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Conceptual framework for media development in creating an immersive experience for smart city of Thailand

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Abstract

This research aims to synthesize the conceptual framework used for media development in the form of creating an immersive experience for smart city of Thailand and to develop a conceptual framework of media in the form of creating an immersive experience for smart city of Thailand. The sample of the research were divided into 5 experts; media and technology and 10 smart city experts. The result show that 1) the synthetic conceptual framework found that the media and technology opined that media should be developed to create an immersive experience and the smart city and experts commented on the use of prototype content in the area of city data platform (CDP). 2) the result of conceptual framework development is blended between technology and personnel that link information to enhance decision-making, leading to improved quality analysis and better city services.

The development of each city has different approaches in terms of population, environment, economy and society, which is suitable information to be used as a model for media production. Virtual environment for personal user's media viewers looks through VR box camera which has visual and auditory capabilities. This is to guide those interested in presenting information about smart city information and city information platform through virtual environment simulation and to promote driving smart city development of Thailand

Keywords: Immersive Experience, Media, Smart City Thailand

INTRODUCTION

People all over the world are realizing the concept of urban development for a better quality of life by combining digital technological systems and innovation [1-5], or information [6] and communication technology [5, 7-9] , with more complicated urban management [6, 10-13] effectively. This aids in the reduction of management expenditures. The lower your energy consumption increase the more convenience and flexibility of people's lives while also ensuring their safety. Better environment and quality of life, as well as contributing to long-term growth as a Smart City, a city that makes use of cutting-edge technology and innovation [14, 15] . increase the efficiency of services [16, 17] and municipal management, as well as the city's and target population's cost and resource utilization [16] . Emphasis on good design and business and public participation in urban development. The government [12] has prioritized to smart city development [3, 18-21] as a national objective that demands immediate action in order to establish livable cities, modern cities, and provide city residents with a good quality of life, happiness, and sustainability [5, 11, 22]. The National Economy and Society Development Plan, No. 12, is in accordance with the 20-year National Strategic Plan. According to the Prime Minister's direction, the Economy Thailand 4.0 Development Model and the digital economy and social development plan [23, 24] have created a committee to advance smart city development. A committee has been formed to promote and support smart city [12, 16, 19, 20, 25-27] development, devise policy initiatives, and drive area-level smart city development. By establishing seven pioneer areas: Bangkok, Phuket, Chiang Mai, Khon Kaen, and Pattaya. Chachoengsao, Chonburi, and Rayong that are three provinces of the Eastern Economic Corridor (EEC). The criteria for the development plan's components are divided into five categories: 1) Determination and ambitions for the area 2) improvement of infrastructure 3) systems of information and security 4) smart city services, as well as 5) management and involvement.

There are two types of smart cities [24, 28-32]: one that is technologically advanced and the other that is not. 1) the same city refers to the initial city that has been evolved into a livable city with its population. The application of technology and innovation is based on the demands of the city. By improving the city's infrastructure, public utilities, housing, recreational spaces, employment, and commerce, as well as arranging

the city's space in a way that reflects the city's culture, tradition, and identity. 2) the term "new city" refers to a city that has been transformed into a contemporary city. In the contexts of the city's needs, technology and innovation are used. By improving the city's infrastructure, housing, recreational spaces, work locations, and commerce, as well as the right allocation of space in the city. The following are seven dimension of smart city development [19-21]:

(1) Cities that consider the influence on the environment and climate change conditions by employing technology to help systematically to manage them are referred to as smart environments.

(2) Cities that employ digital technology to provide value to the economy and efficiently manage resources are referred to as smart economies.

(3) Cities that focus on the development of traffic systems and intelligent transportation to drive the country are referred to as smart mobility through boosting the transportation system's efficiency and connection, allowing for a greater variety of traffic, and being.

(4) Cities that are able to handle energy efficiently are referred to as smart energy.

(5) Cities that aspire to develop knowledge, skills, and an atmosphere favorable to lifelong learning is referred to as smart.

(6) The term "smart living" refers to a city that has built facilities using universal design principles. Encourage people to live in excellent health and have a good quality of life to live, be safe and happy.

(7) Cities that implement government service systems to promote smart governance are referred to as smart cities. The people who are interested in finding out about government information and news. There is ongoing improvement through the implementation of innovative services, with a focus on transparency and engagement.

Singapore [33], a successful smart city country, entered smart city and moved to smart nation, receiving numerous honors and being named the number one smart city in the global smart city Performance Index 2017. The achievement successes through human development Cultivate moral awareness and participation, and have all sectors work together on development.

The major goal of smart city development is to raise government, corporate sector, and civil society awareness and comprehension. in terms of the relevance of such agencies, educational institutions and family institutions are the most important. Smart city advantages in terms of preparing for urbanization (Urbanization) and changes in numerous dimensions According to Tennant, Youssef [22] determining which media to utilize is vital in addition to learning activities or learning scenarios. Media Attributes, which refer to the ability of media to express features such as movement, color, and sound, are the next key element in media selection. The importance of virtual reality [11, 18, 34-38] cannot be overstated. Because smart city [39] development is not covered in school and has a multi-faceted content, it is not included in the curriculum. Furthermore, Thailand is transforming itself into a smart city, people must study through the media in order to comprehend the features of urban growth in all seven dimensions and to perceive the whole picture in every dimension, people would be able to learn and understand more with virtual reality[33, 40-42].

Nowadays, the physical world and the digital simulation world are combined to provide an immersive experience [10, 18, 43] in the virtual world. This gives the impression of being in the real world by mixing real-world and 3D virtual images [11], or in a format that allows the user to gaze through the camera virtual reality, according to Chang and Lai [18], is an interactive technology generated by computers [37, 41, 43-45] to allow people to feel engaged within a uniquely built virtual environment [3, 18, 33, 41]. Allows users to interact with the physical world contribute to attracting attention and having the most happies.

The researcher has an idea to design a conceptual framework for innovation creation to promote knowledge in the form of immersive experience based on the foregoing. To encourage Thailand lead the way in smart city development in order to improve people's quality of life and usage of technology. Energy [27, 28, 46] at its most efficient to gather data in order to develop media that will boost knowledge [11] and understanding by simulating a smart city in the form of an immersive experience [3, 47, 48] in video format for usage on all platforms and virtual reality recognize the future benefits of smart cities and work to maximize their potential for growth while maintaining an environmentally friendly quality of life.

Research Methodology

Population and sample

1. Population, experts used for the synthesis and media quality inspection process have graduated with a Ph.D. or holding an academic position not lower than Assistant Professor in computer science or related fields or who has at least 10 years of teaching experience

2. The sample group for this research uses a specific sampling method. the defining properties that is, an expert who has at least 10 years of experience, including 5 experts used in the synthesis process and quality of media and technology and 10 experts used in the synthesis process and the quality of information on smart city content in Thailand

Tools for research

This study's instruments comprises of an expert interview form with the following details:

1. Complete the expert media and technology interview form with the following information:

1.1 Thailand's smart city technologies The Internet of Things (IoT) is a term that refer Image transmission in the manner of producing an immersive experience picture using IoT technologies and AI presentation of material in 2D and 3D (Model) resolution of the display time spent watching the media and the feedback received

1.2 The content of the original city of smart city in Thailand is presented in seven dimension: smart city, smart environment, smart economy, smart people, smart, smart living, smart mobility, and smart energy in the interview form for specialists in smart city in Thailand. Suggestions and content.

1.3 Developing research instruments the steps are as follows: documents, concepts, theories, and relevant research are gathered for the study. Analyze the topic of issues concerning Thailand's smart city and generate queries in accordance with the research's aims.

1.4 Determining the quality of a tool in terms of the interview form, the experts were asked to review the content for accuracy, consistency, and coverage. The correct of the wording used and provide ideas, and then make modifications to the questions based on the experts' recommendations.

1.5 The information collection area, which includes Phuket, Khon Kaen, Chiang Mai, Phitsanulok, and Bangkok (in Thailand) is a prototype area for smart city development.

Data collection methods primary data (data gathered), interviewer expert media and technology, and smart city expert are some of the data sources used for this study. In order to obtain data for the qualitative study, experts in media and technology were interviewed utilizing the In-Depth Interview approach. Total of 15 people: 5 people, 10 smart city professionals.

The analyzing data analytic induction was used to analyze qualitative data. the data from the interviews was examined by summarizing, gathering opinions, and presenting them in response to the questions.

Results

1. A synopsis of the conceptual framework for media production in the form of an immersive experience for Thailand's smart city. Following the data collection, the interviewer, a media and technology specialist of five people, synthesized the information in order to build the conceptual framework as follows:

Question 1: What are your thoughts on Thailand's smart city initiative? The results reveal that the city uses current and clever technology and innovation to improve service and city management efficiency with a strong focus on good design involvement of both the private and public sectors in urban development. Emphasize the development of information, skills, and a learning environment that encourages lifelong learning, reducing social and economic disparities through the concept of livable city development, a modern city designed to make people's lives easier.

Question 2: What are the characteristics of a smart city in all seven dimensions? Why should Thailand use technology to develop the most? because it would combine information at the city level, the results reveal that City Data Platform (CDP) information development because information will be the most significant aspect of the upcoming development, it will be used in city planning, management, and issue solving. Information is essential in the early stages of urban development since a city cannot move without it.

Question 3: How do you think the digital Internet of Things (IoT) technology and artificial intelligence (AI) may be utilized to construct a seven-dimensional city? Drones, traffic control systems, CCTV control, Smart home technology that connects home gadgets to the internet, smart grids, smart wearables, and other control systems to be able to utilize are all

examples of transportation information business. In every way, whether it's EV cars or government services, it's more convenient.

Question 4: Is establishing an immersive experience suitable for promoting smart city visualization? Why is the outcome display so appropriate? because it will make the text easier to comprehend for the viewers a standard video format. It's a virtual world inside a virtual world.

Question 5: How should the seven dimensions of a smart city be translated into a 2D or 3D (Model) visual, with the result demonstrating that 3D is more realistic than 2D? The spectator will see the picture more clearly since 3D contains a Z-axis, which makes it visible to them.

Question 6: How should the content presentation be organized? The results indicate that it should begin with the city data system and basic information available in the country, followed by a detailed explanation of Thailand's smart city. Because in today's environment, large data is critical. Using big data as a source of inspiration, it is said that it should begin with data and progress from there, offering Organizational Information (DEPA) by presenting smart city data such as smart people. The living environment is first, followed by the economy, mobility, energy, and governance.

Question 7: What should the media resolution be? The results reveal that the screen resolution should be HD, Full HD, or 4K.

Question 8: How long should you watch the media (in minutes)? The results reveal that you should watch it for about 3-5 minutes.

Question 9 Suggestion, the results show that by examining the information received, the information to be conveyed is safety and the environment. then apply it to municipal planning, management, and problem-solving for the benefit of the people. The metadata element is fascinating to present since it can serve as a model for other cities in areas such as crime prevention, accidents, and traffic, and it will aid in the resolution of problems in our country as well as dubbing in regional languages.

As a result of gathering data from the interview with 10 smart city experts synthesis the information to produce guidelines for constructing the conceptual framework as follows:

Question 1: What are your thoughts on Thailand's smart city? In conclusion, Thailand's smart city was a city that used technology as a development tool to meet the 4.0 era's demands for modern innovation and smartness. Increase the efficiency of service and municipal administration, as well as the city's and target population's resource use and cost reduction. Emphasis on smart design, business participation, and government involvement in urban development. Under the concept of creating a livable city, a modern city that provides residents with a high quality of life and long-term satisfaction.

Question 2: If you were to display the content of Thailand's original city in each section, what aspects do you believe should be included? The results suggest that all aspects should be included, for example, a smart environment should have a public garbage can linked to the system. Waste management in the city. The public can use real-time display air quality monitoring locations and green spaces in the smart economy. Should there be an expansion of start-ups or new firms, and there will be electronic transactions, the smart economy should have a proportion of services with open data regulations. Provides a high level of security. Training classes for brilliant people should be available to help them improve their skills in using digital technologies.

Access to E-Learning by the general public and lifelong learning. The smart governance provides online city services, according to channel or online services through an application or other internet channels, there is access to a complaints system, ideas and grievances, and an emergency notification system.

Electronic access to one's health information should be available to the smart living. There is an online appointment system for medical services or enhancing public safety through crime surveillance, or the rate of remote access to health care services. Public transportation should be part of smart mobility (smart travel and transportation). The public transportation routes are equipped with real-time technologies and universal design of transportation facilities for access to transportation services at a distance of 500 meters. The creation of renewable energy is referred to as smart energy or other sources of energy (waste energy, water power, solar energy, etc.)

Question 3: Which element of content should be provided first? The results suggest that the smart data platform presents about data catalog, which was created to collect data. The data exchange was created with the goal of exchanging and advancing information. The data governance was created as a guideline for the

creation of municipal information storage and management systems, as well as the components of a smart city in seven dimensions: smart living, smart governance, smart people, smart economy, smart environment, smart mobility, and smart energy.

Other recommendations, based on the results, demonstrate that a city data platform should be presented to encourage the use of storage platforms and manage city data.

Experts unanimously agreed that media should be developed to create an immersive experience and a smart city as a result of the findings. The experts agreed unanimously with creating a content prototype for a city information portal. The creation of a media conceptual framework in the form of an immersive experience for Thailand's smart city. As the researcher gathered data on acceptable media and smart city data, a conceptual framework was created to lead media development in the manner of producing an immersive experience for Thailand's smart city, as shown in the diagram, the following:

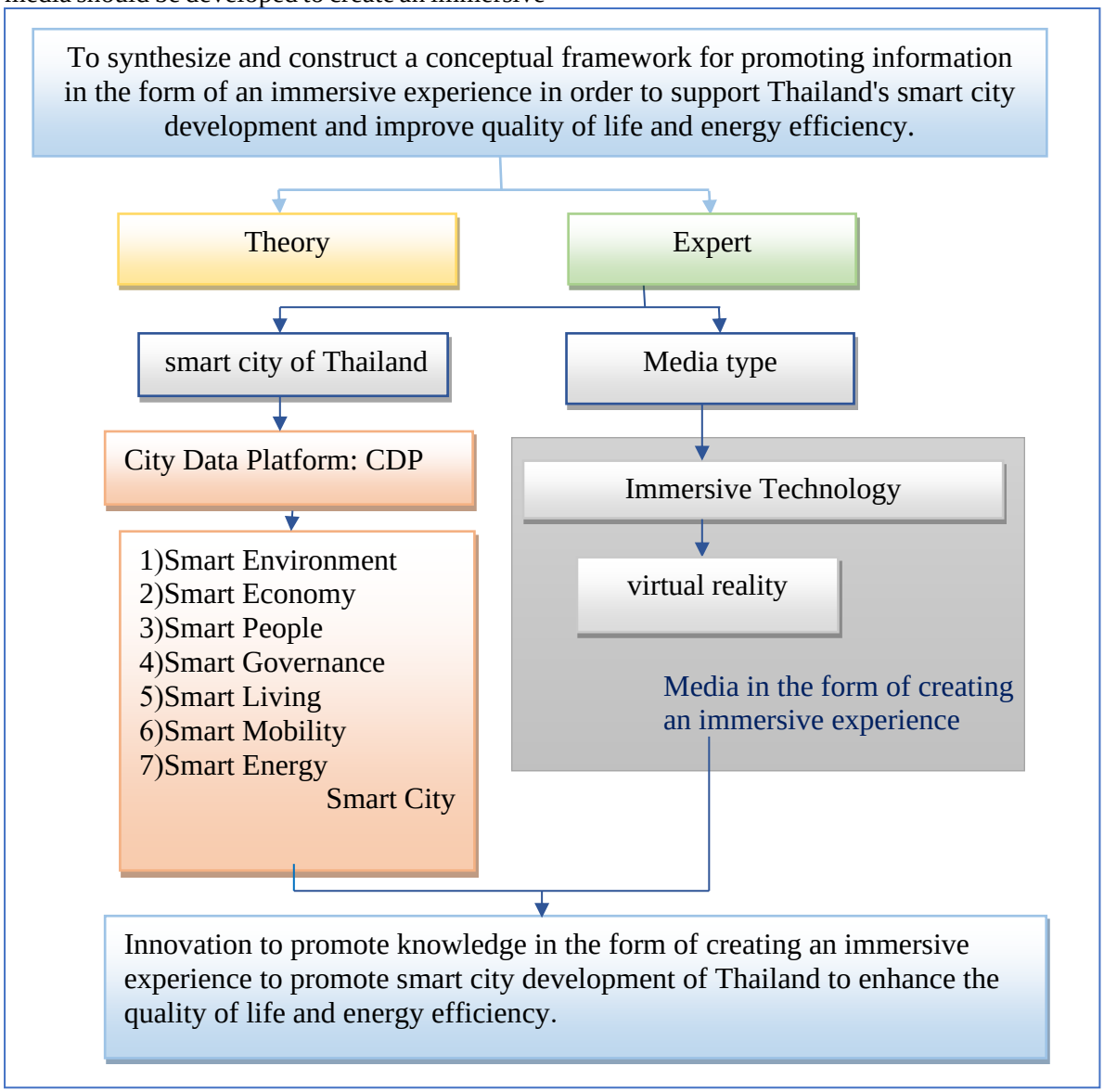

Figure 1. conceptual framework of media development in the form of creating an immersive experience for smart city of Thailand

The following is a description based on the image: based on a review of theory and related research, including smart city concepts, immersive experience concepts, graphic design, and research related to media development in accordance with the model of creating immersive experience, as well as an interview with an expert about smart city information and an expert about media formats, the city data platform (CDP) is a combination

of technology and personnel in improved city services this is the heart of a smart city, which prioritizes people's wants and issues in order to create a sustainable city. Each city's development takes a different approach in terms of population, environment, economy, and society, and relevant information can be utilized as a model for media production, with samples linked to seven dimensions of the smart city data to provide exposure individuals are aware of smart living, smart governance, smart people, smart economy, smart environment, smart mobility, and smart energy are only a few of them. Immersive Systems is a virtual reality system that simulates a virtual environment for individual user's VR BOX cameras, which have both visual and aural capabilities, are used by media watchers.

The findings show that, in the following step, the conceptual framework will lead to the production of media in the form of generating an immersive experience for Thailand's smart city.

Discussion

1. A synthesis of the conceptual framework employed in media development as an immersive experience for Thailand's smart city. The following are some of the findings:

Experts are interviewed with smart cities, media, and technology. The conclusion of the interview information for question 1 (in your opinion, how is smart city in Thailand) is that the expert supplied similar interview information, which is consistent with the smart city Thailand office at a smart city is one that uses current and intelligent technology and innovation to improve service and city management, save expenses, and better utilize resources for the city's and its target population. The importance of good design and the involvement of the private and public sectors in urban development are emphasized. modern cities, according to the notion of livable city development, provide city residents with a high quality of life, happiness, and sustainability.

Interview media and technology experts.

Question 2 (The seven dimensions of smart city features, which field of technology should Thailand grow the most and why), in question 6 (how should content presentation be sorted), and in question 3 (The expert interview about smart city)? it was discovered that the information from the three interviews was linked to information about the city data platform (CDP), indicating that the city data platform should be used as a model and technology for presenting media content (CDP). Because in today's environment, big data is critical. it is suggested that big data should begin with information and then go on to the following 7 areas of information. The city data platform (CDP) is a combination of communication technology or ICT with employees involved in linking information, utilize it to optimize decision-making and lead to development quality analysis, and better serve the city, according to the digital economy promotion agency. This is the heart of the smart city; which views people's needs and issues as the driving force behind a sustainable city.

the conversation media and technology experts.

Question 3 (How do you think digital Internet of Things (IoT) technology and artificial intelligence (AI) can be applied to develop the city's seven dimensions?) The use of digital Internet of Things (IoT) technology and artificial intelligence (AI) to construct 7-dimensional cities in every dimension was discovered. The interview with the smart city specialists in question 2 conforms to the example of 7-dimension city development. What areas do you think there should be content in if displaying the content of Thailand's original cities on each side? The expert information interviewer intended to convey all factors, it was discovered.

Question 4 (Is broadcasting in an immersive experience format ideal for promoting smart cities and why?) in the interview Expert media and technology. As a result, the outcome demonstrates that it is suitable because it will make the text easier to comprehend for the viewers a standard video format. It's a virtual world inside a virtual world.

Question 5 (all 7 dimensions of smart city features). The image should be developed into 2D or 3D (Model). The results demonstrate that 3D is more realistic than 2D since it has a Z-axis, which allows the audience to see properly and clearly.

According to Bec, Moyle [10], VR 's potential to make people feel as if they are in the real world while wearing a gadget, Simulation of a virtual service Simulating

diverse circumstances and improving the flavor and sensation

Question 7 (roughly what screen resolution should the material have), the results reveal that the screen resolution should be HD, Full HD, or 4K, which is compatible with Singh, Lee [39] research. regarding the image's resolution: 1) The prevalent resolution standard is 1366 x 768 pixels, which is known as HD resolution. Assist in the clear viewing of visuals. 2) Full HD has a clear picture with a resolution of 1920 x 1080 pixels. The resolution that corresponds to watching digital television shows and 3) UHD (Ultra High Definition or 4K) offers a 4 times better resolution than Full HD (3840 x 2160 pixels). Virtual reality is a term used to describe a situation in

Question 8 (regarding how long should the media be viewed), the results reveal that it should be viewed for roughly 3-5 minutes, Zhu, Yan [5] conducted research on a model for integrating teaching and learning into academic services to promote learning of EDL TV media with video clip activities of storytelling under the royal umbrella, prepared as 3-5-minute video clips, presented via system and network, where the quality of video clips developed by each student was assessed. The entire degree of quality is exceptional.

2. **Creating an immersive experience for Thailand's smart city by developing a conceptual framework for media. The following are some of the findings:**

The findings in the research on conceptual framework development are divided into two areas:

1) The City Data Platform (CDP) is the brains of a smart city that revolves around the wants and issues of its citizens. In terms of population, ecology, economy, and society, each city's growth takes a unique method. The majority of them have built their own service system for the people and have various objectives. To develop adequately, they are scattered and not integrated. The results of the smart city data synthesis demonstrate that city data platform (CDP) can present 7-dimension smart city sample information to produce a smart city data presentation as a model and the technology that should be employed in media content presentation is city data platform (CDP) can be found out by the general public

Ilić, Milošević [49] did a study on the process of transformation into a smart city: a case study of Khon Kaen Municipality, which corresponds to Sarker [50] research. In accordance with Sharif and Pokharel [51] research, to investigate the process of transformation into a smart city, the impact of the process of transformation into a smart city, and people's adaptability to becoming smart city citizens.

2) A media format is a type of immersive experience systems because it simulates an environment that may be made to look like the real world. The viewers experience learning and information through visual and auditory perception.

In line with Tennant, Youssef [22] research on the development of multimedia media in the form of virtual reality (VR) technology for public relations of tourist attractions in Maha Sarakham Province, Chao, Hu [11] research on the design of information presentation systems, ancient monuments with technology that combines the real world with the virtual world through a physical model

Recommendations

1. The researcher can summarize the following research findings as a conceptual framework and a guideline for individuals interested in media development in the form of constructing an immersive experience system or presenting on smart city information and city information platforms.

2. A research should be conducted in the sample group, and the region for data collection should be expanded to include additional data more all-encompassing

3. To raise public awareness, more research on other issues such as people's attitudes about smart cities in Thailand, smart image in Thailand, and so on should be conducted. Create credibility and chances for the government to construct smart cities, allowing people to gain information and understanding, and leading to long-term smart city development.

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