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Real "Smart Cities": Insights from Civitas PROSPERITY

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1 ABSTRACT

A city does not need to be smart, but to allow people be, behave, live and work smart(er). Furthermore, smart should not be necessarily equalled to high technology, but to the sound management, communication and use of available resources, be they tangible or intangible. Anyway our evolution cannot be limited to technology, even if the latter has become unavoidable. If not accompanied by a comprehensive perspective and coherent management, technology may rather block than facilitate resilience and sustainable urban development. Not always the most technically advanced and expensive solutions are the best (most effective) ones or frequently they cannot work alone, needing to be complemented by soft / lower-cost measures. Moreover, even if the actual "smart city" paradigm would be accepted, there do not seem to be enough resources (especially primary ones) to provide high-tech for everybody (WWF, 2018). In this case high-tech might be replaced by smart-tech staying for innovative solutions of best coping with given situations no matter the level of scientific, cultural, economic and behavioural advancement. These are some of the conclusions of a recent ongoing project funded through Horizon 2020, pleading for a global integrated perspective and providing the appropriate tools to sustainably shape and enhance it.

Being built in response to the challenge "Real Smart Cities. Best practices and concepts for the future", the present contribution informs on how Civitas PROSPERITY (applied research project) integrated these principles and produced innovation in the field of Sustainable Urban Mobility Plans (SUMP). The focus is on bright solutions that can be equally extended and applied in other fields of urban management beyond mobility, such as energy, land-use, cultural heritage etc.

Keywords: smart city, vibrant cities, smart-tech, Civitas PROSPERITY, SUMP

2 CONTEXT

At present cities and communities are vastly confronted with an increasingly evident limitation of resources, important migrations, conflict areas, terrorism, unsustainable urbanisation models and a progressively faster rhythm of change inducing instability. Besides, climate transformations are rendering people's lives even more difficult and unsecure, threatening human life itself (IPCC, 2014). The expectations augmented quantitatively as well as qualitatively leading to unsustainable consumption patterns with the production of more and more waste. Furthermore, ecosystems are shaken by large amounts of pesticides and fertilizers that do not only affect plants and consumers, but also animals and people living in the area (WWF, 2018).

Development (also including advanced technologies) requires an ever important consumption of energy finally rising entropy and stress. It generates important ecological footprints thus coming into contradiction with one of the main actual objectives and political commitments referring to the reduction of both, consumption and pollution (United Nations, 2015).

The democratisation of travelling and opening of borders made the cultural and social differences even more evident. The discrepancies between people and territories (big fortunes of few opposed to large poor masses) accentuated, being complemented by individualism (Biau, 2018) and a certain lack of confidence, references and models degenerating sometimes in alienation.

An important asset and cultural richness, diversity is also rising new problems challenging the traditional urban management models (Wirth, 1938).

The public sector is still in crisis, being overwhelmed by increased complexity and unprecedented problems (Murray et al., 2010; Tosics, 2011; Boonstra and Boelens, 2011); suffocated by unilateral private interests and challenged by the rise of the third sector that poses serious issues of equity and legitimacy.

In 1989, Rizzo was noticing that big transformations occur when the level of entropy is too high determining the shift towards a different energy model with the emergence of new technologies and economic, social and political institutions. The soundness of this statement is evident today when people are talking more and more about a change of paradigm favouring enhanced connections and sharing.

Sustainability is more often interpreted from a comprehensive perspective, by taking into consideration the full lifecycle of objects and from multiple aspects, not only from the financial point of view, but also evaluating social, cultural and environmental impacts. The discharge energy is included in the general calculation being compared to the recycle possibilities and their financial and energy costs.

3   THE MIRAGE OF ADVANCED TECHNOLOGIES AND SMART CITIES

Feeling profoundly destabilised and in the mean time fascinated by the fast evolution of artificial intelligence, many are putting all their hopes in this, expecting high technologies to bring them all they need and make all their dreams come true. Given their increased density, cities are places where all problems are more evident, that are however also attracting the needed resources and intelligence to solve them (GHK Group of Companies, 2000; ECOTEC Research and Consulting Ltd 2007; European Commission, 2011). That is how the concept of smart city emerged, in an attempt to promote them as innovation hubs, where the most advanced technologies are tested and further developed.

According to techopedia "A smart city is a designation given to a city that incorporates information and communication technologies (ICT) to enhance the quality and performance of urban services such as energy, transportation and utilities in order to reduce resource consumption, wastage and overall costs. The overarching aim of a smart city is to enhance the quality of living for its citizens through smart technology."

It is usually built around data with various degrees of accessibility and enabling public authorities to receive and deliver real time information that facilitates the management and use of cities. Even if it implies considerable initial costs, it is expected that in time it is helping significant economies and superior life quality due to better targeted and informed efforts.

The smart city concept is currently associated with advanced technology like smart grids, open data platforms and networked transport systems, the urban mobility being one of its main fields of application together with energy, lighting and water management sectors (Feuilherade, 2017).

From an advanced perspective, technology is expected to enable a better use of resources and territorial cohesion and diminish waste and negative externalities. Thus, according to Komninos et al. (2018), smart city is used to describe the "deployment of digital technologies, smart environment and user engagement to optimize urban systems and the economic and social life of the city".

While technology has a lot of potential and can bring a great relief, if not backed by human intelligence, it might generate unexpected threats and unforeseen side effects. It enables communication, sharing, economies of scale, increased speed, but besides production, it also accelerates consumption and life itself. It allows better transmission of information, but also of huge amounts of random data and disinformation. It implies important costs financially but even more significant ones in terms of raw materials consumption. For instance the electric cars are necessitating high expenses for the creation and discharge of batteries and dedicated infrastructure and are often implying the externalisation of costs and negative effects (Autowise, 2019).

It is thus evident that technology is not everything. An integrative comprehensive perspective is essential frequently making the difference between formal superficial approaches and really sustainable ones (Rotaru, 2014). Money spent under the smart city label is not always contributing to or producing sustainable situations. In India, for example, most of the investments designated for smartness are made in beautification landscaping for the wealthier ones at the costs of the unfortunate ones that rely on nature for survival (Nagendra, 2018). In this sense, in order to promote sustainability, "traditional indicators on outputs relating to investment and infrastructure creation require a shift towards outcomes relating to the quality of life of the city's inhabitants including the vulnerable population of urban poor." (Singhal, 2018)

An important aspect is the extensive involvement of citizens, not only regarded as study elements or audience, but co-opted as active participants in the (re)design and management of their cities. The most successful experiences proved to be the ones based on collaborative approaches and crowd intelligence (Healey, 1998, 2003, 2006; Rotaru, 2014), enabling to work across geographic but also thematic borders (Aoun, 2015).

In this sense, an evolved smart city campaign was recently (lasting since January 18th until March 22nd 2019) launched by the World Bank in Romania (under the name "Choose the priorities of your city!") by

asking citizens to determine the priorities from a list of projects proposed for each city by their local administration. If not every city can afford sophisticated technology, extensive participation and collaborative governance can and should become a constant no matter the level of economic development of territories and people.

A related debate regards the energy consumption and the environmental impact as technology production, implementation and maintenance also demands resources not always easily available. There is a general tendency to misleadingly believe that what is heavier has a more important carbon footprint. Many publishers shifting from paper to digital media for instance, are arguing that they are reducing to a half the emissions associated to their industry. However it is not very clear what is included in the overall account. The use of files and access to cloud services also imply an environmental cost the same as the production and exploitation of the intelligent divices needed for this. Hohenthal et al. (2013) claim that the production of digital content generates 50% of the total climate emissions of newspaper publications, while the consumer choices in accessing a certain item are engendering up to 87% of total emissions from online publications.

Therefore, the information technologies not only might be important socio economic disruptors and seriously affect human health, but also consume increasingly more energy, especially if taking into consideration the entire life cycles (global performance and environmental impact). According to the researchers from Lancaster University's School of Computing and Communications, this consumption is increasing exponentially and opposing the global efforts to reduce carbon emissions (Morley, Widdicks, & Hazas, 2018)

4 THE REAL SMART AS DEMONSTRATED THROUGH CIVITAS PROSPERITY

Addressing one of the main challenges of European cities, namely the urban mobility, and more specifically its management, Civitas PROSPERITY focused on rendering the Sustainable Urban Mobility Plans (SUMP) a really effective operational tool especially in countries, regions and cities where the essence and potential of this instrument were not yet fully understood and capitalised. It started from a comprehensive analysis of the urban mobility situation at national, regional and local levels conduced in the partner countries in order to support the proposition of tailor-made solutions best answering the various specific issues, but widely informed by the international experience and theoretical and practical advancements in the field.

This project has been chosen as case study as it provides a possible approach and management system successful in making the transition towards real smart cities. The main actions included in this complex structure are analysed deriving the principles generally applicable in various fields of urban management.

Transposed into practice, the SUMP philosophy (implying among others extensive participation, circular, interdisciplinary and integrative approaches, continuity of the endeavours, anticipation and long term perspective) demonstrated its virtues as a way of thinking and acting capable of inspiring sustainable development and management models for (future) cities and communities. The comprehensive approach was adopted as a transverse feature that conduced to added value.

The different solutions applied in local situations that allowed the distinction of the innovations to be promoted (through the innovation briefs developed in this context) showed that smart should be rather equalled to ingenuity than to technology. Furthermore, their selection has chiefly considered the possibility to apply them in more economically developed countries as well as in poorer ones, the team being faithful to the conviction that inspiration can go in both senses.

The long term thinking also guiding short and medium term actions resulted in the correlation of the various projects in the same field as well as in their harmonization with the measures in related sectors. For example, the project inspired the update of the SUMP of Făgăraș, the Romanian partner city, reorganised around 3 main interrelated projects meant to restructure together the entire urban mobility system of the city, but also working individually in relation with the different energy and urban design measures. Those 3 projects were presented for being funded through European Regional Programme and their implementation should start this year.

Civitas PROSPERITY has essentially based its actions on various connections between different disciplines but also between people and initiatives. These were both, horizontal ones (at local, national and international levels) and vertical ones (between the various levels of governance). Regular exchanges were facilitated not

only between cities, but also between peers at national or regional level in charge with urban mobility issues. Dedicated sessions were organised for the latter on the occasion of the project meetings.

A network of cities was created including champion and follower ones. Best performing cities were acknowledged as champion cities and invited to share their experience on the occasion of the national promotion, training and coaching events, serving as reference and inspiration for the follower ones. Partner cities were meant to play the role of innovation labs, while the coaching sessions dedicated to them enabled knowledge transfer and work on specific local issues backed by a broader international perspective.

Additionally, a special topic, SUMP ambassadors, was launched including people who were successful in their urban mobility initiatives and willing to share their experience and possibly act as advisors. This enables the dissemination of the endeavours of the ones that supported the preparation, promotion and implementation of the best SUMPs. http://sump-network.eu/ambassadors

The innovation briefs were not only used for the promotion of the project results, but also as basis for discussions, while solutions presented there were sometimes tested and adapted to the local conditions. The overall support offered to public administrations in target countries was completed through the organisation of tailor-made national trainings with a strong operational component. The selection of themes was made depending on the demands in each country and the training modules were adapted each time to the local realities and involving participants in real case studies inspired by their daily work and challenges.

The SUMP taskforces were created as transverse national structures connecting the various levels in the field. Through these, Civitas PROSPERITY succeeded to regularly bring together the policy makers and professionals working with those policies. This enabled changes of attitudes and behaviours, losing the gap between the needs and demands of the local level, and higher administrative institutions supposed to prepare the ground and provide programmes to encourage cities design and implement SUMPs. A novelty of PROSPERITY, the involvement of ministries and high level (national and regional) authorities proved to be very beneficial for the implementation and impact of the project rendering its proposals easier accepted and adopted.

Moreover, the various initiatives developed in the framework of this project were linked. This part of relational thinking and network approach worked very well and it was enhanced by a certain degree of liberty leaving space for improvements that came evident with the advancement of the project. Some of the connections were not planned since the beginning, but developed later on during the project, for example the process of selection of the host cities for the different events in Romania. There, it was launched a call asking the various candidates not only to demonstrate their organisational capacities, but also provide a solid motivation, reflect on their gains from this experience and propose some relevant subjects, measures and sites for the practical exercises and study visit. This helped choose a city really understanding the potential of such a role and willing to progress in the urban mobility field.

Some other not initially planned elements were also the use of the innovation briefs (developed in the framework of the project) for stirring debate in the taskforce meetings and the input from the different brainstorming activities to the taskforces seen as an access gate to the political power. Generally, the communication between different project partners proved to work well enabling the replication and extrapolation of successful experiences tested in various places and sometimes even translated into innovation briefs (like in the case of the Superblocks scheme implemented in Vitoria Gasteiz champion city and inspiring similar initiatives adapted to the local circumstances in partner cities Lisbon and Făgăraş). The multifunctionality was a chief principle in the organisation of the built environment and traffic flows. In this context, a special attention was given to the design and use of public space as an essential component of vibrant cities allowing the transformation of mobility into a pleasant experience coherently balancing the various modes of transport between themselves and with the other urban activities.

What did not work so well was the collaboration with the other projects funded in the same time and having similar targets (so-called sister projects). This was very much wanted by the project steering group in order to increase the impact of each activity and produce a really sustainable shift in the way of understanding, planning and managing cities. It was also highly encouraged (even asked for at a certain point) by the European Commission (EC).

The problems at this level proved that the collaboration culture is not always mature enough. Besides, this idea came at a later stage so there were no dedicated resources and work had to be done mostly on a

voluntary basis. The excessively strict framework imposed by the EC also complicated cooperation as more additional work was asked besides what was promised, without backing this up with dedicated funding. This has taken much of the available energies of the different project teams at the cost of the inter-projects synergies. Moreover, a kind of negative competition seemed to rise among the various similar projects much supported by the EC attitude. To this added the important differences in the approach and methodology of the projects. If PROSPERITY was thought from the beginning very open and flexible to collaboration, pursuing to connect the already existing information and initiatives for a better use, its sister projects were not so focused on win-win cooperation. Maybe there were also some preconceived ideas derived from previous bad experiences that also cumbered the involvement of PROSPERITY in a sustainable cooperation with its sister projects.

The national SUMP programmes introduced or optimised in the framework of PROSPERITY through the SUMP national taskforces were based on a collaborative endeavour, involving the various levels of governance and representatives of relevant stakeholders. They were adapted to each national situation while considering the overall international perspective and getting inspiration from homologues.

One of the main insights of Prosperity is the necessity to have a unitary comprehensive vision and harmonize the various initiatives and efforts. Prosperity equally proved the efficacy and the sustainability of network thinking, promoting vertical connections between the various levels of governance and horizontal ones between peers in the same country or in different ones

The creation of SUMP national taskforces and National SUMP programmes enabled a bottom-up construction or optimisation based on specific national and local realities analysed from a more comprehensive international perspective continuously fed through inputs from different European experts, policy makers and successful best cases.

Even if it focused on the specific topic of urban mobility, Civitas PROSPERITY may also inspire other urban management fields especially in terms of overall development strategy, methodology and project culture. It indicated the approach, principles and system of soft / lower-cost measures to be adopted so that to unlock the full potential of the available assets and generate the shift from high tech to smart tech and sustainable living environments and communities.

5 CONCLUSIONS

The situations analysed in the framework of Civitas PROSPERITY showed that smart cities should be able to ensure the material conditions of our existence as a minimum start requirement and be based on mutual understanding and a shared vision for the future obtained through advanced cooperation, and here it is the role of soft measures.

Without denying the relevance and importance of advanced technology, the experience of Prosperity informed about the various challenges and threats associated and proved that alone it cannot manifest at its full potential needing to be complemented and enhanced through an advanced management. Human intelligence is systematically called to complement the "technological smart". A smart city should rather refer to the use of appropriate technologies (frequently an effective combination of highly innovative ones and traditional classical ones) backed by an intelligent governance system translated through transparency, interdisciplinarity, transversality, connectivity, coherence, coordination and collaboration. Its advancement and full capitalisation become effective through the network thinking model of development and management.

In fact, through its nature the concept of SUMP links high technology and soft measures increasing their potential. The SUMP philosophy introduced a new approach of planning, starting from which Civitas PROSPERITY developed an effective model of urban governance based on extensive communication and inter-sector, crossed vertical and horizontal cooperation. In this case, the various principles were primarily applied to the urban mobility sector, but they can be extrapolated to other fields of urban management like energy and land-use planning for the promotion of the integrated governance of various aspects in cities.

A practical demonstration of the network connectivity model, PROSPERITY tested and promoted the appropriate tools at the level of champion and partner cities playing the role of innovation labs. Instead of focusing since the beginning on specific local problems, the analysis initiated from the bigger picture

(overall context) in an attempt to understand the issues in their complexity and then choose and adapt the appropriate general solution to each concrete particular situation.

A real smart city cannot be an abstract concept to be implemented everywhere in the same way, but should take into consideration the environmental, social and economic conditions of each territory and respond to the needs of people living there. Connections are to be made between different fields of interventions but also with the larger area and nearby towns and cities in order to ensure the general coherence and sustainability of any endeavour.

At the level of Civitas PROSPERITY, smart-tech meant making the best use of the available technologies in each specific context, by considering the entire life cycle of objects and urban planning arrangements and by gathering all the concerned ones around a shared vision for the future.

6 REFERENCES

AOUN C (2015) Innovation must be collaborative for Smart City success, available at https://blog.schneider-electric.com/smart-cities/2015/03/30/innovation-must-collaborative-smart-city-success/ accessed on 10 February 2019

AUTOWISE (2019) Top 7 Disadvantages of Electric Cars, available at https://autowise.com/top-7-disadvantages-of-electric-cars/ accessed on 25 February 2019

BIAU V. (2018) communication on the occasion of the 22nd Summer University of Urbanism, Besancon, France, August 2018

BOONSTRA B. & BOELENS L. (2011) "Self-organization in urban development: towards a new perspective on spatial planning", in: Urban Research & Practice, 4:2, pp 99-122 available online at: http://dx.doi.org/10.1080/17535069.2011.579767 accessed on 10 January 2019

ECOTEC Research and Consulting Ltd (2007), State of European Cities Report – Adding value to the European Urban Audit, European Union, Regional Policy

EUROPEAN COMMISSION (2011), Cities of tomorrow: Challenges, visions, ways forward, European Union

FEUILHERADE, P. (2017) Smart cities to boost energy efficiency in Smart Buildings Magazine from January 23, available online at http://www.smartbuildingsmagazine.com/features/smart-cities-to-boost-energy-efficiency

GHK Group of Companies (2000) City Development Strategies (CDSs). Taking Stock and Signposting the Way Forward, A Discussion Report for DFID (UK) and the World Bank, London

HEALEY P. (1998), "Building Institutional Capacity through Collaborative Approaches to Urban Planning", in: Environment and Planning A, 30 1998, pp. 1531-1546

HEALEY P. (2003), "Collaborative planning in perspective" in: Planning Theory 2(2), pp 101–123

HEALEY P. (2006), Collaborative Planning – Shaping Places in Fragmented Societies (2nd ed.), Macmillan, London

HOHENTHAL, C., MOBERG, Å., ARUSHANYAN, Y., OVASKAINEN, M., NORS, M. & KOSKIMÄKI, A. (2013) Environmental performance of Alma Media's online and print products, VTT, Finland available online at https://www.vtt.fi/inf/julkaisut/muut/2013/vtt-cr-02104-13.pdf accessed on 15 February 2019

IPCC (Intergovernmental Panel on Climate Change) (2014), Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland available at https://ar5-syr.ipcc.ch/ipcc/ipcc/resources/pdf/IPCC_SynthesisReport.pdf accessed on 27 February 2019

KOMNINOS, N., KAKDERI, C., PANORI, A., & TSARCHOPOULOS, P. (2018), Smart City Planning from an Evolutionary Perspective. Journal of Urban Technology, 1-18.

MORLEY, J., WIDDICKS, K. V., & HAZAS, M. D. (2018) Digitalisation, energy and data demand: The impact of Internet traffic on overall and peak electricity consumption. Energy Research and Social Science, 38, 128-137. https://doi.org/10.1016/j.erss.2018.01.018

MURRAY R., CAULIER-GRICE J., MULGAN G. (2010), The open book of social innovation, Social Innovator Series: Ways To Design, Develop And Grow Social Innovation, The Young Foundation and NESTA (the National Endowment for Science, Technology and the Arts), London

NAGENDRA H. (2018) personal communication https://www.thenatureofcities.com/2018/02/20/smart-cities/

RIZZO F. (1989), Economia del patrimonio architettonico ambientale, Angeli, Milano

ROTARU I (2014), Wealth between Heritage, Culture and Innovation.Collaborative Forms of Urban Governance as a Solution for the Creative Valorisation of the European Cities, Politecnico di Milano

SINGHAL S. (2018) personal communication https://www.thenatureofcities.com/2018/02/20/smart-cities/

TOSICS I. (2011) Governance challenges and models for the cities of tomorrow, issue paper commissioned by the European Commission, Directorate General for Regional Policy

UNITED NATIONS (2015) Paris Agreement United Nations Framework Convention on Climate Change (UNFCCC) Available online at https://unfccc.int/sites/default/files/english_paris_agreement.pdf

WIRTH L. (1938) "Urbanism as a way of life", American Journal of Sociology, vol 44, no 1 (July 1938), Published by: The University of Chicago Press, pp. 1-24.

WWF. 2018. Living Planet Report - 2018: Aiming Higher, Grooten, M. and Almond, R.E.A.(Eds). WWF, Gland, Switzerland. http://wwf.panda.org/knowledge_hub/all_publications/living_planet_report_2018/

Smart city definition
https://www.techopedia.com/definition/31494/smart-city

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