TeMA

Journal of Land Use, Mobility and Environment

The climatic, social, economic and health phenomena that have increasingly affected our cities in recent years require the identification and implementation of adaptation actions to improve the resilience of urban systems. The three issues of the 16th volume will collect articles concerning the challenges that the complexity of the phenomena in progress imposes on cities through the adoption of mitigation measures and the commitment to transforming cities into resilient and competitive urban systems.

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Laboratory of Land Use Mobility and Environment
DICEA - Department of Civil, Architectural and Environmental Engineering
University of Naples "Federico II"
Piazzale Tecchio, 80
80125 Naples
web: www.tema.unina.it
e-mail: redazione.tema@unina.it

The cover image shows the building of Kharkiv National University of Civil Engineering and Architecture, destroyed as a result of a missile and bomb attack. March 2022 (Source: STRINGER/Reuters/Forum. https://www.pism.pl/publications/sweden-on-the-russian-aggression-against-ukraine)

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REVIEW NOTES – Urban development and NextGenerationEU

The interventions of the Italian Recovery and Resilience Plan: digitalization in cities

Sabrina Sgambati [a*], Tonia Stiuso [b]

Department of Civil, Architectural and Environmental Engineering
University of Naples Federico II, Naples, Italy
e-mail: sabrina.sgambati@unina.it
ORCID: https://orcid.org/0000-0001-8900-278X
*Corresponding author

[b] Department of Civil, Architectural and Environmental Engineering
University of Naples Federico II, Naples, Italy
e-mail: t.stiuso@studenti.unina.it
ORCID: https://orcid.org/0009-0006-2474-8138

Abstract

Starting from the relationship between urban planning and mobility management, TeMA has gradually expanded the view of the covered topics, always following a rigorous scientific in-depth analysis. This section of the Journal, Review Notes, is the expression of a continuous updating of emerging topics concerning relationships among urban planning, mobility and environment, through a collection of short scientific papers. The Review Notes are made of five parts. Each section examines a specific aspect of the broader information storage within the main interests of TeMA Journal.

This section of the Review Notes deals with the new frontiers of urban development through the lenses of the European program NextGenerationEU.

In particular, this contribution deepens the topic of digitalization in urban areas within the framework of the Italian National Recovery and Resilience Plan. It provides an overview of the proposed reforms, strategies and interventions to boost the digital economy and digitalize public services within the urban context.

Keywords

Digitalization; Innovation; Smart city; Italian Recovery and Resilience Plan.

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1. Digitalization as a new frontier of urban development

The recent global experience of COVID-19 has imposed new challenges for cities (Lai et al., 2020; Bailey et al., 2021), accelerating already ongoing processes such as the digital transition (Allam & Jones, 2021; Fernandes, 2021), which has confirmed its role as a key factor for urban development (Dana et al., 2022). Since the 1990s, the diffusion of innovative means of communication and new technologies triggered renewed competitive processes in cities that have evolved till today, generating new models of economic organisation and social interaction, and configuring a new field of competition, in which cities positioned themselves as attractive and highly competitive poles (Gargiulo et al., 2022). As a result, cities have adapted to the new demands of digitalization as demonstrated by the growth of the information sector and the knowledge economy in the urban economy (Raspe & Van Oort, 2006; Yigitcanlar et al., 2008), as well as the rise of paradigms such as that of the smart city (Aldegheishem, 2019). Regarding the diffusion of the knowledge economy as one of the main pillars of economic development, many soft factors of urban systems have flanked and, to a certain extent, prevailed over the infrastructural component that in the past influenced the establishment of industrial and production activities (Malecki, 2002). Among these soft factors, it may be cited the digitisation of institutional structures, as well as the availability of innovative technologies, or the presence of qualified, educated and skilled workforce, and, finally, innovation in the academic and research centres.

The paradigm of the smart city refers, at first glance, to the possibility, in urban environments, to optimise and improve citizen livability, services and infrastructures thanks to technological innovation (Halegoua, 2020). However, this definition is reductive if we do not consider that a smart city is also and above all a sustainable, efficient and innovative city (Guida, 2021), capable of guaranteeing high levels of quality of life for its citizens thanks to the use of connected and integrated solutions and systems (Batty et al., 2012). In smart cities, digitalization goes hand in hand with innovation, and both are key elements for human, social and economic development (Kim et al., 2021). The binomial innovation/digitalization, in this sense, acquires great importance in cities as a synonym for the efficiency of services, businesses and authorities that are part of the city system and that contribute to the livability of the urban environment. Furthermore, digital technology facilitates participatory urban planning, making people active agents of city's transformations (Granier, 2016).

Another recent aspect of digitalization in urban areas is the digital twin model that can be considered an innovative model of urban planning combining innovations in digital technology with urban operational mechanisms and intelligent control platforms (Allam & Jones, 2021; Fistola & Rastelli, 2021). The physical city is recreated in the digital space, allowing for simulating the effects of phenomena and transformations and, thus, providing feasible solutions for urban upgrading.

In summary, the promotion of digitalization can generate added value on multiple levels, such as economy, mobility, environment, governance, safety, competitiveness and, in broad terms, quality of life of citizens. Specifically, the desirable results of this promotion concern:

- the promotion of technological solutions to improve the services offered to businesses at the urban level and simplify administrative procedures for the development of new business initiatives;
- the promotion of transformation to attract digital nomads;
- the improvement of the relationship between the public administration and citizens throughout more efficient and rapid means of private/public dialogue, both for facilitating decision-making and for simplifying the actions of private actors;
- the digitalization of existing services to support citizens and economic actors;
- the rationalization of the technological infrastructure to guarantee interoperability and accessibility to ICT services;
- the use of technological and digital resources to strengthen the mobility system and the existing urban networks, (optical fibers, broadband, water network, etc.) making them more sustainable and efficient;

- the realization of urban planning tools easily interpretable and interchangeable, as well as, the promotion of digitalization in governance processes;
- the improvement of ecosystem services throughout innovation and digitalization of such services, e.g. temperature or energy monitoring systems for public buildings, sensors to reduce network dispersion, innovative lightening systems, monitoring systems for waste collection, and so on;
- the monitoring of pollution and air quality through the improvement and digitalization of existent services;
- the increase of urban safety through the diffuse use of surveillance systems, monitoring systems of road safety, early-warning systems linked to the specific risks insisting on the territory, and so on;
- the sharing of demographic and spatial data useful for decision-making in business strategies and investments;
- the digitalization of the touristic services offered by the city.

2. Digitalization in the NGEU program and the Italian Recovery Plan

As mentioned, the Covid-19 pandemic forced countries and territories to reimagine and revamp their development pathway, giving a further boost to digitalization. In Europe, the Next Generation EU program aims at making European countries greener and more resilient, and, inherently, more digital (European Commission, 2021).

A significant portion of NGEU funding has been allocated to sustain digital transition, throughout innovations that are able to enhance citizens' welfare and economic preparedness. For what concerns the case of Italy, the digitalization sector has been included among the fields of investment of the Italian NRRP (Governo Italiano, 2021), covering a total budget of €48 billion, absorbing about 27% of the total amount of resources (Openpolis, 2021). The proposed strategies are structured along 2 main axes: (i) digital infrastructure and ultra-broadband connectivity; (ii) the digitalization of the public administrations.

Particularly, the Mission 1- M1 "Digitalization, innovation, competitiveness, culture and tourism" includes investments for a total budget of € 40.29 billion, distributed among 3 components which aim to relaunch the competitiveness of Italy by enhancing the connectivity, the digital performance, and the innovation of several economic sectors. This mission is structured in different components, some of which deal with the digital transition in urban environment. Firstly, the Component M1C1 of the plan delas with innovation, digitalization and security of public administrations, providing a total budget of €10 billion. Secondly, the component M1C2 deals with the digitalization, innovation, and competitiveness of the production system, allocating €27.47 billion. The third component (M1C3) is "Tourism and Culture 4.0" and promotes interventions to renew the touristic and cultural sectors, through the use of, inter alia, digital technology, by allocating € 6.08 billion. From the available documentation it is not possible to understand how the resources will be distributed in the different territories. The available data about the regional distribution of funding concern ultrafast connections, whose allocation has been affected by the differences in the availability of adequate domestic connections emerged during the pandemic. The regions that benefit most are Calabria, Puglia and Sardegna.

Investment	Resources (€ billion)
Plan "Italia 1 giga"	3.8
Plan "Italia 5g"	2.02
School system connection	0.261
Healthcare system connection	1.80
Cloud migration of Public Administrations	1.00
Services and digital citizenship	2.01

Tab.1 the investments for digitalization in the National Plan for Recovery and Resilience (Source: Openpolis https://www.openpolis.it/i-nostri-open-data-per-il-monitoraggio-del-pnrr/)

In conclusion, although the territorial dimension is not predominant in the Italian NRRP, digitalization is being one of the main components of territorial competitiveness for Italy, and cities, as main competitors in the international market, should adapt to the prominent digital evolvement. The development of smart, innovative and sustainable models of growth is one of the main challenges that our cities are called upon to face in the coming years. The investments of NRRP in the digital sector should be managed by policy-makers with a renovated attention to territories and, in particular, urban areas that, thanks to their characteristics and resources can sustain the digitalization itself. In this regard, the plan includes some measures that deal with the digitalization of public entities and services. Digitalization at the policy-level should be accompanied by integrated actions at the urban and metropolitan scale in different sectors (economic, social environmental, and so on) considering both private and public initiatives. In the following tables, there are some of the proposed measures within the framework of the NRRP, that are basically linked to the territorial scale.

Digitalization, Innovation and Cyber-Security of PAs

In this table, some of the main investments of the component M1C1, referred to mission M1, are reported, including both reforms and measures. One of the investments provided by this component is at the national scale and aims to develop a National Digital Data Platform to ensure the interoperability of public data, thus allowing also local institutions, at the city level, to provide safe services in a faster and more effective way and dialogue with national data systems. The funding is accessible by Central public administrations, Metropolitan Areas, Regions, Provinces, and the budget is €556 million. Another important measure of the mission M1C1 is the construction for the Single Digital Gateway, with an investment of €90 million. It tries to respond to the increased mobility needs of European citizens and businesses, being an incentive to modernize public administration and to develop e-government strategies to improve relations with users. A portion of funding is dedicated to the creation of a digital system for production and construction activities, to ensure machine-to-machine communication between the ICT systems of different municipalities. €813 million are destined to improve the citizens experiences of public digital services by defining and promoting the adoption of proven and reusable models; on the other side, €80 million are dedicated to the improvement of accessibility of digital public services through the dissemination of shared tools among Regions, Metropolitan Areas, and Municipalities. The mission provides funding also for the strengthening of the Public Administration website against cyber threats, such as fraud, blackmail, and terrorist attacks and all the risks posed by cybercrime.

MaaS – Mobility as a Service

This investment promotes the adoption of the model "Mobility as a Service" (MaaS) involving Regions and Metropolitan areas, with the Department of Digital Transformation as main implementing body. This model is based on a global concept of mobility, that provides the integration of multiple services of private and public transport thanks to a digital channel. The cities that have been selected as leaders of the project are Milan, Naples and Rome, along with the later occurred Bari, Florence and Turin, with a total budget of €56.9 million. Through the implementation of digital platforms, which combine various functionalities and guarantee different travel alternatives, the project aims at supporting users in planning, booking and paying mobility services according to their needs, in a faster and more effective modality. The platform will cover different modes of transport, such as public transport, car sharing, bike sharing, and taxis. It includes three lines of intervention:

- applying the model to territories: laboratories will test MaaS services through the introduction of digital platforms, new business models, data sharing and interaction between different subjects offering mobility services, assessing the impact on the environment and the socio-economic context;
- creating an open platform ("Data Sharing and Service Repository Facilities - DS&SRF"): this technological infrastructure will be built to ensure effective interaction between multiple operators in the sector and to establish a single national access point to the set of transport and mobility data. The platform will also enable a range of services including enabling the choice of possible travel options and facilitating booking and payment;
- enhancing the digital dimension of public transport for the dissemination of MaaS in selected territories by enabling digital payment services, user information systems and travel booking services.

Therefore, the first phase will finance experimentation in technologically advanced metropolitan cities. In this phase, it will be essential to identify territories with different characteristics to make them testing laboratories where to test the services themselves and the interaction between the various subjects that can offer mobility services.
An effective MaaS service can become an indispensable tool for driving the city towards more sustainable transport modes, a better organization of services, a more effective management of urban space, and improvements in urban planning choices.

"Mobility as a Service for Italy" will lead to the growth and improvement of the transport sector, to offer users an increasingly simplified and accessible experience, and providing alternative modes of transport to the private car through innovation. Public policies will be able to achieve significant results in terms of the homogeneity of the service offered to citizens, economic development for involved businesses, and benefits for the community and the environment. This would have horizontal benefits on competitiveness of territories where these services will be activated. All in all, it can generate benefits not only for users and the public sector but also for the digital economy companies active in the field of transport, thanks to the openness to innovation.

Digital strategies for cultural heritage

The investment M1C3 aims at filling the digital gap of cultural subjects and at supporting local entities in the conservation of heritage, museums, libraries, and so on. This line of action is structured in multiples sub-investment regarding: i) cultural services; ii) the development of R&D sector within the field of cultural heritage; iii) the scientific empowerment of data systems regarding cultural heritage; iv) the improvement of the accessibility to digital cultural services; v) the reduction of inefficiency and costs of management throughout the rationalization of informative systems; vi) the simplification of the relationship between public subjects, citizens and firms.

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Author's profile

Sabrina Sgambati

She is an engineer, Ph.D. student in Civil Systems Engineering at Department of Civil, Architectural and Environmental Engineering of University of Naples Federico II. Currently, her Ph.D. research concerns the topic of urban competitiveness.

Tonia Stiuso

She is a master's degree student in Building Engineering-Architecture at the Department of Civil, Architectural and Environmental Engineering of the University of Naples Federico II.