



<https://doi.org/10.66428/ijppv16i02a004>

Smart City Trajectories and Urban Contexts: A Comparative Analysis of Dublin, Barcelona, and Lisbon

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Keywords: Smart Cities, Actually Existing Smart Cities, Comparative Urban Policy, Contextual Analysis.

Abstract: The global diffusion of smart cities is often accompanied by narratives of technological neutrality and policy transferability. However, critical urban scholarship has shown that smart city initiatives are deeply embedded in specific geographical, socio-economic and institutional contexts. This article advances this perspective through a comparative analysis of Dublin, Barcelona and Lisbon, examining how contextual dimensions influence the governance and evolution of smart city policies and projects. Drawing on the literature on smart cities and comparative urban policy, the article conceptualises context as an explanatory dimension. It develops an analytical framework structured around two interconnected dimensions: the contextual conditions of urban smart and digital transformation and the trajectories of smart city policies and projects. Despite structural similarities as second-tier European metropolitan areas, the three cities display distinct, deeply context-embedded configurations. Dublin reflects a market-oriented and experimental approach, shaped by institutional fragmentation and a strong corporate ecosystem. Barcelona articulates a technopolitical orientation grounded in digital sovereignty and public leadership. Lisbon occupies an intermediate position, combining managerial administrative modernisation with entrepreneurial partnerships. This comparison shows that smart city policies and trajectories are strongly influenced by geographical, institutional and political-economical contexts.

1. Introduction

Over the past two decades, the “smart city” concept has become a dominant framework in urban policy discourse (Karvonen et al., 2018; Coletta et al., 2019a; Kitchin, 2022; Ward et al., 2025). The narrative often suggests that digital technologies and smart city initiatives can be implemented in a relatively standardised way across different urban contexts. Promoted by technology corporations and international institutions, smart city strategies are often presented as solutions to urban challenges such as traffic congestion, sustainability, economic competitiveness or administrative efficiency (Komninos, 2019; Kumar et al., 2020; Dahmane et al., 2025). Such initiatives are said to render cities more efficient, transparent or innovative, reflecting what has been described as a form of technological solutionism (Kitchin, 2014; Lombardi & Vanolo, 2015; Wiig, 2015; Tironi, 2019).

Critical scholarship, however, has not only challenged the optimistic assumptions surrounding the progressive outcomes of smart city initiatives, but also their implicit universalism. Recent research has emphasized that smart cities should not be understood as neutral technological upgrades, but rather as socio-technical assemblages embedded in specific economical, geographical, social and institutional contexts, shaped by asymmetrical power relations (Kitchin, 2015; Kitchin, 2018). Shelton et al.’s (2015) influential formulation of ‘actually existing smart cities’ argues that smart cities do not unfold as uniform and transferable global models. Instead, they materialize through situated processes of adaptation, negotiation and contestation that are deeply conditioned by the local context. Despite these advances, there remains a lack of comparative studies that explicitly foreground context as an explanatory dimension. This limitation was already highlighted by Kitchin, who stressed the need for “...comparative research that contrasts smart city developments in different locales...” (Kitchin, 2015: 133). Much of the existing literature either focuses on individual case studies or compares cities without developing a clear analytical framework in which context is considered a proper dimension. This article therefore attempts to provide an analytical framework in which local contingencies are believed to as structure smart city policies and trajectories, adopting a relational and processual view on these. The analysis therefore focuses on how contextual conditions enable, constrain and mediate different smart city policies and trajectories.

The main research question is: how do urban contexts shape smart city policies and trajectories? Through a qualitative comparative analysis of Barcelona, Dublin and Lisbon, the paper argues that smart city trajectories cannot be understood independently of the socioeconomic, geographic and institutional configurations within which they emerge. The objective is to examine how contextual conditions influence both the formulation and the implementation of smart city and digital urban policies (Reimer & Blotevogel, 2012; Reimer et al., 2014; McGuirk et al., 2021).

Barcelona, Dublin and Lisbon share structural similarities (Rodrigues, 2024). They are all medium-sized European metropolitan areas often described as “second-tier” cities within Europe. However, they differ significantly in terms of socio-economic structures, institutional and planning cultures. These differences provide a productive basis for contextual comparison, enabling an investigation into how cities operating at similar scales can nonetheless generate distinct smart city pathways. Building on this, the article develops and applies a two-dimensional analytical framework that articulates contextual conditions alongside smart city policies and trajectories. By conceptualising context as both an explanatory and structuring dimension, the analytical framework provides a basis for exploring how specific smart city configurations emerge across different urban settings.

The structure is as follows: Section 2 presents the methodological strategy. The analytical framework is presented and discussed in Section 3. Section 4 examines the contextual conditions of the three cities. The evolution of their smart city strategies and key projects is analysed in Section 5. Section 6 conducts a comparative analysis, introducing empirically derived regime categories that have emerged from the study. The article concludes by reflecting on the broader implications for smart city research and urban policy.

2. Methodology

The methodological strategy is based on triangulation, with different methods contributing towards different objectives. First, a literature review was conducted to inform the theoretical and analytical framework, as well as the literature on planning and smart cities in the three cities. A content analysis was also conducted on the local administrative websites, focusing on their documentary production relating to strategic documents and specific documents concerning their smart city policies. The most important smart city projects were then identified and examined through digital ethnography and fieldwork to understand their context and evolution. Finally, these data were complemented by interviews with technicians from the three local administrations focusing on their institutional context, planning and governance processes, strategic orientations, main policies and projects. Thus, the combination of these methodologies provides diverse data for different objectives, based on an interpretative and relational analysis. The three cases were examined using a common analytical framework while allowing for variations in the density and type of evidence available across dimensions and cases.

The period under review is similar across cities, though defined by their individual contexts and political cycles. Lisbon's analysis covers the 2007-2021 PS (Socialist Party) government period, which decisively shaped the city's trajectory. Barcelona's analysis begins with the Xavier Trias government (2011-2015) but focuses on the Ada Colau administration (2015-2023), which marked a significant shift in the city's smart city strategy and trajectory. Dublin's analysis begins with the fragmented projects of the early 2010s (Coletta et al., 2019a), before focusing on the creation of Smart Dublin in 2015, and concluding in 2023. Fieldwork was conducted in all three cities, with the longest and most extensive period in Lisbon (with a focus on 2018–2019), as well as two-month stays in Barcelona and Dublin in 2017. In each city, alongside other fieldwork and interviews, two interviews were conducted with local administrative staff and analysed for this article.

3. Analytical Framework: Actually Existing Smart Cities and Contextual Comparison

3.1 *Actually Existing Smart Cities*

Several studies have questioned the smart city as a unified, universally applicable model. The concept of 'actually existing smart cities' (Shelton et al., 2015; Wiig, 2015; Coletta et al., 2019a) has become particularly relevant in highlighting the frictional relationship between global approaches and local implementation (Tsing, 2005), as well as the fact that smart city projects are adopted within urban

contexts marked by path dependency. As stated by the authors: “(...) smart city interventions are always the outcomes of, and awkwardly integrated into, existing social and spatial constellations of urban governance and the built environment.” (Shelton et al., 2015: 14). Similarly, Kitchin (2015; 2018) emphasises that smart city initiatives are socio-technical assemblages constituted through networks of actors, infrastructures, regulations and discourses. These assemblages are embedded within pre-existing institutional arrangements and power relations, and “smartness” is constructed through negotiations among public authorities, private corporations, consultants, civic actors and other stakeholders.

Smart city policies and projects thus emerge through uneven, contested and contextually specific processes, with contextual embeddedness providing an important, although not exclusive, lens for understanding the phenomenon. This literature consequently calls for greater analytical attention to how smartness is constructed, by whom, and under which conditions. However, while the concept of actually existing smart cities highlights contextual embeddedness, it does not provide a systematic framework for comparing how different urban settings shape smart city policies and trajectories.

3.2 Comparing Smart City contexts

As Kitchin noted: “[t]he logic, drivers and deployment of smart city initiatives in different places is often quite varied.” (Kitchin, 2015: 134). Recognising this requires a comparative approach to examining how path dependency, planning cultures and varieties of capitalism shape distinct patterns of urban and economic development and, in turn, shape different forms of smart cities. Following Kitchin (2015), comparative studies can benefit from comparing both similar and contrasting cases. Focusing on similarities enables us to explore the specific dimensions of smart city initiatives, their impact on economic development and their governance regimes. Conversely, comparing significantly different cases reveals how “... smart city rhetoric and implementation are being produced and grounded in quite different contexts and the ways in which the concept travels and mutates.” (Kitchin, 2015: 135).

The present study draws on the problematisation advanced by Reimer and Blotevogel (2012) and Reimer et al. (2014) concerning the need, in comparative research on planning systems, to avoid the error of “... subordinating aspects of divergence and heterogeneity to those of convergence and homogeneity.” (Reimer et al., 2014: 1-2). This error often stems from methodological nationalism, which prioritises identifying structural homogeneities over contextual specifics and actual modes of action in defining planning systems.

Reimer and Blotevogel (2012) advocate combining the concepts of “planning systems” and “planning cultures” to produce a more comprehensive and concrete understanding of planning practices. According to the authors, this requires assigning greater explanatory weight to context, viewing planning practice as context dependent. This orientation emphasises the importance of identifying the main actors involved and the relations between them, its main interests and power relations, the resources and measures available, and the overall institutional framework (Reimer & Blotevogel, 2012).

In dialogue with this reflection, McGuirk et al., (2021) argue that urban governance strategies emerge through the interaction between contingency and strategy. According to the authors, smart cities arise at the intersection between intentional policy orientations and a set of contingent dimensions:

“Our argument here is that as political-economic aspirations, contending demands on city governance and material geographies are negotiated in the making of smart cities, processes that are piecemeal, opportunist and purposeful overlap and co-evolve. The strategic and the contingent intersect and co-evolve; indeed, formal strategy does not necessarily precede smart city governance, it may be forged post hoc.” (McGuirk et al., 2021: 2).

The authors therefore argue that smart cities do not result from closed conceptual models that are currently in circulation around the world. Instead, they emerge through a non-linear and recursive interplay between contextual conditions, ad hoc initiatives and evolving strategies, shaping distinct smart-city policies and trajectories (McGuirk et al., 2021). Taken together, these contributions reinforce the need to conceptualise context as a structuring dimension in the formation of smart city policies and trajectories.

3.3 Analytical Dimensions

Building on these insights, this article proposes the following two-dimensional analytical framework (Table 1):

Table 1 | Analytical Framework. Own elaboration.

<i>Analytical Dimension</i>	<i>Analytical Sub-Dimension</i>	<i>Main aspects considered</i>
1 Context	Geographical	Urban and regional context; scalar relations
	Socio-economic	Economic structure and development model; technological/digital sector
	Institutional	Institutional context and governance structure; planning competences
2 Smart city policies and trajectories	Institutional and governance frameworks	Governance structure; competences and resources
	Evolution of policies and projects	Strategy and contingency; main policies and projects
	Power relations and construction of digital/smart agendas	Public, private and citizen actors and their relations; dominant narratives and agendas

The first dimension, which is primarily self-explanatory, concerns contextual conditions and focuses on geographical, socio-economic and institutional contexts. These sub-dimensions allow for the characterisation of each urban setting in terms of its geographical context, economic structure and governance and planning configuration. The second dimension – smart city policies and trajectories – requires further clarification:

(1) Institutional and governance frameworks. This sub-dimension contextualises the history of urban policies in the cities under analysis, paying particular attention to their smart city governance models

and institutional arrangements. It involves a macro-level consideration of how smart city governance and policies have evolved and how were institutionally embedded.

(2) Evolution of policies and projects. This sub-dimension aims to identify and analyse the development of smart city strategies and projects over time, examining their emergence, transformation and consolidation within each city.

(3) Power relations and the construction of digital/smart agendas. This sub-dimension addresses the power relations operating within and across institutional settings, as well as the discourses and representations that shape the definition of smart/digital agendas. It considers how particular actors, interests and narratives become dominant in framing what counts as “smart”, thereby influencing policy priorities and project selection.

The interaction between these dimensions enables contextualised comparison, positioning smart city trajectories as emergent outcomes of specific urban contexts. This approach focuses on the dimensions themselves, which vary according to each city’s context. In other words, the degree of evidence for each dimension is specific to each city by its very nature.

4. Contexts in Barcelona, Dublin and Lisbon

The three cities under analysis present important structural similarities alongside significant differences (Rodrigues, 2024) – an aspect that enables both their comparability and the exploration of divergences in the hegemonic modes through which smart urbanism is articulated in each case. Barcelona, Dublin and Lisbon may all be situated within what has been described as a semi-peripheral position in the European urban and economic system (Tulumello, 2022). They belong to countries that were significantly affected by the 2007–08 financial crisis and subsequent austerity measures, which shaped their urban trajectories, particularly regarding housing, public investment and social inequalities. At the same time, they are also members of the European Union and possess relatively comparable metropolitan population scales, making them analytically comparable.

This section examines the geographic, socio-economic and institutional contexts of the three cities, presenting the structural and contingent conditions that shape the formulation and implementation of smart city policies and trajectories in each case.

4.1 Geographic Context

Barcelona, Dublin and Lisbon are often referred to as second-tier European cities within broader continental hierarchies, though they play significant roles within their respective national urban systems. However, important differences emerge regarding their national positioning and internal metropolitan weight (Rodrigues, 2024). While Dublin and Lisbon are national capitals, Barcelona, despite being Spain’s second-largest city and the capital of Catalonia, is not the capital of the Spanish state. This distinction has implications for political authority and the articulation of scalar governance. Dublin occupies a dominant position within Ireland’s urban system, concentrating around 40% of the country’s population - a situation described as ‘macrocephalic’ -, making it the uncontested economic and metropolitan centre. Lisbon dominates Portugal’s urban and metropolitan hierarchy, albeit within a more polycentric national urban structure. Barcelona, for its part, shares national prominence with Madrid and operates within Spain’s decentralised state structure. This structure is embedded in a

complex, multi-level governance framework, which is shaped by Catalan regional autonomy and long-standing tensions between regional and central institutions.

4.2 Socioeconomic Contexts

4.2.1 Dublin

Dublin's economic development has been shaped by a neoliberal national model since the 1990s (Kitchin et al., 2012; MacLaren & Kelly, 2014). As Coletta et al. (2019b: 352) observe, "[a] key factor in the revival of Dublin's fortunes was the adoption of entrepreneurial urbanism to stimulate property development and attract service-based foreign direct investment." This strategy involved an orientation to foreign direct investment, especially in technological sectors (Kitchin et al., 2012).

Dublin attracted major digital firms (Google, Amazon, Facebook, Airbnb), many based in the regenerated Docklands area – 'Silicon Docks' – where main smart city projects are located. The 2007–08 crisis exposed vulnerabilities in this model, triggering social and housing crises. Smart city policies gained renewed legitimacy as part of economic recovery. Dublin increasingly used smart urbanism to become more competitive, innovative and economically resilient, driven by the city's integration into global technological networks (Kitchin et al., 2012; MacLaren & Kelly, 2014; Rodrigues et al., 2022).

4.2.2 Barcelona

Barcelona and Catalonia are among Spain's most economically significant territories, with a strong industrial and commercial tradition (Casellas & Pallarès-Barbera, 2009; Pareja-Eastaway & Piqué, 2011). Following 1970s industrial restructuring, manufacturing activities relocated (notably from Poble Nou) and services expanded. From the 1980s onwards, Barcelona adopted a development model combining urban regeneration, tourism, the cultural economy and knowledge-intensive sectors.

Barcelona's technological ecosystem is less dominated by multinational corporations. While global firms are present, the city's economic ecosystem is characterised by the proliferation of small and medium-sized technology enterprises, many of which are associated with cooperative models and the social and circular economy (Fuster Morell & Espelt, 2018). The city hosts a dense network of makerspaces and digital fabrication centres (*Ateneus de Fabricació*) linked to the technopolitical orientation (Lynch, 2020).

Barcelona also stands out in its technological infrastructure, including extensive fibre-optic coverage, sensor networks in sectors such as mobility, waste and energy, and flagship urban regeneration projects like 22@ (Rodrigues, 2024). These infrastructural investments provide a material foundation for smart urban experimentation.

4.2.3 Lisbon

Portugal has a dual metropolitan structure centred on Lisbon and Porto, but Lisbon holds a stronger political and economic position, particularly in the tertiary sector (Marques et al., 2016). Since the 1970s, the city centre has lost demographic weight while service and knowledge-intensive activities have grown. Lisbon is a major contributor to the national economy, especially in service and digital sectors, accounting for around one third of GDP and employment.

The headquarters of many leading Portuguese digital economy firms are in Lisbon, and an active start-up ecosystem is promoted by explicit public policies (Carvalho & Vale, 2018). The annual Web Summit has further strengthened the city's international visibility as a digital innovation hub. Although Lisbon's technological infrastructure may be less developed than that of Dublin or Barcelona, the city has still experienced a notable level of digital integration (Rodrigues, 2024).

4.3 Institutional Contexts

4.3.1 Dublin

Dublin's metropolitan area is governed by four autonomous local authorities, resulting in fragmented urban governance. There is no single metropolitan authority with consolidated political legitimacy or executive power. Major strategic urban decisions are often taken at a national level (Moore-Cherry & Tomaney, 2019), which creates tensions between local and national governance. These local authorities have relatively limited powers and face financial and human resource constraints (Coletta et al., 2019b).

Within this institutional framework, smart city initiatives tend to align with broader strategic orientations centred on competitiveness, experimentation, and private-sector engagement (Kitchin et al., 2012; Kitchin et al., 2018; Coletta et al., 2019b; Rodrigues et al., 2022). Power relations within Dublin's smart city ecosystem reflect the centrality of private investment and comparatively limited citizen participation, with local authorities frequently acting as mediators.

4.3.2 Barcelona

The *Ajuntament de Barcelona* is the sole municipal authority for urban planning in Barcelona, enabling greater strategic coherence. However, the city operates within a multi-level governance system that includes the *Generalitat de Catalunya*, which has autonomous powers in relation to the Spanish state. It is also worth noting that the municipality has sufficient technical and financial resources necessary to define and implement relatively coherent digital strategies.

The "Barcelona Model" is central to the city's planning culture (Blanco, 2009; Degen & Garcia, 2012). Developed following the democratic transition, this model combines urban regeneration, multi-level governance, public-private partnerships, and participatory mechanisms. Barcelona's governance trajectory has historically combined strong municipal capacity with civic engagement, with the city's associative and sociopolitical context playing an important role. During Ada Colau's mayoral term, these dimensions were particularly evident during a period marked by citizen participation and the importance of the social and solidarity economy. During this time, smart city policies were reconfigured in accordance with these principles.

4.3.3 Lisbon

Lisbon has a single municipal authority responsible for urban planning. Although historically centralised, the city has undergone scalar recomposition over the past decade. Some competencies have been decentralised to parish councils and metropolitan articulation has been strengthened (Seixas et al., 2015; Vale et al., 2021). This institutional configuration facilitates the articulation of city-wide strategies.

While Lisbon's planning culture may not be as internationally codified as the "Barcelona Model", periods of political stability – notably under socialist municipal governance between 2007 and 2021 – have enabled the implementation of strategic visions. Public–private partnerships have become increasingly prominent, reflecting a governance configuration combining administrative coordination with entrepreneurial dynamics. Within this framework, Lisbon has developed internal digital urban platforms that are key to municipal management and autonomy, while also maintaining and fostering partnerships with private companies – something that marks its smart city trajectory.

5. Smart City Policies and Trajectories

Building on the contextual conditions examined in Section 3, this section analyses the evolution of smart city policies and trajectories in Barcelona, Dublin and Lisbon. The following two sections demonstrate that three distinct regimes of smart urbanism emerge: a market-oriented and experimental configuration in Dublin; a civic-technopolitical reorientation in Barcelona, particularly between 2015 and 2023; and a managerial governmentality configuration in Lisbon. These regimes should not be considered as normative ideal-types, but rather as descriptive syntheses that have emerged from empirical analysis (Rodrigues, 2024).

5.1 Dublin

Dublin's smart city initiatives have evolved in close articulation with the city's corporate technology ecosystem and Ireland's neoliberal political economy. Rather than being structured around a comprehensive municipal master strategy, smart urbanism has developed through dispersed projects and test-bedding projects and partnerships with private actors (Carvalho & Otgaar, 2016; Kitchin et al., 2018; Coletta et al., 2019b).

As Smart Dublin administrators stated in interview, Dublinked¹ was the catalyst for establishing Smart Dublin² as a formal entity comprising the four local authorities: "The background to that is that, before Smart Dublin was created, there was an open data portal, Dublinked.". Dublin's approach is represented by a public-private partnership involving local universities and companies such as IBM. Like Dublin Dashboard³, this initiative sought to enhance data availability and transparency, however it remained embedded within partnership logics with private actors. In this context, Smart Dublin primarily operated as a coordination platform rather than a centralised strategic authority (Coletta et al., 2019b). Smart Dublin's technicians also expressed this view, emphasising that Smart Dublin initially attempted to identify and reinforce existing city dynamics before developing a proper strategy based on them.

¹ <https://www.dublincity.ie/innovation-and-technology/dublins-smart-city-plans/dublinked> (last accessed at 20/08/2026).

² <https://smartdublin.ie/> (last accessed at 20/08/2026).

³ <https://smartdublin.ie/dublin-dashboard/> (last accessed at 20/08/2026).

This approach was also evident in previous projects. Open Challenges⁴ and Smart Docklands⁵ exemplify a model where start-ups and corporations test solutions in real urban settings, reinforcing the city as an innovation laboratory⁶ (Kayanan et al., 2018; Rodrigues et al., 2022). The Docklands have become the emblematic spatial anchor of this trajectory, with a concentration of smart city projects and an explicit framing of urban space as a site for experimentation and investment (Rodrigues et al., 2022). As Smart Dublin is the only entity shared by the four local authorities, questions arise regarding the power dynamics and different agendas in Smart Dublin's governance, with Dublin City Council potentially becoming central due to these agglomeration dynamics.

This trajectory is closely linked to limited local administrative capacity (Coletta et al., 2019; Rodrigues, 2024). Austerity measures following the 2007–08 financial crisis constrained municipal budgets and human resources, particularly with regard to highly skilled IT/Smart Cities workers. In this overall context, local authorities have often lacked the institutional autonomy and financial capacity to define and implement an integrated smart city strategy independently (Coletta et al., 2019b). Consequently, public–private partnerships are employed not only as implementation tools, but also as foundational governance arrangements. Private actors often provide technological expertise and financial investment, thereby strengthening their position (Rodrigues et al., 2022; Rodrigues, 2024).

This governance configuration creates dynamism (driven by private actors) but also fragmentation within the ecosystem. Dublin benefits from strong international connectivity and diverse smart city projects. However, the absence of a clearly defined municipal strategy makes it difficult to achieve coherence across projects and stakeholders (Coletta et al., 2019b). Furthermore, citizens play a relatively minor role in setting priorities, with the local administration primarily acting as a mediator between corporate entities and urban spaces (Kitchin et al., 2018; Coletta et al., 2019b; Cardullo & Kitchin, 2019). In line with this, the Smart Dublin institution technicians stated in the aforementioned interview that their governance model was not citizen-centred:

“We are not very citizen centric at the moment. We are not really talking to citizens. They are represented. So... the advisory network has citizen centric organisations who are on the network. So, they do feed in directly. And any citizen who goes onto the Smart Dublin website and email us... they want and have a question or ask to meet us to talk about something... that's available to them, but we haven't seen that much come through that way.”

In summary, Dublin's smart city policies and projects are driven by private actors or through public-private partnerships, with Smart Dublin playing an essential mediating role rather than setting the agenda.

⁴ Nowadays, it continues in the logic of a "pilot projects call" <https://smartdublin.ie/smart-docklands-call-for-pilots-2024-now-open/> (last accessed at 20/08/2026).

⁵ <https://www.dublincity.ie/innovation-and-technology/dublins-smart-city-plans/smart-docklands> (last accessed at 20/08/2026).

⁶ This is in line with the strategy for 2016–2022 presented by Dublin City Council, one of the four local authorities. <https://www.dublincity.ie/dublin-city-development-plan-2016-2022/9-sustainable-environmental-infrastructure/95-policies-and-objectives/95111-smart-dublin-framework> (last accessed at 20/08/2026).

5.2 Barcelona

Barcelona presents a different trajectory. While it embraced corporate-led smart city strategies under Xavier Trias's liberal administration (2011–2015), positioning itself as a global benchmark for urban innovation and smart city projects through the lens of market-oriented smart city self-sufficiency (Mora & Bolici, 2016; de Hoop et al., 2018), the 2015 municipal elections marked a significant turning point. During the *Barcelona en Comú* administration (2015–2023), led by Colau, smart city policy shifted towards citizen participation, transparency and technological sovereignty⁷ (Ajuntament de Barcelona, 2016, 2019; de Hoop et al., 2018). In an interview, a technician from the *Ajuntament's* Digital Technology and Innovation department stated that this political change involved shifting the focus from smart cities to smart citizens⁸, explaining that "...the orientation had to change to something more focused on the citizens' interests."

Rather than rejecting smart city policy, the municipality reclaimed public control over data infrastructures and technological systems – redefining them politically. Technological sovereignty became a central concept: data generated in the city should serve the public interest rather than being commodified by private actors. The municipality supported this reorientation with its resources, including technical expertise, financial resources, and an established planning culture (de Hoop et al., 2018; Rodrigues, 2024). As the aforementioned technician stated, the strategic reorientation was mainly "...a question of political priority..." rather than being greatly affected by structural or institutional limitations.

Projects such as Decidim⁹ (open-source participation platform), CityOS¹⁰, DECODE¹¹ and Sentilo¹² integrated civic engagement into digital governance and strengthened municipal data governance and interoperability. CityOS was conceived as a backbone infrastructure that would enable coordination across departments, though its implementation revealed internal governance challenges related to organisational complexity and inter-departmental articulation (Rodrigues, 2024). According to a technician from the *Instituto Municipal de Informàtica*¹³ (IMI) who was interviewed for this study, changes in governance and political orientation under the Ada Colau administration reflected a shift in focus from installing sensors and collecting as much data as possible, to utilising data to work in specific, strategic projects defined by the Ajuntament:

⁷ As expressed by Francesca Bria, the main person responsible for this strategy: "In our vision, the smart city is made of services that respond to the real needs of the city that citizens themselves have helped to define through the tools of participatory democracy. Services that the city itself develops, using the data that citizens spontaneously decided to donate." (Traldi, 2018).

⁸ Although the rhetoric of 'smart citizens' has already been criticised as a neoliberal ethos (Cardullo & Kitchen, 2019), it is important to view it here as a perspective that attempts to prioritise the needs of the population/civil society.

⁹ <https://decidim.org/> (last accessed at 20/08/2026).

¹⁰ <https://ajuntament.barcelona.cat/digital/en/technology-accessible-everyone/accessible-and-participatory/accessible-and-participatory-0> (last accessed at 20/08/2026).

¹¹ <https://ajuntament.barcelona.cat/digital/en/digital-transformation/urban-technology/sentilo> (last accessed at 20/08/2026).

¹² <https://ajuntament.barcelona.cat/digital/en/digital-transformation/city-data-commons/cityos> (last accessed at 20/08/2026).

¹³ <https://ajuntament.barcelona.cat/institut-innovacio-tecnologia/es/el-instituto/quienes-somos> (last accessed at 20/08/2026).

“On the other hand, over the last 5-6 years, there has been a push on this approach, but with the new government, the idea was more like a “stop.” If there is a clear idea of how to use this technology and it benefits the city, that’s good. But don’t start installing everything without considering why we are going to use it. It’s a change. It’s a government change.”

Barcelona’s trajectory also reflects a distinctive relationship with external stakeholders. Unlike Dublin, the municipality has reduced its market orientation and dependence on multinational corporations. Instead, stronger collaborations have emerged with local associations, civic technology communities and third-sector organisations, many of which articulated critical views on platform capitalism and technological solutionism. Initiatives such as *Ateneus de Fabricació*¹⁴ and Maker-oriented projects¹⁵ further reinforced a socially embedded and participatory understanding of digital innovation. This is confirmed in municipal strategy documents (Ajuntament de Barcelona, 2016, 2019) and in an interview with a Digital Technology and Innovation department technician. It was stated that the strategy revolves around strengthening small and medium-sized enterprises, as well as the circular and social economy, given that “...big companies have other, much easier ways of securing finance and raising funds.”

Importantly, this reorientation was politically contingent. The technopolitical framing of smart urbanism was closely linked to the broader sociopolitical context and the *municipalist* agenda of the period, from which *Barcelona en Común* emerged (Roth et al., 2019). During the 2015–2023 period, Barcelona showed the potential of strong municipal leadership and institutional capacity to reshape smart city discourse and orientation. However, the Trias-Colau transition also showed that this process could be subject to broader political cycles. During the Colau administration, smart city policies and projects shifted towards a municipal-defined orientation, enabling the *Ajuntament* to shape the overall strategy and collaborate with civic and private actors accordingly.

5.3 Lisbon

Lisbon combines entrepreneurial urbanism with a managerial approach to smart transformation centred on: (a) administrative digital modernisation; (b) public-private partnerships; and (c) start-up ecosystem consolidation¹⁶ (Rodrigues, 2024; Donadio, 2025).

In an interview, a Lisbon municipal official stated that core investment had been in internal digital infrastructures and data governance. In particular, the Plataforma de Gestão Inteligente de Lisboa (PGIL¹⁷) has played a key role in coordinating and aggregating digital initiatives within the municipality by leveraging public and private data sources. The aforementioned interview also mentioned an approach combining elements already seen in Dublin and Barcelona. For example, the approach to data collection was similar to that seen in Barcelona:

¹⁴ <https://ajuntament.barcelona.cat/ateneusdefabricacio/en> (last accessed at 20/08/2026).

¹⁵ <https://ajuntament.barcelona.cat/digital/en/technological-entrepreneurship-and-digital-talent/make-culture-digital-manufacturing> (last accessed at 20/08/2026).

¹⁶ The following Lisbon municipality government is finishing a strategic document that, in essence, consolidates these previous dynamics. <https://informacao.lisboa.pt/noticias/detalhe/municipio-prepara-estrategia-lisboa-inteligente-2030> (last accessed at 20/08/2026).

¹⁷ <https://lisboaaberta.cm-lisboa.pt/index.php/pt/lisboa-inteligente> (last accessed at 20/08/2026).

“We don’t integrate data just for the sake of it. Or to create dashboards, or for some other reason... Our platform is very operational. So, either there are associated use cases, and we’ll integrate the data, or we won’t do the integration.”

However, when asked if Lisbon had a defined strategy, the answer was similar to the Dublin case, with the focus being on identifying and strengthening already existing dynamics:

“There is no defined strategy...The approach we are currently taking is to identify everything that already exists within the Council, and to try to make the most of everything that already exists within the Council. We are not drawing up a strategic document.”

Another initiative, the *Laboratório de Dados Urbanos*¹⁸, collaborates with universities and private actors to develop urban data solutions and improve administrative efficiency. Other public–private partnerships play a significant role, with the municipality establishing data-sharing agreements with private companies (Rodrigues, 2024). Lisbon’s intermediate position is reflected in its ability to aggregate and manage diverse datasets. However, the transformative potential of these resources is limited by its human and financial capacities. As mentioned in the interview regarding the *Laboratório de Dados Urbanos*, these partnerships were seen as an opportunity for universities and companies to access data, while the municipality would gain access to their knowledge to solve identified problems: “And that’s why there’s a partnership that benefits both parties. They gain access to the city’s data...And we get the chance to respond to specific problems.” This creates a data-centred governance system, as well as fostering different skills and competencies among stakeholders.

Lisbon’s smart agenda is also linked to its expanding start-up ecosystem (Carvalho & Vale, 2018), particularly around Startup Lisboa¹⁹, the Beato Innovation District²⁰, and the Web Summit²¹ – all involving the municipality. However, this strategy raises questions about the broader social appropriation and distribution of the resulting digital infrastructures and projects (Donadio, 2025).

Citizens are less involved in defining smart city strategies than was observed in Barcelona under Colau’s government. Initiatives tend to focus primarily on administrative modernisation and economic promotion. Data collection and use are defined by the municipality (without strong participatory mechanisms involving citizens) and by third parties, who use this knowledge to develop their own projects and test new ones.

Following Grabher and König’s (2020) conceptual proposal, Lisbon’s trajectory can be described as a form of managerial governmentality. Lisbon combines a pragmatic and partnership-based approach to smart cities transformation with a relatively coherent municipal capacity, especially in terms of technical resources and political orientation. The Lisbon approach combines municipal leadership with external initiatives from the start-up ecosystem and private partners.

¹⁸ <https://lisboaaberta.cm-lisboa.pt/index.php/pt/lx-data-lab/apresentacao> (last accessed at 20/08/2026).

¹⁹ <https://icapital.lisboa.pt/detail/startup-lisboa> (last accessed at 20/08/2026).

²⁰ <https://www.beato.unicornfactorylisboa.com/> (last accessed at 20/08/2026).

²¹ <https://websummit.com/> (last accessed at 20/08/2026).

6. Comparative Discussion: Context as Explanatory

The above comparison shows how contextual conditions – geographical, socio-economic and institutional – interact with policy and project trajectories to generate different configurations of smart urbanism. Table 2 summarises each city's key aspects, focusing on the analytical dimensions and resulting configurations of smart urbanism: Dublin as market-oriented and experimental; Barcelona as civic-technopolitical, particularly between 2015 and 2023; and Lisbon as marked by a form of managerial governmentality. The same analytical dimensions were applied to all three cases, forming the basis for the following cross-case synthesis and the identification of the main configurations.

Table 2 | Cross-case synthesis of smart city contexts and trajectories. Own elaboration.

<i>Analytical Dimension</i>	<i>Sub-Analytical Dimension</i>	<i>Dublin</i>	<i>Barcelona</i>	<i>Lisbon</i>
1 Context	Geographical	National metropolitan centrality; macrocephalia	Major metropolitan centre within a multi-level state; strong regional dimension	National metropolitan centrality within a relatively polycentric system
	Socio-economic	Neoliberal and technology-oriented development model	Diversified urban economy; strong civic-tech and social/circular economy networks	Service- and knowledge-based economy; growing digital and start-up ecosystem
	Institutional	Fragmented metropolitan governance; four local authorities with limited competences and resources	Strong municipal capacity; consolidated planning culture	Municipality with relatively coherent planning and administrative capacity
2 Smart city policies and trajectories	Institutional and governance frameworks	Coordination through Smart Dublin; partnerships compensate for limited municipal capacity	Strong municipal steering and institutional capacity; greater strategic coherence	Municipal coordination combined with private partnerships and an emerging data-governance infrastructure
	Evolution of policies and projects	Fragmented initiatives preceded the articulation of a broader strategy	Clear strategic reorientation after 2015 towards public control, participation and digital sovereignty	Fragmented initiatives followed by pragmatic consolidation around administrative digitalisation and data
	Power relations and construction of digital/smart agendas	Private actors are structurally prominent; local authorities mainly coordinate and mediate; citizen participation is limited. Agenda centred on experimentation and competitiveness	Municipal and civic actors have a stronger role in agenda-setting; private actors remain present but less strategically dominant. Agenda centred on civic participation and digital sovereignty	Municipality retains strategic initiative but relies on external skills, resources and partnerships; citizen participation is limited. Agenda centred on administrative modernisation and innovation
Resulting configuration		Market-oriented and experimental	Civic-technopolitical	Managerial

In Dublin, institutional fragmentation, limited local authority competences, and Ireland's market-led model contributed to a governance structure where public–private partnerships underpin smart city development. The prevalence of pilot projects and urban experimentation reflects a deliberate positioning within the smart city policies in the context of its neoliberal economy. Consequently, the absence of a comprehensive, city-wide strategy is less indicative of policy failure and more indicative of institutional fragmentation, representing a strategic response to the neoliberal national context that perpetuates a market-oriented, fragmented perspective on smart cities.

Barcelona (2015-2023) shows how political will within a stable administrative context can enable alternative approaches. The city's robust capacity, well-established planning culture and sociopolitical environment open to technopolitical initiatives enabled a redefinition of smart urbanism as digital sovereignty and civic empowerment. In this context, strategy is deeply embedded within context: the technopolitical cycle reflects political agency and is supported by the necessary resources to sustain it.

Lisbon illustrates a different relationship between context and smart city policies and trajectories. While more institutionally coherent than Dublin, it lacks Barcelona's political will and financial autonomy. Lisbon's approach can be conceptualised as managerial governmentality, using digital infrastructures and data governance to enhance efficiency and foster entrepreneurship. This configuration is shaped by the city's specific administrative capacities and economic positioning. Here, 'smartness' is primarily defined as administrative modernisation and innovation facilitation.

In all three cases, smart city policies emerge as both products of and producers of context. Governance arrangements reflect pre-existing institutional ecologies while also stabilising, reproducing or contesting them. In Dublin, governance arrangements that rely heavily on partnerships reinforce corporate centrality. In Barcelona, technopolitical strategy consolidates public-sector leadership and civic infrastructures. In Lisbon, managerial coordination sustains a data-driven administrative rationality and its modernisation through public-private partnerships. This recursive dynamic reveals a tension between the conditions of emergence and the structuring of future possibilities: context enables specific trajectories, which may then modify and/or reinforce specific power relations and development models. Thus, this analysis suggests that smart city trajectories may not only reflect inherited contextual conditions but also contribute to reproducing or modifying the contexts in which subsequent actions are taken.

The identified main actors and power relations do not permit an analysis in which specific intentions and actions can be attributed solely to identifiable individuals. From a Foucauldian perspective on power relations (Foucault, 2007; Rodrigues et al., 2022), while individuals have different capabilities and certain actors become dominant, the policies and trajectories originate from the interplay between these actors and the broader context, influenced by specific historical and institutional frameworks.

Finally, the comparison does not advocate a universal or normative model of smart urbanism. Rather, it shows that 'smartness' is contextually constructed. The analytical value of comparison lies in revealing how different contexts produce distinct interpretations of smart cities. Contextual comparison is thus not merely descriptive but explanatory, identifying the main contextual aspects shaping smart city policies and trajectories. Such analysis is inherently processual and interpretative, allowing us to identify how contextual conditions shape smart city policies and projects.

7. Conclusions

This article has examined smart city development in Dublin, Barcelona and Lisbon, emphasising context in shaping smart urban transformation. The comparison shows that smart city agendas are embedded in their urban contexts, and that there is no universal “smart city model” that can be applied across all cities.

The article makes two key contributions through its context-sensitive comparative analytical framework. Firstly, it shows context is not a mere background, but an explanatory dimension shaping governance and planning, and the definition of ‘smartness’ itself. Secondly, it explores the various smart city development paths in Barcelona, Dublin and Lisbon, and the contextual conditions that gave rise to them. In doing so, it challenges reductionist critiques equating smart city development with neoliberal urbanism exclusively, as well as technocratic narratives assuming smart city strategies can be implemented independently of institutional conditions. The case studies illustrate that robust public administration can coexist with dynamic private ecosystems, and that corporate prominence does not negate public agency. What varies is the configuration of relations between actors, the distribution of competences and capacities, and the degree of strategic coherence that institutions can sustain.

The comparison highlights a key tension: smart city trajectories are shaped by inherited contingencies yet also reproduce or transform those conditions. Understanding this recursive dynamic is essential for critically evaluating smart urban transformation. Smart cities should not be viewed as technological endpoints or universally replicable models, but as evolving governance configurations whose trajectories remain open, contested and context dependent.

The article also has policy implications. First, smart city strategies should be continuously adapted to their geographical, economic, institutional and socio-political contexts. Second, governance resources and institutional capacity are as important as technological capacity. Third, governance arrangements define how responsibilities, decision-making and power are distributed among actors. Overall, a more reflexive and context-aware approach to smart urban governance is required – one that recognises the interplay between contingency and strategy and situates technological interventions within broader questions of power, equity, and urban development.

The research has limitations that open avenues for further inquiry. Beyond continuing to analyse these cities’ trajectories (for example, by examining the articulation process in Dublin or the impact of government changes in Barcelona and Lisbon), future research could examine residents’ lived experiences and the socio-spatial outcomes of smart city interventions.

Acknowledgements

The author would like to thank the reviewers and guest editors for their contributions to the review process. In addition, the guidance provided by my supervisors, Mário Vale and Pedro Costa, throughout the research process, must be acknowledged.

This work was made possible thanks to Ph.D. funding granted by the FCT (SFRH/BD/105162/2014).

Use of AI tools

During the preparation of this manuscript, the author used AI-based language tools (specifically, DeepL.com) exclusively for language editing and grammar checking. No AI tool was used for data analysis, interpretation, or the generation of original content. All generated suggestions were critically reviewed and approved by the author.

Declaration of competing interest

The author declares that there are no financial, personal, or professional conflicts of interest that could have influenced the research, analysis, or writing of this manuscript. No competing interests exist.

Data availability

The data supporting the findings of this study are available within the article itself. The cited public sources (such as websites, documents and reports) are referenced in the text and in the reference list. Data from interviews were collected and anonymised by the researcher. Due to consent restrictions, full interview transcripts are not publicly available, and only anonymised excerpts are presented in the article where they are relevant to academic research.

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