Learning from places:
ICTs for EXPO2015 in the Turin-Milan region

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Assuming that:
- personal communication devices may enhance the interaction between people and places;
- Milano will host Expo 2015, where is envisaged a pervasive use of ICTs, with the risk of virtual experience prevailing over the real one;
- it is important to learn from places that directly exhibit some Expo themes, experiencing them and promoting among inhabitants and visitors their value as commons.
- the territories in-between Torino and Milano are a complex region, that don't benefit directly from EXPO, but where the Event itself can contribute to a better relationship between cities, farmland and infrastructures in a unique agricultural landscape.

The paper will presents results from research activities and from Alta Scuola Politecnica projects, to explain how the concepts of "mapping" and that of "interface" applied on these territories can enhance:
- the relationship between place and information in a broader sense;
- the use of ICTs as driver of territorial innovation.

Keywords: Expo 2015, smart region, place making, situated cognition, mapping, sensors

Introduction

This paper is aiming at investigating some possible new relationships between places and knowledge in the age of information technologies, using as study case the event of Expo that will take place in 2015 in Milan. More generally, the interest is focused on the role that ICTs can play as a driver of territorial innovation and how they can contribute to spatial quality of places.

In this sense, it is useful to start assuming some facts that characterize the present situation in general and the context of Milan in particular:

- personal communication devices may enhance the interaction between people and places, and possibly be considered as drivers of territorial innovation, with relevant effects on spatial planning and on urban design issues;
- Milan will host a new kind of Expo, where the experience of the event's themes (feeding the planet, energy for life) will be based also on pervasive use of ICTs, with the risk that virtual experience might prevail over the real one;
- beyond the area of the event, in the territories around Milan there are many places that correspond precisely to such themes, in a sort of open air museum where are located "natural" expo pavilions (farms, agricultural landscapes, often of very high historical and cultural value), often not recognized even by the populations that live in these same territories.

Therefore, it could be relevant that Expo visitors or tourists who will come to Milano as "outsiders" may experience the event themes by learning directly from places and landscapes where agriculture is deeply integrated with history, the populations and food culture. The relationship between the "outsiders" and the "insiders", as stakeholders who live in the territory before and after the event, is essential to better understand the meaning and value as commons of the places where the expo themes actually are more evident and real. To choose a case study, among the many territories surrounding Milan, those of the complex region facing west towards Turin are enriched by some very remarkable features. These landscapes don't benefit directly from EXPO, but the Event itself could produce positive effects, contributing to a better relationship between cities, farmland and facilities in a unique agricultural landscape, crossed by a bundle of infrastructures, mainly related to highways and high speed train lines, but that coexist also with a system of rivers and canals of capital importance for the agricultural system and of great potential in terms of touristic exploitation, particularly in a "green economy" vision.

Therefore, if places are sources of the knowledge that is embodied in the places themselves, it becomes more and more relevant the understanding of how can we make such knowledge accessible in a better and deeper way, what relationship this process can open to innovative territorial uses and practices, if this can improve spatial quality and better services and finally understand if and how, in our particular case, all these issues could be better achieved through the use of ICTs.

Of course, it is worth to consider that the techniques available in the field of ICTs applied to site related information, ranging from QR codes to Location Based Services or Augmented Reality applications are quite diffused. Hence, we are not going to comment here about their effectiveness, which can be considered quite reliable and mature, especially if we see how they are already applied in some renowned sites, few in numbers but already recognized as important and consequently provided with all the services, information and accessibility corresponding to their territorial role.

Rather, we would concentrate our attention, in first instance, on the role that ICTs can play when they are applied on contexts where the places of interest may be more numerous and diffused as part of a network but less attractive elements if taken as single. It could so be possible to understand if, assuming the fact that each of these places are anyway meaningful in themselves and even more if considered as a network of places, the implementation of the use of ICTs can help to rebalance the territorial conditions between places that are already attractive and those that could potentially be so, and so if the ICTs could become decisive as a true driver of territorial innovation and give better chances to meet the needs (in terms of services, spatial quality etc.) both of the inhabitants and of the tourists of Expo and post-Expo, so to give to a wider range of stakeholders a positive legacy after the event.

In this sense, a more general research question has to be posed, if we look at the territory as a network of physical nodes (places, with the whole meaning we can attribute to the word) that can be similar to the digital nodes of internet, not by chance called sites, a word that has gained a virtual sense only in the last decades. Considering the latest developments of cognitive disciplines and of knowledge itself, that are more and more based on a kind of virtual and hypertextual approach, we can ask if it is meaningful to

translate such a virtual cognition model in an analog process of knowledge which should instead be strongly based on physical experience of places. Such a practical and physical approach, based upon real frequentation of places with their physical qualities and their embodied meaning, eventually retrieved and enriched by ICTs, would result in a literal and richer interpretation of the "situated cognition" theories, well known among scholars in the field of educational psychology. Places could in this sense be considered as sort of analogic internet sites, to be "clicked" through direct experience enhanced by ICTs in order to get from and through them information that becomes knowledge. Moreover, such an approach could enrich with meaning and add value to places, and thus bring their inhabitants to a higher sense of belonging to the places themselves. This could result as a truly important legacy of the Expo event.

This contribution also refers to research activities currently going on in the Department of Architecture and Urban Studies[1] and resumes some results from one of the last Alta Scuola Politecnica projects. These projects aim at studying how to encourage the direct experience of places that are related to Expo 2015 themes, by enhancing the relationship between a specific site and the knowledge (not merely information) that can be related to it, by understanding how this topic could be addressed by implementing new applications for mobile terminals and innovative uses of devices for the interaction between objects (or places) and users. Assuming that Expo 2015 is a relevant opportunity to accumulate specific multidisciplinary knowledge concerning a territorial context (the region between Milan and Turin) and a broad set of topics, oriented to the understanding and evaluation of the complex effects of the preparation, realization and legacy of the Event, the project will mainly rely on two different disciplinary realms. On one side, urban planning in order to model the spaces with their spatial qualities and the opportunities for innovative uses; on the other side, ICTs to understand how these representations could be retrieved and shown on user terminals, both fixed and mobile.

The area of interest is that of the metropolitan and regional scale, taking into specific account the so called in-between places: between city and countryside, between the main centres of the Region, between the Expo site in Milan and the hinterland, especially in the agricultural landscape where an exceptionally rich network of canals (with canale Cavour as a backbone [2]), interacts with the agricultural uses and with the different requirements given by the compresence of the infrastructural bundle connecting Turin and Milan. These are places where some of the Expo themes are more clearly evident and where, at the same time, the need of an economic, social and physical reorganization is more pressing.

To provide the necessary information, referring to the two disciplinary contexts stated above, the concepts of "mapping" and that of "interface" are essential, as it is not yet theoretically and practically clear how to fit regional scale information onto mobile terminals of limited dimension, defined by ergonomic criteria, especially when we consider that such mobile terminals have to incorporate information that refer to two different kinds of approaches:

1. top-down, that correspond to the design intentions of authorized actors and that they need to refer to "from above" wide scale abstract visions of collective interest;
2. bottom-up, that correspond to specific services provided to single final users, and that must be supported by "site specific" information, meaning that they are related to the near, concrete context and that they must be defined according to inclusive, socially participated processes.

The main outcome of this project is therefore related to the design of interfaces between users and information available in the territory (provided by sensors or from other data sources, including social communities and people who live in the territory). Such interfaces should be adaptive and designed on a site-specific approach, able to be physically integrated to places so to enhance their imageability (quoting Kevin Lynch) and consequently increase their attractiveness. Methods of analysis oriented to provide

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[1] Research program between the Department of Architecture and Urban Studies (A. Rolando and C. Morandi, with S. Di Vita) and Telecom Italia (F. Faraci, M. Turolla, A. Bragagnini) "The smart region between Turin and Milan: mobile services as driver of territorial innvoation for Expo 2015", 2012-2013

[2] The canals network could be used as a slow mobility – bicycle connection between Turin and Milan, highly accessible also by the highway and the regional railways system

traditional and digital services and to experiment the possibility to use information and design tools based on gps tracking technologies could also find further development through this project.

One relevant aspect that should be further developed is related to the use of sensors useful to diffuse site information and visitors' perception of some specific character of places (i.e. when the rice fields are flooded, if there is fog along a touristic route, what are the conditions of a cycle path etc.). These devices could enhance the process of "listening" of the landscape and be positively integrated also onto procedures of touristic information, for instance starting from information produced by processes that are becoming more and more diffused in the agricultural sector, such those related to the use of gps and other sensors applied in the techniques so called of precision farming. For instance, the information about the level of growth of a cultivation could at the same time be interesting from the touristic point of view, as explained below when reporting of the ASP E-scape project. In this sense, by relating places with the information, in other words "learning from places", if information becomes knowledge, also the meaning of an often abused term like "internet of things" could be augmented and deepened, as explained in this introductory text, by defining a neologism like "internet of places". It should be therefore be possible to combine in a positive way the spatial and quality issues of the many places that make our landscape so rich and the further enrichment, related to the attribution of visibility (and importance) that is today given by innovative uses of information and communication technologies.

E-SCAPE research project
Telecommunication infrastructural networks and use of ICT are supposed to afford users higher efficiency in real-time information system applied in the sectors of environment, society and economy. Besides, digital infrastructures enable the territories to collect, process and distribute helpful data from cloud resources and sensors towards displaying them to the users. For instance, creation of innovative and smart territorial services, it should base on the territorial ability to allow obtainment of significant and combined information with the contribution of collaborative bottom-up users. In addition, smart use of territory is essentially presenting the practice of sustainable use of resources considering protection of local identities, landscape and natural heritage.
Moreover, these spatial ICT upgrades are having impact on the way in which the spaces within the territory are used and experienced, opening up new reality in which physical space 'filled' with information could be presented on a personal communication device. Though, the practice of adjusting the world to its need and filling the surroundings with signs toward better orientation, it is a part of human culture and nature. Nowadays the environment is filled by signs, knowledge, history but these were previously incorporated in acceptable social world through physical forms of churches, libraries, schools, theatres, museums. However, digital communication is changing the way in which contemporary knowledge, stories or metaphors are flowing and establishing in social reality. Still, the comprehensiveness of the powerful relation between digital and physical perspective is under exploration and "E-SCAPE" research project suggested a fruitful research methodology with possibility to be tested during the EXPO event. Again, a term like "internet of places" could provide a contemporary interpretation to the traditional spatial and cultural interpretation of the places.
Purpose of "E-SCAPE", joined research project of Alta Scuola Politecnica[3] and Telecom Italia was discovering the innovative methodology for use of ICT as a driver for territorial change within the Mi-To urban region, specifically concentrate on the "in-between" territories along the regional backbone of Canale Cavour. The main objective of "E-SCAPE" project was to conduct a multidisciplinary study of the territory in between Milan and Turin and to figure out an innovative application for smartphone- [e]-scApp, taking into account the challenges that the territory is going to face as the big catalyst event (Expo2015). Accordingly, [e]-scApp was based on the two most important aspects: it integrates electronic

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[3] Academic institution in partnership between the two main Italian technical universities, Politecnico di Milano and Politecnico di Torino; it involves talented students with different backgrounds to develop multidisciplinary projects with external partners.

[e] tools into the landscape towards its enhancement, through the smartphone *App*lication service that is the final research project outcome.

The design process gave the emphasis to particular topics. Before all, the focus was on the idea of creating smart community able to re-enhance the territory and to encourage the physical experience integration with information flow and already existing data sources, to be available to users. Secondly, [e]-scApp was dedicated to re-establishing strong relationships between people and places through the use of technology. While ongoing practices of ICT uses are increasing the gap between its users and physical spaces by creation of cyber spaces, the innovative approach of [e]-scApp is proposal of situated cognition service requiring strong relationship between people and places in exploring and gaining experiences and knowledge.
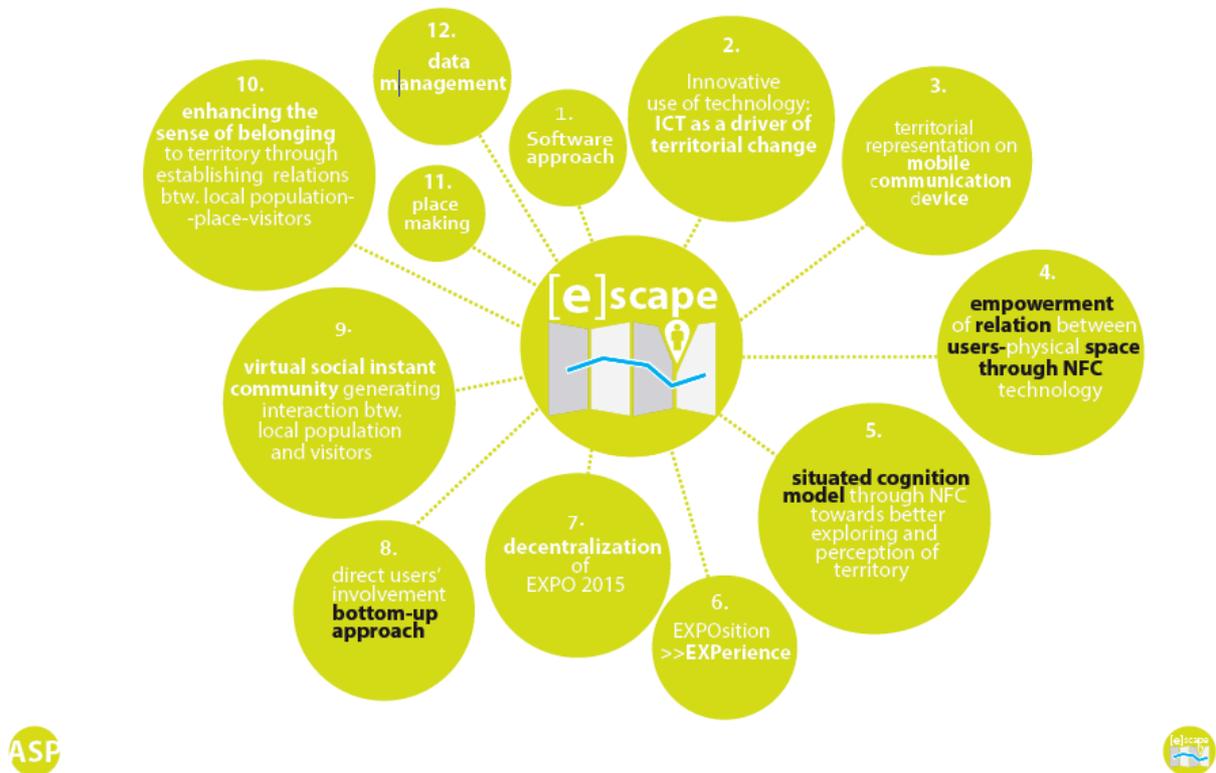

Figure 1. *E-scape key concepts*

To achieve a better understanding of the [e]-scApp solution produced by E-Scape research project, it is necessary to remind the problem setting that the project is referring to.

An in-depth analysis demonstrates territorial unbalances concerning both material (hardware) and immaterial (software) issues. For instance, hardware aspects are on one hand challenged by a complex infrastructural system, including both long fast connections (high-speed railways and highways) between Milan and Turin and slow short connections between the minor poles (old railways and secondary roads). Thus, this particular unbalanced infrastructural system is contributing to the formation of strong bipolar structure across the study area leading to the marginalization of intermediate territories. Besides, referring to the software aspect, unbalances are identified in availability of diverse forms of data and information flows, which are complementary determining different intensity in services' provision. To be more clear,

the lack of immaterial services could be evidently identified by comparing the Milan and Turin high-density metropolitan contexts with the "in-between" territories.

In addition, the project solution reflects the issue of enhancing and promotion of under exploited territorial opportunities as well as their relevant intrinsic value. In particular the Mi-To region, with its cultural heritage, productive fabric and typical agricultural landscape could present a wide range of places to be rediscovered and promoted during the EXPO 2015 event. Indeed, exhibitions and events are the common instruments to distribute informal planning practices. However, the actual situation tends to exclude these "in-between" territories both from touristic and information channels and from the main systems of accessibility (both physical, in terms of transportation and virtual, in terms of information).

In answering these problems, project solution was based on a bottom-up approach giving an active role to users. Through a direct users' contribution and involvement of new dynamics, we strongly believe that a rebalance of the territory might occur. Therefore, the participation as practice is fundamental for project solution aimed to promote the territorial enhancement, significantly considering its users and not only top-down and theoretical approach.
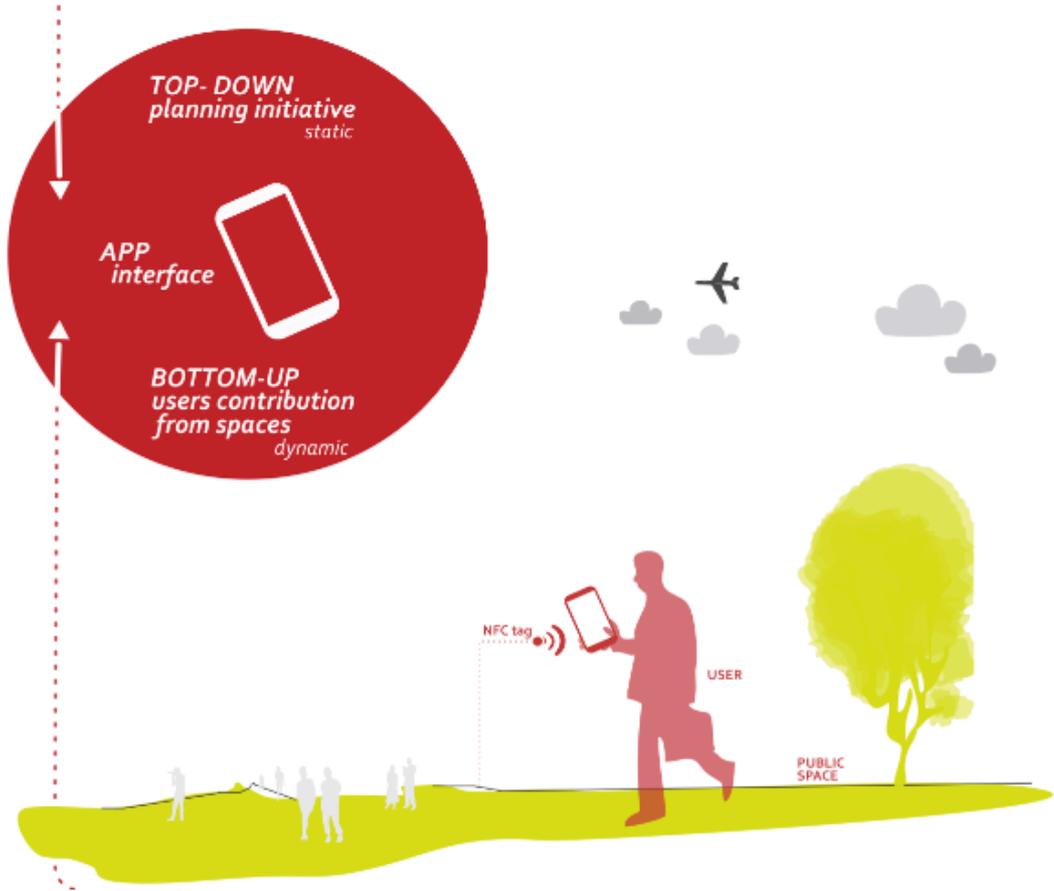
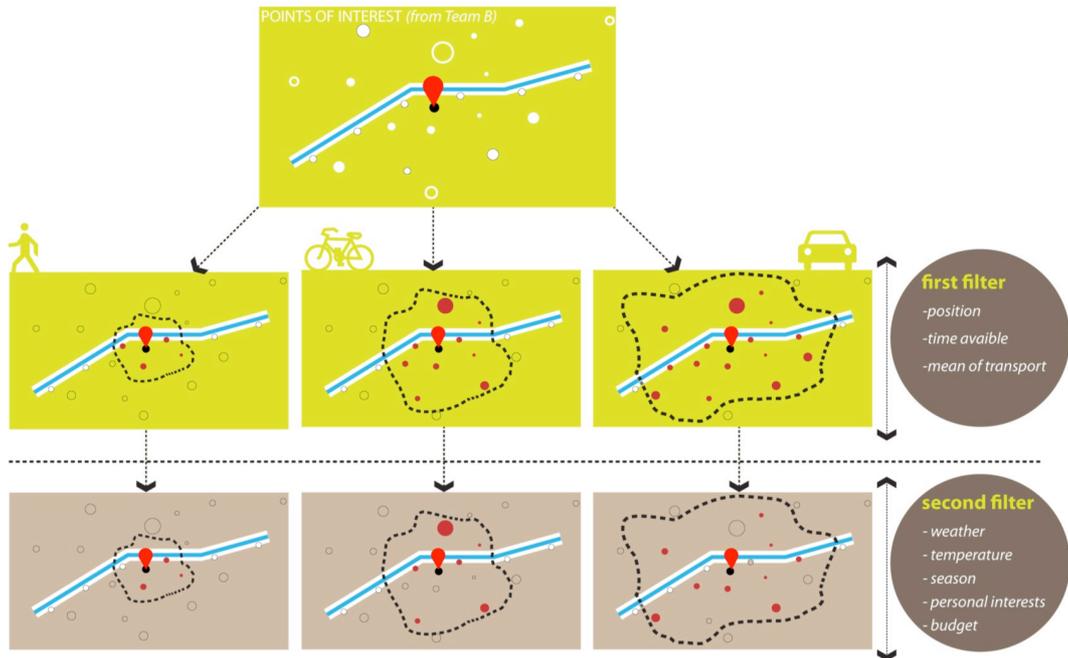Figure 2. *Interfacing space- TOP-DOWN, BOTTOM- UP approach*

Figure 3. *Recommender system filtering*

Considering the needs pointed out in the previous analysis sections, [e]-scApp smartphone app is planned to provide users different experiencing modalities of the territory and to allow them in discovering all its opportunities offered in a smart way. The app has therefore two main perspectives. The first one is concerning the users and the territorial offer, thus the new practice can easily be discovered while corresponding with user's interest (through recommender system filtering (Figure 3 Recommender system filtering). The second opportunity allows users to contribute to the participative mapping process and to implement the territory system intelligence by suggesting new points and paths that they believe are important (Figure 4 BOTTOM UP mapping).
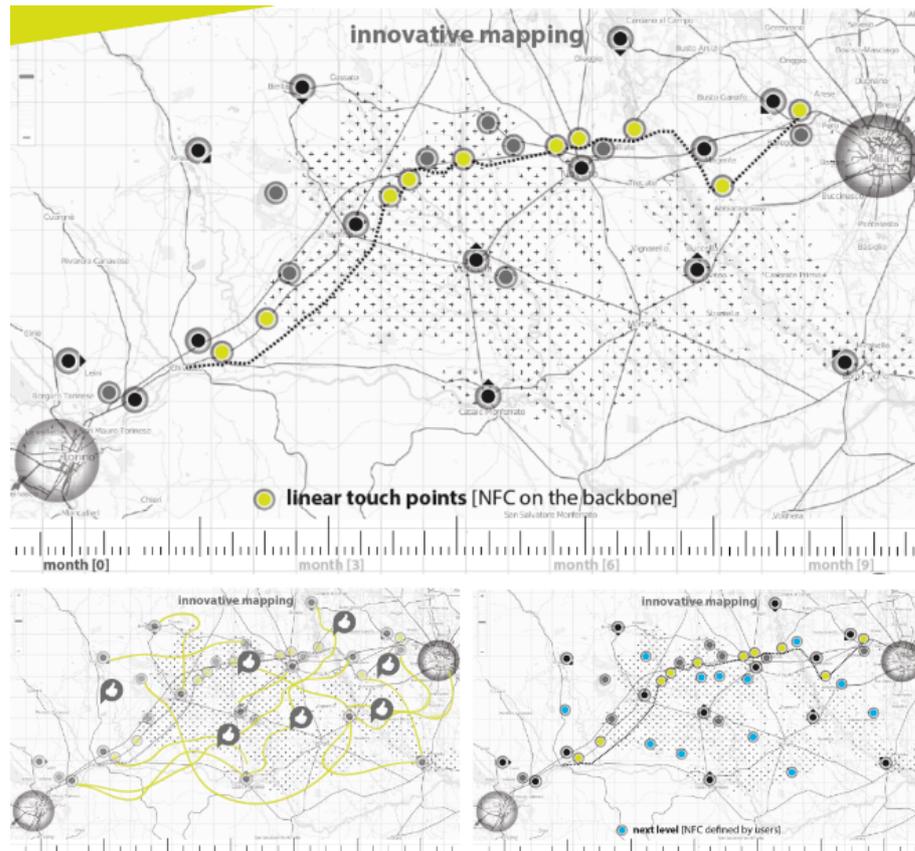
Figure 4. *BOTTOM UP mapping*

Moreover, this interaction enables creation of bottom-up map focused on the users' perception of the territory. A fundamental and innovative aspect of the app is the application of a situated cognition model in physical space exploration, requiring user to be actually present on the territory to entirely benefit of app functionalities. Accordingly, chosen approach is increasing the relevance of the physical space and contributes to its enhancement through the use of proximity technologies in the spatial context. The accomplishment of innovative project aspects is explained in following:

- creation of instant social community between people that share similar interests on the territory (Figure 5 *Instant social community on the territory*)
- promotion of local opportunities in term of heritage, traditions and local excellences;
- creation of users' support through offering proposals about enjoying the possibilities available within the territory (Figure 6 *Users support – enjoying possibilities within the territory*)
- creation of a logic in charge of collecting data about the use of territory in a bottom-up logic.

In addition, a collaborative community made up of active users interested in wandering and exploring the landscape, living and enjoying the territory, could determine new physical and immaterial flows of people and information, also useful towards the rebalancing of the current situation. So, promoting the territorial strengths through the use of technology both by local inhabitants and tourists, could reduce the physical distance between intermediate territories and main poles. Besides, [e]-scApp is able to generate data about users' preferences, their moving within the territory as well as territorial evaluation. In addition, this data

output could suggest important issues to compare in the eventually further project phases regarding both territorial and service advancement.

Considering a wider perspective, this research project aims at contextualizing the concept of smart city in the more suitable and diffused context of the smart region, challenging the territorial reactions through smart concept advantages. Besides, considering them as enabling tools, ICTs add value to the project by facilitating the sharing and dissemination of new experiences and offering statistical documentations in order to understand new dynamics. Even though new social behaviors occur within the physical spaces, they are fully based on immaterial tools and their operations. Therefore, these new perspectives are positioning ICT as a territorial driver of physical changes, also opening up the possibility of territorial development, new planning practices and participatory processes.

Finally, this attempt of using technology based on new social behaviors to drive physical changes and to create new values, movements and data dynamics, approaches the concrete problems of Mi-To region, but at the same time, [e]-scApp is a tool that could potentially allow a repetition in other contexts suffering from similar territorial and informational fragmentations.
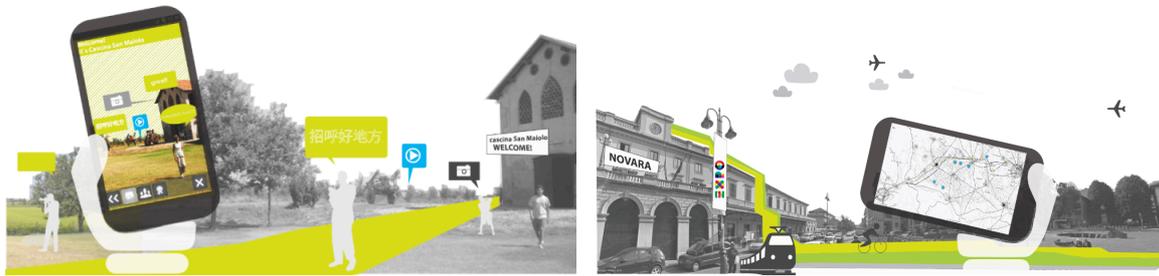

Figure 5. *Instant social community on the territory and BOTTOM-UP data collection*
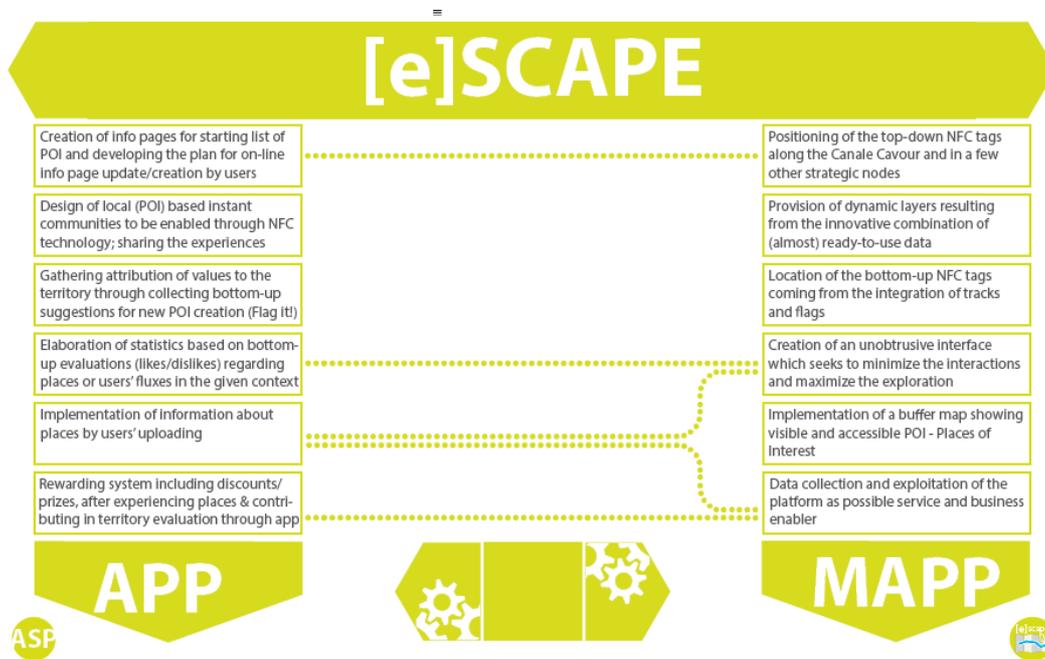Figure 6. *Users support- enjoying possibilities within the territory*

Figure 7. *e-scape products (swapping contributions between hardware and software)*

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