

Empowering recreation in urban parks using digital solutions: A proposed framework for smart urban parks in the city of Tirana

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Abstract

A focus group with recreation administrators, physical activity outdoor trainers, and ICT specialists in Tirana has provided valuable insights into the needs and perspectives of the local community regarding parks and recreational facilities. The primary objective of this study was to gather community-specific data and identify special requirements and potential future implementations that combine smart solutions with park amenities. This approach recognizes that the conventional idea of parks and leisure is evolving in response to park visitors' changing demands and interests. The aim was to engage a diverse range of stakeholders, including park visitors, local residents, community organizations, and technology experts. This focus group served as a platform for open discussions, idea sharing, and collaborative decision-making. Participants had the opportunity to voice their opinions on various aspects of digital transformation, such as implementing interactive displays, developing mobile applications for park information and activities, integrating smart technology for enhanced safety measures, and promoting environmental sustainability through digital initiatives. The content analysis conducted during the focus group has yielded several recommendations for the municipality of Tirana to follow in order to digitally transform urban leisure parks into Smart Parks. The results of the analysis can assist local parks and recreation leaders in formulating strategies that engage the next generation of the community. By incorporating technology and outdoor exploration, these strategies can help highlight the value of park facilities and encourage visitors to actively participate in various activities. By integrating smart solutions, the park administration can create an environment that caters to the evolving interests and needs of the community, fostering greater interaction and enjoyment for all visitors. The administration of parks in Tirana should embrace a strategy that integrates technology and nature to create "Smart Parks." These facilities can enhance adoption, profitability, and engagement across different generations by implementing even a few basic tech solutions. The recommendations provided by the focus

group will serve as a guide for the municipality of Tirana to leverage technology and nature integration effectively.

Keywords: innovative apps; IoT; outdoors; recreation parks; tech facilities.

1. Introduction

Technology innovation is having a game-changing effect on local government parks and recreation management, an industry that has focused on the great outdoors and the simplicity of nature for decades. It is changing how local governments engage and relate to the public, and it is also impacting the services provided by parks and recreation agencies and other facilities.

Cities of various sizes worldwide are increasingly adopting smart parks. These smart parks offer easily accessible Wi-Fi, allowing visitors to stay connected to their essential apps while enjoying the outdoors. This eliminates barriers for users of social media platforms, texting services, or streaming music who wish to be physically active. Investments in smart parks lead to increased visitor numbers, and online visitors are more inclined to share and publish information, which benefits local and national governments, as well as parks and recreation organizations.

The Parks and Recreation Agency of Tirana oversees Recreational Parks, Memorial Parks, Zoo Park, Amphitheater, Olympic Park, Orbital Forest Plantation, Green Crown, Forests & Pastures, and Nature and Activities in the Municipality of Tirana. (<https://aprtirana.al/>).

2. Methodology

This qualitative study design consisted of two stages:

Stage 1: A review was conducted based on papers from international datasets and case studies of recent smart parks. The objective of this stage was to examine multiple studies encompassing diverse viewpoints and significant advancements in smart urban parks both regionally and globally. Reporting article standards for systematic reviews and meta-analyses (Moher et al., 2009) were followed for this systematic review. The following keywords "smart parks," "IoT in recreation parks," "smart recreation park framework," "recreation park innovation," and "digitalization of leisure parks." were used to search for relevant studies published in the last decade (from 2012 to 2022) in Google Scholar. The following criteria were used to determine which research would be included: (a) empirical

studies looking at how ICT affects leisure and smart parks; (b) studies published in English.. The search found 13 articles that matched the inclusion criteria.

According to Braun and Clarke (2006), the processes of content analysis were as follows: (a) familiarity with the information - Reading and rereading the qualitative material helped us become comfortable with the data by helping them comprehend its substance completely; (b) identify and create initial codes, which were labels that summarized the main concepts, ideas, or themes found in the data; (c) finding themes: within the original codes, we have located and looked for overarching themes or patterns. (d) Reviewing and improving themes: themes were combined, or divided to make sure they accurately represent the data; (e) Themes' definition and naming: methodically classifying and grouping the pertinent data segments under each theme; (f) Generating a comprehensive analysis: we applied the defined themes to the entire data set; (g) Interpreting data analysis results and summarizing findings: deriving significant insights from the highlighted themes.

Stage 2: A focus group with 9 participants was organized, involving recreation administrators, physical activity outdoor trainers, and ICT specialists, to gather community-specific data regarding the needs and perspectives of recreation parks. Content analysis - thematic analysis (Braun & Clarke, 2006) was utilized to identify patterns and themes within the qualitative data obtained from the focus group. This process started with the data collection and continued with the transcription, reading, and rereading of the data from the notes and transcriptions of the focus group meeting minutes, analysis, and interpretation. Content analysis of this focus group comprised a systematic examining the information gathered, such as transcriptions and notes, to find trends, themes, and key insights.

3. Results

Several studies investigating smart park development and recent technology enhancement were reviewed for this study. A summary of recent studies related to smart parks are presented in Table 1.

Table 1: A summary of recent studies related to smart parks

Smart Recreation Parks Aspects	Research papers
<i>Internet of Things</i>	(Xu et al. 2014)
<i>Smart Recreation Parks frameworks</i>	(Truch & Sutanto, 2018; Yang et al. 2020, Loukaitou-Sideris et al. 2018)
<i>Promoting Smart Parks Benefits</i>	(Sinclair et al. 2020, Brandis 2018)
<i>Smart Facilities and Challenges</i>	(Buhalis & Amaranggana, 2020; Gretzel et al., 2020; Huang et al., 2012)
<i>Smart Recreation management</i>	(Wang et al., 2020; Li et al., 2020)
<i>Marketing of smart tools in recreational activities</i>	(Koo et al. 2018; Bilgihan et al. , 2021)

Xu et al. (2014) explores the concept of the Internet of Things (IoT), highlighting its potential to connect physical objects, enable data exchange, and revolutionize various industries through enhanced automation, communication, and efficiency. Truch and Sutanto (2018), Yang et al. (2020), and Loukaitou-Sideris et al. (2018) present frameworks for Smart Recreation Parks, offering comprehensive approaches to integrate technology, data analytics, and user-centric design to enhance visitor experiences, optimize park management, and promote sustainability in a digitized park environment. Sinclair et al. (2020) and Brandis (2018) highlight the advantages of Smart Parks, emphasizing how technology integration and data-driven insights can enhance visitor experiences, promote sustainability, and improve park management practices. Buhalis & Amaranggana (2020), Gretzel et al. (2020), and Huang et al. (2012) discuss the implementation of Smart Facilities in recreational settings, exploring the opportunities they present for personalized experiences, improved accessibility, and efficient resource management, while also addressing challenges related to privacy, data security, and technological infrastructure. Wang et al. (2020) and Li et al. (2020) provide insights into the concept of Smart Recreation Management, focusing on the utilization of technology, data analytics, and automation to optimize park operations, enhance safety measures, and streamline visitor flows, leading to improved efficiency and resource allocation. Koo et al. (2018) and Bilgihan et al. (2021) examine the marketing aspects of smart tools in recreational activities, highlighting how innovative technologies, such as augmented reality and mobile applications, can be leveraged to attract and engage users, enhance customer experiences, and drive business growth in the leisure industry.

A step-by-step description of how our content/thematic analysis (Braun & Clarke, 2006) was applied in the context of this focus group on recreation parks are presented as

follows: Familiarization: This section involved transcribing the audio recordings and notes of the discussions and thoroughly reading through the transcripts to become familiar with the content. Initial coding: In this step, we generated initial codes by systematically identifying and labeling meaningful units of data relevant to the research question. These codes can be descriptive, capturing explicit content, or interpretive, capturing underlying meanings. Searching for themes: In this step, we looked for patterns, connections, or repetitions in the codes. We grouped similar codes together to form potential themes. Reviewing themes: In this step we evaluated and refined the identified themes. Defining and naming themes: Develop clear definitions and concise names for each theme to capture its essence. This process involved summarizing the main characteristics and content within each theme. Generating the thematic map: Create a representation of the relationships between themes, highlighting the overarching themes and subthemes. This thematic map provided a comprehensive overview of the entire analysis. Writing the analysis: We provided a detailed description of each theme, including its meaning, relevance, and impact. Reviewing and refining: In this final step we continuously reviewed and refined the analysis by revisiting the data, themes, and interpretations. The goal was to ensure that the analysis accurately represents the participants' perspectives and experiences.

The Thematic analysis in this research enabled us to identify key themes and patterns in focus group data related to recreation parks, such as participants' preferences for specific park features, perceptions of safety and security, opinions on accessibility and inclusivity, satisfaction with recreational activities, and suggestions for improvement.

The focus groups helped elicit information on the topics under study's unique needs and future implementations to integrate smart solutions with park facilities in the city of Tirana. The focus group data analyses helped elicit information on the topics under study's unique needs and future implementations to integrate smart solutions with park facilities in the city of Tirana. Content analysis of the focus group data suggests the following tasks that the municipality of Tirana should undertake to digitally transform urban parks into "Smart Parks":

Task No.1: *Begin the conversion to "Smart Parks" by starting small and gradually implementing incremental changes to build upon success.*

Task No.2: *Adopt new technology initiatives by testing ideas with innovative partners of various sizes and scales.*

Task No.3: *Collaborate with tech startups to experiment with new tech solutions.*

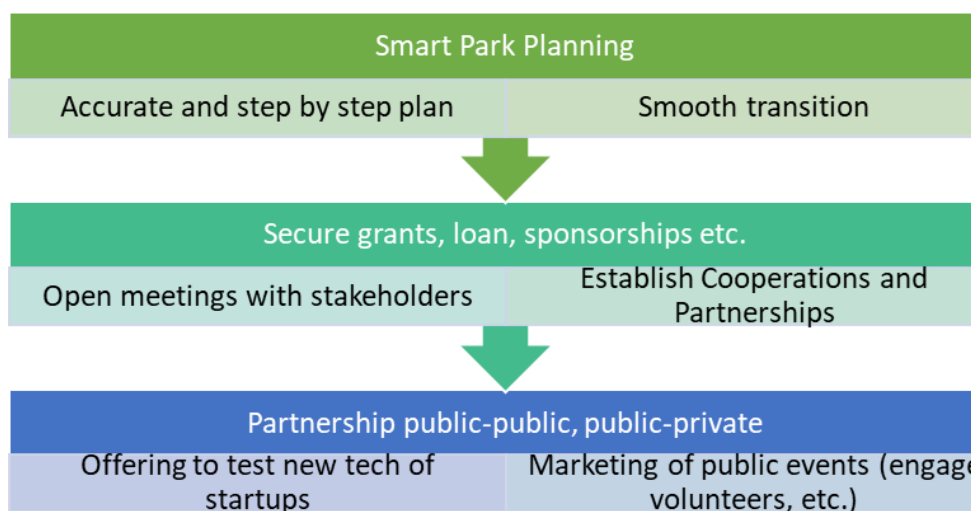
Task No.4: *Develop and execute a pilot project to assess the feasibility and effectiveness of implementing smart park technologies.*

Task No.5: *Reduce costs through partnerships between the public and private sectors, public entities, and non-profit organizations.*

Task No.6: *Establish Innovation & Entrepreneurship offices to oversee the development of smart parks and facilitate partnerships.*

Task No.7: *Secure grants, loans, bonds, and other funding resources by forming strategic partnerships.*

Figure 1: Smart Park Planning steps for the transition from traditional parks to smart parks in the Municipality of Tirana



Content analysis of the focus group data revealed the following aspects that can facilitate the community and the general public in benefiting from technology-enabled park solutions: a) Incorporating smart technology in parks provides an opportunity to engage with a tech-savvy generation, offering essential spaces for socializing, exercising, and enjoying the outdoors; b) Mobile applications can promote physical activity, encourage community engagement in recreational activities, and contribute to improved public health; c) App data can provide valuable insights into the utilization of park features, helping identify areas of high and low usage among amenities; d) Utilizing Internet of Things (IoT) technology to visualize park facilities and implementing a tracking system can contribute to reducing operational costs and optimizing park management; e) Adopting energy-efficient measures such as solar benches and energy-generating exercise equipment can help lower energy costs and promote sustainability within the park environment.

Some potential recommendations of this focus group findings (Figure 1) included: a) Implementing Wi-Fi connectivity in parks to enable visitors to access online resources, social media, or park-specific apps that provide information and interactive experiences; b) Installing smart signage and information boards throughout the parks to provide real-time updates, directions, and information about park features, events, and activities; c) Developing mobile applications or web platforms dedicated to park services, such as reservation systems for sports fields, equipment rentals, and guided tours; d) Introducing

smart lighting systems that adjust brightness and energy consumption based on usage patterns and natural light conditions; e) Incorporating sensors and IoT devices to monitor park usage, environmental conditions, and the availability of facilities, allowing for data-driven decision-making and resource optimization; f) Creating interactive installations or augmented reality experiences within the park to engage visitors in educational and recreational activities; g) Establishing partnerships with local technology companies or startups to encourage innovation and co-creation of smart solutions specifically tailored for park settings; h) Providing charging stations for electronic devices to accommodate the needs of visitors who rely on smartphones or other mobile devices for information and communication; i) Developing educational programs or workshops that teach visitors about the intersection of technology and nature, promoting digital literacy and environmental awareness; Conducting regular surveys and feedback collection to continuously assess the effectiveness of implemented smart solutions and gather insights for further improvements.

By following these recommendations and actively pursuing the integration of technology into park facilities, the municipality of Tirana can create Smart Parks that cater to the evolving preferences of the community.

4. Discussion

Parks and Recreation Agency in Tirana provide parks and other recreational facilities to meet the local community's requirements. A focus group with recreation administrators, physical activity outdoor trainers, and ICT specialists was held to collect community-specific data concerning the needs and perspectives of recreation parks. The primary goal was to gather information about special requirements and potential future implementations to combine smart solutions with park amenities.

Content analyses of the focus group notes and transcripts helped us identify common themes, comprehend participant viewpoints, and draw recommendations. The focus group results provided potential recommendations for transforming urban leisure parks in Tirana into Smart Parks, including implementing Wi-Fi connectivity, installing smart signage and information boards, developing dedicated mobile applications or web platforms, and introducing smart lighting systems. Other suggestions included incorporating sensors and IoT devices, creating interactive installations or augmented reality experiences, establishing partnerships with local technology companies, providing charging stations, developing educational programs, and conducting regular surveys. By following these recommendations and integrating technology into park facilities, Tirana can create Smart Parks that meet the evolving preferences of the community. This approach will not only enhance visitor experiences but also strengthen the value and relevance of parks in the urban landscape, fostering a deeper connection between people, technology, and nature.

It is crucial to collaborate when implementing technology in parks. Public-public collaborations, including those between the park and other city departments, can help to optimize resource utilization and achieve shared objectives at a reduced cost. As the demands and interests of citizens evolve, the traditional concept of parks and leisure is also changing. Park management should adopt an approach that integrates technology and nature to avoid disconnecting from future generations who expect ubiquitous tech accessibility. By implementing even a few basic tech solutions, parks, and recreation facilities have the potential to enhance facility adoption, profitability, and engagement across different generations. Findings of this research showed that by involving the community in this important decision-making process, the resulting digital transformation will align with the needs and preferences of park users while promoting a more accessible, enjoyable, and sustainable recreational experience for all.

5. Conclusions

Stakeholders involved in this study recognize the importance of digital transformation in enhancing the recreational park experience for its residents. To gather valuable insights and ensure inclusivity, a focus group was organized. The aim was to engage a diverse range of stakeholders, including park visitors, local residents, community organizations, and technology experts. This focus group served as a platform for open discussions, idea sharing, and collaborative decision-making. Participants had the opportunity to voice their opinions on various aspects of digital transformation, such as implementing interactive displays, developing mobile applications for park information and activities, integrating smart technology for enhanced safety measures, and promoting environmental sustainability through digital initiatives. The conventional notion of parks and leisure is undergoing a transformation in response to the evolving demands and interests of park visitors. Park administrations should embrace a strategy that integrates technology and nature. By implementing even a few basic tech solutions, these facilities have the potential to enhance adoption, profitability, and engagement across multiple generations. The content analysis findings have provided a set of recommendations for the municipality of Tirana to digitally transform urban leisure parks into "Smart Parks". These results can assist local parks and recreation leaders in defining strategies to engage the next generation of the community and emphasizing the value of park facilities through activities that combine technology and outdoor exploration. Additionally, local parks and recreation leaders can contribute to engaging the next generation and highlighting the value of park facilities by involving visitors in activities that integrate technology and outdoor exploration.

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