## Chapter 9

# The city as a system of places: smart placemaking for future cities

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## Abstract

Placemaking plays a crucial role in enhancing the quality of life in cities, necessitating a holistic approach and the incorporation of smart strategies. This study addresses the gap in existing research by exploring the integration of systems thinking and systems integration in smart placemaking within cities to make the placemaking more resilient, connected, and smart. The city is viewed as a system of interconnected and integrated smart places, where attractions, communication hubs, public spaces, and infrastructures seamlessly connect. The outcomes of smart placemaking include economic prosperity, environmental sustainability, health and well-being, safety and security, cultural preservation, innovation, and resilience. The research develops a framework that highlights the interconnectedness and interdependencies between systems thinking, systems integration, and smart placemaking. The framework provides guidance for city planners, urban designers and policymakers in implementing effective strategies for creating vibrant, inclusive, and sustainable public spaces within the broader context of a smart and interconnected city.

Keywords: smart city; system of systems; systems thinking; systems integration; smart places; Smart Placemaking.

## Introduction

Placemaking has emerged as a fundamental approach to the transformation of urban spaces into vibrant, inclusive and more liveable environments. It emphasises the importance of designing and managing public spaces that promote social interaction, cultural expression and a sense of identity and belonging (Khemri *et al*., 2020). As cities face increasing challenges in terms of population growth, environmental sustainability and technological advances, there is a growing need to adopt a holistic view and incorporate smartness in placemaking strategies (Javidroozi et al., 2015). This is crucial in order to create cities that are enjoyable, healthy, secure, safe, sustainable and resilient for their residents and visitors. While extensive research has been conducted on placemaking, the integration of systems thinking and systems integration with the placemaking agenda remains relatively limited. There is a gap in understanding how these concepts can be effectively applied to create smart and connected public spaces within cities. Therefore, this chapter aims to bridge this gap by exploring the connections between systems thinking, systems integration, and placemaking in the context of smart cities.

This chapter therefore reviews the existing literature on three core concepts: systems theory, systems thinking, and systems integration, along with the emerging field of smart cities. In examining these concepts, they are connected to the practice of placemaking and the concept of ‘smart placemaking’ is developed. This concept considers the city as a system of interconnected and integrated smart places, where technology, sustainability, community engagement and systems thinking converge to create vibrant, inclusive and resilient urban spaces. aim

The aim of this research is to develop a framework that highlights the relationships and interdependencies between systems thinking, systems integration and smart placemaking. By synthesising the findings from the literature review, the research provides a

comprehensive understanding of the key components and principles necessary to create smart and connected public spaces within the larger urban system. This framework will serve as a guide for city planners, urban designers and policymakers in more effectively implementing smart placemaking strategies and contributing to the overall wellbeing and sustainability of cities.

In the following sections, the literature on systems theory, systems thinking, systems integration, and smart cities will be reviewed. The chapter then connects these concepts to the practice of placemaking, exploring how they can be integrated to create the concept of ‘smart placemaking’ within the broader framework of a city as a system of interconnected and integrated smart places. Through this research, I aim to contribute to the development of knowledge and practices in urban design and planning, paving the way for the creation of smarter, more liveable cities in the future.

## Background

*Systems theory*

There are numerous definitions of the term ‘system’. For instance, Machol (1965), Emery (1969), Checkland (1981, 1999), Laszlo and Krippner (1998), Backlund (2000) and Stichweh (2011) have all provided definitions of the term. For example, Machol (1965) conceptualises a system as an operational entity that undergoes varying states over time in response to both external and internal forces, employing the Markov chain theory to describe its continuous evolution. Emery (1969) defines a system as a collection of interdependent components forming an integrated whole, emphasising their interaction and interrelation within the entirety. Similarly, Checkland (1981, 1999) centralises the idea of a system around interconnected elements that collectively exhibit properties distinct from those of their individual parts, reflecting properties inherent to the whole. Laszlo and Krippner (1998) view a system as a complex interplay of components and their relationships, forming a boundary-maintaining entity or process. Backlund (2000) characterizes a system as an assembly of interacting elements held together by relationships. Stichweh (2011) extends the understanding, framing 'system' as the subject of a scientific discipline concerned with the comparative study of various systems. This indicates that the concept of ‘system’ has been studied and analysed extensively, and that there is no single, universally-accepted definition of the term. Each of these authors has contributed to the understanding of systems and how they operate, and their definitions are useful in different contexts and applications. Overall, the varying definitions of ‘system’ reflect the complexity and versatility of the concept, which can be applied in a broad range of fields, including engineering, biology, social sciences and management.

Nevertheless, the various definitions of the term ‘system’ all share a common thread. They view a system as a collection of interconnected components that work together dynamically towards a common goal or purpose. This aspect of interconnectivity is seen as a defining feature that sets a system apart from a mere collection of individual components. This concept is also supported by the principles of systems thinking and systems theories, particularly General Systems Theory (GST) (Bertalanffy, 1968). The GST proposes that a system is an entity composed of interrelated components that exhibit properties and behaviours that cannot be understood by examining each component in isolation. Instead, understanding a system requires analysing the relationships and interactions between its components.

Based on GST, which is a transdisciplinary approach for understanding complex systems, all systems, regardless of their domain, share common features and can be studied as an entity. GST proposes that systems are made up of interrelated components, and their

emergent properties and behaviours cannot be comprehended by analysing each part in isolation. Instead, the entire system must be examined, taking into account the relationships and interactions between its parts. GST also highlights that systems exist in a hierarchy of nested systems, with each level possessing its own unique emergent properties and behaviours. For instance, an organism can be viewed as a system composed of cells, which are systems made up of molecules, and so on. Furthermore, GST asserts that systems are open, which implies that they interact with their environment and exchange matter and energy with it. This interaction with the environment can result in feedback loops, where the system's output influences its input, affecting the system's behaviour over time. Feedback loops can either be positive or negative, resulting in either reinforcing or balancing behaviours within the system (Bertalanffy, 1968; Checkland, 1981, 1999).

This way of thinking provides a useful framework for understanding the complex, interdependent systems that exist in cities, such as transportation, healthcare, education, energy and communication networks, as well as efficient, attractive, modern and inter-connected places within cities, which facilitate social interaction, improve public health, enhance local economies and provide a greater sense of community pride and identity.

*Systems thinking*

Systems thinking is an interdisciplinary approach to understanding complex problems by recognising the interconnectedness and relationships between various components of a system. It emphasises the system's behaviour as a whole and involves identifying feedback loops and behavioural patterns that can influence the system's overall behaviour. In other words, systems thinking is a process of thinking that emphasizes the interconnection and interrelatedness of various components of a system (Checkland, 1999). This approach suggests that changes or improvements made to one part of a system can affect other parts of the system and, therefore, the components of a system cannot be considered separately. Many studies have utilised systems thinking to study various systems such as information systems, enterprise systems and change management (e.g. Kettinger et al., 1997; Pahl-Wostl, 2002; Mingers & White, 2010; Antonelli et al., 2013; Cordeiro De Paula & Pereira Dos Santos, 2019; Setiawansyah et al., 2021) It has also been used to develop organisational change theory (Deming, 2000; Seddon, 2008).

There are four fundamental concepts in systems thinking: emergent properties, layered structure, communication processes and control. Emergent properties refer to the phenomenon where the whole entity generated by the aggregation of unique properties has something more than the mere sum of its components. It is the relationship between the elements that generates a whole entity that can achieve the observer's goal, which cannot be achieved by the collection of parts. For instance, the departments of an organisation have their own properties, but when they link and work together, the emergent properties of the entire enterprise emerge. The integration of this interconnection provides seamless exchange of information and business processes. This same concept can also be applied to cities. Currently, city services cannot be delivered by discrete agents, organisations or sectors, because the systems within cities are closely interrelated. Therefore, many factors must be considered to provide and deliver services to citizens (Javidroozi *et al*., 2019a). For instance, although it can be in favour of the citizens, a municipality should not suddenly decide to bring in new amenities such as playgrounds, benches and public art in a low-income neighbourhood to revitalise a public space, without understanding the inhabitants' concerns and priorities. To appropriately reach such a decision, a large amount of data and considerations from numerous departments such as transport, healthcare, security, energy, as well as the community, need to be considered to allow the usefulness and impact of the new developments to be effectively assessed. This uncomplicated instance exemplifies the importance of the correlation and amalgamation required between the city sectors and their corresponding systems. The second fundamental concept of systems thinking is a stratified

arrangement, implying that the ‘whole’ entity, such as the enterprise and the city, comprises smaller ‘wholes’ within them. As a system of systems, the city evidently encompasses multiple sectors, comprising several organisations and departments that are considered smaller ‘wholes’. Consequently, the idea of stratified arrangement is pertinent to both the city and the enterprise. The final two core tenets of systems thinking are also indispensable in both the enterprise and the city to adapt and endure in the contemporary dynamic business and living milieu. The capacity to control change and adaptability in cities can only be accomplished by transforming the method of city operations to a modern and integrated approach that enables access to real-time data, effective communication among all departments, and timely decision-making (Checkland, 1999).

*Systems integration*

An entity that is composed of interrelated components is referred to as ‘intercommunicated’ and/or ‘interconnected’, but not necessarily ‘integrated’ (Davenport, 1998; Davenport *et al*., 2004). This means that the sub-systems or departments of a system can impact each other without being integrated as a whole, due to the absence of smooth information and process flow among them (Ackoff, 1981; Laszlo and Krippner, 1998). Therefore, an integrated entity, such as a city, must have sub-systems or components that interact seamlessly with each other, allowing them to be viewed as a single entity. As a result, an integrated system should be defined based on the principles of systems thinking and systems theory, particularly GST. Achieving this requires integrating sub-systems at both the information and process levels. Systems integration, therefore, is the process of enabling seamless intercommunication throughout the sub-systems of an entity. By using systems thinking, planners and designers can develop holistic solutions that take into account the interconnectivity and dynamic behaviour of these systems, ultimately leading to more effective and sustainable outcomes (Chen *et al*., 2008; Grabot *et al*., 2008).

Javidroozi *et al*. (2014) assert that successful systems integration requires consideration of the three key elements of people, process, and technology, which have been identified as integral components of a system (Figure 1). They support their argument by referencing Singleton's (1974) definition of a system and Grover *et al*.'s (1995) identification of these elements as organizational sub-systems. In addition to these components, data alignment and sharing among various systems components is another aspect that would be enhanced through the systems integration process.

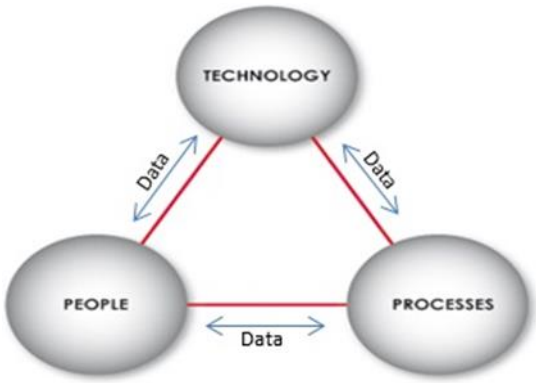


Figure 1: Key elements of systems integration

Given that systems integration can significantly enhance performance, a sufficient and appropriate change in all aspects of the entity, such as a city, is required. Therefore, the key elements of systems integration are the main components that require change and improvement. To facilitate successful implementation of this change, entities need to have

prepared and enthusiastic people, supported by appropriate technology (Ramamoorthy *et al*., 1992). Importantly, during the systems integration process, all operations and circumstances of business strategy, which are created by business processes, are subject to change. Business processes, which are systematic rules connecting inputs to outputs in an organization to address business issues, are a crucial component of systems integration. Other components, such as people, management, roles, tasks, information flow and technology, add value to inputs and generate outputs, such as products and services, for customers (Javidroozi *et al*., 2019b).

## Smart cities – smart everything

Cities consist of many interconnected sub-systems, such as healthcare and transport, that cannot function separately. These components must be connected to each other to improve the overall quality of public spaces and liveability. Even if each component operates flawlessly, without interconnection and interrelatedness, the entity as a whole cannot provide efficient and effective services. Managing changes in a city requires managing the entity as a system, so that changes can be adaptive and integrated rather than reactive and distributed.

Hence, cross-sectoral collaboration is essential in the development of smart cities. Whilst technology plays a crucial role in the transition from traditional services to smart city services, it is important to recognise that technology alone is not sufficient. Liu and Peng (2013) and Marciniak and Owoc (2013) emphasise that technology is merely an enabler. In the development of a smart city, every aspect of the city should embrace smartness. This includes the involvement of people, businesses, technology, processes, data, infrastructures, consumption, spaces, energy, strategies, and management. These components should be interconnected, leveraging each other's data, supporting one another, and minimising waste. This concept, often referred to as 'smart everything', is highlighted in earlier research such as Townsend (2013) and Medina-Borja (2015). To achieve this interconnectedness and maximise the benefits of smart city initiatives, a systems thinking approach is necessary.

A systems thinking approach recognises the interconnectedness and interdependencies within a system. As Checkland (1981, 1999) suggests, everything within a system is related to everything else. Therefore, to bring about improvements and changes in the whole system, it is crucial to ensure that all components are connected and aligned. This principle applies to the city as a 'system of systems', where various sectors and systems within the city need to be interconnected and coordinated. Davidson and Venning (2011) emphasise the importance of systems thinking in comprehending the complexities of a city and viewing it as a system of systems. This perspective acknowledges that a city comprises multiple systems (sectors) that operate together, utilising their own data, processes, technologies, and human resources to improve performance and achieve shared goals.

### *Smart placemaking*

The notion of placemaking has been fully covered in the previous chapters, and it was identified that placemaking plays a crucial role in creating vibrant and liveable cities, and its significance becomes even more pronounced in the context of smart and sustainable cities (Courage, 2020). Placemaking involves the intentional design and development of public spaces that reflect the needs and aspirations of the community. It aims to create places that foster social interaction, cultural expression and a sense of identity and belonging (Toolis, 2017).

In the context of smart and sustainable cities, placemaking becomes essential for several reasons. First, following the requirement of smart cities explained above, placemaking ensures that technology is integrated thoughtfully into public spaces, creating an environment that is not only technologically advanced but also functional, inclusive, and aesthetically pleasing. By incorporating smart features such as interactive displays, smart lighting, and Wi-Fi connectivity, placemaking can enhance the user experience and provide valuable services to the community (Freeman *et al*., 2019; Sanaeipoor and Emami, 2020). Secondly, placemaking can contribute to sustainability goals by incorporating eco-friendly design principles and promoting sustainable practices. This may include incorporating green spaces, integrating renewable energy sources, implementing rainwater harvesting systems and designing for efficient use of resources (Ghavampour and Vale, 2019). By creating sustainable public spaces, placemaking encourages environmentally responsible behaviour and contributes to the overall sustainability of the city.

Furthermore, placemaking in smart and sustainable cities promotes social equity and inclusivity. Enabled by digital technology, it ensures that public spaces are accessible and welcoming to people of all ages, abilities, and backgrounds. Considerations such as universal design, equitable access to amenities and the integration of diverse cultural elements can help to create an inclusive environment that fosters social cohesion and equal opportunities for all community members. Additionally, placemaking in smart and sustainable cities recognises the importance of community engagement and participatory processes. It involves actively involving residents, businesses, and other stakeholders in the decision-making and design processes. By engaging with the community and considering their input and feedback, placemaking can address local needs and aspirations, resulting in public spaces that truly reflect the identity and character of the city.

Hence, in the context of smart and sustainable cities, placemaking becomes even more crucial for creating vibrant, inclusive, and functional public spaces. It ensures that technology is integrated appropriately, promotes sustainability, fosters social equity, and engages the community in the process. By prioritising placemaking in smart and sustainable city development, we can create cities that are not only technologically advanced but also liveable, resilient, and harmonious for their residents and visitors, and at the same time contributing towards developing a holistic view for a city from all aspects of liveability including smart, sustainable, and green agenda, using systems thinking approach (Javidroozi *et al*., 2023).

Accordingly, placemaking in a city should also be smart, meaning that it works as an integral part of the whole city to create an intentional and inclusive design and management of public spaces within the context of a smart city. In smart placemaking, the focus is on leveraging technology as an enabler to improve the functionality, accessibility, and overall experience of public spaces. This includes incorporating features such as smart lighting, interactive displays, Wi-Fi connectivity and real-time data to enhance user convenience, safety and engagement.

Moreover, smart placemaking embraces a systems thinking approach, recognising the interconnectedness of various components within a public space and their influence on the larger urban system. It seeks to align the design and management of public spaces with the broader goals and strategies of the smart city, promoting integration, collaboration, and optimisation. It provides a holistic approach to the design and management of public spaces. By considering the interconnectedness of elements in a system, systems thinking helps to create public spaces that are designed and managed in a way that considers the interplay between the physical environment, social dynamics, and technology.

Emergent properties, layered structure, communication processes and control are fundamental concepts of systems thinking that can be applied to placemaking. Placemaking,

as an application of systems thinking, recognises that a city is a complex system composed of interconnected sectors and departments. The concept of emergent properties highlights that the whole city system has properties and behaviours that go beyond the sum of its individual components. Similarly, in placemaking, the design and management of physical spaces must consider the interconnections and integration of various factors and sectors within the city (Henshaw, 2019; Mingers and White, 2010).

Placemaking acknowledges the need to address the specific needs and characteristics of these smaller systems within the larger urban context. For example, different organisations within a city play distinct roles in the development and maintenance of public spaces, and placemaking requires coordination and collaboration among these entities. The concepts of communication processes and control in systems thinking emphasise the importance of effective information exchange and decision-making within a system (Checkland, 1999). In placemaking, this means facilitating seamless communication and collaboration among different city sectors, departments, and stakeholders. It involves leveraging real-time data, enabling efficient decision-making, and adapting to changing conditions.

By applying systems thinking concepts, placemaking can effectively address the interconnectedness, integration, and adaptive capacity required in the design and management of public spaces. Application of systems thinking recognises the need for holistic approaches that consider the emergent properties of the city system, the layered structure of its subsystems, and the necessity of effective communication and control processes. Ultimately, systems thinking supports the principles of placemaking and the integration of various components and systems to create vibrant, inclusive, and sustainable urban environments.

Hence, drawing upon the foundational principles of systems thinking, the application of these principles can yield a multitude of favourable outcomes within the domain of placemaking, encompassing various key aspects as follows:

- Holistic perspective: systems thinking provides a comprehensive view of public spaces as complex systems, rather than just physical locations. This holistic perspective helps to identify and understand the inter-related components of a public space and how they affect each other;
- Sustainability: systems thinking helps to create public spaces that are sustainable by considering the impact of human activities on the environment and the interplay between the environment and technology. For example, systems thinking can help to design public spaces that use renewable energy sources, reduce waste, and conserve resources;
- Community engagement: systems thinking recognises the importance of community engagement in the design and management of public spaces. By considering the social dynamics of a public space, systems thinking can help to create spaces that are inclusive and foster positive social interactions;
- Resilience: systems thinking helps to design and manage public spaces that are resilient in the face of change and disruption. By considering the interplay between the physical environment, social dynamics, and technology, systems thinking helps to create public spaces that can adapt to change and continue to meet the needs of users;
- Technology integration: systems thinking can help to integrate technology into public spaces in a way that enhances the user experience and fosters positive social dynamics, while also considering the potential impacts on privacy and the environment. This is the main point that connects smart city requirements and place making.

These are the main emergent properties when systems thinking is applied for placemaking. Hence, the sustainability, smartness and citizens' experience will be enhanced, and city will become more liveable, responsive, and resilient to changes.

*The city as a system of smart places*

Smart placemaking is crucial for creating vibrant, inclusive, and sustainable public spaces within a city, as discussed above. These smart places are designed and managed in a way that leverages technology, sustainability, community engagement and resilience to enhance the overall urban experience. However, it is important to know that a city is not just a collection of individual smart places but should be viewed as a system of interconnected and integrated smart places.

A city as a system of smart places means that each individual smart place within the city, whether a park, a transportation hub, a cultural centre or a commercial district, is connected and integrated with other places and systems in the urban environment. This connectivity and integration are achieved through systems integration, which involves bringing together key components and elements (Javidroozi *et al*., 2014, 2023).

Systems integration in the context of a city encompasses various aspects. First, it involves the integration of technology across different smart places, enabling seamless connectivity and data exchange. This could include the integration of smart sensors, Internet of Things (IoT) devices and data platforms that facilitate real-time information sharing and analysis (Abdel-Aziz *et al*., 2016). Secondly, systems integration considers the integration of processes and operations across smart places. It involves coordinating and aligning activities, services and resources among different places to ensure efficient and optimised functionality. For example, transportation systems can be integrated with public spaces to enable convenient and sustainable mobility options for residents and visitors (Javidroozi *et al*., 2019a). Thirdly, systems integration encompasses the integration of stakeholders and communities. It involves fostering collaboration and engagement among various actors, such as government entities, businesses, community organisations, and residents. This integration ensures that the diverse needs, perspectives, and aspirations of different stakeholders are considered in the development and management of smart places. Furthermore, systems integration addresses the importance of data integration and interoperability. It involves harmonising data from different sources and systems within smart places, allowing for holistic insights and analysis. This integration of data supports informed decision-making, performance monitoring, and the delivery of efficient and effective services across the city (Javidroozi et al., 2015).

Hence, a city can be viewed as a 'system of smart places' that highlights the interconnectedness and integration of various elements and systems within the urban environment. Systems integration plays a crucial role in connecting and integrating smart places, enabling seamless communication, data exchange, and collaboration. By embracing systems integration, cities can achieve the full potential of smart placemaking, creating a cohesive and dynamic urban system that enhances the quality of life for its residents and visitors. In addition, systems integration offers a seamless connectivity, coordination, and integration of various physical city places, including attractions, communication hubs, infrastructures, and other key places (Couper *et al*., 2023; Dai *et al*., 2017; Lew, 2017). It involves bringing together these diverse elements to create a cohesive and efficient urban environment:

- Attractions and Cultural Centres: systems integration ensures that attractions and cultural centres within the city, such as museums, theatres, and art galleries, are connected with other places and systems. This can involve integrating ticketing and

scheduling systems, providing real-time information on events and exhibitions, and facilitating collaborative programs and initiatives between different cultural entities;

- Transportation Hubs: systems integration plays a crucial role in transportation hubs like airports, train stations, and bus terminals. It involves integrating various transportation systems, including ticketing systems, scheduling systems, and real-time information displays, to ensure seamless connectivity and efficient passenger flow. Additionally, integrating these hubs with surrounding attractions and services can provide convenient and integrated mobility options for residents and visitors;
- Public Spaces and Parks: systems integration in public spaces and parks involves connecting various systems and amenities. This can include integrating smart lighting systems, surveillance systems, and environmental monitoring systems to enhance safety and security. Integration can also involve providing real-time information on park events, activities, and facilities through digital platforms or interactive displays, enhancing the user experience and engagement;
- Communication Hubs: places within the city that serve as communication hubs, such as community centres, libraries, and information centres, can benefit from systems integration. This may involve integrating communication technologies, digital information systems, and interactive displays to provide access to information, services, and resources. Integration can also facilitate community engagement, allowing residents to participate in decision-making processes and access civic services;
- Infrastructure: while infrastructure itself may not be considered a place, systems integration plays a vital role in ensuring that infrastructural elements, such as smart grids, transportation networks, and utility systems, operate in a coordinated and efficient manner. While systems integration enables real-time monitoring, data exchange, and decision-making to optimise the performance, sustainability, and resilience of the city's infrastructure, it should also help integrate all other places across the city to be seamlessly connected, use each other's data and integrate their processes to provide efficient and on-time services for citizens and visitors.

This discussion leads to the development of a conceptual framework for smart placemaking (Figure 2):


Figure 2: A framework for the city as a system of smart places

This framework represents smart placemaking and requires the application of both systems integration and systems thinking. Systems integration ensures the seamless connectivity and coordination of various elements within a city, such as attractions, communication hubs, public spaces, and infrastructures. It involves integrating technologies, processes, people, using flow of data among them to create a cohesive and efficient urban environment. Systems thinking provides a holistic and interdisciplinary approach to understand the interconnectedness and relationships between these elements. It considers the interplay between the physical environment, social dynamics, technology, and sustainability. By combining systems integration and systems thinking, smart placemaking can create vibrant, inclusive, and sustainable public spaces that enhance the quality of life for residents and visitors, while fostering resilience, safety, security, social cohesion, and efficient resource utilisation within the larger urban system.

## Conclusion

This chapter has explored the integration of systems thinking and systems integration in the context of smart placemaking within cities. By reviewing the literature on systems theory, systems thinking, systems integration and smart cities, a framework was developed that highlights the interconnectedness and interdependencies between these concepts. Through this investigation, several key findings and contributions have emerged.

First, the concept of smart placemaking emphasises the importance of considering the holistic view of cities and integrating technology, sustainability, community engagement, and systems thinking in the design and management of public spaces. This approach promotes enjoyable, healthy, secure, safe, sustainable, and resilient cities.

Secondly, the city can be viewed as a system of interconnected and integrated smart places, where various elements, such as attractions, communication hubs, public spaces, and infrastructures, are seamlessly connected and integrated. This understanding highlights the significance of systems integration in creating cohesive and efficient urban environments. Furthermore, the framework provides a comprehensive understanding of the relationships between systems thinking, systems integration, and smart placemaking. It serves as a valuable guide for city planners, urban designers, and policymakers to implement effective strategies for creating vibrant, inclusive, and sustainable public spaces within the broader context of a smart and interconnected city.

However, this research has certain limitations. The exploration of systems thinking and systems integration in the context of smart placemaking is a relatively new field, and further empirical research and case studies are needed to validate and refine the framework proposed. Additionally, the practical implementation of smart placemaking strategies may face challenges related to funding, stakeholder engagement, and regulatory frameworks, which require further investigation and analysis.

To advance this field of research, future studies should focus on empirically evaluating the effectiveness of the framework in real-world settings. Case studies and comparative analyses can provide valuable insights into the practical application and outcomes of smart placemaking initiatives. Moreover, exploring the social and cultural dimensions of smart placemaking, as well as the long-term impacts on community well-being and urban sustainability, would be valuable areas for further research.

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