JOURNAL OF MANAGEMENT AND BUSINESS SOLUTIONS

Designing a Smart Tourism Marketing Model (Case Study: Tehran Metropolis)

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ABSTRACT

The purpose of this study is to design a smart tourism marketing model for the metropolitan city of Tehran. In terms of research objective, the study is applied, and with respect to data collection method, it is qualitative and based on the systematic grounded theory approach. The participants consisted of 15 academic experts and professionals in the field of tourism management in Tehran, who were selected through purposive sampling and according to the principle of theoretical saturation. Data were collected through semi-structured interviews and analyzed using the three-stage coding process of open coding, axial coding, and selective coding. The research findings led to the identification of six main dimensions of the model: causal conditions (including international, national, economic–market, socio-cultural, and technological–infrastructural factors), the central phenomenon (formation of a smart tourism marketing ecosystem in the metropolitan city of Tehran), contextual conditions (political–governance, economic–financial, physical–infrastructural, and environmental factors), intervening conditions (institutional–governance, economic–market, socio-technological, external, and resource-related factors), action–interaction strategies (including development of integrated data-driven platforms, personalization of travel experience, development of smart content and digital storytelling, stakeholder collaboration and networking, targeted digital marketing, and stakeholder empowerment), and consequences (economic–financial outcomes, tourist experience and satisfaction, managerial–urban governance outcomes, socio-cultural and environmental outcomes, competitive–branding outcomes, and negative consequences). The final proposed model indicates that the realization of smart tourism marketing in Tehran requires the establishment of an integrated ecosystem in which smart technologies, data-driven approaches, inter-organizational collaboration, and attractive digital content are combined within an appropriate governance framework, while taking into account the specific context and challenges of the city of Tehran. This model can serve as a comprehensive roadmap for policymakers, managers, and practitioners in Tehran's tourism sector to achieve smart transformation and enhance the destination's competitiveness at regional and global levels.

Keywords: Smart City, Smart Tourism, Tourism Marketing

Introduction

The rapid transformation of urban systems through digital technologies has fundamentally altered the structure of tourism development and destination management, leading to the emergence of smart tourism as a dominant paradigm within contemporary tourism scholarship and practice. Smart tourism is increasingly conceptualized as an integrated ecosystem in which advanced information technologies, data analytics, artificial intelligence, the

Article history:
Received 19 September 2024
Revised 11 December 2024
Accepted 18 December 2024
Published online 10 January 2025

How to cite this article:
Abbasi, F., Khademi, S. M., & Mashayekh, M. R. (2025). Designing a Smart Tourism Marketing Model (Case Study: Tehran Metropolis). *Journal of Management and Business Solutions, 3*(1), 1-14. https://doi.org/10.61838/jmbs.140

Internet of Things, and stakeholder networks jointly shape the planning, marketing, and experiential dimensions of tourism destinations (1-3). Within this paradigm, tourism is no longer viewed as a linear chain of service provision but rather as a dynamic socio-technical system that connects urban governance, digital infrastructures, tourists, residents, and businesses into a continuous process of co-creation and value generation (4, 5). As cities compete globally for investment, talent, and visitors, smart tourism marketing has become a strategic instrument for positioning destinations, managing demand, and sustaining competitiveness in increasingly complex urban environments (6, 7). This transformation is especially relevant for metropolitan regions, where high population density, infrastructure constraints, environmental pressures, and diverse stakeholder interests require innovative governance and marketing solutions to ensure sustainable tourism development (8, 9).

The theoretical foundations of smart tourism are rooted in the convergence of smart city theory, destination management, and digital marketing. Smart tourism ecosystems are defined as collaborative environments in which public authorities, private enterprises, technology providers, and tourists interact through digital platforms to generate adaptive and personalized tourism services (2, 10). This ecosystem perspective emphasizes that the effectiveness of smart tourism depends not solely on technological adoption but on the alignment of governance structures, institutional arrangements, data-sharing mechanisms, and marketing strategies (4, 11). In this context, marketing shifts from promotional communication toward a data-driven management function that continuously analyzes tourist behavior, predicts demand patterns, and dynamically designs personalized experiences (12, 13). Artificial intelligence and machine learning now play a central role in this process by enabling predictive analytics, recommendation systems, sentiment analysis, and real-time service optimization (6, 14, 15). Consequently, smart tourism marketing operates at the intersection of technology, consumer psychology, urban governance, and strategic management.

Recent empirical studies highlight that artificial intelligence and the Internet of Things significantly enhance destination competitiveness by improving decision-making accuracy, service responsiveness, and customer engagement (11, 16). These technologies enable destinations to move beyond standardized tourism products toward highly personalized travel experiences that respond to individual preferences, behavioral patterns, and situational contexts (12, 17). However, scholars also caution that technological advancement alone does not guarantee positive outcomes; rather, the benefits of smart tourism depend on institutional readiness, stakeholder coordination, and ethical governance frameworks that ensure data security, privacy, and equitable participation (18, 19). Without such frameworks, smart tourism initiatives may exacerbate social inequalities, marginalize traditional businesses, and intensify urban challenges such as overtourism and environmental degradation (20, 21). These concerns underscore the necessity of adopting comprehensive and context-sensitive marketing models that integrate technological innovation with sustainable urban management.

The marketing dimension of smart tourism is particularly critical in metropolitan destinations where competition among cities for global tourist flows has intensified. Marketing ecosystems in smart cities extend beyond conventional promotional campaigns and encompass digital platforms, content ecosystems, stakeholder networks, and governance mechanisms that collectively shape destination identity and brand perception (22, 23). In this environment, smart marketing is characterized by continuous data collection, behavioral analytics, interactive communication, and real-time personalization, enabling destinations to dynamically adapt to market changes and tourist expectations (7, 13). Studies confirm that data-driven marketing significantly enhances tourism performance by optimizing market segmentation, improving customer relationship management, and increasing conversion rates

from digital engagement to actual visitation (6, 12). Furthermore, digital storytelling and immersive content, supported by virtual and augmented reality technologies, contribute to emotional engagement, memory formation, and destination attachment among tourists (24, 25).

At the same time, the proliferation of digital tools has introduced new behavioral and cognitive dynamics into tourist experiences. While mobile technologies enhance navigation and access to information, they may also alter tourists' spatial awareness and memory formation, reshaping how destinations are perceived and remembered (25, 26). These psychological dimensions reinforce the importance of designing smart tourism marketing strategies that balance technological convenience with experiential authenticity and cognitive engagement. Failure to address these subtleties may lead to the phenomenon of "e-lienation," where excessive mediation of experience through technology diminishes emotional connection and satisfaction (18). Therefore, smart tourism marketing must incorporate insights from behavioral science and experiential design to ensure that digital enhancement strengthens rather than replaces the intrinsic value of travel experiences.

From an urban planning perspective, smart tourism marketing is increasingly intertwined with smart city development and post-pandemic recovery strategies. The COVID-19 crisis accelerated digital transformation across tourism systems, forcing destinations to adopt contactless services, virtual experiences, and data-driven management tools to ensure safety and operational continuity (27). In the post-pandemic era, cities now view smart tourism as a mechanism for building resilience, managing demand volatility, and restoring traveler confidence (4, 19). These developments have strengthened the strategic importance of integrating tourism marketing with broader urban governance frameworks, transport systems, environmental policies, and entrepreneurial ecosystems (8, 28). Consequently, smart tourism marketing now operates as a core component of metropolitan economic development and urban competitiveness.

Within this global context, Tehran represents a highly complex and underexplored case for smart tourism marketing. As one of the largest metropolitan regions in the Middle East, Tehran faces multiple structural challenges including congestion, environmental pollution, infrastructural imbalance, governance fragmentation, and international market constraints. At the same time, Tehran possesses significant cultural, historical, and creative assets that position it as a potentially powerful tourism destination if supported by effective smart marketing strategies (10, 23). Existing studies on smart tourism in Iranian cities have primarily focused on technological components or limited sectoral applications, leaving a critical gap in understanding how a comprehensive smart tourism marketing ecosystem can be designed and governed in such a complex metropolitan context (12, 13). Moreover, international frameworks and models often fail to capture the socio-political, institutional, and cultural specificities that shape technology adoption and stakeholder behavior in Tehran (4, 11).

Although previous research has contributed valuable insights into smart tourism development, few studies have systematically integrated causal conditions, contextual factors, intervening variables, strategic actions, and multidimensional consequences into a coherent marketing model grounded in empirical evidence from metropolitan environments. The literature thus reveals a significant theoretical and practical gap: the absence of a comprehensive, context-sensitive model of smart tourism marketing that reflects the complex interactions among technology, governance, market forces, social dynamics, and urban systems in large cities such as Tehran (7, 9). Addressing this gap is essential not only for advancing academic understanding but also for supporting policymakers and practitioners in designing effective, sustainable, and competitive tourism strategies.

Therefore, the aim of this study is to design a comprehensive smart tourism marketing model for the metropolitan city of Tehran based on a systematic grounded theory approach.

Methods and Materials

This study is applied in terms of objective and adopts a qualitative approach based on the systematic grounded theory methodology with respect to data collection procedures. The participants of the study consisted of academic experts and professionals in the field of tourism management in Tehran, who were selected through purposive sampling in accordance with the principle of theoretical saturation, resulting in a final qualitative sample size of 15 participants.

In this study, data were collected through semi-structured interviews using an inductive approach and were analyzed through the processes of open coding, axial coding, and selective coding (Strauss & Corbin, 1997). Data analysis was conducted using the conventional three-stage grounded theory coding procedures (open, axial, and selective coding) with the support of MAXQDA software (version 2020). During open coding, concepts, properties, dimensions, and events were identified through constant comparative analysis. In axial coding, which is a necessary step for examining relationships among the concepts and categories developed in the previous stage (open coding), subcategories were identified. Finally, during selective coding, the categories generated in the previous stage were refined, and the core categories were identified and classified.

To assess the validity of the data collection instrument, Lawshe's Content Validity Ratio (CVR) and the Content Validity Index (CVI) were employed. The results of the CVR analysis, considering that the number of experts was 15 and the minimum acceptable CVR value for this number is 0.49, indicated that all concepts achieved an appropriate CVR index. To evaluate the reliability of the data collection instrument, the inter-coder agreement method was applied. Specifically, a research colleague was invited to participate in the study, and by re-coding three interviews, the intra-topic agreement percentage was calculated as the reliability index using the following formula:

Percentage of Intra-topic Agreement = (2 × Number of Agreements on Codes) / (Total Number of Codes) × 100

The inter-coder reliability for the interviews conducted in this study, calculated using the above formula, was 78%. Since the reliability value exceeded 60%, the trustworthiness of the coding process was confirmed, and it can be concluded that the reliability of the current interview analysis is satisfactory. Throughout the research process, ethical considerations including confidentiality of information, informed consent, voluntary participation, and adherence to research integrity were strictly observed.

Findings and Results

The first stage of data analysis was open coding, during which key points were coded and related concepts were categorized at a more abstract level within categories. At this stage, 197 initial codes were identified, which were reduced to 178 codes after merging and refining similar codes. In the next stage, based on axial coding, the core phenomenon, causal conditions, contextual conditions, intervening conditions, strategies, and consequences were identified among the main categories. Finally, through selective coding, the relationships between the core phenomenon and the other categories were established, resulting in the selection of 26 primary codes and 36 secondary selective codes. The following sections present the paradigms of the systematic grounded theory model in detail.

Causal Conditions: In grounded theory, causal conditions refer to factors that, as causes, lead to the emergence, transformation, or reinforcement of the core phenomenon. These conditions function as the primary driving forces (Strauss & Corbin, 1997). The causal conditions identified in this study are presented in Table 1.

Table 1. Causal Conditions

Primary Selective Code	Secondary Selective Code	Open Codes (Concepts)
International and Global Context (External Pressures and Global Opportunities)	Change in global tourist behavior patterns (smart tourist)	Reliance on online research before travel; expectation of personalization; continuous mobile use during travel; trust in user-generated reviews; demand for real-time communication
	Intense competition among regional and global tourism destinations	Benchmarking competitors; perceived lagging behind; necessity of differentiation and creation of competitive advantage; attention to competitors' investments
	Rapid advancement of key technologies	Overcrowding and spatial concentration; pressure on infrastructure; damage to historical fabric; inefficiency of traditional methods
National and Metropolitan Causal Conditions (Internal Contexts)	Policies and upstream documents	Reference to national policy documents; administrative directives and circulars; establishment of councils and task forces; allocation of specific funding
	Need to address tourism management challenges in the metropolis	Uneven spatial and temporal distribution of tourists (pressure on hotspots and emptiness of other areas); pressure on physical infrastructure and urban services; dissatisfaction of local residents; inefficiency and lack of transparency in traditional management and marketing methods; weakness in crisis management and tourist safety
	Significant growth in internet and mobile technology penetration in Iran	Widespread use of smartphones among domestic and foreign tourists; prioritization of SIM card purchase or Wi-Fi connection upon arrival; complete replacement of paper maps with navigation apps (e.g., Google Maps); online review and rating checks before selecting tourism services; real-time sharing of travel experiences on social media (stories, posts); broad access to 4G internet in major urban and tourism areas
Economic–Market Causal Conditions	Necessity of increasing tourism revenue and economic value for Tehran	Emphasis on tourism as a non-oil and sustainable revenue source for the metropolis; need to maximize tourist value (increase average spending per visitor); goal of distributing tourism income more widely across the city and among small businesses; use of smart marketing to reduce seasonality effects and fill unused capacity during off-peak periods; enhancing Tehran's economic competitiveness compared with other regional tourism destinations to attract service-sector investment
	Emergence and growth of the startup ecosystem and financial technologies in Iran	Presence of leading travel and tourism startups (e.g., Alibaba, Iliagasht) as potential partners and role models; activity of innovative startups in specialized areas (e.g., augmented reality, digital audio guides, queue management); availability of young, educated, and technologically skilled workforce; presence of accelerators, innovation centers, and startup festivals fostering new ideas in smart tourism
	Relative reduction in technology costs	Increased accessibility and affordability of basic hardware (e.g., sensors, RFID cards, interactive kiosks); emergence of cloud solutions and software-as-a-service eliminating heavy initial investment in servers and software; development of open-source software and platforms in areas such as CRM and data analytics; competition among domestic technology providers reducing prices and improving quality; reduced cost of internet access and bandwidth due to increased competition among operators
Socio-Cultural Conditions	Rising expectations of Tehran residents as hosts and domestic tourists	Expectations for smart management of traffic and mitigation of tourism's negative effects on daily life; demand for transparency and participation in neighborhood tourism decision-making through digital channels; expectation of direct economic benefits from tourism within local neighborhoods (e.g., showcasing local businesses on tourism platforms); comparison of Tehran's tourism services with digital standards of other cities or countries; desire to rediscover the city through personalized and innovative digital experiences
	Necessity of changing Tehran's urban image and branding	Negative media portrayal; efforts to attract niche tourists; use of creative digital tools; importance of digital storytelling
Technological–Infrastructural Conditions	Availability of initial digital infrastructure in certain sectors	Expansion of online reservation systems in hotels and some travel agencies; widespread tourism business activity on social media platforms (Instagram, Telegram) for marketing and customer engagement; initial use of QR codes in museums, restaurants, and heritage sites for basic information; presence of preliminary databases (e.g., hotel lists, attractions) on municipal and cultural heritage organization websites
	Experience of the COVID-19 pandemic	Need for rapid development of low-contact or contactless services; mandatory experimentation with virtual experiences as temporary substitutes for physical visits; discovery of efficiency and cost-effectiveness of digital channels such as webinars and live Instagram tours; recognition of the importance of health and mobility data for crisis management and trust-building; formation of new consumer habits for searching, booking, and experiencing travel online; increased managerial and investor readiness to accept risk and invest in digital solutions

Core Phenomenon: The main phenomenon under investigation, as determined based on the results of interviews with research experts, is smart tourism marketing. The core phenomenon is presented in Table 2.

Table 2. Core Phenomenon

Secondary Selective Code	Open Code
Smart Technologies and Digital Infrastructure	Existence and quality of comprehensive Tehran tourism applications; level of access to free Wi-Fi at tourism sites; integration of reservation systems; use of augmented reality in historical sites; deployment of Internet of Things sensors for managing tourist flows; integrated databases
Data-Driven Orientation and Intelligent Analytics	Big data analysis of tourists' search behavior; personalized recommender systems; sentiment analysis of online reviews; use of artificial intelligence for trend forecasting
Stakeholder Interaction and Integration	Level of collaboration among the Cultural Heritage Organization, Municipality, hotels, travel agencies, and startups; existence of data-sharing platforms across sectors; private sector participation in the development of smart solutions
Personalized Tourist Experience	Capability for fully personalized travel planning; delivery of real-time preference-based recommendations; location-based services; creation of interactive and customized content for tourists
Smart Marketing and Omnichannel Communication	Use of targeted influencer marketing; digital campaigns on international platforms; management of the Tehran destination brand in online environments; engaging digital storytelling
Governance Infrastructure and Regulatory Frameworks	Tourist personal data protection policies aligned with regulations such as the General Data Protection Regulation (GDPR); technical standards for platforms; mechanisms supporting investment in tourism technologies; enabling regulations for startups
Smart Content and Digital Heritage	Digitization of museum artifacts (virtual tours); production of virtual reality content for historical sites; use of technology for engaging historical narration; establishment of a comprehensive multimedia attractions database

Intervening Conditions: Intervening conditions are factors that influence the relationship between causal conditions, strategies, and outcomes. These conditions act as mediating, moderating, or reinforcing forces operating within the contextual environment, yet they possess a less stable, more situational, and less structural nature than contextual conditions. They can either facilitate or hinder the implementation of strategies. For the core phenomenon of "formation of a smart tourism marketing ecosystem in the metropolitan city of Tehran," intervening conditions represent influential variables that emerge during the development of this ecosystem (Strauss & Corbin, 1997). The intervening conditions are presented in Table 3.

Table 3. Intervening Conditions

Primary Selective Code	Secondary Selective Code	Open Code
Institutional and Governance Interveners	Level of leadership, political will, and managerial stability	Presence or absence of a "strong and committed leadership team" at the top of responsible organizations (e.g., municipality or tourism deputy); frequent turnover of senior managers leading to shifting priorities and lack of continuity in smart initiatives; degree of practical (not rhetorical) support from senior officials (governor, mayor, minister) for innovative and high-risk projects
	Degree of inter-organizational cooperation and trust	Competitive or data-protective culture among organizations (e.g., municipality vs. cultural heritage) versus collaborative and data-sharing culture
Economic–Market Interveners	Severe and unpredictable macroeconomic volatility	Sudden currency shocks affecting technology acquisition costs and international tourist attraction; domestic economic recession reducing travel priority for domestic markets and disrupting marketing forecasts
	Behavior and reactions of regional competitors	Announcement of new smart tourism initiatives by cities such as Isfahan or Mashhad diverting national attention and resources; aggressive competitive actions by Istanbul or Dubai
Socio-Technological Interveners	Social acceptance and resistance to technology	Resistance of traditional businesses (e.g., conventional travel agencies, traditional tour guides) to platform-based models; societal attitudes toward privacy and digital tracking—media reports of data misuse significantly reducing acceptance of tourism applications; speed of user adoption of new technologies (e.g., acceptance of QR codes)
	Emergence of disruptive technology or dominant global platforms	Introduction of new AI tools reducing content production costs; dominance of a global super-platform in local tour markets creating both threats and opportunities

External Interveners (Beyond Direct Control)	International and geopolitical developments	Changes in diplomatic relations activating or disabling major tourism markets overnight; intensification or easing of sanctions affecting technology access, international payments, and direct flights; occurrence of global crises such as new pandemics or regional conflicts disrupting tourism flows
	National policies beyond municipal control	Implementation of new national cybersecurity policies altering data storage regulations; major national internet decisions such as international bandwidth restrictions
Resource and Capability-Related Interveners	Sudden access to or loss of key resources	Acquisition or loss of critical startup teams or technical consultants; unexpected allocation of special funding (e.g., from the National Development Fund) or sudden termination of project budgets; partnership with reputable international institutions (e.g., universities or technology firms) or their abrupt withdrawal

Contextual Conditions: In grounded theory, contextual conditions refer to the specific and environmental circumstances in which the core phenomenon occurs. These conditions provide the setting within which strategies are implemented and influence the manner and intensity of causal effects as well as the resulting outcomes. Context is more stable and structural than intervening conditions. For the core phenomenon of "formation of a smart tourism marketing ecosystem in the metropolitan city of Tehran," contextual conditions include the inherent, structural, and indigenous characteristics of Tehran that any smart transformation initiative must consider. These are relatively stable structural variables within which strategies must be designed and implemented. In interviews, these factors were often described as constraints, opportunities, or undeniable realities. The contextual conditions are presented in Table 4.

Table 4. Contextual Conditions

Primary Selective Code	Secondary Selective Code	Open Code
Political–Governance and Legal Context	Complex and multi-layered governance structure of tourism in Tehran	Multiple decision-making bodies (Ministry of Cultural Heritage, Tehran Municipality, Governorate, Regional Tourism Organization); restrictive or inconsistent regulations regarding cyberspace, online businesses, and tourism; fluctuating political priorities affecting budgeting and technological project support; level of transparency and accountability in urban governance
Economic–Financial Context	National and urban macroeconomic conditions (stagflation, sanctions)	Limited public budgets for smart infrastructure investment; severe exchange rate volatility affecting imported technology costs and foreign tourist decisions; low purchasing power of segments of the domestic market for paid tourism services; high investment risk for private sector involvement in long-term projects
Physical–Infrastructural Context	Physical and geographical characteristics of Tehran	Vast urban sprawl and high population density; dispersion of tourist attractions across the city (from Shemiran to Rey); persistent infrastructural problems such as heavy traffic and air/noise pollution; uneven quality of essential infrastructure (e.g., high-speed internet) across different districts
Environmental Context	Environmental risks and constraints	Tehran's air pollution as a major deterrent for tourists (especially health and family tourism); water resource limitations affecting physical development and tourism sustainability; growing global tourist attention to "green" and "sustainable" destinations and the pressure to align with these expectations

Action–Interaction Strategies: In systematic grounded theory, strategies refer to actions or interactions that actors undertake in response to the core phenomenon, under the influence of causal conditions and with consideration of the contextual and intervening conditions, in order to achieve desirable outcomes. For the core phenomenon of "formation of a smart tourism marketing ecosystem in the metropolitan city of Tehran," strategies represent the deliberate and planned actions of stakeholders aimed at realizing this phenomenon.

Table 5. Strategies

Primary Selective Code	Secondary Selective Code	Open Code
Creating and developing integrated, data-driven digital platforms	Technical–infrastructural strategy	Designing and launching a “comprehensive Tehran tourism application/portal” as a single interface for tourist interaction; establishing a “city tourism data command center” to collect, integrate, and analyze fragmented datasets; developing intelligent recommender systems based on behavioral and preference analytics; integrating payment, reservation, and information services within a unified digital ecosystem
Personalization and creation of a unique travel experience	Customer-oriented strategy	Providing “dynamic and customizable travel packages” that tourists can configure; using geolocation to deliver real-time recommendations and relevant notifications; designing thematic digital routes and tours; implementing digital loyalty programs with personalized rewards for domestic and international tourists
Development of smart content and engaging digital storytelling	Content–narrative strategy	Producing VR/360° virtual tours and using AR to revive history and enhance the attractiveness of visits; creating digital narratives around attractions, historical figures, and contemporary life in Tehran; leveraging influencers and user-generated content creators to produce authentic and credible content; intelligent multilingualization of content based on tourists’ language and nationality
Smart collaboration and networking among stakeholders	Governance and coordination strategy	Establishing a “Tehran smart tourism stakeholder union/consortium” comprising public, private, academic, and startup sectors; defining technical frameworks and standards for inter-organizational data sharing; designing collaborative revenue models to distribute benefits generated by integrated platforms; creating rapid and formal communication networks (e.g., via organizational messaging platforms) for real-time operational coordination
Targeted digital marketing and intelligent customer relationship management	Communication–promotional strategy	Implementing highly targeted digital campaigns on international platforms such as Google Ads and Meta for specific markets; using AI tools for social media management such as chatbots and sentiment analysis; deploying advanced CRM systems to track the tourist lifecycle and enable scheduled communication before, during, and after travel; actively managing the online brand of Tehran as a destination and providing timely responses to reviews and feedback in digital spaces
Empowerment and training of stakeholders	Capability development strategy	Holding workshops and training courses for small and medium tourism businesses on digital competencies; establishing accelerators or innovation labs dedicated to smart tourism startups; developing standardized digital service guidelines for related industries (hotels, restaurants, transport); training “local digital ambassadors” in tourism districts to produce localized content and engage with tourists

Consequences: In grounded theory, consequences refer to the results or outcomes arising from the implementation of strategies in response to the core phenomenon, under the influence of causal conditions, contextual conditions, and intervening conditions. Consequences may be positive or negative, short-term or long-term, and expected or unexpected. For the core phenomenon of “formation of a smart tourism marketing ecosystem in the metropolitan city of Tehran,” consequences are the outcomes of stakeholders’ actions and interactions toward establishing this ecosystem.

Table 6. Consequences

Primary Selective Code	Secondary Selective Code	Open Code
Economic and financial consequences	Increased efficiency and revenue generation	Higher conversion rates from online visitors to actual tourists due to improved targeting and personalization; increased average daily spending per tourist through smart recommendations and interest detection; reduced marketing and advertising operating costs by replacing expensive, low-yield traditional methods with targeted digital campaigns; broader distribution of tourism income across the city and among SMEs due to the promotion of dispersed attractions and services
	Increased investment and employment	Attraction of venture capital (VC) investment into Tehran's smart tourism startups and creation of technology-based employment (e.g., developers, data analysts, digital content specialists)
Tourist experience and satisfaction consequences	Improved quality and personalization of travel experience	Reduced wasted time and tourist stress in planning, mobility, and purchasing services; enhanced satisfaction and surprise through proactive services, relevant recommendations, and seamless interaction; increased repeat visitation and transformation of tourists into Tehran brand advocates due to positive experiences; reduced complaints and conflicts through information transparency and rapid problem-resolution communication
	Increased confidence and perceived safety	Greater perceived safety due to access to emergency information, reliable navigation, and the ability to track tourists when needed
Managerial and urban governance consequences	Improved data-driven decision-making and integrated management	Access to accurate, real-time, reliable statistics and analytics on tourism flows (e.g., congestion in different locations, momentary satisfaction); proactive rather than reactive management of challenges such as overcrowding, traffic, and infrastructure pressure; increased coordination and reduced duplication across institutions through shared information platforms
	Enhanced urban resilience to crises	Establishment of a strong direct channel for rapid communication and crisis management (e.g., severe air pollution, unrest, or pandemics) for tourists currently in the city
Socio-cultural and environmental consequences	Reduced social tensions and increased positive interaction	Reduced resident dissatisfaction through smart tourist distribution management and educating tourists about local norms; increased community participation and benefit-sharing through the inclusion of local businesses on platforms; improved preservation and promotion of intangible cultural heritage through digital tools and engaging storytelling
	Movement toward sustainable tourism	Reduced environmental impacts through promotion of green transport, reduction of unnecessary travel, and smart waste management; attraction of responsible tourists interested in green and smart destinations
Competitive and destination branding consequences	Strengthened brand and image of Tehran	Shifting Tehran's image from a purely political and crowded city to an attractive, modern, and hospitable destination within the global digital space; creating positive competitive differentiation from other regional metropolises through smart services and unique experiences; attracting specialized media and international influencers to cover innovative aspects of Tehran tourism
Negative or undesirable consequences (unintended effects)	Creation of a new digital divide	Digital marginalization of traditional, small, or older businesses that lack the capability to adapt to technology; increased dependency and vulnerability to internet outages, system failures, or cyberattacks; security and privacy concerns due to extensive collection of tourists' personal and location data; excessive commodification of culture and experience and loss of authenticity in favor of purely digital delivery

Finally, the research model was presented using the Strauss and Corbin (1997) paradigm model, as illustrated in Figure 1, which demonstrates the core phenomenon's relationships with the other categories.

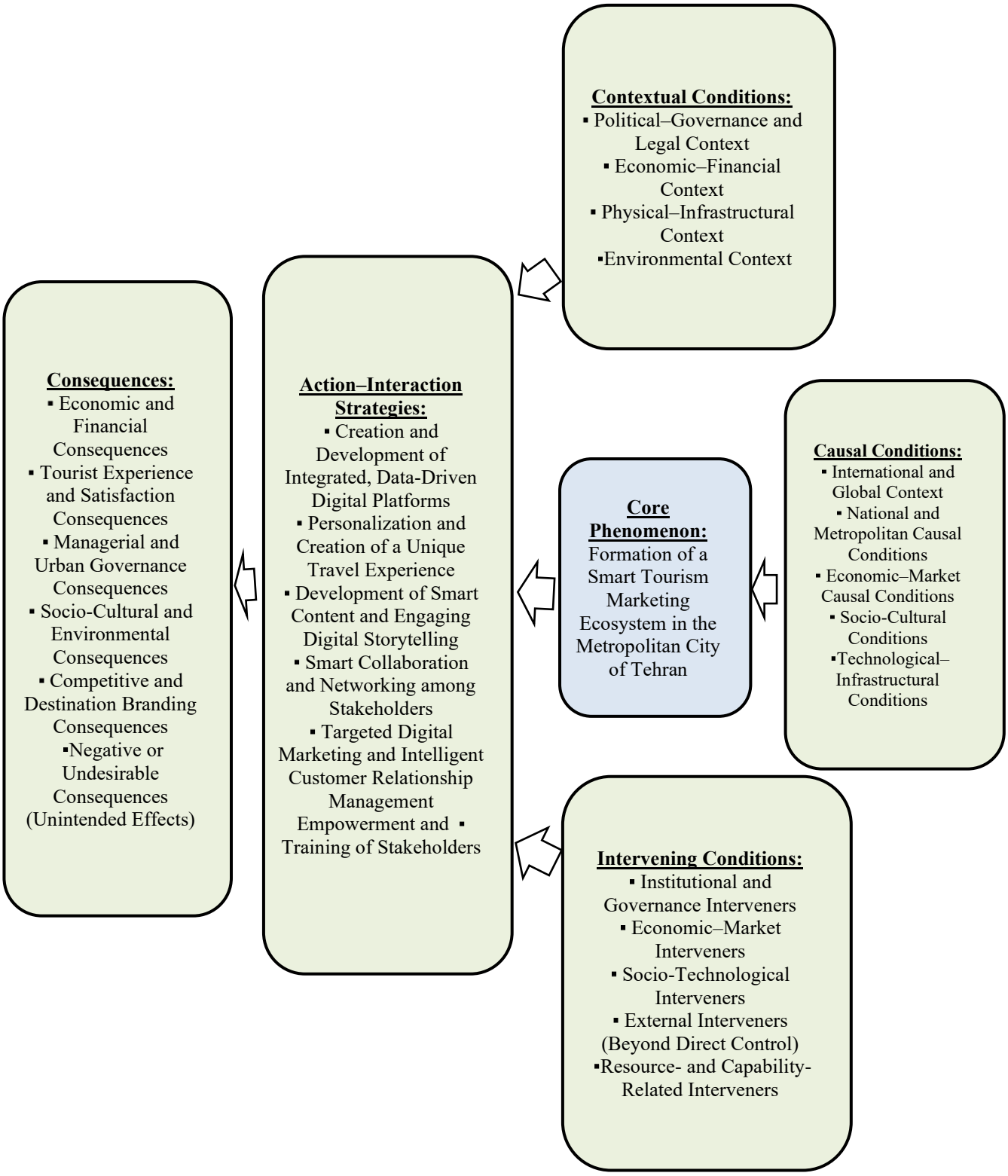

Figure 1. Paradigm Model of Smart Tourism Marketing

Discussion and Conclusion

The purpose of this study was to develop a comprehensive model of smart tourism marketing for the metropolitan city of Tehran through a systematic grounded theory approach. The findings revealed a multi-layered framework

composed of causal conditions, contextual conditions, intervening conditions, action–interaction strategies, and multidimensional consequences, all centered around the formation of a smart tourism marketing ecosystem. The results confirm that smart tourism marketing is not merely a technological upgrade but a complex socio-technical transformation that requires the integration of governance, data-driven intelligence, stakeholder collaboration, and experiential design. This interpretation aligns closely with the conceptualization of smart tourism ecosystems proposed by Gretzel and colleagues, who emphasize that effective smart tourism development emerges from the interaction between technology, stakeholders, and institutional structures rather than from isolated technological interventions (1, 2). The identification of data-driven platforms and integrated digital infrastructures as the foundation of the ecosystem is also consistent with recent findings that highlight artificial intelligence and analytics as central pillars of smart tourism competitiveness (6, 11, 14).

A key result of the present study is the central role of personalization and real-time responsiveness in shaping tourist experiences and satisfaction. The empirical model demonstrates that personalized services, intelligent recommender systems, and context-aware content significantly influence the perceived quality of travel experiences and tourists' emotional engagement with the destination. This supports previous research showing that data-driven marketing substantially enhances tourist satisfaction and loyalty by delivering experiences that reflect individual preferences and situational needs (12, 13). Furthermore, the importance of immersive content, digital storytelling, and user-generated media observed in this study echoes findings from psychological and experiential tourism research indicating that emotional memory and narrative engagement strongly affect destination attachment and revisit intention (24, 25). By integrating these components into the marketing ecosystem, Tehran's smart tourism strategy is positioned not merely as a functional system but as an experiential platform that shapes cognitive and emotional dimensions of travel.

The study further demonstrates that governance and institutional coordination are decisive determinants of successful smart tourism implementation. The identified intervening conditions—such as leadership stability, political commitment, inter-organizational trust, and regulatory coherence—highlight that technological innovation alone is insufficient without supportive governance structures. This conclusion is consistent with prior work emphasizing that fragmented governance and weak institutional alignment remain major barriers to smart tourism development in metropolitan contexts (4, 11). The necessity of cross-sectoral collaboration identified in this research also corresponds with findings from urban tourism studies that stress the importance of stakeholder networks and shared data platforms in enabling adaptive destination management (9, 10). In this respect, Tehran's complex administrative structure intensifies the need for coordinated governance models capable of integrating public agencies, private enterprises, technology firms, and community actors into a unified marketing ecosystem.

Another significant contribution of this study is the recognition of smart tourism marketing as a strategic response to urban challenges such as congestion, environmental pressure, overtourism, and demand volatility. The model illustrates how data-driven management and proactive marketing strategies can mitigate spatial and temporal imbalances in tourist flows while improving urban resilience. This finding corroborates international evidence that smart technologies offer powerful tools for managing demand pressure under infrastructural constraints and enhancing sustainability in urban tourism destinations (8, 20, 21). Moreover, the study's emphasis on crisis management capabilities within the smart tourism ecosystem reflects recent scholarship highlighting the importance of digital platforms and analytics in supporting tourism recovery and resilience in the post-pandemic era (19, 27).

The economic and competitive implications identified in the results further strengthen the argument for adopting smart tourism marketing as a core development strategy for metropolitan regions. The model indicates that smart marketing practices increase conversion rates, raise average tourist spending, stimulate innovation-driven employment, and enhance destination branding. These outcomes are consistent with previous studies that associate smart city initiatives and tourism entrepreneurship with economic growth, competitiveness, and investment attraction (7, 28, 29). Importantly, the transformation of Tehran's brand image—from a politically dominated perception toward a modern, culturally rich, and technologically advanced destination—aligns with global evidence demonstrating that smart destination branding significantly influences international market positioning and tourist demand (3, 5).

However, the study also confirms that smart tourism marketing generates unintended and potentially adverse consequences if not carefully governed. The emergence of digital divides, heightened privacy concerns, technological dependency, and cultural commodification reflect the critical perspectives advanced in tourism ethics and socio-technical studies (18, 26). These findings reinforce the necessity of embedding ethical principles, privacy protection frameworks, and inclusive participation mechanisms into smart tourism governance, as advocated in recent tourism and urban studies (4, 19). Thus, the Tehran model contributes to the literature by demonstrating that smart tourism marketing must be simultaneously innovative, sustainable, and socially responsible.

Overall, the discussion underscores that the proposed smart tourism marketing model for Tehran represents a holistic response to the structural, technological, and competitive realities of contemporary urban tourism. By synthesizing marketing strategy, digital transformation, governance reform, and experiential design into an integrated ecosystem, the model advances existing theoretical frameworks and provides a context-sensitive blueprint for metropolitan tourism development. This comprehensive approach extends earlier conceptualizations of smart tourism ecosystems by explicitly operationalizing the relationships among causal conditions, contextual constraints, intervening forces, strategic actions, and multidimensional outcomes in a single empirically grounded framework (2, 9, 13).

This study was conducted within the specific institutional, socio-cultural, and economic context of Tehran, which may limit the generalizability of the findings to other cities with different governance systems, market structures, and technological capacities. The qualitative design, while offering deep theoretical insight, relied on expert perceptions and may not fully capture the perspectives of tourists or local communities. Time and access constraints also limited the inclusion of certain stakeholder groups such as informal tourism operators and micro-entrepreneurs.

Future studies should validate the proposed model through quantitative testing and structural modeling to assess causal relationships among variables. Comparative studies across multiple metropolitan destinations would enhance the external validity of the framework. Longitudinal research is recommended to evaluate the dynamic evolution of smart tourism ecosystems over time, particularly in response to technological change and policy reforms. Further investigation into tourist behavior analytics and community-level impacts would deepen understanding of smart tourism's social consequences.

Tourism authorities should prioritize the establishment of integrated digital platforms and unified data governance structures as foundational elements of smart tourism marketing. Policymakers must strengthen inter-organizational coordination mechanisms and ensure regulatory frameworks support innovation while protecting privacy and cultural integrity. Capacity-building programs for tourism enterprises and local communities should accompany technological investments to promote inclusive participation and sustainable destination development.

Acknowledgments

We would like to express our appreciation and gratitude to all those who helped us carrying out this study.

Authors' Contributions

All authors equally contributed to this study.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

All ethical principles were adheried in conducting and writing this article.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

Funding

This research was carried out independently with personal funding and without the financial support of any governmental or private institution or organization.

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