

Re-thinking public space and citizenship through ubiquitous publishing and technologies.

The experience of Ubiquitous Pompei for the Italian Digital Agenda.

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Abstract. In this paper, we describe the first instances of a family of projects with similar characteristics. Through these projects, we aim to establish contact with urban communities to a) suggest visions for possible forms of city innovation and to b) start co-creative processes for imagining, designing and enacting transformative processes. These co-creative processes involve technologies and innovative methodologies which are able to create knowledge, participation, sustainable and inclusive business models. One of these projects is the *Ubiquitous Pompeii* where our research and design team developed a city wide process in the city of Pompeii in Italy. Ubiquitous Pompeii started by engaging high school students with a series of workshops structured in two phases: a) students' awareness about the scenarios and opportunities offered by ubiquitous technologies; and b) the acquisition of the skills used to appropriate the technologies and methodologies and to embrace participatory design processes.

Students were able to design and develop their visions for the development of their city and its communities, creating services and digital tools.

Peer-to-peer learning and collaboration practices played a crucial role. Tools, methodologies and roles have been designed and developed to support the emergence of practices engaging all agencies into a networked process for the creation of the digital future of the city. Institutions and operators play the role of facilitators in what basically is becoming a citywide co-creative process. Along these lines, we have structured a transdisciplinary methodology and a technological toolkit dedicated to cities and urban communities including collaborative ethnography to observe the various stages and processes of the project and discuss its meta-stories with the different actors.

The project has been declared as an official best practice for Italy's Digital Agenda, and as such will be scaled to other cities in the near future, also envisioning wider knowledge sharing and collaboration tools which will be able to interconnect the different communities.

Keywords: ubiquitous technologies, co-creation, p2p ecosystem, youth citizenship, transdisciplinarity, Italy.

I. INTRODUCTION

Ubiquitous technologies transform our perception of space, time and relations as well as the affordances of the objects, places and processes of our daily lives [1]. In both private and public domains, affordances are created at cultural, social, administrative and relational levels, defining in our perception what is possible, impossible, suggested, advised against, prohibited [2, 3, 4]. Cultural affordances result from a biased pool of symbolic resources of culture that are brought to bear on the construction of concrete daily situations [5]. Furthermore, Bradner, Kellogg, and Erickson define a social affordance as “the relationship between the properties of an object and the social characteristics of a group that enable particular kinds of interaction among members of that group” [6].

The nature of spaces, objects and processes is the result of a continuous active discourse among different agencies. In Lefebvre's view, the distinction of the perceived, conceived and lived spaces define how public space is socially constructed through a confrontation between what we perceive; what designers, planners and administrations decide; and how we effectively decide to perform [7]. Michel de Certeau looked at the same process from a different angle, by describing the tactics according to which we reclaim our own interpretation of public space, escaping the strategies defined at institutional level [8]. For Edward Soja, the two ideas are brought together in the definition of the *Third Space*, where innovation and transformation are enacted through the co-existence of the different tactics, and their encounter, clash and mutual transformation [9].

On top of that, differences in perception and intention are viewed as opportunities for collaborative transformation of public space by the theorists of peer-to-peer urbanism. For example, Christopher Alexander argues that “towns and buildings will not be able to become alive, unless they are made by all the people in society, and unless these people share a common pattern language [...] and unless this common pattern language is alive itself” [10]. Under the same light, Salingaros claims that “never before so many people have access to essential information [...] that they can use to change their world into something better for all” [11].

We can observe that ubiquitous digital networks and technologies radicalize these approaches. Mitchell's *City of Bits* describes the mutation of public space into a framework for stratified, co-existent, multiple layers of autonomous interpretation, which

become available through data's accessibility and usability under the form of pervasive information [12].

This has transformative effects on spaces and communities, as described in McCullough's *Digital Ground*, where new forms of awareness, relation and citizen activation emerge with the advent of location based systems, creating new forms of situated, relational knowledge and new active roles and practices [13]. Zook and Graham's *Digiplace* goes even further in this direction, describing the constructivist approach which emerges from these processes. For them, the act of expression using ubiquitous technologies and location based services, enacted by multiple agencies creating layers of ubiquitous information, produces a new form of public space, with different types of perception, awareness and possibilities for action [14].

It is possible to, thus, interpret all these observations about the effects of ubiquitous technologies onto public space as the opportunity to unfold them as spaces for novel forms of expression and performance wherein the agency of citizenship can become active and interconnective. Along these lines, we have structured a methodology and a technological toolkit dedicated to cities and urban communities.

II. OBJECTIVES

The objectives of the process described in this paper are to a) confront urban context; b) use ubiquitous technologies and meshed networks to create an accessible, inclusive digital ecosystems; and c) promote transformation of urban spaces and practices by stimulating the emergence of peer-to-peer (p2p) governance and ethical, inclusive and sustainable business models.

This process can be used as a proof of concept and to understand the strategies and methodologies for its scalability, replicability and interconnectability to other contexts.

We have set forth the following list of high-level objectives:

- To activate urban communities and engage them in co-creation processes dedicated to imagining, designing and developing innovative scenarios for their city;
- To raise awareness about near-future scenarios for the innovation of cities promoting new forms of expression, participation, collaboration and governance;

- To promote the usage of ubiquitous technologies and networks, digital ecosystems to reinvent the digital life of the city;
- To promote the emergent formation of thematic communities, focused on projects and issues which are relevant for the territory;
- To design and enact innovative, p2p supply chains and participatory, inclusive, sustainable business models;
- To promote digital alphabetization, digital inclusion and to confront with digital divide;
- To imagine, design and develop participatory practices for the governance of the city;
- To create a shared knowledge and collaboration ecosystem, inside and across communities;
- To allow for the emergence of a network of excellence.

III. PROCESS OVERVIEW

In this paper, we describe the first instances of a family of projects with similar characteristics.

Through these projects, we aim to establish contact with urban communities to suggest visions for possible forms of city innovation and to start co-creative processes to imagine, design and enact transformative processes involving technologies and innovative methodologies which are able to create knowledge, participation, sustainable and inclusive business models.

These projects are composed by the following elements:

- a set of accessible, usable, open source technologies dedicated to ubiquitous publishing, meshed networks and city-based interaction;
- a digital ecosystem for students, citizens, businesses and administrations;
- a knowledge sharing environment;
- a series of workshops, dedicated to students and citizens, allowing them to become aware of radical innovation scenarios, and to co-create services, applications and digital environments which can shape the near-future of cities;
- an emergent academy of excellence, through which selected students are engaged with their peers coming from other cities to develop their skills, learn methodologies and interconnect their experiences, creating opportunity and development;

- a mentoring and coaching service dedicated to students and citizens, through which individuals and groups are supported in developing their ideas and connected to possible sources of funding;
- a series of publications, ranging from academic articles, innovative publishing projects, applications and websites, promoting the results of the projects and creating novel business and communication models;
- a multi-modal digital infrastructure for cities which can be used to combine existing technologies with new ones to create networks, new forms of expression, and sustainable, inclusive, participatory business models.

Projects are performed through the following steps:

- start from education: schools are engaged first, organizing workshops and lectures to inform about cutting-edge innovative scenarios on the use of digital technologies and networks to transform public space and the ways in which citizens work, relate, learn, communicate and participate to the governance of their cities;
- skill-building: selected students are engaged to build their skills using ubiquitous technologies and networks, to imagine, design and implement novel products, services and opportunities for city-wide interaction; workshops, mentoring and coaching sessions are used for this;
- peer-to-peer city and community development: students are supported by facilitators to imagine, design and develop their visions on the near future of the city, creating applications, websites and systems in support of culture, tourism, business, city governance and the possibility for citizens to collaborate and organize;
- citizen engagement: the wider population of the city is engaged through a series of meetings in which needs, visions, ideas and scenarios are co-created;
- emergent design: a digital ecosystem is used from this step onward to engage citizens in a constant state of conversation and discussion; specific tools allow citizens to organize in peer-to-peer ways to create and run projects;
- p2p academy: selected students are gathered from projects and united in the p2p academy, held periodically in one of the cities hosting projects; here they are engaged with workshops, coaching and mentoring sessions dedicated to building their skills and methodologies, and also to confront with participants to other projects to compare experiences and learn from each other;

- recurring events: recurring events in the city engage citizens, tourists, administrations and the wider society, providing resonance for the results of the projects and the creation of further opportunities.

Within each project, we also use – throughout the above steps - a collaborative ethnography to co-create fieldwork with the different people involved in this project i.e. research team, teachers, pupils and other participants. Through the use of a set of scenarios, we explore how young people interact in the planning process of an ubiquitous reality ‘city map’. In different stages of the fieldwork, the multiple participants interact with the fieldnotes and findings, so it *is* more of a horizontal (peer-to-peer) ethnographic process, with no researcher-participant divide.

This research approach is transdisciplinary looking on problems that cross the boundaries of two or more disciplines. In particular, we look at the issues of use, experience and perception of urban public space from a holistic approach where technology, social sciences and architecture could be linked and merged together in transdisciplinary research. This group of projects is such an example of transdisciplinary research where through the use of new/ubiquitous technologies young people can engage in discussions of citizenship and participatory planning of their urban environments.

IV. UBIQUITOUS POMPEII OVERVIEW

The first instance of the project, titled *Ubiquitous Pompeii*, saw our research and design team start a citywide process in Pompeii, in the south of Italy. Ubiquitous Pompeii started by engaging high school students with a series of workshops structured in two phases. The first phase focused on students' awareness about the scenarios and opportunities offered by ubiquitous technologies, including international case studies, specific technologies and usage scenarios. The second phase was dedicated to the acquisition of the skills used to appropriate the technologies and methodologies and to embrace participatory design processes.

The students were engaged into creating possible answers to the question: “how do you envision the future of your city?” From the beginning of the process, peer-to-peer learning processes were stimulated in working groups, both through the use of digital tools and by describing and enacting specific roles and practices which would facilitate peer learning, knowledge sharing and emergent design. Students were able to design and develop their visions,

creating services and digital tools to support their visions for the development of the city and its communities (i.e. tourism, education, participatory city-governance, peer-to-peer supply chains, sustainable/collaborative business models, systems dedicated to the interconnection of communities for relation, awareness and collaboration).

In the following phase the initiative scaled up to city-wide level: a public meeting in the administration's institutional spaces started this further phase in the second half of 2012, with hundreds of citizens joining in. P2p learning and collaboration practices play a crucial role. Tools, methodologies and roles have been designed and developed to support the emergence of practices to engage all agencies into a networked process for the creation of the digital future of the city, from a human-centered, collaborative, constructivist point of view. Institutions and operators play the role of facilitators in what basically is becoming a citywide co-creative process.

The project has been declared as an official best practice for Italy's Digital Agenda, and as such will be scaled to other cities in the near future, also envisioning wider knowledge sharing and collaboration tools which will be able to interconnect the different communities.

V. DISCUSSION

This family of projects focuses its vision on the following elements:

- **p2p** methodologies for learning and governance;
- **ecosystems** and holistic approaches;
- **the emergent academy**.

The usage of p2p methodologies and technologies allows engaging communities in meaningful ways and promote scenarios of active citizenship, in which all actors are aware and insightful, and the creativity of individuals becomes useful knowledge for the whole community. In promoting p2p practices, the figure of the **facilitator** is extensively used.

A facilitator is someone who helps a group of people understand their common objectives and assists them to plan to achieve them without taking a particular position in the discussion.

Dwyer, Ringstaff and SandHoltz have researched the transformation of the teacher into a facilitator with the wide adoption of technologies in classrooms. This

transformation fostered "new instructional strategy that would engage students in a highly collaborative, creative activity" [15]. A facilitator is an individual who enables groups and organizations to work more effectively, collaborate and achieve synergy. Specific tools and methodologies are used to achieving consensus, to contribute structure and process to interactions, to support high-quality decision-making. A facilitator's job is to support everyone to do their best thinking and practice. To do this, the facilitator encourages full participation, promotes mutual understanding and cultivates shared responsibility [16, 17].

The team enters communities as a set of facilitators, enacting inclusive experiential learning scenarios which help communities gain awareness about possible innovations for their city through the adoption of technologies and methodologies. The main objective of this practice is to bring out the value which is present in the members of communities, and create a process/environment in which it becomes shared/shareable.

To do this, new roles are defined within communities. *Citizens are turned into experts* [18]. This means to measure, develop and expose the value of individuals, turning it into a richness for the whole community. Professional history, personal attitude, talents, emotional approaches, empathy, vision, creativity: all of these elements are used and developed to turn "anonymous" citizens into experts which community members can use in fulfilling their needs. Workshops, coaching, mentoring, learning-on-the-job, partnering with other citizens: all of these are possible ways in which people's skills and attitudes can be developed to adopt new roles in the community.

Many new roles emerge: facilitators, amplifiers, connectors, routers, recombinators, developers, enhancers are among the most interesting and common we have already observed. Citizens who have learned to: a) support other citizens in their projects; b) identify weak signals and to amplify them for other people to more easily become aware about them; c) identify opportunities for collaboration and connection; d) transfer information from one domain to the other; e) suggest and promote transformation in groups, partnerships, agglomerates, to optimize effectiveness, feasibility and sustainability; f) take ideas and develop them into full, living projects; and g) make things more clear for other people, rationalizing, exposing or highlighting issues, objectives, opportunities.

All roles are based on the ideas of the **commons**: resources that are owned in common or shared among

communities. These resources are said to be "held in common" and can include everything from natural resources and common land to software. Here, too, commons can take many forms: software components; knowledge elements; skills; know-hows; documentation; public space and resources.

The idea behind these projects is to use innovative technologies and methodologies to create an ecosystem in which the commons approach is used to share resources towards the development of opportunities for culture, business, relation, governance [19]. For example, one of the main assets of these projects is their knowledge base: an environment in which all knowledge produced by project-related processes is organized and made accessible to all other participants to the ecosystem, freely usable and exploitable. Even constructive processes can be seen as commons. The techniques of **co-creation**, describe this exact vision, as people join together in a common decisional and operative space to agree on issues, things to do and projects to develop.

In this discussion, we have used many times the word "ecosystem". This is, in fact, another fundamental component of these project's vision. Here, we describe ecosystems as distributed adaptive open socio-technical systems with properties of self-organisation, scalability and sustainability, inspired from natural ecosystems [20]. Our vision of ecosystems is largely inspired by natural ones: communities of individuals in conjunction with the non-living components of their environment, interacting as a system. Ecosystems come in various sizes but usually encompass specific, limited spaces. Ecosystems are defined by the network of interactions among and between organisms and their environment and linked together through nutrient cycle and energy flow.

Ecosystems are controlled both by external and internal factors. External factors control the overall structure of an ecosystem and the way things work within it without being influenced by the ecosystem.

Ecosystems are dynamic entities. Ecosystems in similar environments that are located in different parts of the world can end up doing things very differently simply because they have different configurations and contexts.

Internal factors not only control ecosystem processes but are also controlled by them and are often subject to feedback loops. While the resource inputs are generally controlled by external processes, the

availability of these resources within the ecosystem is controlled by internal factors.

Diversity affects ecosystem functioning. Ecosystems provide a variety of goods and services upon which participants depend; the principles of ecosystem management suggest that rather than managing individual typologies, natural resources should be managed at the level of the ecosystem itself. Classifying ecosystems into ecologically homogeneous units is an important step towards effective ecosystem management, but there is no single, agreed-upon way to do this.

In these projects, ecosystems are presented under the form of digital ecosystem (DE): p2p networked environments in which individuals and groups represent themselves and the resources which they can share with the community (commons), together with the opportunities for collaboration (tasks, projects, focus groups, discussions etc.) [21].

In the DE, communities are emergent, meaning that the overall community is constituted by a continuously recombinant set of smaller ones, which constantly form and assemble around specific themes, projects, events, interests. Communities are not fixed, and they mutate with the transformation of the “environment”. The objective of the DE is to place the foundations to promote the emergence of participatory, sustainable, visionary models for business, culture, information, arts, expression, socialization, organization and governance.

VI. CONCLUSIONS

We have described here first the strategic approach of a family of projects and then of one of its instances. Their purpose is to explore the possibilities and opportunities offered by the wide and accessible availability of ubiquitous technologies and networks to design and enact city-wide processes which are able to substantially redefine the concepts of public space, citizenship and city governance. In our experience, the creation of peer-to-peer ecosystems is central to the possibility to catching these opportunities.

The scenario of radical reinvention of the ways in which citizens and other forms of city-dwellers (such as tourists) live and relate in cities requires questioning the fundamental models through which urban contexts are used and performed.

Many times technologies and networks are used as a light cosmetic intervention onto existing forms of top-

down decision-making processes. This is the case of many experiences of crowdsourcing applied to urban politics [22].

On top of that, the widespread understanding of the opportunities offered by the possibility to transform cities into smart-cities is often limited to a technocentric vision, or to a scenario in which city dwellers are considered as being sensors, extensions of their devices which constitute a convenient tool for city-monitoring in a top-down fashion [23].

What we envision is to turn the scenario upside down, and to leverage the opportunity for ubiquity, multiplicity and synchreticity offered by contemporary technologies and networks to describe a radically different scenario. Here, the focus of attention lies onto a peer-to-peer ecosystem, which sits at the centre of the life of the city. This is enabled by the wide and accessible availability of ubiquitous technologies and networks, and is enacted through a series of open source technologies and meshed networks, and through the possibility for citizens to appropriate these technologies to organize and coordinate themselves around/into the ecosystem.

In this vision, institutions and operators act as facilitators, using specific tools to gain awareness of the multiple scenarios which shape the urban context and acting as operative enzymes stimulating the production of knowledge, collaboration, awareness and activation.

This scenario allows to substantially transform the layouts according to which decision making and collaboration/coordination processes take place in cities. It can also provide sustainable ways through which citizens can design and develop emergent businesses, generate knowledge and know-how, produce peer-to-peer supply chains and aggregate around the themes and issues which are more relevant to the urban context.

Furthermore, the idea of merging the digital ecosystem to an operative environment which is dedicated to the emergence of peer-to-peer learning processes goes in the direction of imagining the ways in which such systems will be able to evolve autonomously, naturally and feasibly.

On the other hand, not enough evidence has yet been produced about the ways in which these kinds of operative and collaborative environments are able to scale. While the possibility to extend them to entire urban contexts and to interconnect different ones to establish virtuous networks across communities and

territories seems feasible and desirable, not enough investigation and practice has yet been performed to be able to describe the processes according to which these environments will be able to extend and evolve.

In fact, together with the participation of this family of projects to the Italian Digital Agenda, this is one of our main concerns and possibly the most pressing of the items in our planned research on this subject matter.

REFERENCES

- [1] D. Morley, "What's "Home" Got to Do with It?: Contradictory Dynamics in the in the Domestication of Technology and the Dislocation of Domesticity", *European Journal of Cultural Studies*, vol 6(4), 2003, pp. 435-458.
- [2] J. J. Gibson, J. J., "The theory of affordances", in *Perceiving, Acting, and Knowing*, R. E. Shaw & J. Bransford, Eds. Hillsdale, NJ: Lawrence Erlbaum Associates, 1977.
- [3] J.J. Gibson, "The Ecological Approach to Visual Perception", Boston: Houghton Mifflin, 1979.
- [4] D. A. Norman, "The psychology of everyday things", New York: Basic Books, 1988.
- [5] S. Kitayama, H. R. Markus, H. Matsumoto, & V. Norasakkunkit, "Individual and collective processes in the construction of the self: Self-enhancement in the United States and self-criticism in Japan", *Journal of Personality and Social Psychology*, vol. 72, 1999, 1245-1267.
- [6] E. Bradner, W. Kellogg & T. Erickson, "The adoption and use of "Babble": A field study of chat in the workplace", In: ECSCW'99, Proceedings of the 6th European Conference on Computer Supported Cooperative Work. Copenhagen, Denmark 12-16 September 1999. Dordrecht: Kluwer Academic Publishers
- [7] H. Lefebvre, "La Production de l'Espace", Paris: Anthropos, 1974.
- [8] M. De Certeau, "The Practice of Everyday Life", Los Angeles: University of California Press, 1994.
- [9] E. Soja, "Thirdspace", Malden: Blackwell, 1996.
- [10] C. Alexander, S. Ishikawa, M. Silverstein, M. Jacobson, I. Fiksdahl-King & S. Angel, "A Pattern Language: Towns, Buildings, Construction", New York: Oxford University Press, 1977.
- [11] N. Salingeros, "Peer-to-Peer Themes and Urban Priorities for the Self-organizing Society, Permaculture Research Institute", [online] Available at: <http://permaculture.org.au/2012/02/07/peer-to-peer-themes-and-urban-priorities-for-the-self-organizing-society/> [Accessed 11 August 2012].
- [12] W. J. Mitchell, "City of Bits: Space, Place, and the Infobahn" Cambridge: MIT Press, 1995.
- [13] M. McCullough, "Digital ground : architecture, pervasive computing, and environmental knowing", Cambridge: MIT Press, 2004
- [14] M. Zook & M. Graham, "From Cyberspace to DigiPlace: Visibility in an Age of Information and Mobility", in *Societies and Cities in the Age of Instant Access*, H. J. Miller ed., Dordrecht: Springer, 2007.
- [15] D. Dwyer, C. Ringstaff & J. Sandholtz, "Changes in Teachers' Beliefs and Practices in Technology-rich classrooms. *Educational Leadership*, 1991, vol. 48, issue 8, pp. 45-53.
- [16] S. Kaner with L. Lind, C. Toldi, S. Fisk, & D. Berger, "Facilitator's Guide to Participatory Decision-Making", San Francisco: Jossey-Bass, 2007.
- [17] S. Cacciamani, D. Cesareni, F. Martini, T. Ferrini, & N. Fujita "Influence of participation, facilitator styles, and metacognitive reflection on knowledge building in online university courses", in *Journal Computers & Education*, Volume 58 Issue 3, April, 2012, pp. 874-884. Oxford, UK: Elsevier Science Ltd.
- [18] F. Fischer, "Citizens, Experts, and the Environment: The Politics of Local Knowledge", Durham: Duke University Press, 2000.
- [19] E. Ostrom, "Governing the Commons. The Evolution of Institution for Collective Action", New York: Cambridge University Press, 1990.
- [20] G. Briscoe & P. De Wilde, "Digital Ecosystems: Evolving service-oriented architectures", in *Conference on Bio Inspired Models of Network, Information and Computing Systems*, Los Alamitos: IEEE Press, 2006.
- [21] A. Corallo, G. Passiante & A. Prencipe, Eds, "The Digital Business Ecosystem", Cheltenham: Edward Elgar Publishing Limited, 2007.
- [22] J. C. Bertot, P. T. Jaeger & J. M. Grimes, "Crowd-sourcing transparency: ICTs, social media, and government transparency initiatives", in *DGSNA (Digital Government Society of North America)*, Proceedings of the 11th Annual International Digital Government Research Conference on Public Administration Online: Challenges and Opportunities (pp. 51-58), Puebla, Mexico 17-20 May 2010, Digital Government Society of North America.
- [23] C. Ratti & A. Townsend, "The Social Nexus", *Scientific American Magazine*, [online] Available at: <http://www.scientificamerican.com/article.cfm?id=the-social-nexus> [Accessed 11 August 2012].

