International Journal of Religion
2024
Volume: 5| Number 7 | pp. 714 – 721
ISSN: 2633-352X (Print) | ISSN: 2633-3538 (Online)
ijor.co.uk
DOI: https://doi.org/10.61707/btwqn510

Building and Developing Smart Cities in Ho Chi Minh City, Vietnam - Current Situation and Solutions

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Abstract

Building and developing smart cities is an inevitable trend globally, including in Vietnam. Ho Chi Minh City is one of Vietnam's largest cities, experiencing rapid development and urbanization. Establishing and developing smart cities in Ho Chi Minh City is a necessity in the context of the fourth industrial revolution and the ongoing digital transformation in all sectors, aiming at the ultimate goal of serving and improving the quality of life for the city's residents. This article focuses on clarifying several issues: (1) Analyzing the concept and criteria of the smart city model; (2) Investigating the current situation of building and developing smart cities in Ho Chi Minh City, including both the achievements and existing limitations; (3) Proposing solutions to enhance the effectiveness of building and developing smart cities in Ho Chi Minh City in the current context.

Keywords: *Smart City, Ho Chi Minh City, Current Situation, Solutions*

INTRODUCTION

Some Fundamental Issues of Smart Cities

In recent years, with the requirements of urbanization and the objective demands of urban management, the concept of smart cities has become increasingly popular and of interest to many countries. The term "smart city" was first defined in 1994. However, to be understood in the sense that we commonly use today, it wasn't until 2010 when the EU began using "smart" to refer to the convergence of conditions for sustainable development and operations in urban areas [1]. The increasingly widespread use of the term "smart" may have been inspired by the emergence of smartphones, devices that marked a turning point in modern social life. Currently, there are many definitions of smart cities. A simple definition could be: "A smart city is a city that combines science and technology with policies to improve community quality" [2]. The 2015 Osborne Clarke report on Europe's Smart Cities defined smart cities as cities deploying advanced technologies, creating innovations in providing public services, and leveraging databases with the ultimate goal of becoming prosperous, sustainable, and better for living [3]. In another report, the European Commission defined a smart city as a place where communication and services are created by the effects of information and communication technology for the benefit of residents and businesses. Smart cities go further in using better and less polluting technologies [4]. Thus, broadly speaking, a smart city is understood as the development of a sustainable and "smart" city, essentially "smart growth" to cope with climate change and social issues. Worldwide, policymakers recognize the importance of "smart growth" and continually research to build developing cities into greener and smarter urban areas.

In a narrow sense, a smart city can be divided into four layers: the Sensor Layer, the Network Layer, the Platform Layer, and the Application Layer. With this structure, core technologies are primarily focused on the Application Layer, considered the most important central technology infrastructure; information technology is seen as a tool to connect the technological infrastructure of smart cities. Additionally, a smart city can be understood as an organic connection between technology, humans, and institutional components. In summary, a smart city applies technology to connect, collect, and analyze information from residents and management

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levels to enhance the quality of life and ensure sustainable development. It is a city with a convergence of efficient infrastructure, sustainable development, and a friendly living environment. A smart city can also be divided into six main areas: (1) smart living; (2) smart governance; (3) smart economy; (4) smart environment; (5) smart people; and (6) smart transportation [5]. Moreover, many researchers believe that a smart city is an "upgrade" of a digital city; it is the integration of a digital city with technologies. These technologies promote communication between devices, between humans and devices, between humans and society, while helping urban management become smarter [6]. Evaluation criteria for a smart city include: (1) Modern digital infrastructure, combined with openly implemented real-time data to allow people access whenever needed; (2) Electronic organizational management, using modern information technology; (3) A smart economy is key to building a smart city; (4) Critical services and infrastructure managed by smart computing technology; (3) Investment in modern information and communication technology infrastructure; (6) A community of citizens who are capable of participating and can coordinate with authorities to manage the city; (7) The natural environment is one of the important criteria for building a smart city [7].

CURRENT STATE OF SMART URBAN DEVELOPMENT IN HO CHI MINH CITY, VIETNAM

Achievements

a. Urban Development Strategy of Ho Chi Minh City Government

In November 2017, the Ho Chi Minh City government unveiled the Smart City Development Project for the period 2017-2020, with a vision extending to 2025 (referred to as the Project). The National Assembly also endorsed Resolution No. 54/2017/QH14, which experimented with specific mechanisms and policies for the development of Ho Chi Minh City. The Project focuses on enhancing the governance efficiency through data system integration, creating utilities for citizens and businesses to participate in management. The four main components include: Establishing a shared data repository and developing an open data ecosystem; Constructing the Smart City Operations Center; Establishing a Simulation and Socio-Economic Forecasting Center; Establishing the City's Information Security Center.

In 2022, the Politburo issued Resolution No. 31-NQ/TW outlining the development direction and tasks for Ho Chi Minh City until 2030, with a vision towards 2045. The resolution emphasizes the development of a polycentric city, regional connectivity, green urban areas, and smart cities, aiming for harmonious development between rural and urban areas. The focus is on breakthroughs in urban infrastructure construction.

Simultaneously, the 11th Party Congress of the city considered smart urban development a central task, specifying the timely implementation of the Smart City Development Project. The city aims to effectively operate the Shared Data Repository and invest in completing the Smart Operations Center and the Forecasting Center. Big Data technology is proposed for modernization, cost reduction, improved quality, and forecasting capability in critical areas. Artificial Intelligence (AI) is to be applied in deploying smart and innovative urban areas, experimenting with applying AI research results from universities and research institutes to practical production and society. The completion and operation of smart tourism operation centers for various sectors are also planned.

It can be affirmed that these innovative strategies represent a political opportunity for the city to leverage its creative spirit, unity, and determination of the Party, government, and people for development. Additionally, city leadership has actively studied and learned from practical experiences in implementing smart city models in major cities worldwide, recognizing their effectiveness in modern social governance. Therefore, the implementation of smart urban development in Ho Chi Minh City is both essential and urgent, offering the most effective solution to support rapid, sustainable development, and narrowing the gap with other cities in the region.

Moreover, Decision No. 6179/QD-UBND dated November 23, 2017, of the People's Committee of Ho Chi Minh City approved the Smart City Development Project for the period 2017-2020, with a vision extending to 2025. It emphasized that "Ho Chi Minh City will develop a relatively high and sustainable economy based on the optimal exploitation of resources, with citizens at the center of urban life." Decision No. 2393/QD-UBND

dated July 3, 2020, of the People's Committee of Ho Chi Minh City approved the City's Digital Transformation Program, stating the purpose of making Ho Chi Minh City a smart city by 2030 with fundamental innovations in the operation of the city's digital government machinery, digital state-owned enterprises, and the prosperity and civilization of a digital society.

With such high political orientations and determination of the city government, Ho Chi Minh City has shown positive changes in realizing the goals of the smart urban development strategy.

b. Criteria for Smart Governance

In recent times, Ho Chi Minh City has established crucial pillars to serve as a framework for all infrastructure and applications.

*Building a shared data repository:*The city has focused on constructing a shared data repository and developing an open data ecosystem. This involves the integration of databases such as electronic documents, an e-portal, complaints, denunciations, hotlines, business registration, foreign investment, public investment projects, land information, healthcare facilities, professional certifications, educational institutions, and educational services. Data related to drainage systems, urban lighting, green parks, wastewater treatment, bridge data, road data, and traffic signal data have been integrated into the city's shared data repository at https://data.hochiminhcity.gov.vn. This integration has gradually formed the appearance of a smart city throughout the entire municipality.

Synthetic information system: From 2019 to 2022, the city put into operation a Comprehensive Information System to serve the direction and administration of the city's leadership. The system provides classified indicators by month, quarter, and year, presented in the form of graphs, charts, and illustrative images, supporting the People's Committee of the City in evaluating the increase/decrease, completion rate compared to the plan, and comparing figures for the same period or between stages.

*Information Security Center:*The Information Security Center was established in October 2020 under the name of the Joint Stock Company for Operating the City's Information Security Center, with over 75% of the capital contributed by state-owned enterprises. The center is tasked with ensuring information security and rescue for the technical infrastructure of state agencies, state-owned enterprises, units belonging to the city's political system, followed by businesses, organizations in the city, and subsequently expanding domestically and internationally.

*Economic-Social Modeling and Forecasting Center:*This center officially began operations in early June 2019, carrying out functions such as organizing investigations, surveys, and collecting information to build a database to meet the requirements of constructing analytical, forecasting, and modeling models. The center is gradually systematizing quantitative models to analyze, forecast, and simulate major economic and social indicators, along with some domestic and international issues to serve the city's development requirements. In addition, the center provides consulting services and cooperates with organizations and individuals both domestically and internationally.

Upto now, the city has completed the synthesis of scientific forecasting methods. Consequently, it has applied models to forecast certain economic and social indicators and developed quantitative economic models using macro and micro datasets under technical conditions to model for analysis of some economic and social characteristics in the city. From 2021 onwards, the center has expanded the scope of simulation to predict development trends for all areas under the Smart City Development Project, serving the directing and managing tasks of the City Party Committee, the People's Committee, and relevant agencies.

Results from the Provincial Governance and Public Administration Performance Index (PAPI) survey for Ho Chi Minh City indicate a significant development in administrative procedures, increasing from 6.9 points in 2019 to 7.39 points in 2022, with the highest score achieved in 2020 at 7.39 out of 10 points.

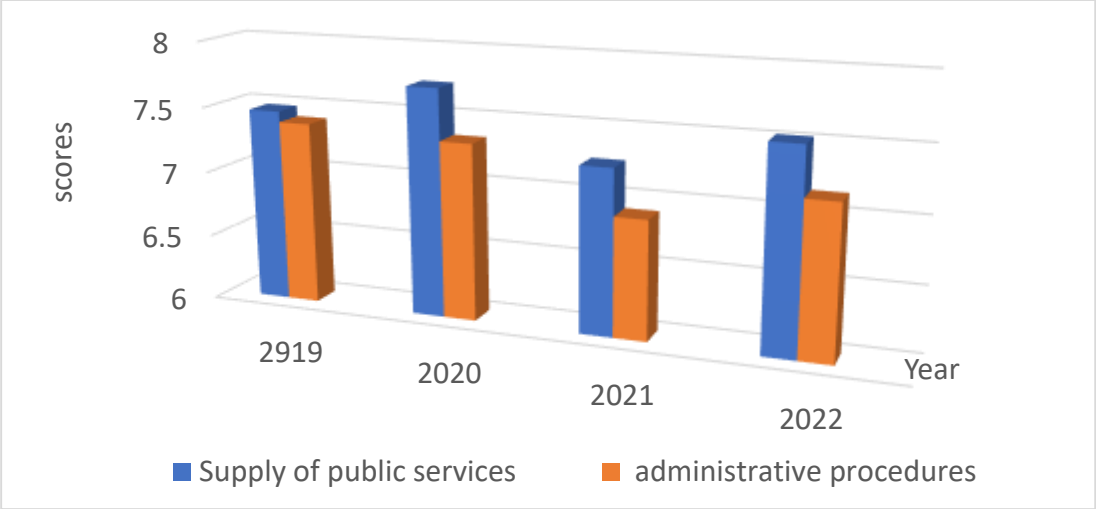

Figure 1. *Public Service Delivery and Administrative Procedures Index of Ho Chi Minh City from 2019 to 2022 (Source: https://papi.org.vn/)*

Survey on the Satisfaction Index of Public Administrative Services (SIPAS) indicates a positive trend in the satisfaction level of citizens and organizations with the services provided by the city's government. The satisfaction index has shown an increase from 80.8% in 2019 to 86.5% in 2022 [14].

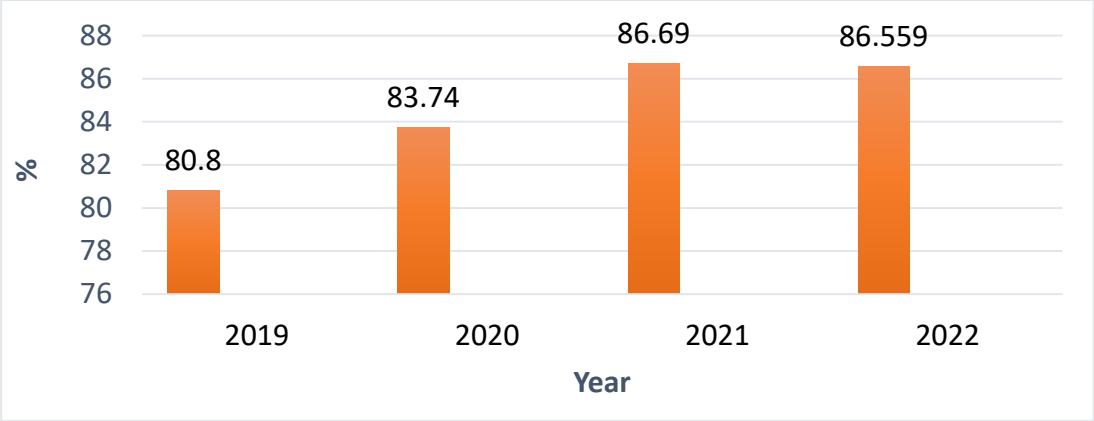

Figure 2: *Citizen Satisfaction Index Regarding the Public Administrative Services in Ho Chi Minh City (Source: Compiled from reports by the People's Committee of Ho Chi Minh City for the years 2019-2022)*

c. Digital Transformation and Online Public Services

In line with the strategic goal of building a smart city, the People's Committee of Ho Chi Minh City issued Decision No. 2393/QD-UBND on July 3, 2020, approving the Digital Transformation Program until 2030. According to this decision, the city aims to provide 100% of Level 4 online public services through various access channels, including mobile devices, by 2030. It also targets the processing of 100% of city and district-level work records and 95% of ward-level work records in an online environment. Currently, the city offers 1,335 public services, including 970 Level 3 services and 356 Level 4 services. The city's electronic one-stop information system connects 18 departments, offices, and sectors, as well as 24 districts and municipalities, operating on the city's shared data platform. In 2021, under the theme "Building Urban Governance and Improving the Investment Environment in Ho Chi Minh City," the results of online public service provision showed that 3,268,394 records were processed for Level 3 and Level 4 services. In 2022, the percentage of administrative procedures provided as Level 4 online public services was 46.31%, with 805 out of 1,738 procedures. The total number of records processed for Level 3 and Level 4 online public services was 4,019,068.

d. Smart Economic Development

Over the past period, Ho Chi Minh City has achieved significant milestones in the economic sector, particularly in the development of e-commerce. The E-commerce Index of Ho Chi Minh City has shown a consistent upward trend. In 2022, the city continued to lead the ranking with a score of 90.6 [16].

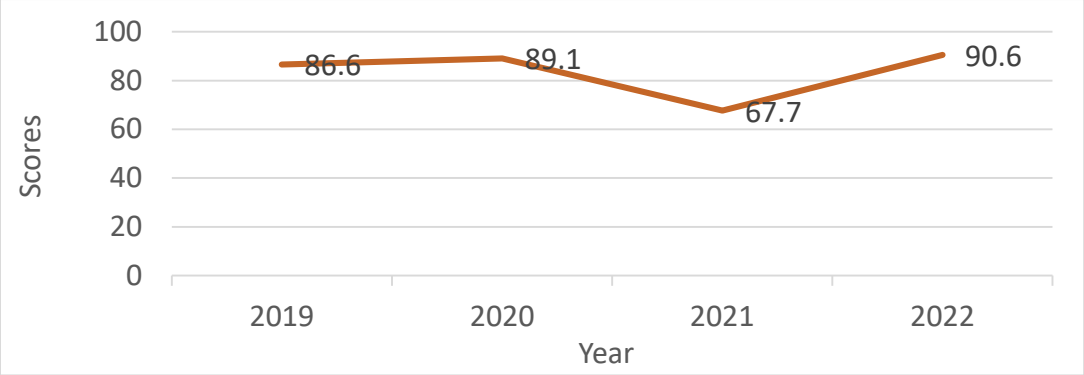

Figure 3: *E-commerce Index in Ho Chi Minh City from 2019-2022*

(Source: Compiled from the E-commerce Index Report in Vietnam for the period 2019-2022)

e. Smart Traffic Criteria

The Smart City Operations Center, located at the headquarters of the People's Committee of Ho Chi Minh City, officially commenced operations in April 2019. It has successfully connected and integrated data from more than 1,500 cameras, including those from the Departments of Transportation, Health, Education and Training, the City Police, and cameras from several districts. This center serves as the focal point for addressing issues arising from all aspects of society, interacting with citizens, and supporting city leaders in decision-making. The city plans to deploy over 10,000 cameras at strategic locations, integrating data into a centralized monitoring system by 2025. In early 2020, the city introduced the Urban Traffic Management Operations Center, incorporating an online traffic information portal for citizens. It also established a network of surveillance cameras connected to the Smart City Operations Center, shared with various units to enhance security. All peripheral devices are centrally connected, managed, and controlled at the Traffic Monitoring and Control Center.

f. Urban Infrastructure

Investments in urban infrastructure have been concentrated, emphasizing key transportation, water supply, and drainage projects to enhance connectivity. The city's development towards the east, west, and south creates conditions for stronger regional connections. Currently, the city is laying the groundwork for building a smart city, with an expanding urban space, rapid development of urban infrastructure, particularly in transportation, significantly improved urban environments, and increasingly effective urban management through the application of scientific, technical, and information technology [18].

g. Healthcare

The city has implemented an information portal for the healthcare sector, providing various sections related to examination, treatment, preventive healthcare, and administrative reforms. The online portal enables real-time queries about licenses, the scope of professional activities for individuals, and healthcare facilities for examination and treatment. The city is actively implementing the electronic health record system at Thu Duc District Hospital, aiming to establish a "paperless" hospital. Additionally, efforts are underway to interconnect the databases of over 6,000 medicine-supplying facilities with the national pharmaceutical database [19].

h. Education and Training

The city has undertaken the comprehensive construction of an information technology architecture for the education and training sector, laying the foundation for the development and implementation of an e-government and smart city model. Simultaneously, an electronic information portal has been launched, comprising nearly 2,000 member websites representing various educational units [19].

Existing Issues and Limitations

Regarding the Competence of Officials and Civil Servants: To actualize the goals set for the construction and development of a smart city, the participation of officials and civil servants is essential, starting from policy planning, strategic planning, forecasting capabilities, to organizational and implementation capabilities. However, a portion of the city's officials and civil servants is still slow to change their perceptions and mindset, as well as lacking the execution capabilities to meet the requirements set forth in the process of building and developing a smart city.

*Concerning Smart Urban Infrastructure:*The smart urban infrastructure system lacks coordination, with weak interconnectivity. A unified and consistent infrastructure framework among regions has not been established. The methods of regional connectivity are not diverse, and there is insufficient adaptation to climate change, rising sea levels, with signs of overload in major urban areas. The land ratio allocated for transportation is low. Urban railway lines are progressing slowly and are not yet operational. The public transportation system operates with low efficiency (only about 16-20% compliance with the Road Traffic Law). Security and safety regarding water sources, water quality, and continuous water supply are not guaranteed. In many urban areas, residents still face water shortages during dry seasons and saline intrusion. The urban drainage and wastewater treatment system has limitations, meeting only about 60% of the urban drainage needs. The total amount of wastewater collected and treated in the city is only about 13%. Most wastewater treatment plants operate below 50% of their designed capacity. Urban flooding is a frequent occurrence.

Regarding the Application of Information Technology in Smart City Operations: Although Ho Chi Minh City has the potential to be the most advanced region in applying information technology in the country, and the digital transformation process is actively pursued, there are still many limitations compared to the requirements set for the operation of a smart city in the city. One of the reasons for this situation is the lack of synchronization in the application of information technology in urban operations.

Concerning Public Financial Issues: Presently, the percentage of the budget retained for the city is decreasing. In 2000, the budget retention rate was 33%, but it reduced to only 18% in the period from 2017 to 2020. This reality leads to diminishing resources, causing difficulties in balancing, regulating development, and investing in the construction of a smart city and implementing the digital transformation program [21].

SOLUTIONS TO ENHANCE THE EFFECTIVENESS OF BUILDING AND DEVELOPING A SMART CITY IN HO CHI MINH CITY, VIETNAM

Improve the Management Capacity of City-Authorized Officials and Civil Servants

One of the critical factors determining the success of building and developing a smart city is the human factor, especially the city's officials, civil servants, and employees. To achieve this, the locality needs solutions to invest in the development of human resources in a focused and centralized manner. It is essential to further promote advanced professional training, incorporating sustainable smart city development content into training programs, and enhancing the management capabilities for urban construction and development.

Ensure Consistency in the Implementation of Smart City Building Programs, Plans, and Initiatives in the City

The city government needs to integrate and align the vision and goals of building a smart city into various programs, plans, initiatives, and projects to create consistency, save resources, and ensure comprehensive development.

Upgrade and Enhance the City's Information Infrastructure System

A prerequisite for building a smart city is to have a strong and widespread information infrastructure system throughout the city. A successful lesson from South Korea and Singapore in transitioning to smart cities is investing in building a comprehensive smart infrastructure system, implementing the spirit of connectivity everywhere, all the time.

Promote the Application of Information Technology and Improve the Quality of Public Service Delivery for Citizens and Businesses

In recent years, despite positive changes in deploying online public services, the requirements of a smart city demand an open, accessible public database system that serves the access, use, and reuse needs of all city residents.

Develop a Smart City Ensuring Social Harmony

In the rapidly developing economic landscape, especially with technological advancements, any transformation has dual effects on social life. The practicality shows that Ho Chi Minh City has population characteristics, where many communities gather from across the country for livelihood. The complexity of the population makes it challenging to create a unified intellectual and living standard during the transition to a smart city model. Therefore, the city government needs to rigorously evaluate the impact of any development policy before construction and enactment. It should consider vulnerable groups in society, guide and support them to avoid being left behind, ensuring they benefit positively from the smart city model.

CONCLUSION

In this study, a smart city is understood as an urban area that applies technology to connect, collect, and analyze information from residents and management levels to improve the quality of life and ensure sustainable development.

The construction and development of a smart city in Ho Chi Minh City are an objective necessity, meeting the needs of state and social management at the local level, leveraging the city's potential and strengths in comparison with other cities nationwide and in the region.

The Ho Chi Minh City government has made significant efforts in planning and implementing policies to realize the smart city model. The results are evident across various sectors, from administration, public service delivery, economy, transportation, healthcare, to education. The participation of citizens and society is a crucial factor in providing input data for the smart city management system. However, the city also faces many difficulties and challenges, including issues related to the quality of human resources, infrastructure, technology, and public finance.

Recommendations for Enhanced Effectiveness

To improve the effectiveness of building and developing a smart city, the Ho Chi Minh City government needs to implement a synchronized set of solutions, with a focus on addressing issues related to human resources, urban infrastructure, and ensuring social welfare harmony. It requires a holistic approach to tackle challenges and create a balanced and sustainable smart city.

REFERENCES

Damri R P, Cocchia A. Smart city and Digital City: twenty years of terminology evolution. in ItAIS2013, X. Conference of the Italian Chapter of AIS, 14 December 2013, Milano, Italy.

Mcclellan Stan, Jimenez Jesus A, Koutitas George. Smart cities: applications, technologies, standards and driving factors.

Clarke Osborne. Smart cities in Europe: Enabling innovation.

Foo See Liang. Gary Pan. Singapore's vision of a smart nation. Asian Management Insights. Research Collection School of Accountancy. 2016;3(1):76-821.

Cohen Boyd. The 3 generation of smart cities, Inside the development of the technology driven city.

https://tapchixaydung.vn/ha-tang-ky-thuat-trong-quy-hoach-thanh-pho-thong-minh-o-viet-nam-20201224000011249.html.

https://vietnamnet.vn/do-thi-thong-minh-can-nhung-tieu-chi-cu-the-nao-2030828.html

Resolution No. 31-NQ/TW dated December 30, 2022, by the Politburo on the Direction and Tasks for the Development of Ho Chi Minh City until 2030, with a Vision to 2045.
https://www.tapchicongsan.org.vn/web/guest/nghien-cu/-/2018/823933/xay-dung-thanh-pho-ho-chi-minh-tro-thanh-do-thi-thong-minh.aspx.
https://www.hcmcpv.org.vn/tin-tuc/phat-huy-vai-tro-cua-moi-can-bo-dang-vien-trong-viec-tham-gia-xay-dung-do-thi-thong-minh-1491891643.
https://www.hcmcpv.org.vn/tin-tuc/phat-huy-vai-tro-cua-moi-can-bo-dang-vien-trong-viec-tham-gia-xay-dung-do-thi-thong-minh-1491891643.
https://nguoidothi.net.vn/tp-hcm-dang-di-dung-huong-trong-xay-dung-do-thi-thong-minh-23456.html.
https://papi.org.vn/
4. Report of the People's Committee of Ho Chi Minh City on the Results of Administrative Reform Over the Years 2019-2022" (in Vietnamese).
https://vtv.vn/kinh-te/van-con-rao-can-trong-trien-khai-chinh-phu-dien-tu-20200918063141933.htm.
https://vecom.vn/bao-cao-chi-so-thuong-mai-dien-tu-viet-nam-2020
https://nhandan.vn/tp-ho-chi-minh-no-luc-xay-dung-do-thi-thong-minh-post473566.html.
https://www.tapchicongsan.org.vn/web/guest/nghien-cu/-/2018/823933/xay-dung-thanh-pho-ho-chi-minh-tro-thanh-do-thi-thong-minh.aspx.
Project to Develop Ho Chi Minh City into a Smart City: Remaining Challenges and Solutions." Source: www.hcmcpv.org.vn, August 10, 2020. (in Vietnamese)
https://baochinhphu.vn/thuc-day-chuyen-doi-so-va-phat-trien-do-thi-thong-minh-102220616175308892.htm.
https://vnexpress.net/ty-le-ngan-sach-tp-hcm-duoc-giu-lai-thap-nhat-nuoc-4126726.html.