Development of Urban Dashboard for Smart District Planning and Management

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***Abstract*—District planning and management are gaining renewed attention, while urban digital dashboards have expanded with open data and smart city initiatives. Yet, most dashboards remain descriptive and provide limited support for district diagnosis and strategy-making. This paper synthesizes prior research and leading practices in urban dashboards and district planning to propose design principles for the urban dashboard that supports smart district planning and management. Based on a review of district planning theory, assessment methods, and global dashboard practices, the study develops an integrated framework consisting of (1) a fine-grained smallest spatial unit database, (2) Application Programming Interface (API) -based automated data acquisition, (3) analytics combining Geographic Information System (GIS) indicators and generative Artificial Intelligence (AI) for comparative diagnosis and action exploration, and (4) an interactive interface with visualization and natural-language dialogue. The framework is positioned as planning-oriented digital infrastructure supporting both top-down policy prioritization and bottom-up place management.**

Keywords- urban dashboard; district; neighborhood; BID.

I. INTRODUCTION

In recent years, urban policy has increasingly emphasized the importance of spatial reconfiguration and management at the district scale. Districts represent a walkable spatial unit and serve as a fundamental planning scale rooted in residents' daily life. They also function as a community unit and, in many contexts, constitute the smallest scale of local self-governance beneath prefectures, municipalities, and wards.

Internationally, institutional models, such as Business Improvement Districts (BIDs) have established a framework in which local businesses secure funding at the area scale and autonomously implement cleaning, safety measures, publicity, and events [1]. In addition, within urban design and transport policy, the concept of the X-minute city—which promotes pedestrian-oriented urban form, improved local accessibility, and the reorganization of public services at the district scale—has rapidly gained traction worldwide [2]. In Japan, and particularly in Tokyo, district-based urban initiatives, such as Area Management have expanded in redevelopment areas and central districts. In these initiatives, private firms and landowners increasingly take responsibility for maintaining and operating public spaces, promoting pedestrian circulation, shaping urban landscapes, and enhancing local attractiveness [3]. This trend aligns with a broader international shift toward understanding districts not only as "spatial units," but also as "managerial units" for urban governance and place management.

In parallel with the expansion of district-based urban governance, global momentum toward urban digitalization (smart cities) and data-driven policymaking has accelerated. Technological developments—including the improvement of open data infrastructures, the establishment of urban operating systems, and the spread of IoT and sensing technologies—have made it increasingly feasible to visualize and monitor urban conditions. In particular, cities, such as London [4], New York [5], and Paris [6] have begun to publish digital dashboards (hereafter, urban dashboards) that aggregate city-scale data and present them at district-scale spatial units, enabling residents and local organizations to access and utilize urban information. Yet, compared to these global cities, Tokyo lacks an urban dashboard that visualizes urban conditions at the district scale. Although the Tokyo Metropolitan Government has released dashboards related to policy evaluation [7], there remains no comprehensive mechanism that assesses urban space itself and provides data in a form that can be reorganized and interpreted at the district scale. As a result, despite the growing number of district-scale planning and management initiatives across cities, a digital infrastructure that connects city-scale data with district-scale practice remains missing.

Focusing on this gap, this paper aims to propose design principles for an urban dashboard that reorganizes city-scale data into district-based units and visualizes districts' relative characteristics. Such an urban dashboard should be positioned not only as a tool for public authorities to identify priority districts and target interventions from the perspective of urban publicness, but also as a foundational infrastructure for smart district planning and management—enabling district management organizations and citizens to understand the distinctive features of their own area and to advance policy formation and consensus-building.

The paper is structured as follows. Section II outlines the review methodology. Section III reviews research on urban dashboards and compares dashboard practices in major cities to clarify their design rationales and limitations, as well as the gap in Tokyo. Section IV summarizes the theoretical development of district planning, institutional frameworks,

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and the evolution of district assessment methods, and presents an analytic perspective for district diagnosis to inform dashboard design. Section V integrates the discussions in Sections III and IV to propose a conceptual model and design framework for an urban dashboard that supports smart district planning and management. Section VI concludes.

II. METHODOLOGY

This study is positioned as a review-based research project that systematically organizes existing literature, policy documents, and practical reports in the fields of urban planning and smart cities, with the aim of developing an integrated understanding of district planning theory and urban dashboards. This study is positioned as a review that bridges two strands of scholarship that have not been sufficiently connected to date: research on urban dashboards and research on district-scale planning and assessment. To ensure transparency and reproducibility, this Section presents the literature search process and selection criteria.

The primary search was conducted using Web of Science, a major academic database for urban planning and smart city research. The review targeted literature published from 1970 onward. The following English keyword combinations were used: "urban dashboard", "city dashboard", "district planning", "neighborhood planning", "Business Improvement District", "15-minute city". In addition, administrative reports, open data portals, and technical documentation related to urban dashboards were collected for major cities (e.g., London, New York, Paris, and Tokyo) in order to supplement academic findings with practice-oriented insights.

Among the collected materials, those meeting the following criteria were selected for review: Research on urban dashboards, open data, and smart city analytics, Studies on district-scale planning and governance, Literature on district diagnosis and assessment methods (both subjective and objective), Studies on the 15-minute city and accessibility analysis, and Implementation cases in specific cities (New York, London, Paris, and Tokyo).

III. URBAN DASHBOARDS: CONCEPTS AND GLOBAL PRACTICE

A. *Conceptualizing Urban Dashboards*

The urban dashboard is an information platform that integrates diverse urban indicators and visualizes them on a single interface through maps, charts, and related tools. Since the 2010s, urban dashboards have been increasingly introduced in major cities worldwide as platforms providing evidence for decision-making, driven by the expansion of open data, the rise of Evidence-Based Policy Making (EBPM), and the diffusion of business intelligence tools [8]. By visualizing urban processes and performance through data, dashboards support rapid situational awareness and Key Performance Indicator (KPI) management within administrations, while also offering an intuitive means for communicating urban conditions to the public [9].

Existing research includes studies on UI design based on comprehensive reviews of global dashboard practices [8], [10], as well as studies focused on user experience [11], [12]. Regarding use contexts, research has examined both administrative applications—such as leveraging dashboards for policy design and operational improvement through case studies [13]—and citizen participation perspectives. In the latter stream, dashboards are discussed as mechanisms through which local governments present publishable data in accessible formats, thereby enhancing transparency and accountability, while enabling citizens and businesses to use data for their own decisions and analyses [11], [14]. At the same time, some studies have pointed to the insufficient interactive and dialogical capacities of many existing urban dashboards [10].

B. *International Comparison of Dashboard Practices*

Major global cities have developed urban dashboards that reflect distinct urban strategies and administrative cultures. The dashboards of London, New York, and Paris are representative examples. Table 1 summarizes their key characteristics and Figure 1 shows their user interfaces. Tokyo's 23 wards constitute a megacity comparable in population scale to London and New York, while the wider metropolitan region is comparable to Greater Paris. Moreover, Tokyo's chōchōmoku (smallest neighborhood block units) are among the finest-grained spatial units used internationally and function as a base unit for statistical analysis, similar to London's Lower Layer Super Output Areas (LSOAs) and New York's Neighborhood Tabulation Areas (NTAs). For these reasons, comparing Tokyo's potential dashboard development with established practices in London, New York, and Paris is academically justifiable.

In London, the Greater London Authority provides the London Area Profiles [4], which visualize census-based statistics on society, population, housing, and related dimensions at borough and ward scales, in a format close to raw data.

In New York City, the nonprofit organization Measure of America develops and publishes DATA2GO.NYC [5]. It visualizes over 400 indicators across three spatial scales—from boroughs to neighborhoods. Compared to London's dashboard, it places stronger emphasis on composite indices that are easier for the public to interpret, such as the Human Development Index (HDI). Its interface also enables exploratory analysis, such as examining correlations among indicators, supporting users' independent analytic engagement.

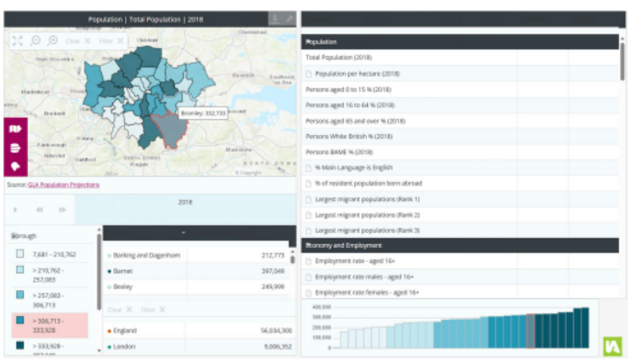
In Paris, the urban planning agency APUR provides the Portail des mobilités / Mobility Portal Greater Paris [6], a mobility-focused dashboard specialized in geospatial analysis that aligns with the 15-minute city concept. It supports analyses of accessibility to daily services via transport systems, as well as relationships between travel modes and environmental impacts. Notably, it includes future projections (e.g., 2030 forecasts for travel demand and air pollution), highlighting its function as a planning support tool for encouraging environmentally sustainable behavioral change.

These dashboards are useful for diagnosis and comparison at the district scale; however, they were not developed as dashboards specifically intended for district planning and management. Relatedly, the urban dashboards in all three cities remain largely limited to data visualization and descriptive statistics, and they offer little in the way of Artificial Intelligence (AI) -based automated diagnosis or policy recommendation functions. Such AI-enabled capabilities are needed because enabling citizens to diagnose district-level issues and explore policy options in natural language through generative AI can improve civic literacy regarding district management and urban policy and, in turn, encourage more proactive civic participation.

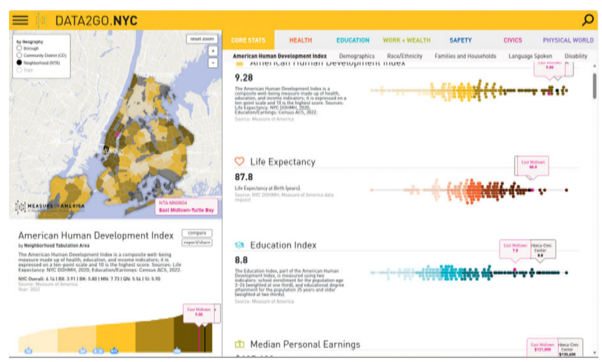
In Tokyo today, open data is widely provided through the Tokyo Metropolitan Government Open Data Catalog [15] and the Tokyo Data Platform [16]. The metropolitan government also publishes policy-evaluation dashboards [7] that visualize progress on long-term strategies and policy measures. However, the primary focus of these dashboards is KPI management. Additional dashboards exist in domains, such as fiscal management [17], Small and Medium-sized Enterprise business sentiment [18], and administrative process digitalization [19], yet Tokyo still lacks an urban dashboard capable of diagnosing the structure of urban space and district characteristics. This gap is particularly salient given the growing prevalence of district-based urban

TABLE I. CHARACTERISTICS OF URBAN DASHBOARDS IN LONDON, NEW YORK AND PARIS

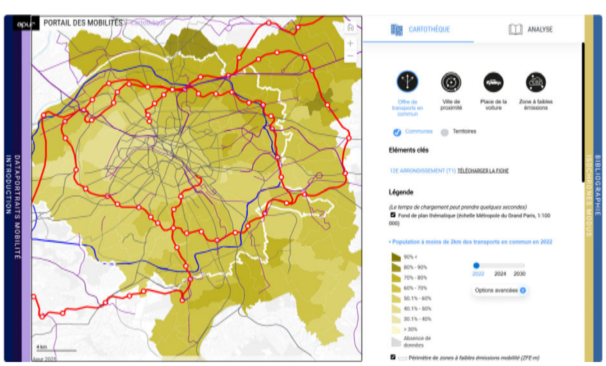
City	London	New York (NYC)	Paris
Urban dashboard	London Area Profiles [4]	DATA2GO.NYC [5]	Portail des mobilités [6]
Spatial units for data aggregation	32 boroughs within Greater London	5 boroughs / 59 community districts / approx. 200 neighborhoods (NTAs) within NYC	131 communes / 12 territories within the Greater Paris region
Indicators	89 indicators on population, economy and employment, public safety, housing, environment, transport, education, and health	Approximately 400 indicators on the Human Development Index (HDI), demographic diversity, health, education, economy, public safety, civic/political participation, housing and living conditions, etc.	More than 50 indicators on walkability-based accessibility to public transport hubs and everyday services, commuting distance and travel modes, air pollution, etc. In addition, forecasts for transport demand and air pollution in 2030 are also provided.
Visualization features	a. Visualizes the spatial patterns of each indicator by linking maps and histograms (main screen) b. Enables district-scale profile reports	a. Visualizes the spatial patterns of each indicator by linking maps, histograms, and scatter plots (main screen) b. Enables district-scale profile reports c. Displays results of correlation analysis between indicators	The main interface consists of three types: a. Visualizes district characteristics using charts b. Visualizes the spatial patterns of key indicators on maps and provides corresponding excerpts from research reports c. Visualizes transport accessibility on maps from any user-selected location



London Area Profiles (London) [4]



DATA2GO.NYC (New York City) [5]



Portail des mobilités (Paris) [6]

Future Tokyo: Tokyo's Long-Term Strategy Policy Dashboard (Tokyo) [7]

Figure 1. User interface of urban dashboards in London, New York, Paris and Tokyo.

governance and Area Management across the city. In short, Tokyo faces a challenge in the absence of a digital infrastructure that connects city-scale data to district-scale planning and management.

IV. The History of District Planning Theory

As confirmed in Section III, urban dashboards are useful for comparing districts, yet they offer only limited functionality for the diagnosis and decision-support required for district planning and management. This Section therefore organizes the evolution of district-scale planning theory and the shifts in approaches to district assessment as the theoretical foundation for bridging this gap. On this basis, it extracts the key requirements for a dashboard that can support smart district planning and management, and links the discussion to the design proposal in Section V.

A. Evolution of Theoretical Foundations

Theories and practices of district-scale planning have transformed gradually alongside shifts in twentieth-century planning thought. In early modernist and functionalist planning, Clarence Perry's neighborhood unit concept [20] served as a representative model, proposing a district spatial structure organized around elementary school catchments and prioritizing the distribution of daily functions and the exclusion of through traffic. This model became widely institutionalized as a guiding principle for residential development. However, the large-scale redevelopment projects promoted during the 1950s and 1960s were increasingly criticized for producing uniform spatial environments and undermining community cohesion, leading planners to reconsider approaches grounded in everyday lived experience [21].

Responding to these critiques, Jane Jacobs [22] emphasized that mixed land uses, diversity, and pedestrian-oriented environments generate urban vitality, articulating a vision of the city that foregrounded social dynamics at the district scale. From the 1960s onward, advocacy planning and collaborative planning gained prominence, reframing planning not as a purely expert-driven technical exercise but as a dialogical process involving citizen participation and interest mediation [23]. In the 1970s, the importance of local resources and human-scale environments was reaffirmed, and historic district preservation and community design became central themes of district planning theory [24]. In the 1980s and 1990s, New Urbanism emerged in the United States, promoting walkable streets, mixed use, and traditional block design [25]. During the same period, Transit-Oriented Development (TOD) evolved as a planning and development paradigm, strengthening arguments for concentrating residential and employment functions around transit stations and integrating district form with mobility systems [26]. By the 1990s, these urban design and development theories became embedded in institutional frameworks and guidelines across countries, consolidating districts as policy units where urban regeneration, transport policy, and community planning intersect [27].

In the twenty-first century, district-scale planning entered a new phase centered on sustainability, mobility optimization, and the reorganization of everyday living areas. Districts have increasingly been positioned as strategic units for reshaping metropolitan structures [28]. Building on these trends, planning agendas have once again strongly foregrounded walkable, human-centered public space as a key international direction [29]. Barcelona's Superblocks (Superilles) exemplify this shift: by restricting car traffic at the block scale and reallocating space toward pedestrians and cyclists, the project has become a globally recognized model of district-scale public space transformation [30]. Similarly, Paris's "15-minute city" strategy and the "X-minute city" initiatives in places, such as Milan and Portland propose urban structures in which daily functions can be completed within the district, encouraging optimized everyday mobility and a reconfiguration of living areas [28].

More recently, comprehensive district models have expanded further, including eco-districts [31] designed for climate change mitigation and innovation districts [32] aimed at fostering startup ecosystems. These approaches integrate environmental, economic, and social values, redefining districts not merely as spatial units but as sites of layered value creation and as foundations for sustainable, multifunctional urban structures.

B. International Comparison of Institutional Frameworks

District-scale planning institutions vary widely across countries, but many are positioned within hierarchical planning systems. They range from statutory instruments defining land use policies and building rules, to more flexible frameworks implemented as guidelines. In addition to formal planning instruments, private and community-led district management has become an increasingly important element of contemporary district governance.

In the United Kingdom, the 2011 Localism Act established Neighbourhood Development Plans (NDPs) as statutory plans, enabling community organizations to influence land use decisions [33]. While more than 2,600 areas have advanced plan-making, shortages of local capacity—especially in urban contexts—remain a persistent challenge [34].

In the United States, many cities adopt Neighborhood Plans as subordinate components of comprehensive plans, and their flexible operation often connects with redevelopment and historic preservation policies [35]. Moreover, BIDs are widely adopted as practical governance mechanisms that improve district environments through additional contributions from businesses, supporting functions, such as events, cleaning and safety measures [1].

In Japan, the district plan system introduced in 1980 provides a foundational planning framework. It enables municipalities to designate rules on building form and landscape through formal urban planning decisions, and resident-based organizations, such as local planning councils often participate in plan formulation and implementation [36]. In addition, Area Management has expanded in central districts of major cities, with private actors engaging in public space management and event programming to form business communities and enhance district value [3]. In Tokyo, in contrast to BIDs that are funded through additional levies on area businesses, developer-led Area Management has become common, particularly where major office developments serve as anchors. Such initiatives operate alongside large-scale redevelopment and aim to differentiate districts from competing urban areas [3].

Other institutional frameworks, such as Germany's B-Plan which regulates detailed land use under administrative leadership [37], also play important roles. Across these diverse systems, a shared challenge lies in balancing alignment with higher-scale plans and the flexibility required to reflect district-specific needs.

C. *Approaches to District Assessment*

Methods for evaluating districts have evolved alongside the history of urban planning. Early neighborhood unit models relied primarily on physical criteria, such as facility placement. From the 1960s and 1970s, as citizen participation expanded, social evaluation approaches emphasizing lived experience and community issues gained prominence [20]. Since the 1990s, the spread of Geographic Information System (GIS) has made quantitative assessments more common, including analyses of accessibility, facility distribution, and walking catchments, forming the foundation of contemporary living-area analytics [38].

District assessment methods can be broadly categorized into objective and subjective approaches. Objective approaches are exemplified by the internationally widespread "15-minute city" (and broader "X-minute city") frameworks, which evaluate access to everyday functions through travel time metrics [2]. These methods rely on GIS-based quantitative analysis and are used for inter-area comparison and policy target-setting. Recent progress in the open data availability of urban environmental indicators has further strengthened the quantity and quality of objective district evaluation.

Subjective approaches, by contrast, have a long history in Japan. Since the 1970s, the Community Karte (often translated as Community Profile) has been developed as a participatory tool through which residents examine local living environments, identify problems, and connect analysis to planning proposals—thereby integrating community-based evaluation into administrative policy [39]. This approach incorporates not only measurable conditions but also residents' perceptions, enhancing public involvement and linking directly to contemporary participatory district diagnosis practices. Internationally, similar principles appear in initiatives, such as the UK Parish Plan system and participatory rural appraisal in developing contexts, which enable communities to identify needs and integrate them into planning processes [40]. In this sense, the conceptual foundation of community profiling can be regarded as part of a shared international planning ethos.

Comparing the two approaches, the 15-minute city framework is strong in urban spatial analysis based on objective data, whereas the Community Karte (Community Profile) is strong in identifying issues grounded in lived experience and in facilitating consensus-building. For district assessment to function not merely as description or ranking but as a tool that supports district planning and management, it is necessary to combine participatory evaluation with data-driven evaluation and to enable both a top-down approach—through which public authorities identify priority districts and concentrate support and investment—and a bottom-up approach—through which district management organizations and residents understand the characteristics of their own area and advance policy formulation and consensus-building. Achieving this requires an urban dashboard that can be used by multiple stakeholders, including public authorities, district management organizations, and citizens. Specifically, such a dashboard should restructure diverse datasets collected at the city scale into district-based units, enabling inter-district comparison and time-series monitoring, while also integrating and presenting subjective information, including residents' perceptions and on-the-ground knowledge. In this sense, an urban dashboard of this kind can be positioned as a digital infrastructure for smart district planning and management.

V. Discussion: An Integrated Framework for District Planning and Urban Dashboards

A. *Requirements for Urban Dashboards for Smart District Planning and Management*

As discussed in Section III, digital urban dashboards in major global cities reorganize city-scale data—such as population, transportation, environment, land use, and human mobility—into district-based units, enabling inter-district comparison and situational awareness. At the same time, however, many dashboards remain centered on visualization and descriptive statistics and do not sufficiently support the practical needs of district planning and management, including problem identification, priority-setting, and the examination of policy options.

As summarized in Section IV, district planning theory has expanded from viewing districts as "units of everyday living," exemplified by the neighborhood unit concept, to understanding them as "units of management and value creation." Approaches to district assessment have likewise evolved toward integrating subjective, participation-based evaluation with objective evaluation using GIS and related methods, and toward linking diagnosis to concrete improvement strategies. In practice, however, carrying out tasks, such as interpreting districts' relative characteristics from multi-dimensional data, structuring the key issues, and formulating plausible policy options in a sustained and repeatable manner goes beyond what visualization and descriptive statistics alone can support; in this sense, generative AI is essential for performing such work effectively. Accordingly, dashboards that support smart district planning and management must go beyond visualization and incorporate generative AI functions that automatically extract districts' relative characteristics and challenges and propose improvement options, thereby serving as a shared infrastructure usable by both top-down actors (public authorities) and bottom-up actors (local stakeholders). This shift transforms district diagnosis from an expert-dependent practice into a more transparent, data-driven process and constitutes a core element of digital transformation (DX) in urban planning.

B. Design Framework for Urban Dashboards for Smart District Planning and Management

As the proposed dashboard aims to function as a diagnostic instrument that visualizes districts' relative characteristics—strengths, weaknesses, and biases—through AI-based analysis. City-scale data are automatically collected and decomposed into chōchōmoku-scale units, structured into a database, aggregated into districts composed of multiple chōchōmoku, and analyzed. In addition to mapping and graphical visualization, the dashboard incorporates generative AI to propose district issues and potential improvement strategies.

Urban dashboards consist of three layers: a data layer, an analytics layer, and a presentation layer [29]. Building on this model, the dashboard proposed in this study adds a data acquisition layer and consists of four layers, as shown in Figure 2.

1) Data Layer

The data layer comprises two spatial scales. The first is a database at the chōchōmoku-scale, which serves as the minimum unit for data aggregation. The second is a district-scale database, constructed by combining multiple chōchōmoku-units. District boundaries may vary depending on the managerial coverage of Area Management organizations, the spatial extent of developers' assets, or empirically observed living areas derived from mobility data. Therefore, the dashboard interface should allow users to define district boundaries flexibly.

2) Data Acquisition Layer

Data are automatically retrieved via Application Programming Interfaces (APIs) from sources, such as the Tokyo open data catalog, national census results, and commercial statistics, and then organized into chōchōmoku-scale datasets for database construction. A current challenge is the lack of standardized data formats across open data websites and survey sources. To reduce the need for manual preprocessing and enable low-cost, continuous updates of the data layer, the dashboard should incorporate API-based mechanisms for automated data collection and structuring.

3) Analytics Layer

The analytics layer consists of three sub-functions:

(3-1) Aggregation Functions

Some datasets are not available at the chōchōmoku-scale. For such data, spatial analyses—including GIS-based processing of facility distribution datasets—are conducted to generate chōchōmoku-scale aggregates, which are then stored in the database. For social media data, natural language processing and image analysis can be applied to derive district characteristics, which are also stored in the database.

(3-2) Evaluation Functions

Based on the integrated datasets, the dashboard computes a district-scale well-being score. Similar to the HDI used in New York's dashboard [5], this provides a composite index that summarizes district conditions into an interpretable measure. Using survey results that reveal relationships between residents' subjective well-being and objective urban environmental variables, a function linking environmental indicators to well-being can be constructed, enabling well-being estimation from district-scale urban environment data.

(3-3) Generative AI Functions

Generative AI supports analyses, such as:
identifying spatial patterns and distinctive characteristics across indicators, extracting each district's relative features and issues (i.e., which indicators are significantly distinctive

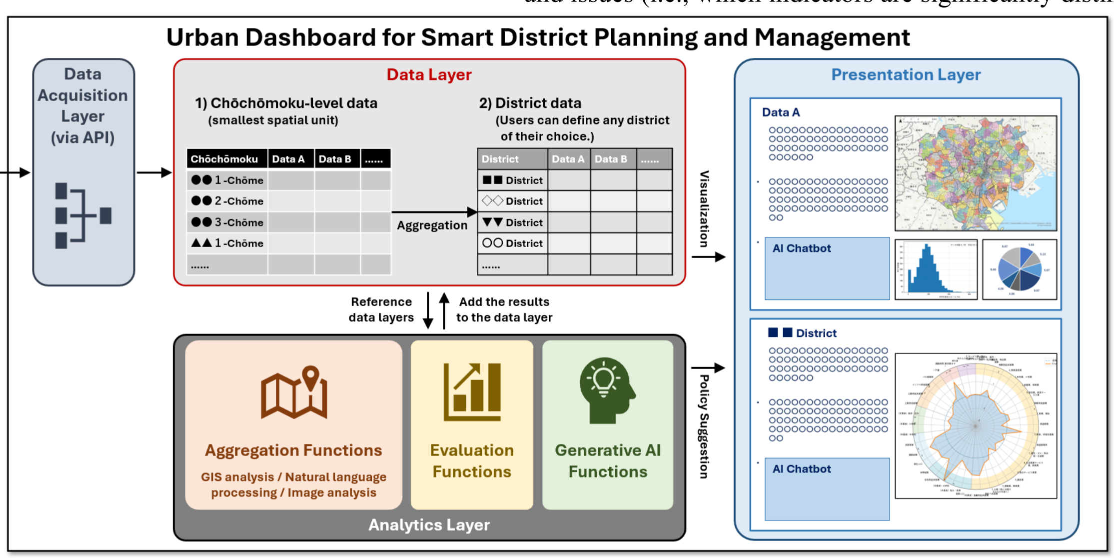


Figure 2. Conceptual image of the urban dashboard for smart district planning and management.

compared with other areas), exploring improvement strategies based on identified challenges, and generating reports synthesizing these analyses.

4) Presentation Layer

The presentation layer integrates visualization and an interactive user interface, comprising multiple switchable screens. The first screen visualizes citywide spatial characteristics through heatmaps, histograms, scatter plots, and similar tools. The second presents district-scale analytical results and interpretations, highlighting each district's relative positioning. The third provides policy and action recommendations generated through the AI functions described above. Through a chatbot interface, users can engage in natural language interaction to identify priority districts and potential solutions from a metropolitan-scale perspective (e.g., development guidance, areas for targeted investment), as well as to develop district-specific intervention strategies from a local perspective (e.g., recommendations for Area Management initiatives based on district characteristics).

VI. Conclusion and Future Work

Building on the international momentum toward district-scale planning and management and the advancement of urban digitalization and data utilization, this study proposes design principles for a new urban dashboard that restructures city-scale data into district-scale units and visualizes districts' relative characteristics through AI. While existing urban dashboards are useful for inter-district comparison and situational awareness, they are largely centered on visualization and descriptive statistics, and offer limited functionality for addressing practical needs in district planning and Area Management—particularly problem identification and the derivation of improvement strategies. To address this limitation, the study draws on the evolution of district planning theory—from districts as units of everyday living to districts as units of value creation and management—and the shifts in district assessment methods, especially the linkage between participatory evaluation and data-driven evaluation, and on this basis presents an integrated framework that incorporates generative AI functions.

The proposed framework consists of four key elements: (1) establishing a database based on chōchōmoku-scale spatial units; (2) automated data collection and structuring via APIs; (3) analytics using GIS and natural language processing for aggregation, well-being evaluation, AI-based identification of district issues, and exploration of improvement strategies; and (4) an integrated interface combining visualization with interactive, dialogue-based user experiences.

In particular, API-driven automated updating of the data layer and natural-language diagnosis and exploration enabled by generative AI represent critical implementation conditions for treating districts as "managerial units." This design enables administrations to identify disadvantaged districts and spatial inequalities from the perspective of public interest and to prioritize interventions accordingly. At the same time, Area Management organizations and residents can better understand local strengths and weaknesses and use the dashboard to shape strategies for improving pedestrian circulation, activating public spaces, and enhancing district attractiveness. In this sense, the proposed approach can be positioned as a foundation for urban planning digital transformation that supports both governmental and community-driven use and contributes to autonomous district-based place management.

Future research challenges include, first, the need to refine methods for computing well-being. Because appropriate approaches may differ between residential neighborhoods with large nighttime populations and business districts with large daytime working populations, separate well-being modeling frameworks may be required for living environments and working environments. Second, while generative AI-based recommendations offer high usability, they may omit district-specific contexts and consensus-building processes. Generative AI should therefore be positioned not as a substitute for expert and stakeholder decision-making but as a supportive tool for structuring debates and enabling comparative evaluation. Based on these considerations, future empirical work should apply the framework to specific districts in Tokyo, validate indicator systems, evaluate dashboard usability, and test the validity and outcomes of AI recommendations—including policy adoption, behavioral change, and measurable shifts in outcome indicators.

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