

“SELF-HEALING” PROCESSES FOR THE CITYSCAPE

Computationally driven collective initiatives

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Abstract. The subject of this paper describes a proposal on processes and strategies that a community should inherit towards a collective effort for the improvement of public space, in order to evaluate, preserve or cancel actions towards this scope of their personal, and extended, scenery. This project, within the spectrum of what an era, underlined by (financial) crisis, represents, is an experiment on the active cooperation of the citizens for their own benefit. That affects, amongst others, the social and public management of space, by creating and activating a community’s feeling of “ownership and responsibility” within its neighborhood. It is expected to achieve an intense caring environment both for the public space, and the extended private scenery. Identifying the tools for actions as such, there comes the necessity for them to be able to make the interested parties feel comfortable with the main artifact and challenge them for collaboration. The digital era, the social media power, as well as the need of the individuals towards networking and belonging, shall perform the main attraction to the subject, leading to the creation of a digital tool linking the people actively to the changes they want to see. This paper debates on the development of an application that enables citizens to take part on the well-being of the(ir) public space.

1. Introduction to the Idea

The term cityscape describes the sum of elements that are experienced as the setting of a city as its inhabitants conceive it. The scenery in which one is living, walking, working and operating – a scenery that architects and engineers are responsible for, at a first read – and combines private and public matter. The state of the space that is being inhabited, though, is subject to the users, the citizens. Living in an era where financial and ethical crisis is imminent, a caring attitude from both state and citizens can be

limited. The results are obvious within the city tissue, with abandoned-looking areas and mistreated infrastructure, affecting the quality of the citizens' everyday life. Conditions of unstable political situations and protest, may deteriorate the situation, making the government vulnerable while keeping track or dealing with all of the cityscape issues.

The subject of this paper deals with processes and strategies that a community should inherit in order to evaluate, preserve or cancel actions towards the improvement of their personal, and when extended, public, scenery. It is a proposal for emergent actions, with immediate results, both affecting the city image and the inhabitants' psychological health. By taking advantage of the increased communicative applications, the up and coming collective spirit for constant improvement and the spontaneous character of each individual, the creation of a "tank" for action is being proposed. Stimulating the cooperation of the citizens for their own benefit influences, amongst others, the social and public management of space, by creating a community with the feeling of "ownership and responsibility" within its neighborhood.

Identifying the tools for actions as such, there comes the necessity to make the interested parties feel comfortable with the main artifact that will be provided and challenge them to collaborate. At this point the digital era, connectivity and interaction (IoT), the social media power, as well as the need of the individuals towards networking and belonging, shall perform the attraction to the subject, leading to the creation of a digital tool linking the people actively to the changes they want to see. An application that enables citizens to take place on the well-being of the(ir) public space.

2. Background and State of the Art

2.1. COLLECTIVE SPIRIT AND MOTIVATION: THE POWER OF THE MASSES

Current economic and social challenges may result in a crisis of the public sector organizations' ability to effectively provide various forms of public services. Simultaneously, social innovations and, in particular, people's emerging active and collaborative attitude can be among the most promising drivers of change for public services. (Manzini & Staszowski, 2013). The city management often lacks efficiency, while simultaneously an urge of people to belong somewhere, to be active members and to be respected, is noticed. In order to achieve the turn from a self-centered approach to a more global and caring citizen of the city, there needs to be motivation. As

declared in research conducted at the University of Australia, the types of motivation can be identified into the following categories: (1) Ideology, by contributing to a larger cause. (2) Challenge, as personal achievement, endorsing knowledge. (3) Career, succeeding and getting recognized. (4) Socializing, the need to have shared experiences and the sense of belonging. (5) Fun, enjoying the process. (6) Reward and recognition, experiencing private or public acknowledgement. (7) Duty, awakening the participation and responsibility notion of the parties. The proposing application will attempt to trigger all of those motivation types as part of the methodology to application process.

2.2. INTERNET OF THINGS (IOT)

The Internet of Things (IoT) is expected to offer advanced connectivity of devices, systems and services that goes beyond machine to machine communications and covers a variety of protocols, domains and applications. (Hoelle, *et al.*, 2014). By definition, it is the network of physical devices, embedded with electronics, software, sensors, actuators, and network connectivity that enable these objects to collect and exchange data. Computational power is the link to the data mining that IoT is producing. This principal, in the case of this project, is used as the tool to connect the participating parties and their actions to the perception of space and the interventions happening in favor of the city life. At this type of network governance [...] on the one hand, the efficiency is enhanced through distributed knowledge acquisition and decentralized problem solving; on the other, the effectiveness is improved through the emergence of collective solutions to global problems in different self-regulated sectors of activity. (Dedeurwaerdere, 2007) With smart phones and mobile technology increasingly becoming available to a larger number of people, it should be possible to create inclusive systems which are available to all and change the future of individuals, enterprises, and the public sector. The IoT, for the purposes of this product, facilitates the data flow, makes them accessible to the public establishing transparency in the processes, enables a hi-tech approach for everyday operations and inserts the above to the citizens' everyday life, into their mobile phones.

3. Methodology – Operation Flow of the System

3.1. THE PROBLEM

The public holds the perception that neither their fellows nor the local authorities care enough about the cityscape, the communal areas. It is

believed that the authorities do not pay the adequate attention to the needs of their people and that the system is corrupt, and favors certain castes of people or areas of the city. This makes citizens careless about their immediate environment. By achieving meaningful mechanisms of public participation, underlining the collective spirit and feeding the sense of participation and ownership of the cityscape, care is expected to rise as a natural consequence.

The workflow of the idea behind this project hinges on the triptych: Locate–Act–Enjoy. One locates the problematic spots, they act: (a) by recording it and publishing it, (b) by offering services (or hardware) to fix it (c) by enjoying the outcome visually, functionally, raising the quality of life, becoming an active member of society and receiving appreciation for making change happen. The central idea of the project is to alert the authorities to issues within the cityscape and to motivate the citizens dealing with those in theory or praxis. The key point focuses on the development of a network among shorted-out information as a database, activating citizens and companies, to accelerate the state on dealing with public space repairs.

3.2. MANAGING THE SYSTEM – LOOKS AND FUNCTIONS

There are three main types of core facts that shape the application: Profiles, Actions and Rewards. Initially one creates a profile, declaring their interest on the matter, they act and react in different ways regarding the level of engagement they wish to have and regarding the latest, they receive rewards.

3.2.1. Profiles

Individuals, enterprises as well as **institutions** (universities, schools) are welcome to participate in this collaborative action. In order for one to be part of the system, they have to set a profile for action, which will allow them to interact with other people/companies and the authorities as identified entities. The profile can be a combination of existing social profile incorporating additional information. The following data are considered to be necessary: Name and contact details: as a basic feature of the profile and contact channel to the individual, the company or the institution. Age: the age can ensure that, the access on certain actions are restricted. Simultaneously, this would allow the creation and live update of databases. The correlation of age groups and interests, facts and figures, could be helpful for general statistics and future researches. Fields of Interest: stating their hobbies, interests and tendencies, can be a filter on what appears on their info-board and on where they could participate. Expertise: declaring their profession. Stating expertise would allow, or deny, parties take part in

later processes. Areas of Interest: locations on their field of action. Where do they spend time, live or work? Reporter or Doer: declaring if they are interested in reporting problems within the city, or if they'd like to take part in the healing process themselves. Enterprises shall note whether they can offer services, merchandise or support on the rewards sector. Tax Number and ID: necessary for the rewarding system. (a) eligible for possible tax reductions (b) verification key for the individuals and companies.

In the case of institutions, the repair of the faults could become a real practice scheme for students, sensing and dealing with reality in real time. Names of supervisors and their contact details should be provided.

Related authorities' departments must be on the platform with active profiles. The official name of the department and the specialization of it shall be declared as well as contact information for those responsible have to be available. This project is setting a live communication portal from the governmental public sector departments to the public. Each department will get notifications when issues addressed to it are referred in the system. The department will have to filter and assign them to the respective group of employees that will get the work done. The contact rate, the response rate and success of the department deal with the issue will be embedded in the platform and available to the public. In cases where the healing action maintains a low level of complication, the citizens themselves will be eligible to be assigned (upon request) for the healing process.

3.2.2. *Actions*

The way that the project operates will be based on the triptych: (a) record/share (social media effect), (b) react/evaluate (individual initiatives on participation principles), (c) enjoy (reward system).

The process of recording the actions requires: (a) documentation photo, (b) location, (c) evaluation/categorization according to the following characteristics: (1) Level of Complication (how difficult is the implementation of the repair? A scale 1 to 5 declares a low to high level of expertise) (2) Level of emergency (How urgently does the reported incident need to be taken care of? A scale 1 to 5 declares a low to high level) (3) What kind of expertise is required? (Assign the nature of the intervention: built, electric, plumbing, [...]). This input is going to address the request to the respective department within the state authorities. (4) Aesthetic or Functional? (Is the intervention of an aesthetic or functional nature?).

The actions reported shall include anything that a citizen might want to improve in their surroundings. That is a list that can be continuously updated on the fly, and could include: In small-scale interventions: painting, cleaning, signage, fixing broken tiles, plumbing failures, broken lights or

even gardening. In large-scale interventions: road elevation issues, gas or water leaks, decaying or broken infrastructure. Regarding the levels of complication and expertise required, those eligible will be logged by the respective departments, and on the platform. Any citizen could declare interest on taking care of those which have low level of complication and apply to their interests and expertise. Upon completion of the intervention, the citizens are then able to evaluate the result. The evaluation scheme can operate as a quality factor for future processes, stored under the profile of the reporter, the relevant state department and the employer/doer, and takes into account accuracy, time for completion and quality, as statuses.

The result of a prim public space improves the quality of everyday life and pushes citizens to maintain it while simultaneously improving their psychological health. Contributing to the well-being of the public space, aesthetically and functionally, enhances the sense of ownership, which can also be seen as an extension of their personal space. Under the scope of the system described, everything operates following principles of the Internet of Things. The data are being processed, stored or cached and the state departments are getting connected with the citizens live. All this information and network connections are available and accessible for future use. Inhabiting those active cities will no longer be just an optical pleasure; through interventions and participation, sentimental relationships will develop and be encouraged by a reward system.

3.2.3. Rewards

The Rewards tab will become unlocked and “points” will be added on the profile of the users, as an extra motivation, once they start reporting issues, or participate in the repairs. Motivation is always a key factor for the success of any initiative. This aspect in the project is covered predominantly by the improvement of the environment that people live in. Still, providing a reward system to the involved parties for their commitment to the public well-being can only lead to a chain effect of constant refinement. Therefore, each valid report and repair adds on the account of the user adequate points. The amount of points added get affected by the levels of complication and expertise of the action taken. Hereby different methods of redeeming the collected points are presented: (a) Recognition: an “invisible” monument is created, underpinning the value of each individual. The picture and/or description of the citizen who contributed, and the way they did, appears on the spot virtually, if they wish. (b) Ethos, Social contribution: aid offered to NGOs. The citizen transfers the desired amount of points to the institution of their choice. (C) Reductions: participating companies (e.g. local super markets, shops, services) offer products at reduced prices. (D) Tax

reductions: the state recalculates the tax addressed to each party according to their points/contribution to the cityscape. € ECTS points: in the case of educational institutions, the participants could gain ECTS points for classes relevant to the operations they implemented. Additionally, they could create a productive competition scheme with other schools: whichever collects more points gets, for example, new laptops, new sports equipment, an excursion.

At the case of the authorities, the points system is translated into trust points and to a live evaluation process. They promote transparency in assigning tasks and can showcase the efficiency of their governance.

4. Expected Results

Sounding a bit romantic, but as Gandhi stated, “Be the change that you wish to see in the world.” The project seeks to get implemented by two different European cities. One which could be considered without financial problems, and another which is affected by the crisis of the latest times. The comparison of the findings among those case studies is expected to provide material for future consideration, since the processes operated will be conducted in environments with diverse mentalities, financial conditions, and public space management. It will be distributed to the youths, who are familiar with up-to-date technologies and are expected to get engaged actively spreading their visions and enthusiasm, projecting (and creating) a space they ‘d love to live in.

Sensing and actuating: sensing the problem and getting the habitants themselves actuated to deal with the issues that arise within their extended private sphere, the(ir) public space. As Carlo Ratti at his Talk in TED 2011 mentions, “as architects, as engineers as designers, we always think of how people will use the things that we design but always reality is unpredictable and that is the beauty of doing things that are used and interact with people.” The project is expected to achieve an intense caring environment both for the public space, and the extended private scenery by merging the knowledge of public services and professionals on how to operate in the system (bureaucracy, hierarchy, paperwork), with the citizens’ awareness of “in what type of city I want to live in”. It is sensible to utilize information and communications technology and increased networking abilities to address urban challenges. “Connections become relevant and add value because the right information is delivered to the right person in the right time in the most appropriate way.” (Mitchell *et al.*, 2013)

The future expectations within a spectrum of augmented reality lies in intensifying the social engagement towards a system that would allow a type of self-governance of the public space. Creating bridges between the research, industry and authorities is a gesture that can go the extra mile towards a progressive public sector for the public good. This project is not a way to detour the public sector or authorities, but rather support it with new tools and operation systems.

5. Discussion – Conclusion

The establishment of a live and up-to-date communication system among individuals, enterprises and the public sector is believed to lead to the well-being of a city, and one that can deal locally with its faults. Achieving the creation of an archive that dynamically updates and invites authorities and individuals in raising the quality of the cityscape can only be promising. Increasing transparency, quality and time of execution regarding issues that derive within the city tissue, are factors to motivate and activate people, providing a new perspective on what belongs to the citizens.

Incubating technological innovations in favor of the social good, could lead to long term opportunities, such as enhancing the touristic aspect of an area, triggering research and attracting entrepreneurs and investors in favor of those initiatives. The effective applications of data analytics could enhance the potential to transform business, government and society into a more interactive and efficient mechanism. This chance that arises, turning barriers into opportunities, by placing the energy of the mass to build and create rather than to destroy, seems to be the right tactic for progress.

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