

## Assessing perspectives on the efficacy of digital tools in managing recreation parks in Tirana: A case study

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**Abstract:** The research aims to investigate on the effects of introducing technological advances in the management of urban parks and other recreational spaces in the city. Local government parks and recreation management, an industry that has strived to focus on the benefits of outdoor activities and the simplicity of nature for decades is experiencing a paradigm shift because of technological innovation. This is affecting not only how local governments interact with and engage the public, but also the services offered by parks, recreation departments and other institutions. For the purpose of gathering community-specific information about the requirements and perspectives of recreation parks in the municipality of Tirana, a focus group was organized with recreation administrators, physical activity trainers, fitness specialists, entertainers, smart technology specialists, and representatives from the local leisure and recreation businesses. The qualitative data obtained from the focus group were grouped into patterns and themes, and were then examined using content analysis. Based on the findings, parks and recreation facilities can potentially improve facility adoption, profitability, and engagement with a range of generations even if only a few basic tech solutions are implemented. Local parks and recreation leaders may help engage the next generation of the community and highlight the value of park facilities in the community by getting visitors involved in activities that combine technology and outdoor exploration.

**Keywords:** *Innovative apps, IoT, Outdoors, Recreation parks, Tech facilities.*

### 1. Introduction

The management of urban parks and other recreational facilities from the local government, a sector that has strived to focus on the value of outdoor activities and the simplicity of nature for decades, is experiencing a paradigm shift as a result of technological innovation. This is affecting not only how local governments interact with and engage the public, but also the services offered by parks, recreation departments and other institutions.

#### 1.1. Smart Parks Terminology

Urban parks are an important component of urban ecological building and a critical infrastructure for promoting sustainable urban growth. These open green areas have strategic relevance when considering their function in improving the quality of life in an increasingly urbanised society by reducing stress and promoting mental health. Natural surroundings may also be viewed as a source of active experience, offering a feeling of challenge, seclusion and closeness, as well as aesthetic and historical continuity [1]. The fast advancement of information technology has resulted in the establishment of smart cities, which have in turn opened the way for the birth of smart parks. Smart parks have revitalised physical public spaces and increased the societal demand for them. This has

resulted in additional requirements and uses for public areas, altering both individual and communal habits [2]. Technological advancements have allowed digital expression, intelligent service control and administration, and monitoring and maintenance procedures, allowing for seamless interactions with visitors via mutual perception and comprehension [3].

#### *"Internet of things" (IoT)*

The phrase "Internet of Things" (IoT) refers to physical devices outfitted with sensors, computer power, software, and other technologies that connect with one another and exchange data over the Internet or other communication networks [4, 5]. Technological advancements are transforming the way local governments manage parks and recreational facilities. IoT is transforming how local governments interact with and engage the public, and it is also influencing the services offered by parks and recreation agencies and other facilities [6-8].

#### *1.2. Smart Parks*

Smart parks are becoming more and more common across the world in cities of all sizes. The smart park provides conveniently available Wi-Fi, enabling visitors to stay connected to their essential apps and tech facilities [6, 8-11] while still enjoying being outside. By doing this, it dismantles obstacles for people who need to be more physically active and also want to use their social media sites, messaging applications, or streaming music services [7-9]. Investments in smart parks increase visitors, and connected tourists are more likely to share and publish information, which benefits parks and recreation agencies and local and central government [6, 10-12].

#### *1.3. Mobile apps*

Some smart natural and urban parks also provide mobile applications that advertise the park's amenities and facilities and make it simple for visitors to sign up for upcoming events and activities [11]. Park managers should adopt a strategy in order to develop and implement applications that take visitors on a tour through the park, share interesting tidbits about the local recreation activities [9] and provide engaging games, quizzes, and surveys that are all specific to the park where the user is currently standing.

#### *1.4. GIS and spatial big data*

Studies evaluating nature-based recreation using spatial big data have increased significantly over the past ten years, especially in the context of protected areas [10, 13, 14]. In order to get around some of the drawbacks of traditional data-gathering methods, a new field of study uses spatial big data as a source of revealed preferences for the valuation of nature-based recreation [15]. This potential is made feasible by the discovery of GPS data as a reliable proxy for the recreational use of natural places [16].

#### *1.5. Drones*

Drones are aerial vehicles that are controlled by a ground-based controller and frequently have the ability to capture still images or live video. Drone technology is being used more and more by parks and recreation authorities [16] as part of their public safety plans. These agile aircraft could provide critical eyes in the sky along remote park trails or allow park managers to remove unsafe trail segments without placing staff members in potentially dangerous circumstances to check on conditions [10, 16].

#### *1.6. Beacon Counters*

Another safety innovation that helps families relax and enjoy their time at the park is the use of beacon counters [9]. Bluetooth-enabled beacon counters are connected to smartphones through a tether. In order to limit how far their child can walk and explore, parents can rent a wristband that has a beacon built into it, where a warning alert sounds if the visitor travels further than the permitted separation, urging the two parties to get back together [8, 9].

### 1.7. *Electronic Kiosks*

Some smart parks also provide on-site digital displays that advertise the amenities of the park and facility and make it simple for visitors to sign up for upcoming events and activities while they are still front of mind [8, 9]. Both attendance and revenue are increased by offering such amenities [9]. Such park kiosks can also assist in educating visitors and educating younger generations about the development and history of the country.

### 1.8. *Smart Benches*

Any Park with Wi-Fi access must have charging stations using smart benches so that visitors can maintain their connection. Smart parks are incorporating charging stations [8] and even solar-powered charging benches into their facilities.

### 1.9. *Augmented Reality and Gaming*

The ability of parks and recreation departments to engage with young people who are spending more time indoors and in front of screens than ever is one of their biggest challenges. Augmented reality technology can help attire young generation in park exploration [9]. By encouraging young people to use augmented reality games using geolocation technology, games can help to promote socializing and outdoor enjoyment.

### 1.10. *Apps for Citizen Request Management*

The request management application is a technological solution that enables improved resident service and aids in park maintenance. Such tools make it possible for the general public to report observed maintenance requirements from any connected device, and the repair procedure for the public works and parks and recreation maintenance crews can be sped up by the resident taking a geotagged photo and including it with their request [8, 9].

### 1.11. *Energy-Generating Exercise Equipment*

Exercise equipment that generates energy: Equipment for outdoor workouts is made to last and requires low maintenance. Additionally, these devices offer a benefit by converting kinetic energy into chemical and potential energy, which may then be used as a clean energy source [8, 9].

Several studies were reviewed pertaining to the understanding and analysis of different elements of tourism, recreation, and environmental management using mobile phone data, social media data, and other digital data sources. Kubo, et al. [11] used data from mobile phone networks to examine the economic impact of climate change on coastal tourism in Japan. Using data from mobile phones, Jaung and Carrasco [12] performed a travel cost analysis of Singapore's urban parks and protected areas.

In a meta-analysis of research employing geolocated social media data as a stand-in for recreational visits to natural areas, Ghermandi [14] conducted a meta-analysis of research employing social media data that can be geolocated as a stand-in for leisure visits to natural places. Fisher, et al. [15] measured recreational use in dispersed public areas using social media data and on-site counts. In order to better comprehend urban green space. In order to better comprehend urban green space, Cui, et al. [16] did a narrative analysis of the literature on studies utilizing volunteered geographic information and social media data. These publications demonstrate how digital data sources are increasingly being used to manage tourism, leisure, and environmental resources.

## 2. Methodology

To gather community-specific information about the requirements and perspectives of recreation parks in the city of Tirana, a focus group with 9 participants, including recreation administrators, physical activity trainers, fitness specialists, animators, smart technology specialists, and representatives from the local leisure and recreation business was organized. Data collecting was the first step in this process, which continued through transcription, reading, rereading and analyzing data for the purpose

of classifying responses into patterns and themes. The focus group's qualitative data, were then examined using content analysis and interpreted.

### 3. Results

The focus groups assisted in gathering data on the particular requirements of the study's topics and potential implementations of digital tools to combine smart solutions with park amenities in the city of Tirana.

Urban Recreation Parks in the city of Tirana are medium to large green spaces that are used to spend time in touch with nature as well as provide physical, social, educational, and cultural activity making city public parks great resources for enhancing general human health. Parks and Recreation Agency is the office responsible for administering recreational parks, memorial parks, the Zoo Park, the Amphitheatre, the Olympic Park, the Orbital Forest Plantation, as well as for taking care of the green crown, forests & pastures, and nature activities in the Municipality of Tirana (<https://www.aprtirana.al>).

Urban Recreation Parks in Tirana are listed below.

- The Great Artificial Lake of Tirana. The Great Artificial Lake of Tirana in its current form dates back to 1957 and is conceived as a Flora and Fauna Park.
- Farke Lake. Farke Lake is about 2.3 kilometres from the national road and 9.6 km from the heart of Tirana, making it convenient for people to reach this park.
- Tirana Zoo Park. Tirana Zoo Park was built in 1966 and is located in the green area of Tirana, next to the Botanical Garden and together with the Great Park makes the green crown of the city.
- Youth Park. The Youth Park was built in 1959 and is the only urban park in central Tirana.
- Olympic Park. (Olympic park of Tirana was built in 2017, and is a contemporary sport complex).

Digital solutions implemented by the municipality of Tirana in the urban parks are as follows:

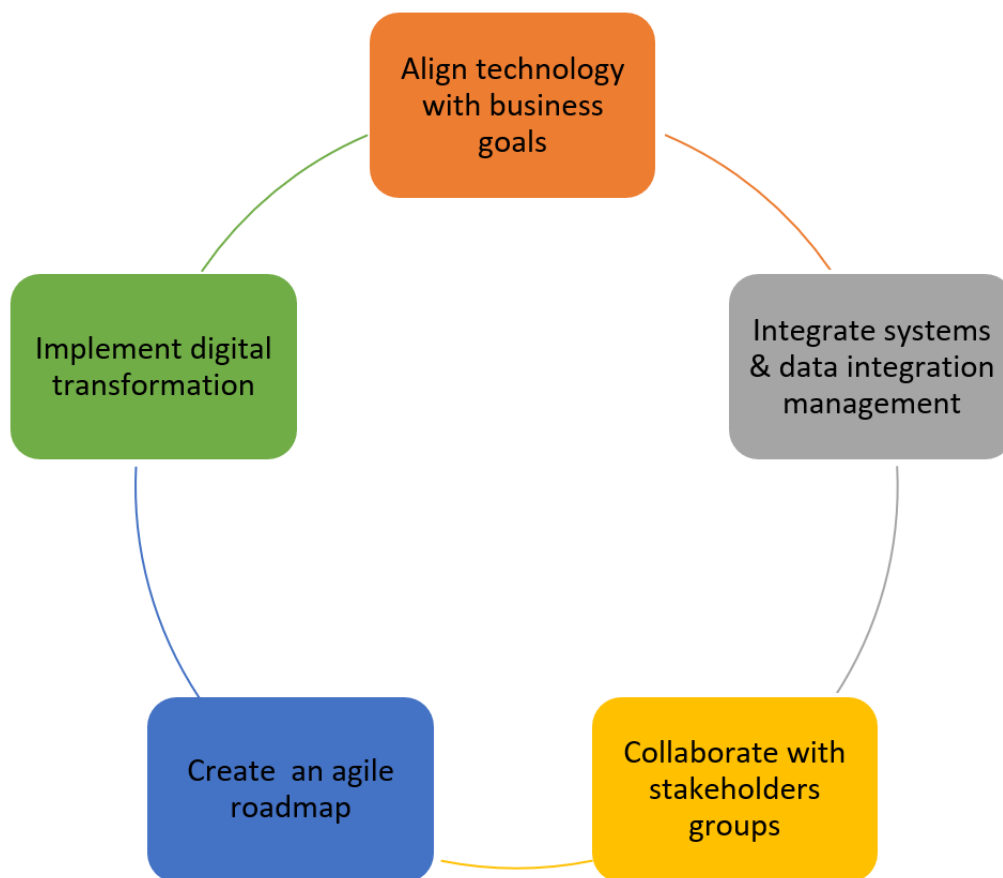
1. Web apps/Mobile Apps: App "Tirana ime Outdoor" for information and events management
2. Web Portal for Online site reservations, Volunteering online registration, Online Sponsorships, Online events calendar

There is an ongoing action plan for smart solutions in these parks, which aims to digital transformation solutions in the near future.

**Table 1.**  
Urban recreation parks in the city of Tirana.

No.	Urban park	Description and classification	Digital solutions (Currently offered)
1	The Great Artificial Lake of Tirana	The territory of The Great Artificial Lake of Tirana consists of a hilly massif with gently sloping slopes. In the southern part, the water mirror of the Artificial Lake is formed, which with its extension creates very picturesque small bays and peninsulas. There are several historical, artistic, social-cultural, memorial works, etc.	Mobile App: - App "Tirana ime Outdoor" for information and events management Web Portal for: - Online site reservations - Volunteering online registration - Online Sponsorships - Online events calendar ( <a href="https://aprtirana.al/">https://aprtirana.al/</a> )
2	Farke Lake.	This region is notable for its natural heritage, picturesque mountainous environment, and biodiversity.  This heritage includes artifacts, environments, ecosystems, uncommon and distinctive habitats, relics, and endemic species.	Mobile App: - App "Tirana ime Outdoor" for information and events management Web Portal for: - Online site reservations - Volunteering online registration - Online Sponsorships - Online events calendar ( <a href="https://aprtirana.al/">https://aprtirana.al/</a> )
3	Tirana Zoo Park	Visiting the Zoo will be an all-day activity that includes picnic areas along the drive routes, and green spaces free from structures and designated for visitors. In addition to these, playgrounds are scattered to make the experience as rich as possible for children and parents.	Mobile App: - App "Tirana ime Outdoor" for information and events management Web Portal for: - Online site reservations - Volunteering online registration - Online Sponsorships - Online events calendar ( <a href="https://aprtirana.al/">https://aprtirana.al/</a> )
4	Youth Park	Rinia Park has an area of 29.81 ha with green spaces, and a different relief on certain surfaces, which serves not only as an acoustic wall, but also encourages physical activities for children.	Mobile App: - App "Tirana ime Outdoor" for information and events management Web Portal for: - Online site reservations - Volunteering online registration - Online Sponsorships - Online events calendar ( <a href="https://aprtirana.al/">https://aprtirana.al/</a> )
5	Olympic Park	Olympic Park is a contemporary complex that has been designed with sport, Olympic competition in mind.	Mobile App: - App "Tirana ime Outdoor" for information and events management Web Portal for: - Online site reservations - Volunteering online registration - Online Sponsorships - Online events calendar ( <a href="https://aprtirana.al/">https://aprtirana.al/</a> )

The focus group data result outlined that the smart solution offers a significant chance to lessen the burden of maintenance and revalorization costs on the government. Additionally, it urges the community and stakeholders to take into account the demands of visitors and be updated to address the needs of future generations.



**Figure 1.** Proposed strategy from the focus group for implementing “Smart Parks” in the Municipality of Tirana.

The following set of recommendations, crafted through insightful collaboration and extensive analysis from the focus group, serves as a strategic blueprint for parks to navigate the complexities of digital transformation effectively. By embracing these recommendations, parks can align technology initiatives with business objectives, foster integration, cultivate collaboration, and adopt agile methodologies, ensuring a successful and sustainable journey towards digital excellence.

**Recommendation 1.** Align technology with business goals. Stakeholders in parks must work with internal departments to align the value of digital transformation with business goals in order to properly focus on connecting the systems that will have the biggest impact on the administration. This is necessary for the implementation of transformative IoT initiatives. It is crucial to consider digital transformation in terms of business objectives rather than merely projects. Too many efforts fail because they adopt a restricted perspective or solely concentrate on advanced technological features for their own sake.

**Recommendation 2.** Be open to integrations. Connecting systems and software in a way that enables shared data removes manual interventions and reduces redundant data entry is essential for achieving IoT ambitions. Data integration management will be built on top of systems that prioritize API interconnectivity in software stack architecture.

**Recommendation 3.** Collaborate and work closely with stakeholder groups. Find collaborators in other important departments who are as excited about IoT prospects as you are and who will work with you to develop solutions and identify efficiency. Collaboration across departments, executives who support initiatives, and employee buy-in are all necessary for success.

Recommendation 4. Create an agile roadmap for your digital transformation. When companies use agile approaches as part of their digital transformation, they can start seeing benefits right away without having to pay a hefty up-front fee for a lengthy project. In an iterative approach known as "agile," cross-functional teams work together to develop projects. Risk-averse public sector organizations can immediately recognize the advantages of IoT initiatives by creating value iteratively, which enables leaders to win over additional stakeholders.

These recommendations, crafted through qualitative content analysis, signify a pivotal moment towards leveraging technological innovation to enhance the vitality and relevance of local parks and recreational facilities. Drawing upon insights gleaned from the focus group, these recommendations encapsulate actionable strategies aimed at digital transformation of urban recreational parks. Content Analyses of focus group data regarding the benefits of implementing "Smart Parks" in the Municipality of Tirana are presented in Figure 2.



**Figure 2.**  
Benefits of implementing "smart parks" in the municipality of Tirana.

#### 4. Discussion

Parks and Recreation Agency in Tirana provide parks and other recreational facilities to meet the requirements of the local community. 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.

It's crucial to collaborate while implementing technology in parks. Public-public collaborations, including those between the park and other city departments, can help to better utilize resources and achieve shared objectives at a lower cost.

This study results propose to establish new technology-focused offices for Innovation & Entrepreneurship in order to develop, test, deploy, and scale new technologies. These agencies could work with park departments to fund the creation of Smart Parks and be useful partners. Private-public partnerships can give entrepreneurs and tech firms the possibility to test or pilot cutting-edge solutions, and park management the chance to offer the local community a new service.

Therefore, the digitalization of recreation urban parks is particularly significant because it creates a platform that offers cutting-edge services to urban residents and is related to the development of cities and the global main challenge of a healthy lifestyle. In order to achieve this, the findings of this study demonstrate that the integration of smart technology into a public urban park, is a complex, multi-faceted process.

## 5. Conclusions

As citizens' demands and interests change, the traditional conception of parks and leisure is also altering. Before distancing themselves from future generations who anticipate ubiquitous tech accessibility, park management should adopt an approach of integration between tech and nature. Parks and recreation facilities can potentially improve facility adoption, profitability, and engagement with a range of generations if you implement even a few basic tech solutions. Local parks and recreation leaders may help engage the next generation of the community and highlight the value of park facilities in the community by getting visitors involved in activities that combine technology and outdoor exploration.

### Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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## References

- [1] A. Chiesura, "The role of urban parks for the sustainable city," *Landscape and Urban planning*, vol. 68, no. 1, pp. 129–138, 2004. <https://doi.org/10.1016/j.landurbplan.2003.08.003>
- [2] R. Languillon-Aussel, "Digitalization of public spaces. The great urban change?," *Articulo-Journal of Urban Research*, no. 22, 2021. <https://doi.org/10.4000/articulo.4859>
- [3] X. Xie, L. Zheng, R. Wang, and Z. Gou, "Visitors' experience of using smart facilities in urban parks: A study in Shenzhen," *Journal of Outdoor Recreation and Tourism*, vol. 46, p. 100759, 2024. <https://doi.org/10.1016/j.jort.2024.100759>
- [4] K. Ashton, "That 'internet of things' thing," *RFID Journal*, vol. 22, no. 7, pp. 97–114, 2009.
- [5] L. Da Xu, W. He, and S. Li, "Internet of things in industries: A survey," *IEEE Transactions on Industrial Informatics*, vol. 10, no. 4, pp. 2233–2243, 2014. <https://doi.org/10.1109/tii.2014.2300753>
- [6] M. M. Abdelhamid, "Revitalization of historical urban parks using a smart approach," *Engineering Research Journal*, vol. 164, pp. 20–36, 2019. <https://doi.org/10.21608/erj.2019.123878>



- [7] E. Truch and J. Sutanto, *Smart Parks: Bringing new technologies to national parks and urban greenspaces*. UK: Lancaster University Management School: Lancaster, 2018.
- [8] Z. Yang, X. Fang, and L. Changlin, "Research on the construction framework of smart park: A case study of intelligent renovation of Beijing Haidian Park," *Landscape Architecture*, vol. 27, no. 5, pp. 78-87, 2020.
- [9] A. Loukaitou-Sideris, K. J. Ferdman, R. Gmoser-Daskalakis, and C. Hum, "SMART parks™: A toolkit," Retrieved: <https://innovation.uskin.ucla.edu/sites/default/files/ParksWeb020218.pdf>. [Accessed 12 December 2024], 2018.
- [10] M. Sinclair, M. Mayer, M. Woltering, and A. Ghermandi, "Using social media to estimate visitor provenance and patterns of recreation in Germany's national parks," *Journal of Environmental Management*, vol. 263, p. 110418, 2020. <https://doi.org/10.1016/j.jenvman.2020.110418>
- [11] T. Kubo, S. Uryu, H. Yamano, T. Tsuge, T. Yamakita, and Y. Shirayama, "Mobile phone network data reveal nationwide economic value of coastal tourism under climate change," *Tourism Management*, vol. 77, 2020.
- [12] W. Jaung and L. R. Carrasco, "Travel cost analysis of an urban protected area and parks in Singapore: a mobile phone data application," *Journal of Environmental Management*, vol. 261, p. 110238, 2020. <https://doi.org/10.1016/j.jenvman.2020.110238>
- [13] E. Heagney, J. M. Rose, A. Ardeshiri, and M. Kovac, "The economic value of tourism and recreation across a large protected area network," *Land Use Policy*, vol. 88, p. 104084, 2019. <https://doi.org/10.1016/j.landusepol.2019.104084>
- [14] A. Ghermandi, "Geolocated social media data counts as a proxy for recreational visits in natural areas: A meta-analysis," *Journal of Environmental Management*, vol. 306, 2022. <https://doi.org/10.1016/j.jenvman.2021.114062>
- [15] D. M. Fisher *et al.*, "Recreational use in dispersed public lands measured using social media data and on-site counts," *Journal of Environmental Management*, vol. 222, pp. 465-474, 2018. <https://doi.org/10.1016/j.jenvman.2018.05.045>
- [16] N. Cui, N. Malleon, V. Houlden, and A. Comber, "Using VGI and social media data to understand urban green space: A narrative literature review," *ISPRS International Journal of Geo-Information*, vol. 10, no. 7, p. 425, 2021. <https://doi.org/10.3390/ijgi10070425>