National Digital Economy Plan to Foster Social and Economy Benefits in Thailand

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***Abstract*—Present day, business leaders and policy makers in ASEAN member countries have put greater emphasis on the National Digital Economy Plan due to the fact that broadband Internet connection exerts positive effects on economic and social development, both at the national and regional levels. The extent of development may vary depending on the quality and coverage of infrastructure services considered the major factor propelling the global economy. The sparseness of fixed broadband infrastructure in developing countries makes mobile broadband network have more significant positive impact, because mobile telecommunications services have already played a major role in providing Internet access for people living in various countries in the region. This paper proposes a guideline to develop the National Digital Economy Plan for Thailand. The research methodology of this paper is based on qualitative in-depth interview with many experts in various fields. The results of qualitative analysis can be used to assist policy makers in development of strategy and framework of the Thailand's Digital Economy Plan to foster social and economic benefits in the digital economy era.**

***Index Terms*—digital economy, broadband, plan, social, economy, Thailand**

I. Introduction

Many countries drew up and adopted different forms of national broadband development plans, such as laws, policy frameworks, strategies, and regulations. These plans remarkably focus on different scopes of development, for example, some might give importance to servicing broadband networks alone, but some might underline the improvement of information technology, connection capacity, including the launch of road maps to take steps toward an information society.

Although the National Broadband Plan is now at its initial stage, there are some obvious signs of development that ensure its progress. Based on the broadband committee's report, the development or the adaptive application of the National Broadband Plan may accelerate the rate of access to fixed broadband services and the access to mobile broadband services. However, the increasing rates of access are different depending on how well the wireless technology is playing a role in expanding itself rapidly, carrying low costs, and contributing to fulfilling the goal of the National Broadband Plan [1].

The participation of the industry sector in formulating The National Broadband Plan is said to be one of the most significant factors behind achievement. Regarding to this, it is realized that the full-scale development of broadband networks to enhance a country's competitiveness and to strengthen the popular sector should rely on the close cooperation among the public sector, industry sector, and stakeholders. Technically, the public sector will engage in promoting the aforementioned cooperation on behave of a consultant or a participant who helps major stakeholders with the formulation of plans or related policies. Consequently, the public sector must be responsible for introducing the methods and steps in putting the development plan into actual practice: Pushing forward by ministries but monitoring and evaluating by state agencies. For the tasks of turning policies into practice, imposing regulations, and studying restrictions (like those in a complex planning stage), the public sector should seek for some degree of cooperation from other related sectors, both internationally and locally. Besides, the government should furnish each of the processes with adequate budgets as well as monitor its progress at intervals [2]. To impose policies, it is important that various factors pertaining to the development should be taken into consideration, for example, people with the skill to use broadband will facilitate selecting the digital content presented in regional dialects.

II. Digital Economy in Asean and Thailand

For the ASEAN region, the creation of digital economy and society has been widely considered so as to encourage sustainability development and enhance a better living standard of people in the region. Furthermore, the role of ICT operations and the convergence of ICT technology also pertain to the country's development in terms of economy, society, culture, as well as human and national security.

The ministerial conference on Asia-Pacific telecommunity (APT), held from 10 to 11 September 2014 in Brunei Darussalam, issued the Brunei Darussalam Statement on "Building Smart Digital

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economy through ICT" by means of exchanging opinions on promoting the smart digital economy as follows [3].

A. Policies Promoting Sustainable ICT and Smart Digital Economy

The supporting policies will promote investment, provide business opportunities and equal access to technology, and bring about innovation and creativity through the appropriate control mechanism that also places emphasis on consumer protection.

B. Stable and Secured Society through the Support of ICT

The Asia-pacific region is located in disaster prone zones. Consequently, the preparation for natural disasters, such as tsunamis, typhoons, floods, earthquakes, and volcanic eruptions, is considered a priority. For example, the installation of a warning system and the offer of assistance and relief to natural disaster victims through ICT applications can be made under the regional and international cooperation.

C. Confidence in ICT

The integration of digital into telecommunications (Digital Conclusion) can serve as a gateway to unprecedented opportunities. Meanwhile, this integration can also lead to various forms of threat that discourages the convergence of technologies in telecommunications. Therefore, the cooperation at the regional and international levels should be promoted to support the emergence of effective cyber technology and provide chances for people to use secure ICT devices and applications.

D. Sustainable ICT Ecosystem to Promote Innovative Creations

The ecosystem of sustainable ICT comprises the stakeholders involved in the infrastructure, networks, devices, applications, services, and data that effectively integrate with one another and take part in offering advantages to people in the region.

E. Producing Performances and Development at the Organization Level

The creation of smart digital technology relies on the ICT-skilled personnel and appropriate mechanism at the organization level, for example, the host of regional training and the exchange of skills, knowledge, and capabilities among experts in various countries.

F. The Enhancement of Regional Cooperation to Improve ICT

The enhancement of cooperation plays a pivotal role in propelling the regional economic growth, alleviating poverty problems and economic inequality, as well as increasing the chance of employment. This is aimed at narrowing the digital gab among the member countries on the basis of creating mutual benefits.

For Thailand, the digital economy policy is considered a major tool for escalating the country's economic potential and setting up a foundation for supporting the country's economy to grow securely and sustainably. The Thai government aims every sector at taking part in improving the economy, experiencing progress, and being capable of competing in the modern world. Consequently, five development strategies have been introduced in order to take steps toward the digital economy as follows: [4]

- Improve the digital for the society and knowledge resources.
- Improve infrastructure to promote services.
- Improve the digital for economy
- Enhance security and confidence when using the digital technology.
- Improve the digital infrastructure.

There are many methods that various sectors proposed to the government in order to make progress toward the digital economy, such as the improvement and amendment of laws necessary for propelling digital economy, the expansion of Internet networks to cover the demand of people, and the study of business models. However, the development of concrete indicators for assessing the success from driving the strategy toward Thailand's digital economy has not been mentioned yet.

The assessment of success in driving the strategy toward the digital economy is an inevitable important matter. Therefore, the study should be undertaken on the countries that have already carried on the process, for example, the EU member countries that have developed the DESI indicators to monitor the progress in improving the digital economy and to assess its results in order to be used as the reference for building up confidence among every level of investors: both locally and internationally. Besides, this can also raise awareness of the popular sector to place greater emphasis on the ways of life involved with the digital economy, due to the acknowledgement of advantages gained over the digital economy and the success in carrying out policies - reflected through the established indicators [5].

III. Research Methodology

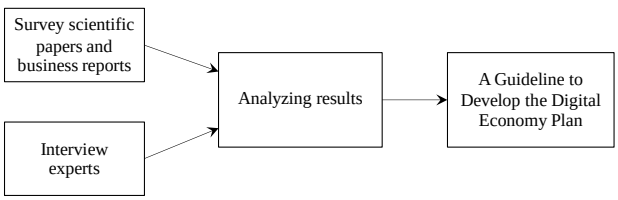

Figure 1. Research framework

It is important for every country that the national broadband plan and strategy exploits to drive the maximum possible the economic and social benefits. The objective of this paper is to propose a guideline to develop the National Digital Economy Plan for Thailand to maximize possible national socio-economic benefits. To achieve this goal, the paper adopts the in-depth interview approach to explore the research objective. In

this research, the secondary source information is from academic papers, business reports and industrial analysis reports. The research framework of this paper is illustrated in Fig. 1.

We classified subject matter experts into four categories depending on their area of expertise in ICT technologies, Economics, Social science, Policy and strategic management. The total number of subject matter experts or respondents is 12 with 3 from each key focus area.

IV. Results and Discussions

The research came up with six major suggestions that benefit the imposing of roadmaps for the National Digital Economy Plan as follows:

A. Adequate Availability of Spectrum

1) Allocation of adequate spectrum

To be achieved in developing mobile broadband networks, the adequate supply of spectrum for mobile telecommunications operators is required. This can be noticed from South Korea where several frequency bands are provided. In addition, the adoption of LTE technology can make the existing frequencies available for a wider range of people, as well as can increase the demand for telecommunications services.

Generally, the public sector should impose spectrum allocation to facilitate the setting up of wireless broadband infrastructure without applying the one-size-fits-all concept that enforces the application of spectrum to every type of operations: for seeing that the market environment and government's objectives may vary among countries. For example, an auction may be considered an effective approach to spectrum allocation, just in case the demand is greater than the supply.

2) License renewal and retrieval of spectrum for new allocation

In the Asia-Pacific region, the 2G spectrum license permitted by the public sector will reach its renewal period in a few years, and there are other 112 licenses requiring renewal in the next 10 years. Thereby, the retrieval of the 2G spectrum can be conducted in order that it can be allocated again for mobile broadband purposes. Technically, the renewed telecommunications license should be authorized to support the neutral services that facilitate telecommunications operators in selecting appropriate technology for that particular spectrum. Furthermore, in renewing the license, its tenure should cover the duration of 15 years, so that investors can reasonably imagine the benefits gaining through investment.

In doing this, the regulating sector should deliver confidence to operators by guaranteeing the transparency of licensing or renewal activities. Regarding to this, there must be an agreement made among related sectors to impose a road map during 3-4 years ahead of the license expiry date. Also, if the public sector agrees to adopt a new market structure, it has to guarantee the absence of any impact or loss on users and network investment without benefit discrimination or barriers to new comers into the market. However, the public sector should make room for the stakeholders who are relevant to each market level.

B. Cost Reduction

The National Digital Economy Plan must be aimed at attracting telecommunications operators to make investment on infrastructure and new services. Furthermore, the abolition of specific taxes on some sectors and some kinds of fee which may impede the laying down of broadband networks should be done.

1) Abolition of specific taxes on mobile services

Some countries in the Asia-Pacific region further levy specific taxes on some mobile telecommunications industries or customers, apart from those charged through the general taxing system. This includes the collection of specific communication taxes such as the excise duty on mobile phones and airtime utilization as well as the revenue share levied form telecommunications operators.

The existence of specific taxes on mobile telecommunications hinders the expansion of telecommunications networks and the development of services that support economic growth. The reduction or abolition of specific tax rates on mobile telecommunications will bring about the rise in both GDP and tax revenue. This will make the state produce more budget surplus in the blink of an eye because the relief from tax payment may promote the use of telecommunications services, exerting positive impacts on the whole economic system.

2) Modifying funds to provide more adequate telecommunications infrastructure services

Many countries worldwide have established the funds to furnish people living in the boondocks with infrastructure services. This requires the consideration of methods to impose the development mechanism. However, the study of this paper shows that the particular funds obstruct the development of broadband services in many countries due to the existence of telecommunications operating fees and barriers to the investment on new infrastructure. Therefore, the alternative methods in the National Digital Economy Plan, such as the forge of alliances between the public and private sectors or the imposition of terms and conditions specified in operating permits, should be adopted along with the allocation of funds to bring about pertinent aspects of development, to create a lucid time frame, and to promote management transparency. Besides, allocation of the funds should be made through holding competitions, using impartial principles, as well as relying on industry consultation. In addition, the government should induce investment through the methods adhering to market mechanism, for example, the raise of coverage proportions to the number of people who promote private investment-resulted from new

allocation, and the improvement of regulations to lower barriers to investment and reduce chances of government interference.

According to the GSMA's study conducted in 2013, it is found that less than one-eighth of the objectives out of those among the 64 funds have been fulfilled and that one-third of the funds are still waiting for disbursement. Although the fundraising activities have already been conducted, the total amount of money that has not been disbursed among the 64 funds still meets 11 billion US dollars. Moreover, it is found that the money donated to the funds has not been spent in accordance with essential purposes or development capacities, whereas other kinds of fund are fail to promote adequate development. For example, 3.9 billion US dollars of the funds in India has not been spent usefully.

C. Removal of Barriers to Telecommunications Infrastructure Rolls Out

To draw up the National Digital Economy Plan, the consideration of various barriers caused from regulations is a must, for example, the transmission of electromagnetic frequencies (EMF) beyond restrictions of the World Health Organization (WHO) may hinders the base station set-up among telecommunications operators, and also make the capacity of broadband and the population-wide coverage of telecommunications services become undeveloped.

Therefore, the control sector should adopt international standards to manage the EMF by setting up mobile base stations that are well-accepted among people, proposing the state mechanisms to reduce barriers arisen from public administration, setting exceptions aside for small-sized stations, providing rental areas for the installation of systems, improving the existing stations, simplifying licensing procedures, and so on. However, there should be no regulation in relation to environmental impacts since the broadband generally has positive effects on the environment, in terms of generating efficient communication and obviating travel necessity.

Furthermore, the share of common telecommunications infrastructure in some areas is supported to expand business competency. Here, the government should introduce the regulations that encourage every form of telecommunications operators to share the common infrastructure and networking devices voluntarily. Also, the infrastructure should be shared fairly among interested sectors without discrimination, favoritism, but at reasonable prices. However, the use of common infrastructure should stem from business negotiations in relation to competitive levels in the market, not from control regulations.

D. Encouragement to Bring about Competitions in Appropriate Levels

The National Digital Economy Plan requires the imposition of terms and conditions imposed to let appropriate competition happen to propel the improvement of innovation and efficiency. At the same time, policy makers should carefully not allow fierce competition, which has negative effects on investment decision making, to happen.

The public sector should pay higher attention to facilitating general-level competitions in mobile telecommunications than taking too much control. Since the latter will impede innovation development and result in higher cost, investment limitation, and negative impacts on customers stemming from ineffective allocation of resources, spectrum in particular.

Seeing that the telecommunications industry should be at a proper size and focus on investment activities, the operators should, therefore, give importance to either making profits or setting the prices suitable for the purchasing power at the same time. As regards to this, the spectrum allocated to the firms that lack potential for laying down networks may cause sluggish competition in market.

E. Introducing Policies on Innovative Development

The National Digital Economy Plan should set up policies on innovative development to escalate its competitiveness. This includes the improvement of new products and services, especially in the SME businesses that can respond to the changes in cultures, consumption behaviors, and ways of life. It is believed that the investment made in innovation and research aspects will alleviate economic crisis, escalate competitiveness, and boost the turnover up through effective applications of technology to reduce costs and resource consumption, as well as save time when coping with general affairs and unnecessary documents.

F. Developing the Digital Economy Scorecard

Apart from the strategy to bring about concrete development, Thai government also introduced the Digital Economy Scorecard to be used as a framework for assessing and comparing levels of progress as well as the success in gearing the economic system toward the age of digital economy. This concept resembles the one utilized in assessing the performance in carrying out various procedures in organizations. Accordingly, explicit indicators are set up in accordance with the Digital Economy and Society Index: DESI to pave ways for fulfilling the desired objectives and to express the level of how far each country in the region has already pursued the digital transformation strategy. The aforementioned indicator comprises five major aspects as follows: [5]

- Connectivity is used in identifying the stage of development and quality of broadband. The access to high-speed broadband services is considered a necessary condition for competition.
- Human capital is used in assessing the skills necessary for making use of the digital society. This includes basic skills of individuals in carrying out online activities, consuming digital goods, and exercising advanced skills at being the

manpower - taking advantages of technology to yield more products and promote economic growth.

- Use of Internet is a way to collect the data on people's online activities, for example, the utilization of information, communication, trading, and banking services.
- Integration of digital technology is used in assessing how far the business has become digital by applying technology to enhance the efficiency, reduce costs, and build up consumer confidence, as well as promote the cooperation in business and market expansion.
- Digital public service is used in accessing how far public services, taking the aim at developing e-Government and e-Health for promoting modernization and effective management, have become digital.

Features of the DESI indicators utilized in determining levels of success in carrying out policies are as follows:

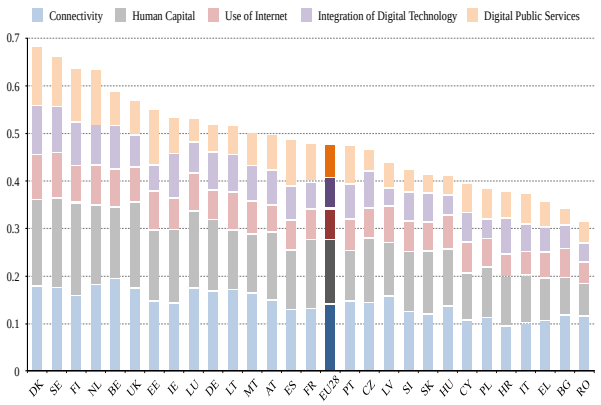

Figure 2. The Digital Economy and Society Index (DESI) [5].

Fig. 2 comparison of the 5 DESI indicators among the EU country members, made in 2014, shows that the conductivity and human capital are the most significant factors propelling the digital economy.

Each index comprises 2-4 indicators, including the quantitative indicators that reflect how various aspects have become involved in digital, ranged from 0-1 (by percentage). For example, the connectivity index will comprise five indicators as follows:

- Fixed broadband can be assessed through the percentage of coverage areas and percentage of households with access to fixed broadband.
- Mobile broadband can be assessed through the percentage of registered numbers to the entire population, and the percentage of the allocated spectrum to the spectrum applicable for mobile broadband services.
- Speed can be assessed through the percentage of households with a minimum broadband download speed of 30 Mbps, and the percentage of users with a minimum broadband speed of 30Mbps to the entire households with fixed broadband.
- Afford ability can be assessed through considering the minimum monthly charge for the Internet service at the download speeds of 12-30Mbps (based of the advertisement) alone.

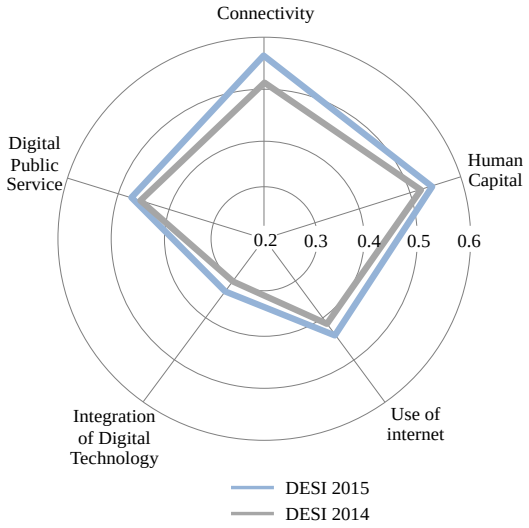

Figure 3. Advancement in European's digital economy [5]

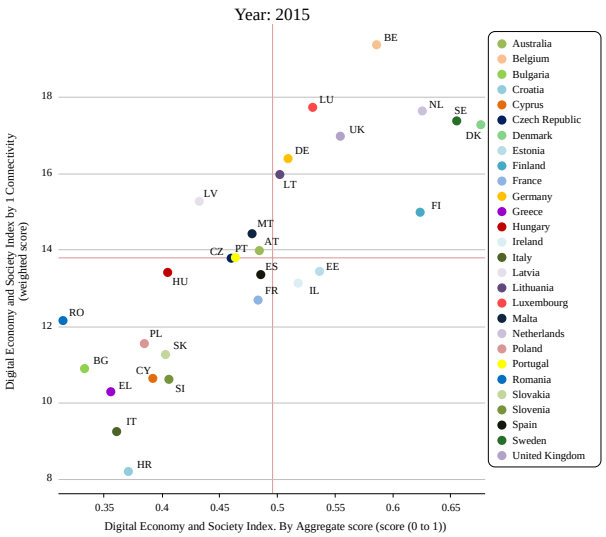

Figure 4. DESI on connectivity (Weighted Score/Aggregate Score) [5]

The indicators for the DESI index is used in monitoring and observing various aspects of development taking place in the EU member countries as well as can compare the operating procedures of countries in the region, based on the 3 performance levels: high, intermediate, and low.

These indicators may be effectively used as the road maps propelling Thailand's digital economy. This is because not only do the DESI indicators play a role in assessing the success in digital economic development, but also the digital social development in terms of the general public, businesses, and public services. These processes have been undergone by the EU member countries since 2014, and determined to fulfill the target within 2020. However, for Thailand where the development of digital economy was initiated in 2015, there has been no plan yet for establishing any index

which determine the success in driving the strategy toward the digital economy-so as to express concrete results and can monitor the operation of digital economic policies by the government. This affects the building up of the government's confidence to undergo any process in general. Consequently, the development of key performance indicators is, therefore, considered an important matter that should not be overlooked.

V. Conclusion

Broadband is not just a new technology but a key innovation to digitizing national and regional economies. It is the ultimate tool for governments to deliver e-government services, promote new forms of businesses, increase productivity and enables the rise of innovative businesses in all industry sectors, and also the key to increasing skills of all citizens. The full benefits of broadband can only be realized from the cooperation of government, regulator, mobile operators and all leading industry sectors enabling and motivating the development of mobile ecosystem that transcends to all industry sectors. This paper has concluded the guideline for Digital Economy Plan and broadband development plan for ASEAN and is beneficial to especially developing countries like Thailand. If implemented to a complete extent, it will increase GDP, socio-economic development, result in national competitive advantage and ultimately transcend developing countries to developed economies.

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