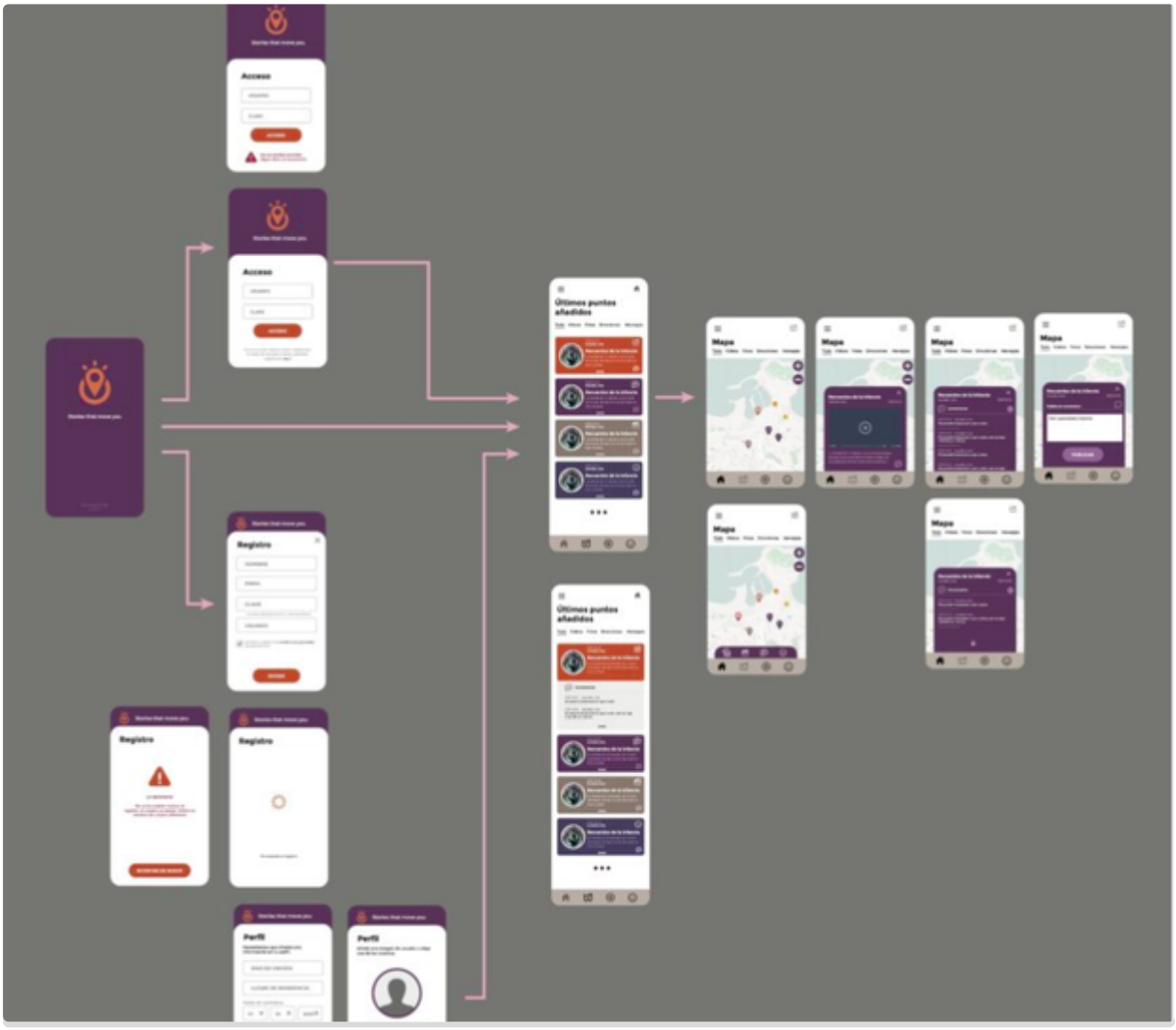
GEO-DEMA APP SURVEY RESULTS

A collective imaginary through an App

User Needs & Survey Results

This paper outlines a research project, funded under the Erasmus+ Higher Education 2020 Program, which involves the conceptualization, design and implementation of a Smart City application where the wealth of data collected by students at the initial stage to understand the user needs. The platform will also create an adequate environment (physical and virtual) for cooperation between citizens, higher ed. institutions and city authorities enabling that the information added by one part to be available to all stakeholders. This objective proposes an approach to the concept of Smart Cities that puts the citizen as the focal point of the data collection and information sharing process.



Introduction

Smart infrastructure and smart services (SISS) are the core elements of a smart city. Smart infrastructure includes hard infrastructure (all urban facilities and all ICT-based hardware) and soft infrastructure (individuals and groups of people living in the city, business processes, software applications and data), which are equipped with the latest ICT to provide corresponding smart services. Although theoretical research and practical construction have been effective, the field of the smart city is still in its infancy, and there is a certain gap between utopia and reality. The development of smart cities costs a lot of money, but its initial basic goals have never been fully met.

The application of information technology has been deeply rooted in people's work and life, and the demand of residents to participate in urban management has increased significantly, and they require a higher level of public management and public service level. Improving residents' sense of well-being has become the main driving force and ultimate goal of smart city construction in various countries, which is also listed as an important indicator of the smart city evaluation system. Subjective well-being (SWB) measures quality of life and determines the importance of smart cities in people's lives. Different countries and cities have different levels of development, and residents' experiences and demands for happiness are also at different levels. At present, some scholars have begun to pay attention to the topic of well-being brought by the smart city to the residents.

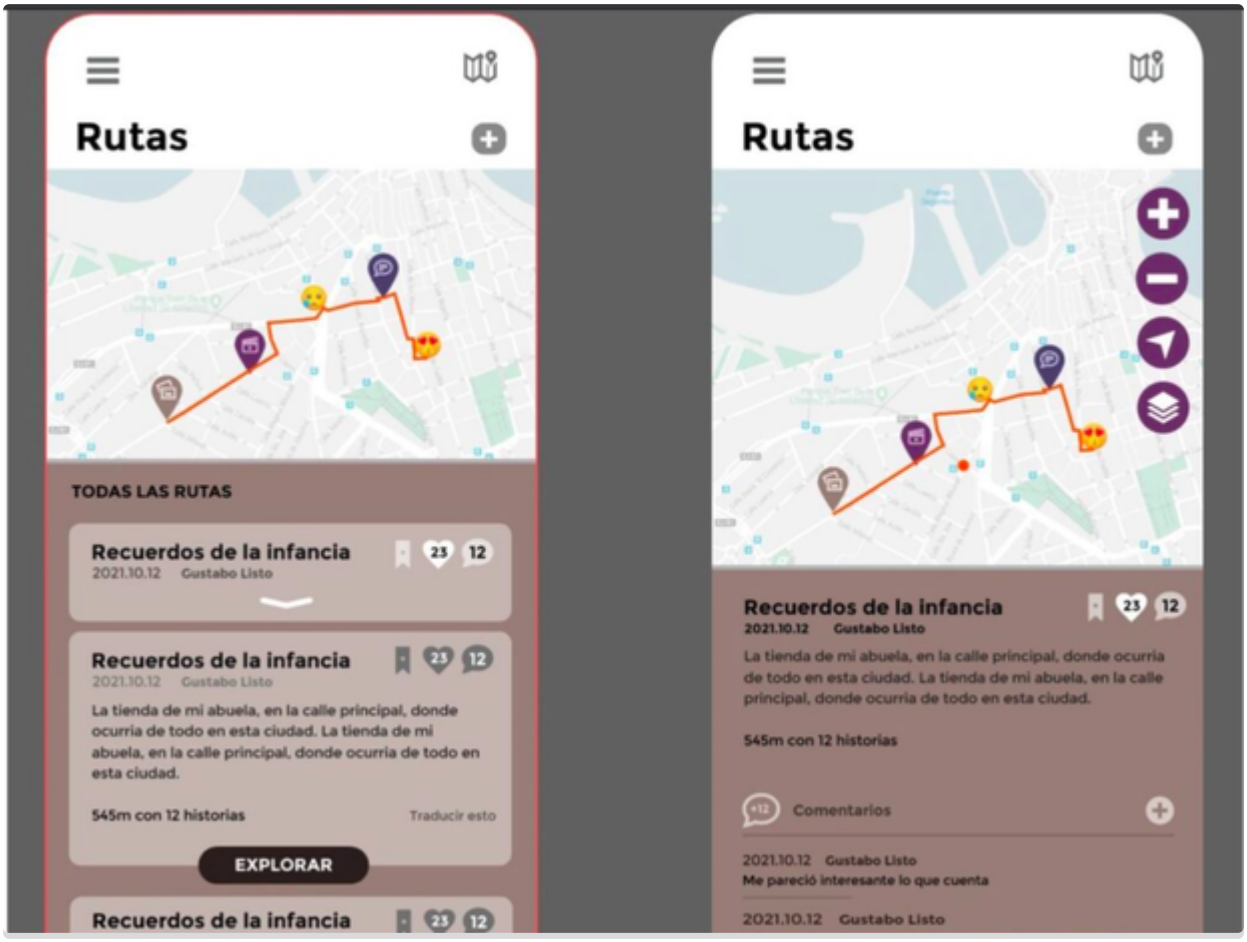
The citizen is the most relevant element in this process of sharing information, because humans have the most notably sensory and processing capabilities that allow them to create criteria about city status. Thus, allowing people to be more than a passive information receiver but an active contributor to healthy smart city pulse. Hence, is fundamental that the citizen can be engaged in a virtual community, to consult and share information. Applications (Apps) play an important role in this

subject, affecting the way that the citizen uses and share the information in the smart cities. In this context, it is fundamental that the citizen can share the information and knowledge associated with the events in the city. Some studies have emphasized the importance of knowledge sharing in Apps, to identify the aspects that facilitate the knowledge sharing behavior.

Emotions have effects that can transform the lives of individuals and groups. Shared emotions connect people to objects and places and shared sentiments bring people together to create social solidarities, groups and collectivities. This sense and state of belonging is only made through the collective coming together of emotions (Wright, 2015). The emotions that bring belonging into being can be positive or negative, emotions. For these reasons, emotions play an important part in constructing belonging and social collectivities.

Emotions are an important part of the human behaviour and are used in several researches. Some researches report that places and destinations in a city can produce positive emotions in their citizens, as the contact with natural places inside the cities. It can promote psychological restoration, improve the mood and attention, and reduce stress and anxiety. Furthermore, this evidence is particularly important for positive associations between, experience of natural places and mental or physical health, what confirm the importance of the knowledge about city's areas as a good emotions agent.

To increase the level of interaction in smart city context, SMARTDEMA project develops a smart phone application (APP) to enable its users to share their stories about a specific place in the city and to analyze the emotions and to interact with other user stories. This APP is an important tool to improve the level of citizens' and visitors' information about, what kind of emotions the citizens feel when they visit certain areas in the city.



Theoretical Background

Subjective well-being (SWB) is an important concept in the field of positive psychology and quality of life, and refers to an overall assessment of an individual's self-state and quality of life in a certain period of time, including life satisfaction, positive emotion, and negative emotion. Positive and

negative emotions are also generally considered as the perceptual dimension of SWB, which refers to individuals' perception of their own subjective emotions.

With changes of the city environment and the way of interaction between people and the city, there has been an effort of researchers to turn the cities into a higher interactive environment, with capabilities to engage citizens in a personalized way (Adikari & Alahakoon, 2021; Lin et al 2019; Rosa & Postolache, 2016; Wright, 2015; Solanas et al 2014), and try, among other things, discover the emotions felt by its citizens, due several aspects of the city's areas such as tourist spots, public transports, food an drink, the country in general, the sport activities in the city and street illuminations. Creating an effective user experience within a smart city is an important factor of success (Sheth, Srivastava & Michahelles, 2018). The Stimulus-Organism-Response (SOR) framework of environmental psychology argues that objective conditions such as atmosphere, design, and social factors stimulate consumer perceptions. In smart cities, smart infrastructure and smart services SISS, as a kind of artificially created activity scene, will inspire urban residents and visitors to participate actively or passively and produce various experiences. Residents' personal experiences of SISS may change their situations and paces of life, which may directly affect emotional changes, different levels of needs and cognitive attitudes (Al-Azzawi, 2019). Geo Dema App also enables users produce experiences through sharing stories, videos, pictures and interacting (like commenting, tagging..) with the other users. In addition, experiential marketing can provide emotional and functional values through feel perception, think perception, and service quality to induce customer satisfaction in hotels and the tourism industry (Yuan & Wu, 2008). At the same time self-determination theory argues that when a person's behavior satisfies the three basic psychological needs of ability, relationship (relatedness), and autonomy, the individual's well-being increases.

Ability (Competence): The experience of mastery over a task or particular domain

The concept of competence originates from the idea that individuals seek to control outcomes and this control allows them to experience mastery over a task or particular domain.

Relatedness: Social connections and a high concern for others

Individuals need to interact with other human beings. This sense of relatedness is demonstrated through social or virtual connections and a high concern for others through caring. Self-determination theory posits that relatedness is important for individuals and is linked to intrinsic motivation.

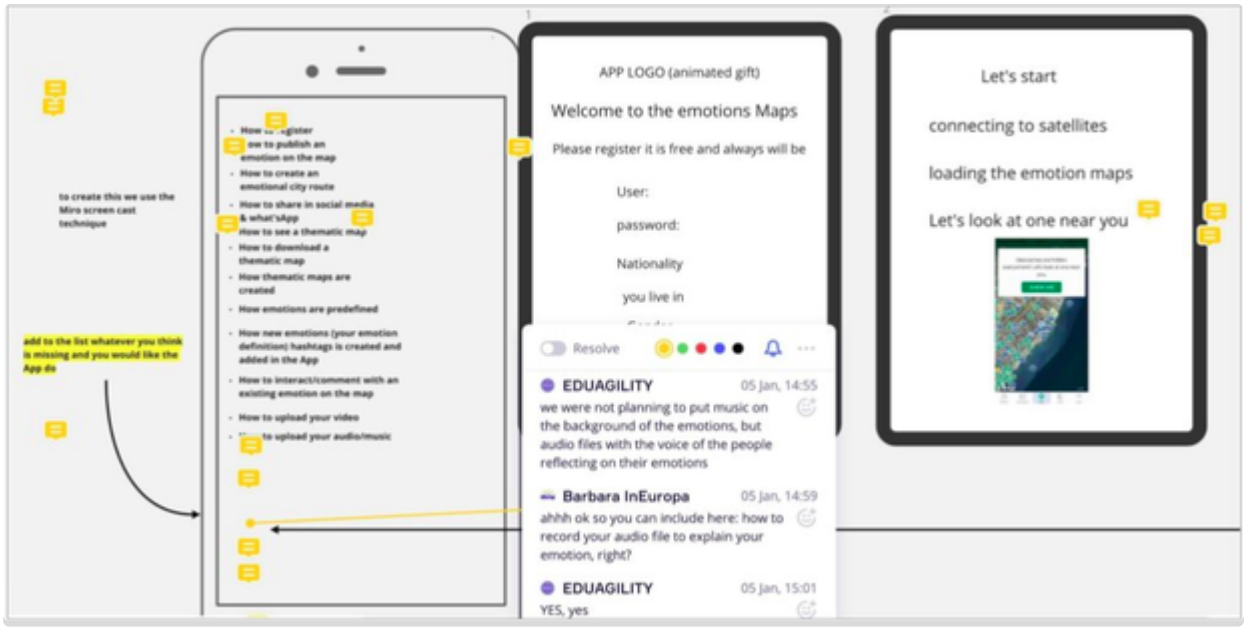
Autonomy: A sense of choice and endorsement in a task. Autonomy is based on the understanding that people are empowered when they feel a sense of choice and endorsement in a task – their actions are volitional

In the technology acceptance model (TAM), perceived usefulness is a key factor in explaining a user's acceptance of a new system. It refers to the user's perception of a particular system that contributes to improving their performance. The usefulness experience broadens the application range of perceived usefulness and reflects the extent to which user needs are effectively met. It is mainly used to describe urban residents' perception of the information and service they get by Smart infrastructure and smart services (SISS) that is beneficial for the improvement in the quality of their life. In order to people share information in those kind of apps, first they have to accept technology. In this study the evaluation of the user acceptance was done according to some social psychology theories: sense of bellowing (familiarity, perceived similarity and trust in other members); perceived and expected reciprocal benefits; perceived value; knowledge power and enjoyment; beside the intension to use an application.

Sense of Belonging: Some researchers studied what factors attract people to the apps. For those authors, an important factor for the success and survival of an app or virtual communities is the sense of belonging and participation. According to Hagerty et al., sense of belonging is considered as one specific process of connection between people arising from a personal attachment to amfamiliar locality, territory, geographic place or symbolic space that gives one a feeling of being 'attached to and rooted' and an important factor for emotiomal health and social well-being. Sense of belonging describes an emotional connection of a user to an app that are related with a sense of identification and membership expressing their emotions about the city. Antonsich (2010) presents a different vision from the perspective of a geographer, he is critical of what he sees as an over-emphasis on

belonging as attachment to the social collective and the over-looking the emotional and spatial connectedness to places and spaces.
He describes this personal, intimate and existential sense of self and place attachment as a relationship of ‘place-belongingness’. Acknowledging that relationships and circumstances are connected, multiple and in flux, Wright argues for examining ‘how belonging is constituted by and through emotional attachments’ and ‘to consider the work that belonging-as-emotion does in creating subjectivities, collectivities and places’ (Wright, 2015).
This study aims to investigate the need for designing an App for capturing the emotions of citizens based on their stories that are connected to different places in cities. This App also enables users share their travel experiences and visits with other potential travelers. With the help of the app we try to understand if:
- There is a positive relationship between sharing stories or using Apps and place attachment.
- Sharing stories through apps have an impact on changing people’s emotions about the city
-Sharing stories through apps have an impact on place attachment.

-Sharing stories through apps have an impact on emotional well-being
The main objective of this study is to evaluate the expected user acceptance of a mobile application for a smart city, using a scenario where a person uses this service. We are also interested to identify the constructs from the previous theories that are more related with intention to use a mobile application and.to understand user needs.



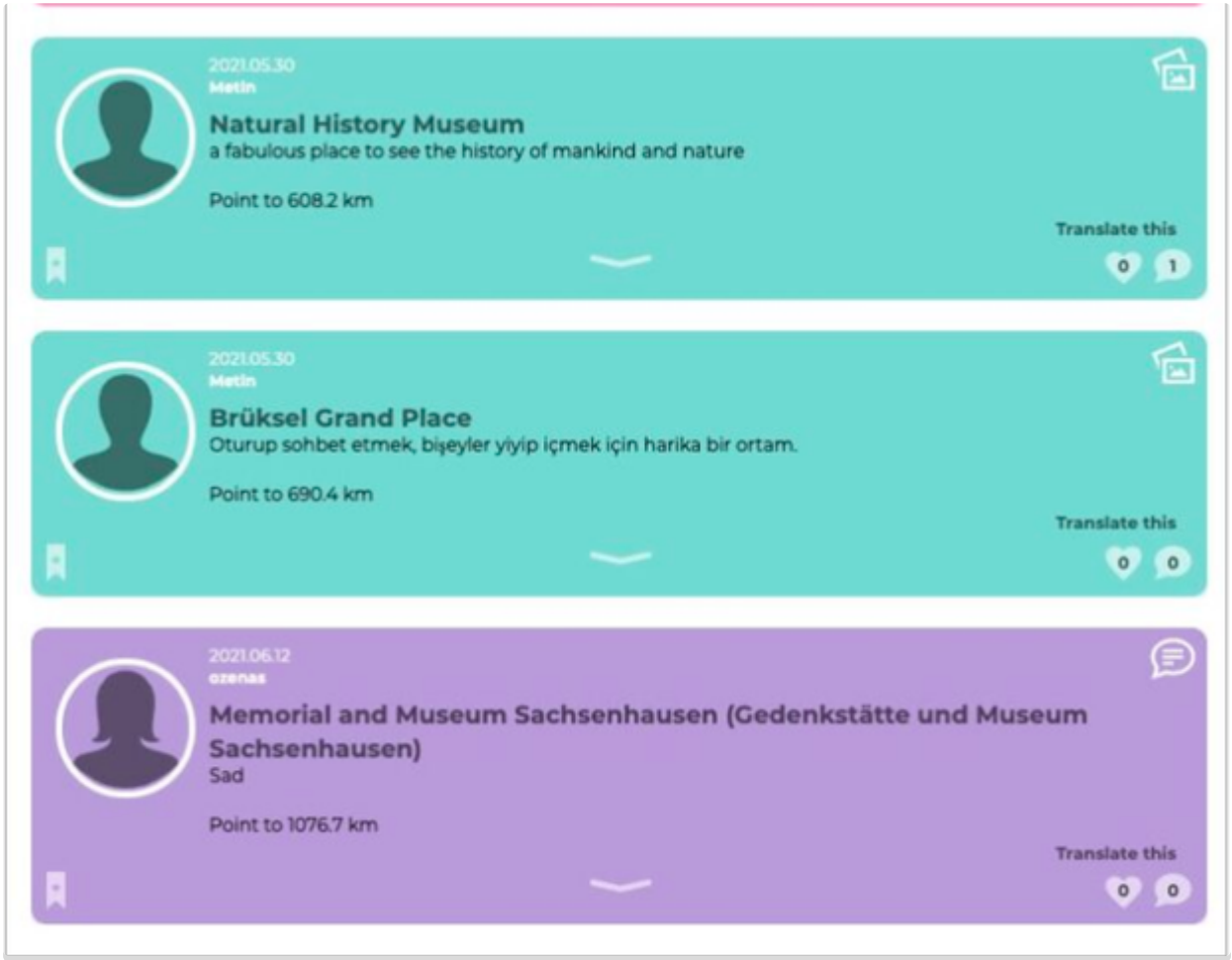
Methodology

We propose an APPs interface that analyzes the emotions of citizens and its relations between these emotions and the different areas of the city. A questionnaire was designed to elicit the expected participant acceptance of an application for a smart city to understand the intention to use. This study aims to investigate the need for designing an App for capturing the emotions of citizens based on their stories that are connected to different places in cities of two countries, namely Turkey and Slovenia. The questionnaire was developed through various steps. First, relevant references as indicated in the literature review were scanned to produce an initial pool of questions. Second, the authors reflected upon their personal experiences to refine the list of items in quality and quantity. Third, the authors developed an initial questionnaire by sharing their opinions via e-mail and virtual meetings. Fourth, the final survey version was drafted in English and distributed to 10 respondents for a pilot study. Next, all authors reviewed the amended version of the survey to ensure items flowed well.

The questionnaire was translated into Turkish and Slovenian for distribution among citizens of the focal countries. Finally, each translated form was sent to four academics per country to verify that the items read well in their own language and that the survey measured meaning and cultural values as intended. Some items were reworded to enhance clarity and comprehensibility, but no additional items were included at this stage.

The final survey consisted of three parts. The first and second sections focused on the users' needs and preferences regarding the features of the Apps. The last section solicited respondents' demographics. This questionnaire was uploaded to an online platform with unique links for automatic distribution to respondents in each country. Data for the main survey were gathered between 12 March and 1 May 2021. Each author was responsible for approaching potential respondents in their respective country by sending separate emails to each respondent. Using snowball sampling, the authors leveraged their social networks by asking friends and colleagues to distribute the survey to potentially interested individuals. Once data collection was discontinued, all questionnaires were checked for missing variables. Surveys containing more than five unanswered items, and those from 11 respondents who had responded incorrectly to an attention-check question, were discarded from analysis. The remaining items were merged into a single table to run statistical analysis and explore possible differences within or between countries. The authors ultimately collected 491 useable surveys from Turkey, and 185 from Slovenia.

Empirical data were analysed using factor analysis and regression analysis to examine differences among the two countries. Exploratory factor analysis was conducted to identify dimensions and constructs from the data, as no prior studies had tested these features together. The analysis applied a latent root criterion of 1.0 for factor insertion; 0.40 was the cut-off criterion for factor extraction. The second step involved rescaling the constructs extracted using a five-point scale. The last step involved running regression analysis to determine the influence of independent variables over a group of dependent variables.



Results

In both countries, the higher proportion of respondents is represented by young generations who are at least a university student. An exploratory factor analysis was performed. This indicates that data seemed suitable for factor analysis. Variables with loadings equal to or greater than .40 were included in a given factor to decrease the probability of misclassification. A total of 21 satisfaction items from the factor analysis resulted in three factor groupings and explained 63.25% of the variance. Most of the factor loadings were greater than .60, indicating good correlations between the items and the factor groupings. A Cronbach's alpha test was used to determine the internal consistency. The coefficients ranged from .62 (Factor 3) to 94 (Factor 1), indicating that variables were considered to be internally consistent. Factor 1, negative emotions, refers to 10 items indicating feeling boredom, uncomfortable, fear, worried, ashamed etc. Factor 2, positive emotions 1, was composed of eight statements specifically on feeling happy, peaceful, relaxed, nostalgic etc. Factor 3 is the second group on positive emotions addressing three statements such as feeling proud, hopeful and romantic.

a. Results for Turkey

In the next stage, we run a series of regression analysis to better indicate how a group of independent variables, namely positive or negative emotions etc, is likely to have an impact over another group of dependent variables such as the need for developing an App, intentions for playing a game based on personal stories and emotions shared in the App, intentions of sharing stories, emotions etc.

The expression of users' positive emotions has a strong positive influence on the perceived importance of developing an application that lets people express their emotions about the cities. Such positive emotions include feeling happy, peaceful, joyful, hopeful, romantic or proud. These positive emotions also have a strong influence on the users' intentions of playing a game based on personal stories and emotions shared in the Apps.

Both positive and negative emotions convey a strong influence on the users' concerns that the different types of emotions connected to a specific place in the city arouse their curiosity to explore the stories and places. This means that, regardless of the directions of emotions, users become curious in exploring the stories and places in a certain city. Furthermore, positive emotions are highly associated with the users' intentions of sharing stories, videos, pictures and interacting through an App. This leads the users to connect themselves to the city visited or is supposed to be visited.

The expression of emotions about a certain city is possible through sharing stories, videos, pictures or interacting through an App. The expression of positive emotions also has a positive influence on changes in their emotions, their perceptions in general, and their image perceptions of the city. This means that the more the users convey positive emotions about the city the more they hold more positive emotions and perceptions about the city and perceive its image more positive.

In the second part of this study, we tried to assess how the intentions of telling stories about the city while using an App has been influential on the need of developing an App and playing a game. Both photos and audios appear to be the most convenient instruments for the users to tell about their stories on the need of developing an App that will allow the users to express their emotions about the city. Despite their changing positions and the inclusion of texts as the third item, there are three influential factors on the users' intentions of playing a game based on personal stories and emotions shared in the App.

Moreover, the feedback from the respondents suggests that they also would like to be rewarded for their sharing contribution, comments or stories. The instruments of such a procedure include obtaining points and certificates. The need for obtaining these two instruments has a positive influence on the need for developing an App and also the intention for playing a game based on personal stories and emotions shared in the App.

As we know, individuals usually express their emotions by using various ways, methods or platforms. In our study, the respondents hold the intentions to share their emotions about the food and drink in the city, the country in general, and the sport activities in the city. In the same order, these three factors are the most influential on the need for developing an App about the city whereas the sport activities in

the city has emerged as the only single factor on the users' intentions of playing a game based on their personal stories and emotions shared in the App.

Practically, there are also different options for the users to express their emotions while using different forms of Apps or social media outlets. The respondents appear to be using stories, hashtags, stickers, emojis etc. In this study, using stories has become the most influential single factor over the need for developing an App. However, four factors, namely hashtags, stickers, stories, and emojis, are the most influential elements on the users' intentions of playing a game. Only the emojis has a negative influence meaning that using more emojis may result in less intentions of playing a game.

b. Results for Slovenia

The respondents consider that developing an application that lets people express their emotions about the cities is almost a very good idea. They usually tend to express their emotions about travel and places, food and drinks, and nature in the city. The respondents convey a group of positive feelings regarding their emotions about the city such as feeling happy, excited, joyful, inspired and relaxed, among others. In terms of expressing their negative emotions in the same category, the following feelings are assigned with the highest scores, feeling disappointment, uncomfortable, unhappy, fear and anger, among others. Not surprisingly, emojis and stories are mostly preferred options to express emotions by using Apps. In a similar vein, sharing photos and texts are the most convenient two options to tell their stories about the city while using the Apps.

The respondents are more likely to agree that the different types of emotions connected to a specific place in the city arose their curiosity to explore the stories and places, sharing stories, videos, pictures and interacting through the Apps may connect themselves to the city, and these options may also positively change their emotions about the city and their image perceptions of the city, too. Lastly, the following options are the most influential on the respondents' intentions of visiting a new location in the city, e.g. recommendation of friends, recommendation of family members, trying something different and existence of any event.

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SMARTDEMA Project website

Stories that move you

smartdemaproject.org

GEO-DEMA APP link

Stories that move you ...

smartdema.es

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