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# AI Agents Empower the Precise Provision of Urban Public Cultural Services: Value Mechanism, Practical Obstacles and Governance Paths

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**Abstract:** Artificial intelligence agents are reshaping the provision of urban public cultural services. Endowed with perception, reasoning, and autonomous interaction, agentic AI can coordinate cultural resources, identify cultural demand, and extend service scenarios, creating new possibilities for precise public cultural provision. However, its application also introduces risks, including opaque decision-making, biased data, privacy exposure, and unequal access to intelligent services. These tensions indicate that technological precision cannot be separated from public cultural values. This study therefore examines how AI agents enable the precise provision of urban public cultural services, what obstacles constrain this process, and how governance can reconcile technological efficiency with cultural equity. Through a qualitative, mechanism-building analysis based on existing research and illustrative cases, the study identifies five value mechanisms: operational efficiency enhancement, cultural demand sensing, precise service matching, systemic resilience, and access-cost reduction. It further identifies three categories of obstacles concerning technology, ethics, and institutions. On this basis, three governance pathways are proposed: human–AI collaborative provision, inclusive cultural governance, and adaptive algorithmic supervision. The study argues that the value of agentic AI ultimately depends not on technological autonomy itself, but on whether its capabilities are embedded within appropriate institutional arrangements and public cultural values.

**Keywords:** Agentic AI; Urban public cultural services; Precise provision; Algorithmic governance

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## 1. Introduction

Cities concentrate substantial public cultural resources, and public cultural services constitute an important component of contemporary urban governance. With the rapid development of large language models and

autonomous agents, AI agents are increasingly being incorporated into cultural service scenarios. Libraries, museums and other cultural institutions have begun to employ intelligent systems for enquiry answering, collection recommendation, exhibition guidance and service interaction [1]. Unlike conventional AI applications that primarily perform predefined tasks, contemporary AI agents can perceive their environment, pursue goals, and interact with external tools and information resources. The integration of agent architectures with foundation models further enables agents to plan tasks, retain contextual information, and execute multi-step actions [2]. From an information-systems perspective, such capabilities also reshape the boundary between human decision-making and machine delegation, making agency increasingly distributed across human and technological actors [3]. Research on AI-enabled services further suggests that the value of agentic AI lies partly in coordinating human and machine capabilities rather than simply replacing human labor [4].

This technological shift has particular implications for the precise provision of urban public cultural services. Traditional cultural provision often relies on relatively standardized service processes and periodic demand surveys, making it difficult to identify heterogeneous and latent cultural needs in a timely manner. AI agents can process multiple sources of information, identify patterns in user demand and coordinate cultural resources across service institutions, thereby creating opportunities for more responsive provision. At the same time, AI applications in the public sector face challenges related to data quality, algorithmic transparency, organizational capacity and accountability [5]. The development of AI-enabled urban governance also raises broader questions concerning how technological systems reshape institutional arrangements and public values [6]. Cross-national evidence on government AI further indicates that successful adoption depends not only on technological capability but also on data governance, organizational capacity and institutional coordination [7–8].

These opportunities are accompanied by important governance dilemmas. Algorithmic decision-making may be difficult for citizens and frontline professionals to understand or contest, while the use of data-intensive systems can generate privacy and accountability concerns [9]. Algorithmic systems may also reproduce inequalities when some social groups are less visible within digital environments or have fewer opportunities to benefit from intelligent services. Thus, the central issue is not simply whether AI agents can make cultural service provision more precise, but how technological capabilities are translated into public cultural value, what obstacles constrain this process, and how governance can prevent precision from becoming a source of new exclusion.

## 2. Value mechanisms of agentic AI in cultural service provision

The value of agentic AI in public cultural provision is not confined to a single service stage. Rather, its ability to perceive information, process demand, coordinate resources, and interact with citizens can reshape the service process as a whole. Five interconnected mechanisms can be identified: operational efficiency enhancement, cultural demand sensing, precise service matching, systemic resilience, and access-cost reduction. Together, these mechanisms facilitate a transition from relatively standardized provision toward more responsive and adaptive cultural services.

## 2.1. Enhancing operational efficiency

Before the deployment of agentic AI, public cultural personnel often devote substantial time to routine tasks, including answering repetitive enquiries, processing registrations, providing event information and conducting catalogue searches. Task-oriented AI agents can automate such high-frequency and relatively standardized transactions, allowing cultural professionals to redirect their attention toward activities requiring professional judgement, such as collection curation, educational programming and community engagement. The service value of AI therefore lies not simply in reducing labor inputs, but in reallocating human attention toward tasks that require contextual and professional judgement.

Agentic architecture can also facilitate resource coordination across cultural institutions. Instead of operating isolated digital platforms, municipalities can connect cultural inventories, service schedules, and user requests across libraries, museums, and community cultural centers. Such integration can reduce coordination costs and improve the utilization of dispersed cultural resources. Research on human–AI decision-making demonstrates that combining AI predictions with public managers can produce better decision outcomes than relying exclusively on either humans or algorithms [10]. At the same time, the broader application of AI in public organizations depends on organizational integration rather than technological deployment alone.

Therefore, the efficiency value of agentic AI derives from both task automation and the reallocation of human judgement. An agent that merely adds another interface without being integrated into existing service processes may increase rather than reduce organizational complexity. Efficiency should consequently be evaluated according to improvements in the overall service process rather than the mere presence of an AI system.

## 2.2. Sensing cultural demand

Traditional approaches to identifying public cultural needs, such as questionnaires, focus groups, and complaint records, tend to be periodic and reactive. They are more likely to capture explicitly expressed preferences than latent demand. Agentic AI provides an alternative by continuously processing information generated through cultural-service interactions, including borrowing records, browsing behavior, event bookings, and user feedback. Through natural language processing and pattern recognition, agents can identify recurring preferences and emerging interests, thereby improving the visibility of cultural demand.

This capability enables public cultural provision to move from a predominantly reactive model toward a more anticipatory mode of service delivery. Instead of waiting for citizens to formulate complete requests, cultural institutions can use agent-generated information to identify potential needs and adjust service resources accordingly.

However, demand sensing should not be equated with autonomous determination of cultural needs. AI systems operate on available data and therefore inevitably reflect the characteristics and limitations of those data. The use of AI in public services requires attention to data quality, transparency and human oversight. Moreover, algorithmic systems should support rather than replace human judgement, particularly where cultural needs involve contextual and normative considerations. From this perspective, AI can enhance the visibility of demand, but it cannot independently determine what constitutes legitimate cultural need.

## 2.3. Balancing service precision with cultural equity

Precision and equalization should not necessarily be treated as competing objectives. The profiling and matching capabilities of AI agents can improve the alignment between cultural resources and differentiated

needs while also helping institutions identify groups that remain underserved. Agents can match collections, educational programs, guided tours, and other cultural resources with individual or group characteristics, thereby improving the responsiveness of service delivery.

The potential of intelligent technologies in cultural institutions is also supported by research on museums. Systematic evidence indicates that digital transformation technologies can influence museum engagement and accessibility, while research on AI-enabled museum public cultural services suggests that intelligent technologies can support innovation in service models [11–12]. When these capabilities are combined with cross-institutional resource coordination, cultural resources concentrated in particular venues can potentially be extended to community and peri-urban populations.

Nevertheless, precision does not automatically produce equalization. Personalization operates within existing patterns of digital participation. Individuals and groups with greater digital access and capability are more likely to benefit from intelligent services, whereas groups with limited access may remain poorly represented. The digital divide has increasingly shifted from simple physical access to inequalities in the material conditions and capabilities required to benefit from digital technologies. Therefore, equalization should be regarded as a public-value objective that must be deliberately incorporated into intelligent service provision rather than an automatic consequence of precision.

## 2.4. Strengthening systemic resilience

Urban public cultural service networks are vulnerable to external disruptions, including public health emergencies, extreme weather events, budgetary fluctuations and sudden increases in cultural demand. When physical venues are temporarily unavailable, intelligent systems can support online exhibitions, remote educational activities, digital enquiries and other alternative forms of cultural access. During periods of high demand, AI-enabled systems can also assist with reservation management, visitor-flow monitoring and dynamic resource scheduling.

The central value of agentic AI in this context lies in its capacity to sense changes, coordinate distributed resources and adjust service processes dynamically. This can help cultural service networks maintain continuity when external conditions change.

However, resilience is an organizational and ecosystem-level capability rather than an inherent characteristic of an individual AI system. The effectiveness of AI-enabled resilience therefore depends on inter-organizational coordination, data sharing, and organizational capacity [7–8]. At the same time, extensive behavioral data collection for dynamic scheduling may create additional privacy concerns. Consequently, technological resilience needs to be developed together with appropriate institutional and data-governance arrangements.

## 2.5. Reducing citizen access costs

Barriers to public cultural services extend beyond financial costs. Citizens may encounter learning costs when navigating catalogues and booking platforms, procedural costs when completing registration requirements, and psychological costs when interacting with unfamiliar institutional environments. Natural-language interaction enables AI agents to lower some of these barriers by allowing citizens to articulate their needs conversationally and receive relevant cultural information without mastering complex digital interfaces.

This mechanism can potentially expand access to public cultural services by reducing cognitive and

procedural barriers. Research on intelligent cultural services also suggests that perceived intelligence can contribute to users' evaluations of service quality.

However, such benefits are not distributed equally. Citizens with limited digital capabilities may experience intelligent interfaces as another form of technological barrier. The digital divide concerns not only whether people can access digital technologies, but also whether they possess the material resources and capabilities needed to use them effectively [13]. Therefore, reducing access costs requires age-friendly interaction, accessibility features, offline assistance, and community-level mediation rather than relying exclusively on intelligent interfaces.

## 3. Practical obstacles to precise cultural supply

The value mechanisms discussed above do not operate automatically. Their effectiveness is constrained by the interaction of technological characteristics, ethical risks, and institutional arrangements. These constraints affect precise cultural provision in three interconnected ways: technical problems may distort whose needs are identified; ethical problems may determine who can benefit from intelligent services; and institutional problems may make responsibility difficult to locate when harm occurs.

### 3.1. Technical level: Algorithmic opacity and biased cultural data

Algorithmic opacity is a major challenge for AI-enabled public cultural services. The complexity of contemporary foundation models and the proprietary nature of some commercial AI systems can make their decision processes difficult for citizens and frontline cultural professionals to understand. When the basis of a recommendation cannot be adequately explained, professionals may find it difficult to verify or correct the output. This creates challenges for both service quality and administrative accountability.

Data quality presents a related problem. Intelligent systems identify cultural demand through available data, yet digital behavioral data do not necessarily represent the entire population. Residents who interact less frequently with digital cultural platforms may be less visible within the system. If such limitations are not recognized, AI-based recommendations may reproduce existing patterns of participation rather than identify unmet demand.

Generative AI also introduces risks such as inaccurate cultural information and inappropriate content generation. These problems are particularly important in public cultural services because cultural provision involves not only functional matching but also the representation of cultural diversity, identity and heritage. More broadly, the use of AI in public-sector contexts requires attention to accuracy, transparency, privacy and organizational responsibility.

Excessive dependence on external technology providers may further complicate governance. When key technological capabilities are controlled by commercial vendors, public cultural institutions may have limited influence over model development, data processing and system updates. Responsible AI strategies in local government therefore need to connect technological deployment with organizational and institutional arrangements.

### 3.2. Ethical level: Privacy erosion and the cultural digital divide

Precise cultural provision is data-intensive. Reading histories, browsing traces, booking records, and other behavioral information can provide valuable signals for personalization, but their aggregation may also reveal

sensitive patterns of individual interests and behavior. The development of accountable AI therefore requires institutions to establish mechanisms for making algorithmic decisions subject to scrutiny and responsibility.

A second ethical problem concerns unequal representation. When some groups participate less frequently in digital cultural environments, their needs may be less visible to intelligent systems. This creates a potential feedback effect: limited representation leads to fewer relevant recommendations, which may further reduce participation and consequently generate less data about these groups.

The digital divide constitutes another important obstacle. Digital inequality involves not only physical access to devices and networks but also differences in the material resources and capabilities required to benefit from digital technologies. If agentic services become the dominant channel for public cultural provision, residents with weaker digital capabilities may be formally included while remaining substantively underserved.

### 3.3. Institutional obstacles: Accountability vacuums and public value drift

Agentic AI can distribute decision-making across multiple actors, including public authorities, cultural institutions, technology providers, system developers, and frontline professionals. When an AI-generated recommendation, interpretation, or content selection causes harm, responsibility may become fragmented across these actors. Accountability research emphasizes that algorithmic systems do not eliminate institutional responsibility; rather, they make the allocation and exercise of responsibility more complex.

Empirical research on algorithmic discrimination in public services further shows that citizens continue to attribute responsibility to public organizations when algorithmic systems generate discriminatory outcomes. The perceived distribution of responsibility also varies according to the relationship between public organizations and the algorithmic system [14]. Thus, outsourcing technological development does not necessarily eliminate public responsibility.

A second institutional obstacle is public-value drift. Under pressure to demonstrate digital innovation, cultural institutions may prioritize visible technological deployment, efficiency and user uptake while giving insufficient attention to cultural diversity, accessibility and equity. International analysis of local-government responsible AI strategies indicates that formal institutional arrangements and governance mechanisms are important components of responsible AI implementation.

The institutional problem therefore has two dimensions: responsibility may become unclear when algorithmic decisions cause harm, while the objectives guiding technological deployment may gradually drift away from public cultural values.

## 4. Governance pathways: Re-anchoring public cultural value

The obstacles above are not primarily technical failures; their common root is excessive confidence in technology as a substitute for judgement. Under that assumption, efficiency and take-up become the leading criteria, residents are reduced to behavioral data points, and cultural value — diversity, identity and shared meaning — becomes an externality. A people-centered shift requires that the object of provision be people with cultural identities, that humans and agents be complements rather than substitutes, and that success be defined by equity and cultural value. Three governance pathways follow.

## 4.1. Building a human–AI collaborative provision mechanism

Human–AI collaboration should constitute the basic organizational principle of agentic public cultural service provision. Public cultural institutions should define service objectives, ethical constraints and decision boundaries, while AI agents undertake information processing, resource matching and routine coordination. When uncertainty, anomalies or conflicts involving cultural values arise, decisions should be returned to qualified cultural professionals rather than resolved autonomously.

Cultural content selection, interpretive framing and programming decisions require particular attention because they involve heritage, identity and pluralistic cultural values. By contrast, routine matching, scheduling and information retrieval are more suitable for algorithmic execution. Research demonstrates that combining AI predictions with public managers can improve decision quality, while human involvement in machine-supported decision-making can strengthen perceptions of procedural fairness [15]. These findings provide empirical support for maintaining human judgement within AI-enabled public service processes.

Human–AI collaboration also needs to be reflected in accountability arrangements. Responsibility should follow decision authority across system design, procurement, deployment and operation rather than being assigned only after harm occurs. Institutions should therefore specify who can approve, override, modify and withdraw agent-generated decisions.

The purpose of human–AI collaboration is consequently not merely to place a human at the end of an automated process, but to institutionalize professional judgement as a necessary component of intelligent cultural provision.

## 4.2. Advancing inclusive cultural governance

Inclusive governance is necessary to prevent precise provision from reproducing existing inequalities. Residents should not be treated merely as data sources or service recipients, but as participants in the design, evaluation and oversight of agentic cultural services. Their participation can be incorporated into needs assessment, interface testing, recommendation evaluation, and monitoring of agent behavior.

Inclusion also requires multiple access channels. Age-friendly interfaces, accessibility functions, community-level assistance, and digital literacy initiatives can reduce barriers for residents with different levels of digital capability. Intelligent services should not completely replace offline alternatives. Libraries, museums and community cultural centers should retain non-digital or assisted service channels so that formal universal access does not become substantive exclusion.

Inclusive governance also requires organizational coordination. Shared objectives, data standards and resource-sharing arrangements can help prevent intelligent systems from reproducing institutional silos. Evidence from local-government AI strategies highlights the importance of organizational capacity and institutional arrangements in responsible AI implementation.

Accordingly, inclusion should be incorporated into the entire provision process—from data collection and demand identification to algorithmic matching and benefit distribution—rather than being treated as an additional service for vulnerable groups.

## 4.3. Building an agile and interpretable algorithmic supervision system

Algorithmic supervision should extend beyond one-time technical assessment to become a continuous governance process. Because agentic systems may change their outputs as models, data, and service contexts

evolve, static compliance checks may be insufficient. Governance should therefore combine technical evaluation with ethical and public-value assessment.

First, transparency requires institutions to make the basic logic of data collection and recommendation sufficiently understandable to users and cultural professionals. Second, explanation requires frontline staff to provide meaningful reasons for recommendations rather than simply attributing outcomes to the system. Third, correction and remedy require mechanisms through which inaccurate or discriminatory outputs can be corrected and affected residents can seek redress.

These arrangements should operate through dual review. Technical review should examine data quality, model performance and potential risks, while public-value review should assess whether agentic operations are consistent with cultural diversity, accessibility and equity. Governance research emphasizes the need to connect AI ethical principles with applicable legal and institutional frameworks rather than treating ethical guidelines as isolated declarations [16].

Algorithmic supervision should also cover the full lifecycle of agentic systems, including application, assessment, deployment, operation and withdrawal. Responsible AI strategies in local government demonstrate the importance of institutionalized review and governance arrangements. Meanwhile, public trust in government AI is shaped jointly by transparency, ethical conduct and perceived benefits [17]. Thus, procedural compliance alone is insufficient to sustain public confidence.

## 5. Conclusion and implications

AI agents create new possibilities for the precise provision of urban public cultural services by improving operational efficiency, sensing cultural demand, matching resources with differentiated needs, strengthening service resilience, and reducing citizen access costs. However, these capabilities do not automatically generate public cultural value. Algorithmic opacity and imperfect data may distort demand identification, data-intensive personalization may generate privacy and inclusion concerns, and distributed decision-making may complicate institutional accountability.

The analysis suggests that the central governance challenge is not technological capability itself, but the relationship between technological precision and public cultural values. Precision can improve responsiveness, but it may also reproduce existing inequalities if data representation, access conditions, and institutional objectives are not adequately considered. Human judgement therefore remains necessary in those decisions involving cultural values, while AI can assume more responsibility for information processing, matching, and routine coordination.

Three implications follow. First, technological deployment should be guided by service outcomes rather than innovation indicators. Institutions should clarify the cultural problem to be addressed and establish evaluation criteria before deployment. Second, governance arrangements should develop alongside technological systems, covering responsibility, transparency, explanation, correction and public-value review throughout the system lifecycle. Third, vulnerable and digitally disadvantaged groups should be incorporated into the design of intelligent cultural services through accessible interfaces, offline alternatives and community-level support.

The broader implication is that the intelligent transformation of public cultural services should move beyond techno-solutionism. Public cultural services are inherently normative institutions concerned with

cultural diversity, social inclusion, collective identity and public participation. These values cannot be fully reduced to optimization objectives. The future of agentic public cultural services therefore depends less on maximizing technological autonomy than on establishing appropriate boundaries between machine capability, professional judgement and institutional responsibility.

This study is qualitative and mechanism-oriented, and its propositions should therefore be further tested empirically. Future research could examine whether agentic cultural provision actually narrows or widens differences across age, location and digital capability; compare cities with different institutional arrangements and degrees of dependence on external technology providers; and investigate how multi-agent systems alter accountability and supervision. Such research would help determine whether AI-enabled cultural provision can become not only more precise and efficient, but also more inclusive and publicly valuable.

## Disclosure statement

The author declares no conflict of interest.

## References


[1] Cox AM, Pinfield S, Rutter S, 2019, The Intelligent Library: Thought Leaders' Views on the Likely Impact of Artificial Intelligence on Academic Libraries. Library Hi Tech, 37(3): 418–435.

[2] Wang L, Ma C, Feng X, et al., 2024, A Survey on Large Language Model-Based Autonomous Agents. Frontiers of Computer Science, 18(6): 186345.

[3] Baird AM, Maruping LM, 2021, The Next Generation of Research on IS Use: A Theoretical Framework of Delegation to and from Agentic IS Artifacts. MIS Quarterly, 45(1): 315–341

[4] Srivastava A, Fuloria S, 2026, Agentic AI in Services: Orchestrating Human-machine Synergy for Service Excellence. International Journal of Quality and Service Sciences, 18(1): 204–212.

[5] Wirtz BW, Weyerer JC, Geyer C, 2019, Artificial Intelligence and the Public Sector — Applications and Challenges. International Journal of Public Administration, 42(7): 596–615.

[6] Cugurullo F, Caprotti F, Cook M, et al., 2024, The Rise of AI Urbanism in Post-Smart Cities: A Critical Commentary on Urban Artificial Intelligence. Urban Studies, 61(6): 1168–1182.

[7] OECD, 2025, Governing with Artificial Intelligence: The State of Play and Way Forward in Core Government Functions.

[8] David A, Yigitcanlar T, Desouza K, et al., 2024, Understanding Local Government Responsible AI Strategy: An International Municipal Policy Document Analysis. Cities, 2024(155): 105502.

[9] Busuioc M, 2021, Accountable Artificial Intelligence: Holding Algorithms to Account. Public Administration Review, 81(5): 825–836.

[10] Keppeler F, Borchert J, Pedersen MJ, et al., 2025, How Ensembling AI and Public Managers Improves Decision-making. Journal of Public Administration Research and Theory, 35(3): 261–276.

[11] Li J, Zheng X, Watanabe I, et al., 2024, A Systematic Review of Digital Transformation Technologies in Museum Exhibition. Computers in Human Behavior, 2024(161): 108407.

[12] Yang Z, Xia M, Wan X, et al., 2023, Artificial Intelligence Technology Enabling Innovation in Museum Public Cultural Service Models. Applied Mathematics and Nonlinear Sciences, 9(1): 20231661.

[13] van Deursen AJ, van Dijk JA, 2019, The First-level Digital Divide Shifts from Inequalities in Physical Access to

Inequalities in Material Access. New Media & Society, 21(2): 354–375.

[14] Alon-Barkat S, Busuioc M, Schwoerer K, et al., 2025, Algorithmic Discrimination in Public Service Provision: Understanding Citizens' Attribution of Responsibility for Human Versus Algorithmic Discriminatory Outcomes. Journal of Public Administration Research and Theory, 35(4): 469–488.

[15] Hermstrüwer Y, Langenbach P, 2023, Fair Governance with Humans and Machines. Psychology, Public Policy, and Law, 29(4): 525–548.

[16] Lee JW, Lee K, 2025, Building a Consensus: Harmonizing AI Ethical Guidelines and Legal Frameworks in the Republic of Korea for Enhanced Governance. Government Information Quarterly, 42(3): 102060.

[17] Bian X, Wang B, Yang A, 2025, The Trust Trifecta: How Transparency, Ethics, and Benefits Shape Public Confidence in Government AI. Government Information Quarterly, 42(4): 102083.

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