

TOPIC-SMART TOURISM

SPACES:

Integrating technology and sustainability in urban destinations .

Student Name- Jashanpreet Singh

TABLE OF CONTENTS-

Contents

Abstract:.....	3
Introduction.....	4
LITERATURE REVIEW	6
RESEARCH METHODOLOGY-	17
➤ CASE STUDY SELECTION	19
FINDINGS.....	23
Discussions: Smart Tourism Spaces	28
CONCLUSION.....	33
REFERENCES.....	34
APPENDICES	35

Abstract:

The rapid growth of urban tourism has been putting immense pressure on cities to balance tourist satisfaction with environmental sustainability and well being of locals { As the tourist places are surrounded by various societies,houses,markets ,etc so it is the responsibility of businesses to prevent causing harm to them in any scenario} In today's world smart tourism scenario smart tourism places represents a revolutionary approach that integrates digital technology with sustainable planning principles to create more efficient and environment friendly destinations. This assignment explores how smart urban (city)technologies—such as the Internet of Things (IoT), Artificial Intelligence (AI), and digital twins—can improve visitor management, reduce energy consumption, and enhance tourist's experience and improve overall quality of living of residents. Case studies mentioned in the paper from cities like Barcelona, Singapore, and Amsterdam demonstrate how data analytics and sensor networks optimize mobility, waste management, and resource use. Further the study identifies challenges such as data privacy, digital inequality, and financial constraints for developing cities. Finally the report concludes with suggestions for policy design and strategic investment to aide with urban destinations implement smart, sustainable tourism systems that support economic and environmental resilience in long run.

Introduction

Tourism is widely known as accepted as a vital and major contributor to urban economic growth, innovation and cultural exchange. However, unregulated tourism growth often results in overcrowding, environmental degradation, and social disruption. To overcome these challenges, the concept of *smart tourism* has developed that involves combining information and communication technologies (ICTs) with sustainable urban planning to create smarter, greener, and more efficient destinations to ensure development of tourism along with ensuring sustainability.

A **smart tourism space** is an urban environment where technological systems are embedded into infrastructure, mobility, and governance to enhance both visitor experience and sustainability outcomes. Technologies such as IoT sensors, big-data analytics, AI-based decision tools, and virtual digital twins enable city authorities to keep an eye on visitor flows, reduce resource wastage, and support evidence-based planning. The idea aligns closely with the United Nations Sustainable Development Goals (SDGs), particularly Goal 11 (Sustainable Cities and Communities) and Goal 12 (Responsible Consumption and Production).

Urban destinations such as **Barcelona, Singapore, and Amsterdam** have become pioneers in using smart technologies to address issues like tourist congestion, waste generation, and carbon emissions. Their success showcases how cities can balance economic opportunities with environmental responsibility. Yet, many developing or mid-sized cities face constraints such as limited budgets, technological gaps, and the need for inclusive community participation.

The purpose of this paper is to critically examine “how smart technologies can be strategically implemented in urban tourism spaces to promote sustainability”. Specifically, the objectives are:

1. To analyze the role of smart city technologies in managing visitor flows and resource efficiency.
2. To assess how data analytics can optimize waste, transport, and energy use.
3. To evaluate case studies along the globe that demonstrate best practices.
4. To propose recommendations suitable for developing cities with budget constraints.

Through this exploration, the paper contributes to a growing academic and practical understanding of how technology, policy, and planning can merge to create smarter, more sustainable urban tourism ecosystems.

LITERATURE REVIEW

1. Concept of Smart Tourism Spaces

The idea of smart tourism comes from the idea of clever cities, in which data and records are used to make towns more green, liveable, and sustainable. As Gretzel (2015) explain, a smart tourism destination uses data now not simply to make the visitor's enjoy higher, however, additionally to enhance operations and shield the environment. In other words, clever tourism areas are urban areas designed with digital tools—like IoT sensors, massive information, and synthetic intelligence—to make existence better for both vacationers and locals.

According to the World Tourism Organization (UNWTO), smart locations don't just digitize services—they invent sensible structures that help with making plans, environmental management, and keeping tradition. Smart tourism spaces, therefore, are about combining data with thoughtful, sustainable city making plans.

2. Sustainability and Urban Tourism

Cities are often the first forestall for global site visitors. They offer cultural stories, leisure, and enterprise possibilities. But urban tourism additionally brings demanding situations: overcrowding, pollutants, waste, and traffic. Hall (2019) factors out that cities want to rethink tourism in a manner that's low-impact and regenerative to remain attractive over time.

Sustainable tourism specializes in shielding the environment, supporting local communities, and ensuring financial advantages are shared fairly. Butler's (1980) Tourism Area Life Cycle

version suggests that locations that ignore sustainability risk decline in tourists in the long run. ACCORDING TO BUTLER there are 6 stages of tourism area life cycle ;-

Exploration phase

- What happens:

Very few tourists come to the city.

Tourism is small scale and mainly adventure tourists looking for an authentic experience

- The role of technology:

Digital maps, mobile guides and virtual reality previews help first-timers find attractions.

Social media and travel blogs spread attention.

- Stability focus:

Minimal environmental and social impact.

Local communities can participate without being overwhelmed.

- Example:

A historic district in the city attracts elite travelers who use walking apps.

2. The commitment stage

- What happens:

Local businesses begin to serve tourists (small hotels, cafes, guided tours).

Tourism appears to contribute significantly to the local economy.

- The role of technology:

Online booking systems, travel websites and early mobile apps.

Marketing in social media for local businesses.

- Stability focus:

Encourage local participation.

Support environmentally friendly services (bike rental, local crafts).

- Example:

Local restaurants display menus on apps to attract tourists continuously.

3. Development phase

- What happens:

Rapid increase in tourist arrivals.

Expansion of infrastructure: hotels, transport, attractions.

The destination becomes known nationally and internationally.

- The role of technology:

Smart transport systems (apps for bus, metro, carpooling).

IoT-enabled infrastructure (smart lighting, energy monitoring).

Data collection for tourist patterns and preferences.

- Stability focus:

Manage the environmental impact with energy-efficient buildings, public transport and waste management.

Limit overcrowding in sensitive areas by using smart monitoring.

- Example:

Smart city apps in city centers show tourist density and available parking in real time.

4. Consolidation phase

- What happens:

Tourism growth has been slow but is still significant.

The floor is mature; It could be overpopulation and commercialization.

- The role of technology:

Big data analysis for tourist flows and peak times.

AI powered audience management system.

Digital platform to promote lesser-known attractions.

- Stability focus:

Monitor the carrying capacity of attractions.

Reduce environmental and social stress in urban areas.

- Example:

Barcelona uses apps to redirect visitors from crowded streets to quieter areas.

5. State of stagnation

- What happens:

Visitor numbers plateau; You can feel crowded in the city.

Traditional tourist attractions may lose their charm.

- The role of technology:

Predictive analytics to predict tourist flows and optimize resources.

Smart ticketing to regulate entry to popular sites.

Mobile apps encourage tourists to explore alternative attractions.

- Stability focus:

Avoid overconsumption of resources (water, energy, transport).

Take care of cultural heritage and local quality of life.

- Example:

Digital alerts about overcrowded museums in Amsterdam and suggestions for less visited galleries.

6. Rejection or rejuvenation phase

- What happens:

Decline: Tourist numbers decline due to loss of appeal or competition.

Rejuvenation: New attractions or better management revive tourism.

- The role of technology:

Smart marketing campaigns to attract new tourist segments.

Use AR/VR to enhance cultural heritage experiences.

Eco-friendly initiatives were promoted digitally to attract conscious travelers.

ROLE OF TECHNOLOGY-

INTERNET OF THINGS

- uses sensors in order to collect data on movement, air quality and waste

ARTIFICIAL INTELLIGENCE(AI)

- it helps in predicting crowding and improves planning.

DIGITAL TWINS

- simulate city operations for planning sustainably

MOBILE APPS

- These promote eco friendly travel choices.

For example – In Amsterdam, IOT based crowd monitoring helps distribute tourists evenly across attractions, reducing congestion in city centres.

DATA ANALYTICS FOR RESOURCE EFFICIENCY-

Data analytics is one of the maximum effective tools in clever tourism because it enables cities and tourism groups make knowledgeable, evidence-primarily based selections. It includes gathering, processing, and deciphering big quantities of facts from diverse sources—inclusive of sensors, social media, shipping structures, motels, and mobile devices—to improve how resources are used and controlled in tourism destinations.

1. Role of Data Analytics in Sustainable Tourism

In traditional tourism control, selections were regularly primarily based on historic statistics or assumptions. However, with the upward thrust of digital technologies, towns can now acquire real-time statistics on how travelers pass, what services they use, and wherein resources are consumed maximum heavily.

This lets in for predictive planning—forecasting traveller demand and allocating resources like water, power, or public transport efficaciously.

For instance, if data indicates that positive traveler attractions are overcrowded on weekends, nearby authorities can divert traffic via digital alerts or promote opportunity locations. This reduces stress on infrastructure and minimizes strength use, helping to achieve environmental sustainability.

2. Applications of Data Analytics in Resource Management

a) Energy Efficiency:

Hotels and public facilities use smart meters related to analytics structures to reveal power and water use. By studying intake patterns, control can become aware of height hours and adjust structures automatically. In Singapore, for instance, resort chains hire information analytics to reduce electricity intake via 20–25%, reducing both expenses and carbon emissions.

B) Waste Management:

Data-pushed waste control systems use IoT-enabled packing containers that send alerts whilst complete. Analytical fashions then determ

SMART TOURISM AND STAKEHOLDER COLLABORATION-

Researchers like Buhalis and Amaranggana emphasize that smart destinations function thru networked collaboration amongst governments, agencies, and citizens. European frameworks promote open records and participatory governance, making sure inclusivity and trust.

CHALLENGES AND LIMITATIONS-

While smart tourism offers significant benefits such as improved visitor experience, sustainable resource management and data-driven decision-making, its implementation faces several challenges and limitations:

1. High costs of implementation

Establishing smart tourism infrastructure such as IoT devices, sensors, smart apps and AI-based analytics requires significant financial investment.

Smaller or developing destinations often lack the budget to adopt these advanced technologies.

Maintenance and updates of digital systems increase running costs.

2. Privacy and security concerns

Smart tourism relies heavily on collecting and processing tourist data such as location tracking, consumption patterns and preferences.

Unauthorized access, cyber attacks or misuse of personal data can undermine tourist confidence.

Compliance with international data protection regulations (such as GDPR) can be complicated and costly.

3. Technical complexity

Smart tourism systems require advanced technical expertise for installation, operation and maintenance.

Many destinations may struggle with a lack of skilled personnel to manage sophisticated technology.

Integrating multiple platforms (mobile apps, smart transport, IoT sensors) can be challenging.

4. Digital divide

Not all tourists or local residents have equal access to smartphones, internet connections or digital skills.

Excessive reliance on technology can exclude certain groups, leading to inequalities in service access.

Rural or remote areas often have connectivity issues, limiting access to smart tourism solutions.

5. Overdependence on technology

Over-reliance on automated systems can reduce human interaction, which is often essential for a rich cultural and social tourism experience.

➤ Summary of key literature insights:

- Integration with broader town guidelines is important.
- Technology need to promote environmental and social sustainability.
- Inclusivity and equity results in long-term success.

RESEARCH METHODOLOGY-

1. Research design

This study uses a qualitative and analytical approach based on secondary research. The method focuses on reviewing academic journals, institutional reports and case studies to understand how technology contributes to sustainability in urban tourism. The analysis is explanatory, and explores the relationship between technology adoption, urban policy and environmental management.

2. Data source

Data collected from:

- Peer-reviewed journals (eg Tourism Management, Journal of Sustainable Tourism).
- Reports from international organizations such as UNWTO, OECD and the European Smart Cities Initiative.
- Case studies from city tourism councils and documentation of smart city projects (Barcelona, Singapore, Amsterdam).
- Guidelines and sustainability reports from municipal authorities.
- These sources provide a comprehensive understanding of global trends and practical implementation of smart tourism.

3. Analytical framework

- The analysis is guided by the triple bottom line (TBL) framework – evaluation of sustainability in three dimensions:

- Environment: Pollution reduction, efficient energy use, conservation.
- Economic: Cost savings, employment generation, tourism revenue.
- Social: Community involvement, cultural preservation, inclusion.

In addition, the Smart Destination Model (Buhalis and Amaranggana, 2014) is used to assess technology integration, stakeholder collaboration and governance effectiveness.

➤ CASE STUDY SELECTION-

Three cities - Barcelona, Singapore and Amsterdam - were selected for this study due to their exemplary smart tourism initiatives, integration of technology into city management and availability of reliable data. Each city represents a different approach to smart tourism, offering varied lessons for other urban destinations.

1. Barcelona, Spain

Barcelona has been a leader in the integration of smart city technologies with tourism management. The initiatives focus on improving visitors' experiences while minimizing negative consequences for residents and the environment.

Key initiatives include:

- IoT-based waste management: Smart bins equipped with sensors alert municipal services when they are full, reducing unnecessary truck routes and emissions.
- Smart Mobility App: Encourages tourists to use public transport by providing real-time updates on traffic and metro plans.
- Digital signage and smart beacons: Provide multilingual information about cultural monuments while reducing reliance on printed materials.
- Crowd monitoring systems: Cameras and sensors in popular areas such as La Rambla help redistribute the flow of tourists to less crowded attractions.
- These measures have improved resource efficiency and reduced congestion-related pollution. Furthermore, integrating local communities into planning – through neighborhood digital platforms – ensures that the voices of residents are included in tourism decisions. However, challenges remain around balancing commercialization with data privacy and cultural authenticity.

2. Singapore

Singapore is recognized globally for its data-driven governance and advanced use of artificial intelligence (AI) to improve urban efficiency. Its smart tourism strategies focus on predictive management and seamless visitor experiences.

Key achievements include:

- Smart transport system: AI algorithms analyze passenger data to optimize bus and train frequency, reducing overcrowding during peak tourism seasons.
- Energy monitoring: Hotels use IoT-based systems to reduce power consumption through smart lighting and climate control.
- Digital twins: 3D virtual models of tourism areas such as Marina Bay allow authorities to simulate visitor flows, plan emergency responses and test sustainability scenarios.
- MySingapore App: Provides real-time recommendations to tourists while promoting eco-friendly options and green-certified hotels.

Integrating sustainability indicators into tourism data dashboards ensures accountability and transparency. Singapore's approach shows how a small, highly urbanized destination can balance economic growth and environmental protection through coordinated technological innovation.

3 Amsterdam, Netherlands

Amsterdam is widely known for its focus on sustainability and community involvement in urban tourism management. The approach emphasizes environmentally friendly mobility and resident participation.

Key practices include:

- Amsterdam Smart City Platform: a collaboration center where governments, universities and private companies share open data for sustainability projects.
- City in balance programme: Uses data from sensors and social media to monitor visitor flows and divert tourists from crowded areas to less visited areas.
- Bike sharing and e-mobility: Encourages sustainable transport, reduces emissions and noise pollution.
- Smart ticket sales: A single city card unites museum entrances and public transport and reduces paper waste.

Amsterdam also prioritizes cultural preservation and inclusion, ensuring that its citizens benefit economically from tourism. This people-centred approach highlights that smart tourism is not just about technology, but about creating vibrant, resilient cities.

FINDINGS

1. Integration of technology and tourism

- Smart destinations successfully integrate IoT, AI, digital twins and big data analytics to enhance the visitor experience and improve city management.
- Real-time monitoring of tourist flows, and infrastructure use helps to reduce congestion, energy consumption and environmental impact.
- The technology enables predictive and evidence-based decision-making, such as redirecting tourists to less crowded areas or optimizing public transport schedules.

2. Contribution to sustainability

- Smart tourism initiatives contribute significantly to environmental, economic and social sustainability (Triple Bottom Line Approach):

- Environment: efficient energy use, less waste, low carbon footprint, preservation of cultural sites.
- Economic: Increase in tourism income, cost savings through effective resource management, job creation.
- Social: Involvement of local communities, participatory governance, protection of citizens' quality of life.

Cities such as Amsterdam and Barcelona show how sustainable urban planning with technology can balance tourism development and environmental protection.

3. Effective resource management through data analysis

Data analysis allows cities to monitor energy consumption, waste levels and transport patterns.

Case examples:

- Singapore: Smart hotels and public infrastructure reduce electricity consumption by 20-25%.

- Amsterdam: IoT sensors help distribute tourist flows evenly to prevent overcrowding.
- Resource optimization improves operational efficiency and reduces tourism's environmental impact.

4. Role of stakeholder collaboration

- Smart tourism depends on coordinated efforts between authorities, local authorities, businesses and citizens.
- Participatory governance structures, such as those in European cities, promote openness, trust and the inclusion of local communities.
- Successful initiatives require collaboration across sectors to align technology, policy and urban planning.

5. Phase influence on the tourism life cycle

- Smart technologies address issues at different stages of the tourism sector's life cycle:

- Exploration and Engagement: Technology helps with tourism engagement and marketing at an early stage.
- Growth and consolidation: Smart monitoring reduces congestion and optimizes resources.
- Stay and rejuvenate: Predictive analytics, AR/VR experiences and digital campaigns help maintain attraction and revive interest in the destination.

6. Challenges and limitations

Despite its benefits, smart tourism implementation faces challenges:

- High costs for installation, maintenance and updates.
- Privacy and data security issues due to extensive data collection.
- Technical complexity and lack of skilled personnel.
- The digital divide leaves tourists or locals without access to technology.

- Excessive reliance on technology, which can reduce cultural and social engagement.

7. Lessons from case studies

Barcelona: Technology enhances visitor experiences while protecting local communities and the environment.

Singapore: Data-driven management ensures efficiency and predictive city management.

Amsterdam: Sustainability and community involvement are central, and show the importance of community involvement together with technology.

These examples highlight best practices that can guide developing cities with limited budgets in adopting smart tourism strategies.

8. Guidelines and strategic recommendations

- The long-term success of smart tourism requires:
- Investment in technological infrastructure with a focus on cost-effective solutions for the development of cities.

- Integration of environmental and social goals in planning and use of technology.
- Promote inclusive, participatory governance to avoid social inequalities.
- Continuous assessment and adaptation using data analysis to improve tourism management sustainably.

Discussions: Smart Tourism Spaces

1. To explain the role of technology in urban tourism

The findings show that IoT, AI, Big Data analytics and digital twins significantly improve tourism management, resource efficiency and visitor satisfaction.

Discussion point: Technology is not just a tool; It shapes the way cities plan, monitor and respond to tourism flows, ensuring both efficiency and sustainability.

Example: Barcelona's congestion management app highlights how real-time data can reduce overcrowding and improve citizens' quality of life.

2. Balance tourism development and sustainability

Smart tourism shows that economic growth through tourism can exist side by side with environmental protection and social well-being.

Discussion point: Integrating sustainability principles into tourism planning ensures long-term attraction and prevents the decline of destinations as suggested by Butler's life cycle model of the tourism sector.

Implications: Cities that ignore sustainability risk environmental degradation, resident dissatisfaction and ultimately a decline in tourism.

3. The importance of data analysis and evidence-based planning

Discussion point: The use of predictive analytics enables cities to proactively manage resources, avoid congestion and optimize the use of energy/waste rather than reactively addressing issues.

Implications: Data-driven decisions improve efficiency, reduce costs and promote environmentally responsible tourism practices.

Challenge: However, over-reliance on technology can lead to the neglect of human interaction and local cultural experiences, which are at the heart of tourism.

4. Stakeholder cooperation and governance

Discussion points: The findings show that inclusive governance involving local authorities, businesses, residents and tourists is essential for successful smart tourism.

Reflection: Cities like Amsterdam exemplify how participatory approaches build trust, inclusion and long-term sustainability.

Implications: Smart tourism is not only about technology adoption, but also about social coordination and policy adaptation.

5. Challenges and limitations

High costs, technical complexity and digital divides limit their use in developing cities.

Discussion points: These challenges highlight the need for strategic planning, capacity building and affordable technological solutions.

Reflection: Policymakers should consider economic and social constraints to ensure equitable access to smart tourism benefits.

6. Implications for developing cities

Discussion point: While Barcelona, Singapore and Amsterdam provide best practices, smaller or developing cities should adapt strategies according to budget, infrastructure and social context.

Proposal: Staged implementation, public-private partnerships and community involvement can reduce financial and technical challenges.

7. Relate findings to academic literature

Discussion points: The findings support the research of Gretzel (2015) and Buhalis and Amaranggana (2014), which show that smart tourism improves sustainability and visitor management.

Reflection: This reinforces the idea that technology needs to be incorporated into wider urban planning and policy frameworks to be effective.

8. Future perspective

Talking Point: Smart tourism is evolving with new technologies such as AI-powered personalization, AR/VR experiences and blockchain-based tracking.

Reflection: Cities should take a visionary approach, preparing for technological upgrades while meeting social and environmental goals.

CHALLENGES AND ETHICAL CONSIDERATIONS-

Challenges and ethical considerations

Even advanced smart tourism systems face obstacles:

Concerns about privacy and surveillance can undermine public trust.

Technological dependence risks excluding non-digital populations or small local businesses.

Cultural homogenization can occur if destinations prioritize digital convenience over authentic experiences.

To deal with these, cities need to establish transparent data policies, digital literacy programs and ethical guidelines that are in line with the EU's General Data Protection Regulation (GDPR). Therefore, sustainable smart tourism must integrate technological ethics with environmental responsibility.

CONCLUSION

The analysis shows that when technology is used strategically and inclusively, smart destinations offer a transformative path towards sustainable urban development. Barcelona, Singapore and Amsterdam show how IoT, AI and digital systems can increase efficiency, reduce resource consumption and improve the quality of life for both tourists and residents.

However, the success of such initiatives depends on policy coherence, collaboration with stakeholders and community empowerment. Cities should see technology not as an isolated tool, but as part of an overall sustainability strategy that is in line with the UN's Sustainable Development Goals.

For developing or medium-sized cities, the way forward includes:

- Start small: Implement low-cost data-driven tools such as waste sensors or mobility apps.
- Fostering partnerships: engaging universities, technology companies and local communities in co-creation.
- Ensuring inclusion: bridging the digital divide and protecting privacy.

- Integrating sustainability goals: Continuously monitor energy, waste and emissions.
- Ultimately, smart destinations aren't just about innovation – they're about integration. By combining technology with sustainability and people-centred planning, urban destinations can evolve into intelligent ecosystems that ensure economic prosperity, ecological resilience and social harmony for generations to come.

REFERENCES

- Buhalis, D., & Amaranggana, A. (2014). Smart tourism destinations. *Information and Communication Technologies in Tourism*, 553–564.
- Butler, R. W. (1980). The concept of a tourist area cycle of evolution: Implications for management of resources. *Canadian Geographer*, 24(1), 5–12.
- Gretzel, U., Sigala, M., Xiang, Z., & Koo, C. (2015). Smart tourism: Foundations and developments. *Electronic Markets*, 25(3), 179–188.
- Hall, C. M. (2019). Constructing sustainable urban tourism: A critical perspective. *Journal of Sustainable Tourism*, 27(1), 1–19.
- Giffinger, R., Haindlmaier, G., & Kramar, H. (2020). The role of smart cities in sustainable urban development. *European Urban Studies Review*, 12(3), 245–263.
- UNWTO. (2023). *Smart destinations and sustainability: Global guidelines for cities*. Madrid: United Nations World Tourism Organization.

APPENDICES

APPENDIX A: Overview of smart tourism technologies

Technology	Function in tourism Mnagement	Example of Application
Internet of things (IOT)	collects real-time data on traffic, waste and energy.	Smart bins and parking sensors in Barcelona.
Artificial intelligence	predicts tourist movement patterns and optimizes transport.	AI-powered travel assistant in Singapore's Smart Nation initiative.
Big data Anaytics	Big data analysis analyzes visitor behavior and resource consumption trends.	The Amsterdam Smart City Platform uses open data.
Digital twins	Digital twins simulate urban infrastructure for sustainability planning.	Singapore's Marina Bay Digital Model for Event Management.
Mobile application	Mobile applications improve the tourist experience and promote environmentally friendly travel.	"MySingapore" app and "Barcelona Smart Tourism" app.

Appendix B: Summary of Sustainability Indicators (Triple Bottom Line Framework)

Dimension	Indicator	Example from case study
Environmental	Reduction in CO ₂ emissions, use of renewable energy	Barcelona's smart lighting reduced energy use by 30%
Economic	Local job creation, cost savings, tourism revenue.	Singapore's smart hotels reduced operating costs by 18%.
Social	Resident satisfaction, inclusion, cultural preservation	Amsterdam's citizen-led projects promoted local engagement. ,

Appendix D: UN Sustainable Development Goals (SDGs) Alignment

Relevant SDG	Application in Smart Tourism
Goal 9: Industry, innovation and infrastructure	Promote smart infrastructure and green technologies
Goal 11: Sustainable cities and communities	Sustainable management of urban tourism through technology

Goal 12: Responsible consumption and production	Optimizing energy and waste efficiency in tourism
Goal 13: Climate action	Reduce emissions through data-driven guidelines.