

The Development of Local Smart City Model in Thai's Context: A Delphi Technique

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The article has the objective to develop local smart city model in Thai's context. The Delphi research technique was used in the study by 18 experts with competence of smart city and local government. The experts are divided into 3 groups: an academic sector, a local government sector, and a private and civil society sector. The result demonstrates that local smart city models in Thai's context consist of 9 factors: 1) sector collaboration factors, 2) internal local government organization factors, 3) local smart city centre, 4) people's participation factors, 5) public mechanistic factors, 6) social equality awareness factors, 7) positioning Identifications of development factor, 8) external context factors, and 9) local smart city potential factors.

Key words: *Smart City, Local Smart City, Thailand.*

Introduction

In the present, the population in urban areas has continuously increased. That is to say, more than a half of population in the world lives in urban areas (United Nations, 2011). There is also more tendency of movement of population into urban areas. The UN estimates that by 2050, 66 percentage of the world's population will move to live in urban areas (United Nations, 2015). Moreover, they estimate that by 2099, 80 percentage of the world's population will live in urban areas (Hardoy et al, 2013). Also, many countries, especially about 90 percentage of developing countries, are driving the policy of urbanization (James H. Spencer, 2015). This makes the urban area multiply development and has been prioritized from the past to the present. It can be said that urbanization will be an crucial issue in the 21st century development and will become a challenging issue to the planning process to prepare the urban infrastructure in the city. Therefore, due to the fact that national development

causes the rapid growth of the city, there are many negative effects, such as environmental problems, criminal problem, hygienic problems, etc. These problems cause social inequality as a consequence. It can be seen that the city has become an key point of development in various areas. On the other hand, urban areas have many difficulties.

Due to the changes of the world's economy and societies with application of technology in daily life, the concept of sustainable city has been replaced by the concept of smart city. In fact, both of concepts share related urban development principles. That is, urban development with information technology facilitates quality of lives of people and environment. Many scholars commented that "cities cannot be truly smart without being sustainable" (Ahvenniemi et al., 2017; Yigitcanlar, T. et al., 2019). They also commented that the concept of smart city development is a way to deal with problems in cities (Bansal, N. et al., 2017). Hence, it can be said that smart city development is an important key to improve quality of lives of people in cities according to sustainable development as well.

In term of academic matter, smart city can probably be a marriage between the application of technology and urban governance (Meijer, A., Rodriguez Bolivar, M. P., 2015). This is consistent with many scholars who said that the importance of the promotion of smart city concerns with the adaptation of technology to fit in the context. So, the majority considered that smart city development involved with science field. In fact, it involved with social science as well (Chourabi et al., 2012). That is to say, smart city development maybe requires collaborations from other sectors rather than public sectors. It must be an establishment of collaboration and a network with non-government organizations to jointly provide public services. This must apply technology to urban governance to lead to a concrete success with sustainable development and to promote social equality called "Smart City Governance" (Ruhlandt, R.W.S., 2018).

Thus, in Thailand, the concept of smart city is raised in the development of the country. To establish a concrete form in driving smart cities, the Thai government, led by prime minister of Thailand, has appointed Thailand's National Smart City Committee to establish Thailand's Smart City Supporting Development Plans. It is the strategic planning to drive smart city development in the future according to each area's context and the guidelines of the application of technology. The planning divided smart city dimensions in 7 dimensions: Smart Economy, Smart Living, Smart Environment, Smart Energy, Smart Mobility, Smart Governance, and Smart People. In addition, by 2022, 100 cities in 76 provinces will be developed into smart cities. However, the boundary of the development is restricted to provincial level. That is, local government organizations, which mainly provide public services in the areas, are excluded. If they can develop the responsible areas into local smart cities, it may causes the access to infrastructure and public services more effective.

The development in local level can give an advantages. That is, local government will be flexible to the context. The leaders and people also have better understanding of their geography, resulting in effective local smart city development. Moreover, local government organizations are a form that helps to promote decentralization and democracy to establish citizen-centric governance (Angelidou, M., 2014)

In the present, there are 7,852 local government organizations¹ in 2 forms: general form (Provincial Administrative Organizations: PAOs, Manucipality, and Tambol Administrative Orgranizations: TAOs) and special form (Bangkok and Pattaya). They are responsible for the provision of public services in the areas and truly meet people's needs. They are also sectors that help ease the central government's burdan (Kowit Phuangngam, 2016). The study by Weerasak Krueathep (2015) found that local government organizations play an important role in improving the quality of life of people, especially at the foundation level. They also distribute the opportunity to the access to public services for the public inclusively and play an important role in reducing social inequality. Thus, Therefore, the government should urgently urge local government organizations to act as "a partnership" role in helping to reduce social inequality. The more decentralized, the more likely it will expand the opportunities to provide public services to people. Besides, the growth of urban society will be an important driving force in decentralization. In the last 50 years, it was found that the growth of urban society increased rapidly. This causes local government organizations in urban areas (municipality) to take over the role of the government in governing the city and providing public services of cities. It is because public services in urban areas are complex and unique. In general, local government organizations are more flexible in spatial work than the national government.

From above, it can be seen that local government organizations play an important role in managing infrastructure, inclusively distributing public services and reducing social inequality. It can be said that "*the principle of local governance and decentralization are to move administrative power and solution to the problems and people's needs*" (Woothisarn Tanchai, 2015). If the smart city concept is coordinated in the local government organization to be a local smart city, it can increase the efficiency of the local government organization in the provision of public services as well. Therefore, this research synthesizes data to be clear about the role of smart cities that will reduce social inequality and needs to develop a smart city at the local level in the future. What factors will support the establishment of a local smart city to define a model of local smart city development? This may lead to a prototype area and may be able to expand to develop in other local government organizations in the future.

¹ Data from Department of Local Government of Thailand, 2020

Research Objective

The objective of this research is to develop the local smart city model in Thai's contexts.

Research Methodology

To form a model of a local smart city, the researcher used Modified Delphi Technique from 18 experts in local government organizations and smart city development, according to sample size by Thomas T. Macmillan (1971, cited in Suwimon Wongvanit, 2015). The groups of experts were divided into 3 groups. **Group 1:** a group of experts from the academic field is a group of 6 experts who are professors, scholars, as well as scholars in the research area and people with knowledge and ability about urban development, smart city development and local government. **Group 2:** a group of experts from local areas is a group of local government organization administrators. In this research, 7 mayors were selected with experience in local administration which has a policy to develop the area into a smart city which is the same area as the quantitative data collection. **Group 3:** a group of experts from private sectors and civil society is a group of executives, associations, companies involved in urban development, public utility, and public administration in the areas in this research, consisting of 5 chairman of the provincial chamber of commerce, president of provincial tourism association and representatives from the urban development company.

The data from in-depth interviews were taken into content analysis and the data from questionnaires were considered from mean that does not exceed 3.5 and Interquartile range (I.R.) that does not exceed 1.50. This means the question reach a consensus.

The Result of the Research

The Data from In-depth Interview

From in-depth interviews with 18 experts, it was found that it causes well connected information. In public governance, the operation is transparent and verifiable and benefits people. To develop local government organizations to be local smart cities, it must require various factors to develop in the aspect of multi-stakeholder partnerships. That is to say, it requires collaborations from 1) central government 2) private sectors 3) academic sectors 4) civil society organizations, and 5) international organizations to establish collaborations in the area. To create concrete collaborations, there must have a collaborative sector between local areas to develop specific areas to be local smart cities.

To be local smart city, local government organizations must determine the positioning identifications of development first or which dimension should be prioritized, such as being a tourism city or safety city. Thus, local government organizations that will develop into local

smart cities “should not consider what technology will be applied in the area, but consider what fits in the context of the area.” To determine the positioning identifications of development, local leadership factor can dictate the direction of the local area and can establish people’s participation, which leads to public engagement. Additionally, experts commented that local government organizations that will develop into local smart cities may have to maintain the old infrastructure to be developed. The area must also be highly-urbanized with high density of population, suitable size and human resources with competence to jointly develop the local area. From these opinions, it can be said that Thai’s local government organizations in the form of municipality must be the most suitable form to develop local smart cities.

The matter on local decentralization is also considered as a factor to develop local smart cities. That is to say, if there is a clear decentralization within local government organization, local development policies and the provision of public services will meet people’s needs and decrease dominance in policies from central government. Besides, urban development regulations must be improved, according to urban development to eliminate obstacles in local smart city development. In addition, external context factors including economy, politics, society and technology, which are beyond local government organizations’ authorities, are considered as factors affecting local smart city development as well. Finally, local smart city potential factors must come from the positioning identifications of development by local administrators and people in the local areas. The experts commented that it should be restricted to Thailand’s Smart City Supporting Development Plans. Also, the potential of local smart cities should be agreeable with authorities according to the law. It may have to mainly focus on Smart Living, Smart Governance, and Smart People.

The Data from Delphi Questionnaires

After In-depth interview, the researcher brought the data to create Delphi questionnaires to find consensus among experts. The questionnaire comprises 9 factors, 63 questions, calculated Median and Interquartile Range (I.R.) to demonstrate the level of opinions and consensus on each factor and question by presenting each item as follows:

Factor 1 Sector Collaboration Factors: this factor has components of collaboration from 5 sectors as follows:

Public organizations: it was found that experts have consensus that the role of public sectors must be facilitators in the management of local smart cities (Mdn. = 5.00, I.R. = 0.25) and public sectors must have a policy to promote the development of local smart cities that are concrete and clear (Mdn. = 5.00, I.R. = 0.00) and give an importance to public sectors in formulating policies for local smart urban development plans (Mdn. = 4.00, I.R. = 1.00).

Private sectors: it was found that the experts have consensus that private sectors are flexible in regulations, making it an important part of local smart city development (Mdn. = 5.00, I.R. = 1.00). The private sectors that develop smart local cities may need to adjust their business goals to "make profits but not neglect the underprivileged" (Mdn. = 4.50, I.R. = 1.00). And, the role of private sectors must also be a technology leader to manage local smart cities (Mdn. = 4.00, I.R. = 0.25).

Academic sectors: it was found that the experts have a consensus that academic data will help support the policy process of local smart cities (Mdn. = 5.00, I.R. = 0.00). Also, the opinion that the academic sectors must play a role as an academic and research service to support local smart cities (Mdn. = 4.00, IR = 1.00). And, the role of academic sectors in the provision of useful support information for effective policy decisions (Mdn. = 5.00, IR = 0.00).

Civil society organizations: it was found that experts have consensus that civil society plays a role in coordinating the needs of people in local smart cities (Mdn. = 4.00, IR = 1.00), plays a role to help reflect the problems that arise in local smart cities (Mdn. = 5.00, IR = 0.00), and help examine the interests of people as an informal sector (Mdn. = 4.00, I.R. = 1.00).

International organizations: it was found that experts have consensus that international organizations must have a role to promote technology and innovation for local smart cities (Mdn. = 4.00, I.R. = 1.00). The use of technology, innovation or knowledge, gained from international organizations, must consider to fit in the context (Mdn. = 5.00, I.R. = 0.00). And, international organizations play a role in promoting knowledge (Mdn. = 3.50, I.R. = 1.00).

Factor 2 Internal Local Government Organization Factors: consisting of sub-factors as follows:

Local characteristics: it was found that experts have a consensus that local government organizations that will develop into local smart cities must have high urbanization characteristics (Mdn. = 4.00, I.R. = 0.25), must have a suitable size of area (not too small or too large), (Mdn. = 4.00, I.R. = 1.00), must have rather population density (Mdn. = 4.00, I.R. = 1.00), and there is an idea that the municipality is likely to be most suitable for developing a local smart city (Mdn. = 4.00, I.R. = 1.00).

Local infrastructure and resources: it was found that experts have consensus on all of them. That is to say, the development of local smart cities should have enough existing local infrastructure (Mdn. = 4.00, I.R. = 0.50) as well as having talented personnel as a part of the development of local smart city (Mdn. = 5.00, IR = 0.00). Also, it seems that social capital

and indigenous knowledge can be useful to local smart city development (Mdn. = 4.00, I.R. = 1.00).

Local leadership: it was found that experts have consensus on all of them. There is an opinion that local leaders can create collaboration between local smart cities and relevant sectors (Mdn. = 5.00, I.R. = 0.00). Also, local leaders can create public participation in the development of local smart cities (Mdn. = 5.00, I.R. = 0.00) and local leaders must play a role in the exchange of information in urban development (Mdn. = 5.00, I.R. = 0.00).

Local authorities and roles: it was found that experts have consensus that the local legal authority helps to determine the mission and makes clear about the provision of public services in the local smart city appropriately (Mdn. = 5.00, I.R. = 0.00), and local authorities will reduce the complication of the mission of the local smart city with other agencies (Mdn. = 4.00, I.R. = 1.00).

Factor 3 Local Smart City Centre Factors

Experts have a consensus with the opinion that local smart city centre should have the authority to help to cooperate between local smart cities with similar social and cultural contexts (Mdn. = 4.00, I.R. = 1.25), the collaboration in providing public services between local smart cities (Mdn. = 4.50, I.R. = 1.00), the centre have the authorities to promote the sharing information (Mdn. = 5.00, I.R. = 0.25), the sharing information of smart city centers will contribute to the local policy decision-making process (Mdn. = 5.00, I.R. = 0.25). Local smart city centre should play a role in integrating development plans between local smart cities with similar contexts to the holistic development (Mdn. = 4.00, I.R. = 1.00). Also, the center should also play a role in the integration of the development plan between local smart cities and other agencies with a development strategy in the holistic development (Mdn. = 4.00, I.R. = 1.00). However, experts have no consensus that the local smart city centre should be under the provincial authority (Mdn. = 2.00, I.R. = 2.00).

Factor 4: People's Participation Factors

It was found that the experts have a consensus on the people's participation is an important part that allows local smart cities to determine the positioning identifications of development (Mdn. = 5.00, I.R. = 0.00), encourages long-term collaboration (Mdn. = 5.00, I.R. = 0.00), and it is an important part of citizen awareness, promoting local ownership awareness (Mdn. = 5.00, I.R. = 0.00).

Factor 5: Public Mechanistic Factors: consisting of 3 sub-factors as follows:

Urban Administrative Regulations: it was found that the experts have a consensus on improving regulations related to city governance to be modern and up to date that helps the development of local smart cities are more effective (Mdn. = 5.00, I.R. = 0.00), and the reduction of certain urban administrative regulations that will help the development of local smart cities to be more efficient (Mdn. = 5.00, I.R. = 0.00).

Decentralization: it was found that experts have consensus on that decentralization of administrative decisions will promote the development of local smart cities (Mdn. = 4.50, I.R. = 1.00). And also help local smart cities to provide public services to meet the needs of people (Mdn. = 5.00, I.R. = 0.00).

Public Engagement: the experts have a consensus on that public engagement will help to develop as a local smart city (Mdn. = 5.00, I.R. = 0.00). And also have an important part for sustainable city development (Mdn. = 5.00, I.R. = 0.00).

Factor 6 Social Equality Awareness Factors: consisting of 2 sub-factors as follows:

Citizen-centric services: it was found that experts have consensus on that the provision of public services that meet the needs of the people is important in the development of local smart cities (Mdn. = 5.00, I.R. = 0.00) and is considered as a way to reduce social inequality (Mdn. = 5.00, I.R. = 0.00).

Technology drive to social inclusion: it was found that experts have consensus that local smart cities need to bring technology to help drive social inclusion (Mdn. = 5.00, I.R. = 1.00), the technology used to develop local smart cities must be suitable for the context (Mdn. = 5.00, I.R. = 0.00). And, it requires the level of access to information for the safety and privacy of people (Mdn. = 4.00, I.R. = 1.00).

Factor 7 Positioning Identifications of Development Factor

It was found that the experts have a consensus on that determining the positioning identifications of development helps to enhance the potential (strengths) in the development of local smart cities (Mdn. = 5.00, I.R. = 0.00), and to help solve problems that occur in local smart cities (Mdn. = 5.00, I.R. = 0.00). It may also have to consider from the local context (Mdn. = 5.00, I.R. = 0.00), and there is the opinion that determining the positioning of local smart cities without having to be smart in every aspect (Mdn. = 5.00, I.R. = 0.00).

Factor 8 External Context Factors

It was found that the experts have a consensus that economic context (Mdn. = 5.00, I.R. = 0.00), socio-culture context (Mdn. = 4.50, I.R. = 1.00), politic context (Mdn. = 4.00, I.R. = 1.00), and technology context (Mdn. = 5.00, I.R. = 0.00) affect the development of local smart cities.

Factor 9 Local Smart City Potential Factors

The experts have a consensus that the local smart cities have sufficient potential for development in every dimension: Smart Economy (Mdn. = 4.00, I.R. = 1.00), Smart Living (Mdn. = 5.00, I.R. = 0.00), Smart Environment (Mdn. = 5.00, I.R. = 0.00), Smart Energy (Mdn. = 5.00, I.R. = 1.00), Smart Mobility (Mdn. = 5.00, I.R. = 0.00), Smart Governance (Mdn. = 5.00, I.R. = 1.00), and Smart People (Mdn. = 5.00, I.R. = 0.00).

Discussion

The smart city development is a public policy that the government is implementing in Thailand. It is to bring technology to develop the city and the provision of public services for people. In urban context where has a diversity of population who have different in social status, income and living styles, it results in social inequality in the urban areas. In Thailand, it was found that the poor living in urban areas has lesser chance to access public services than the poor living in rural areas or outside the municipality (Thailand Development Research Institute, 2013). One of the goals of smart city development is to establish social inclusion to reduce social inequality (Caragliu A., et al., 2009). Thus, the results found that it requires many factors to develop local smart cities.

Factors 1: Sector Collaboration Factors which is considered as an important factor: it was found that sectors related to smart city development include public sectors, private sectors, academic sectors, civil society organizations, and international organizations. The results of this research are consistent with the research of Mora L., et al.,(2019); Martin, C., et al. (2019) and Kummitha R.K.R, Crutzen N. (2019). It was found that the development of smart cities requires quadruple-helix collaborative model including public sectors, private sectors, academic sectors and civil society organizations with the creation of a network for development that will efficiently clarify local urban development (Angelidou M., 2017; Ruhlandt, R.W.S., 2018; Sujana Adapa, 2018; Zhu, S., et al., 2019). In the research, it was found that each sector plays different roles (table 1).

Table 1: Sectors and their roles in the development of local smart cities

No.	Sectors	The Role to Local Smart City Development
1.	Public sectors	Facilitator
2.	Private sectors	Technological Leader
3.	Academic sectors	Academic Service Provider
4.	Civil Society Organizations	Informal Examiner
5.	International Organizations	Technology and Innovation Supporter

Factor 2 Internal Local Government Organization Factors: these factors will include 4 sub-factors (4L). The research results can be discussed as follows:

Local Characteristics, the research shows that the local government organizations that will develop into local smart cities (1) must have high urbanization characteristics, (2) have the suitable area size and (3) have densely populated areas. It may be said that, for Thailand, a local government organization in a form of a municipality may be suitable for the development of a local smart city the most. The result is consistent with Alizadeh, T. (2017).that mid-size cities are most suitable for developing a smart city and the result of the research is supported by Martin, C., et al (2019) that the district unit is suitable for developing a smart city.

Local Infrastructure and Resources are the requirement for a city that will develop into a local smart city for urban development including knowledgeable and skilled personnel, sufficient social capital and local wisdom. Therefore, it can be further developed into a smart city which is consistence with Martin, C., et al (2019)who said that smart city development requires proper infrastructure and human and social capital development (Angelidou, M., 2017) to effectively manage the city.For Thai local government organizations, human resource development still depends on the organizational structure that is set by the central government. That is to define the position or department in the organization, resulting in same organizational structure of all local government organizations.

Local Leadership, local leaders play an important role in determining local vision. Therefore, local leaders must have the ability to cooperate between other sectors and to create people's participation and play a role in driving to exchange information on urban development which is consistent with the research of Sujana Adapa (2018) that shows leaders play a role in smart city development which requires collaboration in urban development in different sectors and play an important role in setting goals and local vision (Axelsson K., Granath M., 2018). Also, the leadership process will contribute to changes in the city (Kathleen M. Grave, 2016).

Local Authorities and Roles can determine missions, establish clarity regarding public services and reduce complexity of missions. For Thailand, authorities and roles of local government organizations have laws that define the scope of their authorities. However, in some cases, it was found that certain types of public services are related to other public sectors. Ruhlandt, R.W.S. (2018) stated that clear roles and responsibilities will increase the efficiency government which will directly affect the provision of public services more efficiently (Giffinger et al., 2007).

Factor 3 Local Smart City Centre Factors: in addition to receiving collaboration from social sectors, in local smart cities that bring technology to arrange public services for people in the city, some types of public services may be beyond the potential of a single local government organization. Therefore, the process of creating collaboration and IT sharing between local government organizations may, therefore, be an effective solution with the intervention of Local Smart City Centre to promote Local Government Collaboration with similar socio-cultural contexts which is consistent with Scholl, Alawadhi (2016) and Borsekova K., et al., (2018) which found that the potential of a single local government organization cannot be driven into a smart city. The collaboration between local areas will result in the collaboration of the provision of public services. However, the research shows that the characteristics of the local smart city center should not be under provincial level because it will cause political dominance. As a result, the provision of public services to people in the area does not meet the needs. Therefore, the center is maybe formed by a collaboration between similar local smart cities or a similar social-cultural context which may be established in the form of “Committee Centre”, consisting of people with competence from various sectors.

Factor 4 People’s Participation Factors: the issue of creating people's participation is considered as controversial study with a policy from public sectors to encourage people's participation, especially the participation between people and local government organizations. There are many research support that the participation plays a crucial part in smart city development including Angelidou, M. (2017), Praharaj, S, et al, (2017), Ruhlandt, R.W.S. (2018), Umaporn Pupphachai (2018), and Lynch, C.R., (2019) with research results that participation is one factor in the smart city development.

Factor 5 Public Mechanistic Factors are considered as factors affecting the development of local smart cities, consisting of (1) Urban Administrative Regulations, (2) Decentralization and (3) Public Engagement with the following details:

Urban Administrative Regulations: with the characteristics of smart city development that uses technology to manage the city, it causes the management process and the environment to change dynamically. Therefore, if the laws regarding urban development are not updated in

time for the actual environment and the situation, it may cause problems in city management. Also, the reduction of certain administrative regulations in the city may help the development of local smart cities more efficiently. This is consistent with Ruhlandt, R.W.S. (2018). Smart city administration must carry out policies and special enactment. And, policies for smart city management must be implemented that can be practically effective (Bolivar, M. P. R., Meijer, A. J., 2016).

Decentralization has been discussed many times and is important to local government as well. That is to say, if there is decentralization to local government organizations, it will give local government organizations full authorities in the provision of public services for local people. The local administrators themselves are well aware of needs of local people, resulting in local public services meeting needs of people. In term of Smart City Governance, it is considered as a degree of autonomy which is an important part of smart city development (Bolivar, M. P. R., & Meijer, A. J., 2016; Sujana Adapa, 2018). This research shows that decentralization of administrative decision-making process to local government organizations will promote the smart city development and help to provide public services that meet needs of people. This is consistent with the results of Angelidou, M. (2017).

In terms of **public engagement**, it requires public mechanism that creates social partners for people. This has a deeper meaning, which is greater than people's participation, resulting in people's attachment to local areas. This also creates citizen consciousness and awareness of local ownership, which will be an integral part of sustainable city development. Ruhlandt, R.W.S. (2018); Pham, Long T. (2017) found that the strategy for smart city Governance development is to create public engagement. There is also a research by Hatuka, T., & Zur, H. (2019). which was found that smart resident does not refer to an active participation but public engagement by giving opportunities and appropriate choices.

The overall of public mechanistic factors, it can be said that local government organizations may be difficult to drive these 3 parts since it is the development process or procedure of central government systems. Either legislation or decentralization is still a driving force issue of local government organizations. For public engagement, local government organizations may only conduct projects or activities that promote attachment to the local people but creating a higher level of public engagement in other ways, such as partnership or allowing people to participate in the official investigation of local operations is still absent.

Factor 6: Social Equality Awareness Factors is one goal of the Smart City concept. A cause of social inequality is the lack of access to public services or infrastructure (Office of the National Economic and Social Development Board, 2018). It was consisting of Promotion of Citizen-Centric Services and Technology Drive to Social Inclusion.

The promotion of Citizen-Centric Services is important to reduce social inequality. In other words, the cause of social inequality is the inability to access public services or public services that do not meet the needs of people (Aphiwat Rattanawaraha, 2009). For Thai local government organizations to know the needs of local people, it still depends on the village community management to hear the opinions and proposals of the local people and taken into the local development plan. However, it was observed that in the local community meetings, local people are still less interested in such activities and local government officials hold a community meeting as one of the local development plan process without the realization of people's participation. Therefore, local government organizations that will develop into local smart cities may have to take steps in creating public engagement within their own context and potential.

In part of the **Technology Drive to Social Inclusion**, the research found that local smart cities have to use technology to help drive social inclusion, which must be adjusted to fit in the local context. Also, there must need to set the level of access to information for the safety and privacy of people as well. This is consistent with the research which was found that characteristics of cities in the future will be cities that use technology to facilitate everyone in the society to use services and gain benefits inclusively (Gudowsky, N., et al, 2017). The use of technology must promote social cohesion, which must not discriminate people into social status or without geographic barriers (Miklian, J., Hoelscher, K., 2017) and social gender (Yamini J, Singh, 2019). In addition, there is a research consistent with the findings that the technology used in urban development must be integrated with various sectors and adjusted to fit in social, economic and cultural conditions of local areas (Mora L., et al., 2019).

Factor 7 Positioning Identifications of Development Factors will give directions to the development of the city by considering internal local government organizations. The local administrators can understand the context in the area very well and be able to enhance capacity or local strengths. They also help to solve problems that occur in the local smart city area directly. This is suitable for the local context without being smart in all aspects. This is consistent with the findings of Praharaj, S, et al. (2017) and Alizadeh, T. (2017) who emphasize that smart cities must be considered as appropriate for local residents. So, it must consider which the area needs to develop first. Therefore, for local smart cities, the positioning identifications of development may have to considering internal local government organizations, promoting people's participation to know the needs of people, and create collaboration between local government organizations and local people and being the main determinant of positioning identifications of development.

Factor 8 External Context Factors are highly dynamic and beyond the control of local government organizations. This result is consistent with the research of Sujana Adapa (2018) and Passakorn Hoisangthong (2018) who found that environmental context affects the smart

city development and lead to Sustainable Development Goals (SDGs), especially technological factors that need to be integrated to fit in areas (Mora L., et al., 2019). Therefore, local government organizations must consider the external context to help to promote the potential, worthiness and reasonability of local governance with following factors:

- 1) Politics: politics has an effect on urban development. For example, democracy encourages decentralization to the locality rather than socialism.
- 2) Economy: it is also considered as an external context that results in the development of local smart cities. If having a good economic system, it affects the development and the procurement of tools and equipment for technology.
- 3) Socio-culture: the form of socio-cultural in each area has a clear effect on access to public services and people's participation. For example, caste societies are also an obstacle to the smart city development.
- 4) Technology: this factor has dynamic development, causing local areas to use technology as necessary and suitable to fit in the context.

Factor 9 Local Smart City Potential Factors

From Delphi research technique, it was found that experts have a consensus that local smart cities have an efficiency in the development in 7 development dimensions, consisting of Smart Economy, Smart Living, Smart Environment, Smart Energy, Smart Mobility, Smart Governance, and Smart People. These must be selected to fit in the context of the area. However, from the interview, local smart cities must prioritize authorities and responsibility of local government organization including their own competence. Thus, Smart Living, Smart Governance, and Smart People should perhaps be developed first.

Suggestion for Research Findings

Suggestions for Local Government Organizations

- 1) Find collaboration networks in local development, including public sectors, private sectors, academic sectors, civil society sectors and international organizations for integrating collaboration into the development in the area.
- 2) Establish a clear strategy for local development which may be prepared in a specific local smart city development plan or put the local smart development agenda in the local development plan
- 3) Local government organizations should have self-evaluation, which includes Local Characteristics, Local Infrastructure and Resource, Local Authorities and Roles, and Local Leadership which will indicate the readiness to develop into local smart cities or guidelines for determining positioning identifications of development



- 4) Activities should be conducted to create people's participation with in the area. This will lead to the process of creating public engagement and encourage public services by local government organizations to meet the needs of people in the area

Suggestions regarding Public Sectors

- 1) Laws related to urban development should be modernized in accordance with reality.
- 2) Decentralization should be concretely promoted to local government organizations to reduce policy dominance from the central government.
- 3) Public sectors should help to establish a central organization to coordinate the development of local smart cities which may be called “Local Smart City Coordination Centre.”
- 4) There should be to promote understanding regarding local government organizations that will develop into local smart cities about the use of technology to fit in the local context.

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