Citizen-Centric Smart City Practices of Local Governments During COVID-19: Istanbul Metropolitan Municipality Case

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Abstract Smart cities are based on the idea of creating more liveable and sustainable cities through the information and communication technologies (ICT) for their services. The ultimate goal of a smart city is to make cities healthier and sustainable for its residents, remove bureaucratic barriers before access to public services, introduce innovative solutions to city-related problems, and consider citizens' wishes and expectations. Smart cities that involve citizens in the service delivery process and implement many participatory principles and institutional mechanisms for this can be defined as citizen-centric smart cities. In this chapter, citizen-centric smart city practices of Istanbul Metropolitan Municipality during the time of COVID-19 are addressed, and these practices are categorized under six groups. These are smart transportation, e-municipality practices, voluntary participation, crowdfunding, open government data, and free internet access - support for distance learning. This chapter concludes that it is essential for local communities to develop collective behavior to cope with a pandemic, and as technology users citizens roles are critical. Further developing digital healthcare practices and distance education and channelizing resources toward these practices become a prominent field in the post-pandemic stage.

Keywords Smart city · Citizen-centric smart city · Citizen-oriented smart city · COVID-19 · Pandemic · Crisis management · Istanbul Metropolitan Municipality · Local communities · City-related problems · Technology

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1 Introduction

Many critiques targeted studies for merely focusing on the technology aspect of smart cities and emphasized the importance of comprehensively tackling environmental, human, social, and cultural dimensions of smart cities, and within time, there has been an extensive consensus in the smart city literature (see Hollands 2008; Giffinger et al. 2007; Lim et al. 2018; Malek et al. 2021; Bibri 2021; Seçkiner Bingöl 2021a). Various researchers underline the contribution of social capital owned by residents of cities, technology users, citizens, and the city itself in growing, developing, and sustaining smart cities as a whole (see Hollands 2008; Simonofski et al. 2019a; Caragliu et al. 2011; Granier and Kudo 2016; Seçkiner Bingöl 2021c).

Smart cities are based on the idea of creating more liveable and sustainable cities through the information and communication technologies (ICT) for their services. The ultimate goal of a smart city is to make cities healthier and sustainable for its residents, remove bureaucratic barriers before access to public services, introduce innovative solutions to city-related problems, and consider citizens' wishes and expectations.

Smart cities have different aspects such as technology, environment, human, transportation, and economy. Although there is extensive literature on technology, sustainable environment, sustainable transportation, and economy-related aspects of smart cities, cities' human aspects have been included in this discussion relatively later (see Seçkiner Bingöl 2021c). Smart cities that intend to become citizen-centric smart cities should ask and elaborate on these questions "How do residents of cities contribute to smart cities? What are their roles in developing smart cities? Are smart cities sustainable without citizens' contributions?"

The citizen-centric smart city draws attention to the responsibilities of the citizen in the smart city and conceptualizes the smart city from the perspective of citizenship (Malek et al. 2021). According to this understanding, instead of the traditional view of meeting only the needs of citizens, citizens should jointly produce and contribute to the construction of the flow city together with the rulers (https://encyclopedia.pub/entry/6360). As stated above, most of the research on smart cities focuses on dimensions such as technology, economy, environment, and sustainability. Mostly, the social dimension, citizen dimension, and citizen participation dimension of smart cities are neglected. Studies on the citizen-centric approach in the construction of smart cities are limited. On the other hand, the citizen-centric approach to smart city or citizen-centric smart city concept has been the subject of some recent studies and European Commission projects (see Lim et al. 2018; Gao et al. 2020; Oh and Seo 2021; EU 2021).

This chapter concentrates on the citizen-centric smart city concept and discusses citizen-centric practices of smart cities during the COVID-19 pandemic. Istanbul Metropolitan Municipality (IMM), whose smart city practices are among the pioneers of the smart city concept in Turkey, is analyzed as a case study. Hereby, the study aims to contribute to the citizen-centric smart city literature with the case of

Istanbul. This chapter employs the document review method as the primary methodology; thus, activity reports of the Municipality and its website are taken as primary sources. First, the citizen-centric smart city concept is given by discussing the citizens' roles in smart cities. Second, an outline of citizen-centric practices and smart cities' COVID-19 coping strategies are drawn. Finally, citizen-centric smart city practices of IMM during the COVID-19 period are analyzed under six categories.

2 Citizen-Centric Smart Cities

Citizen-centric smart city can be defined as an urban management approach that puts citizens in the center of the provision of urban services, takes into account the contribution of citizens in the provision of these services, and includes citizens in the service delivery process. It also implements many institutional mechanisms and detailed participation principles to achieve citizen centrity. Unlike new public management, new public governance pays attention to citizens' satisfaction and participation (see Vigoda 2002; Karkın 2019; Çolak 2021). Several discussions over good governance and participation concentrate on citizens' contribution to governance, particularly their involvement in service production processes. Citizens are now a subject of governance processes. In the post-new public management, citizens are not passive objects for whom policies are produced but are active subjects of policies that concern them (Kutlu et al. 2009; Çolak 2021).

Smart city management employing such an approach allows citizens to become stakeholders in the provision of urban services and participate in projects. Thus, "citizen participation in smart cities" is a topic that merits a separate discussion. Citizen participation in smart cities requires citizens to participate in mechanisms such as public meetings or assemblies, electronic participation, virtual summits and meetings, crowdsourcing, participant-budgeting, and volunteering activities, and in the design of smart city projects as stakeholders. Citizen-centric smart cities build mechanisms and institutional arrangements that actively pave the way for citizens to participate in city management processes.

Another topic regarding citizens' participation in smart cities is their roles. There are numerous studies on citizens' roles in smart cities. For instance, Lim et al. (2018: 49) discuss two types of citizens in smart cities, namely. the ideal type (or the active type) and the depressive type (or the passive type). Ataç (2020) states that well-educated citizens with language skills and technology competencies are vital for smart cities. Berntzen and Johannessen (2016) elaborate on citizens' roles in smart cities in three categories: experienced citizens, data collectors, and democratic participants. Simonofski et al. (2019b: 50–54) introduce three citizen types in smart cities: democratic participants, co-creators, and ICT users. To achieve strategic success in smart cities, the citizen-centric approach suggests a direct proportion with citizens' education levels, ability to use technological tools, and knowledge of

Table 1 Citizens' roles in smart cities

Active (ideal type)	Passive (depressive type)
Democratic participants	ICT users
Co-creators	Data collectors (sensors)
Experienced citizens	Consumers

Seçkiner Bingöl (2021a: 1950)

foreign languages (see Ataç 2020). Seçkiner Bingöl (2021a) introduced the following classification for citizens' roles using the existing literature:

According to Table 1, citizens have different roles in smart cities. These roles are classified in different ways. City managers need to know the types of roles to which citizens belong. City managers can only know how they could expect citizens' contribution to their projects based on the role groups to which the citizens belong. According to Lim et al. (2018: 50), active citizens are those equipped with awareness and education and who can participate in public life and create public value. Passive citizens, meanwhile, are described as technology users, consumers, who feedback on technology, and who complain (Lim et al. 2018).

Democratic participants participate in city-related decision-making processes; co-creators help test technologies through participation mechanisms such as public meetings and share their comments and recommendations. ICT users experience various new technologies and learn; data collectors provide feedback through technology and mobile communication devices; consumers use the technology and try to adapt to technology (Simonofski et al. 2019b).

3 Citizen-Centric Smart Cities During COVID-19 Pandemic

Local governments have public health-related duties, including providing basic infrastructure and delivering cleaning, environmental, and recycling services for smart cities. Additionally, local governments should plan cities considering public health needs to create a healthy physical environment (Seçkiner Bingöl 2022b). They have also wide roles and responsibilities in improving infrastructure elements such as green areas, water quality, and air quality (Karataş and Gördeles Beser 2021).

Since the breakout of the COVID-19 pandemic, countries have started implementing measures to fight the pandemic, both at central and local government levels. Contracting through social contacts, the virus mostly affected highly populated cities (Seçkiner Bingöl 2022b). Local governments took over significant tasks in fighting against the pandemic and resorted to innovative tools in their service provision, primarily technological ones.

It is of great importance for local governments to implement effective strategies in times of any crisis, including a pandemic since these administrations are the closest units of management for citizens and directly affect the daily lives of their residents. By closely observing and understanding the needs and demands of the local people, local governments can own various leading practices.

On the other hand, local governments can be seen as secondary institutions during disasters and pandemics in many countries. This may lead to coordination problems between central and local governments, as central governments may fail to allocate sufficient resources, capacity, and authority to local governments (Yeşildal 2020). Local governments are critical stakeholders in minimizing the risks of disasters and pandemics, as historically, the bottom-up approach has been more successful in disaster management (Yeşildal 2020; Bimay and Kaypak 2022; also see Uçar Kocaoğlu 2021; Uçar Kocaoğlu et al. 2023).

It is highlighted that smart cities are essential actors in coping with global crises (Troisi et al. 2022). Smart cities were known to contribute to adapting to global crises even before the COVID-19 pandemic broke out. On the other hand, although technology plays a transforming role in smart cities, smart tools alone are not automatically leading to an organized transformation (Troisi et al. 2022). There is an emphasis, therefore, on the users of smart technologies. In the end, a smart society is one that has developed the ability to collectively work in implementing disaster coping strategies (Rachmawati et al. 2021: 2).

Developing collective coping methods against the challenges residents faced due to the COVID-19 pandemic and building local wisdom through this practice of collective work was one of the fundamental requirements of creating smart local communities (Rachmawati et al. 2021). Developing a hygienic living culture, increasing environmental awareness, developing cleaning habits at home (i.e., use of disinfectants), and wearing masks are signs of the significance of individuals forming a smart community (Rachmawati et al. 2021: 2).

The ability of citizens to adapt to various technologic changes during the pandemic was one of the factors affecting the success of the fight against it (Troisi et al. 2022). Citizens' attitudes toward technology, susceptibility, and perceptions are among the points that should be considered. Identifying barriers before using technology and participating in technology can effectively make coping with future crises easier (Troisi et al. 2022). For instance, citizens accepting the effective use of distance learning and digital healthcare applications are essential in adopting these practices.

During the COVID-19 pandemic, smart cities worldwide put numerous innovative applications into practice. Offering ICT-based services was vital in facing the COVID-19 pandemic (Rachmawati et al. 2021). Some of the well-known examples are navigation and camera systems to monitor and measure crowds, technologic innovations to establish social distancing (crowd forecast cameras, wearable distance calculators), GPS devices used to manage traffic, COVID-19 test kits and test locations, digitalized municipal services (to the greatest possible extent), e-government and e-municipality applications, disinfection spraying stands in public transportation and other crowded common use areas, social distancing floor marks at parks and shopping malls, thermal cameras used to measure body temperatures, developing mobile phone applications which can be used to monitor the locations of positive cases, deliver distance learning and learning applications, as well applications for remote social interaction (online concerts, online chats, online events), remote healthcare, for hotels in touristic regions to sustain social distancing

measures, and professional disinfection practices (Seçkiner Bingöl 2022a). Although there are similar applications in different smart cities of the world, each city has a different local population and environmental dynamics.

The following section will study the smart city applications of Istanbul Metropolitan Municipality during the COVID-19 pandemic and examine citizen-centric ones.

4 Citizen-Centric Smart City Applications of Istanbul Metropolitan Municipality During the COVID-19 Pandemic

With a population of 16 million, Istanbul is one of the pioneers of implementing smart city applications in Turkey. A highly dense urban population, and ongoing rapid urbanization, led Istanbul to face various issues related to the use of resources (Seçkiner Bingöl 2021b). Hence, in Istanbul, the first smart city initiative started with the launch of the Smart City Project Phase I Services Contract in May 2016. ISBAK A.Ş (Istanbul IT and Smart City Technologies Inc.) was awarded the contract and it launched the smart city implementation plan through its "Smart City Project Office" (Ataç 2020: 278). In 2017, the Smart City Directorate began following up on smart city practices. To implement them, Istanbul followed these five steps in the first phase: literature screening and review of best practices in the world, analysis of the existing situation, setting the vision and strategy, developing a detailed infrastructure design and prioritization, and devising governance principles and performance indicators (IBB 2017: 50; Seçkiner Bingöl 2021b). After this stage, many smart city projects were carried out in Istanbul; IMM hosted approximately 120 smart city projects between 2008 and 2019 (Seçkiner Bingöl 2021b).

Ministry of Environment, Urbanization and Climate change produced the Istanbul Smart City Road Map within the framework of the National Action Plan and revised the road map to allow local governments to create city-specific smart city strategies. As part of the given revision work, Smart City Project Inventory was developed in June 2019. An analysis of citizens' needs, studies, and surveys have been used to identify and prioritize the projects. A Preliminary Workshop on Setting up the Smart City Vision and Mission for Istanbul was organized with 259 participants. During the following Workshop, smart city governance infrastructures were created in nine thematic areas: mobility, energy, environment, life, security, human, economy-finance, governance, and ICT. Four hundred citizen surveys were filled, and 60 interviews were conducted to represent different citizen profiles (immigrant, disabled, tourist) living in the city. Fourteen different smart cities' ecosystems and detailed governance structures, such as London, Paris, Birmingham, Barcelona, were analyzed (IBB 2021: 113).

Like in many cities, Istanbul also developed various strategies and implemented measures to cope with COVID-19. Studies on local governments during the

COVID-19 pandemic municipalities took over many roles, including informing the public, providing social aid and assistance, enabling access to healthcare services and digital education, supplying medications, forming call lines for health services, and providing transportation and transfer services (Kavas Bilgiç 2020). In their study analyzing five districts of Istanbul for their activities during COVID-19, Urhan and Arslankoç (2021) refer to municipal activities such as street disinfection, support for distance learning, protection mask production, psychologic counseling, feeding stray animals, organizing mini concerts, producing and distributing informative brochures, flyers, billboards, and videos, assistance for refugees, in addition to social welfare assistance they have provided. Peker and Köseoğlu (2021) listed Istanbul Metropolitan Municipality's work for informing the public on COVID-19 and awareness raising; providing shelter, cleaning, and hygiene control services; and distributing protective masks and other cleaning substances, as well as other various social welfare services provided. In their study on Istanbul Metropolitan Municipality, Bek and Bek (2021) categorized municipal activities as awareness raising, social welfare assistance, healthcare services, education, and culture services. Koronavirus.ibb.istanbul web page was created in Istanbul, and screens on public transportation such as trams, subway, billboards, and flyers were used to inform people about COVID-19. In the sociocultural sphere, online panels were held with physicians as panelists, online workout classes for residents, online bookstores were created, and online chess tournaments were organized, as an example of activities provided by the municipalities (Bek and Bek 2021). Based on these studies, we can conclude that municipalities carried out activities to inform the public, produce masks and other protective equipment, disinfect and secure hygiene, feed stray animals, provide in-kind and in-cash social welfare aids. On the other hand, municipalities organize social life, offer smart city apps, support healthcare services, support distance learning, and offer participatory practices (Seçkiner Bingöl 2022b). Besides these citizen-related services, there are also citizen-centric policies during COVID-19 which some municipalities conduct. As Istanbul Metropolitan Municipality is one of them, following section will consider Istanbul's citizen-centric activities during COVID-19.

Istanbul Metropolitan Municipality's citizen-centric activities during COVID-19 can be divided into six categories: smart transportation, e-municipality work, volunteering participation, crowdfunding, open government data, and free internet access-supporting distance learning.

4.1 Smart Public Transportation

As it is known, with the breakout of COVID-19, one of the cities most affected systems was public transportation. Public transportation became limited and kept under control. The use of public transportation was reduced significantly in many countries. The use of public transportation was reduced by 83% in Istanbul (IBB 2020a). One of the first practices launched in Istanbul to promote healthy

transportation was the mobile transportation app with square code. This application used a mobile phone-based application using a square code to cross tilts at public transportation. Hence, the increasing effects of using cash and personal belongings could be alleviated. The first pilot trials of this application started at 35 locations in Istanbul in April 2020 and offered the opportunity to make contact-free payments (IBB 2020a). The second practice Istanbul Metropolitan Municipality launched was Traffic Jam Mobile App (İBB YolGösteren). This app helped citizens to view traffic density on the road, avoid jammed roads, and help reduce traffic. Users of this app could also feed in data by using the notification menu in the app, notifying road works, jams, road incidents, and other traffic issues on their routes, allowing the other users to be informed.[1] Third, using the HES Code (The Code for the abbreviation for Life fits Home) became required to use public transportation, limiting individuals with COVID-19 or those who have contact with the infected from using public transportation.

Technically integrated with the Ministry of Health, this application reported individuals using public transportation who are COVID-positive or possibly contacted the Ministry of Interior.[2] Another practice introduced within the scope of smart transportation and citizen-centric practices is contact-free pedestrian buttons at pedestrian crossings. This practice used photocells to prevent the use of press-on pedestrian buttons.[3] Smart city practices subsidiary ISBAK equipped traffic lights with contact-free pedestrian buttons using remote sensing technology, allowing pedestrians to cross roads touch-free. Seven hundred eighty-one pedestrian buttons have been replaced with contact-free ones throughout the city. Additionally, 60 buttons were replaced with "accessible" buttons. In 2021, a total of 997 accessible pedestrian buttons (contact and contact-free) were installed at intersections (IBB 2021: 145).

Besides standard measures such as extensive disinfection at public transportation, increasing the number of trips based on flexible working hours, and reducing the number of passengers per trip, a cycling and walking campaign was launched to cope with the COVID-19 pandemic. The project promoted walking and cycling for short distances and was implemented under WRI Turkey Sustainable Cities Cooperation and The Partnership for Healthy Cities initiative. It aims to promote confidence in public transportation and minimize personal automobile use.[4] As a part of this project, IMM displayed campaign visuals on billboards and overpasses, reminding the necessity of preserving social distancing and respecting hygiene

[1] For detailed information see: https://uym.ibb.gov.tr/kurumsal/haberler-ve-duyurular/ibb-yolgosteren-1#:~:text=%C4%B0stanbul%20B%C3%BCy%C3%BCk%C5%9Fehir%20Belediyesi%20taraf%C4%B1ndan%20geli%C5%9Ftirilen,hedefinize%20ula%C5%9Ft%C4%B1ran%20canl%C4%B1%20navigasyon%20uygulamas%C4%B1d%C4%B1r

[2] https://www.ibb.istanbul/arsiv/37286/ibb-ulasimda-hes-kodu-calismalarina-basladi

[3] https://www.ibb.istanbul/arsiv/36743/ibbden-covid%2D%2D19a-karsi-temassiz-yaya-butonu

[4] https://www.ibb.istanbul/arsiv/37160/ibb-covid-19a-karsi-bisiklet-ve-yurume-kampan

measures at public transportation and emphasizing alternative transportation forms through its slogans such as "Move for your health."[5]

As can be seen, all citizen-centric applications introduced for the transportation system can be implemented by citizens using, adopting, and participating in the use of these applications. For instance, the HES Code application works with citizens installing this application on their phones and learning how to use it. Similarly, the use of non-contact pedestrian buttons may become operational with the use of citizens. Reducing the density in public transportation becomes sustainable with the use of the abovementioned IBB Yol Gösteren application by the citizens. Similarly, the widespread use of bicycles is only possible if citizens adopt the use of bicycles for the short distances.

4.2 E-Municipality Services Application

The COVID-19 pandemic helped the advancement of e-municipality services. Municipalities launched new practices such as developing informative webpages for citizens and online social welfare assistance services (see Bostancı and Yıldırım 2021). Municipalities carried out services online during the pandemic to the greatest extent possible. One of the first responses of Istanbul Metropolitan Municipality as a part of e-municipality services during the pandemic was launching the "https://koronavirus.ibb.istanbul/" website, which was used to inform the public, organize online events, and build online volunteering platforms. This webpage contained information regarding COVID-19, vaccination against it, municipalities' measures against COVID-19, COVID-19-themed interviews, an interactive map locating cases, COVID-19-related social media accounts, interactive bulletins, municipality activity reports, and brochures. Through the website, citizens could remain informed about COVID-related measures and the municipality's response, participate in volunteering works, and listen to discussions and interviews on the pandemic. The webpage also presented daily statistics on coronavirus, the highest number of cases per city, and vaccination rates on a map.

Municipalities website "www.ibb.istanbul" is available both in Turkish and English languages and offers 41 different e-municipality applications (IBB 2020b: 60). Thirteen online training programs produced under UN's Making Cities Resilient Campaign, considered to be the reference for building resilient cities during COVID-19, were also delivered by IMM. These training dealt with raising disaster awareness and improving institutional capacities (IBB 2020b: 72).

> "Creating a Control Centre, Central Software, and installing Vehicle Tracking Systems, GPS trackers, and camera systems inside public vehicles is ongoing. The Control Centre is designed to be fully integrated with 153 Call Centers and aims to enable effective and central supervision and management of public vehicles, minimize safety problems, and

[5] https://www.ibb.istanbul/arsiv/37293/ibbden-daha-saglikli-kentsel-hareketlilik-ici

transform the transportation system to become proactive and citizen-centric" (IBB 2020b: 109).[6]

Many e-municipality services of IMM were already active before the pandemic, and these services, such as e-info, e-payment, e-statement, and e-inquiry, were fully functional. However, e-municipality services are provided under social assistance, except for koronavirus.ibb.istanbul website, notably launched for COVID-19, seemed to be product of the pandemic period. Online delivery of social welfare assistance services became possible; different online platforms, including Suspended Bills, Family Support Package, Mother-Child Support Package, and Education Support Package, bringing those in need with benevolent citizens, were created and used effectively.

"Istanbul is Yours" (*İstanbul Senin*) mobile application[7] is another service offered for citizens to access all necessary municipal applications through one platform. This new-generation application hosts a secure joint payment infrastructure that can be downloaded from the Google store or App store and works through digital ID details. The application aims for transparency and participation in city services. Citizens can access accurate information regarding the recent developments in their city and express their thoughts and opinions on the management of the city. The application contains the inclusive democracy and interaction platform "Söz Senin" (It is Your Word), complaints and requests platform "Çözüm Merkezi" (Solution Centre) and "Suspending Bill" as well as "Live Help" which have been developed during COVID-19. Additionally, the "Halk Bakkal" (People's Mini Market) solidarity platform developed to protect craftsmen and neighborhood minimarkets, Emergency Numbers, Where is My Bus app, Career Istanbul app, City Map app, and Disaster Information systems are a part of this comprehensive application (IBB 2021). Citizens can also use square codes to make payments on the application and follow up on their filed complaints.[8]

E-municipal applications are unthinkable without citizen use and citizen participation. E-municipality is sustainable only with e-participation of citizens and citizen interaction. Therefore, it is very important for citizens to use electronic services, learn how to use them, and adopt these practices. In the COVID-19 process, the development of e-municipal services increased the interaction between the citizens and the administrators, enabling the citizens to follow the process closely, to be informed about the process, and to participate actively in the process. For example, citizens have contributed to the establishment of social distance by adopting e-municipal practices, participated in activities that contribute to the process through voluntary platforms, contributed to social solidarity with applications such as Suspended Bills (Askıda Fatura), and shared their views and suggestions on city management with the Istanbul is Yours application. Accordingly, we can say that the development of e-municipal services in the COVID-19 process has contributed to

[6] See https://askidafatura.ibb.gov.tr/

[7] See https://istanbulsenin.istanbul/hakkimizda/

[8] See https://istanbulsenin.istanbul/hakkimizda/

the improvement of the process by increasing the participatory interaction between the citizens and the administration.

4.3 Voluntary Participation Activities

Istanbul Metropolitan Municipality carries out voluntary participation activities in disasters. Voluntary participation activities for COVID-19 are also among those. To start with, the Municipality delivered COVID-19 training to its volunteers. Voluntary production of protective masks and distribution of those followed the series of COVID-19 voluntary activities. Under the Collective Production Movement in Istanbul Initiative, citizens who owned workshops produced protective masks, and those with 3D printers produced other protective equipment besides protective masks (Koronavirus Istanbul 2021).[9]

The Disaster Volunteers Project aimed to train and group volunteers of 35–40 people informed on disaster preparedness in every neighborhood.[10] The Municipality organized a series of events under this Project. The project's goal was to train and build teams of 25–30 disaster volunteers in each neighborhood to carry out disaster preparedness responsibilities. Individuals from every age group received disaster awareness training and various pieces of training on first aid, climbing knot techniques, station techniques, making stretchers and moving injured on stretchers, rope climbing, and building reels. The ultimate goal is to equip them with skills that may be necessary in the case of a disaster and improve their first-response capacities. The comprehensive work included search and rescue training for dogs and planning these training centers for each district to ensure joint efforts of district municipalities and residents during disasters (Seçkiner Bingöl 2021d).

Animal lover volunteers in each municipality took an active role in feeding the strays. Directorate of Museums and Libraries in Istanbul worked with volunteering celebrities to readout books for the hearing and vision impaired.[11] Volunteering psychologists provided counseling and attended online chats. Collective Production Movement produced masks. Volunteers were organized to discuss vaccination-related concerns; citizens participated in online social events, including online chats (Koronavirus Istanbul 2021).

The active role of volunteers in the management of the COVID-19 process shows how important the contribution of citizens is in the management of crisises. As mentioned above, the participation of voluntary citizens in the feeding of stray animals has facilitated the work of the municipality administration. Volunteers who participated in the disaster trainings learned to act together with the management in case of disaster and gained an important advantage for the next crisis situation. The

[9] See https://koronavirus.ibb.istanbul

[10] https://akom.ibb.istanbul/afet-gonulluleri/

[11] https://seslikutuphane.ibb.gov.tr/tr/gonullu-seslendiren-islemleri.html

realization of mask production with the participation of citizens, the elimination of vaccine hesitance, and the revitalization of social life with the participation of volunteers in online chats show how important the contribution of citizens is in the management of the process.

4.4 Crowdfunding Activities

The relevant literature on crowdfunding shows the relation of the concept with crowdsourcing. Crowdsourcing is roughly defined as getting the crowd's opinions regarding a problem solution or improvement of any institutional activities and using these opinions to solve these problems (Çağlar 2019; Atsan and Erdoğan 2015). In crowdfunding, crowds come together and tip in small amounts of money to collect funds (Çubukçu 2017).

Crowdfunding is becoming more popular with the increased use of technology. Local governments have developed methods suitable for crowdfunding during COVID-19. The pandemic paralyzed many sectors, citizens working without insurance became unable to meet their basic needs, and applications for social welfare assistance increased significantly. Municipalities, unable to cover up for the economic damage led by the pandemic due to their limited budget and capacities, introduced crowdfunding and used this new method to meet the social welfare assistance requests of the people (Saylam and Ünal 2022).

Istanbul Metropolitan Municipality also developed crowdfunding activities for social welfare assistance during this process. It created social media platforms that bring those in need with benevolent citizens. Crowdfunding activities that started with the #Birliktebaşaracağız (together we will succeed) hashtag were grouped under Suspending Bill, Family Support Package, Mother-Child Support Package, and Education Support Package. Suspending Bill was planned for those in need and unable to pay their water and natural gas bills; Mother-Child Support for mothers with children of 0–4 ages; Family Support Package for families in need of aid-in-cash; and Education Support Package for students in need of aid-in-cash.

Table 2 presents the number and amounts of aid spent under Istanbul Metropolitan Municipality's Crowdfunding Campaign. According to this table, Istanbul Metropolitan Municipality collected approximately 88.984.324 TL (approx.

Table 2 Istanbul metropolitan municipality's crowdfunding campaigns

Support package	Matched package (number of aid)	Total aid in TL
Suspending Bill	366,099	60,036,424
Family Support	73,330	12,898,950
Mother-Child Support	50,288	9,224,700
Education Support	270,297	6,824,250

Source: Generated by the author from https://askidafatura.ibb.gov.tr/fatura-listesi

$4.943, 000) and brought it to aid those in need. The donations were collected online and directed to those in need in the form of aid-in-cash, payments of bills, and support aids; this is remarkable in terms of being citizen-centric; personal data of the ones in need remain confidential.

Crowdfunding practices realized with the contribution of citizens have significantly supported the social aid activities of Istanbul Metropolitan Municipality during the COVID-19 process. This shows us that citizen-centric practices such as crowdfunding are effective in the provision of social aid services, which have a critic role in mitigating crises'effect on citizens.

4.5 Open Government Data Portals

Istanbul Metropolitan Municipality serves in 10 different categories (environment, human, mobility, governance, energy, safety/security, disaster management, economy, information, and communication technologies) through its open government data portal on https://data.ibb.gov.tr address. Twenty-eight of those are online, while there are 190 datasets in total. The portal was visited 15 million times in 2021. Three hundred twenty-one data requests were submitted by users (IBB 2021). While the available data sets included data on medical home services, measures against vectors, disaster management, and data on healthcare and medical institutions, citizens can also file requests to ask for additional data or new data sets.

In the COVID-19 process, open data has been effective in providing information about health services. Open data portals contribute to the transparency of services offered to citizens. In addition, the ability of citizens to evaluate open data and request data from the management enables citizens to participate in the city administration. Data sets on traffic density, public transportation hours, different information on transportation, bicycle paths, and data sets published in the form of maps have been effective in maintaining the purposes of citizens such as sustaining social distance and reducing crowds during the COVID-19 process.

4.6 Free Internet Access and Support for Distance Learning

Free access service (IBB Wi-Fi) is the municipality's step toward popular MuniWiFi (Municipal Wi-Fi) practice worldwide. This service aims to provide free internet access in busy public areas and public transportation and expand free coverage throughout the city. As of 2021, free Wi-Fi service is available in many social areas such as the metro, museums, libraries, city squares, parks, and tourist attraction centers (IBB 2021). Istanbul Metropolitan Municipality also supported young people with computers and free internet, mainly due to distance learning implemented during COVID-19. A total of 35 BELNET centers (muni-wifi) operating in 21 districts under the Provincial Directorate of Ministry of Youth and Sports kept their

doors open for students receiving distance learning, allowing them to connect to free internet. In-house computers in those centers provided internet access with harmful content filters. The centers respected hygiene and social distancing measures while being able to host 328 students at once.[12]

The spread of free internet access is undoubtedly of vital importance in the implementation of citizen-centered policies, such as benefiting from e-municipal services, using open data sets, interactive information about the COVID-19 process, participating in online platforms, quick access to vital information, having information about community movements in times of crisis, and being able to organize quickly.

More importantly, the widespread use of free internet is indispensable for citizens to transition to distance education, work remotely, and participate in remote health practices during the COVID-19 process.

5 Conclusion

Citizen-centric smart city can be defined as cities that put both techonolgy and citizens in the center of the provision of urban services, take into account the contribution of citizens in the provision of these services, and implement various institutional mechanisms to become citizen-centric. With the development of the new public governance approach, citizens are no longer passive objects of public service provision processes but are active subjects of the process. Smart city management implementing this approach allows citizens to become stakeholders in the provision of urban services, participate in projects, and participate in decisions that affect them. Hence the question of "how citizens should participate in smart cities" is the main topic for discussion. While discussing, one should consider various participation mechanisms in place, such as public meetings, participatory budgeting, and voluntary participation, as well as the roles of citizens in smart cities. Citizens in smart cities may belong to different role groups, such as consumers or co-creators, and city administrators need to understand to which processes citizens can actively contribute.

It is highlighted that smart cities are essential actors in coping with global crises (see Troisi et al. 2022). Although technology plays a transforming role in smart cities, smart tools alone do not automatically lead to an organized transformation (Troisi et al. 2022). There is the emphasis, therefore, on the users of those smart technologies; a smart society is one that has developed the ability to collectively work in implementing disaster coping strategies (Rachmawati et al. 2021: 2). For instance, to build healthy environments, society should develop environmental awareness and develop habits of wearing masks and minding their hygiene.

[12] https://belhabelediye.com.tr/istanbul-buyuksehir-belediyesinden-ogrencilere-uzaktan-egitim-destegi/

The COVID-19 pandemic showed how important it is to provide technology-based services in smart cities and people's adaptation to technology and ability to develop collective behaviors.

During the COVID-19 pandemic, smart cities in countries put numerous innovative applications into practice while every city worked with its dynamics of population, environment, and citizens to overcome this pandemic.

In many countries, we have seen examples of COVID-19 measures, which include navigation and camera systems to monitor and measure crowds, technological innovations to establish social distancing (crowd forecast cameras, wearable distance calculators), GPS devices used to manage traffic, e-government, and e-municipality applications. In addition, it is seen that there are applications such as temperature measurement with thermal cameras, phone applications that allow you to see the locations of infected people, applications to support distance education, online social activities, and online health applications (Seçkiner Bingöl 2022a, b).

Researches analyzing metropolitan municipalities during the COVID-19 pandemic in Turkey, on the other hand, conclude that municipalities carried out activities to inform the public, produce masks and other protective equipment, disinfect and secure hygiene, feed stray animals, provide in-kind and in-cash social welfare aids, organize social life, offer smart city apps, support healthcare services, support distance learning, and participatory practices (see Kavas Bilgiç 2020; Bek and Bek 2021; Urhan and Arslankoç 2021; Seçkiner Bingöl 2021e).

With a population of 16 million, Istanbul is one of the pioneers of implementing smart city applications in Turkey. Strategically implementing smart city practices since 2016, the city has built its Smart City Project Inventory as of June 2019 and utilized needs analysis and survey methods to identify and prioritize the projects (IBB 2021). This study focusing on citizen-centric smart city practices of Istanbul Metropolitan Municipality during the time of COVID-19 classified them under six categories: smart transportation, e-municipality, voluntary participation, crowdfunding, open government data, and free internet access - support for digital education.

Mobile apps for transportation, GPS applications showing traffic jams, HES code practice showing whether there are COVID-19 contacted individuals on public transportation, and touch-free pedestrian crossing buttons are among citizen-centric practices adopted by Istanbul Metropolitan Municipality during the pandemic. It is seen that all citizen-centric applications introduced for the transportation system can be implemented by citizens using and participating in these applications.

As a part of e-municipality services, the "https://koronavirus.ibb.istanbul/" website was launched and used to inform the public, and online events were organized, and online volunteering platforms were built. "İstanbul Senin" (*Istanbul is Yours*) mobile application was developed to preserve transparency and participation in city services; live support and Suspending Bill services were offered. The development of e-municipal services in the COVID-19 process has increased the interaction between citizens and administrators, enabling the citizens to closely monitor the process, to be informed about the process, and to participate actively in the process. We can say that the development of e-municipal services in this process has contributed to the improvement of the process by increasing the participatory interaction between the citizens and the administration.

Istanbul Metropolitan Municipality also developed crowdfunding activities for social welfare assistance during this process. It created social media platforms that bring those in need with benevolent citizens. Crowdfunding activities that started with the #Birliktebaşaracağız (together we will succeed) hashtag were grouped under Suspending Bill, Family Support Package, Mother-Child Support Package, and Education Support Package. Crowdfunding practices realized with the contribution of citizens significantly supported the social aid activities of Istanbul Metropolitan Municipality during the COVID-19 process. It shows that citizen-centered practices such as crowdfunding are effective in the sustainability of social assistance practices, which have an important role in alleviating crises.

Istanbul Metropolitan Municipality's open government data portal "https://data.ibb.gov.tr" serves as ten different categories (environment, human, mobility, governance, energy, safety/security, disaster management, economy, information, and communication technologies). The ability of citizens to evaluate open data and request data from the administration enables citizens to participate in the administration. Datasets on traffic density and public transportation hours; different information about transportation and bicycle paths; and data sets published in the form of maps have been effective in maintaining the purposes of citizens such as maintaining social distance and reducing crowds during the COVID-19 process.

With distance learning introduced during the pandemic, Istanbul Metropolitan Municipality supported young people with computers and free internet. Undoubtedly the spread of internet access has a vital importance in the implementation of citizen-centered policies. Thus, citizens benefit from e-municipal services, use open data sets, learn interactive information about the Covid-19 process, participate in online platforms, access vital information quickly, have information about community movements in times of crisis, and organize quickly. More importantly, the widespread use of free internet is indispensable for citizens' transition to distance education, remote working, and participation in online health applications.

In conclusion, it is seen that Istanbul Metropolitan Municipality provides many citizen-centric services during the COVID-19 process. The contribution of citizens is important in ensuring social distance; reducing traffic density; using e-municipality; and providing crowdfunding, voluntary participation, and social assistance. It is seen that it is important for citizens as technology users and the society as a whole to develop common behaviors in order to maintain citizen-centric practices in pandemics. Free Wi-Fi offered by local governments and support for distance learning is becoming more common. On the other hand, developing digital healthcare applications and efforts spared for those are the topics that should be studied for the post-pandemic period.

References

Ataç B (2020) Yerel yönetimlerde akıllı şehre geçiş sürecinin yönetimi: İstanbul Büyükşehir Belediyesi örneği. Doctoral Dissertation, İstanbul Medeniyet University.

Atsan N, Erdoğan E (2015) Girişimciler için alternatif bir finansman yöntemi: kitlesel fonlama (Crowdfunding). Eskişehir Osmangazi Üniversitesi İİBF Dergisi, 10(1): 297–320.

Bek N, Bek A (2021) Yerel yönetimlerin COVID-19 ile imtihanı: İstanbul Büyükşehir Belediyesi örneği. ÇOMÜ LJAR, 2(4): 117–127.

Berntzen L, Johannessen MR (2016) The role of citizens in smart cities. Proceedings of the Management International Conference. University of Presov, Slovakia. Available via https://www.researchgate.net/publication/309040628_The_Role_of_Citizens_in_Smart_Cities/stats. Accessed 21 11 2022.

Bibri SE (2021) Data-driven smart eco-cities and sustainable integrated districts: A best-evidence synthesis approach to an extensive literature review. Eur J Futures Res 9(16). https://doi.org/10.1186/s40309-021-00181-4.

Bimay M, Kaypak Ş (2022) Küresel salgın (COVİD-19) süreci ve yerel yönetimlerin hizmet sunumunda yapısal ve işlevsel değişimler. Dicle Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 12(23): 431–455. https://doi.org/10.53092/duiibfd.1039135

Bostancı S, Yıldırım S (2021) COVID-19 pandemi sürecinde Türkiye'de e-belediye uygulamaları. In: Bulut Y (ed) COVID-19 pandemisinin idari, siyasi, uluslararası ilişkiler, ekonomi ve işletmeler üzerindeki etkileri. Ekin Basın Yayın Dağıtım, p. 81–98.

Çağlar MT (2019) Yeni nesil alternatif finansman yöntemi olarak kitlesel fonlama: Dünya ve Türkiye uygulaması. Uygulamalı Sosyal Bilimler Dergisi 3(2): 18–34.

Caragliu A, Del Bo, C-Nijkamp P (2011) Smart cities in Europe. Journal of Urban Technology 18(2): 65–82. https://doi.org/10.1080/10630732.2011.601117

Çolak Ç (2021) Kamu yönetİmİ, katılımcılık ve vatandaşın değİşen rolü: Seçmenden ortak üretİcİ vatandaşa. Memleket Siyaset Yönetim (MSY) 16(35): 37–72.

Çubukçu C (2017) Kitlesel fonlama: Türkiye'deki kitlesel fonlama platformları üzerinden bir değerlendirme. Journal of Entrepreneurship and Innovation Management 6(2): 155–172.

EU (2021) A citizen-centred approach to smart cities. https://ec.europa.eu/research-and-innovation/en/projects/success-stories/all/citizen-centred-approach-smart-cities

Gao Z, Wang, S, Gu J (2020) Public participation in smart-city governance: A qualitative content analysis of public comments in urban China. Sustainability 12: 8605. https://doi.org/10.3390/su12208605

Giffinger R, Fertner C, Kramar H, Kalasek R, Pichler N (2007) Smart cities: Ranking of European medium-sized cities. Vienna: Vienna University of Technology.

Granier B, Kudo H (2016) How are citizens involved in smart cities? Analysing citizen participation in Japanese smart communities. Information Polity (21): 61–76. https://doi.org/10.3233/IP-150367

Hollands R (2008) Will the real smart city please stand up? City: Analysis of Urban Trends, Culture, Theory, Policy, Action 12(3): 303–320. https://doi.org/10.1080/13604810802479126

IBB (Istanbul Metropolitan Municipality) (2017) Faaliyet Raporu. https://www.ibb.istanbul/Uploads/2018/4/2017-iBB-Faaliyet-Raporu.pdf. Accessed 20 Nov 2022

IBB (2020a) Koronavirüsle mücadele faaliyet raporu 2020 Mayıs- Haziran. İstanbul Büyükşehir Belediyesi.

IBB (2020b) Faaliyet Raporu. https://ibb.istanbul/BBImages/Slider/Image/faaliyet-raporu-2020.pdf. Accessed 20 Nov 2022

IBB (2021) Faaliyet raporu. https://ibb.istanbul/BBImages/Slider/Image/2021-faaliyet-raporu.pdf. Accessed 20 Nov 2022

Karataş A, Gördeles Beser N (2021) Yerel yönetim birimleri olarak belediyelerin salgın hastalıklar konusundaki sorumlulukları: COVID-19 pandemisi örneği. Ömer Halisdemir Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi 14(4):1340–1351.

Karkın N (2019) Doğrudan vatandaş katılımına ilişkin kuramsal çerçeve. In: Uçar Kocaoglu B (ed) Kamu yönetiminde doğrudan vatandaş katılımı. İmaj Yayınevi, Ankara, p. 31–51.

Kavas Bilgiç A (2020) COVID-19 ile mücadele sürecinde yerel yönetimlerin genel görünümü. İdealkent 11(31): 2084–2112. https://doi.org/10.31198/idealkent.817322

Koronavirus Istanbul (2021) https://koronavirus.ibb.istanbul/. Accessed 20 Nov 2022

Kutlu Ö, Usta S, Kocaoğlu, M (2009) Vatandaş odaklı/Vatandaşın odakta olduğu yönetim: Kent konseyleri ve Selçuklu Belediyesi örneği. Sosyal Ekonomik Araştırmalar Dergisi 9(18): 507–532.

Lim S, Malek J, Hussain M, Tahir Z (2018) Citizen ğarticipation in building citizen-centric smart cities. GEOGRAFIA Malaysian Journal of Society 14(4): 42–53. https://doi.org/10.17576/geo-2018-1404-04

Malek J, Lim S, Yigitcanlar T (2021) Social inclusion indicators for building citizen-centric smart cities: A systematic literature review. Sustainability 13(376): 1–29. https://doi.org/10.3390/su13010376

Oh J, Seo M (2021) Measuring citizens-centric smart city: Development and validation of ex-post evaluation framework. Sustainability 13(20): 11497 https://doi.org/10.3390/su132011497.

Peker D, Köseoğlu İ (2021) Koronavirüs (COVID-19) salgınında krizle mücadelede yerel yönetimlerin rolü: Beş büyükşehir belediyesinde bir analiz. ASSAM Uluslararası Hakemli Dergi 8(18): 87–102.

Rachmawati R, Mei ETW, Nuran IW, Ghiffari RA, Rohmah, AA, Sejati MA (2021) Innovation in coping with the Covid-19 Pandemic: The Best practices from five smart cities in Indonesia. Sustainability 13, 12072. https://doi.org/10.3390/su132112072.

Saylam A, Ünal, G (2022). Kamu yönetiminde elektronik vatandaş katılımı uygulamaları: Ankara Büyüşehir Belediyesi örneği üzerinden bir inceleme. In: Seçkiner Bingöl E (ed) Kamu yönetiminde katılım üzerine güncel tartışmalar. Gazi Kitabevi, Ankara, p. 221–254.

Seçkiner Bingöl E (2021a) Akıllı şehirlerde vatandaş katılımı: Sistematik bir literatür analizi. Nevşehir Hacı Bektaş Veli Üniversitesi SBE Dergisi 11(4): 1946–1966. https://doi.org/10.30783/nevsosbilen.998684

Seçkiner Bingöl E (2021b) Akıllı şehir projelerine vatandaş katılımı: İstanbul Büyükşehir Belediyesi örneği. Ömer Halisdemir Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi 14(4): 1251–1275. https://doi.org/10.25287/ohuiibf.848261

Seçkiner Bingöl E (2021c) Citizen participation in smart sustainable cities. In: Babaoğlu C, Kulaç O, Akman E (ed) Handbook of research on global challenges for improving public services and government operations, IGI Global, USA, p. 443–463. https://doi.org/10.4018/978-1-7998-4978-0.ch023

Seçkiner Bingöl E (2021d) Afet yönetiminde yerel yönetimlerin gönüllü katılım faaliyetleri: üç büyükşehir belediyesi örneğinde bir inceleme. In: Oktay E, Pekküçükşen Ş, Yıldırım A (ed) Kayfor Orta Asya Kayfor18 Proceedings Book, Taşkent, Özbekistan, 23–24 September 2021.

Seçkiner Bingöl E (2021e) COVID-19 pandemisinde gelişmekte olan ülkelerin sosyal koruma önlemleri üzerine bir analiz. Hacettepe Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi 39(COVID-19 Özel Sayısı): 39–54. https://doi.org/10.17065/huniibf.901036

Seçkiner Bingöl E (2022a) COVID-19 pandemisi sürecinde yerel yönetimlerin akıllı kent uygulamaları: Amsterdam ve Kopenhag Örnekleri. In: Türe E (ed) Abstracts of Ubak 14th International Scientific Research Congress, Asos Yayınları, Ankara, 20–21 Agust 2022.

Seçkiner Bingöl E (2022b) COVID-19 pandemisi sürecinde Türkiye'de sosyal belediyecilik uygulamaları. In: A Belli, A Aydın, A Tunc (ed) Yerel yönetimlerde güncel gelişmeler ve yerel siyaset tartışmaları. Orion Akademi, Ankara, p. 241–271.

Simonofski A, Serral A, De Smedt (2019a). Hearing the voice of citizens in smart city design: The CitiVoice framework. Bus Inf Syst Eng 61: 665–678. https://doi.org/10.1007/s12599-018-0547-z

Simonofski A, Asensio SE, Wautelet Y (2019b) Citizen participation in the design of smart cities: Methods and management framework. In: Viscizi, A, Lytrats (ed) Smart cities: Issues and challenges: Mapping political social and economic risks and threats. Elsevier, The Netherlands, p. 47–62. https://doi.org/10.1016/B978-0-12-816639-0.00004-1

Troisi O, Giuseppe F, Mara G, Francesca L (2022) COVID-19 sentiments in smart cities: The role of technology anxiety before and during the pandemic. Computers in Human Behavior, 126: 106986. https://doi.org/10.1016/j.chb.2021.106986

Uçar Kocaoğlu B (2021) Afet yönetiminde elektronik vatandaş katılımı. In: Saylam A (ed) Kamu yönetiminde elektronik vatandaş katılımı. Gazi Kitabevi, Ankara, p. 157–181.

Uçar Kocaoğlu B, Kocaoğlu M, Phillips R (2023) Beyond recovery and resilience. In: Brennan M.A., R. Phillips, N. Walzer, B. Hales (ed) Community development for times of crisis. Routledge, p. 255–271.

Urhan G, Arslankoç S (2021) COVID-19 pandemi sürecinde sosyal politika ve yerel yönetimler: İstanbul İlçe Belediyeleri örneği. Çalışma ve Toplum 2(69): 945–980.

Vigoda E (2002) From responsiveness to collaboration: Governance, citizens, and the next generation of public administration. Public Administration Review 62(5): 527–540.

Yeşildal A (2020) Doğal afetlerle mücadelede yerel yönetİmlerİn rolü ve kapasİte sorunları: Esnek şehİr uygulaması. Fırat Üniversitesi İİBF Uluslararası İktisadi ve İdari Bilimler Dergisi 4(1): 87–116.