3 Platforms, design and technology

Venanzio Arquilla and Benedetta Rotondo

Abstract The phenomenon of digital acceleration we are currently experiencing must necessarily come to terms with what will be the level of acceptance of this infiltration. It is very important to understand the interaction between user, technology and space. Design has an important role to play in re-imagining projects by focusing on community participation and involvement, working on systems with a more beneficial impact, and building new services that dialogue with communities and the territory.

Keywords Smart cities · Digital transition · Platforms for sustainable evolution · Space-human-technologies · Phygital experiences

3.1 Introduction

Today, the future of urban society is gaining increasing interest due to the many nationally and internationally agreed goals and strategies. For example, Sustainable Development Goal 11 of the United Nations 2030 Agenda promotes more inclusive, safe, resilient, and sustainable cities (Caprotti, 2018a; Caprotti et al., 2017). Urban centres with advanced infrastructures and services adapted to new lifestyles and citizens' needs countering exclusion and addressing environmental issues related to pollution and climate change (Moreno et al., 2021).

New technologies play a crucial role in achieving this mission, improving the quality of life, and ensuring a better future for the planet and the next generations. The Fourth Industrial Revolution of the 21st century has led to countless technological innovations, such as artificial intelligence (AI), virtual reality (VR) and the internet of things (IoT), which are increasingly merging with spheres of urban life (Allam et al., 2022; Ross & Maynard, 2021).

In this future digital vision, addressing the overall sustainability issue is relevant. The implementation of these new technology platforms will have to ensure significant benefits for local communities to justify the initial environmental impacts and substantial development costs. All innovations involve sacrifices; the point is to know how to manage them and make the actors understand the potential of the introduced solution.

3.2 Digital acceleration and smart cities

Digitisation means the implementation of digital technologies within everyday life. In the city context, digitalisation has been shown to offer significant advantages in energy and resource management, economic development, housing, community engagement, mobility and healthcare (Barcik et al., 2022).

The advent of Covid-19 accelerated the digital transition: smart cities where new technological solutions are implemented for the benefit of citizens and the environment, a development strategy that takes advantage of rapid data processing and the availability of Big Data (Caprotti, 2018b).

Specifically, the European Union defines smart cities as: “A place where traditional networks and services are made more efficient with the use of digital solutions for the benefit of its inhabitants and business. A smart city goes beyond the use of digital technologies for better resource use and fewer emissions. It means smarter urban transport networks, upgraded water supply and waste disposal facilities and more efficient ways to light and heat buildings. It also means a more interactive and responsive city administration, safer public spaces and meeting the needs of an ageing population” (European Commission, 2022).

Currently, the concept of smart cities can be achieved through the wide availability of internet of things (IoT) devices with the ability to collect, analyse and distribute data in real time. In addition, IoT devices are expected to exceed 75 billion by 2025, and internet speed is also predicted to increase with the advent of 6G mobile connectivity technology (Moreno et al., 2021).

3.3 Digital limitations

With the previously mentioned high maturity level of technological developments and digitalisation, it is increasingly difficult to distinguish the real from the simulated. Thus, we are witnessing the phenomenon of *phygital*, a neologism born from synthesising the terms "physical" and "digital." *Phygital* relates to general connectivity in which everyday objects are interconnected and connected to the environment, gathering information from it and adapting their performance. The physical and the real do not simply complement but reinforce each other (Carella et al., 2019).

In this context, an interdisciplinary approach with service designers, product designers, interaction designers, architects, and ICT experts is essential to create new experiences and interactions between man, machine and space, three entities that are increasingly in dialogue with each other (Carella et al., 2019).

Moreover, there is a significant digital divide within smart cities between people with access to technology and information and those with very limited or almost no access: elderly vs young, urban vs rural, rich vs poor, educated vs less educated, etc. As a result, a significant portion of the population needs to take advantage of all the urban services provided. Those most affected are the elderly: not being digital natives, they find new technologies challenging to understand and refuse to use them (Baltac, 2019).

According to data collected by Eurostat[1] in 2018, the percentage of Europeans between the ages of 55 and 74 who have never used the Internet is about 11%. Inclusiveness is a crucial concept: new digital cities must ensure that everyone, including the poor, disabled and elderly, can access digital platforms

[1] https://ec.europa.eu/eurostat

(Baltac, 2019). The goals of intelligent urban governance involve promoting digital inclusion fostered by a robust broadband connection, ensuring digital literacy and the proper technical support, and providing devices and materials designed for self-sufficiency and participation (Kolotouchkina et al., 2022).

3.4 Top-down and bottom-up approaches

Nowadays, urban design has a more top-down orientation where the "experts" in the field make decisions from above and approve or reject the proposed urban plans. In this model, the State and companies seek to impose information and communication technologies on the urban landscape without involving citizens (Burns & Welker, 2022).

The bottom-up approach, on the other hand, aims to rethink the city "from below" by involving residents first-hand in the implementation of new urban initiatives. In this way, the opinions and needs of users, the end users of spaces, are considered. The limitations encountered in this case are the lack of interest in the projects and the systemic and cultural backwardness in the digital field, as highlighted in the previous section (Burns & Welker, 2022).

A winning strategy in the rethinking of Smart Cities consists, therefore, of the combination of the two mentioned approaches: top-down and bottom-up. Fair cooperation between public administration and the local community would lead to more flexible and personalised services to improve cities' economic, social and environmental well-being (Semeraro et al., 2020).

3.5 Designing the proximity[2]

Following this in-depth overview of the problems and strategies that have to be considered and addressed in order to rethink the city of the future, several reflection questions emerge. What is intended by the proxemic city, and what implications does it entail? How will mobility, related to the concept of physical and relational distance, change? What services can digital platforms provide to local communities, and how can they be integrated into the urban context? How can design increase citizen participation in urban evolution?

Cristiana Favini, Chief Design Officer & Strategist at Logotel[3], reminds us that design plays a vital role in rethinking urban spaces. "Designing proximity"

---

[2] For the Milan Design Week 2021, a series of talks were organised on the topic "Designing the proximity" thanks to the collaboration between BASE Milano and POLI.design, together with the Department and the School of Design. Specifically, this section collects interesting reflections and insights that emerged during the panel "Design, platforms and economies of proximity" moderated by the professors Venanzio Arquilla and Francesco Zurlo.

[3] Logotel is a company that provides services and expertise on an international level, from strategy to field implementation, combining different disciplines and skills.
https://www.logotel.it/

means creating new projects that stimulate citizen participation and services that dialogue with communities and the territory.

In this process, the design must consider and explore four fundamental dimensions: ethical, aesthetic, conversational and cultural. This implies the creation of digital platforms that are accessible to everyone, intuitive, with which the user can easily dialogue and interact. Stefania Mandini, full professor at the University of Milano-Bicocca, makes us reflect on the acceptance of these new smart devices, especially for elderly people. In the design phase, it is essential to put the user, the main driver of the process, at the centre and to create ad hoc interfaces with a clear and simple language in which the technology is aesthetically integrated and hidden in the final product. Moreover, at the ethical level, it is important to emphasise the value of data transparency: if the users are aware of the hidden dynamics behind the technologies, they will also be able to accept them and use them without fears. In the cultural sphere, on the other hand, we find the concept of phygital acculturation: we should not risk tending towards deculturation, introducing transversal solutions that may suit different countries, but focus on customisation, i.e. on understanding the needs of the individual community with its traditions and habits. Every culture requires a different interface, and technology must be ready and flexible to adapt to different contexts (Carella et al., 2019; Zurlo & Arquilla, 2019).

Another important aspect to consider when designing emerged in the dialogue with Simone Tani, a public policy expert. He says that over time people's needs change; therefore, it is essential to have the ability to understand them and develop new opportunities in line with those new needs. He brings up the example of municipal markets, characteristic of Italian history, which have been reduced with the advent of shopping malls. The concept of marketplace, as a meeting and gathering place, integrates the economic aspect with the social one and it is well suited for integration with digital platforms. Simone is working with the municipality of Milan to stimulate the repopulation of some abandoned areas of the city by creating a recovery accelerator for shops, systems of lasting proxemic relations.

An interesting case study was presented by Paolo Barbato, CEO and co-founder of Wiseair[4]. An innovative startup that offers air quality monitoring services within municipalities. A platform that collects and provides real time data to public administrations to detect and take timely action on pollution. They started a process of change that actively involves citizens without imposing themselves on public administrations. On their side they have, therefore, the main stakeholder who trusts the new technology, the ethical acquisition of data and takes personal action for the well-being of the society.

Another relevant topic is how the mobility of the future will evolve and how distances within cities will change. Among the experts in the field, Alberto Pigna of Enel X Srl[5] argues that mobility will be more and more sustainable, but

[4] https://wiseair.vision/

[5] Enel X Srl is a new division of the Enel Italia SpA group, which promotes digitisation, sustainability, and innovation in the energy sector with the aim of improving the energy

also connected and hyperconnected. People's way of life will vary, and transits from one place to another will be faster and more efficient. An interconnected, multimodal, systemic, pure service dimension will characterise a remarkable cultural change.

Finally, Marzio Riboldi of the Midea group[6] highlights how electric vehicle technologies are enabling a major transformation in the architecture of the car. Thanks to the electric motor and micromotors, we will be able to experiment with new configurations, moving away from the classic idea of a four-wheel vehicle with a steering wheel. In this way, user-machine interaction will also evolve, we will have the opportunity to carry out more activities in different positions, not just sitting.

3.5 Conclusions

Enzo Manzini[7], in his book "Inhabiting Proximity", explains that it is difficult to predict the future situation because there are so many scenarios and economies that are colliding. However, three possibilities can be hypothesised: "The first is the so-called smart city that preserves the idea of the city of high-tech distances; the second, on the other hand, is the city of zero minutes, where everyone stays at home, and everything comes home, in which the function of the city is completely lost. And finally, a proximity scenario understood as proximity where the things we need are nearby and our neighbors make sense to us. We will have a relationship with them, so functional proximity but also relational proximity."

Designing the 15-minute city or the proxemic city is a concept that has been around for a long time and is gaining importance recently. The idea comes from Carlos Moreno, a professor of humanities at the Sorbonne in Paris, and is based on three basic pillars: community, curation and digital innovation. He envisions urban centres where citizens do not have to travel by car, but can reach all necessary services (healthcare, cultural venues, stores and schools) in a maximum of 15 minutes on foot or by bicycle (Giovani 2030, 2021).

Physical proximity, given by the proximity of spaces, is also linked to relational proximity. People have more opportunities to meet, support each other, share and collaborate to achieve common goals. The implementation of this new model, however, entails a major cultural change and the breaking down of the inequalities that characterise society. The 15-minute city cannot be the prerogative of only a few privileged urban areas, but must be a right of all citizens.

Ezio Manzini, argues that physical and relational proximity are essential aspects for the future. Although we cannot design relationships, it is possible to

---

efficiency of homes, promoting electric cars, charging stations and WallBoxes (a device that connects to household electricity and transmits it through a special cable to the electric car). https://www.enelx.com/it/it

[6] Midea Group is a leading global robotics and automation technology company https://www.midea-group.com/

[7] Enzo manzini is an honorary professor of Politecnico di Milano, who has worked in design and sustainability for decades and started DESIS (an international network of schools aiming for social and sustainable innovation).

imagine various conditions, platforms, and contexts that foster user interactions. As designers, therefore, we must focus on relationships and identify those elements that enabled them.

The post-pandemic society has realised the importance of proximity services and is ready for change. More participative, inclusive, digital and sustainable cities are on the horizon. In this future *phygital* context, the designer takes into account ethical, aesthetic, conversational and cultural dimensions in order to promote integration and dialogue between citizens, space and technology (see Figure 1.1). A strategic design that has proximity as its object, considers the needs and culture of individual users and encourages natural and transparent interactions between man and machine (Ludiero, 2022; Manzini, 2022).

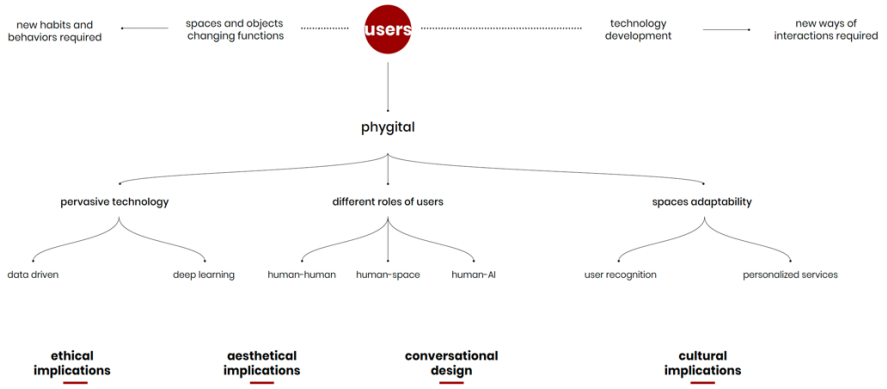

Figure 1.1: Main drivers and elements to consider in designing a future phygital experience (Zurlo & Arquilla, 2019).

3.6 Eco-digital-human future cities (future scenario)

In the possible scenario of the future city, technologies will increasingly play a major role in improving the lives of citizens and countering serious environmental issues such as pollution and climate change. With more humanised and dialogic technology, more inclusive and accessible platforms, it will be possible to make all residents participate in the sustainable development of the community. The co-design of services will help this digital transition and acceptance process by fostering dialogue between citizens, technologies, and urban contexts.

References

Allam, Z., Sharifi, A., Bibri, S. E., Jones, D. S., & Krogstie, J. (2022). The Metaverse as a Virtual Form of Smart Cities: Opportunities and Challenges for Environmental, Economic, and Social Sustainability in Urban Futures.

Smart Cities 2022, Vol. 5, Pages 771-801, *5*(3), 771–801. https://doi.org/10.3390/SMARTCITIES5030040

Baltac, V. (2019). Smart Cities—A View of Societal Aspects. *Smart Cities 2019, Vol. 2, Pages 538-548*, *2*(4), 538–548. https://doi.org/10.3390/SMARTCITIES2040033

Barcik, P., Coufalikova, A., Frantis, P., & Vavra, J. (2022). The Future Possibilities and Security Challenges of City Digitalization. *Smart Cities* , *6*(1), 137–155. https://doi.org/10.3390/SMARTCITIES6010008

Burns, R., & Welker, P. (2022). Interstitiality in the smart city: More than top-down and bottom-up smartness. *Https://Doi.Org/10.1177/00420980221097590*, *60*(2). https://doi.org/10.1177/00420980221097590

Caprotti, F. (2018a). Future cities: moving from technical to human needs. *Palgrave Communications*, *4*(1), 1–4. https://doi.org/10.1057/s41599-018-0089-5

Caprotti, F. (2018b). Future cities: moving from technical to human needs. *Palgrave Communications 2018 4:1*, *4*(1), 1–4. https://doi.org/10.1057/s41599-018-0089-5

Caprotti, F., Cowley, R., Datta, A., Broto, V. C., Gao, E., Georgeson, L., Herrick, C., Odendaal, N., & Joss, S. (2017). The New Urban Agenda: key opportunities and challenges for policy and practice. *Urban Research & Practice*, *10*(3), 367–378. https://doi.org/10.1080/17535069.2016.1275618

Carella, G., Arquilla, V., Zurlo, F., & Tamburello, M. C. (2019). Phygital experiences design. *Design e Tecnologie. Design, Robotica e Mondo Macchinico Nell'età Del Post-Umano.*

European Commission. (2022, December). *Smart cities*. https://commission.europa.eu/eu-regional-and-urban-development/topics/cities-and-urban-development/city-initiatives/smart-cities_en

Giovani 2030. (2021, December 20). *Agenda 2030: le città del futuro | Giovani2030*. https://giovani2030.it/iniziativa/agenda-2030-citta-inclusive-sostenibili-e-sicure/

Kolotouchkina, O., Barroso, C. L., & Sánchez, J. L. M. (2022). Smart cities, the digital divide, and people with disabilities. *Cities*, *123*, 103613. https://doi.org/10.1016/J.CITIES.2022.103613

Ludiero, A. (2022, March 15). *"Abitare la prossimità. Idee per la città dei 15 minuti" di Ezio Manzini*. Pandora Rivista. https://www.pandorarivista.it/articoli/abitare-la-prossimita-idee-per-la-citta-dei-15-minuti-di-ezio-manzini/

Manzini, E. (2022). *Livable Proximity: Ideas for the City that Cares - Ezio Manzini*. https://books.google.it/books?hl=es&lr=&id=QChcEAAAQBAJ&oi=fnd&pg=PT15&dq=future+citY%3B+PROXIMITY%3B+DESIGN+&ots=mQZ8jBvhIG&sig=-FaycCE0mguFWKgjIDnXjmgnxSM&redir_esc=y#v=onepage&q=future%20citY%3B%20PROXIMITY%3B%20DESIGN&f=false

Moreno, C., Allam, Z., Chabaud, D., Gall, C., & Pratlong, F. (2021). Introducing the “15-Minute City”: Sustainability, Resilience and Place Identity in Future Post-Pandemic Cities. *Smart Cities 2021, Vol. 4, Pages 93-111*, *4*(1), 93–111. https://doi.org/10.3390/SMARTCITIES4010006

Ross, P., & Maynard, K. (2021). Towards a 4th industrial revolution. *Https://Doi.Org/10.1080/17508975.2021.1873625*, *13*(3), 159–161. https://doi.org/10.1080/17508975.2021.1873625

Semeraro, T., Zaccarelli, N., Lara, A., Cucinelli, F. S., & Aretano, R. (2020). *A Bottom-Up and Top-Down Participatory Approach to Planning and Designing Local Urban Development: Evidence from an Urban University Center*. *9*(4), 98. https://doi.org/10.3390/LAND9040098

Zurlo, F., & Arquilla, V. (2019). *Phygital acculturation*.