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Smart Cities: Urban Transformation through Intelligent Applications in Romania

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Abstract. *Smart cities represent a transformative approach that combines advanced technology and smart applications to address contemporary urban challenges. The study explores the implementation of smart city solutions in Romania, with a focus on five key areas: transportation and mobility, smart governance, smart health, public safety, and environmental monitoring. By analyzing representative applications, the research highlights the positive impact of digitization on infrastructure efficiency and citizens' quality of life. However, initiatives are accompanied by challenges such as financial limitations, lack of public trust, and regional disparities. The article highlights the importance of public-private collaboration and a coherent national strategy to maximize the benefits of smart cities, promoting social inclusion and sustainability. The results provide insight into Romania's potential to become a best-practice model in Eastern Europe.*

Keywords: smart city, urban transformation, digitalization, sustainability, IoT, smart governance, public safety.

Introduction

Smart cities are an innovative approach to urban transformation through smart technologies and applications for improved quality of life of citizens.

In Romania, the notion of smart citizenship is becoming more widely accepted and could, in return, change the cities into highly efficient, sustainable communities. According to the Romanian Association for the Smart City (ARSC), Romania is endowed with all the necessary resources to become a paradigm in Eastern Europe as a livable, "smart" nation, projecting assured consideration towards sustainable development and digitalization of public services (CECCAR Business Magazine, 2024).

The pressures of rapid urbanization face Romanian cities. The emergence of smart technologies is, therefore, central to the effective management of urban infrastructure and public service delivery. Investments in technologies such as IoT, AI, and Big Data are quintessential for transforming cities into responsive and better-connected urban environments (Smart Cities of Romania, 2020).

The quality of life in Romanian towns is heavily influenced by technology, as it reforms the way citizens interact with public administration and access services. With the implementation of digital measures, Romanian municipalities are improving their efficiency and transparency while making information accessible and bureaucracy less burdensome. These developments, in turn, further enhance the experience for citizens who have the possibility of requesting services online, at their convenience, saving time and cost (Ionica, 2023).

Digitalization has facilitated seamless communication between the authorities and the people. Citizens have direct access to online platforms to provide feedback and make inquiries, thereby creating greater proximity and clear understanding between them and the administration.

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This step not only enhances the integrity and credibility of public institutions within the community but also gives rise to satisfaction among citizens with the respective services.

Financial, legislative, and technical hurdles constitute the greatest challenges to smart city projects. To start with, financing stands out as the main difficulty. Without sufficient funding support from both central and local governments, cities cannot build the requisite infrastructure to become smart. Underlying laws could be inadequate and too rigid, preventing innovation and an agile response to emerging technology. In addition, old-fashioned infrastructure is often quite underdeveloped to support smart city solutions, making integration into existing systems so very difficult (Start-up.ro, 2024).

Another vital issue regards data privacy and security. Citizens respond negatively to smart technologies out of surveillance and misuse of personal data. This causes a lack of trust in their initiatives, often requiring considerable participation for the smart cities to work properly. Also, time-consuming procurement and administrative processes could hinder the prompt implementation of their plans. Thus, for cities to be truly smart, the problems mentioned above must be handled with coherent policies and collaborations between diverse stakeholders (NEOS, 2022).

Thus, this paper explores how smart applications induce urban transformation initiatives and projects responsible for the future of smart cities in Romania.

Motivation

A smart city concept provides a solution for urban communities in Romania with contemporary challenges. In a world confronted with the ever-rising urbanization-afforded pressures on infrastructure and resources-innovative solutions remain imperative to optimizing the workings of cities. Transportation and mobility solutions, smart governance and e-government platforms, public safety systems, environmental monitoring and urban planning, and smart health and telemedicine represent the five main areas applicable to smart cities, which are rich in opportunities in improving the quality of life of the citizens.

Transport and mobility solutions remain the backbone to rounding up a good and sustainable transport system. The introduction of smart technologies in this field not only reduces congestion but also cuts greenhouse gases emitted into the atmosphere, thus promoting "greener mobility." Smart governance and e-government platforms promote the transparency and accessibility of public services. Accordingly, interactions between the citizens and authorities can be improved. It allows citizens to participate actively in making choices concerning various issues, consequently raising their trust in public institutions.

Moreover, public safety systems equipped with advanced technology pave the way for safer surroundings for the populace. Smart cameras and data analytics are always monitoring the city to avert crime and the management of emergencies. Using environmental protection and sustainable urban planning would also be an important task in confronting climate change and pollution challenges.

Finally, smart health and telemedicine are transforming the way citizens access health services, facilitating remote consultations and thus improving the accessibility of healthcare.

Thus, exploration will not only portray the likely transformation of smart cities in Romania but also draw to attention the collaboration between public and private sectors in installing these innovative solutions. This is the cornerstone for building more resilient, connected, and sustainable communities capable of tackling future challenges.

Literature review

Smart cities have become a somewhat hot topic in Romania. This comes in the context of a wider global wave on urban transformation through smart applications. A study reviews the concept of smart city within Romanian cities by conducting an in-depth analysis describing its benefits and challenges of implementation. The authors emphasize that even though many cities have embraced smart technologies to enhance public and private transportation systems, there are substantial hurdles that block progress such as financial constraints and inadequate infrastructure (Bălășescu et al., 2022).

The study says that among several flagship cities in Romania, it mentions Bucharest, Cluj-Napoca, and Brașov. Different projects being initiated include the setup of computerized traffic systems, integrated infrastructure for non-motorized transport, and online platforms for real-time traffic updates. However, surrounded by these advances, the authors note that the integration of smart technologies is often impeded by existing legislative frameworks that can rarely stand innovation (Bălășescu et al., 2022).

Based on our literature review, we derive the principles under which a city is to be regarded as smart and sustainable, grouped into five key thematic areas: transportation and mobility solutions, smart governance and e-government, public safety, environmental monitoring and urban planning, and smart health and telemedicine, as also depicted in Figure 1. Collectively, these areas spot out the key pillars for urban transformation that are vital for the building of resilience in effective communities. They indicate key components necessary for the construction of cities which now have to manage contemporary demands while addressing improvement in the quality of citizens' lives.

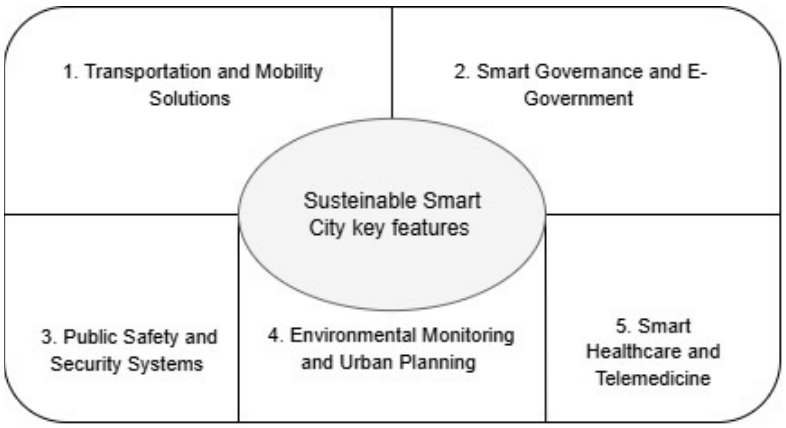

Figure 1. Key areas of a sustainable smart city

Source: Author's illustration.

In Romania, smart city initiatives have ranged from transportation and green mobility to digital governance and sustainable urban planning. For example, the Western Alliance, a collaboration among Cluj-Napoca, Timisoara, Oradea, and Arad, aims at creating modern infrastructure like metropolitan underground transport and green trams. These initiatives work towards carbon emission cuts and better connectivity in the region. Other such projects analyzed e-governance solutions for digitalizing the policies of administrative procedures aimed at providing citizens wider access to public services through web technologies (Ivan et al., 2020).

Besides mobility and governance, the other initiatives targeting smart health and environmental monitoring are in the offing. An interesting project is "4D Cities" in Baia Sprie for

diversifying health services for vulnerable groups, which include the elderly. Funded under URBACT from the EU, the project aimed to create innovative solutions for emergency healthcare and safety and had partnership arrangements between local authorities and private healthcare providers. Other projects, such as in Suceava and Vaslui, were focused on sustainable urban markets and the reduction of the ecological footprint. This proved the capability of smart solutions to meet the needs of local communities (Ivan et al., 2020).

Another study stresses the necessity of tailoring urban development policies to meet local specifics and promoting social inclusion to avert the multiplicative effect on regional disparities and the marginalization of peripheral communities. Local communities should be involved in planning and installing projects so as to ensure that power structures are not created that will become alien to the residents. The conclusion of this article stresses the fact that smart city projects are key to urban development, and therefore equitable distribution of the smart city approach should be ensured by not focusing solely on larger megacities while promoting social inclusion and local customization (Dragan et al., 2023).

Public safety has taken center stage in modern smart cities such that various initiatives are being implemented. For instance, in London, an innovative system is being implemented to optimize traffic flow. Such initiatives include smart traffic lights, a network of cameras, and sensors that monitor traffic in real-time, subsequently giving information that could ideally help reduce congestion. These technologies not only optimize traffic flow but also reduce the risk of accidents and increase safety in urban areas (Izman, 2023).

To start, a project called the "Green Map" has been initiated in Iasi within the disciplines of environmental watching and urbanism. For this purpose, 22 visibility sensors for air quality, temperature, humidity, and carbon dioxide levels shall be installed. This system enables the collection of relevant data for designing the urban environment to support better planning of green areas and pollution reduction. At the same time, urban refurbishing projects such as "Iasi after the Blocks is Our City" have focused on restoring flora spaces, modernizing playgrounds, and upgrading infrastructure to be transportation-friendly and ecologically sustainable (Izman, 2023).

Smart health and telemedicine are growing fields in Romanian smart cities. Cluj-Napoca has integrated digital technologies to support energy efficiency in medical buildings by using smart meters and monitoring systems. In addition, projects in Iași, such as "Digital Transformation for Entrepreneurs", have proposed innovative solutions for the health sector, supporting both digitization and accessibility of healthcare services. These initiatives demonstrate how cities can use smart technologies to improve public health and provide effective solutions for communities (Izman, 2023).

Simultaneously, municipalities like Copenhagen have successfully applied the automation of administrative processes, backed by artificial intelligence, with most administrative procedures digitized to save thousands of hours and significantly cut operational costs. In Romania, from 330 smart city projects in 2019, the number increased to 860 in 2021, in 124 cities, with Alba Iulia, Cluj-Napoca, and Iasi as the top three (Vegacomp, 2021).

It is essential for all parties to ensure that the next city meets the monitoring of the environment and sustainable urban planning, especially with projections from the United Nations that Romania's urban population will reach around 66.67% by 2050. The use of sensors for air quality monitoring is one example. Ongoing air quality projects in Cluj-Napoca and Iași permit the collection of crucial data whose significance could lead to pollution reduction while optimizing resources. Progress in digitalization and the efficient use of technologies enables the creation of safer and more people-friendly spaces for cities, where sustainability is also improved (Milan, 2021).

Relevant Applications of Smart City Solutions in Romania

Representative Application in the field of Transportation and Mobility

The Tranzy mobile app is a helpful guide for users of public transport (Figure 2), ensuring real-time updated information on buses and trams. The users can check the arrival times of stations, identify the most efficient way based on a certain departure point, and find nearby stops. The application utilizes synced GPS data to provide accurate vehicle information and traffic alerts that can help make the traveling experience more enjoyable and effective (Tranzy, 2024).

Besides the availability of the generation of reports to facilitate operation optimization for the transport company, Tranzy aids in improving the quality of public transport services. The application comprises a self-service bike station monitoring system that displays the exact number of bikes that are currently available momentarily and is available in some cities like Cluj-Napoca, Iași, Chișinău, Botoșani, Timișoara, and Oradea.

Tranzy encourages open data initiatives that can lead to improved public transportation services, thereby enhancing the rider experience. Tranzy provides real-time status updates from self-service bike rental stations in the station network, displaying updated bike and open seat availability. That supports sustainable mobility and the integration of urban transport modes. Also, it gives riders the option of spotting their present location, finding the closest station, and planning routes to get to where they want to go. Users can enter addresses manually or select locations directly on the map through a friendly interactive interface.

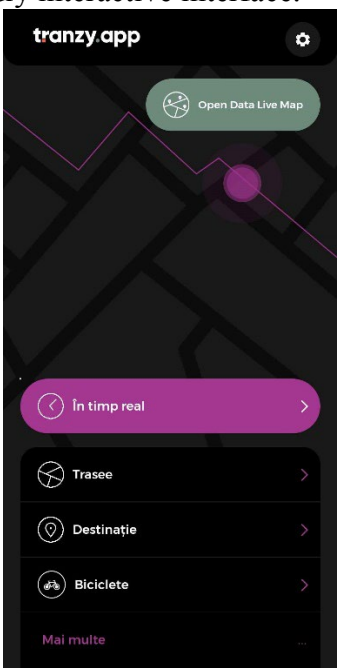

Figure 2. Tranzy mobile application menu

Source: Screenshot taken by the author from the Tranzy mobile application.

Tranzy is entirely fee-free for use and charges no user fees. Provides real-time, current information on urban public transport, such as arrival times for buses and trams, optimal routes, and traffic alerts at no charge to the user; hence, such information becomes more readily available for urban travel entirely free of any cost.

Key Application in the field of Smart Governance and E-Government

The RoeID mobile application is made by The Authority for Digitalization of Romania as a key instrument to digitalize public services in Romania. It allows citizens to create a digital identity recognized by public authorities and private companies of the country, making access to various online services smoother (eIDAS, 2025).

Complementing the further growth process through the cooperation of the Ministry of Research, Innovation and Digitalization (MCID) and the Romanian Digitalization Authority, the body is the greatest step in digitalizing public services in Romania. Financed with 74 million Romanian RON from European funding, RoeID allows citizens to develop a digital identity by having them take a photo of the ID card, their own image, and a quick video. This resolution expands access to government digital platforms for Romanians in the diaspora, thereby abolishing physical presence at counters. Therefore, RoeID provides a platform for online authentication into various public services, strengthening the digitalization process of the Romanian administration (Digital Skills & Jobs Romania, 2023).

Its purpose is to offer Romanians easy and consolidated access to several digital government services through a single sign-on (SSO) authentication system, as illustrated in Figure 3. These include payment of taxes through the Ghișeul.ro platform, obtaining criminal record certificates from government platforms without going to the counters, access to social security and healthcare information, management of consular services for Romanians living in the diaspora, energy supplier switch or utility bills, natural calamities insurance policymaking (PAID), and such services. Through this amalgamation of services, RoeID greatly contributes in the digitization of public administration in Romania, offering citizens a viable and streamlined medium to carry out their dealings with state institutions (eIDAS, 2025).

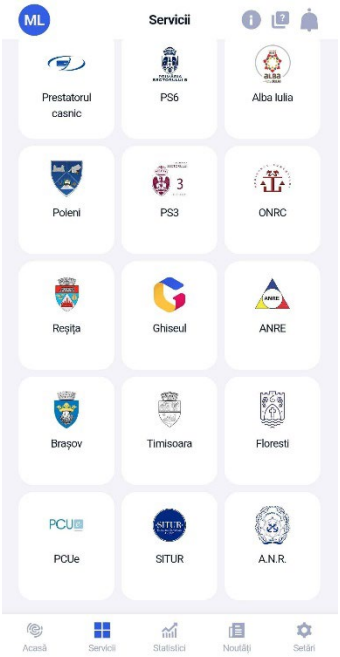

Figure 3. RoeID mobile application menu

Source: Screenshot taken by the author from the RoeID mobile application.

RoeID functions as a digital identity verification mechanism for Romanian citizens and is compatible with various governmental electronic platforms of the EU Member States. Thus, RoeID

has EU-wide applicability, operating in tandem with another initiative launched by MCID - SITUE (Technological Interoperability System with EU Member States), the unified identification platform for European Member States (eIDAS, 2025).

The application is characterized by an intuitive interface that allows free and instant access to government digital platforms anywhere, anytime, without the necessity of physically visiting the counter. Users can submit their documents, launch complaints, or settle financial obligations at any time 24/7. RoeID eliminates duplicate identity verification by allowing access to a platform whereby the users can carry out these possibilities within a single set of credentials and hence optimize the identification and authentication process in accessing a range of combined online services and platforms of the Romanian government institutions.

Representative Application in the field of Smart Healthcare and Telemedicine

Ringdoc is an innovative system of computerized access to medical practice through video consultations with specialists or general practitioners. Users can quickly connect with the first available doctor in their chosen specialty anywhere in the world, thus eliminating traditional appointments. The application aims to facilitate medical consultations and reduce waiting periods and anxiety.

Each family member may establish an individual account within the Ringdoc platform, enabling the centralized management of health-related needs for children, spouses, and elderly dependents through a unified interface. This allows healthcare professionals to keep records of all interactions as well; providing subsequent care providers with complete medical background on a given patient. This also greatly facilitated continuity of care by making sure that treatment plans were being made with updated information about the medical conditions.

Another primary function of the app is to provide the requisite means for patients to perform 40 medical specialties. This allows for a selection of a doctor and for scheduling consults online (Figure 4). Through these platforms, patients can receive specialized medical consultations directly from their smartphones or laptops, irrespective of location.

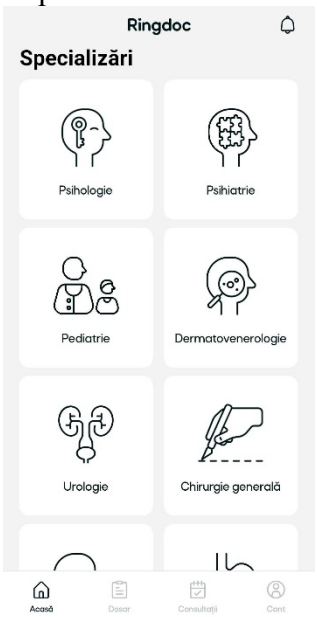

Figure 4. The menu with some of the specializations of the Ringdoc application

Source: Screenshot taken by the author from the Ringdoc mobile application.

Moreover, there is a doctor-oriented version of Ringdoc that allows them to enhance their patient portfolios, market their service, and optimize costs and times in their business.

Key Application in the field of Environmental Monitoring and Urban Planning

The CalitateAer app is the only average air quality application that provides official data from Romanian institutions in line with the European Commission provisions. The app was developed by the country ministry to inform citizens in real-time about pollutant concentrations that affect their health (Ministry of Environment, Waters and Forests, 2022).

Using the search or localization functions, users can choose from over 160 stations distributed across Romania to view air quality information, including the values of the general index and the specific indices of each monitoring station. In addition, users can follow the concentration evolution for the last 24 hours, week, month, or year, for the monitored indicators: particulate matter (PM10 and PM2.5), nitrogen dioxide/oxides (NO2 and NOx), sulfur dioxide (SO2) and ozone (O3). At the same time, to improve data accuracy, we learn that 19 analyzers were purchased for the Bucharest-Ilfov area and 11 for other cities, as well as 4 self-laboratories for Bucharest, Brasov, Iasi and Bacau (Ecologic, 2022).

The CalitateAer application allows the observation, in real-time, of air quality at each monitoring station across the country (Figure 5) based on the most updated data of the last few days. This allows one to follow the concentration evolution of certain pollutants, such as particulate matter or nitrogen dioxide, depending on time intervals.

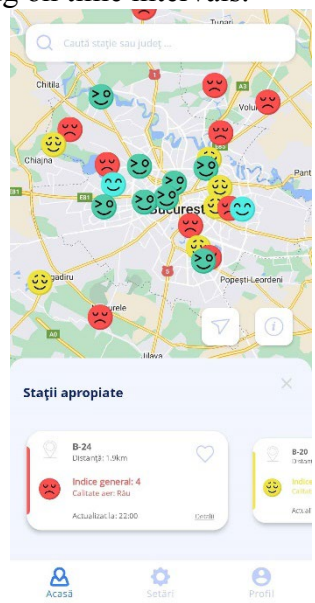

Figure 5. Air Quality Stations in Bucharest from the CalitateAer App

Source: Screenshot taken by the author from the CalitateAer mobile application.

This application allows users to bookmark their favorite stations easily, in order to access relevant information in the subsequent future. Such a mechanism contributes significantly to continuous environmental monitoring and the proactive way in which public health is protected.

Representative Application in the field of Public Safety and Security Systems

The Bright Sky Romania mobile application is a free digital tool launched by Vodafone Foundation Romania, in partnership with the Romanian Police, Necuvinte Association, and Code for Romania

Association. Primarily, it" targets its clientele to the domestic violence victim, but also to someone willing to help in this regard. Provides proper integrated databases of information regarding any phenomenon of domestic and gender-based violence in Romania, for the provision of specialized assistance and support" (Vodafone Foundation Romania, 2020).

The Bright Sky RO enables users to assess the safety of a relationship by completing an electronic questionnaire. It provides a secure diary for individuals to store files in text, photo audio, or video format so that it can be sent to a selected email address and proper evidence in any future proceedings. Other information provided by this app concerns the causes and effects of domestic violence, as well as safety plans, relevant legal provisions that could protect a victim, and tips to enhance online security.

The Bright Sky RO application possesses a safety feature that helps seekers activate a hidden mode and offers an extra layer of privacy. This is achieved by tapping the cloud icon in the app. This function is instrumental in protecting users during those times when privacy becomes crucial (Figure 6). Additionally, it bears an education section providing information about forms of gender-based violence, debunks associated myths, and lists tips for increased online safety.

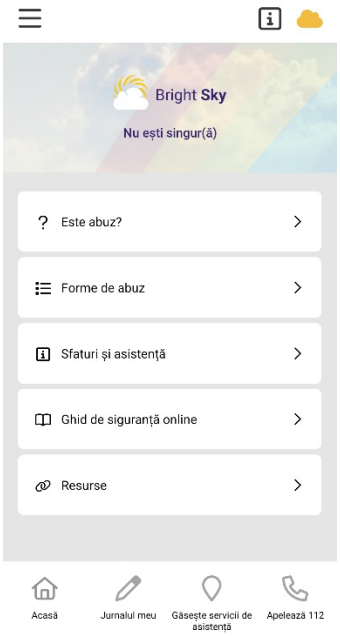

Figure 6. Bright Sky Ro mobile application menu

Source: Screenshot taken by the author from the Bright Sky Ro mobile application.

The app comes in Romanian, English, and Hungarian and can be downloaded from the App Store as well as the Google Play Store. The downloads amount to more than 92000 and it has been downloaded on more than 13000 terminals, with around 9000 active users. The app was awarded 2nd place at the Gala CSR Awards 2021 and the silver medal at the Community Index Competition (Vodafone Foundation Romania, 2020).

These features, Bright Sky is finding to be a great weapon in their battle with domestic violence, offering practical and informational support alike to both the victim and their supporters.

Evaluation of Smart City Applications' Functionalities

To set a well-structured comparison between the smart city applications mentioned in this study, this table highlights important features in terms of target users, impact, technologies used, availability, and potential challenges. Through this comparison, a much clearer understanding of how these applications contribute to urban innovation across several heterogeneous domains was achieved.

Table 1. Comparative analysis of Smart City applications

Criteria	Tranzy	RoeID	Ringdoc	Calitate Aer	Bright Sky RO
Domain	Transportation and Mobility	Smart Governance	Smart Healthcare	Environmental Monitoring	Public Safety
Main Features	Real-time public transport monitoring, optimal routes, self-service bike stations	Digital identity, authentication for public services	Video consultations with doctors, medical history management	Air quality monitoring, official environmental data	Support for victims, confidential journal, hidden mode
Target Users	Travelers, transport authorities	Citizens, public institutions	Patients, doctors	Citizens, environmental authorities	Victims of domestic violence, supporters
Impact on Users	Reduces waiting time, promotes sustainable mobility	Simplifies access to government services	Quick access to medical consultations	Increases awareness of pollution levels	Provides assistance and enhances public safety
Technologies Used	GPS, Open Data	eIDAS, AI, SSO	Telemedicine, Cloud	IoT, environmental sensors	AI, secure database
Accessibility & Availability	Free, Android/iOS	Free, Android/iOS/Web	Free/paid, Android/iOS	Free, Android/iOS	Free, Android/iOS
Limitations & Challenges	Requires constant support from authorities	User reluctance, regulatory constraints	Limited access to doctors, internet dependency	Variable sensor coverage	Confidentiality, data protection

Source: Author's own research

Table 1 provides a clear perspective on the diversity and specificity of each analyzed application. We observe that, although all fall within the Smart City domain, they address distinct areas, ranging from transportation and mobility (Tranzy) to public safety (Bright Sky RO).

In terms of functionalities, each application brings innovative solutions tailored to user needs. For example, Tranzy facilitates real-time public transport monitoring, offering optimal routes and access to self-service bike stations, thus contributing to more efficient urban mobility. On the other hand, Ringdoc revolutionizes access to medical services through video consultations and medical history management, significantly improving the patient experience.

Analyzing the target users, there is a predominant focus on citizens. However, some applications, such as RoeID, also target public institutions by facilitating authentication and access to government services. This diversity in audience highlights the adaptability and relevance of these applications across different sectors of society.

Different impacts for users include time saving and enhanced accessibility (for Tranzy and Ringdoc), raising awareness on environmental issues (for CalitateAer), and relief for domestic violence victims (for Bright Sky RO). These contributions draw attention to the technological controversy that significantly helps ameliorate the quality of life in urban agglomeration.

To summarize, the comparative table illustrates how each application contributes to aspects of the Smart City concept by solving specific needs with tailored technological solutions. The variety in the methods applied and the functions served speaks a great deal for innovation in the drive for smarter and more connected cities.

Methodology

The methodology of this applied research evaluates the influence of the implementations of smart cities in Romania, by combining qualitative research methodologies with their quantitative counterparts using comparisons and contrasts based on various quantitative and qualitative variables. Various systematic stages led this research into the identification, evaluation, and synthesis of relevant information concerning the topic of smart city topics.

Stage one involved a large literature review to understand global and regional trends on matters concerning smart cities. Sources consulted include scientific articles, government reports, case studies, and digital resources covering aspects such as digitalization, sustainability, IoT, and artificial intelligence. This information enabled the conceptual framework to be designed and represented in the various operational scopes of smart city solutions: transportation, governance, healthcare, personal security, and environmental monitoring.

The data were gathered using a mix of direct research and existing sources. This included documentary analysis, and a compilation of case studies investigating initiatives in Cluj-Napoca, Iași, and Bucharest because these cities represent similar levels of development in smart technology. Additionally, statistical data were integrated where necessary, provided by institutions such as Vegacomp or the Ministry of Environment, to provide a comprehensive overview of the current smart cities' situation in Romania.

A comparative table was developed to group and compare the obtained information, underlining the main characteristics of the analyzed applications. The criteria it refers to include the field of application, offered functionalities, target group, social impact, used technologies, accessibility, and implementation challenges. This comparative approach provides a clear perspective on the differences and similarities existing within the digital solutions implemented in different cities in Romania and eases the identification of the more efficient methods in the implementation of smart city technologies. Results from this comparison are shown in Table 1.

During the analysis stage, a comparison was done so as to see the contrast and comparison between local and international initiatives with the aim of illuminating the barriers and opportunities for development. It was aimed to pinpoint critical factors that actually help or hinder the provision of smart infrastructure services using this method.

This article draws its conclusions from a correlation between the obtained data and the studied results by critically assessing them for practical recommendations for the sustainable development of smart cities in Romania.

Results and discussions

The research highlighted significant advances in the adoption of smart technologies for urban transformation in Romania. The analyzed applications demonstrate the potential of digital solutions to address various urban challenges.

For example, the Tranzy app helps optimize public transport by providing real-time information, which has significantly reduced waiting times and increased the efficiency of urban mobility.

Firstly, the smart governance area can promote and facilitate the interaction of citizens with public administration with greater transparency and fewer bureaucratic processes. The solution is seen as a great success in the centralization of access to digital public service and providing better time convenience for its users.

The Ringdoc application is an important step in smart health, providing easy access to medical consultations and reducing the geographical barrier for patients in rural areas.

The Air Quality App assisted environmental campaigns by monitoring real-time pollution for timely remediation by the authorities to enhance air quality.

Bright Sky RO gave a stellar performance in ensuring public safety through support provided to domestic abuse victims with the use of resources and digital tools that prioritize both privacy and accessibility.

Nevertheless, urban transformation comes not without its challenges. A major hurdle in developing such large-scale projects is the lack of funding, while a limitation to their acceptance is also inherent in citizens' hesitancy toward digital technologies fueled by fears about data privacy. In addition, regional inequalities reveal themselves, with most initiatives being concentrated in big cities and thereby sidelining smaller communities. These issues are a signal that a coherent national strategy is needed to promote collaboration between the public and private sectors while ensuring that all regions develop uniformly and according to local specifics.

These results underscore the sustainable and transformative power of smart technologies to build efficient cities but also underline the importance of overcoming the respective challenges to maximize their benefits.

Conclusion

The transformation of Romanian cities through smart initiatives is an essential process in furthering urban sustainability and efficiency. The research sheds light on how digitization provides significant contributions to living conditions for the people, which confirms their favorable impact on transport, health, environment, public safety, and governance. These initiatives reflect the upward organ of a trend to use technologies for addressing complex urban challenges, from sustainable mobility to air quality monitoring.

However, a persistent issue remains in areas like financing, resistance to technology, and regional disparities, thereby facilitating the need for clear public policies and partnership strategies between public and private actors. The national smart cities strategy should not only promote advanced technologies but also take social inclusiveness to ensure a just transition fitted to the peculiar needs of communities, big and small, ill or well-placed on the map.

Cities obtain citizens' dynamic active participation in the long term and become smart through an enabling environment in which advanced technologies are leverage for public benefit. This research provides evidence that, by introducing bright and sustainable solutions, Romania

may become a good example of best practices in Eastern Europe, creating more connected, resilient, and environmentally friendly communities.

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