

HO CHI MINH NATIONAL ACADEMY OF POLITICS

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**DEVELOPMENT OF PHU QUOC SPECIAL ZONE, AN GIANG
PROVINCE IN THE DIRECTION OF SMART CITY**

DOCTORAL THESIS

MAJOR: POLITICAL ECONOMY

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INTRODUCTION

1. The urgency of the topic

The Fourth Industrial Revolution and digital transformation are taking place strongly, profoundly changing production methods, economic space organization and development management models. Digital technologies such as artificial intelligence (AI), big data, Internet of Things (IoT) and cloud computing not only create new elements of the production force but also impact the method of mobilization, allocation and use of resources, the method of creating and distributing value as well as the relationship of interests between actors in the economy. In that trend, smart city development has become an important orientation to improve the efficiency of resource use, management quality, competitiveness, quality of urban service provision and people's lives.

Phu Quoc Special Zone, An Giang province, with a natural area of about 575.29 km², a population of about 157,629 people, is the largest island city in Vietnam and holds an important strategic position in terms of economy, politics, defense and security on the southwest sea of the country [90]. With its location on an important maritime trade route of the Gulf of Thailand, marine resources, abundant natural landscapes and the ability to connect with economic centers in the region, the Phu Quoc Special Zone has many favorable conditions to develop tourism, services, marine economy and become a modern sea and island city in the direction of smartness.

The fact that Phu Quoc has become a special zone under An Giang province after the process of rearranging administrative units sets new requirements on decentralization, decentralization, budget management, planning authority and coordination mechanism between the special zone government and the provincial government. If it is not clearly defined and implemented synchronously, the overlap of authority, the dispersion of resources and the lack of consistency in management can affect the effectiveness of the development of the Phu Quoc Special Zone in the direction of smart city.

Stemming from the above requirements, the PhD student chose the topic ***"Development of Phu Quoc Special Zone, An Giang Province in the direction of a smart city"*** as a doctoral thesis in the direction of smart city in order to contribute to supplementing the theoretical and practical basis for the development of special zones in the direction of smart city, and at the same time provide scientific arguments for policy making, improving institutions and improving the efficiency of mobilization, allocation and use of resources, harmonizing interest relations and improving competitiveness, contributing to the fast, effective and sustainable development of Phu Quoc Special Zone in the new period.

2. Research objectives and tasks

2.1. Purpose of the study

On the basis of researching theoretical and practical issues on the development of special zones in the direction of smart city, the thesis analyzes, assesses the current situation and proposes solutions to promote the development of Phu Quoc Special Zone in the direction of a smart city in an effective way,

harmonizing interests and sustainable development to 2030, with a vision to 2045.

2.2. Research tasks

In order to achieve the set research objectives, the thesis focuses on performing the following main tasks:

Firstly, an overview of research works related to the thesis topic, an overview of the results and values that can be inherited, pointing out the limitations, research gaps and thesis issues that need to be clarified.

Secondly, systematizing, supplementing and clarifying the theoretical basis for the development of special zones in the direction of smart city, including the concept, characteristics, contents, evaluation criteria and factors affecting the development of special zones in the direction of smart city.

Thirdly, to study the experiences of the development of smart city and special zones of some typical countries, such as Korea, Singapore, China, Dubai; and at the same time to study the practices in Da Nang and Hue, thereby drawing reference lessons for the Phu Quoc Special Zone.

Fourthly, on the basis of the theoretical framework of the thesis, analyze and evaluate the current situation of the development of the Phu Quoc Special Zone in the direction of the smart city in the period of 2017 - 2025 in terms of the achieved results, limitations, causes and problems raised.

Fifthly, proposing directions and main solutions to develop the Phu Quoc Special Zone, An Giang province in the direction of smart city to 2030, with a vision to 2045.

3. Object and scope of research

3.1. Research objects

Research and development thesis in Phu Quoc Special Zone, An Giang province in the direction of smart city from the perspective of political economy.

3.2. Scope of the study

Content: The thesis does not delve into the technical solutions of smart city, but focuses on analyzing the economic relations between the State, enterprises, investors and people in the process of mobilizing, allocating and using resources; owning, managing and exploiting data; distributing value and ensuring harmony of interests. On that basis, the thesis researches four contents: (i) perfecting institutions and governance models based on data and technology; (ii) planning and development of infrastructure and technology; (iii) human resource development, digital economy and innovation; (iv) ensuring the harmony of interests in the development of special zones in the direction of smart city.

Regarding space: The thesis focuses on research in the Phu Quoc Special Zone, An Giang province; at the same time, it refers to and compares the experience of developing special zones in the direction of smart city in a number of countries and localities at home and abroad in order to draw lessons for the Phu Quoc Special Zone.

Regarding time: The thesis analyzes the current situation of the development of the Phu Quoc Special Zone in the period of 2017 - 2025; proposes development directions and solutions to 2030, with a vision to 2045.

4. Theoretical basis and research methods

4.1. Theoretical basis

The thesis is carried out on the basis of the methodology of Marxism-Leninism, Ho Chi Minh Thought and the views and guidelines of the Communist Party of Vietnam and the State's policies and laws on economic development, digital transformation, special zones and smart cities. At the same time, the thesis inherits and applies theories related to the development of special zones in the direction of smart city.

4.2. Research methods

The thesis is carried out on the basis of the methodology of Marxist-Leninist political economy, combined with social science research methods suitable to the research objectives and objects. Specifically: (1) scientific abstraction methods combined with logic - history, analysis - synthesis, induction - interpretation to systematize the theoretical basis and explain research problems; (2) methods of collecting, synthesizing and analyzing documents to inherit relevant research works, documents and data; (3) statistical, comparative and quantitative analysis methods to assess the current situation, development trends and related indicators; (4) SWOT is used as a tool to synthesize analysis results to identify strengths, weaknesses, opportunities and challenges; PCM is used to support the systematization of the relationship between problems, causes, objectives, solutions, resources and expected results. SWOT and PCM do not replace the theoretical framework and political economy analysis framework of the thesis.

5. New contributions of the thesis

5.1. Theory and approach

Firstly, the thesis contributes to clarifying and supplementing the concept of development of special zones in the direction of smart city. The thesis points out that this is not merely the process of applying digital technology to the management and provision of public services, but a specific socio-economic development process, in which the development of production forces is increasingly based on science and technology platforms, data, modern infrastructure and high-quality human resources; at the same time, this process requires the corresponding and synchronous completion of production relations, institutions and management methods, ensuring the harmony of interests between subjects in order to release and maximize development resources.

Secondly, the thesis develops an analytical framework for the development of special zones in the direction of smart city from the perspective of political economy. The analytical framework is built on the basis of clarifying the relationship of interests between participants (the State, enterprises, people, investors), establishing the principle of ensuring harmony of interests as an axis throughout the content and evaluation criteria; at the same time, identifying and explaining the system of factors affecting the development of special zones in the direction of smart city in association with the unique characteristics of special economic zones, overcoming the limitations of the mechanical application of conventional smart city theoretical frameworks to the special zone model.

5.2. Regarding practice

Firstly, from international and domestic experiences, the thesis draws six

reference lessons for the Phu Quoc Special Zone: perfecting specific institutions; synchronously developing technical and digital infrastructure; promoting the digital economy, innovation and high-quality human resources; building a people-centered smart governance model; linking development with environmental protection and adaptation to climate change; strengthening regional linkages and international integration.

Secondly, based on the empirical database and the developed analysis framework, the thesis conducts a comprehensive and practical analysis and evaluation of the results achieved, the remaining limitations and clearly indicate the causes of the limitations in the process of developing the Phu Quoc Special Zone (An Giang province) in the direction of the smart city. This is an important practical basis, serving as a solid foundation for proposing the solution system of the thesis.

Thirdly, on the basis of combining the results of theoretical and practical research with the analysis of the domestic and international contexts, the thesis proposes a system of synchronous and highly feasible solutions, closely following the actual conditions and development characteristics of the Phu Quoc Special Zone, An Giang province, contributing to providing scientific arguments for policy making for the development of special zones in the direction of smart city in the coming period.

6. Structure of the thesis

In addition to the introduction and conclusion, the thesis is structured into 4 chapters with 11 sections, specifically as follows:

Chapter 1: Overview of the research situation related to the development of Phu Quoc special zone, An Giang province in the direction of smart cities.

Chapter 2: Theoretical and practical basis for the development of special zones in the direction of smart city.

Chapter 3: The current situation of development of Phu Quoc special zone, An Giang province in the direction of a smart city.

Chapter 4: Directions and solutions for the development of Phu Quoc special zone, An Giang province in the direction of a smart city.

Chapter 1

OVERVIEW OF THE STUDY

REGARDING THE DEVELOPMENT OF PHU QUOC SPECIAL ZONE, AN GIANG PROVINCE IN THE DIRECTION OF A SMART CITY

1.1. OVERVIEW OF RESEARCH WORKS ON URBAN AREAS, SMART CITIES, URBAN DEVELOPMENT, DEVELOPMENT OF PHU QUOC SPECIAL ZONE, AN GIANG PROVINCE IN THE DIRECTION OF SMART CITIES

1.1.1. Urban studies and urban development

Studies on urban and urban development are approached from many perspectives such as economics, planning, governance, society and environment. The works have clarified the role of urban areas in population concentration, capital, labor, science and technology and economic activities; at the same time, it is affirmed that urban development has an important impact on economic growth, structural

transformation, innovation and competitiveness improvement. Many studies also emphasize the need to associate urban development with the efficient use of resources, environmental protection, social justice and sustainable development.

1.1.2. Studies on smart cities and smart city development

Studies on smart city have clarified the role of digital technology, data, AI, IoT, digital infrastructure and smart governance in improving the efficiency of management, service provision and the quality of life of people. Smart city is increasingly approached as an integrated development model, in which technology is a tool, while institutions, governance, people and community participation are the guaranteed conditions. However, many projects are still inclined towards technical aspects and technology application, not fully analyzing the process of mobilization, allocation and use of resources, data ownership and control as well as the distribution of benefits between subjects.

1.1.3. Studies on special zones and development of Phu Quoc special zones in the direction of smart cities

Studies on smart city mainly focus on specific institutions, preferential policies, investment attraction, infrastructure development and international integration. For the smart city, the works have mentioned tourism development, marine economy, planning, infrastructure, environmental protection and orientation for smart city construction. However, most of the research still approaches special zone and smart city as relatively separate fields; it has not clarified the interaction between special zone institutions, digital economy, data management and interest relationships between the State, businesses, investors and people. There have not been many comprehensive research works on the development of smart city from the perspective of smart city.

1.2. OVERVIEW OF THE SCIENTIFIC VALUE OF RESEARCH RESULTS AND GAPS IN THE THESIS THAT NEED TO BE FURTHER CLARIFIED

1.2.1. Scientific value of research results

Domestic and foreign projects have contributed to clarifying theoretical issues on urban development, urban development, smart city, special economic zones, urban governance and sustainable development. Studies have shown the role of institutions, science and technology, data, infrastructure, human resources, innovation and people's participation in the development of urban areas. These results provide an important theoretical basis, approach and practical experience for the thesis to selectively inherit the research and development of Phu Quoc Special Zone in the direction of smart city.

1.2.2. Inconsistent issues of research works

The studies also have different approaches in terms of concept, content, structure and criteria for evaluating smart city; there is no agreement on the role of technology, institutions, markets and people's participation in this development model. The relationship between the development of special zones and the development of urban areas, digital transformation and digital economy has not been fully explained. Issues of data ownership, management and exploitation; decentralization and decentralization; cybersecurity; digital divide; value distribution and harmony of interests between subjects have not been systematically studied, especially for special sea and island zones such as Phu Quoc.

1.2.3. Gaps and research directions of the thesis

1.2.3.1. Research gaps

Firstly, there has not been much research to develop a theoretical framework for the development of special zones in the direction of urban development from the perspective of political economy, linking the development of digital production forces with the requirements of perfecting production relations, institutions and governance methods.

Secondly, studies have not fully clarified the relationship between actors in the mobilization, allocation and use of resources; data ownership, management and exploitation; creation, distribution of value and ensuring the harmony of interests in the development of special zones in the direction of smart city.

Thirdly, a system of content and evaluation criteria suitable to the characteristics of the special sea and island zones has not yet been formed, which is simultaneously affected by urbanization, tourism development, international integration, environmental pressure and climate change.

Fourthly, research on smart city mainly focuses on each individual field such as tourism, marine economy, planning, investment or environment; there have not been many comprehensive analyses of the current situation, structural bottlenecks and system of solutions for the development of Phu Quoc Special Zone in the direction of smart city.

1.2.3.2. Research direction of the thesis

From the above gaps, the thesis identifies the following main research directions:

Firstly, the approach to the development of special zones in the direction of smart city from the perspective of political economy development considers this not only a process of applying technology but also a process of developing production forces, perfecting institutions, innovating management methods and adjusting the relationship of interests between subjects.

Secondly, clarify the concept, characteristics, roles, contents, evaluation criteria and factors affecting the development of special zones in the direction of smart city; on that basis, develop an analytical framework in accordance with the characteristics of smart city.

Thirdly, to analyze the current situation of Phu Quoc Special Zone in the direction of the smart city in the period of 2017 - 2025 in the following aspects: institutions and governance; planning, infrastructure - technology; human resources, digital economy and innovation; ensuring the harmony of interests among subjects.

Fourthly, forecasting trends, determining directions, objectives and proposing a system of solutions for the development of Phu Quoc Special Zone in the direction of smart city to 2030, with a vision to 2045, in accordance with the Party's guidelines, the State's policies and laws and local practical conditions.

Chapter 1 Synopsis

Chapter 1 has provided an overview of research works on urban areas, smart city, special zones development in the direction of smart city. The studies have provided important theoretical and practical bases on institutions, governance,

technology, data, infrastructure, human resources and sustainable development. However, there are still gaps in the research and development of Phu Quoc Special Zone in the direction of smart city from the perspective of political economy, especially in terms of the mechanism of resource allocation, data management, value distribution and interest relationships between actors. This is the basis for the thesis to build a theoretical framework, analyze the current situation and propose solutions for the development of Phu Quoc Special Zone in the direction of smart city.

Chapter 2

THEORETICAL AND PRACTICAL BASIS FOR SPECIAL ZONE DEVELOPMENT IN DIRECTION SMART CITY

2.1. DEFINITION, CHARACTERISTICS AND ROLES OF DEVELOPMENT OF SPECIAL ZONES IN THE DIRECTION OF SMART CITIES

2.1.1. Concept of special zones, urban centers, smart cities and development of special zones in the direction of smart cities

2.1.1.1. Definition of special zones

A special zone is a defined geographical-administrative area, which is subject to specific mechanisms, policies and management models in order to create a favorable environment to attract investment, develop advantageous economic sectors, promote innovation and enhance international integration. Compared to ordinary administrative units, special administrative zones have a higher degree of autonomy and flexibility in organizing the management, mobilization and use of development resources.

2.1.1.2. Urban concept

Urban area is a form of socio-economic spatial organization of population concentration, non-agricultural economic activities and technical and social infrastructure systems; at the same time, it is a place to concentrate, allocate and exploit resources, play a central role and create a driving force for development for the region and territory.

2.1.1.3. Smart city concept

Smart city is an urban model that applies digital technology and advanced technologies to connect, integrate and optimize urban management, operation and service provision; improve the efficiency of using resources, people's quality of life and urban competitiveness; at the same time, promote innovation, develop the digital economy and modernize urban governance.

2.1.1.4. Concept of development of special zones in the direction of smart cities

In the author's view, the development of special zones in the direction of smart cities is a process of socio-economic development with characteristics of special zones, in which production forces and management methods are based on science, technology, data, modern infrastructure and high-quality human resources, in order to improve the efficiency of mobilization, allocation and use of resources, ensure the harmony of interests between subjects, thereby promoting sustainable socio-economic development and constantly improving the quality of life of the people.

2.1.2. Characteristics of smart cities and development of special zones in the direction of smart cities

Smart cities has the following basic characteristics: operating on the basis of digital technology, data and connectivity infrastructure; data-based management and real-time operation capabilities; integration and interconnection between fields; people-centered; promoting innovation, green growth and sustainable development.

The development of special zones in the direction of smart city both carries the common characteristics of smart city and is associated with institutions, policies and specific development spaces of special zones. This process requires a combination of flexible management mechanisms with modern infrastructure, digital economy, high-quality human resources and smart management; at the same time, it is necessary to harmoniously address the relationship of interests between the State, businesses, investors and people.

2.1.3. The role of special zone development in the direction of smart cities

Developing special zones in the direction of smart city contributes to modernizing production forces, innovating growth models and improving the efficiency of mobilization, allocation and use of resources. This process promotes institutional improvement, transformation of management methods to data-based governance, creating a favorable environment for the digital economy and innovation. At the same time, developing special zones in the direction of smart city contributes to improving competitiveness, service quality and people's lives; protecting the environment, adapting to climate change and strengthening international intergration capabilities.

2.2. CONTENTS, EVALUATION CRITERIA AND FACTORS AFFECTING THE DEVELOPMENT OF SPECIAL ZONES IN THE DIRECTION OF SMART CITIES

2.2.1. Contents of development of special zones in the direction of smart cities

2.2.1.1. Completing institutions and governance models based on data and technology

This content focuses on perfecting specific mechanisms and policies; decentralization and decentralization; administrative reform and improving state governance capacity. The focus is on shifting from traditional administrative management to data-based governance, strengthening connection and sharing of data between agencies; building digital government and promoting the participation of people and businesses in the administration of special zones.

2.2.1.2. Planning and development of infrastructure and technology

This content analyzes the degree of integration between the spatial planning of the special zone and the architecture of the smart city, including transport, electricity, water, environment, broadband telecommunications, sensor networks and intelligent operation centers (IOC). The planning and infrastructure must be developed synchronously, capable of connecting and integrating digital technology and adapting to the characteristics of the sea and island cities, thereby improving the efficiency of resource use and operation capacity of the special zone.

2.2.1.3. Human resource development, digital economy and innovation

This content focuses on developing high-quality human resources, digital skills and smart citizens; promoting the digital economy, smart tourism, e-commerce and

business models based on digital platforms. At the same time, it is necessary to form an innovation ecosystem, strengthen links between governments, businesses, training institutions and science and technology organizations, creating a driving force to improve productivity and competitiveness of the special zone.

2.2.1.4. Ensuring the harmony of interests in the development of special zones in the direction of smart cities

This content focuses on analyzing the relationship of interests between the State, enterprises, investors and people in the mobilization, allocation and use of resources; exploitation of land, resources and data; creation and distribution of value. Ensuring the harmony of interests requires increasing publicity, transparency, community consultation, reasonably regulating added value and creating conditions for people to participate and enjoy development achievements.

2.2.2. Criteria for evaluating the development of special zones in the direction of smart cities

On the basis of selectively inheriting sets of smart city criteria and adjusting them in accordance with the characteristics of sea and island special zones, the thesis develops four groups of criteria: (i) institutions and governance models based on data and technology; (ii) infrastructure and technology planning and development; (iii) human resource development, digital economy and innovation; (iv) ensuring the harmony of interests in the development of special zones in the direction of smart city.

Table 2.1. Some criteria for evaluating smart cities

Criteria	Description
Smart Economy	Enterprise, infrastructure, efficiency
Smart Citizen	Smart education, cultural awareness, life activities
Intelligent Management	Policy, government support, community engagement
Smart Movement	Public transit, transportation networks, accessibility, and connectivity
Smart Environment	Water management, environmental management, smart energy
Smart Life	Smart housing, health, career opportunities, income, safety

Source: Rudolf Giffinger et al.

The groups of criteria both reflect the level of technology application and infrastructure development, as well as assess governance capacity, resource efficiency, participation of subjects and the level of enjoyment of development achievements of the people.

2.2.3. Factors affecting the development of special zones in the direction of smart cities

The development of special zones in the direction of smart city is affected by the following main factors:

Firstly, institutions, mechanisms, policies and state governance capacity play a guiding role, creating an environment for mobilizing, allocating and effectively using development resources.

Secondly, the level of science and technology and digital infrastructure determines the ability to connect, integrate data, provide services and operate smart systems.

Thirdly, the quality of human resources and innovation capacity directly affect the ability to receive and master technology and develop the digital economy.

Fourthly, economic conditions, the ability to mobilize investment resources and the level of international integration determine the scale, speed and quality of implementation of special zone development projects in the direction of smart city.

Fifthly, natural conditions, geoeconomic location and specific advantages create development opportunities but at the same time set requirements on environmental protection, carrying capacity and adaptability to climate change.

Sixthly, the participation of people, businesses, investors and the social community is a condition to ensure the feasibility, consensus and sustainability of the development process.

In general, institutions and state governance play a guiding role; science and technology and digital infrastructure are the foundation; human resources and innovation are the driving forces; while economic resources, international integration, natural conditions and social participation are factors that ensure the development of special zones in the direction of smart city.

2.3. DOMESTIC AND INTERNATIONAL EXPERIENCES ON SMART CITY DEVELOPMENT AND LESSONS FOR PHU QUOC SPECIAL ZONE, AN GIANG PROVINCE

2.3.1. International experience

The thesis studies Seoul's experience in building digital government and data-based governance; Singapore in implementing the Smart Nation strategy, integrating data and being people-centric; Shenzhen in combining special administrative institutions with science and technology and innovation; Dubai in developing digital infrastructure, smart services and an environment to attract technology enterprises.

2.3.2. Domestic experience

Da Nang's experience shows the role of smart city, digital government, shared data and IOC in improving governance efficiency. Hue's experience emphasizes building a digital interaction platform, promoting people's participation and linking smart city development with cultural preservation, environmental protection and improving the quality of urban services.

2.3.3. Lessons learned for Phu Quoc Special Zone

From international and domestic experiences, the thesis draws six lessons for the Phu Quoc Special Zone: (i) perfecting specific, flexible and competitive institutions; (ii) synchronously developing technical infrastructure, digital infrastructure and smart city infrastructure; (iii) promoting the digital economy, innovation and developing high-quality human resources; (iv) building a people-centered smart governance model; (v) linking development with environmental protection, green growth and climate change adaptation; (vi) strengthening regional linkages and international integration.

Chapter 2 Synopsis

Chapter 2 has clarified the concept, characteristics, roles, contents, evaluation criteria and factors affecting the development of special zones in the direction of smart city from the perspective of political economy. The development of special zones in the direction of smart city is not only the application of technology but

also the process of modernizing production forces, perfecting institutions, innovating management methods and adjusting the relationship of interests between actors. International and domestic experiences provide important lessons on institutions, infrastructure, technology, human resources, governance, environment and international integration, as a basis for analyzing the current situation of Phu Quoc Special Zone development in Chapter 3.

Chapter 3

THE CURRENT SITUATION OF DEVELOPMENT OF PHU QUOC SPECIAL ZONE, AN GIANG PROVINCE IN THE DIRECTION OF A SMART CITY

3.1. OVERVIEW OF PHU QUOC SPECIAL ZONE, AN GIANG PROVINCE AND DEVELOPMENT CONDITIONS IN THE DIRECTION OF SMART CITIES

3.1.1. Geographical location, natural conditions and development advantages

The Phu Quoc Special Zone has its own characteristics in terms of geographical location, sea and island space, natural conditions and resources. These are both important advantages and set specific requirements for planning, infrastructure investment, data management, environmental protection and organization of development in the direction of smart city.

3.1.1.1. Strategic location of Phu Quoc Special Zone in the Southwest Sea and ASEAN

Phu Quoc is the largest island in Vietnam, with a natural area of about 575.29 km², including 22 large and small islands, of which Phu Quoc Island has an area of about 567 km². Located in the Gulf of Thailand and the economic exchange space of Southeast Asia, the Phu Quoc Special Zone has favorable conditions for the development of tourism, high-quality services, logistics, marine economy and expanding links with domestic and regional economic centers.

However, the isolated nature of the island space also increases the cost of connectivity, infrastructure investment and the provision of essential services; at the same time, it places high requirements on the ability to predict, manage risks and ensure energy, water, data and environmental security.

3.1.1.2. Natural conditions and advantages of the sea and islands for the development of Phu Quoc special zone in the direction of smart city

The Phu Quoc Special Zone has a relatively mild climate, abundant tourism resources and a diverse marine and island ecosystem with primeval forests, coral reefs, seagrass beds and Phu Quoc National Park. These conditions create the potential for the development of ecotourism, marine economy, green cities and high-quality services.

However, marine and island resources and ecosystems have a finite carrying capacity, vulnerable to urbanization, population growth, tourism development, pollution and climate change. Therefore, the development of the Phu Quoc Special Zone in the direction of smart city must be associated with monitoring, collecting and analyzing environmental data; controlling the capacity of destinations; economically using resources and improving the resilience of infrastructure.

3.1.1.3. Role in regional development and international integration

The Phu Quoc Special Zone plays an important role in the development of sea and island tourism, logistics, shipping and maritime services; at the same time, it is a point of economic connection of the Southwest region with the Gulf of Thailand and the world. With a strategic position in national defense, security and sovereignty of the sea and islands, Phu Quoc has an important significance in combining economic development with ensuring national defense and security and expanding international integration.

The organization of APEC 2027 creates a motivation for the Phu Quoc Special Zone to accelerate infrastructure investment, improve service quality, modernize governance and strengthen international connections. However, this event also sets requirements to ensure investment progress, resource efficiency and the ability to sustainably exploit works after the event.

3.1.2. Overview of the socio-economic development situation of Phu Quoc Special Zone in the period of 2017 - 2025

3.1.2.1. Economic growth and restructuring

In the period of 2017 - 2025, the Phu Quoc Special Zone economy has clear fluctuations. Before the COVID-19 pandemic, the economy grew quite quickly, in which tourism and services played a major role. In the period of 2020 - 2022, economic activities declined due to the impact of the pandemic, especially in the fields of tourism, accommodation, transportation and trade. From 2023, the economy will recover strongly, the total value of products in the area and budget revenue will increase again.

**Table 3.1. Socio-economic indicators in Phu Quoc special zone
Period 2017 - 2025**

TT	Criteria	DVT	2017	2018	2019	2020	2021	2022	2023	2024	2025
1	Total value of products in the area	Billion VND	73.942	78.659	86.841	52.428	52.149	48.230	60.480	72.712	95.810
1.1	Trade services -	Billion VND	37.200	38.953	46.650	32.653	31.774	24.651	39.403	46.339	63.085
1.2	Industry - Construction	Billion VND	32.517	35.763	35.895	15.237	16.273	19.321	21.077	21.864	28.113
1.3	Agriculture, forestry, fisheries	Billion VND	4.225	3.943	4.296	4.358	4.102	4.258	4.530	4.509	4.612
2	Growth Rate	%	17,4	6,38	10,40	-39,63	-0,53	-7,52	25,40	20,22	31,76
2.1	Trade services -	%	29,47	4,71	19,75	-30,00	-2,69	-22,43	59,85	17,60	36,13
2.2	Industry - Construction	%	20,48	9,98	0,37	-57,56	6,80	18,74	9,09	3,73	28,59
2.3	Agriculture, forestry, fisheries	%	11,22	-6,67	8,95	1,44	-5,87	3,80	6,38	-0,46	2,29
3	Local budget revenues	Billion VND	4.250	4.338	4.836	5.398	5.243	5.405	7.743	8.972	9.202

Sources: Author's synthesis and author's handling, estimates.

The economic structure continues to shift in the direction of increasing the role of trade – services, tourism and economic activities associated with urbanization. However, the economy is still heavily dependent on tourism, real estate and the exploitation of resource advantages; the digital economy and innovation have not become strong enough growth drivers. This practice poses a requirement to diversify the economic structure and shift the growth model from exploiting available advantages to relying more on technology, data, productivity and innovation.

3.1.2.2. Population, labor and human resources

The population of the Phu Quoc Special Zone is growing rapidly, mainly due to the mechanical increase from other localities to work in the tourism, services, construction and trade sectors. The increase in population and labor contributes to market expansion, the addition of human resources and the promotion of urbanization but also puts pressure on housing, transport, health, education, the environment and public services.

The labor structure has shifted in the direction of reducing the proportion of agriculture, forestry and fisheries, increasing the proportion of industry - construction and services. However, workers with digital skills, technology human resources, data management, smart city management, high-quality tourism and international logistics are still lacking, not meeting the requirements of transforming the development model.

3.1.2.3. Socio-economic infrastructure

The transport infrastructure of the Phu Quoc Special Zone is developed on road, air and sea modes. The trans-island trunk roads, coastal roads, seaports and Phu Quoc International Airport contribute to expanding connections with the Mekong Delta, Ho Chi Minh City and tourist centers in the region.

Electricity, telecommunications, tourism, health and education infrastructure have been gradually invested. However, the development rate between types of infrastructure and between the central area and the peripheral area is uneven. The water supply, drainage, wastewater treatment, solid waste, public transportation and social infrastructure systems in some areas have not kept up with the growth rate of population and tourists.

3.1.2.4. Socio-cultural characteristics and residential life

The socio-cultural culture of the Phu Quoc Special Zone is the intersection of the culture of the sea and islands, the culture of the Southern residents and traditional religious values. The population structure is diverse, including long-term residents associated with marine occupations, agriculture, handicrafts and the part of the population that migrates to work in the tourism, service, trade and construction industries.

The process of economic development and urbanization contributes to raising incomes, expanding employment opportunities and access to modern services. However, disparities in living conditions, digital skills and access to services between the central and suburban areas, between skilled workers and unskilled workers still exist.

3.1.2.5. The role of tourism, services and marine economy in the development of Phu Quoc special zone in the direction of a smart city

Tourism, services and marine economy are the industries that play a driving role in the growth, investment attraction, job creation and economic restructuring of the Phu Quoc Special Zone. The number of tourists increased from about 3.2 million in 2017 to about 8.268 million in 2025, of which international visitors will reach about 1.8 million.

The development of tourism promotes the application of booking platforms, tour booking, digital payment, digital maps, accommodation management and customer data analysis. However, tourism growth also increases pressure on transportation, electricity, water, waste treatment, sea and island ecosystems and public services. Therefore, smart tourism development must be associated with visitor flow management, capacity control, environmental protection and improving the level of participation and beneficiary of the local community.

3.1.3. Advantages and disadvantages in the development of Phu Quoc special zone in the direction of a smart city

3.1.3.1. Advantages

The Phu Quoc Special Zone has an important geoeconomic and geostrategic position; outstanding potential in tourism, services and marine economy; the ability to connect by air and sea; at the same time, it has received investment attention from the central government, localities and large corporations. Telecommunications infrastructure, Internet, online public services, digital payments and smart tourism applications have formed the initial conditions for development in the direction of smart city.

3.1.3.2. Difficulties

The Phu Quoc Special Zone faces the pressure of urbanization, population and tourist growth; technical, social and digital infrastructure are not synchronized; high-quality human resources are still lacking; distributed data and interconnection capabilities are still limited. In addition, the management institutions of special zones, mechanisms for coordinating resources, protecting the environment and harmonizing interests among subjects are not yet complete; climate change and the isolated characteristics of the island increase risks to the development process.

3.2. CURRENT SITUATION OF DEVELOPMENT OF PHU QUOC SPECIAL ZONE, AN GIANG PROVINCE IN THE DIRECTION OF A SMART CITY IN THE PERIOD OF 2017-2025

3.2.1. The current situation of institutions and governance of the development of Phu Quoc Special Zone in the direction of a smart city

3.2.1.1. Undertakings, policies and orientations for the development of Phu Quoc special zone in the direction of a smart city

In the period of 2017 - 2025, the central and local governments have issued many guidelines and policies on urban development, digital transformation, smart city, marine economy development of Phu Quoc. This is an important political and legal basis for the Phu Quoc Special Zone to deploy digital government, digital infrastructure, online public services and smart applications.

Table 3.2. System of guidelines and policies on the development Phu Quoc Special Zone of smart city

ST T	Text	Key Contents	Implications for the Phu Quoc Special Zone
1	Document of the 13th Congress of the Party	To develop modern, civilized and urban centers, smart city; to build Phu Quoc into an international marine eco-tourism and service center	Strategic orientation of Phu Quoc development according to the model of a modern sea and island urban area
2	Document of the 14th Congress of the Party	Promoting digital transformation, green transformation, renewing growth models and improving the quality of urbanization	Creating a political basis for the development of smart city and digital economy in the Phu Quoc Special Zone
3	Decision No. 830/QĐ-UBND dated 07/4/2017	Approving the construction of Phu Quoc smart city, Kien Giang province in the period of 2016 - 2020,	Creating a foundation for implementing the smart city model in Phu Quoc
4	Decision No. 84/QĐ-TTg dated 19/01/2018	Approving the Vietnam Green Growth Urban Development Plan to 2030	Orientation for green urban development, adaptation to climate change
5	Decision No. 950/QĐ-TTg dated 01/8/2018	Approving the Project on sustainable smart city in Vietnam for the period of 2018-2025, with a vision to 2030	Creating a foundation for implementing the smart city model in Phu Quoc
6	Resolution No. 06-NQ/TW dated 24/01/2022	Planning, construction, management and sustainable development of Vietnam's urban areas	Emphasis on smart city governance, green cities and innovation
7	Decision No. 1289/QĐ-TTg dated 03/11/2023	Approving the planning of Kien Giang province (An Giang) for the period of 2021-2030, with a vision to 2050	Identifying Phu Quoc as a center of marine economy, tourism and smart city
8	Decree No. 269/2025/ND-CP	Regulations on smart city development	Completing the legal corridor for digital infrastructure, IOC, data and smart city governance
9	Document of the 11th Party Congress of Kien Giang Province	Synchronous infrastructure development according to the model of green growth, smart city	Concretizing the smart city development of local urban areas

Source: Synthesis of the author from central and local documents

The Phu Quoc Special Zone is oriented to develop into a multi-center sea and island city, a high-quality tourism and service center, associated with the marine economy, green growth and international integration. However, regulations on planning, investment, land, finance, digital transformation and data management are still scattered in many sectors and fields; the integration and coordination mechanism has not been fully formed in accordance with the requirements of the development of special zones in the direction of smart city.

3.2.1.2. The current situation of administrative reform and building digital government

The Phu Quoc Special Zone has promoted administrative reform, implemented an electronic one-stop system, managed electronic documents, digital signatures and online public services. The rate of administrative procedures processed online has increased, contributing to improving publicity, shortening the processing time and improving the quality of service for people and businesses.

However, digitization does not mean a complete transformation of governance methods. Data between agencies is still scattered, standards and responsibilities for updating are not consistent; the ability to share and exploit data for forecasting and decision-making is still limited. The participation of people and businesses in the process of monitoring, feedback and co-governance on digital platforms is not frequent.

3.2.1.3. Application of digital technology in urban governance

The Phu Quoc Special Zone have deployed AI cameras, geographic information systems (GIS), field reflection platforms, specialized databases, and IOC projects. These applications support the management of planning, land, transportation, security, tourism, and interaction between the government and the people.

However, IOC is still in the process of investment and completion; databases have not been fully integrated; the application of AI, big data and IoT is mainly deployed to a certain extent. New digital technology mainly supports management activities, but has not fundamentally changed the management method in the direction of real-time integration, forecasting and operation.

3.2.2. The current situation of planning, infrastructure and technology for the development of Phu Quoc special zone in the direction of smart city

3.2.2.1. Current situation of planning for development of Phu Quoc special zone in the direction of smart city

The planning of the Phu Quoc Special Zone gradually shifts from prioritizing the development of physical infrastructure to the orientation of green, smart growth, energy saving and adaptation to climate change. The general plan to 2040 creates a basis for organizing development space, arranging functional areas and orienting infrastructure investment.

However, technical infrastructure and digital infrastructure planning have not kept up with the pace of urbanization, population growth and tourism development. The integration of spatial planning with GIS databases, sensor networks, broadband infrastructure and IOC is still limited. From 2024 to 2025, infrastructure and technology investment will be accelerated in association with the requirements of APEC 2027 preparations.

3.2.2.2. Current status of infrastructure for the development of special zones in the direction of smart cities

Telecommunications infrastructure, Internet, fiber optic cables, WAN networks, public Wifi and digital platforms continue to be expanded. E-government, surveillance cameras, online accommodation management, tourism maps, scene reflections and electronic payments have gradually formed the foundation for the development of smart cities.

Table 3.3. Statistics on a number of information technology infrastructure indicators in Phu Quoc Special Zone in the period of 2017 - 2025

Criteria	2017	2018	2019	2020	2021	2022	2023	2024	2025
BTS station (station)	210	235	260	280	295	310	325	334	345
Fiber optic cable coverage rate of communes and wards (%)	75	82	90	95	98	100	100	100	100
Percentage of state agencies connecting to WAN (%)	82	88	95	100	100	100	100	100	100
Computer/staff (machine/person)	0,65	0,72	0,80	0,90	0,95	1,00	1,00	1,00	1,10
Online public services level 3-4 (TTHC)	35	60	85	120	150	230	310	380	420
Rate of online processing of administrative documents (%)	12	18	28	40	45	60	68	75	80
IOC system at the special zone/city level	-	-	-	-	-	Investment Preparation	Pilot	Initial Operation	Finishing
Percentage of communes and wards with public Wi-Fi (%)	20	28	40	55	65	78	85	92	100
Rate of electronic documents exchanged between agencies (%)	55	68	82	90	95	98	99	100	100

Sources: Author's synthesis and author's handling, estimates.

However, technical infrastructure, digital infrastructure and social infrastructure have not yet formed an integrated system. Sensors, cameras and data collection equipment are still concentrated in central areas, tourist areas and a number of large projects. Public transport infrastructure, water supply and drainage, waste treatment, energy supply and data backup have not fully met the requirements of a smart sea and island special zone.

3.2.3. The current situation of human resource development, digital economy and innovation

3.2.3.1. The current situation of human resources and smart citizens

In the period of 2017 - 2025, the total number of employees increased from about 98.5 thousand to 134.2 thousand people; the proportion of service workers increased from 50.3% to 58.3%, while the proportion of agriculture, forestry and fishery workers decreased from 31.2% to 17.9%. The proportion of workers with basic digital skills increased from about 15% to 46%.

Community digital technology teams, electronic identification, non-cash payments and online public services contribute to the formation of the initial elements of smart citizens. By 2025, the whole special zone will have about 54 community digital technology teams with 380 members; about 100 thousand electronic identification accounts will be activated.

However, the Phu Quoc Special Zone still lacks high-quality human resources in the fields of digital technology, data management, AI, cybersecurity, smart city management, international logistics and smart tourism. The digital skills of the majority of people and workers are at a basic level; the team of full-time civil servants in charge of information technology is still thin.

3.2.3.2. The current situation of digital economy development and innovation

The digital economy in the Phu Quoc Special Zone is developing quite rapidly, especially in tourism, accommodation, trade, transportation and payment. In the period of 2017 - 2025, the percentage of businesses using digital platforms will increase from about 22% to 88%; business establishments participating in e-commerce will increase from 15% to 75%; non-cash payments will increase from 18% to 85%; the rate of booking online travel services will reach about 82%.

Some businesses have applied AI, big data, digital maps and management platforms in customer analysis, demand forecasting and improving visitor experience. However, the digital economy is mainly developed in tourism and services; the ability to interconnect data, innovation capacity and the level of technology application of small businesses and business households are still limited. The Phu Quoc Special Zone has not yet formed a synchronous innovation ecosystem and does not have a complete statistical system on the contribution of the digital economy.

3.2.3.3. Development of digital technology enterprises

Businesses in the Phu Quoc Special Zone are increasingly promoting the application of digital platforms, e-commerce, electronic payment and data management. Some large enterprises initially applied AI, big data and IoT in customer management, energy operation, security assurance and service provision.

However, the number of digital technology enterprises is still small; research, development and technology transfer activities are not strong. The application of modern technology is mainly concentrated in large enterprises and central areas, and has not spread widely to small enterprises, business households and the entire space of special zones.

3.2.4. Ensuring the harmony of interests in the development of special zones in the direction of smart cities

The development of the Phu Quoc Special Zone has contributed to increasing budget revenues, attracting investment, creating jobs and expanding access to public services. Many large projects generate additional revenue from land, tourism and services, while promoting infrastructure development and the labor market.

However, the benefits from growth, resource exploitation and land value increase have not been distributed in harmony between the State, businesses, investors and people. The disclosure of information mainly stops at aggregate data; there is no index system that fully reflects the level of reinvestment in revenue sources for infrastructure, environment, welfare and community livelihoods. The mechanism for consulting people, supervising investors' obligations and regulating the increase in land value is not clear, giving rise to the risk of conflict of interest.

3.3. ASSESSMENT OF THE CURRENT SITUATION OF DEVELOPMENT OF PHU QUOC SPECIAL ZONE, AN GIANG PROVINCE IN THE DIRECTION OF SMART CITY IN THE PERIOD OF 2017-2025

3.3.1. Results achieved

In the period of 2017 - 2025, the Phu Quoc Special Zone will gradually transform its development model in the direction of relying more on digital technology, digital economy and smart services. The system of guidelines, policies and planning has been gradually supplemented; administrative reform, e-government and online public services have made positive changes.

Urban infrastructure, digital infrastructure and connectivity are expanded; a number of platforms such as AI cameras, GIS, field reflection and IOC are deployed. Digital tourism, e-commerce, cashless payments and online services are developing rapidly. The digital skills of people and workers are gradually improving.

The application of technology in urban management, tourism, health, education, environment and security contributes to improving governance efficiency, service quality and competitiveness. These results create an initial foundation for the development of the Phu Quoc Special Zone in the direction of smart city.

3.3.2. Limitations and causes

3.3.2.1. Limitations

Firstly, the institutions and mechanisms for decentralization and decentralization for the development of special zones in the direction of smart city are not synchronized; regulations on planning, investment, land, finance, digital transformation and data management are still scattered.

Secondly, the smart governance model is not complete; specialized data is not interconnected, the IOC has not fully promoted its role in integrating, analyzing, warning and supporting real-time decision-making.

Thirdly, the digital economy and technology enterprises have not developed commensurate with their potential; the level of digital transformation between large enterprises and small enterprises and business households is still different; the innovation ecosystem is still weak.

Fourthly, technical, social and digital infrastructure are not synchronized; transportation, electricity, water, waste treatment, public services and data collection and storage infrastructure are still under great pressure.

Fifthly, high-quality human resources, technology human resources and smart city management are still lacking; digital skills and foreign language proficiency of a part of the workforce have not met the requirements.

Sixthly, the mechanism for regulating interest relations is not really harmonious and transparent; local people and businesses are still limited in participating in the value chain and enjoying the fruits of development.

Seventhly, the pressure on natural resources, the environment and the ecosystem of the sea and islands is increasing; the capacity to treat waste, monitor, forecast and adapt to climate change is still limited.

3.3.2.2. Causes of limitations

The above limitations first of all stem from the speed of urbanization, population growth and tourism development faster than the capacity of infrastructure and governance. The isolated characteristics of the island increase the cost of investment, operation, backup and connectivity.

Regarding subjective causes, institutions, planning and interdisciplinary

coordination mechanisms are not synchronized; investment resources for digital transformation, data infrastructure and environment are still limited. The quality of human resources and digital skills has not met the requirements; the ability to connect, share and exploit data is not effective. The linkage between governments, businesses, training institutions and science and technology organizations is not close; the mechanism for mobilizing community participation and monitoring of interest relationships is not complete.

3.3.2.3. Problems posed to the development of Phu Quoc special zone in the direction of smart city

Development practice requires synchronous resolution of the relationships between specific institutions and governance capacity; between growth rate and responsiveness of infrastructure; between technology application and interconnection, governance and data protection; between attracting investment and improving the endogenous capacity of the local economy.

The Phu Quoc Special Zone needs to strongly shift to data-based governance; synchronously develop technical infrastructure, digital infrastructure and social infrastructure; promote the digital economy associated with high-quality tourism and marine economy; improve the quality of human resources; ensure the harmony of interests among subjects; protect the environment and adapt to climate change. At the same time, economic development must be closely associated with ensuring national defense, security, data safety and sovereignty over the sea and islands.

Chapter 3 Synopsis

Chapter 3 has analyzed the natural conditions, socio-economic conditions and the current situation of the development of the Phu Quoc Special Zone in the direction of smart city in the period of 2017 - 2025 in four aspects: institutions and governance; planning, infrastructure - technology; human resources, digital economy and innovation; ensuring the harmony of interests.

The research results show that the Phu Quoc Special Zone has made strides in infrastructure connectivity, digital government, online public services, digital economy and smart applications. However, the development process still encounters bottlenecks in terms of institutions, data governance, infrastructure synchronization, human resources, innovation, environment and interest relationships. The results and problems raised are the practical basis for the thesis to determine the direction and propose solutions in Chapter 4.

Chapter 4

DIRECTIONS AND SOLUTIONS FOR THE DEVELOPMENT OF PHU QUOC SPECIAL ZONE, AN GIANG PROVINCE IN THE DIRECTION OF A SMART CITY

4.1. FORECASTING TRENDS AND DIRECTIONS FOR THE DEVELOPMENT OF PHU QUOC SPECIAL ZONE, AN GIANG PROVINCE IN THE DIRECTION OF SMART CITIES

4.1.1. Forecasting the development trend of smart cities in the world and in Vietnam by 2045 affecting the development of Phu Quoc Special Zone in the direction of smart cities

By 2045, smart cities in the world and in Vietnam will develop in the direction of integration, based on digital data, AI, digital platforms and smart

management associated with digital transformation, digital economy and digital government. This trend creates opportunities for the Phu Quoc Special Zone to develop digital infrastructure, smart tourism, marine economy and high-quality services; at the same time, it sets out the requirements to improve the institution of special zones, develop digital government, digital human resources and improve management capacity to increase competitiveness and develop the Phu Quoc Special Zone in the direction of smart city.

4.1.1.1. Forecasting the development trend of smart cities in the world to 2045

By 2045, smart cities in the world will develop in the direction of integration, centered on people, data and digital technology. The main trends include the development of digital government, data-based urban governance; the application of AI, Big Data, IoT and the "digital twin" model in urban planning, monitoring and administration; upgrading the IOC in the direction of real-time multi-sector operation; at the same time, strengthening cybersecurity, protecting data and improving the efficiency of urban governance.

4.1.1.2. Forecast of smart city development trends in Vietnam to 2045

By 2045, the trend of smart city development in Vietnam will shift from piloting to synchronous, integrated development and associated with national digital transformation, digital government and digital economy. The main trends include improving institutions and legal frameworks; developing digital government and digital data; upgrading the IOC in the direction of multi-sectoral analysis, forecasting and operation; promoting public-private cooperation in digital infrastructure investment; and at the same time strengthening information security, cyber security and data protection to improve the efficiency of governance and smart city development.

4.1.2. Forecast of factors affecting the development of Phu Quoc special zone in the direction of smart city to 2045

By 2045, the development of the Phu Quoc Special Zone in the direction of smart city will be affected by many factors such as special zone institutions and smart governance; urban infrastructure and digital infrastructure; digital economy, smart tourism and marine economy; along with island resources, environment and climate change. At the same time, high-quality human resources, digital skills and the participation of smart communities will play an important role in improving the operational efficiency and sustainable development of the Phu Quoc Special Zone.

4.1.3. Orientations for development of Phu Quoc special zone, An Giang province in the direction of smart city

Develop the Phu Quoc Special Zone in the direction of a smart city and island city, taking tourism, high-quality services and the marine economy as the growth engine associated with digital transformation and the application of modern technology. At the same time, synchronously develop digital infrastructure, urban infrastructure, digital government and smart governance; improve the quality of human resources, protect the environment, adapt to climate change and strengthen the international integration in order to build the Phu Quoc Special Zone in the direction of the smart city.

4.1.4. Objectives of development of Phu Quoc special zone, An Giang province in the direction of a smart city

4.1.4.1. General objectives

Developing the Phu Quoc Special Zone in the direction of smart city in

association with digital transformation, innovating the growth model and perfecting modern institutions and governance in order to improve management efficiency, service quality and competitiveness. On the basis of digital technology and data, the Phu Quoc Special Zone is oriented to become a smart tourism city, a regional economic center and high-quality services, developing green, sustainable and adapting to climate change.

4.1.4.2. Specific objectives

Improve special zone institutions, digital government and data-based governance models; synchronously develop technical infrastructure, digital infrastructure and inter-regional connections. Develop digital economy, smart tourism and modern marine economy; improve the quality of human resources, digital skills and quality of life of people. At the same time, build a green and smart Phu Quoc Special Zone, protect marine and island ecosystems, adapt to climate change and develop sustainably.

4.2. SWOT ANALYSIS OF THE DEVELOPMENT OF PHU QUOC SPECIAL ZONE, AN GIANG PROVINCE IN THE DIRECTION OF A SMART CITY

4.2.1. Strengths	4.2.2. Weaknesses
Phu Quoc has many advantages to develop in the direction of smart city such as strategic geographical location, the potential for international sea and island tourism and a convenient connection system through airports, seaports and cross-island transportation. The rapid economic growth with tourism and services is an important driving force, creating resources for the development of digital infrastructure and digital government. At the same time, a young and dynamic population along with the early development of telecommunications infrastructure, online public services and digital payments have created a favorable foundation for digital transformation and urban development.	Phu Quoc still has many limitations in smart city development such as the quality of human resources and digital technology human resources is not high; urban infrastructure, environment and traffic are not synchronized; urban data is still scattered and lacks connectivity. At the same time, the disparity in living standards and access to digital services between the central and peripheral areas still exists, increasing the risk of the digital gap in the process of smart city development.
4.2.3. Opportunities	4.2.4. Threats
Phu Quoc has many opportunities to develop a smart city thanks to the policy of promoting digital transformation, digital economy and smart city of the Party and State. The trend of developing smart, green and sustainable tourism creates favorable conditions for the application of digital technology in urban management, tourism and the environment. At the same time, the ability to attract technology corporations and strategic investors will contribute to mobilizing resources for smart city development under the PPP model.	Phu Quoc faces many challenges in smart city development such as urbanization pressure, population and tourist growth causing infrastructure overload and deterioration of the marine and island environment. Climate change, sea level rise and competition with international tourism centers also create great pressure on sustainable development. At the same time, cybersecurity, data leakage and privacy risks are increasing during the implementation of smart city.

Source: Author's analysis and review

4.2.5. SWOT matrix and strategic orientation

The thesis uses the SWOT matrix as a tool to synthesize research results, thereby identifying four orientation groups: SO promotes advantages to take advantage of opportunities; ST uses strengths to respond to challenges; WO takes advantage of opportunities to overcome limitations; WT minimizes weaknesses and risks. The results show that the development of Phu Quoc Special Zone in the direction of smart city needs to associate the application of technology with institutional improvement, infrastructure and human resource development, data management, efficient use of resources and harmonization of interests between the State, businesses and people.

4.3. SOLUTIONS TO DEVELOP PHU QUOC SPECIAL ZONE IN THE DIRECTION OF A SMART CITY BY 2030, WITH A VISION TO 2045

4.3.1. Improving institutions, policies and governance models

Improve specific mechanisms and policies and appropriate decentralization and decentralization for the Phu Quoc Special Zone; strengthen coordination between the Central Government, An Giang province and the special zone government. Develop digital government, standardize databases, improve the ability to connect and share data; operate the IOC in the direction of integration, analysis, forecasting and decision-making support. At the same time, promote administrative reform, publicity, transparency and promote the participation of people and businesses.

4.3.2. Planning and synchronous development of infrastructure and technology

Integrate special zone spatial planning with smart city architecture; synchronously develop transportation, airports, seaports, logistics, electricity, water, environment and social infrastructure. Complete digital infrastructure, broadband telecommunications, sensor networks, data platforms and backup systems; apply AI, big data and IoT in traffic management, tourism, land, environment and security. Mobilize resources through public-private cooperation, while ensuring the long-term effectiveness of works serving APEC 2027.

4.3.3. Digital economy development and innovation

Promote digital transformation in enterprises; develop smart tourism, e-commerce, digital payment, smart logistics and marine economic services. Form an innovation ecosystem, technology testing mechanism and support digital technology enterprises; strengthen links between governments, businesses, training institutions and science and technology organizations. Prioritize digital solutions for the management of passenger flows, transportation, energy, clean water, waste and protection of sea and island ecosystems.

4.3.4. Development of human resources and smart citizens

Training and fostering digital skills, foreign languages and data use capacity for officials, employees and the community; prioritizing human resources for tourism, services, technology, smart city management and marine economy. Completing policies on attracting, remunerating and retaining experts; strengthening training links between educational institutions and enterprises. Developing a model of smart citizens capable of using digital services, participating in the governance and supervision of urban activities.

4.3.5. Ensuring the harmony of interests among subjects

Develop a mechanism to regulate the increase in land value, determine the annual land price adjustment coefficient close to the market and prioritize part of

the revenue from land and tourism for essential infrastructure, welfare and livelihood of the people. Periodically publicize land indicators, settlement of complaints, project progress and obligations of investors. Establish a formal community consultation mechanism in planning and large projects, ensuring the harmony of interests between the State, enterprises, investors and people.

4.3.6. Strengthening regional linkages, international integration and development management capacity

Strengthen the connection of the Phu Quoc Special Zone with the Mekong Delta region, Ho Chi Minh City and domestic economic centers through transport, logistics, tourism and digital infrastructure. Expand international cooperation in smart city, digital transformation, marine economy, environmental protection and human resource training; attract strategic investors and high-tech enterprises. At the same time, improve the capacity of governance, investment supervision and inter-sectoral coordination to ensure efficient, safe and sustainable development.

Chapter 4 sub-finale

Chapter 4 has forecasted trends and influencing factors; determining directions, objectives and strategic orientations for the Phu Quoc Special Zone development of smart city. On that basis, the thesis proposes six groups of solutions on institutions and governance; planning, infrastructure – technology; digital economy and innovation; human resources and smart citizens; harmony of interests; regional linkages and international integration. Solutions need to be implemented synchronously, with a roadmap and put people at the center of the development process.

CONCLUSION

Developing the Phu Quoc Special Zone in the direction of smart city is an objective requirement of the process of digital transformation, modernization of production forces and renewal of the management model. From the perspective of political economy, this is not only the process of applying technology but also the process of perfecting institutions, improving the efficiency of mobilization and resource allocation, developing the digital economy and ensuring the harmony of interests between the State, businesses, investors and people.

The research results show that in the period of 2017 - 2025, the Phu Quoc Special Zone has made progress in infrastructure, digital government, online public services, digital economy and smart tourism. However, the development process is still limited in terms of institutions, governance and data interconnection, synchronization of infrastructure, quality of human resources, environmental protection and distribution of benefits among subjects.

On that basis, the thesis proposes six groups of solutions on institutional improvement and governance; infrastructure and technology development; promoting the digital economy and innovation; developing human resources and smart citizens; ensuring the harmony of interests; strengthening regional linkages and international integration. The research results contribute to supplementing the theoretical and practical basis and providing scientific arguments for the development of the Phu Quoc Special Zone in the direction of smart, green and sustainable.

LIST OF SCIENTIFIC RESEARCH WORKS RELATED TO THE THESIS OF AUTHOR

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