ISSN: 0974-5823 Vol. 7 No. 2 February, 2022

International Journal of Mechanical Engineering

Sustainable smart city construction in Da Nang city, Vietnam

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ABSTRACT

In Vietnam, many provinces/cities, including Da Nang city, have implemented and launched projects on sustainable smart cities and initially showed positive results. However, the construction of a sustainable smart city in Da Nang city is still facing many challenges and difficulties, requiring local authorities to continue to create a legal corridor, perfect the policy on construction building and developing sustainable smart cities; at the same time, have appropriate plans, roadmaps and solutions to realize the sustainable smart city development scheme for the period of 2018 - 2025 and orientation to 2030.

Keywords: Sustainable smart city; smart urban development project; Da Nang city.

1. INTRODUCTION

Da Nang city enters 2021 as the driving force of the central region of Vietnam. The initial results in building a sustainable smart city open up many new opportunities, creating momentum for Da Nang to build an urban government with a focus on convenience, connecting businesses, bringing many amenities for the people. Da Nang identifies building a sustainable smart city as the next step for urban government, in which information and communication technology is used as a tool to solve the challenges of current urban management modern, data-driven, information is collected, stored, processed, analyzed, and supported in decision making. In order to deploy a sustainable smart city, Da Nang city has promulgated the overall architecture of a sustainable smart city with 6 pillars and 16 smart fields period 2018 - 2025, orientation to 2030 with specific goals:

(1) by 2020, ready infrastructure, platforms and smart data;

(2) by 2025, intelligentize applications;

(3) by 2030, intelligentize community applications and complete the construction of sustainable smart cities synchronously connected with sustainable smart city networks in the country and in the Asean region.

2. RESEARCH QUESTIONS AND HYPOTHESES

Da Nang city aims to become an ecological, modern, livable city and by 2030, complete the construction of a sustainable smart city (Nguyen Trung Thanh, 2018). However, in the process of implementation, building a sustainable smart city has appeared many difficulties and challenges. Therefore, this study aims to establish a scientific basis for the improvement of policies and implementation of building Da Nang city into a sustainable smart city in the coming years and will answer the following questions after:

(1) The actual situation of implementation and results achieved when building a sustainable smart city in Da Nang city in recent years have met the tasks set out?

(2) What are the advantages and disadvantages of building Da Nang city into a sustainable smart city?

(3) What are the solutions to improve the policy and implement the construction of Da Nang city into a sustainable smart city in the coming years?

To answer the above questions, the following research will focus on solving the following tasks:

(1) Evaluation of the actual situation of implementation and results achieved when building a sustainable smart city in Da Nang city in recent years.

(2) Analyze the advantages and disadvantages when deploying and building Da Nang city to become a sustainable smart city.

(3) Proposing solutions to perfect the policy and deploy to build Da Nang city into a sustainable smart city in the coming years.

3. DATA AND METHODOLOGY

Identifying sustainable smart cities as an inevitable trend in the country's socio-economic development, over the past years, State of Vietnam have paid special attention to directing the exploitation and application of advances science and technology to support this work. On July 1, 2014, the Politburo issued Resolution No.36-NQ/TW on promoting the application and development of information technology to meet the requirements of sustainable development and international integration (Politburo, 2014).

On November 1, 2016, at the 4th Conference of the Party Central Committee (term XII) issued Resolution No.05-NQ/TW on a number of major undertakings and policies to continue changing new growth model, improve growth quality, labor productivity, and competitiveness of the economy, which clearly states: soon build a number of special administrative-economic zones; prioritize the development of a number of sustainable smart cities (The Party Central Committee, 2016).

On September 27, 2019, the Politburo issued Resolution No.52-NQ/TW on a number of undertakings and policies to actively participate in the 4.0 technology revolution, in which it is required to effectively utilize the society brought about by the 4.0 technology revolution to promote the process of renovating the growth model, restructuring the economy in association with implementing strategic breakthroughs and modernizing the country. In particular, for the urban sector, the goal is to have at least 3 sustainable smart cities by 2025 in the three key economic regions of the North, the South and the Central; by 2030, form a number of sustainable smart urban chains in the key economic regions of the North, the South and the Central; step by step connecting with smart city network in the region and the world (Politburo, 2019).

Implementing the Party's policy, the Government has issued the Action Program to implement Resolution No.36-NQ/TW; at the same time, promulgate many specific policies, such as: Decision No.1819/QD-TTg dated October 26, 2015 of the Prime Minister on approving the national program on information technology application in operations of state agencies in the 2016 - 2020 (Prime Minister, 2015); On January 11, 2018, the Ministry of Information and communications issued official letter No.58/BTTT-KHCN guiding the guiding principles of information and communication technology in building sustainable smart cities in Vietnam (Ministry of Information and Communications, 2018).

In particular, in Decision No.950/QĐ-TTg dated August 1, 2018 of the Prime Minister approving the project on sustainable smart city development in Vietnam for the period of 2018- 2025 and orientation to 2030 with the goal of: Objective: sustainable smart city development in Vietnam towards green growth, sustainable development, exploiting and promoting potentials and advantages, improving the efficiency of resource use; optimally exploiting resources and people, improving the quality of life, and at the same time ensuring creating conditions for organizations, individuals and people to effectively participate in research, construction investment, management smart city development management; limit risks and potential hazards; improve the efficiency of state management and urban services; improve the competitiveness of the economy and international integration (Prime Minister, 2018).

Based on the Government's policy of building sustainable smart cities, up to now, about 38/63 provinces and cities under the central government of Vietnam have been implementing a sustainable smart city project for the whole province or for some urban areas in the province (Saigon Economic Review, 2021). Basically, localities are implementing the construction of e-Government, focusing on building a public administrative center, deploying online public services at different levels, so there are many advantages. to implement the goal of sustainable smart city development. Most of the new localities are in the initial steps, signing partnership contracts, formulating sustainable smart city development projects, building architectural frameworks, piloting a number of urban services sustainable intelligence. Some localities have achieved initial results, bringing positive impacts and effects such as Ho Chi Minh City, Hanoi, Da Nang, Binh Duong, Binh Duong, Hai Phong...

Thus, the sustainable smart city development in Vietnam's provinces and cities is in the initial stage and initially showing positive results (Numbers and Facts Magazine, 2021). However, cities in Vietnam, including Da Nang city, are facing many challenges such as a distributed urban database system in many industries, lack of consistency leading to forecasting, direction and management are difficult. In order to provide objective and scientifically accurate solutions, we have conducted a survey of the current situation, evaluated the achieved results as well as analyzed the advantages and disadvantages when implementing the construction of Da Nang city sustainable smart city. In addition, we consult experts and managers in proposing solutions to continue to improve policies and deploy Da Nang city to become a sustainable smart city in the coming years.

4. RESEARCH RESULTS

4.1. Actual situation of deploying sustainable smart city construction in Da Nang city

In order to become a big, smart and creative city, Da Nang city has issued Decision No.1950/QĐ-UBND dated May 3, 2019 on the implementation of the project “Building a smart city in the city” (People's Committee of Da Nang city, 2019). Da Nang city in the period of 2018 - 2025, with a vision to 2030 in 2019 and 2020. The main tasks of the project are:

- Task group on smart management:

(1) Upgrading and expanding the city urban network (MAN Network);

(2) Upgrading and expanding Da Nang data center;

(3) Centralized monitoring, operating and processing center, multitasking (phase 1);

(4) Forming specialized data sharing platform;

(5) Building an urban spatial database;

(6) Completing the database of citizens, household registration, and enterprises;

(7) Building data warehouse (phase 1);

(8) Development of an intelligent data analysis platform;

(9) Update and upgrade the platform and application of the City's e-Government information system;

(10) Online public services level 3, 4;

(11) Pilot implementation of the model of "Smart urban area" in Lien Chieu district;

(12) Develop a set of criteria for evaluating the effectiveness of smart cities.

- Smart economy tasks:

(1) Building an intelligent tourism monitoring system (phase 1);

(2) Tourism database;

(3) Online accommodation system;

(4) Smart travel card (phase 1).

- Tasks on smart traffic:

(1) Developing and promulgating the information technology application architecture for the transportation industry;

(2) Intelligent traffic control monitoring system;

(3) Transport industry database;

(4) Traffic portal application;

(5) Parking monitoring.

- Tasks on smart environment:

(1) Developing and promulgating the information technology application architecture for the natural resources and environment sector;

(2) Building an automatic environmental monitoring system in the city;

(3) Building an integrated service platform for environmental monitoring data;

(4) Building a database of energy demand management;

(5) Building a database of electrical works based on GIS;

(6) Develop software to control power supply reliability and power quality;

(7) Building a database on the potential of rooftop solar energy exploitation.

- Smart life tasks:

(1) Completing the security and order monitoring system (phase 1);

(2) School IoT device surfing network;

(3) Educational databases and electronic school records;

(4) Vocational education database;

(5) Citizens health record database;

(6) Electronic hospital;

(7) Smart hospital (phase 1);

(8) Food hygiene and safety database;

(9) Traceability of food (phase 1);

(10) Vessel supervision;

(11) Forest monitoring.

- Smart citizen tasks:

(1) Smart city application incubator;

(2) Completing the data service portal;

(3) Deploy online payment methods for public services and public services;

(4) Communicating, training and guiding citizens.

- Group of tasks, mechanisms and policies:

(1) Develop and propose to the ministries and central branches a specific mechanism to have resources to build a sustainable smart city in Da Nang city;

(2) Develop and advise the City People's Committee to promulgate policies to encourage the socialization of smart applications through public-private partnerships and information technology service hire;

(3) Develop and advise the City People's Committee to issue the Regulation on sharing digital data;

(4) Deploying information safety and security for shared smart applications; appraise and guide departments, branches and localities to implement information safety and security for specialized intelligent applications. Permanently supervise, detect, warn, guide and support agencies and localities to handle incidents of malicious code, information safety and security;

(5) Lead and work with the Ministry of Construction to get the support of the Central Government in construction investment and pilot application of sustainable smart urban solutions for 01 out of 03 urban areas of the country according to Decision No.950/QĐ-TTg;

(6) Preside over advising the City People's Committee on plans and solutions to attract investment in renovating and embellishing existing urban technical infrastructure to apply sustainable smart city technology; attracting investment in the development of technical infrastructure for sustainable smart cities with priority (urban lighting, traffic, water supply, drainage, solid waste collection and treatment, power grid, warning);

(7) Advise the City People's Committee to establish, approve and deploy urban-level smart urban areas (existing and new) in the city;

(8) Using the results, especially the data of the programs and projects in this Scheme to promote the implementation of start-ups and innovations under the project "Development of the start-up ecosystem in Da Nang city to 2020, with a vision to 2030" according to Decision No.1219/QD-UBND dated March 6, 2017 of the People's Committee of Da Nang city;

(9) Advising on additional functions, tasks and personnel of relevant agencies and units to ensure the implementation of the Scheme and maintaining, updating and operating systems and applications after completion;

(10) Include training content on deployment and operation of smart systems and applications into the annual training and retraining plan for cadres, civil servants and public employees;

(11) Deploy international cooperation in supporting, cooperating in providing financial resources, consulting, transferring experience and solutions and technology of foreign organizations and enterprises in service of urban construction. sustainable smart market;

(12) Deploy the model of "Smart urban area" in the city's Hi-Tech Park. In addition, the city has also issued a list of programs and projects to be implemented in the period of 2019 - 2020 and assigned specific tasks to agencies in charge and coordination to implement the scheme.

4.2. Some results achieved when deploying and building Da Nang city to become a sustainable smart city

(1) About smart governance: Da Nang city has deployed the Mini IOC centralized monitoring system and 6 basic smart city services according to the urban service pilot guideline of the Ministry of Information and Communications (including: reflection service, suggestions; public service monitoring services; traffic monitoring services; urban order and security monitoring services; information safety monitoring services; social network information monitoring services) and 12 other additional services such as monitoring of water and air environment; monitoring the situation of the Covid-19 epidemic, open data, monitoring garbage truck journeys, ...

(2) About smart traffic:

- Da Nang deploys the center for traffic monitoring and signal control; nearly 200 smart traffic surveillance cameras and number plate recognition and traffic violation detection applications; piloting cameras to measure traffic and automatically control traffic control signal lights in real time… In addition, the city has used traffic monitoring and management systems deployed by central authorities such as: handling and exploitation systems using cruise monitoring equipment; driver license management software; weighing station management software.

- Da Nang is implementing specialized traffic projects for smart traffic such as parking monitoring, deploying high-quality bus systems, automatic ticketing systems, management and monitoring systems operating unit, traffic map system, real-time passenger information system at the waiting hall, central security monitoring system, infrastructure system); online traffic portal.

- In order to promote smart life, Da Nang has deployed the center to monitor security and order through cameras, and has mobilized people and businesses to equip more than 34500 security surveillance cameras; pilot application of identification for urban management...

(3) Field of security and order and natural disaster prevention, rescue and rescue:

- Deploying a system of surveillance cameras for security and order, so far the city has invested about 1800 specialized cameras. At the same time, the system is also connected to 25000 cameras equipped by people and businesses.

- Testing the surveillance camera system at Tho Quang dock area to detect and manage boats entering/exiting at the dock. Pilot application of forest fire detection and warning.

(4) About smart education: The city is piloting a network of IoT devices to monitor schools; the sound system informs the classroom; school lighting system includes central management system and light monitoring system of 26 classrooms.

(5) Electricity supply field:

- In the field of smart grid: Da Nang city is supplied with 100% electricity from the national grid, there is no renewable power plant (solar, wind, waste). Currently, EVN has deployed a monitoring, control and data acquisition (SCADA) system for substations, intermediate stations, and isolation bridges for the power grid; 100% of 110kV, 22kV, 0.4kV substations are deployed to measure and collect data remotely; replace 100% of individual customer meters with electronic to read readings remotely, through a centralized control center.

- In the field of public lighting: the city has established a centralized monitoring center for public lighting electricity; piloting power distribution cabinets in Hai Chau district and replacing LED lights in 19 streets in the city.

(6) Food safety and hygiene:

- Building a food safety portal, publicizing information and data on food safety at antoanthucpham.danang.gov.vn.

- Building a food safety database for departments, departments, branches and people's committees of districts to use together, serving food safety management; assisting people to look up restaurants, street eateries, processing facilities, and production facilities that meet food safety standards (via SMS, via Zalo, via the 1022 switchboard). Piloting to look up the origin of food sold at Han market via QR Code is being piloted.

(7) About smart health:

- Da Nang has deployed electronic health applications at 100% of commune and ward medical centers, hospital management applications and electronic medical examination and treatment at all 16 district health centers and general hospitals, specialty, integrated online hospital fee payment, health insurance.

- Forming citizen electronic medical records and managing patient codes in the whole city, with 1367268 citizen data, integrating and synchronizing medical examination and treatment data with all 16 hospitals and all 56 stations commune and ward health centers in the city. Recently, when the Covid-19 epidemic broke out, these systems have been effective, such as online medical examination and treatment registration ...

(8) Water supply field:

- Deploying SCADA system to monitor water flow and pressure through monitoring sensors, automatic monitoring of factors such as water level, flow rate, pressure and water quality; collect and process data, give appropriate reports and warnings.

- Implement an online control system for water quality of raw surface water (input water), treated water and water brought into the supply network for customers; the criteria of turbidity, pH, salinity... are controlled continuously and automatically.

(9) Environmental field:

- Implemented and installed automatic and continuous monitoring and monitoring system at 06/11 wastewater treatment stations (04/06 industrial parks and 02/05 domestic wastewater treatment stations); 01 automatic water environment monitoring station on Cau Do river and a number of production units with a wastewater discharge capacity of over 1,000m3/day; 01 air quality monitoring station (Air Quanlity Index-AQI) meets the requirements and meets the criteria of the Environmental City Project (AQI from 61.20 to 74.77/year);

- The air environment monitoring system (product of the microchip center under the Department of Information and Communications), including 16 measuring indicators, is installed at the city's administrative center.

- Implemented a water environment monitoring system in 05/10 lakes of the city, monitoring water quality indicators for early detection and warning timely handling, avoiding environmental crisis.

In addition, Da Nang has also deployed smart energy, using Chatbot to guide visitors automatically; online accommodation application to register and manage tourists staying in Da Nang (web and mobile app). Deployed the Chatbot application to guide public service administrative procedures and had more than 103,000 automatic answers, an average of 4,000 times per month. In July 2019, Da Nang put the online public service portal into operation. Currently, the whole city has 97% of administrative procedures implemented online; 50% of online public services reach level 4 compared to the target set by the Government. Up to now, about 130,000 electronic corporate and citizen accounts have been allocated. Using electronic citizen data to automatically fill in eforms, blanks, receipts for the convenience of citizens and officials. People enjoy the pilot of automatic document issuance, without having to go to a one-stop shop to receive results.

The e-government information system has been put into use by Da Nang since July 2014, deploying shared applications to serve the internal operations of agencies, granted to 100% of staff, with nearly 20,000 accounts email usage; 100% administrative dossiers and electronic one-stop application, sending and receiving documents at four levels of government; 99% of all electronic documents sent in communication are not accompanied by paper copies. The city's public service portal, there is also the Da Nang Feedback and Rescue Portal (1,000 times/month), the Give and Take application and the 1022 Call Center (10,000 turns/month); Automated consulting chatbot (more than 4,000 consultations/month), open data portal, e-portal, Danang Smart City application. Building a

sustainable smart city needs to mobilize large resources, from 2014 to now, the Department of Information and Communications of Da Nang has actively acted as a focal point, connected and mobilized the active participation of organizations, domestic enterprises (Viettel FPT, VNPT, Vietinbank, MoMo, ABB...) and international (KOICA, JICA, WeGo, ASCN, Deagu City - Korea...); especially the resources of local units and businesses to deploy a number of smart application systems under the Da Nang brand (Make in Da Nang) and have been successfully replicated in other localities.

Conclusion: Compared to the target set by 2020, Da Nang has completed 12/13 target groups set out in the Smart City Construction Project (01 goal of "smart travel card" is temporarily suspended, moved to the next stage); completed 11/13 tasks by 2025 of Project 950. Through the process of smart city deployment, the city has achieved initial success so far and has been recognized by international organizations as the Excellence Award. WeGO Award in the field of bridging the digital gap awarded by the World Organization of Sustainable Smart Cities WeGO in 2014; ASOCIO Smart City Award awarded by the Asia-Oceania Computing Industry Organization in 2019; The Vietnam Smart Cities Award 2020 is organized and awarded by the Information Technology Services and Software Association (VINASA) (the only award for the group of cities/cities). In addition, in 2020, Da Nang also received the Smart Digital Infrastructure Award (including digital data), smart public services. These are examples of the results of infrastructure development and public services in Da Nang. In April 2021, Da Nang has just reached the top of smart city governments in the Asia-Pacific region according to the ranking of Eden Strategy Organization. Accordingly, Da Nang is one of 30 cities with "unique and innovative smart city initiatives" and one of the five typical cities of the Asia-Pacific region, along with other major cities. such as Munich, Geneva, Manchester, Orlando, Pittsburgh...

4.3. Conditions of benefits and difficulty exists when deploying to build Da Nang city into a sustainable smart city

(1) Conditions of benefits:

- Leaders of Da Nang city are determined, directing agencies, units and localities to focus on promoting sustainable smart city construction, information technology application and development; The city has established a Steering Committee for Information Technology Application and Development, a Steering Committee for Sustainable Smart Cities led by the Chairman of the City People's Committee to direct the implementation. Consensus participation from leaders, officials and employees of all agencies, units and localities across the city.

- Mechanisms and policies for the application and sustainable development of smart cities are fully, promptly and regularly supplemented and updated; especially central documents such as Resolution No.52-NQ/TW dated September 27, 2019 of the Politburo "on a number of undertakings and policies, actively participating in the fourth industrial revolution"; Resolution No. 43-NQ/TW dated January 24, 2019 of the Politburo on construction and development of Da Nang city to 2030, with a vision to 2045, which defines building a sustainable smart city and develop spearhead fields Information technology industry, electronics and telecommunications associated with digital economy; and Resolutions of the XXI Congress of the Party Committee of Da Nang City, term 2016 - 2020; Resolution No.07-NQ/TU dated April 16, 2019 of the Standing Committee of Da Nang City Party Committee on the development of information and communication technology infrastructure to approach the trend of industrial revolution 4,0. In each period, framework documents have been developed to ensure the orientation of models, processes and technologies for development: e-government architecture, smart city architecture.

- Results and experiences gained in pilot deployment of smart applications in the past time; At the same time, the readiness of technologies (cloud computing, artificial intelligence, big data, automation, internet of things...) is an opportunity for Da Nang city to deploy a sustainable smart city. at now.

- Information technology human resources for management in state agencies; technical team to ensure operation and build a force of experts to advise and critique to ensure the selection of technologies and solutions; advise city leaders; support people and businesses to access and use information technology applications.

- The growth of businesses, especially software and digital content businesses, has had local and domestic solutions to apply recognition, machine learning, cloud computing, and analytics technologies. data... creates the necessary confidence in being proactive about technology to continue to develop better in the coming time. People and businesses in Da Nang city have relatively high skills and application of information technology (high rate of mobile and Internet subscriptions; 98.0% of households have computers, 97.9% of households have computers internet connection; 100% Internet-connected businesses).

- Investment funding sources are diversified and supplemented from many sources, including capital from the state budget and funding from enterprises and information and communication technology groups (IBM, Intel, VNPT, Viettel, FPT ...), capital from investors, sponsors Vietinbank, World Bank, KOICA..., state budget capital is interested in cooperation and implementation.

- The participation of the social community to support the deployment of sustainable smart city construction, especially information and communication technology systems to ensure the monitoring of security and order situation in urban areas. residential; people voluntarily register for electronic citizen accounts; participate in commenting and reflecting on issues related to urban management on the electronic government information system...

(2) Difficulty exists:

- Sustainable smart city based on data is the idea of developed countries; these solutions and products are suitable for countries with high economies, Vietnam with low economic scale; Da Nang has a low per capita income, the choice of solutions, investment scale, investment items and when to invest are issues that need to be evaluated and criticized... to ensure effectiveness. it is a difficult problem.

- Data must ensure inter-regional connectivity in the deployment of sustainable smart cities, there should be connection between departments, branches, districts and districts; data sharing by central ministries and branches; the synchronization from senior leaders so that the system is consistent in terms of data, not in terms of processes; this is a very difficult problem when building and operating the system; especially for a sustainable smart city, this is a very important requirement to ensure the continuity from collection to storage, processing and decision-making.

- Issues related to data standards and regulations that have not been standardized in the fields of Education, Health, Transport, Environment...; Localities depend too much on consulting partners and businesses to provide solutions, using different standards, with no common metrics.

- The policy is inconsistent in the issuance of state management documents of each industry that do not support the application of technology, the Sandbox mechanism has not been recognized to support the pilot, leading to the risk of disrupt architecture, affect data exchange, lack of synchronization, slow down the data building process for sustainable smart city development.

- The implementation of a sustainable smart city requires quite large and long-term funding and has not yet created an environment for businesses to participate in for appropriate investment due to being bound by investment institutions.

- The data infrastructure of the city depends on the central ministries and branches; specialized databases (resources, environment, traffic, construction, security) under the "ask – give" mechanism; local data is still sandy and fragmentary, lacking a sharing and updating mechanism.

- Data has a decisive role as the soul for intelligence, through piloting, showing human resources for data construction, management and analysis..., requiring high qualifications and narrow expertise. This human resource is being invited by enterprises to compete, attracting this human resource is very difficult, so in fields such as Education, Health, Tourism, Transport, environment... human resources are not available. ready to receive and operate information technology systems for e-government and sustainable smart cities.

- Communication about smart services has not been effective; the use of online public services has not been widespread, the habit of interacting with systems such as scene reflection, online public services, etc., of the people is not uniform on the basis for creating data.

4.4. Solutions to complete policies and deploy to build Da Nang city into a sustainable smart city in the coming years

(1) Propaganda and awareness raising: Develop programs and propaganda materials to disseminate through mass communication channels for people about the benefits in building a sustainable smart city as well as provide information to people about applications and utilities smart government so that people can exploit, monitor and monitor. Promote the work of information and communication on the mass media to raise awareness for state agencies, organizations, businesses and people about the plans and contents of the implementation of the development scheme. Sustainable smart cities create consensus among all levels of government and people in the city to deploy synchronously and effectively in the city.

(2) Developing mechanisms and policies: Developing and promulgating regulations, synchronous regulations, uniform processes in the use of shared and specialized applications; regulations on management, operation and use of sustainable smart urban infrastructure, sustainable smart urban management system of the city and sectors in a synchronous and unified manner to ensure the operational process is effectively implemented in the construction and operation of the smart city of Da Nang. Develop coordination regulations, cooperation programs with agencies and organizations on ensuring safety, information security and confidentiality of information on the Internet. Promote the use of digital signatures in information technology application activities of state agencies. Develop policies to encourage people and businesses to conduct electronic transactions, use online public services, and apply technology and smart services to life to improve the quality of life, study and work.

(3) Organizational structure and human resource development:

- Training of cadres and civil servants: Every year there is a plan to train, retrain and disseminate knowledge and skills of information technology application, information safety and security to be able to carry out the tasks. professional and operational computerization process; skills in using and exploiting integrated information systems of sustainable smart cities.

- Training staff in charge of information technology: Implement training and retraining programs on construction, management and supervision of information technology application, safety and security projects for staff. specialized in information technology; organize intensive training, train a number of experts, deploy smart applications of the fields.

- Training information technology leaders (CIOs): Deploying training programs on management, directing organizations to apply information technology to solve professional problems and manage costs and risks; skills to identify and evaluate new technological developments; thinking skills and transferring smart application projects to well implement the smart city construction and development strategy.

(4) Solutions on technology and standards: Prioritize the selection and investment of modern and suitable technology for smart city deployment such as cloud computing, artificial intelligence, virtual reality and research and development, technology transfer to appropriate software. with smart city development orientations. Uniform application of information technology application standards: standards on connectivity, standards on integration of databases, information access, information security and data specifications to ensure connection smooth, synchronous connection and the ability to share and exchange information safely and conveniently between state agencies and between state agencies and organizations and individuals.

(5) Financial solutions: To ensure the capital to meet the application and sustainable development of smart cities, it is necessary to mobilize capital from many different sources. Mobilizing and using capital sources from the state budget, from socialization sources and from other sources; encourage forms of outsourcing, public-private partnership to implement projects of application and development of information technology to build sustainable smart cities.

(6) Ensuring information safety and security: Focus on building a contingent of technical staff with appropriate qualifications to manage, operate, and ensure information safety and security for the network information system of agencies and units in the city. Paying attention to infrastructure and technical investment; increase the use of anti-virus software and regularly maintain and maintain the internal network and computers at the agency. Timely prevent, prevent and quickly overcome attacks on the system.

(7) Strengthening information technology application: Focus on applying information technology in the direction of sustainable smart city development in all industries and fields, especially in the fields: information and communication, education, health, tourism calendar, resources and environment, traffic, security and order. Strengthening the provision of online services, smart services for people such as: public administrative services, distance learning (e-learning), electronic learning materials (e-library), school connection - family, government - citizen, patient - doctor, ...

(8) Strengthening international cooperation, joint ventures: Promote international cooperation in information technology associated with smart application fields of sustainable smart cities such as education and training, research and transfer to meet the requirements of industrialization and modernization. Attract investment from strong IT corporations from countries with traditional cooperation relations with the province such as Japan, Korea and Asean countries. Organize cooperation with educational institutions, training, reputable information technology firms at home and abroad to train experts in information technology for the province and cooperate in working and investing intelligence and resources to the province. Actively seek domestic and foreign partners to establish relations, enlist support and help in all aspects, share information and knowledge, experience, transfer technology of domestic organizations and international companies, multinational companies, research institutions, consulting centers, experts, especially overseas Vietnamese in building and developing sustainable smart cities.

5. CONCLUSION

It is forecasted that by 2030, the population of Da Nang will be about 2.5 million people, of which the official urban population is about 2.3 million people. As a connecting city and a locomotive in the Central - Central Highlands region, on the basis of existing infrastructure, Da Nang is striving for sustainable development, becoming a green, modern and sustainable smart city, people's quality of life will be improved. In particular, it will eliminate greenhouse gas emissions; have crime prevention solutions, emergency support services; have smart transportation and transportation solutions that save time; deploying smart medical solutions to improve life expectancy; create many jobs; have solutions to choose housing and save energy to save costs and facilitate the implementation of sustainable development targets of the United Nations.

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