more people can get together to solve problems and try to be more proactive in increasing quality of life.

At the beginning of the study I constructed hypotheses on the relationship between civic engagement and online applications. My aim was to investigate the enhancement methods and techniques of civic engagement by using the possibilities of interactive media and data visualization. In order to remember the hypotheses, I will repeat them and share the conclusion of each statement.

"If a citizen engagement tool represents the information in a location and time-based manner to the communities,

- a. People will more likely to share their ideas and stories with their community.

Applying the literature review and designing a concept for storytelling did testing this statement. Tabletop game design offered us the opportunity to observe participants' behaviors and attitudes on storytelling. As they see the action cards on the map and

the contexts of actions, they started to relate much more personally to the issues and started to join discussions. The short questionnaire that I executed at the end of each session caused the participants to be affected from other participants' actions.

- b. People will more likely get involved in their local issues.

Again as an insight from the short questionnaire, which had been done at the end of the tabletop game sessions, participants denoted that during the game sessions they related much more with their local issues. Moreover, during the in-depth interviews, 3 interviewees mentioned that when they encounter a local issue on social media, such as a minor transformation of public space in their neighborhood, they are more likely to be aware of micro level issues. So, the study has fulfilled this statement.

- c. A location-based system would trigger a better discussion environment with improved awareness within the city.

This statement has been investigated by analyzing in-depth interviews and validated by the tabletop game study. At the end of the game sessions, participants were asked to evaluate the effectiveness of the location-based context on triggering discussions in the existing concept. They conveyed that the concept can trigger a better discussion environment. Whereas, raising awareness in the city would require many more effective channels that include all citizens in the city, even those without internet access.

At the beginning of this research I aimed at designing a service to support civic engagement in the city while the main focus for the research has been about collecting the users needs. For such a service that has a wide variety of users, Individuals and communities' needs are varied and changeable. Here I will try to explain my insights based on what is learned from the research. People want to build and sustain their own environment and community, they are able to access a large number of information source about the city (online sources, social media, census data and etc.), but the representation of these information is not understandable, not easy to interact and control to build a much more livable city. When people want to make changes in social life they should find evidences according to the urban facts. At this point an online story telling tool can have a supportive role in order to produce evidences. Evidences can be appropriate instruments for demanding change from authorities and building some more livable communities. Moreover, participatory urban information systems alike my online storytelling design concept can be an opportunity to build city archives.

5.2. Limitations

During this project, I envisioned to develop a transparent interactive online storytelling concept which brings together all kinds of users and actors in the city from activists, NGOs, opinion leaders, children, disabled people to the local government while I could only cover a specific group within this research period, mainly, opinion leaders in the city. When looking back to my research, I would redesign my research according to all city actors.

5.3. Future Work

In this study I explored the user requirements for supportive civic engagement online applications. With the help of the study I created a digital storytelling concept to foster civic engagement in urban level. During this study, I reached out to a limited number of users because my aim was to obtain beneficial qualitative insights from the potential users. Although the proposed design was based on the users' feedback, the interaction models can be derived from much wider user research studies. The usability of Post Istanbul is excluded from this study. Therefore, user feedback can be gathered and applied in terms of usability in the future. Location and time-based interfaces can be investigated and developed within the civic engagement concept.

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7. Appendices

7.1. In-depth Interviews Outline

1) In which environment you get into an argument? (Family/Friends) On what topics and how frequent?

a) Who starts the arguments usually?

b) How do you define the people that you may get into an argument? Which characteristics lead you to do that?

c) Do you prefer to be alone or with a group while making an argument?

2) Which issues about the city are you interested broadly?

3) Are you a member of a union, non-governmental organization, political party or group, sports or recreation organization?

a) For how long?

b) What is your position?

c) If you are a member of an organization, do you follow it via internet?

4) On what purposes do you use the internet?

5) Which social media applications are you using?

6) How do you use the internet to get the news?

7) How do you use the internet for research?

8) From how many news portal or blog do you receive information daily?

9) How do the social media applications you are using differ from each other based on their purposes? For instance; some people may use twitter to get the news and prefer facebook for their personal sharing. How do you define your usage?

10) Based on what criteria you choose the people you follow on social media? (Friend, friend of a friend of mine, famous person etc.)

11) Whereas some people may share every experience they had on social media, others may prefer to share only their opinions about the agenda or some may even only repost the shared news. What is your social media habit?

- 12) How do you read the news from online news platforms? Do you share after reading? On what topics do you share about?
- 13) Do you get into arguments through social media? If you do, what are the occasions and on what topics do you share about?
- 14) Apart from the agenda news, how do you receive information about other topics such as city life?
- 15) How does he/she receive information?
- 16) What drives him/her to an argument?
- 17) Does he/she share his/her own opinions?
- 18) Does he/she improve others' opinions?
- 19) How does he/she see the social media or information sources? How does he/she define his/her relationship with them?
- 20) How does he/she share something that he/she found relative with the city? Does he/she tend to share? For instance; a trouble in the city that he/she came across triggers him/her to share this on social media?
- 21) What are advantages and disadvantages of social media? (Accessing flash news, can't accessing old stuff immediately etc.)
- 22) Visibility of which type of data is important about the city? (Traffic, population, economy etc.)
- 23) How may the visualization of the information about population distribution, weather, settlements, economy, business industries, transportation and health contribute?
- 24) What may be the expectations about the application? Ask this towards the end of the meeting.
- 25) You may ask about a real experience?
- 26) How does he/she take notes? How can you use it later on? How can you note down what you've learned?

7.2. Publications from the thesis study

Genç, Ö., Çay, D., & Yantaç, A. E. (2015, August). Participatory Explorations on a Location Based Urban Information System. In International Conference of Design, User Experience, and Usability (pp. 357-367). Springer International Publishing.



Participatory Explorations on a Location Based Urban Information System

Özge Genç, Damla Çay, Asım Evren Yantaç

Arçelik Research Center for Creative Industries, Koç University, Istanbul

dcay13@ku.edu.tr, ogenc13@ku.edu.tr, eyantac@ku.edu.tr

Abstract. In this paper, we share our user research experiences from an ongoing participatory location based urban information system design study. While the geographical information system (GIS) field advanced by means of sensors, data collection and data processing, there is still a limited number of visualization studies. Here, we envision novel solutions that represent spatio-temporal data for effective use in daily life. With this intention in mind, as early stage studies in our research process, we conducted a series of participatory design (PD) workshops together with an ethnographic artifact, a custom sketchbook to identify user scenarios and explore possible visualization techniques. The main objective of the study is to explore new ways of visualizing and interacting with the complex location based data that will provide intuitive yet easier and more effective daily life information for the public.

Keywords: Participatory design, design research, journal, urban information visualization, spatio-temporal data, ethnographic research

1. Introduction

Nowadays, location-based information systems' role is progressively gaining importance in our everyday life. With the help of social media applications and mobile technologies (Craig et al., 2002), location based content is being generated easily by the public and substantially used for several purposes such as understanding decision making process about key social, political economic and environmental facts (Porter, 2011). Especially gathering location-based information from local communities is relatively more valuable in order to create sustainable solutions for human needs and improve the quality of life (Elwood, 2008). It is obvious that different approaches such as participatory design (PD), user centered design, ethnographic research methods and participatory geographical information systems (PGIS) have common characteristics in terms of their main aim. Although these practices have been used by different disciplines, it is seen that they share the common ground of understanding the needs of human and coming up with relevant design solutions.

In our ongoing design study, our aim is to make a contribution to the participatory geographical information systems (PGIS) studies by means of novel ideas for information representation and interaction. We have been gathering both content related needs and visualization inspirations from users by conducting PD workshops and individual user input by journal studies in combination. In PGIS studies; more of the participatory approaches can be seen at the information gathering stages, while public involvement has been weak during information visualization stages.

This paper shares our insights from an ongoing research study for exploring new ways of visualization and interaction of spatio-temporal data in daily urban life. Meanwhile we are also looking for sustainable and effective ethnographic data collection methods for spotting intuitive use patterns. With this perspective, our objective is to investigate possible visualization

techniques by adopting PD and ethnographic research methods in our study. We envision that these insights may lead us to more sophisticated and effective participatory interactive solutions for interaction with the urban data.

2. Background and Motivation

Throughout the last 50 years, location based data has been elaborately investigated by scholars under the field of Geographical Information System (GIS). Recently, this field has discovered the importance of spatial information analysis (Maguire et al., 1991). Subsequent to spatial information analysis, making explanations and predictions related to spatial information have become much simpler (Clarke, 1997). On the other hand, public knowledge has become an important issue to identify the needs of locals (Elwood, 2008). With the help of volunteered geographic information (VGI) (Goodchild, 2007; Sui, 2008), GIS has been shifted to a more democratic approach. This is because VGI methods provide an environment where the public can be much more engaged with the production of collaborative geographical knowledge. Interactive online instruments such as Google Maps and Open Street Map create open access for the public to build and share their own maps.

While location-based applications are becoming widespread, users' needs grow and become diverse. A variety of personas use these systems and a huge number of information layers appear on maps. This situation reveals the need for studies on geographic information visualization techniques. Moreover, new contexts of usage such as mobile phones, big screens or dual screens create challenges in both visualization techniques and interaction models. One of the most commonly seen participatory geographic information visualization technique is attaching pins on the maps (Ushahidi Crisis Maps; Global Transition to a New Economy). Color-coding, using attributions of visuals elements, such as circles, squares, lines, using textures, and 3D modeling are other ways of representing geographic information on map (Roth et al., 2010; Fifa Development Globe).

An important issue in location-based information visualization studies is the lack of public participation in the evaluation process of visualization techniques. One of the instruments of public participation in design is cultural probe method. Cultural probes are a range of physical objects which participants interact with. These objects help us to understand user needs and behaviors. Probes can be notebooks, postcards or maps (Gaver et al., 1999). A cultural probe even can be a wearable prototype where direct user feedback is collected, like a wearable recorder to collect city sounds (Gaye et al., 2004). Some geographical visualization techniques were evaluated by conducting user studies (Dockerty et al., 2006; Lange, 2001; Appleton and Lovett, 2003). In addition, some researchers have done collaborative geographical visualization sessions to design much more usable systems (Brewer et al., 2000). Since the geographic visualization topics are varied and complex and technology use changes quickly, we believe that sustainable methods for learning about user mental models and user needs, as well as the need for public engagement to the visualization process is crucial. GIS tools, such as Arc View, have dominantly been used in the field of participatory GIS. These tools would be effective in order to visualize geospatial information but there would also be several usability problems due to the similarities of these kinds of software.

3. Method

With the perspective above, our main approach in this study is to explore how people intuitively perceive their presence and movement on the map, how they visualize it and how participatory methods can be used for learning from the users about these two questions. For this purpose, we collaborated with people from different design domains with a series of participatory design and journal studies in 2014. Here, in this paper, we discuss five consecutive stages (Figure 1); workshop 1 (user needs + visualization), workshop 2 (conceptualization + visualization), workshop 3 + journal study (visualization), interview (user needs) and a table top game (mental model + information architecture).

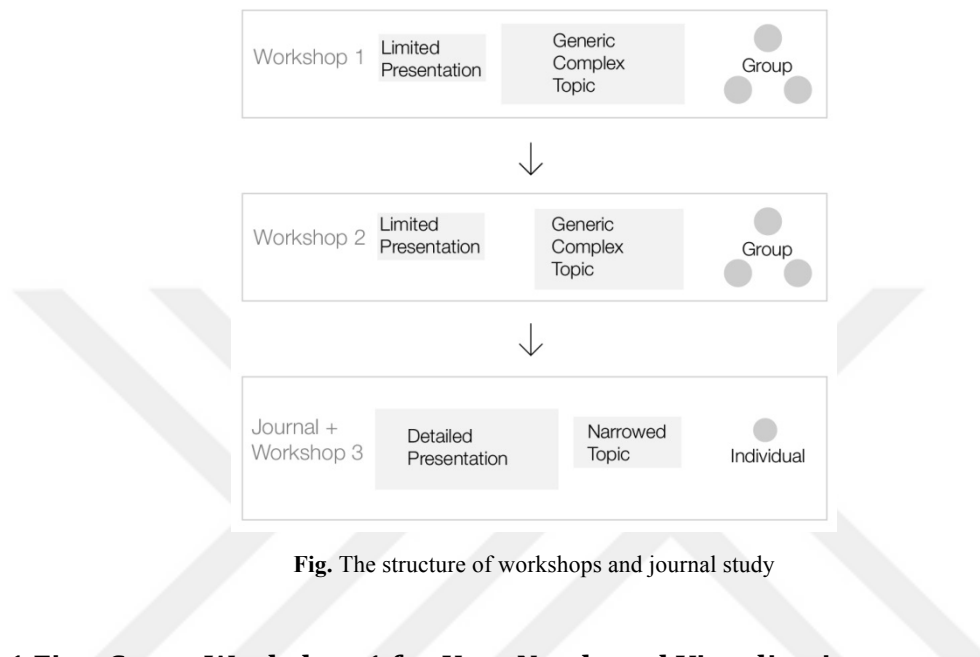


Fig. The structure of workshops and journal study

3.1 First Stage: Workshop 1 for User Needs and Visualization

All the process started by planning a series of design workshops which were announced to designers as exploratory studies on spatio-temporal data visualization about the city and how people interact and perceive this information within their daily life.

Workshop 1 was announced online through an art and design institution, SALT Istanbul. Five participants who from different design backgrounds like interaction design, architecture, urban planning attended the workshop. After a presentation about data visualization, we briefed the participants about the “Design Network of Istanbul” case study. After a card sorting session to discuss about the content and information architecture of given topics, we separated them into two groups to work on issues related to data visualization (time, navigation, route, action). Working individually for a while, and then brainstorming as a group, teams gathered and presented their ideas to each other, discussed and voted for one of the ideas. Our aim in voting was to see if the competition engages participants more or not, and it ended up being time consuming and left less time for visualizing ideas. At the end, two teams presented their final ideas.

Even though there were some interesting ideas pointed out like the effects of day and night change in the city on human movement and how to visualize them; the results were not satisfying in terms of detail. Our insight from this study is that; the workshop content was too loaded for a one day practice and the participants didn’t engage enough in the topic presented.

3.2 Second Stage: Workshop 2 for Conceptualization and Visualization

With a similar agenda and based on our previous experience, we held a second workshop at Koc University. The workshop was announced online to networks of design domain. Five participants; four students and one graduate attended. The workshop which started with our presentation where we briefly explained what data visualization is and showed relevant examples of it as well as the output of the first workshop. After the presentation, we asked the participants to visualize spatio-temporal information for scenarios that were presented to them. Discussions included personas and different scenarios also using factors like day/night. These scenarios were based on daily movements and actions of certain personas in the city; such as a tourist, disabled person, homeless, couple, family, employee, tradesman and local tourist. For idea generation and sketching, the participants were divided into two groups and each group had five scenarios to visualize. Since there was no voting, two groups gathered only once at the end of the workshop to present their ideas and discuss.

Even though the structure of Workshop 2 was more focused on the visualization part than Workshop 1, time wasn't enough again for more sophisticated visualization ideas. After Workshop 2, we decided to change our method. We prepared a journal (Figure 2) and sent it to a group of participants that we announced the previous workshops, before inviting them to the 3rd workshop.

3.3 Third Stage: Journal Study and Workshop 3 for Visualization

At this stage, we created a journal with which users reflect their city experience with visual and verbal representations. Our aim here was to give the users enough time to intuitively reflect how they perceive and represent their presence and movement in the city based on their own daily experiences. There were three important questions that we were interested in this study; (1) what are the things that people choose to record?; (2) how do they visualize them?; (3) How do they perceive their presence in the city?

Journal Structure

The Journal, an A5 sized notebook, which the user can carry around while travelling, is designed with enough pages for seven days (Figure 2). For each day, there are several parts allocated for different needs. First, there is a grayscale map of Istanbul and a blank page for free drawing. Then, there is a striped page for the user to write their experience. Finally, there is a page with questions, aiming to guide the user to think about some of the issues in the city; such as “Were there any hitches around the city?” or “What type of information did you need to achieve?”

We announced the journal study to a group of the previous workshop participants and other people with design background. During this period, we announced a third workshop. One of the main objectives is to learn about the journal users' experience with this new medium and discuss them.



Fig. Journals design for the participatory studies

Workshop 3

9 participants, mostly from interactive media design field, attended the third workshop. The workshop lasted for 6 hours and consisted of three parts; (1) presentation about visualization methods and discussion about the journal, (2) journal users' experience sharing, (3) users' selection of topics and their individual working process on visualization. The workshop started with a detailed and structured presentation about data visualization, followed by briefing on the journal. In the second part, the participants who had the journal shared their experiences. Some of the journal users addressed that they started to pay more attention to their surrounding while completing the journal. In this part, the participants, who didn't have the journal, had problems with engaging. Later on, we shared our user scenarios from the previous workshops. This was followed by a discussion and idea generation session about user needs. Afterwards, each participant selected a topic to visualize individually. Some of these topics were; historical transformation of the city, sounds of the city, events in one hour, empty areas of the city. For each topic that the participants chose, they determined 3 to 5 types of information to visualize. We imposed this limitation to participants to make them focus on visualization rather than information structure. This individual sketching session lasted for one hour. After an hour, participants presented their work and discussed their ideas all together.

Interview for User Needs

While we were conducting visualization exploration studies with designers, we also had a parallel process of long discussion sessions with the participants. However, non-designers' perspective had to be included in the study as well. Therefore we executed in-depth interviews with relatively a more heterogeneous group. The outline of the interviews was based on citizen engagement in city governance, decision-making and planning. The aim of the study was to investigate citizen activities related to social life in the city. In order to have a heterogeneous group, we contacted with political activists, journalists, city planners, students, academicians, shopkeepers, cyclists, health activists, and filmmakers and so on. Thereby we had 17 interviews. During the selection of participants, we applied snowball-sampling method. With the help of these interviews we had considerably detailed information about social movements and activities in Istanbul. We understood how and in which way people use media for taking part in the urban life, what kind of information and actions should be included. We used these insights in the next stage as user needs and mental model.



Fig. A scene from the table top game

Tabletop Game for Mental Model and Information Architecture

As mentioned earlier, the intention is not only the visualization, yet how people interact with this information. Thus, apart from all the above mentioned visualization and user need explorations, we also questioned how people interact, discuss and ideate on maps. With this in mind, we conducted a custom tabletop game for citizen engagement discussions (Figure 3). Aim of the game was to observe the user experience while citizens of a city partake in the discussion on urban issues, using computer and online-like actions such as discover, share, archive and so on. The context of the discussion was one of our on-going studies on building a citizen engagement support system application.

Briefly, the game was based on events and incidents happening in a city. Thus it was highly related to storytelling. We conducted three game sessions with minimum 4 players and a moderator in each (Figure 4). Sessions were played around a table. In the center of the table we placed an empty Istanbul map in order to motivate the players to make discussions on map. We collected a series of real events that were related to both public and private city life, such as; a large fire of a historical building, social movements, new regulations on public transport. On each game, we opened 10 event cards one by one and gave five discussion minutes to the players. Each player had a set of action cards and they were asked to make actions with those cards based on their preference to react to the event. The action cards were built based on a previous in-depth interview study that we had conducted with 17 participants. The cards were; see, share, discover, disseminate, archive, create, interpret, argument, story, map, idea, report, group, petition, crowd funding and two jokers. Within 5 minutes for each event, players discussed and conducted their actions about the event.

The game acted as a useful tool to understand interaction models and build information architecture for location-based systems. With the help of the tabletop game we found an interaction pattern and applied it to our citizen engagement support system design. The result of the game sessions is an issue that requires further discussion; for this reason, we will share our findings in another paper that will be on location based citizen engagement tools.

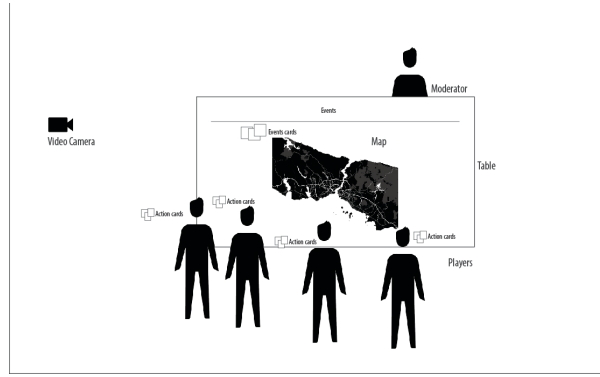


Fig. Tabletop Game Setup

4. Insights and Discussion

In this section, we share our insights from above-mentioned participatory exploration studies; (a) the use of workshops; (b) user needs; (c) visualization inspirations.

Regarding the evolution of workshop structures, observation of the participants' attitudes and reflections were effective in obtaining beneficial results. The first modification was about providing preliminary information for location-based visualization methods. We prepared a presentation about different methods at the beginning of each workshop as a briefing. Compared to the first two, in Workshop 3, we presented a much more structured presentation based on the categorization of visualization topics, visualization styles and interactivity levels. Also the journal study helped a lot for users to be more ready for the ideation process. As a result, participants seemed to be more willingly engaged in discussions.

The second modification was about the focusing level of each workshop. First two workshops had more generic topics such as; designers' network in the city or visualizing urban data for disabled people. However, these topics were excessively complex to study at a limited time. Based on this experience, we inevitably narrowed down and identified topics at the workshop with participants. The journal users' experiences and their true stories have been significantly influential for the scenario building process. In addition, journal study was also effective in getting representative insights about the execution of the study. Encouraging participants to create individual visual stories about daily urban life has also been effective in order to reflect more creative visualization concepts about their individual and fictional urban experiences.



Fig. Visualization sketches from PD workshops.

Apart from reflections on the PD workshop methodology, we also gained some insights about alternative user needs for urban data systems. Participants had discussing on concepts such as; spatio-temporal data about day and night change, facades of buildings as information providers, detailed information about pedestrians or urban cycle riders, transportation systems, public sphere information, environmental factors (such as noise, acoustics, waste, animal life), social issues (such as language and immigration), social and cultural events effecting the urban life, historical change of the city landscape and plan.

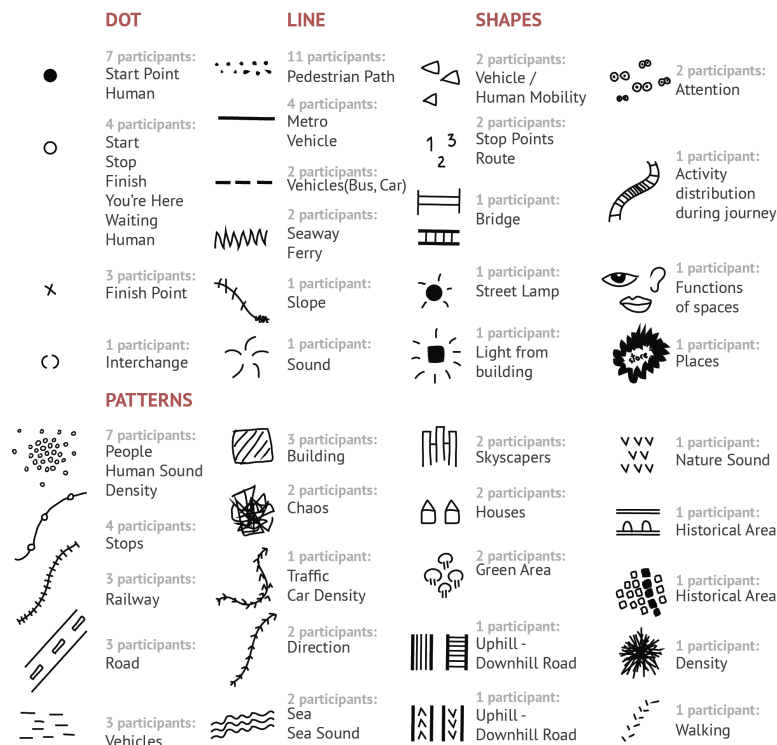


Fig. Chart of visual representations from journals and workshops.

Although with these early studies we predominantly collected insights regarding user needs, we were also able to gather some ideas related with visualization (Figure 6). The prominent visualization inspirations have some common features such as; color-coding, metaphoric visualization, texture usage and attributes of lines or dots. To identify different types of information (such as density, activity, pace), locations and actions, participants used color attributes such as; hue, saturation or alpha. Discrete geometric shapes, predominantly circles have been used to visualize human movements while in contrast; repeated amorphous shapes have been used to visualize vehicle movements. Obstacles have been visualized by patterns such as; broken lines, curved lines, zigzags and jagged lines based on their impact. Metaphoric visualization techniques have been used for noise and movement visualization. Density, place attributes and states have been visualized by using textures.

After we created an outline of the visual representation patterns, we categorized most of the visual elements from journals and workshops; into dots, lines, shapes and patterns (Figure 6). As Bertin suggests (1983) these are basic and commonly used elements in the area of location based visualizations and maps. We looked into the visual characteristics of each element and what they were meant to stand for by the participant. After we sorted and analyzed the visual information from the journals and workshops, we built a chart. This chart contained the most commonly used elements by the participants. It also contained uncommon and remarkable representation ideas. The numbers at the top of each element indicates how many participants used that visual element. Location based visualization in relation to city context is one of our main research topic as a design research group. City by its nature is a multi-layered and complex phenomenon. In these studies, our aim is to reach self-represented visual and interaction styles that particularly coexist with the city phenomenon.

5. Conclusion

In these early stages of designing participatory location based information systems, we made use of a variety user research and participatory design approaches. With the intention of collecting intuitive insights about users' needs for such a system, understanding the mental model and exploring how people visually represent and locate themselves in the city, we conducted a series of workshops and other user studies.

One of the main contributions of this early stage exploration study is the evolution of an iterative process of running the participatory studies and how to engage the participants more in the process while we also collected some insights about user needs and visual representation ideas. We believe that the study with journals helped a lot for more participation and saved a lot of time by involving participants' daily life experience in the process, instead of working only in limited hours of a workshop. Another critical point has been that, although we invited users from different backgrounds and tried to create a heterogeneous group in the 3rd Workshop, this was not the case in the 1st and the 2nd. Hence, there was not enough data to generalize the expectations or needs of a random citizen from an urban information visualization tool. Thus, the whole study has to have a more interdisciplinary approach.

In the end, one of the main intentions here is to explore effective and sustainable ways of learning about users' needs and mental model while interacting with the urban data. As mentioned above, we envision that these studies will lead us to interactive solutions building upon such ethnographic and participatory approaches. Meanwhile we also contribute to the GIS field by exploring visualization and interaction methods. We are now planning to detail the studies with more use of journals that incorporates with interactive tools and making use of

other artifacts for pre-workshop activities recruiting more diverse user backgrounds. At the same time, we are also developing prototypes to evaluate the previously collected ideas.

Acknowledgements

We would like to thank all the designers and design students who were involved in the PD workshops; Hande Özusta for the presentation structure and archiving; SALT-Galata for providing space for the workshops, Yağmur Gökçe and Başak Sucuka for proof reading; Hüseyin Kuşçu for interactive prototype development. Some of this study is connected to a Koç University, Seed Grant Funded project.

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