4. CREATING SMART CITIES: SKILLS AND ABILITIES TO DEVELOP IN YOUNG PEOPLE[1]

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Abstract: *A human-centred approach to smart cities includes the development of skills that allow those who lead urban innovation to achieve positive social impacts. This work presents some of these skills, such as the ability to analyse territorial contexts, to conduct design activities, to adequately apply innovative technologies, for the benefit of a positive experience of the people themselves, as well as the ability to translate ideas in business projects.*

Keywords: smart city, competences, youth

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CREARE LE SMART CITIES: COMPETENZE E CAPACITÀ DA SVILUPPARE NEI GIOVANI

Abstract: *Un approccio human-centred alle smart city prevede lo sviluppo di competenze e abilità che permettano a chi guida l'innovazione urbana di raggiungere impatti sociali positivi. Il lavoro presenta alcune di queste competenze e abilità, quali la capacità di analisi dei contesti territoriali, di condurre attività di progettazione, di applicare adeguatamente le tecnologie innovative, a vantaggio di un'esperienza positiva delle persone stesse, nonché la capacità di tradurre idee in progetti di business.*

Keywords: smart city, competenze, giovani

1. Introduction

Reflection and interventions aimed at increasing and improving skills are a central theme in Italy, as well as in Europe (and beyond), for a coherent, satisfactory, and sustainable development of society. The issue is also closely linked to the development of one of the most emblematic and influential places of human activity to date, namely the city, seen from the perspective of innovation and transformation, both digital and social. The issue certainly has several levels of interpretation, from the general, referring for instance to the strategic dimension of urban development based on territorial and cohesion policies (Fioretti *et al.*, 2020), to the particular, focusing instead on the ability to train people capable of dealing with situations that may arise in life and work, such as accessing online services or having to make decisions when faced with issues that do not have a single choice. Thus, it is not only a matter of enabling individuals to acquire new knowledge, but also of giving them the opportunity,

first as individuals, and then as members of a community, to put this knowledge into practice, becoming capable and skilled in managing the processes that ensue. Insights into disciplinary and transversal competences can be found in the numerous national and European studies conducted by Eurydice[2], the institutional information network on the policies, structure, and organization of European education systems.

Much of the literature on the subject of "capacity building" and competence development (Tahirsylaj and Sundberg, 2020; Kaplan, 2010; Crick, 2008; OECD, 2005) has questioned what characteristics and qualities are needed to best meet the challenges in the field of education, work, but also life itself (i.e. the so-called competences for life or soft skills), such as being able to handle stress and emotions, communicate effectively, etc. In any case, that of the '21st Century skills' (González-Salamanca *et al.*, 2020; Dede, 2010), i.e., the framework of competences considered fundamental in the 21st century, is perhaps the main model to refer to in order to identify the competences to be promoted and developed through innovative and increasingly multidisciplinary learning paths. In this regard, digital competences, i.e., the ability to use and manage at various levels digital technologies, media and the data and information generated by them, fall within the aforementioned model. These are joined, again within the '21st Century skills' model, by learning and innovation competences, i.e., the ability to continuously adapt to a changing context that mainly requires the application of critical thinking, creativity, and collaboration (which undoubtedly passes through good communication). Finally, part of the same model are the so-called professional and life competences, which refer to personal and interpersonal skills and abilities needed to develop and manage everyday challenges and opportunities, such as being able to make

[2] Eurydice: https://eurydice.indire.it/.

conscious choices and be an active participant within one's social system of reference.

In this contribution, we have chosen to focus on some of the implementation aspects of competences drawn from the broader model of '21st Century skills', i.e., on practices and skills that are obligatory steps in the design of urban innovations that are effectively and efficiently integrated into the social and organizational fabric of the city. In fact, if on the one hand the smart city cannot disregard an intrinsic reference to technologies, hence to the development of digital skills, on the other hand it is even more essential to refer to the human and social aspects of its very being as a city, i.e. a place and a space that welcomes relationships and social interactions on a human scale (supported in the vast majority of cases by technologies), aimed at a common objective, which is undoubtedly also that of collaboratively building the urban environment.

2. What are smart cities?

The term 'smart city' has, for some decades now, been widely used both in academic circles and in political, technological, technical (e.g., urban planning-architectural) and community discourse. Although there is no shared definition of a smart city, what most experiences have in common concerns the use of information and communication technologies for the improvement and optimization of certain processes in the urban sphere oriented towards the general improvement of people's lives (Albino *et al.*, 2015). In this contribution, in relation to the smart city, reference will be made to the concept of 'person' and not to the more commonly used ones of 'citizens', 'residents', 'city users', etc., since, in the authors' perspective, the complexity of the person in

the round is considered, his or her individual and relational experience of interaction with the city (cf. on this aspect the studies on the 'sociology of the person' such as: Spe Group - Sociology for the Person, 2007) and not just one part or area of this experience. However, especially in the first smart city experiences, the focus on technological aspects was preponderant: partnerships between urban administrations and technology companies were, in fact, the prerequisite for implementing specific projects. One example among many is the experience carried out in the city of Songdo (South Korea) where, through the intervention of the company CISCO, a city was to be created which, thanks to the use of smart sensors, proposed the possibility of providing its citizens with all services within a maximum distance of 5 minutes (Herzberg, 2017). Numerous criticisms have been levelled at such 'smart city' projects. Although, in fact, it was through such technology-driven experiences that this concept became widespread and established, it is also true that such a public-private partnership led to the imposition, in the specific contexts of application, of certain proprietary technological solutions, which in fact limited the diffusion of innovation more widely than the cities themselves (Boorsma, 2020).

The experience of the city of Barcelona in 2013 was particularly decisive in defining a new smart city approach. For the first time, in fact, elements broader than the single implementation of a technological project for the city were considered. The 'Barcelona Smart City' project envisaged the use of sensor elements in the city to solve certain problems related to traffic, parking, mobility, etc. In implementing this strategy, however, the focus was also on cultural aspects, such as the study of the impact of these elements in terms not only economic but also social (e.g., related to the educational aspects of the population, in terms of improving public health, as well as in terms of creating new jobs),

in fact becoming an open environment in which the positive impacts of specific initiatives are multiplied (Bakıcı *et al.*, 2013). Nowadays, the academic and non-academic debate on smart cities focuses on the need to use digital technologies to improve the experience of different types of citizens in the city to solve their specific problems and needs. This paradigm shift allows for a so-called human-centred approach to cities themselves (Opromolla, 2021). This approach is flanked by the consideration of the smart city as a service ('City as a Service'), which implies the ability of cities to interconnect different services, even those belonging to different spheres, using technological architectures that are considered open. A concept, that of 'City as a Service', which nowadays is transformed into the model of 'City On-Demand', where, precisely thanks to the integration of services, devices, and systems, it is possible to bring into being (in real time) new services that did not exist before the request (Klassen and Buske, 2018). The concept of 'City as a Service' is also important in relation to the need to understand the smart city not as a set of individual interventions referring to specific and crystallized domains (e.g., interventions in the social sphere, interventions in the mobility and environment sphere, interventions in the governance or energy sphere, etc.) but as a 'meta-project' oriented towards providing a positive experience of interaction, beyond the specific domain. Considered in this way, moreover, the smart city becomes not a project, but a process, something that is constantly changing, but tending towards clear objectives. That is, it involves design thinking in which the final vision to be achieved is clear, but also the specific activities to be carried out to get to that point, as well as the processes for measuring the social impacts that are being achieved. Technologies, economic processes, public administrations, urban spaces, etc. are therefore not considered as separate areas, but as elements included in a complex universe within

which they contribute to the realisation of the 'smart' vision of the city, but at the same time benefit from it, creating additional processes. This approach to the smart city involves a much broader focus on people. Focusing on the 'person' dimension allows the 'social' dimension of the smart city to be understood from different points of view. In general, people do not only represent those to whom solutions (technological and otherwise) must be provided, but also those who can actively participate both in the design and implementation of these solutions and in the definition and implementation of appropriate public policies, according to various models and instruments of participation promoted in the Open Government framework (McDermott, 2010). This includes not only a strengthening of the competencies of the subjects involved in the transformation processes of a smart city, with a particular centrality of the role of the leaders who guide the processes, but also of the specific inhabitants and frequenters of the cities. As will be further clarified in section 3.2, part of a smart city is the involvement of people in the implementation of transformation processes, through an approach that combines top-down activities (defined and conducted at the governance level) and bottom-up activities (defined and conducted by people).

3. Competences and skills needed for the development of a smart city

Beyond the various definitions that can be given of it, the smart city is a complex organization, since it is the result of the interaction and relations between numerous agents according to diverse objectives (Opromolla and Volpi, 2020). Therefore, identifying all the competencies required for its development in a definitive and exhaustive manner may not lead to an unambiguous

result (assuming it was possible to have a complete overview). Basically, as already mentioned, one can take as a reference model, to be declined in different situations, that of the '21st Century Skills'. It offers the possibility of working according to numerous approaches, both traditional and innovative, on the knowledge, skills, and abilities necessary for the development of a smart city, starting with digital skills, through to creative and entrepreneurial skills, understood here as those qualities that allow one to perform a transformative act, aimed at creating a complex system that produces positive impacts in the context of reference. One can also interpret this competence as active citizenship, placing a greater focus on the public sphere, rather than on business. However, it is always a set of characteristics acquired by the individual and brought back to the community under different manifestations and practical interventions that influence the individual's quality of life and 'enable' him or her to fully realize the self. On the side of the individual, the focus is on the formation of responsible and resilient people, able to recognize, understand and deal with personal and collective problems, overcoming crisis situations related to both internal and external contexts. On the smart city development side, there is the need to identify skills, i.e., the ability to perform certain tasks, connected to the competencies above described which, if put into practice, will create a path for defining, maintaining and adapting the system itself. Some basic skills, of an intrinsically social and innovative nature, are: knowing how to analyse and understand the context and the stakeholders that take part in the process of shaping and transforming the smart city; knowing how to involve the various social players through collaborative approaches aimed at achieving a common goal. This positively predisposes towards the creation of a real impact on society, with a view to continuous improvement or development.

3.1 Analysing the smart city context and stakeholders

At the basis of the human-centred design process, here applied to the smart city, there is the exploration and analysis of the context and the actors (human and non-human) involved in a specific service or in solving a given problem. Contextual analysis makes it possible to become aware and conscious of the dynamics and processes at work in each system, which define its overall structure, from a systemic perspective (Minati, 2001). These processes are the result of interactions between different stakeholders who collaborate or oppose each other for individual and/or collective purposes, based on a goal to be achieved, such as a specific smart city model to be developed. Since these relationships and interactions are not fixed and stable, but are subject to change, it is important, on the one hand, to apply critical thinking and initiate communication processes aimed at gathering the different points of view of those acting within the system, and, on the other hand, to be able to imagine and implement a problem-solving path capable of adapting and responding appropriately to the specific conditions generated from time to time by the system. This requires innovation and creative skills, as well as knowledge from multiple disciplines. It is evident that the competences identified by the '21st Century Skills' model, those of learning and innovation and professional and life skills, are essential in this framework. Digital skills are also important because, especially with reference to the smart city, we now live in a socio-technical system (Manzini, 2015), in which technologies, such as the Internet, but also and increasingly Artificial Intelligence (AI), interpenetrate the social system and are themselves part of people's lives and organizational systems of reference. In other words, they are part of society. In this scenario, it is appropriate to think in a systemic perspective and adopt

approaches suited to working and operating in complexity, such as human-centred design, which offers methodologies and tools designed for non-linear processes of value creation, both at the human and experiential level, and at the economic level. Such an approach is oriented towards the identification of the elements that make up a system and the type of relationships that exist between them, to understand what goals and objectives set and maintain these relationships. From this mapping of the system, it is possible to identify the challenges and opportunities that may present themselves to the various stakeholders and that, on closer inspection, derive from the structure of the system itself. Given that it is not possible to have a truly complete and total view of the system, this exercise makes it possible to outline strategies for action that consider the feasibility and desirability of a given intervention in the context of the smart city as much as possible. Since it is never a single element that determines the processes taking place in the smart city, but a set of concurrent causes and feedback loops, elements can emerge from the mapping process that require the involvement of different multidisciplinary fields, from which to draw knowledge and approaches to be adapted and declined even outside the rigid boundaries of the sector. In the systemic field, in fact, the mixing and 'contamination' of ideas is the key element that helps to observe a given problem or phenomenon from several points of view, and often to find innovative solutions, which break out and break the logic and the complex system of cross-references that has produced that given problem.

Although personal qualities of empathy, understanding of the other, open-mindedness, observation and inventiveness facilitate such a task, this competence and skill can be refined with experience and through continuous learning, as well as through the use of tools to support creative activity, such as those

offered by human-centred design, including the stakeholder map, which allows the realisation of a visual or physical representation of the different groups of actors involved in a given system, showing and tracking their relationships, interactions and interests (Stickdorn *et al.*, 2018).

3.2 Conducting research on (and with) people

Interventions that are conceived and developed within the smart city must primarily consider the requirements of the system's components. These requirements are based on the needs and expectations of the people who live, operate, and interact within the smart city. For this reason, once a situation has been identified, whether problematic or simply improvable or even emerging (due to the dynamics and processes underlying the system itself), it is essential to understand the real needs, the actual behaviour of people and the goals that guide their actions at an individual and community level, such as the supranational directives, largely traceable to the 'Sustainable Development Goals - SDGs'[3]. which push the smart city towards more ecological and sustainable models. Knowing how to conduct research on and with people is therefore important to create solutions that are coherent and satisfying for those who will use them on the one hand and those who will be affected by them on the other. To reinforce this concept, there is also the consideration that top-down solutions alone are rarely effective. This is because it is not the system itself that produces them, but a body that is considered external, and therefore not necessarily accepted by the community. On the contrary, in order to avoid situations of 'rejection' and failure (with the consequent loss of resources, first and foremost time and money), the involvement of the stakeholders is crucial, i.e., the

[3] https://sdgs.un.org/goals.

users and beneficiaries of the service, solution or intervention under consideration. Human-centred design offers countless tools and moments for discussion, collaboration, and feedback in this respect. Principally, we can identify two contrasting approaches, one in which people are involved in a more passive way, and one in which their active participation is at the centre of the design and creation process, applied in consideration of numerous variables, such as the degree of influence of the result on the lifestyle of the people affected by a given intervention. In the first case, people's needs and interests are collected through traditional social research tools, including questionnaires, interviews, focus groups, direct observation, etc., or through ad-hoc tests created for a specific field of interaction, such as usability tests of systems based on digital technologies aimed at the use by specific categories of users. Although this is the basis for human-centred design, it should be emphasized that the person remains an external subject to the whole process of definition, conception and realisation. In fact, his or her involvement is limited only to certain moments when the information available to him or her is either still vague even for the entire design team or has already been oriented in some way towards specific choices. In the second case, on the other hand, the participants, who are then also the ultimate users or beneficiaries of the solution or intervention, are involved on an ongoing and constant basis, albeit under the guidance of experts and facilitators. In this case, we use the term 'co-creation' (Sanders and Stappers, 2008), to refer to a collaboration that places all participants at the centre of the design and creation process, with a much greater decision-making weight and a much greater awareness of the designed solution, since the limits and motivations of the design choices are evident and comprehensible to the community concerned from the moment of their manifestation.

Undoubtedly, there is no one approach that is better or preferable to the other, nor clear boundaries between the two modes of user involvement. On the contrary, one must consider the space and distance between the two as a field of experimentation, in which different collaborative and participatory models are emerging and being adapted from time to time. In any case, knowing how to conduct research on and with people is a prerequisite for the sustainable development of the smart city, which presupposes the acquisition of numerous skills that, as we have seen, fall within the '21st Century Skills' (e.g., communication, collaboration, social and intercultural interaction, responsibility, etc.).

4. *The need for training young people for the development of a smart city*

The previous section focused on several basic skills useful for the development of a smart city, focusing on how an analysis of the application context, as well as the needs of the people who live in the city, is an essential element. In this section we would like to continue to explore the various skills needed for a smart city, on the one hand, and focus on those skills that it is particularly useful to develop in young people, on the other. The RE-EDUCO (*REthinking EDUcation COmpetencies, Expertise, best practices, and teaching in the Digital Era*)[4] project, financed as part of the Erasmus+ programme and aimed at enhancing the role of digital culture in the private and professional lives of young people, with the aim of boosting their chances of growth, has shown how smart cities represent an area in which it is necessary to train young people. From the experience of the international competition (i.e., the last

[4] Website: http://re-educo.eu/.

step of a training course on entrepreneurship aimed at high school students from Finland, Greece, Italy, Spain, and Cyprus), it clearly emerged how, through innovative learning methodologies, it is important to train young people in the correct design of the services of a smart city, given the centrality of the city in everyone's daily life. Three specific competencies will be explored in the following three sub-sections: 1. Understanding how to best integrate digital technologies in the development of the smart city, for the benefit of the citizen; 2. Understanding how to design and prototype the user experience within the complex system of city services; 3. Identifying the most appropriate way to translate innovative digital ideas into business solutions. These skills emerged from the experience of the two authors as tutors of the projects implemented by the Italian schools that participated in the RE-EDUCO international project competition.

4.1 Knowing and applying emerging technologies in a smart city

In section 2 of this article, it was argued that the idea of a human-centred smart city goes beyond the mere application of digital technologies to the urban context, focusing rather on the social, economic and environmental impacts of such processes. One of the necessary and increasingly in-demand skills in this area concerns knowledge of emerging digital technologies and their relative and appropriate application. This translates into the ability not to imagine an indistinct application of technologies, but to be able to foresee and guide the 'social' side of the implemented technological innovation.

There are numerous technologies and digital devices that make cities 'smart', integrated into urban spaces and public services, which have added complexity to the city itself. Today, the maximum reference of the implementation of digital technologies to

the context of smart cities is based on the application of the logic of the Internet of Things, i.e., the ability to transform common objects present in the urban context (through the integration of smart sensors and network technologies) into 'smart' objects capable of monitoring the city or automating certain urban processes (Talari *et al.*, 2017). The ever-increasing use of these devices leads to the production of a large amount of data (so-called Big Data), which nowadays represent an important value, both for the knowledge of the territory and for the prediction of specific phenomena soon. Without delving into issues relating to the privacy of data, which would require special treatment, the authors of this paper would like to emphasize here how skills are needed that focus on how to derive value from this data, including the use of artificial intelligence systems.

A central objective of training young people on these issues is not only to familiarize them with these technologies, but to understand how to adapt them to the objectives and the vision of a 'smart' city that one wishes to achieve (an objective that must, of course, be structured starting from the data gathered from an adequate analysis of the territory, its vocation, and the actors in it). The functioning and technical characteristics of these technologies should not, in fact, influence people's patterns of interaction with the city, but rather identify how they can be functional to improving people's experience with the city itself. Since, as mentioned, the integration of technologies in the city spaces adds complexity, the meaning of the city changes and people's experience itself becomes more complex (Curtis and Opromolla, 2019). In direct connection with this aspect, of particular importance is training oriented towards the design of services (which have digital technological systems at their base) that allow citizens to focus solely on achieving their goals, rather than on understanding how these technological systems work. If a system, therefore, is difficult to understand (e.g.,

because the interaction interface is inadequately designed), people will waste a lot of time understanding what the interface is asking for and what it wants them to do, rather than focusing on the end goal to be achieved. In this context, therefore, specific training on how to make designed services usable is crucial. Although in the following section we will elaborate on the theme of user experience, it is useful here to reiterate how, in an urban context characterized by the presence and integration of an ever-increasing number of technologies, training should also be oriented towards the capacity to make this experience as fluid and natural as possible.

An important consideration concerns the ways in which technologies can strengthen the city's social networks. Of course, here again, it is not technologies that create such interactions, since they can only intervene in a context where such networks are already in place (Bartoletti, 2000; Bartoletti and Faccioli, 2020). Lastly, a reference to data, which was partly alluded to in the first part of this paragraph to emphasize that the need for the smart city is not only to analyse the data collected through the various digital devices present in the urban environment and to draw useful information from these, but also to be able to adequately communicate this information, through the use of data visualization tools capable of creating comprehensible messages. The messages conveyed do not only have the objective of transmitting information, but in many cases have the potential to create new services or enable new processes, e.g., oriented towards strengthening social relations (Marinelli and Parisi, 2020).

4.2 Designing and prototyping the citizen experience in a smart city

A smart city that, as such, focuses on its human value and the social impact of the solutions it wishes to implement, must necessarily offer its citizens an experience of interaction with the

elements that make up its spaces and services, as positive as possible. This is important, as mentioned in the previous section, especially considering the presence of digital technologies. Providing a positive experience means understanding people's mental and cognitive models, as well as their needs, and designing urban services and spaces based on what emerges. This can only be achieved if one has the skills to conduct research with the potential users of the solution and the actors present in the territorial context, as already highlighted in section 3. Designing the experience therefore means identifying the objectives that, within a given context, users have, and organizing the flow of interaction with a service, a product, or the spaces of the city, based on this objective. This all refers to user experience (Norman, 1995). One of the capabilities required of those who design for smart cities is to think not only about the user experience with a specific space or service in the city, but to design considering that the user experience in an urban context occurs with multiple points of contact of the same service, considering the frequent intersection between different services and in light of the numerous stimuli and variables that in an urban context can come between the user and the achievement of his or her objective (Opromolla *et al.*, 2020). Only this enables the design and implementation of a complete and 'continuous' experience with digital and physical elements of the city. Considering this, another of the capabilities required of those who design for smart cities is to ensure that all the components of the city (services, structures, products with which people interact), whether physical or digital, are oriented towards conveying messages that make interaction as transparent as possible and support people in achieving these goals. Bolter and Grusin (1999) spoke of 'transparency of experience' in this regard. A practical example of what is shared here is the interaction in city spaces oriented towards the

achievement of specific destinations, a goal that can be made possible by a coherent and clear organization of the elements (physical and digital) of the city. Of course, this transparency in the experience of 'using' a smart city is only possible if one thinks about the experience of the different types of actors in the city and what issues they face. However, it must be emphasized that thinking about people's experience of the city does not only mean thinking about the mere practical-operational activities of using the city itself. It also means considering the properly emotional aspects of interaction. De Lange in his blog 'The Mobile City' speaks in this regard of affective smart cities, i.e., cities that also consider the emotional well-being of people, a goal to which digital technologies can contribute[5]. A particularly important concept is that of 'empathy', which from the perspective of designing interactive solutions indicates the ability to think about the users of such solutions, going beyond the collection of generic information about them, but focusing on the reason for their choices and actions, very often dictated not only by rational factors but also, precisely, by emotional ones. A particularly important design tool for designing an adequate user experience in smart cities is the User Journey Map, a tool that allows the visualization of the process that enables a specific user to reach a specific goal[6]. Thinking about the experience, from the perspective of this tool, means reflecting on the activities carried out by the user in each phase (therefore not only in the actual interaction phase with a service or system, but also considering what happens before and after this phase). For each phase, the User Journey Map makes it possible to reflect, both from the analytical point of view of the as-is and from the design point of view of the to-be, on the activities

[5] The Mobile City, http://themobilecity.nl.
[6] Gibbons S., Journey Mapping 101 (2018), https://www.nngroup.com/articles/journey-mapping-101/.

performed and the channels with which they interact, as well as on the emotional 'highs' and 'lows' of the interaction experience. Finally, analysing and defining the experience is not enough. In fact, it is necessary for the experience to be prototyped, i.e., tested, making it more concrete, before proceeding with the implementation of the associated physical and digital services. The main objective of using prototypes is to convey an idea of what is intended to be implemented in the design phase itself (possibly by identifying several alternative versions of a solution), to test a draft of the solution with potential users in terms of usefulness or ease of use.

4.3 Knowing how to translate the idea into a business project

Of course, the research and analysis phases of the social needs and requirements of a smart city are essential to the success of any development intervention, as is the design of the interaction underlying a digital (and other) product, service, or platform. However, a further aspect should not be overlooked, the project's ability to sustain itself and evolve over time based on a sustainable economic and governmental model. Indeed, there are three pillars on which a successful innovation rests: social desirability, technical feasibility, and financial sustainability (Brown, 2009).

Consequently, it is necessary to know how to translate the idea into a business project, i.e., into a part of the complex system that will integrate and interact with the rest of the initiatives and socio-economic models present in the specific context within a smart city. The creation of the business is by no means disconnected from the rest of the design process. On the contrary, social desirability and technical feasibility are constituent elements that take on a long-term perspective precisely because of the business idea that connects and contains them. This is well

evidenced by another typical tool of human-centred design, namely the business model canvas (BMC), which facilitates the translation of the service concept into a business process consisting of specific components (or blocks) that are distinct but at the same time strongly interconnected (Osterwalder *et al.*, 2010). Although each block is fundamental to the creation of a sustainable business, the one that appears central within this contribution, as well as in the canvas itself, is the block dedicated to the value proposition, i.e., the way in which the offer is created that connects the customer to the market through the satisfaction of the needs of the specific user segment and the resolution of any problems that emerge in the attainment of a specific objective by the potential customer. This approach makes it possible to build a proposal that is of real interest to the person, creating real value in the relationship. Here again, the importance of acquiring social mapping and collaboration skills emerges, as described in section 3 of this article.

Created in 2010, over the years the business model canvas has been adapted and declined according to the contexts of its application, adding, or modifying some of its building blocks. These include models that emphasize the creation of environmentally and socially sustainable businesses, precisely in the interest and welfare of society. Beyond the professionalism and technical knowledge required in the conception and running of a business, the basic skills required for this type of action include much of the leadership and initiative skills that apply as much to entrepreneurship as to active citizenship. In fact, as already mentioned, in the smart city more and more forms of public-private partnerships are emerging, aimed not only at making a profit, but at achieving a common good, also by forming partnerships with citizens or involving citizens in various forms of investment and fundraising. Therefore, it is appropriate, especially

for young people, to acquire knowledge, skills and abilities in the economic and financial spheres that can be considered professional and life skills, with positive impacts both at public and social level, as well as at private level.

5. Conclusions

The aim of this contribution was to reflect on a few skills considered necessary for the development of a smart city. The aspects addressed have no claim to being exhaustive but are to be considered as examples of a model that is to be proposed as a conclusion to the path taken in this contribution. This model, still to be considered at a basic level, was developed from the experience as tutors of the two authors of this article within the RE-EDUCO project. In following the students in the formulation of their 'smart city' project, the authors noted the need to train new professionals in the design and implementation of services for smart cities, considering three main assets, profoundly linked to one another:

- the technological one, since cities can clearly improve people's lives through the application of technologies,
- the social one, linked to the guarantee of a positive experience of interaction with the city (also and especially through digital technologies),
- the economic one, linked to the guarantee that technological and urban development ideas do not remain as such, but are transformed into projects.

These three assets correspond to the three skills discussed in section 4, which are considered particularly important for the training of future smart city professionals (hence young people) as

they are considered strategic for the type of smart city proposed here.

Apart from the type of skills needed and how the assets to which these belong are linked to each other, the model must also reflect on the training process that enables young people to acquire these skills. In general, it is important that this process is not based on traditional formal courses, but on participative approaches focusing on practice-oriented knowledge. Among the main tools we can identify:

- school workshops, oriented towards understanding the functioning of technologies and the construction of entrepreneurial ideas,
- territorial workshops that, through the involvement of different actors (first and foremost those who govern the territory and those who already play an active role in it, such as regularly formed neighbourhood committees), enable a connection with real reference contexts,
- meetings with companies and economic realities in general, to understand not only the services and products that these companies offer, but also possible business models oriented towards the growth of the territory.

These tools are not to be considered as separate, but in connection with each other. From a certain point of view, they are themselves part of the smart city development process and a manifestation of the skills acquired by a specific community. Indeed, their dual function of education and production of a result that generates a social impact should be emphasized. Figures such as facilitators and moderators are fundamental in this training model. Their specific characteristics change depending on the context and the specific tool used.

In conclusion, these activities are indeed opportunities for training and skills development, but they can already be

considered part of a process of implementing these skills that, if repeated, will produce increasingly fruitful and favourable results for the development of the smart city.

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