Smart City Sense

Summary

The Sense Smart City project proposes an approach to the concept of Smart Cities that places the citizen as the focal point of the data collection and information sharing process. This concept has the Citizen as a relevant element of the process of collection and provision of information related to the City Status, becoming more than a mere consumer of information about the city, making him an active contributor, possibly, due to its sensory and processing capacities, the most relevant. The project involves the conceptualization, design and implementation of an IT platform where the wealth of data collected by citizens (volume, variety and detail), is aggregated with data collected by a variety of other existing sensors in the city giving, in real time, a clearer and more vivid vision of the global "Pulse/Beat" of the city. The platform will also create an adequate environment (physical and virtual) for cooperation between citizens and the authorities enabling that the information entered by one party to be available to all stakeholders. This vision will be supported on a set of technologies and knowledge (Big Data and Data Mining, Statistical Reasoning, Social Sciences or Human Factors) that will allow to cover: the information collection and interface process (human and physical sensors), analysis and evaluation of the quality of the collected data, aggregation and analysis of heterogeneous data, city modelling including its physical and functional relationships, interface and information presentation mechanisms to citizens and authorities and mechanisms to engage and stimulate the participation.

Objectives

The Smart City Sense project proposes a cooperative and collaborative model with the active participation of the various agents of the city (people and entities) that sequentially and incrementally:

- Encourage, facilitate and promote the diffusion and sharing of information relevant to the city.
- Intelligently process and analyse of this information.
- Make available the information collected and processed in the most appropriate way and tailored to the specific needs of various beneficiaries (citizens or authorities) in an understandable and useful way for their activities.

To achieve this goal, a technological (information technology) platform is proposed to collect, integrate, and process data and present information that intends to provide an environment of trust, efficiency, management, cooperation and co-responsibility of the various stakeholders in order to reach levels efficiency and quality of life in the city in its various aspects. Figure 1 shows the logic underlying the Smart City Sense project and highlights the breakdown of the very concept of quality of service that will be transversal to all the services that contribute to the smart city. As a rational system, the platform will collect the information, supported by technology that will allow implementation in the citizen-sensor concept (not being limited to the citizen with only source of information), in a non-invasive way, will process the interpretation and analysis of the information considering the differences between the perception of the citizen, perception of the planner and the decision maker, and perception of who offers the various services, and finally will produce elements for recommendations on the design of services and satisfaction of needs, and their monitoring. One of the great potentials of the smart city is the ability to maintain continuous feedback and adjustments of the services to the needs.

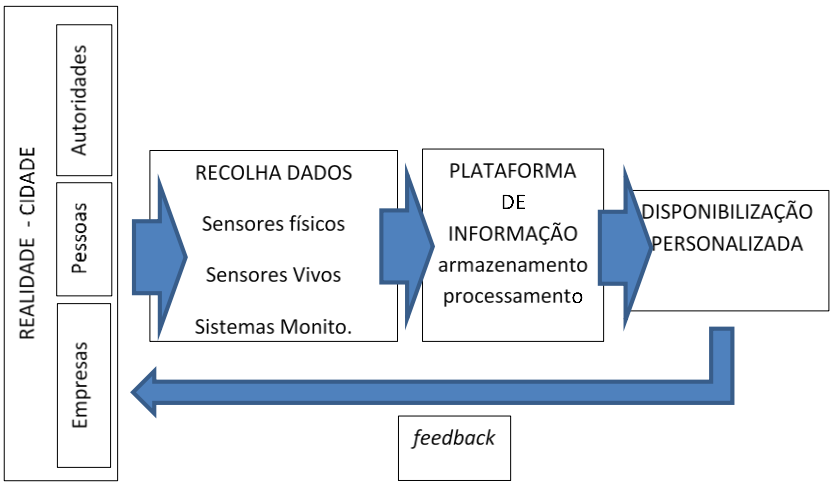

Figure 1. Diagram of the proposed concept.

Project Reference

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Leading Institution

IST – Instituto Superior Técnico (Portugal)

Partners

Thales Portugal, S.A. (Portugal), School of Human Kinetics of the Lisbon University (Portugal), Municipal Police of Lisbon (Portugal)

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CERIS

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smartcity.isr.tecnico.ulisboa.pt

Given the complexity involved in obtaining these results, it is fundamental to use Information and Communication Technologies (ICT) as they will be used to create tools to support cooperation and information sharing between Citizens and Entities and for the processing, analysis, distribution and adequate presentation of this information according to the profile of the various agents. This high-level objective is supported by the following sub-objectives:

- Study and define user profiles of urban environments according to their needs, responsibilities, abilities, limitations, expectations and lifestyles. This information allows to define the correct strategy of the users' involvement either in the information sharing or in the presentation of the information by the system.
- Study and implement a citizen reporting tool or facilitation system that simultaneously stimulates user engagement (associated with challenges and rewards) so that citizens feel encouraged to contribute relevant information to ensure a better environment in the City.
- To study and implement the processes of interaction and information sharing between the various stakeholders, Citizens and Authorities in real time, developing information collection and presentation interfaces, with high levels of usability adapted to the user profile and context of use, optimize and facilitate the sharing and analysis of information.
- Collect and integrate information from different sources and with different formats and contexts. E.g.: (Objective information from sensors vs. subjective information from people).
- Modelling heterogeneous information representing urban spatial relationships and categorization in the various elements of the city.
- A set of inference / machine learning algorithms that take into account the structure represented extrapolate the state of the city (variables of interest) from incomplete observations (data) collected by the multiple sources of information. It is proposed to use two classes of methodologies: Optimization methods / global classification with missing data and diffusion methods in (hyper) graphs.

Provide information to citizens in real time about various dimensions of quality of life in the city, such as comfort, accessibility, safety, pollution, health, mobility, tourism, culture, sports, leisure activities.