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Research article

City strategies, public services and strategic digital city: Berlin case

Estrategias urbanas, servicios públicos y ciudad digital estratégica: el caso de Berlín

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Abstract
Introduction: Cities are dynamic, rapidly evolving, and growing exponentially, hence the need for constantly improving city strategies, public services with an integration of recent information technology resources and tools for city transformation, good quality of life, economic performance, and sustainability, which plays a vital role in modern urban management. **Objective:** to analyze how digital technologies influence city strategies and public services, with a specific focus on Berlin's strategic digital city project and its role in

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urban development, governance, and citizens' participation. **Methodology:** focuses on applying both qualitative and quantitative methods to analyze documents of digital policies, strategic plans, performance metrics, and citizen engagement data related to smart technologies. The research protocol was built on two constructs and six variables that assessed improvements in public service efficiency, sustainability, economic competitiveness, and citizen participation in governance. **Results:** show that Berlin's digital strategy significantly enhanced public service delivery, increased accessibility, and supported sustainable practices. Economic growth and citizen involvement in governance also improved through digital platforms. **Conclusion:** Berlin demonstrates how a well-structured digital transformation strategy with a strategic digital city can foster inclusive, efficient, and sustainable urban development, serving as a model for other global cities.

Keywords: strategic digital city; city strategies; public services with information technology; quality of life; innovation.

Resumen
Introducción: Las ciudades son dinámicas, evolucionan rápidamente y crecen de forma exponencial, lo que genera la necesidad de mejorar constantemente las estrategias urbanas y los servicios públicos mediante la integración de herramientas y recursos tecnológicos actuales. Esto es clave para la transformación urbana, la calidad de vida, el rendimiento económico y la sostenibilidad, desempeñando un papel fundamental en la gestión urbana moderna. **Objetivo:** de esta investigación es analizar cómo las tecnologías digitales influyen en las estrategias urbanas y los servicios públicos, con un enfoque específico en el proyecto de ciudad digital estratégica de Berlín y su papel en el desarrollo urbano, la gobernanza y la participación ciudadana. **Metodología:** de investigación combina métodos cualitativos y cuantitativos para analizar documentos de políticas digitales, planes estratégicos, indicadores de rendimiento y datos sobre participación ciudadana vinculados a tecnologías inteligentes. El protocolo de investigación se basa en dos constructos y seis variables que evalúan mejoras en la eficiencia del servicio público, la sostenibilidad, la competitividad económica y la participación ciudadana en la gobernanza. **Resultados:** muestran que la estrategia digital de Berlín ha mejorado significativamente la prestación de servicios públicos, ha aumentado la accesibilidad y ha apoyado prácticas sostenibles. También se observó un crecimiento económico y una mayor implicación de la ciudadanía en la gobernanza a través de plataformas digitales. **Conclusión:** Berlín demuestra cómo una estrategia de transformación digital bien estructurada puede fomentar un desarrollo urbano inclusivo, eficiente y sostenible, sirviendo como modelo para otras ciudades del mundo.

Palabras clave: ciudad digital estratégica; estrategias urbanas; servicios públicos con tecnología de la información; calidad de vida; innovación.

1. Introduction

Urbanization and rapid growth have significantly increased the demand for efficient, high-quality public services, presenting complex challenges for cities worldwide. To address these challenges, city strategies, information systems, and technological alternatives are being developed globally to foster economic and social advancement.

In response to the accelerating pace of urbanization and the growing urban population, there is an increasing demand for innovative approaches to public service delivery (Amiryar & Asano, 2022; Oliver-Gonzalez & Martin-Herrero, 2025).

Consequently, city governments are increasingly turning to digital technologies and strategic urban policies as tools to promote sustainable economic and social development (Bayro et al., 2025).

Within this context, information technology has gained prominence worldwide for its capacity to enhance citizens' quality of life and support sustainable urban growth (Kitchin, 2014; Mora et al., 2019). Against this evolving urban backdrop, the concept of the Strategic Digital City has emerged as a forward-thinking model that employs information and communication technologies (ICTs) to strengthen governance, optimize service delivery, and promote civic engagement (Rezende, 2023; Almeida & Fumagalli, 2024).

Key components of this digital transformation have become particularly prominent in European urban centers. Cities such as Berlin have pioneered comprehensive digital strategies that improve urban management and participatory governance. Berlin stands out as a leader in integrating digital governance frameworks with urban infrastructure, demonstrating how technology can enhance the efficiency, sustainability, and resilience of urban systems (Hollands, 2008; Anthopoulos, 2017; Meijer & Bolívar, 2016).

City strategies in this domain serve as mechanisms for power-sharing, encouraging civic engagement and citizen participation in decision-making processes. These strategies are grounded in structured methods and procedures designed to generate tangible outcomes and support long-term urban planning (Brady, Chaskin & McGregor, 2020; Chou, Erkkilä & Mölsä, 2023; Lee, 2023; Mitchell, 2020).

Through data-driven decision-making, intelligent infrastructure, and inclusive digital policies, cities can position themselves as global models for how technology empowers citizens and improves quality of life (Helbing et al., 2024). Moreover, public services enabled by information technology are increasingly characterized by transactional interactions between citizens or public managers and the electronic services offered by municipalities, city governments, and related public institutions.

These digital interactions reshape the nature of engagement between citizens and public officials, while also redefining the competencies required from both groups (Chou, Erkkilä & Mölsä, 2023; Anderson, Hallin & Ivory, 2022; Lee, 2023; Lindgren et al., 2019). For example, citizen participation in the Example PCMB initiative aims to strengthen democratic governance by directly involving local communities in decision-making processes (Toledo, 2020). Ultimately, sustainable cities and Strategic Digital City projects are developed and maintained through deliberate efforts to foster environmental resilience, equitable healthcare, and inclusive economic growth (Rezende et al., 2025).

The Strategic Digital City research problem lies in understanding how city strategies and public services interact within the framework of a Strategic Digital City. While digital transformation continues to accelerate globally, cities face several obstacles, particularly in ensuring digital inclusion, building robust infrastructure, and improving coordination between departments (Rezende, 2023).

Although the Strategic Digital City concept emphasizes the adoption of information technology to improve urban management, its implementation faces persistent challenges, including limited citizen participation, unequal territorial distribution of benefits, and incoherent technology use (Fumagalli, Rezende & Guimarães, 2022; Flores & Rezende, 2022; Rezende, 2023; Rezende, Almeida & Fumagalli, 2024).

Another key issue in city strategies is that urban digital initiatives often suffer from fragmentation and a lack of coordination across departments. In Berlin, for instance, progressive digital projects have been launched, yet their integration into a unified urban strategy remains incomplete. Bureaucratic inertia, limited stakeholder collaboration, and misalignment with long-term development goals weaken the overall impact of digital governance (Cancelo, 2025; Matesanz, 2025).

A more strategic, participatory, and inclusive approach is required to ensure that technology advances broader urban objectives and social priorities (Kutkov et al., 2025; Kuzmak et al., 2025). These gaps hinder the effective and equitable implementation of digital strategies. Addressing them is essential for ensuring that technological innovation supports sustainable development and enhances quality of life for all urban residents through coordinated public services, city strategies, and city information systems (Mora et al., 2019; Lee, 2023; Murzakulova, Kuznetsova & Mogilevski, 2023; Roberts & Edwards, 2023).

The public service research problem centers on how digital transformation aims to make public services more accessible, transparent, and efficient. Despite these ambitions, many cities still experience significant disparities in access, digital literacy, and institutional responsiveness. Vulnerable groups remain at high risk of digital exclusion, and public institutions often struggle to adapt to technological advancements.

Overcoming these issues requires policies that prioritize equity, usability, and adaptability in the delivery of digital public services (Faruq et al., 2025; Wirata et al., 2025). Compounding these challenges is the pressing need for the public sector to develop effective policies, strengthen collective capacities, and enhance interactions among key actors, particularly local government officials, public administrators, and citizens (Chou, Erkkilä & Mölsä, 2023; Anderson, Hallin & Ivory, 2022; Lee, 2023; Lindgren et al., 2019).

Despite recognition of the importance of internal organizational factors in shaping strategic approaches, research remains scarce on the connection between functional capacities and distinct strategic typologies (Lee, 2023; Mitchell, 2020). Consequently, the public sector is under increasing pressure to innovate continuously, meeting citizens' needs through the effective use of information technologies (Oliver-González & Martín-Herrero, 2025; Trivellatto, Martini & Cavenago, 2021).

The research question guiding this study is: What is the relationship between city strategies, public services, and information technologies in the context of the Strategic Digital City in Berlin?

The objective is to analyze the relations between Berlin's city strategies, public services, and digital technologies within the strategic digital city context and to evaluate their impact on inclusive urban development.

The research is justified by the importance of the strategic digital city concept, which has become increasingly significant as digital governance shapes modern urban life. It reflects a shift from technology-centered approaches to participatory frameworks that embed technology into governance, infrastructure, and civic engagement.

Examining Berlin through this lens provides valuable insights into how cities can become more sustainable, transparent, and citizen-focused (Fumagalli, Rezende & Guimarães, 2021, 2022; Flores & Rezende, 2018, 2022; Rezende, 2023; Rezende, Almeida & Fumagalli, 2024).

Strategic Digital Cities not only improve service delivery but also enhance residents' quality of life, boost urban competitiveness, and facilitate social, commercial, and industrial interactions. From a sociotechnical perspective, collective intentions are closely linked with the mobilization of digital and informational capacities, which raise infrastructure standards, support economic activity, and enable more effective public service delivery (Rezende et al., 2025).

City strategies are essential to enabling these digital transitions. Berlin's experience demonstrates both the potential and the challenges of designing coherent and inclusive strategies that align with long-term urban development goals (Townsend, 2013; Batty et al., 2012). The complexity of urban governance lies in the fact that power, knowledge, and resources are distributed among diverse actors who must engage in ongoing negotiation and collaboration (Arrona et al., 2018).

Strategic approaches foster innovation by strengthening the dialogue between public managers and citizens, encouraging civic participation, and shaping local public policies. They also highlight the critical role of local authorities as strategic and creative agents driving innovation and citizen engagement (Chou, Erkkilä & Mölsä, 2023; Lee, 2023; Mitchell, 2020; Pozoukidou & Chatziyiannaki, 2021; Rezende, Almeida & Fumagalli, 2024; Trivellatto, Martini & Cavenago, 2021).

Public services represent the primary interface between Berlin's administration and its residents, making their digital transformation key to understanding how technology influences daily urban life. This transformation reveals both opportunities and challenges in designing services that are accessible, inclusive, and adaptable to future needs (Mora, Balice & Deakin, 2019; Komninos, 2008).

Digital participation, particularly efforts that empower youth to think critically and act responsibly online, plays a vital role in fostering collaborative innovation. Such innovation emerges through stronger interactions between public administrators and citizens, promoting civic participation and generating policies that better reflect local needs (Silva et al., 2024).

2. Literature Review

2.1. Strategic Digital City

The strategic digital city concept represents a paradigm shift in urban management, leveraging information technology to move beyond conventional internet access and embrace a comprehensive suite of systems and services. Rooted in the principles of strategic city management, this approach emphasizes the deliberate application of IT resources to address complex urban challenges while aligning with broader city strategies, public services, and city information (Rezende, 2023).

At its core, the strategic digital city is structured around four interconnected components: city strategies, city information, public services, and IT resources. These elements work in synergy to enhance urban management capabilities, optimize citizen services, and strengthen security measures, extending far beyond basic digital connectivity.

Moreover, the strategic digital city transcends geographical boundaries by fostering active citizen engagement and participation within a global network. It serves as a dynamic platform that supports city functions, facilitates collaboration among diverse stakeholders, and improves the efficiency and effectiveness of urban governance (Rezende, 2023; Rezende, Almeida & Fumagalli, 2024).

This innovative model has been recognized for more than a decade as a robust and well-established approach to urban management, particularly for its integration of city strategies into digital infrastructures (Fumagalli, Rezende & Guimarães, 2021, 2022; Flores & Rezende, 2018, 2022; Rezende, Almeida & Fumagalli, 2024; Rezende et al., 2025; Ribeiro, Rezende & Yao, 2019; Teixeira & Rezende, 2023; Al lahham et al., 2026).

2.2. City Strategies

The city strategic concept in the digital era represents a transformative approach to urban management, leveraging advanced digital techniques to enhance planning, governance, and service delivery. Digital cities, in this context, are defined as realistic digital representations of urban environments, including their assets, processes, and systems, that support decision-making and improve urban outcomes (Nochta et al., 2021).

City strategies also function as powerful instruments for directing policy initiatives, securing essential external funding, and fostering community integration. By offering a structured framework for public dialogue and collaborative action, these strategies lay the groundwork for meaningful progress in local development management (Brandtner et al., 2017; Chou, Erkkilä & Mölsä, 2023; Lee, 2023; Trutkowski, Odzimek & Zarkowsk, 2022).

Moreover, by fostering community involvement and cultivating a sense of ownership over urban development, city strategies help create more engaged and invested communities. This is particularly significant in contexts where state regulations play a decisive role in shaping housing access for refugees, underscoring the broader social and political implications of strategic urban planning (Brady, Chaskin & McGregor, 2020; Lee, 2023; Mitchell, 2020).

2.3. Public Services with Information Technology

Public services are broadly understood as services delivered by the government or its authorized entities, under legal norms and regulatory oversight, to meet essential community needs or, secondarily, to serve the convenience of the state. Examples include public education, law enforcement, healthcare, public transportation, telecommunications, and other fundamental services (Meirelles et al., 2013). As technology advances, public sector institutions must continuously adapt, integrating innovations that often originate outside governmental frameworks (Dunleavy & Margetts, 2023).

In the context of public service delivery, various maturity frameworks have been developed to assess and classify the effectiveness of digital government initiatives, ensuring ongoing improvement in service quality and accessibility. Successful delivery of digital services requires robust technical, organizational, and political capacities within governmental institutions (Bertot, Estevez & Janowski, 2016).

The effectiveness of these services depends heavily on citizen trust, which in turn relies on the government's ability to guarantee data confidentiality, integrity, and availability through effective city information management systems (Lindgren et al., 2019).

Furthermore, technological innovation in government, achieved through collaboration with startups and the private technology sector, can be a powerful tool to improve efficiency, transparency, and citizen participation in public administration (Linss, González & García, 2024).

2.4. Conceptual Relations

The relationship between city strategies, public services, and the strategic digital city provides a structured framework for understanding urban digital transformation. These concepts are deeply interconnected through urban governance, technological integration, and participatory mechanisms, all of which shape public service delivery and the development of city strategies.

The Strategic digital city model integrates digital technologies into urban planning and governance, enhancing infrastructure, public services, and overall urban management (Rezende, 2023; Kitchin, 2014; Mora et al., 2019). Within this framework, city strategies leverage data-driven policies and ICT tools to improve economic sustainability and the efficiency of public services (Rezende, 2023; Batty et al., 2023; Meijer & Bolívar, 2023).

Berlin's digital strategy exemplifies how municipal policies can align with digital transformation to optimize administrative processes and foster greater citizen participation (Rode, 2019; Mora, Bolici & Deakin, 2019). Digital governance models harness ICT to streamline service delivery, increase transparency, and support sustainable urban development (Meijer & Bolívar, 2016; Townsend, 2013; Kitchin, 2014).

Berlin's smart city initiatives, for instance, have implemented digital platforms that enhance citizen engagement, improve service accessibility, and promote transparent governance. This approach establishes a strategic city network involving multiple stakeholders, which relies on robust policy frameworks to integrate public administration with digital solutions effectively (Rezende, 2023; Angelidou & Galdon-Clavell, 2024).

The digitalization of public services further enhances efficiency, accessibility, and innovation by enabling real-time data processing and automated decision-making in urban management (Terlizzi, 2021). Berlin's smart city framework has utilized ICT to refine public administration and encourage citizen-led urban initiatives (Farhan & Nurmandi, 2022; Dunleavy & Margetts, 2023). The strategic digital city model aligns with public service reforms by employing participatory governance mechanisms and open data platforms, ensuring sustainable urban growth (Rezende, 2023; Nam & Pardo, 2024).

In Berlin, participatory digital governance has significantly improved transparency while ensuring that digital services are consistent with broader city strategies. Partnerships in public services have also played a central role in integrating digital platforms into city strategies, fostering both economic growth and innovation (Rezende, 2023; Kitchin et al., 2023).

Despite these advances, challenges in digital inclusion persist, requiring strategies that guarantee equitable access to technology for all demographic groups (Nikolay, 2024; Brabham, 2008). The Strategic Digital City model serves as a crucial link between city strategies and digital public services, facilitating effective urban governance and promoting sustainable development (Rezende, 2023; Batty et al., 2023; Townsend, 2013; Kitchin, 2014).

Berlin demonstrates the potential of digital transformation to improve service delivery, enhance citizen participation, advance urban development, and strengthen economic competitiveness (Rode, 2019; Mora et al., 2024). The integration of smart technologies, city strategies, and digital policies offers a valuable blueprint for other cities seeking to create digitally advanced urban environments (Long, 2019; Ozbek & Karacoban, 2025).

3. The research methodology

The research methodology outlines the approach used to explore the integration of municipal strategies and public services within the framework of the Strategic Digital City. A case study method was selected for its effectiveness in examining contemporary phenomena within real-life contexts (Nichols & Edlund, 2023; Morin, Olsson & Atikcan, 2021). Berlin was chosen as the case study due to its innovative and sustainable urban planning, as well as its global recognition for integrating city strategies into digital governance (Nichols & Edlund, 2023; Morin, Olsson & Atikcan, 2021).

The study employed a mixed-methods approach, combining quantitative and qualitative analyses. The quantitative component involved counting the number of city strategies and public services associated with each municipal theme under the Strategic Digital City framework. The qualitative component focused on examining the names, sources, and characteristics of these strategies and services through content analysis and observation (Morin, Olsson & Atikcan, 2021; Nichols & Edlund, 2023; Yin, 2017). This combination provided a comprehensive understanding of digital urban governance in Berlin.

The research followed a four-phase process. The first phase, data preparation, involved developing the theoretical framework, defining the research method, selecting Berlin as the case study, and establishing the research protocol. The second phase, data collection, relied on official sources, including municipal strategic plans, government documents, and official websites. The third phase, data analysis, examined municipal strategies and public services leveraging information technology, assessing research variables and conducting comparative analyses. The final phase, data documentation, compiled results, conclusions, contributions, and limitations.

The research scope was limited to Berlin, Germany, due to its leadership in digital innovation, economic growth, sustainability, and urban development (Nichols & Edlund, 2023). Berlin's integration of city strategies into public services enhances efficiency, transparency, and citizen participation, making it an ideal model for examining the intersection of urban governance and digital technology.

The unit of observation consisted of digital government documents and city strategy records sourced from official city and government websites. Three primary documents were analyzed: the *Berlin Strategy | City Development Plan Berlin 2030*, the *Smart City Strategy*, and reports from Berlin's digital transformation initiatives (Nichols & Edlund, 2023; Yin, 2017).

These documents were selected because they are official documents that guarantee the credibility of the analyses and provided critical insights into Berlin's strategic approach to digital technology and public service modernization. The public services were analyzed through official governmental sites such as Berlin Service-Portal (*Bürgerportal*), *Mein Berlin* (the city's official participation platform for citizen engagement) and Berlin's official Mobility-as-a-Service (MaaS) platform that integrates public transit.

To ensure a rigorous and reproducible operationalization of the two constructs, the documentary data collection was guided by strict inclusion criteria such as source authority and credibility, construct alignment, thematic relevance and temporal validity. Applying these standardized criteria resulted in the final dataset of 20 primary city strategies and 696 active digital public services, ensuring the subsequent analysis reflects a credible, verifiable, and highly accurate representation of Berlin's digital governance.

The systematic coding procedure consisted of extracting the data from official portals and categorizing each initiative deductively according to the six variables (Name, Theme, Source) of the established research protocol.

The research protocol is the result of the Strategic Digital City research group and has been replicated in several cities around the world, such as Edinburgh, Amsterdam, and Canada, among others (Flores & Rezende, 2018, 2022; Fumagalli, Rezende, & Guimarães, 2021, 2022; Rezende, Almeida & Fumagalli, 2024; Rezende et al., 2025; Ribeiro, Rezende & Yao, 2019; Teixeira & Rezende, 2023; Gabbiatti Menegheti et al., 2024; Al lahham et al., 2024).

It consists of a structured data analysis around two constructs and six variables (Yin, 2017). The first construct focused on city strategies, including:

(i) name of the city strategy,

(ii) theme of the city strategy, and

(iii) source of the strategy.

The second construct examined public services leveraging information technology, analyzing:

(i) name of the public service,

(ii) theme of the public service, and

(iii) source of the service.

By systematically categorizing these variables, as shown in Table 2, the study ensured a structured and replicable methodology for assessing Berlin’s city strategies and digital services, enabling a nuanced understanding of how digital transformation shapes urban governance and citizen engagement (Nichols & Edlund, 2023; Yin, 2017).

Table 1.

Research Protocol

Construct	Variable	Issue – question	Measurement Unit	Variable type
City strategies	Name of the city strategy	What is the strategy name?	Strategy name	Qualitative
	Theme of the city strategy	What theme is the strategy related to?	Municipal administration; Agriculture; Science and technology; Commerce; Culture; Marketing; Education; Sports; Financial; Government; Housing; Industry; Legal and regulatory; Leisure; Materials or Logistics; Environment; Construction; Planning; Human Resources; Rural; Sanitation; Health; Security; Municipal Services; Social; Traffic; Transport; Tourism; Urban.	Quantitative
	Source of the strategy	What is the strategy source?	Strategy source name	Qualitative
Public services	Name of the public service	What is the public service name?	Public service name	Quantitative
	Theme of the public service	What theme is the public service related to?	Municipal administration; Agriculture; Science and technology; Commerce; Culture; Marketing; Education; Sports; Financial; Government; Housing; Industry; Legal and regulatory; Leisure; Materials or Logistics; Environment; Construction; Planning; Human Resources; Rural; Sanitation; Health; Security; Municipal Services; Social; Traffic; Transport; Tourism; Urban.	Quantitative
	Source of the service	What is the public service source?	Public service source name	Qualitative

Source: the authors

Based on the research protocol, a Microsoft Excel spreadsheet was used to support the analysis, where the city strategies and public services identified in the specified sources were recorded. From this, each variable was analyzed and recorded. With the support of Excel, each variable was categorized, and the percentage of each was determined based on the total number of strategies and public services identified in the city.

The research timeframe spanned from February 2025 to December 2025.

4. Analysis and Discussion

4.1. City strategies analysis

This step contextualized the role of city strategies in driving digital transformation and sustainable urban development. By examining the strategic alignment between municipal objectives, technological integration, and public engagement, the study assessed how city strategies serve as tools for governance, policy implementation, and long-term planning. As shown in Table 2, the name of the strategies in relations to their thematic, year and source classification.

Table 2.

City strategies analyzed by year, theme and source

Name of City Strategy	Year	Thematic Category	Source Classification
Berlin Cultural Development Concept	2019	Cultural Preservation and Tourism	Participatory initiative https://www.berlin.de/sen/kultur/
Berlin Digitalization Strategy (E-Government Act)	2016	Economic Growth and Innovation	Governmental report https://www.berlin.de/sen/inneres/
Berlin Startup Agenda	2021	Economic Growth and Innovation	Academic / Policy Study https://acortar.link/XJlblC
Berlin Strategy | City Development Plan Berlin 2030	2015	Social Equity and Inclusion	Governmental report https://acortar.link/OtyziQ
Berlin Tourism Plan (Tourismuskonzept 2018+)	2018	Cultural Preservation and Tourism	Academic / Policy Study https://acortar.link/AqM3rw
Charter for Berlin's Urban Green Space	2019	Sustainability & Environmental Resilience	Academic / Policy Study https://acortar.link/iy1dTj
Circular Economy Initiative (Zero Waste Strategy Berlin)	2021	Sustainability & Environmental Resilience	Participatory initiative https://acortar.link/dMay3i
Climate Action Plan 2050 (BEK 2030/2050)	2017	Sustainability & Environmental Resilience	Governmental report https://acortar.link/TF322Y
Foreign Trade Program Berlin *Außenwirtschaftsprogramm*	2021	Global Integration & International Relations	Academic / Policy Study https://acortar.link/Z72K6B
Gemeinsam Digital: Berlin (Smart City Strategy)	2022	Economic Growth and Innovation	Governmental report https://smart-city-berlin.de
Integration and Diversity Concept of the State of Berlin	2021	Social Equity and Inclusion	Participatory initiative https://www.berlin.de/sen/ias/
International Relations Strategy (Senate Guidelines)	2021	Global Integration & International Relations	Governmental report https://acortar.link/6pXZmT
Joint Innovation Strategy of Berlin and Brandenburg (innoBB 2025)	2019	Economic Growth and Innovation	Governmental report https://www.innobb.de/en
Masterplan Industrial City Berlin 2022–2026	2022	Economic Growth and Innovation	Governmental report https://www.berlin.de/sen/wirtschaft/
Memorial Concept of the State of Berlin (Heritage Preservation)	2020	Cultural Preservation and Tourism	Academic / Policy Study https://www.berlin.de/sen/kultur/
Mobility Strategy 2030 (StEP MoVe)	2021	Sustainability & Environmental Resilience	Governmental report https://acortar.link/MJbCGt
Open Data Strategy of the State of Berlin	2020	Economic Growth and Innovation	Governmental report https://daten.berlin.de/
Shaping the City Together (Stadtforum 2030)	2019	Social Equity and Inclusion	Participatory initiative https://acortar.link/BB8FJh
Urban Development Concept Berlin 2030	2013	Social Equity and Inclusion	Governmental report https://www.stadtentwicklung.berlin.de
Urban Development Plan (StEP Wohnen 2030 - Spatial Justice)	2019	Social Equity and Inclusion	Academic / Policy Study https://acortar.link/D23Lox

Source: The authors based on the database.

4.1.1. City strategies name analysis

Berlin's urban development strategies reflect a multifaceted approach aimed at balancing economic growth, social equity, cultural preservation, and environmental sustainability. The city's governance draws on academic literature, urban policy trends, and international best practices to position Berlin as a competitive global city. These strategies are documented across policy reports, strategic plans, and urban studies, each addressing distinct yet interconnected dimensions of urban management.

A central theme in Berlin's approach is fostering economic dynamism by attracting foreign investment, supporting creative industries, promoting startups, and developing technology hubs. For example, the *Berlin Strategy | City Development Plan Berlin 2030* presents a comprehensive vision that integrates urban society with institutional stakeholders, emphasizing open space preservation, creativity, and inclusiveness. The participatory initiative *Shaping the City Together* engaged approximately 2,500 Berliners through the City Forum 2030 and recorded around 75,000 monthly website visits, demonstrating significant public interest and involvement.

Enhancing social equity is another key strategy, ensuring that the city's growth benefits all residents and addresses inequalities. Policies under this strategy aim to combat poverty, support marginalized communities, and ensure equitable access to public services and inclusive education. The *Urban Development Concept Berlin 2030* aligns with this approach, focusing on long-term planning in housing, infrastructure, and environmental sustainability. Notably, it sets concrete targets, such as creating 86,000 new apartments by 2036, prioritizing climate-friendly and affordable housing solutions.

Information technology plays a central role in Berlin's strategic vision, as exemplified by the *Smart City Strategy*. This plan leverages digital technologies to improve infrastructure, foster innovation, and enhance urban efficiency across key sectors such as mobility, energy, and e-governance. While the qualitative objectives are well-articulated, specific quantitative metrics for implementation and impact are limited in the sources reviewed.

A critical comparison of Berlin's *Smart City Strategy* and the more recent *Gemeinsam Digital: Berlin* (GD:B) framework reveals a stark tension between aspirational policy and empirical implementation. While the city's strategic vision actively leverages digital technologies to enhance urban efficiency and e-governance, verifiable quantitative indicators demonstrate highly uneven progress across different municipal sectors. For instance, according to the *Bitkom Smart City Index 2024*, Berlin achieved a perfect score (100 points) and secured first place nationwide in the Mobility category, yet the city languished in 28th place in the overall smart city ranking.

This discrepancy underscores a critical fragmentation in urban governance; while digital mobility infrastructure excels, broader administrative integrations lag significantly. Nationwide, Berlin's overall smart city ranking currently sits at 33rd place with an index score of 75.6 out of 100. This empirical data corroborates critiques found in broader urban literature (Townsend, 2013), which argue that strategic digitalization often prioritizes highly visible, capital-intensive technological deployments over comprehensive, equitable infrastructure development.

Berlin's commitment to sustainability is further evident in initiatives such as the Circular Economy Initiative, which seeks to transition the city toward sustainable resource use, waste reduction, and circular economic practices. Urban agriculture projects, including community gardens and urban farms, promote sustainable farming practices while fostering community engagement through partnerships among government bodies, NGOs, and residents.

Berlin's strategic plans also encompass sectors such as tourism and international relations. The *Berlin Tourism Plan* aims to position the city as a leading tourist destination while balancing tourism growth with residents' quality of life, emphasizing sustainable tourism and cultural heritage preservation, though without detailed quantitative targets. Similarly, the *International Relations Strategy* seeks to strengthen global partnerships, cultural exchanges, and economic cooperation, reinforcing Berlin's status as a global city, albeit without extensive metrics for these collaborations.

A core element across Berlin's strategies is participatory urban planning. Initiatives like *Shaping the City Together* actively involve citizens to ensure that urban development aligns with community needs and promotes inclusivity. Furthermore, participatory initiatives like *Shaping the City Together* boast engagement metrics of approximately 2,500 involved citizens and 75,000 monthly website visits. However, these figures often reflect the participation of already-privileged demographics.

For marginalized groups, including refugees striving to actualize their spatial justice and right to the city, navigating these digital participation portals remains hindered by linguistic, administrative, and technological barriers. This empirical reality demands a more rigorous impact-measurement system that evaluates the success of public engagement through the lens of equity and accessibility, rather than relying solely on the sheer volume of website traffic.

Collectively, these strategies demonstrate Berlin's commitment to integrating economic growth, technological innovation, social equity, and environmental sustainability. By combining qualitative aspirations with specific targets where possible, they guide the city's transformation into a resilient, inclusive, and forward-looking global metropolis.

4.1.2. City strategy themes name analysis

Berlin's urban development strategies reflect a multifaceted approach aimed at balancing economic growth, social equity, cultural preservation, and environmental sustainability. As shown in Table 3.

Table 3.

the count and percentage of strategies for each thematic category, broken down by their source classification

Thematic Category	Academic / Policy Study	Governmental report	Participatory initiative	Grand Total	Percentage
Cultural Preservation and Tourism	1	0	1	2	15%
Economic Growth and Innovation	1	5	0	6	30%
Global Integration & International Relations	1	1	0	2	10%
Social Equity and Inclusion	1	2	2	5	25%
Sustainability & Envirnmental Resilience	1	1	1	3	20%

Source: The authors based on the database

Economic Growth and Innovation (30%) Berlin emphasizes economic dynamism through strategies that attract foreign investment, support creative industries, promote startups, and develop technology hubs. The *Berlin Strategy | City Development Plan Berlin 2030* highlights the integration of urban society with institutional stakeholders to foster creativity and economic competitiveness. Complementing this, the *Smart City Strategy* leverages digital technologies to enhance infrastructure, improve urban efficiency, and stimulate innovation in key sectors such as mobility, energy, and e-governance. These efforts underscore Berlin's ambition to establish itself as a leading global innovation hub.

However, while the *Smart City Strategy* successfully leverages digital technologies to stimulate mobility and e-governance, it frequently prioritizes capital-intensive technological deployments over equitable infrastructure. Literature on smart urban governance warns against *technological solutionism*, where the influx of venture capital and the development of tech hubs disproportionately benefit central boroughs while neglecting peripheral areas (Hollands, 2008; Townsend, 2013). Verifiable quantitative indicators, such as the spatial distribution of tech-sector investments versus localized inflation in commercial rents, are notably absent from the strategic documents. Without these metrics, the strategy risks prioritizing corporate digital expansion over comprehensive, city-wide economic resilience.

Social Equity and Inclusion (25%) Addressing inequality and ensuring that urban growth benefits all residents are central to Berlin's strategies. The *Urban Development Concept Berlin 2030* outlines policies to combat poverty, support marginalized communities, and promote inclusive education. Public participation initiatives, such as *Shaping the City Together*, engage approximately 2,500 Berliners through the City Forum 2030, reflecting a commitment to inclusive governance and incorporating diverse perspectives into urban planning.

However, the thematic distribution of Berlin's urban strategies exposes a profound contradiction between economic expansion and spatial justice, particularly within the housing sector. While the *Urban Development Concept Berlin 2030* sets a concrete, quantitative target of creating 86,000 new apartments by 2036 to prioritize climate-friendly and affordable solutions, empirical evidence indicates a severe implementation deficit.

Data from the *2025 JLL Housing Market Report* and the *2024 IBB Housing Market Report* reveal that Berlin experienced a 38.5% year-over-year collapse in building permits in 2024, dropping to just 9,772 approved units, while asking rents simultaneously reached an all-time high of €15.74 per square meter. This quantitative reality critically undermines the strategy's *Social Equity and Inclusion* pillar, which theoretically aims to combat poverty and support marginalized communities.

Sustainability and Environmental Resilience (20%) Environmental sustainability is a cornerstone of Berlin's urban development approach. The Circular Economy Initiative exemplifies this theme by promoting sustainable resource use, waste reduction, and circular economic growth. Urban agriculture projects, community gardens, and climate-friendly housing initiatives further support this vision. The *Urban Development Concept Berlin 2030* also sets specific targets, such as creating 86,000 new apartments by 2036, emphasizing sustainability and affordability.

The *Urban Development Concept Berlin 2030* sets a concrete target of creating 86,000 new apartments by 2036, yet there is no clear empirical data on the lifecycle carbon emissions or ecological footprint of such massive construction efforts.

The promotion of the *Circular Economy Initiative* must be quantitatively reconciled with the resource consumption required for this housing boom. Comparing these policies against established frameworks for environmental sustainability (Arora & Mishra, 2019), it becomes evident that Berlin's strategy relies heavily on qualitative climate-friendly aspirations rather than verifiable, real-time indicators of energy optimization and waste reduction.

Cultural Preservation and Tourism (15%) Berlin's rich cultural heritage and dynamic tourism sector are integral to its strategic vision. The *Berlin Tourism Plan* aims to position the city as a premier tourist destination while balancing tourism growth with residents' quality of life. It emphasizes preserving cultural heritage and enhancing visitor experiences, ensuring that tourism development aligns with broader urban objectives.

While the *Berlin Tourism Plan* aims to balance visitor growth with residents' quality of life, it lacks empirical indicators to manage the adverse effects of platform-driven overtourism. The digitalization of the housing market, such as short-term rental platforms, directly undermines cultural preservation by removing housing stock from local residents and altering the neighborhood fabric.

Without verifiable quantitative indicators, such as localized short-term rental caps, carrying capacity metrics for historical sites, or empirical data on resident displacement rates, the strategy isn't clear on a measurable framework for how the tourism with the quality of life will be balanced.

Global Integration and International Relations (10%) Strengthening global partnerships and fostering cultural exchanges are essential to Berlin's international strategy. The city seeks to enhance its global standing through economic collaborations and diplomatic initiatives, although specific quantitative metrics for these partnerships are limited in the sources reviewed.

Global Integration and International Relations strategies are explicitly limited by a lack of specific quantitative metrics. The city's ambition to enhance its global standing through economic and diplomatic collaborations is presented entirely as a narrative framework.

Castells' (2011) theory of the network society indicates that true global integration in the digital age is defined by measurable flows of capital, information, and institutional partnerships. While Trutkowski et al. (2022) suggests that international strategies must be grounded in robust indicators such as the volume of Foreign Direct Investment (FDI) specifically aligned with the UN Sustainable Development Goals (SDGs), or the measurable adoption of best practices sourced from international smart city networks. Without these empirical benchmarks, the Global Integration theme operates as a symbolic framework rather than a strategic mechanism for localized urban improvement.

Berlin's strategic vision embodies a holistic approach, recognizing the interconnections among economic, social, environmental, cultural, and global dimensions. Economic growth strategies are closely linked with innovation-driven policies, fostering startups and technology hubs while improving infrastructure to support these developments. Social equity initiatives ensure that economic prosperity is distributed inclusively, providing marginalized communities with access to resources and opportunities.

Sustainability efforts are integrated into broader urban planning policies, including affordable housing and urban agriculture projects, reflecting Berlin's ambition to become a climate-resilient city while enhancing residents' quality of life. Cultural preservation initiatives maintain the city's unique identity amid modernization, ensuring that tourism growth does not compromise Berlin's cultural fabric. Finally, Berlin's international strategies aim to strengthen its global presence through diplomatic and economic collaborations that align with its broader developmental goals.

When innovation-driven economic strategies outpace sustainable housing development, it precipitates severe gentrification and spatial marginalization. From an urban governance perspective, this disparity disproportionately affects vulnerable populations, including refugees and low-income residents, actively denying them equitable access to urban resources. Consequently, Berlin's strategic vision empirically struggles to harmonize its ambition to be a leading global innovation hub with the urgent, foundational mandate for spatial justice and equitable urban development.

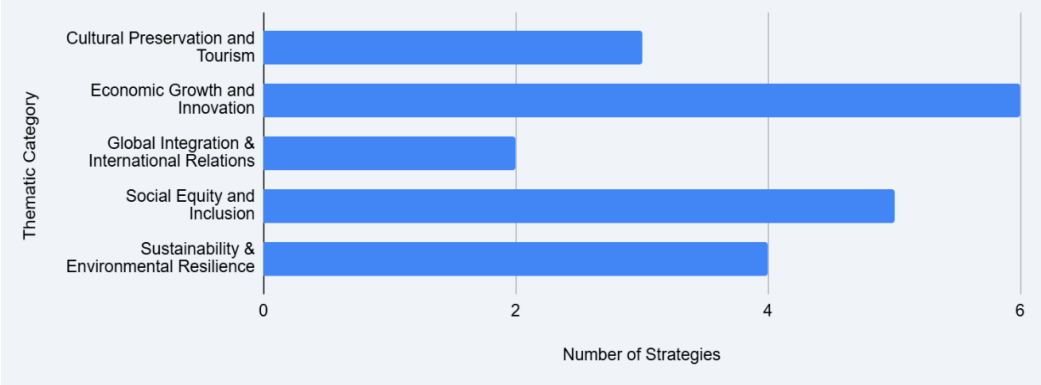
Overall, Berlin's urban development strategies demonstrate a balanced pursuit of economic vitality, social equity, environmental sustainability, cultural preservation, and global integration. As shown in figure 1, The city's strategic focus is heavily concentrated on economic development and social inclusion, with these two areas dominating the planning efforts.

The city has also significantly ramped up its strategic planning efforts in recent years as shown in figure 2, with the majority of the documented strategies being published since 2019. The years 2021 (6 strategies, and 2019, represent the peak periods of strategy publication. Overall, 75% (15 out of 20) of the strategies were published in the four-year window between 2019 and 2022, which shows strong recent focus on strategic planning.

Each thematic area analyzed contributes to shaping Berlin into a resilient, inclusive, and forward-looking global metropolis (Senate Department for Urban Development, Construction and Housing, 2025; Berlin, 2025).

Figure 1.

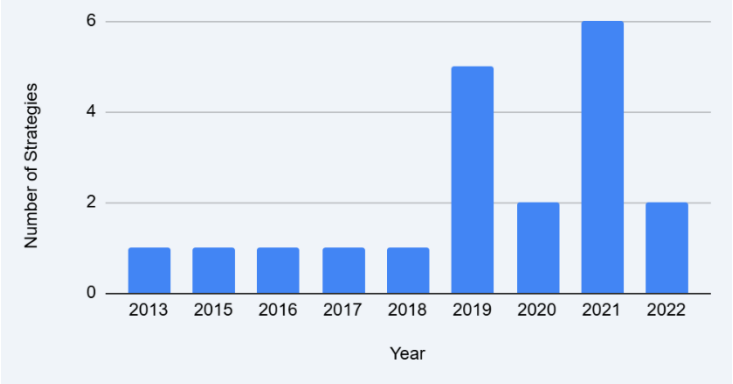
Distribution of City Strategies by Thematic categories



Source: primary source of Field dataset Senate Department for Urban Development, Construction and Housing, 2025; City Berlin, 2025).

Figure 2.

Distribution of City Strategies by Year



Source: primary source of Field dataset

4.1.3. City Strategy source name analysis

The analysis of the sources of city strategies involves examining the diverse factors and influences that shape urban policies and development. These sources include government policies and regulations, which, at national, regional, and local levels, guide zoning laws, environmental regulations, and housing policies.

Economic factors, such as growth, employment, and industry trends, play a central role in shaping strategies as cities seek to attract investment and enhance infrastructure. Social needs and demographic dynamics, including population size, age distribution, and diversity, also influence urban planning, with attention to public health, education, and affordable housing. Environmental sustainability has become increasingly important, prompting cities to adopt green strategies, such as sustainable transport, waste management, and renewable energy initiatives.

Technological advancements are progressively integrated into urban strategies, with cities employing smart technologies, digital infrastructure, and innovative solutions to improve quality of life and optimize urban management.

Cultural and historical contexts also inform strategy development, as the preservation of heritage and the promotion of cultural identity are integral to urban planning.

Public participation and civil society engagement further shape city strategies, ensuring that community input contributes to more inclusive development. Additionally, international influences and global trends guide cities toward successful models of sustainability and social welfare. Political leadership, local priorities, and academic research provide further direction, generating evidence-based strategies in areas such as transportation, housing, and public spaces. Together, these diverse sources interact to produce complex, multidimensional strategies for sustainable, resilient, and inclusive urban development.

Berlin's urban strategies exemplify this balance between economic growth, sustainability, digital innovation, and social equity. Key sources influencing these strategies include urban planning and governance documents, which reflect theoretical frameworks such as the Right to the City and principles of spatial justice.

These strategies are shaped by multiple factors, including government policies, economic trends, social needs, environmental concerns, digitalization, cultural context, and citizen participation, with political leadership and academic research further guiding urban planning. Key policy documents include the *Urban Development Plan* (focused on spatial justice), the *Climate Action Plan 2050* (environmental governance), the *Digitalization Strategy* (e-governance and data-driven decision-making), and the *Mobility Strategy 2030* (sustainable transport). Housing policies address affordability and gentrification, guided by social justice principles. Approximately 90% of Berlin's strategies are evidence-based, reflecting a strong reliance on data and research.

The strategic sources can be grouped into three main categories, as shown in figure 3:

- **Governmental reports (50%)**, such as *Berlin 2030* and the *Smart City Strategy*, which set formal policy frameworks emphasizing economic competitiveness, sustainability, and technology.

- **Academic studies (30%)**, which provide theoretical analyses, evaluate policy outcomes, and suggest improvements through mixed-method research.

- **Participatory initiatives (20%)**, such as *Shaping the City Together*, which incorporate grassroots input to promote inclusivity and public accountability.

This combination of top-down planning, academic evaluation, and citizen engagement creates a robust and adaptive framework. Governmental reports provide insight into Berlin's strategic vision and formal policy direction, prioritizing economic competitiveness, technological integration, and sustainable urban growth.

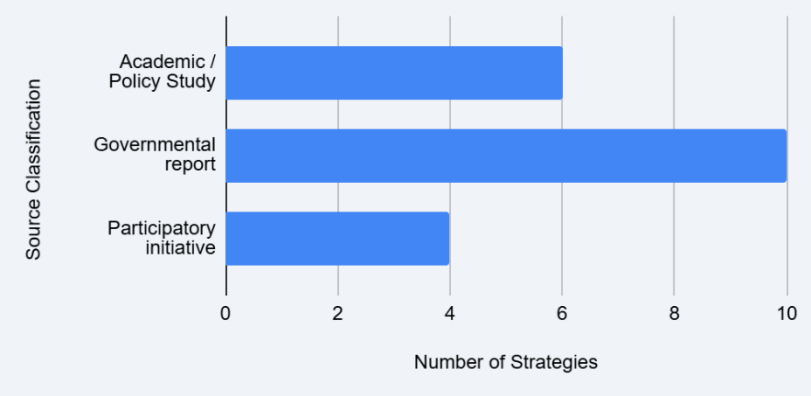
Academic studies enrich this discourse by critically analyzing policy outcomes, offering nuanced interpretations of urban dynamics, and supporting evidence-based policymaking. Participatory initiatives ensure that policies resonate with the local population, reinforcing social equity and inclusivity in urban governance.

The data suggests that while external studies and public participation contribute to strategic development, the formal output is predominantly government-owned.

However, the triangulation of governmental directives, academic scrutiny, and public participation underpins Berlin's holistic approach to urban development. The interplay between these sources not only legitimizes the strategies but also enhances their adaptability to evolving urban challenges. This diverse sourcing structure ensures that Berlin's urban development strategies remain comprehensive, inclusive, and forward-looking, capable of addressing both current and future urban needs (Senate Department for Urban Development, Construction and Housing, 2025).

Figure 3.

Distribution of City Strategies by Source Classification



Source: primary source of field dataset**.**

4.2. Public services with information technology analysis

The analysis of public services with information technology focuses on understanding how digital tools and technological innovations transform the delivery, accessibility, and efficiency of municipal services. Public services, traditionally delivered by government institutions to meet essential community needs, are increasingly shaped by the integration of digital technologies, including e-governance platforms, data-driven decision-making systems, and smart infrastructure solutions.

4.2.1 Public services with information technology name analysis

Analyzing the impact of information technology on public services in Berlin provides valuable insights into how digital solutions shape urban governance, service delivery, and citizen engagement. The city's integration of digital technologies has significantly transformed public service provision, emphasizing efficiency, transparency, and accessibility.

The Berlin Service Portal, for instance, provides access to 696 services, the majority of which are available online. These services reflect the city's administrative priorities and are designed to support both residents and businesses. Key recurring terms in service names, such as *Anmeldung* (registration), *Beantragen* (apply), *Erlaubnis* (permit), and *Gebühr* (fee), highlight major focus areas, including residency, identification, transportation, and licensing.

Services typically follow a structured naming convention, often in the format Function + Object, for example:

- *Anmeldung einer Wohnung* (Registration of an apartment).
- *Führerschein beantragen* (Apply for a driver's license).
- *Gewerbeanmeldung* (Business registration).

Some service names include additional clarifications to improve user comprehension, such as:

- *Abmeldung einer Wohnung (wenn Sie ins Ausland ziehen)* (Deregistration of an apartment when moving abroad).
- *Ersatzführerschein nach Verlust oder Diebstahl* (Replacement driver's license after loss or theft).

This combination of legalistic precision and explanatory titles enhances usability while maintaining the formal tone necessary for official procedures. Most services relate to personal documentation and transport, reflecting their central role in urban life. Berlin's approach demonstrates how digital governance strategies can improve administrative clarity, streamline service delivery, and strengthen public trust.

Although the Berlin Service Portal consolidates 696 services with a majority accessible online, a critical evaluation suggests a necessary distinction between informational web presence and fully transactional, end-to-end digital processing. The structured naming conventions, such as *Anmeldung einer Wohnung* or *Gewerbeanmeldung*, reflect traditional bureaucratic pathways that have been shifted to a digital medium, rather than indicating a fundamental reengineering of the services themselves.

As noted by Dunleavy and Margetts (2023) regarding the third wave of digital era governance, simply digitizing existing forms does not inherently eliminate administrative burdens or improve public sector capability. To assess this digital transformation, the analysis requires verifiable quantitative indicators, such as the percentage of these 696 services that require no in-person follow-up at a physical office, or empirical data tracking the average reduction in processing times per application.

4.2.2. Public services themes with information technology name analysis

Analyzing public service themes in Berlin through the lens of information technology highlights the sectors where digital tools and platforms have been implemented to enhance efficiency, accessibility, and inclusivity. A key focus is on the thematic organization of services, which facilitates citizen engagement and improves urban governance.

The government and digital public services theme emphasize the digitalization of municipal services, enabling residents to interact with authorities through online platforms. A central example is the *Bürgerportal* (Citizen Portal), which provides access to a wide range of services, including applying for permits and licenses, renewing documents such as passports and driving licenses, and completing administrative tasks like tax payments, registration, and housing support. By moving routine tasks online, the city increases operational efficiency and reduces the need for in-person visits.

The German *Onlinezugangsgesetz* (OZG) established a verifiable quantitative mandate to digitize 575 distinct administrative services by the end of 2022; however, many services online remain stuck at a low digital maturity level, often functioning as downloadable PDF forms that still require physical signatures and mail processing rather than end-to-end transactional automation.

The Service Portal Berlin organizes services into 18 thematic categories, as shown in table 4, reflecting different aspects of citizens' daily lives. These include Work and Social Affairs, Transport, Disability, Family and Equality, Health and Care, Culture and Science, Safety and Emergencies, Taxes and Finance, Tourism, Environment, Consumer Protection, and Economy. This thematic approach simplifies navigation, allowing users to quickly access the services relevant to their needs. Certain themes, such as transport, health, and social affairs, are more prominent due to their broad impact, while others serve more specialized audiences.

The categorization of the Service Portal Berlin into 18 distinct themes successfully simplifies front-end navigation yet critically masks severe back-end data fragmentation. Because these 18 thematic areas correspond to decentralized and often autonomous Senate departments and borough offices, there is a lack of verifiable cross-departmental data compatibility. Consequently, users are frequently forced to repeatedly input identical demographic and administrative data across different portals.

Education represents another area where information technology has been integrated effectively. Initiatives such as the *DigitalPakt* program provide schools with advanced digital infrastructure, including interactive whiteboards, high-speed internet, and digital teaching tools. These efforts aim to ensure equitable access to technology, enhance learning outcomes, and prepare students for a digital future.

However, while the program aimed to ensure equitable access to digital infrastructure, deploying interactive whiteboards and high-speed internet addresses only the hardware dimension of digital equity. These technological investments risk becoming obsolete without verifiable funded mandates for ongoing IT maintenance and pedagogical training for educators.

Citizen engagement is further strengthened through digital platforms that facilitate participation in local governance. The *Mein Berlin* app, for instance, allows residents to report urban issues, such as potholes or broken streetlights, directly to city officials, enabling prompt responses and improving urban maintenance. Open data platforms also provide access to planning information, allow citizens to submit feedback, and support participation in policymaking processes, thereby fostering transparency and democratic engagement.

Although without verifiable quantitative indicators, such as the demographic breakdown of active app users and the percentage of citizen feedback that directly results in tangible policy shifts empirical data, open data platforms have the risk of further marginalize vulnerable populations, thereby functioning as mechanisms of segregation rather than inclusive democratic policymaking.

Despite these advances, challenges remain, including ensuring digital equity, safeguarding data privacy, and effectively managing public-private partnerships. Berlin prioritizes addressing these concerns to maintain trust and inclusivity. By ensuring that IT-enabled services are secure, accessible, and responsive to diverse community needs, the city demonstrates how technological innovation can support efficient, transparent, and citizen-centered urban governance.

Table 4.

Key digital services & platforms by thematic categories and primary sourcing agency

Thematic Category	Key Digital Services & Platforms	Primary Sourcing Agency
Government & Registration (Meldewesen)	Bürgerportal; *Anmeldung* (Residency registration); ID renewals	*Bürgeramt* / Decentralized Boroughs
Transport & Mobility	BVG App; Digital ticketing; Parking permits; Jelbi (MaaS)	Senate Dept. for Mobility / Kfz-*Zulassungsstelle*
Housing & Real Estate	*Wohngeld* (Housing benefit) applications; Building permits	Dept. for Urban Development and Housing
Work & Social Affairs	Unemployment registration; Citizen's Income (*Bürgergeld*) portals	Dept. for Integration, Labour and Social Services
Education & Schools	DigitalPakt deployment; School registration; Digital learning portals	*Senatsverwaltung für Bildung* (Dept. for Education)
Health & Care	Telemedicine portals; Electronic Patient Records (ePA); Care allowance	Dept. for Health, Care and Equality
Economy & Business	*Gewerbeanmeldung* (Business registration); Startup funding	Dept. for Economics, Energy and Public Enterprises
Environment & Nature	Environmental sensors (*Kiezbox*); Open green-space mapping	Dept. for the Environment and Climate Protection
Taxes & Finance	ELSTER (Electronic tax declaration); Local property tax portal	Senate Department for Finance
Citizen Engagement	Mein Berlin App; City Forum 2030 portals; Participatory budgeting	Stadtentwicklungsamt (Urban Development Office)
Migration & Integration	Foreigners' Registration Office (*Ausländerbehörde*) digital portals	State Office for Immigration (LEA)
Safety & Emergencies	KATWARN (Emergency app); Digital police reporting (*Internetwache*)	Berlin Police / Dept. of Interior
Culture & Science	Digital heritage archives; Online ticketing for state museums	Senate Department for Culture and Europe
Family & Equality	Elterngeld (Parental allowance) digital applications; Daycare voucher (Kita-Gutschein)	Senate Dept. for Education, Youth and Family
Tourism & Events	VisitBerlin app; Event registration portals; Tourist tax collection	VisitBerlin / Dept. of Economics
Disability Services	Severely disabled pass applications; Accessible transit mapping	State Office for Health and Social Affairs (LAGeSo)
Consumer Protection	Digital fraud reporting; Health inspection open data (Smiley system)	Dept. for Consumer Protection
Public Space & Infrastructure	Digital zoning maps; Public Wi-Fi deployment (Free WiFi Berlin)	Senate Department for Urban Development

Source: The authors based on the database.

4.2.3. Public services with information technology source name analysis

Berlin has been actively integrating information technology into its public services to enhance efficiency, accessibility, transparency, and sustainability. The city's deployment of digital platforms, advanced technologies, and data-driven tools has transformed public service delivery, fostering a more responsive, inclusive, and efficient urban environment. The primary goal of using information technology in public services is to streamline processes, increase accessibility, and strengthen citizen engagement.

The Service Portal Berlin consolidates services provided by a diverse range of governmental bodies, offices, and specialized agencies. Key sources include the *Bürgeramt* (Citizen's Office), responsible for administrative tasks such as registration and documentation; the *Ordnungsamt* (Public Order Office), overseeing public safety and regulatory enforcement; and the *Kfz-Zulassungsstelle* (Vehicle Registration Office), handling automotive-related matters. Digital education initiatives are coordinated by the *Senatsverwaltung für Bildung* (Senate Department for Education), while urban planning and participatory governance are supported by the *Stadtentwicklungsamt* (Urban Development Office) and open data platforms.

These sources illustrate a complex network of institutions working toward integrated governance. By consolidating services through the Bürgerportal, Berlin improves accessibility and streamlines interactions between citizens and municipal agencies. Specialized departments leverage digital tools to enhance service delivery in areas ranging from education to urban planning, reflecting a strategic approach to technology adoption. However, reliance on multiple agencies can create fragmentation, highlighting the need for stronger interdepartmental coordination.

According to Lindgren et al. (2019), the successful digitalization of public services relies heavily on overcoming isolated administrative operations to configure cohesive, automated workflows. While the *Bürgerportal* attempts to serve as a unified front-end interface for citizens, the back-end integration of these diverse sources frequently lacks verifiable data-sharing protocols.

A critical assessment of this digital infrastructure demands quantitative indicators of interdepartmental coordination, such as the volume of automated cross-agency data exchanges or the measurable reduction in redundant data requests submitted to citizens. Without empirical evidence demonstrating successful back-end interoperability, the consolidation remains superficial, echoing the recognized difficulties of maintaining continuous capability innovation within highly compartmentalized public sector environments.

Therefore, achieving the full potential of Berlin's Strategic Digital City framework necessitates measurable structural reforms that actively dissolve these historical agency boundaries. Emphasizing digital equity remains a critical priority, ensuring that all residents can benefit from technological advancements in public services.

5. Results

Based on the analyses and respective metrics, it is evident that Berlin's city strategies and public services are designed to promote sustainable urban development and enhance residents' quality of life. The adoption of information technologies has made the city more responsive, inclusive, and efficient, paving the way for future-ready urban management that prioritizes sustainability, digital equity, and improved citizen experiences.

Digital government services, such as the *Bürgerportal*, have become fundamental in streamlining administrative tasks, reducing bureaucracy, and significantly improving service accessibility and efficiency. Public mobility solutions, including the BVG App and digital ticketing systems, are transforming urban transport by enhancing convenience and reducing reliance on paper-based processes.

Geographic Information Systems (GIS) play a vital role in data-driven urban planning, supporting efficient resource management and sustainable growth, although their impact is more long-term and integrated into large-scale infrastructure projects.

In the healthcare sector, digital health solutions such as telemedicine and electronic health records improve access to medical services, enabling remote consultations and personalized care, and ensuring greater inclusivity in health provision. Citizen engagement and public feedback mechanisms, including the *Mein Berlin* app and open data initiatives, empower residents to participate in governance. These tools increase transparency and accountability, giving citizens a voice in shaping their city.

Environmental sustainability initiatives, such as smart grids and environmental sensors, support Berlin's green agenda by monitoring and optimizing energy consumption, air quality, and overall environmental health. Public safety and emergency management have also been enhanced through AI-powered surveillance and emergency response platforms, which, while specialized, play a crucial role in maintaining security and ensuring swift emergency responses. Efforts toward digital inclusion ensure that marginalized and vulnerable populations can access public services and technologies, addressing digital divides and promoting equitable access.

Citizen participatory urban planning exemplifies Berlin's commitment to inclusive governance. Initiatives like "Shaping the City Together" demonstrate the city's efforts to incorporate diverse perspectives into urban development, while digital platforms such as *Mein Berlin* allow residents to report local issues, provide feedback on urban projects, and engage in decision-making processes. This digital engagement fosters a sense of ownership among citizens and strengthens transparency in urban governance.

Synthesizing the empirical data gathered across the 696 identified digital public services reveals a distinct operational asymmetry within Berlin's urban governance framework. While the volume of digitized services suggests an expansive e-government portfolio, the results demonstrate that digital service provision is heavily skewed toward mandatory administrative compliance, such as residency registration (*Anmeldung*) and vehicular licensing, rather than proactive civic empowerment.

It becomes evident that Berlin's digital infrastructure currently functions more as an electronic repository for traditional bureaucratic processes rather than a transformative, third-wave digital governance platform. The sheer quantity of services (696) categorized into 18 distinct themes inadvertently quantifies the persistent departmental silos within the Senate, highlighting a critical need for back-end compatibility to realize the holistic vision outlined in the *Smart City Strategy*.

Furthermore, the synthesized results expose a quantifiable tension between Berlin's dominant strategic themes. The empirical distribution of city strategies, where Economic Growth and Innovation commands a 30% share while Sustainability and Environmental Resilience trails at 20%, materializes as a tangible policy gap in practice.

For instance, while digital mobility platforms like the BVG app successfully scale to millions of users, the integration of environmental sensors and smart grids remains largely confined to isolated pilot districts. Berlin's current digital trajectory disproportionately accelerates market-driven technological hubs over universally accessible ecological infrastructure.

Overall, Berlin's integration of information technology into its public services serves as a powerful tool to advance the city's strategic objectives. Each digital initiative aligns closely with broader urban strategies, creating a cohesive ecosystem where technology enhances economic growth, promotes social equity, supports sustainability, preserves cultural heritage, facilitates global integration, and empowers citizens in urban governance. This alignment not only streamlines public service delivery but also ensures that digital innovation drives a more inclusive, sustainable, and dynamic urban future.

Table 5.

Results comparison between city strategies and public services

Variables	Empirical Results	Strategic & Operational Strengths	Implementation Gaps & Weaknesses
Strategy Name	20 formal strategies characterized by broad, holistic visions.	Establishes a highly comprehensive, long-term normative framework covering all major aspects of urban development.	Heavily relies on qualitative narratives rather than verifiable quantitative Key Performance Indicators, making policy execution difficult to audit or enforce.
Strategy Theme	High concentration in Economic Growth (30%) and Social Equity (25%).	Strongly positions the city as a competitive global innovation hub while theoretically prioritizing affordable housing and social inclusion.	Economic and tech-hub expansion frequently outpaces social policies, aggravating gentrification. The strategic goal of 86,000 new apartments is actively contradicted by a 38.5% collapse in actual building permits.
Strategy Source	50% Governmental Reports, 30% Academic, 20% Participatory.	Ensures policies are legally robust, structurally integrated, and supported by evidence-based academic research.	While platforms like *Stadtforum* record 75,000 visits, this model aggravates the segregation and aren't very favorable for the marginalized or vulnerable population
Public Service Name	696 digitized services consolidated on the *Berlin Service Portal*	Provides a centralized, highly visible digital front-door for citizens, maximizing the sheer volume of services accessible from home.	Requires printed PDFs and physical signatures, no real transformation for real digital strategic city.
Public Service Theme	Fragmented distribution across 18 distinct administrative categories (Mobility, Health, Taxes, etc.).	Simplifies front-end user navigation by grouping complex bureaucratic processes into recognizable, daily-life categories.	The 18 silos force citizens to repeatedly submit identical data to different agencies, preventing the realization of a unified digital platform.
Public Service Source	Decentralized delivery sourced from 12 semi-autonomous boroughs and specialized Senate departments.	Allows localized, specialized administration tailored to specific district needs.	Service efficiency depends entirely on the IT capacity of an individual borough office, leading to verifiable wait-time disparities and systemic execution hurdles.

Source: The authors based on the database.

The critical comparison of variables across the two primary Strategic Digital City constructs as shown in table 5, reveals a paradox within Berlin's urban governance. When evaluating the first construct, City Strategies, the variables demonstrate that Berlin excels at generating comprehensive, evidence-based policy frameworks.

The integration of governmental, academic, and participatory sources provides a strong theoretical foundation for sustainable urban development. However, the critical analysis exposes that this high-level strategic formulation frequently lacks the quantifiable metrics necessary to manage conflicting themes.

For example, the pro-growth orientation of the economic strategies actively accelerates urban gentrification, directly undermining the social equity strategies designed to protect vulnerable demographics.

This strategic friction cascades into the execution phase, as evidenced by the second construct, Public Services with IT. While the sheer volume of 696 digital services organized into 18 themes, initially appears as a strength of digital modernization, the empirical reality highlights a severe implementation gap. The pros of a centralized front-end portal are negated by the cons of a decentralized, siloed back-end. Instead of leveraging information technology to reengineer public administration, the municipality has largely digitized its existing bureaucratic inefficiencies, resulting in persistent media breaks.

Ultimately, this variable by variable comparison demonstrates that without bridging the gap between strategic intent and back-end interoperability, Berlin's digital transformation risks prioritizing technological proliferation over equitable, seamless public service delivery.

To validate the efficacy of Berlin's approach to urban digitalization, a critical comparison with contemporaneous European municipalities is essential. Evaluating Berlin alongside the capital cities of Amsterdam (Gabbiatti Menegheti et al., 2024) and Edinburgh (Al lahham et al., 2024) provides a robust empirical baseline, as all three cases share comparable democratic governance structures, complex population dynamics, and identical methodological evaluation frameworks.

The selection of Amsterdam and Edinburgh have been systematically analyzed utilizing the exact same dual-construct Strategic Digital City protocol, measuring the alignment of city strategies against public IT services. This methodological symmetry eliminates variable inconsistencies, allowing for a verifiable, one-to-one quantitative comparison of how differently structured European capitals operationalize digital transformation to address universal urban challenges.

Comparing Berlin's results with Amsterdam highlights a divergence in administrative architecture and thematic prioritization. Where Berlin's decentralized borough system generates an expansive matrix of 696 digital services, empirical data from Amsterdam demonstrates a highly centralized, hyper-compact digital ecosystem operating with only 7 primary public IT services. Amsterdam's framework significantly reduces front-end complexity, funneling citizen interactions through a streamlined Municipal Services core (28.57%).

Furthermore, Amsterdam's strategic documentation reveals an aggressive, ecology-first policy stance, dedicating a combined 66.66% of its strategies directly to Environment and Leisure, contrasting sharply with Berlin's 30% focus on economic innovation. This comparison suggests that Berlin's massive volume of online services may actually hinder digital usability, and that adopting Amsterdam's model of thematic concentration could significantly enhance verifiable citizen adoption rates and sustainable outcomes.

Conversely, comparing Berlin to Edinburgh provides critical insights into the integration of social equity within digital strategy. Edinburgh's strategic digital city application exemplifies a model of regional, socio-economically driven digital governance. Quantitatively, Edinburgh distributes its 20 city strategies with absolute parity (5% each) across an extensive range of themes, preventing any single economic objective from overpowering social mandates.

More crucially, Edinburgh's public IT services prioritize environmental and social welfare (11% each), deeply embedding tools like the *Edinburgh Alcohol and Drug Partnership* into the municipal digital framework. While Berlin effectively utilizes digital platforms for general civic engagement (*Mein Berlin*), Edinburgh's results demonstrate a more targeted deployment of information technology to address specific socio-economic vulnerabilities.

This juxtaposition reveals that to mature its digital governance, Berlin must shift from generic participatory platforms toward the highly localized, equity-driven digital service distribution, ensuring that technological advancement tangibly mitigates urban inequality.

6. Conclusion

City management represents a complex challenge, particularly in rapidly evolving metropolises like Berlin, where social, economic, and environmental factors are in constant flux. This study emphasizes the critical connection between city strategies and public services, focusing on the use of information technology within the context of urbanization and population growth.

The primary aim was to explore how improving citizens' quality of life can simultaneously promote the economic and social development of cities. Berlin serves as a compelling case study to illustrate how digital initiatives can enhance public service delivery and citizen participation. However, it is crucial to consider territorial disparities and strive to create competitive advantages across all regions when developing strategies for healthy, equitable cities.

The research objective was achieved by analyzing city strategies and public services in Berlin, focusing on their relationship with the Strategic Digital City concept. The analysis, based on the city's digital platforms and official documents, revealed a concerted effort toward transparency in management and the effective application of information technology.

The results indicate that Berlin is highly committed to sustainable development and enhancing the quality of life for its inhabitants through a diverse array of city strategies and services. These initiatives reflect the municipality's core priorities, encompassing economic growth, social inclusion, environmental resilience, cultural preservation, global integration, and participatory urban planning. Furthermore, the broad involvement of various organizations in creating and implementing these initiatives underscores the extensive, collaborative effort required to promote sustainable urban growth in Berlin.

The research contributions are multifaceted. For city managers in Berlin, the analysis provides actionable insights into effective municipal strategies that prioritize citizens' quality of life and environmental sustainability. From a scientific perspective, the study expands the theoretical understanding of the Strategic Digital City concept by synthesizing various academic frameworks.

For the city itself, the findings validate its commitment to integrating key developmental themes into its overarching strategies. For citizens, the research highlights the vital importance of active participation in public management. Finally, this study contributes to broader academic discussions on social and economic development, the intersection of science, technology, and society, and modern city management.

However, the research has notable limitations, including its exclusive focus on Berlin and its reliance primarily on secondary data sources, such as official documents, reports, and digital platforms, without continuous field monitoring or longitudinal observation throughout the study period.

In conclusion, information technology is not just an enabler of urban management; it is a vital component of city strategies and the long-term vision for strategic digital cities, driving growth, sustainability, and enhanced public administration. While this research provides a thorough analysis of Berlin's digital strategies and public services, it is based on secondary data sources, such as publicly available documents and online platforms.

Future studies could further enrich our understanding by incorporating primary data collection methods, such as interviews with city planners and public administrators. Comparative studies with other cities could also offer valuable insights into the challenges and successes of the digital transformation process.

Ultimately, this study emphasizes that information technology plays a crucial role in urban development. Its success hinges on aligning digital initiatives with broader city goals and fostering active citizen participation in governance. As cities continue to evolve, technology's role in shaping the future of urban life and management remains critical in creating more inclusive, equitable, and efficient urban environments.

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