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Proposed Consumptions for Building Ho Chi Minh City a Smart City from the Experience of Some Countries in the World

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ABSTRACT: Urbanization is taking place in many parts of the world and is being implemented rapidly in regions of dynamic development. Vietnam is one of the countries with fast international integration. Therefore, the process of urbanization is also very developed. Ho Chi Minh City - one of the two most developed cities in Vietnam also has a strong urbanization process. However, for this urbanization to be sustainable, effective measures are needed. Therefore, we propose some measures to build the city. Ho Chi Minh City has become a smart city from the experience of Japan, the Netherlands, and the US. Since their experience in building smart cities in these countries, we hope to contribute to building Ho Chi Minh City into a smart city in the 4.0 era.

KEYWORDS: Smart city, Ho Chi Minh City, experience, Japan, Netherlands, USA.

1. RATIONALE

Along with the development trend, the process of urbanization is taking place in many parts of the world and is being implemented rapidly in regions with dynamic development. According to data from several research organizations around the world, rapid urbanization leads to a shift of population from rural areas to urban areas. According to the World Health Organization (WHO), "In 2010, more than 50% of the world's population lived in urban areas. It is expected that by 2050, this rate will increase to 70%" (http://aita.gov.vn/). In general, population growth in balance with development will make an important contribution to promoting economic development, allowing the accumulation of capital, material, technical and human resources, creating favorable conditions for economic development. job development and provide a cleaner living environment. However, the problem is how to develop cities sustainably. In recent years, the concept of building a smart city has been introduced and tested in several cities in developed countries. So what is a smart city?

Assoc.Prof.Dr. Nguyen Van Thanh affirmed: "Building and developing a smart city that ensures security, well-being and safety indicators in the context of the Fourth Industrial Revolution" that: "A smart city is a The city uses an integrated system control tool connecting the real world system and the virtual world, mainly system thinking, the means is using information and communication technology: the goal of building a city valuable, vital, competitive and resilient streets, the measure of which is the satisfaction of the residential community; criteria to meet the standards of security, safety, and safety in terms of design, society and environment". (Nguyen Van Thanh, 2018, p.8)

And the telecommunications technology standards research organization (ITU-T) gives the closest definition to reality in the current context: "A sustainable smart city is an innovative city using innovative technologies. Information and communication technology and other means to improve the quality of life, urban service efficiency, and competitiveness, and at the same time ensure that the needs of present and future generations are met. Future in economic, social, environmental, and cultural aspects".(https://forbesvietnam.com.vn).

The Central Institute for Economic Management (VIETNAM) once affirmed: "A city can be called smart when it invests in human and social resources along with information and communication infrastructure to promote the development of economic development. Economically sustainable development and improve the quality of life, while effectively managing natural resources through coordinated management".(Central Institute for Economic Management, 2018, p. .2).

There are many different definitions of a smart city in the world, but in general, the concept of a smart city can be understood as: "a city with outstanding economic growth achievements and improved quality of life thanks to the application of information technology and telecommunications technology to the city's infrastructure. Smart cities monitor critical infrastructure including bridges, roads, tunnels, railways, subways, airports, seaports, communications, water, electricity, and even large buildings, to optimize resources and security. And these cities maximize services to their citizens, providing a sustainable environment that promotes happiness and well-being. These services are based on information and communication technology infrastructure."

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In recent years, Smart City deployment projects have been implemented around the world. According to statistics from the research report "2012 of Yonsei University (Korea) to 2012, there are about 143 Smart City deployment projects being implemented around the world, concentrated in North America and South America. , Europe and Asia" (http://aita.gov.vn). Therefore, it is necessary to learn about smart city construction activities in developed countries and draw experiences to apply to big cities like Ho Chi Minh (Vietnam).

2. CONTENT

2.1. Experience in building smart cities in some countries in the world

2.1.1. Japan

Assoc.Prof.Dr. Nguyen Van Thanh: Japan is building its smart cities by integrating smart communities, such as the Toyota Smart Community (F-Grid) project. Japan's smart city strategy is also based on an effort to maximize the synergies between smart adaptation and smart mitigation.

A relationship between communication adaptation strategies (such as afforestation, flood control, and emergency response) and mitigation (including energy efficiency, renewable energy deployment, and modality changes). in transportation) may overlap and thus reinforce each other.

These synergistic outcomes include (but are not limited to) green infrastructure, resilient critical infrastructure, and compact cities. All synergistic factors are core to Japan's smart community.

Purpose of Japanese smart community:

First, large-scale deployment of a distributed energy distribution system with a focus on renewable energy;

Second, using information technology, storage, and grid connection to synchronously generate electricity to balance supply and demand in the community.

Third, to form a network of residential areas, offices, and buildings using renewable energy, storage, and other infrastructure to realize a self-healing energy system after a disaster with a high degree of autonomy. high automation.

A typical example of the construction of a smart city in Japan is Hirosaki City. Spatial planning of this city: "Plan for Optimization of Places" is part of Hirosaki City's plan to build a smart city. As with most Japanese smart community projects, policy integration between energy and spatial planning has resulted in strong, well-funded partnership programs to accelerate the process. The integration-centric policy is to respond to population decline and aging in the face of increasing climate change and other hazards. Site optimization plans have guided the relocation and densification of hospitals, schools, aged care, and other public services. The increase in density will increase the cost performance – the benefit of the smart energy grid relative to the input, while reducing energy use. For example, the concentration of population and social infrastructure reduces the need for motorized transport (especially single-passenger cars) to support the use of public transport, cycling, and commuting. set. Besides, it cuts down on the energy used to pump water away. It also reduces the per capita costs of maintaining roads and other critical infrastructure.

The integration of spatial planning with energy distribution has been underway over the past three years, with the number of cities adopting the "Location Optimization Plan" increasing from 62 municipalities in December 2014 to 384 urban areas in December 2017. Central agencies also linked most with each other with the Compact City Design Support Group initiative, improving the efficiency of planning and spending through the reduced overlap and other sources of administrative inefficiencies.

Research results show that, at least in Japan, building Smart Communities produces very impressive results. Smart communities are at the core of a policy that combines environmental protection, adaptation, and resilience to disasters and promotes the efficient use of renewable energy. In addition, Japan has more ambitious goals than renewable energy and reducing greenhouse gas emissions. Technical approaches to organization and financial resources to lead an energy revolution and create a cost-effective and competitive environment in a country with many demographic challenges, finance, climate, and natural disasters.

2.1.2. Netherlands

Amsterdam is the capital of the Netherlands, founded in a small fishing village on the banks of the Amstel River. In 1270, people built a levee to prevent floods here and named it Amsterdam. Since then, the name of the dyke is also the name of the city and the capital of the Netherlands. Later, the development of trade with countries along the Mediterranean and Baltic seas made Amsterdam an important and bustling trading port of Europe.

Although not in a "prime" position for the construction of a permanent Capital, but over the centuries built and developed by its inhabitants, Amsterdam today has become one of the most beautiful cities in the world. world famous for its culture, art, and science. However, today, people know Amsterdam more than sustainable urban development.

Amsterdam is ranked 10th on the ranking of smart cities in the world and 4th in Western Europe.

The Dutch capital is ranked 3rd in technology, 6th in international reach, and 13th in the world rankings for urban planning. Urbanization in recent years has led governments to take more initiatives toward creating a sustainable urban environment. The city is a good opportunity to apply new technologies such as public transport, advanced heating and cooling systems, especially technology applied in green buildings.

Amsterdam will be one of the first cities to be affected by sea level rise due to climate change, so in a variety of ways, leaders have chosen to develop a CO2-reducing method of transport. It is the most convenient way to convert from private to public transport, with special emphasis on using bicycles.

The City of Amsterdam started in 2009 as a smart city initiative with more than 170 collaborative projects developed by the city's citizens, authorities, and businesses. These projects operate on wirelessly connected platforms to enhance real-time decision-making for the city. The city also stated that the main goals of the smart city project are to reduce traffic congestion, save energy and improve safety for residents. To encourage the efforts of local people, the city of Amsterdam organizes an annual smart city initiative competition to capture and apply citizens' initiatives and applications in line with common development goals. of the city. For example, the Mobypark application helps people rent parking spaces to those in need.

The city relies on the data collected from this app to determine parking space needs and vehicle movements in the city. Some families are provided with smart devices that measure energy consumption, thereby helping people reduce unnecessary energy consumption. Other innovations such as smart city lighting allow the city to control and adjust the brightness of street lights, and smart traffic management allows real-time traffic flow determination on the street. several routes from which to choose the most optimal route.

Along with that is the policy of developing "Smart Street" projects with a combination of many businesses in the city. These projects focus mainly on energy-saving solutions in buildings and streets to reduce CO2 emissions through the use of advanced technologies and encouraging behavior change.

Many projects have been established in 4 different areas: sustainable public space, sustainable transport, sustainable living, and sustainable work. The goal of this smart project is to test environmental technologies and pilot programs in the city. These initiatives will then be tested to draw successful lessons and limit risks, increasing sustainability when applied on a larger scale. This process creates the foundation for sustainable solutions in the future.

One of the best projects among the above projects is the "Climate Street" project. On these streets, various technologies have been applied that will be tested to create sustainable solutions for other streets in the city. The project focuses on businesses, public spaces, and logistics.

Some examples include the implementation of smart metering of energy consumption, smart lights that automatically dim when no one is present, integration of street lighting using energy-saving bulbs, and more. this project is many other projects launched at the same time to make a lot of visual impact on sustainability. These projects and programs of action have become an inspiration to other cities, creating a platform for widespread change. The information collected from the projects is shared on the website to ensure knowledge sharing.

2.1.3. America

The City of San Diego started its smart city initiative in 2014. After a while, the local government's constant efforts in applying science and technology have earned it the title of "smart" city. "America's Best for San Diego. Starting in 2014, the city government partnered with General Electric to install more than 3,000 street lights into the wireless system to save energy and reduce greenhouse gas emissions. With this move, the city can control the lights remotely, saving more than half a million dollars in energy and maintenance each year.

However, the city government knows that street lights are much more than that. That's why they installed smarter street lights, which can monitor parking spaces, track illegal activities, and even measure air quality. Built on a separate Internet of Things platform, these modern lights integrate cameras, microphones, wifi, Bluetooth, and even sensors to measure temperature, humidity, and even magnetic fields. The computer algorithm allows these lights to help drivers find a suitable parking place and report it to the authorities when it detects illegal parking.

Not only that, the city government is ambitious to build phone applications about these lights to help locals and tourists. In addition, San Diego hopes to be able to use technology to filter out dangerous roads that need improvement, based on nearby data, not just traffic accident data. This is a way to improve the safety of road users.

To address traffic congestion, the city's transportation department has partnered with private companies to expand the range of information the city can provide. Waze's Connected Citizen Program can Connect to use information from over 600 other places, providing information about traffic jams, the location of potholes, or notifications of animals crossing the road. With this program, the city does not need to install any additional sensors because all information is provided from the user's smartphone.

The city government is also trying to improve other aspects of the transport infrastructure. At San Diego International Airport, for example, Terminal 2 has smart parking guidance technology and a storm drain system. Electric charging stations are also installed to support electric vehicles.

The movement to save energy and reduce pollution also spread to the Port of San Diego. To improve the atmosphere, the city uses a near-shore energy system, allowing cargo ships to plug in and charge right at the port instead of having to run a diesel engine.

In 2014, the government installed sensors to measure energy consumption, providing users with real data and easy control. Even the trash cans are equipped with sensors to measure the effectiveness of the application of real data in garbage collection and cleaning of floodplains.

The government also cooperates with many other organizations and companies to tackle climate change, improve infrastructure and quality of life. (http://dothi.reatimes.vn/)

By studying countries around the world about building and developing smart cities, we can see that their evaluation standards are based on 6 criteria:

- Smart economy (competitive development);
- Smart movement (traffic - technical infrastructure);
- Smart residents (human resources, capacity);
- Intelligent environment (natural resources);
- Smart city management;
- Good quality of life (smart).

Thus, with the explosion of the Fourth Industrial Revolution, the trend of building smart cities has become an indispensable development method for urban areas, especially big cities in the world. like in Vietnam, especially in cities with rapid urbanization like Ho Chi Minh City.

2.2. Some recommendations to build Ho Chi Minh City into a smart city

The Industrial Revolution 4.0 has had an impact on many countries around the world, bringing many opportunities and advantages to countries in general and cities in particular to build a smart city. Ho Chi Minh City can learn from the experience of many other countries; grasp the fields of science and technology.

2.2.1. Advantages and Challenges of Ho Chi Minh City in Building a smart city

Advantages: Looking back at the nation's history, we see that Ho Chi Minh City was opened and appeared on the map of Vietnam in 1698, Nguyen Huu Canh established Gia Dinh Palace. Marking the birth of Ho Chi Minh City with the name Gia Dinh. In the 19th century, this city was known as the pearl of the Far East.

Today, in the 21st century, TP. Ho Chi Minh City is located in the central position of South - Vietnam is a city directly under the central government and has strong socio-economic development conditions with a population of 8,993,082 people1. As a leading place in terms of economic development, the period 1996 - 2000 accounted for 17%, the period 2001 - 2010 accounted for 20% and the period 2011 - 2019, accounted for more than 22% of the national economy2. The rate of contribution to the State budget of the city is also increasing, in the period 2001-2010 accounted for 26.5%, and in the period 2011 - 2019 accounted for 27.5%.(Bui Ngoc Hien - Phan Thi Thuy Tien, 2021)

Becoming a smart city is a necessary condition for the city to develop sustainably in the coming decades. At the same time, bringing practical benefits to each citizen of the City in the new context, with the impact of the industrial revolution 4.0 and international integration.

To effectively exploit the City's advantages and potential, the City People's Committee issued Decision No. 6179/QD-UBND dated November 23, 2017, approving the construction project of the city. Ho Chi Minh City becomes a smart city in the 2017-2020 period, with a vision to 2025, which defines: "Ho Chi Minh City. Ho Chi Minh City will develop a relatively high and sustainable economy, based on the best exploitation of resources, with the people as the center of the city"; Decision No. 2393/QD-UBND dated July 3, 202 approving the digital transformation program of the city. Ho Chi Minh also clearly stated the purpose: "By 2030, Ho Chi Minh City will Ho Chi Minh City becomes a smart city with fundamental and comprehensive innovation in the operation of the digital government apparatus of digital businesses and the prosperity and civilization of a digital society"; Decision No. 4250/QD-UBND dated September 28, 2018, approving the architecture of the city government. Ho Chi Minh; Decision No. 2392/QD-UBND dated July 3, 2020, on building and updating the architecture of the city government. Ho Chi Minh.

Difficulties: In the transition to building smart cities, cities face many common challenges brought by the world context such as impacts of non-traditional security (28 global risks); risks from emerging technology…

In addition, the percentage of the budget that is remitted to the City is gradually decreasing, "in 2000, the percentage of the budget retained was 33%, but only 18% in the period 2017-2020" (Bui Ngoc Hien). – Phan Thi Thuy Tien, 2021). This fact leads

to decreasing resources, causing many difficulties in balancing and regulating development as well as investing in building smart cities and implementing digital transformation programs.

At the same time, Vietnam in general and Ho Chi Minh City in particular also have limitations in receiving the impact of the fourth technological revolution such as lack of synchronization, development bias, new appeared only the field of e-commerce (in 15 key areas of the fourth technological revolution); … This is also considered a challenge for Ho Chi Minh City.

Besides, there are also many other challenges such as flood control, environmental pollution reduction, and traffic congestion... These issues are becoming more and more urgent, requiring city authorities to pay attention and handle them. Thoroughly.

2.2.2. Some recommendations to build Ho Chi Minh City into a smart city

Firstly, developing e-government as the core to building a smart city, creating the most favorable conditions for people and businesses when communicating with government agencies, and gradually improving the quality of life of people. people based on selecting the most essential areas to improve: environment, health care, education, traffic, security and safety, tourism, and urban management...

Second, building the infrastructure foundation for a smart city with a centralized monitoring and control center connecting to the telecommunications infrastructure, receiving and processing information flows in various fields of social life. of the city, forming an information system and large database, integrating, exploiting, and providing visual information to support leaders in making timely and accurate decisions.

Third, to form a centralized science and technology transfer zone and build a start-up business incubator to actively participate in the process of industrialization - modernization and building a smart Ho Chi Minh city.

Fourth, strengthen the training of high-quality information technology human resources for smart city development. Swedish Ambassador to Vietnam Pereric Hogber emphasized so when sharing Sweden's experience in smart city development at the ASOCIO Smart City Summit 2018: "Want to have the smartest city Smart people are needed. New smart people have smart apps and smart policies. The key is that people and governments have to take responsibility for smart development that comes with a smart economy." (https://theleader.vn/) In addition, it is necessary to strengthen communication and promotion to raise public awareness of the benefits of smart cities and actively participate in the construction process. , operate the smart city.

Fifth, using planning as a tool to orient and manage smart cities according to the following principles:

"Develop to preserve – Preserve to develop"
"Planning and design must conform to the laws of nature"
"Plan first – Build later"
"Plan first – Invest later"
"Plan first – Build later"
"On Earth First – On Earth Later"
"Management according to ecological urban design indicators"
"The goal is to achieve a city of value, vitality, competitiveness, resilience"
"Do not develop first, fix later".

3. CONCLUSION

In summary, the implementation of smart city construction acts as one of the most effective solutions to support Ho Chi Minh City's faster and more sustainable development, accelerating the process of narrowing the gap between the two cities. distance from other cities in the region and the world.

However, to build a long-term successful smart city, Ho Chi Minh City. Ho Chi Minh City needs to focus on sustainability in three areas of society, economy, and environment. To do this requires great efforts not only from the government but also from the people. When focusing on sustainable development, businesses will implement the goals to bring the best living environment for people. Which, the most important issue of sustainable development is urban planning, and traffic system. Currently, if it is better planned, Ho Chi Minh will have better development conditions. Traffic in Ho Chi Minh City is currently facing many challenges in terms of infrastructure construction, traffic congestion, and environmental protection. Therefore, smart mobility applications and smart traffic will help people move more easily. Besides, smart city governments also need to pay more attention to smart communication networks, make large investments in infrastructure to provide smart payment services for people, and soon build a society. do not use cash. Hopefully shortly, with the efforts and efforts of the leaders and the people of Ho Chi Minh City. Ho Chi Minh City, this city will become one of the leading cities in smart city construction and development, worthy of its position as one of the two largest cities in Vietnam.

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