A Step towards Digital Inclusion within the Thailand Digital Economy and Society Development Plan

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The Office of the National Digital Economy and Society Commission (ONDE), Thailand is currently undergoing research studies on digital technology for the nation's social and economic development policies. The goal is to create a quality, equitable society through digital technology according to Thailand's Digital Economy and Social Development Plan. This paper presents research methods and findings on the needs of five specific groups that are fragile and vulnerable: the disabled, the elderly, the disadvantaged and children, youth and women. The paper concludes with the presentation of action plans for digital technology development to bridge the gap in Thailand's digital divide.

Key words: *Thailand digital inclusion, fragile and vulnerable groups, the elderly, the disabled, the disadvantaged, children and youth, women.*

Introduction

The Office of the National Digital Economy and Society Commission (ONDE), Ministry of Digital Economy and Society (MDES), Thailand, is responsible for the policy conceptualization of digital technology for social and economic development. The missions are to:

(1) determine the direction and strategy for digital development for the countrys economy and society;

(2) promote, coordinate and integrate all sectors in order to fully utilize digital

technology in the economic and social activities;

(3) lay the foundation for high-performance digital infrastructure to support future forms and volumes, and

(4) promote an environment that is conducive to innovation and utilization of digital technology in economic and social activities.

A part of the strategic effort includes a study and development of digital inclusion policies and action plans. All missions are directly related to the use of technology to help develop the country. The objectives are to lead the country to meet the goal of Thailand 4.0. In this regard, research and monitoring of technological progress are essential while creating a plan to promote and develop a digital society. Our aim is to create a quality and equitable society through digital technology in Thailand'a Digital Economy and Society Development Plan under the Sufficiency Economy Philosophy for Sustainable Development Goals (Ministry of Foreign Affairs, 2017).

In this study tools were developed to probe the needs of five fragile and vulnerable groups: the elderly, the disabled, the disadvantaged, children, youth and women. The survey was conducted during October-December 2018 and interview results were obtained from 4,848 study subjects from these special five groups. Stakeholders were also invited from each group to take part in focused group discussions to provide insights into identified needs and propose sustainable solutions. The study found that the most common problems among these groups were a lack of opportunities in continuing education and personal development and health issues, cyberbullying and family violence and public safety.

Technology trends specifically aimed for these five groups were reviewed. The cumulative study leads to the proposition that the digital platform has appropriate designs for each group of users. The platform would need to be equipped with the latest digital technology that can effectively provide all types of services to any user. A person who needs a specific service such as an emergency assistance or personal healthcare would be directed to the appropriate agency in a timely manner. The platform could also give appropriate recommendations to a woman or an elderly personal in the context of personal development or offer online courses for continuing education. It could also provide other personal consultation services to troubled youth or disadvantaged people. We are confident that the platform and the proposed action plan will serve the identified needs and eventually empower our people to be competitive human resources for the Thailand 4.0 era and ensure inclusive and equal access to digital technology.

This paper is organized as follows. In the next section an overview of Thailand's strategic frameworks and plans is presented followed by the methodology of the research survey and a

summary of the key findings from the surveys and focused group discussions. Finally, the framework plan for the next three years and the research conclusions are presented.

Thailand Digital Economy and Society Development Strategies (2018-2037)

This section presents an overview of Thailand's strategic frameworks and plans that our study and policy development were based upon. The 20-year National Strategy framework (2018-2037) and Thailand 4.0 Policy (National Strategy Secretariat Office, 2017), the Twelfth National Economic and Social Development Plan (2017-2021) (Office of the National Economic and Social Development Board, 2017), Thailand Digital Economy and Society Development Plan (2018-2037) (Ministry of Digital Economy and Society, 2018), and the national reform agenda were reviewed. The work was also aligned with Sustainable Development Goals (SDGs) (Sachs et al., 2018; Shaharuddin, Nawi, & Mansor, 2015).

Our plans focus on the development of all sectors to achieve ``Securities, Prosperity and Sustainability." They aim to achieve visible results in the first five years to encourage all Thai people to prepare for and adapt themselves to future challenges. They emphasize transitioning Thailand from a middle-income country to a high-income country with stability, wealth and sustainability, along with promoting Thailand to become a transportation and logistics hub of the region. The goal is a Thai trade and service nation that is a source of organic products and agriculture through creativity and environmentally friendly innovations.

The plans aims to develop and apply innovation in various dimensions to drive and increase the country's potential. They focus on creativity or value-added approaches that could increase social equality and reduce economic disparity issues. Furthermore, they also prepare human resource scientific and technology literacy for effective development. The strategy and plan to create fairness and reduce inequality focuses on arranging qualified and effective state services. The plans intend to support job creation, generate income and provide sufficient healthcare for everyone including the elderly, the disadvantaged and women. They also strengthen communities as part of sustainable social development and will reduce income gap problems among demographic groups and difference in government service quality as well as restrictions on the accessibility to justice process and technology.

To create fairness and reduce inequality, technology plays an important role to generate the highest benefits for the target groups to enhance individual potential and to increase necessary skills for living. These actions will reduce the income gap for different social classes, increase the likelihood of access to available public services and increase opportunities of resource access resources equally. Based on the above framework, the Thailand Digital Economy and Society Development Plan consists of four goals as follows:

(1) Enhancing Thai economic competitiveness by using innovation and digital technology as a key tool for creating innovative production and services.

(2) Creating equal opportunities with information and services through digital media to enhance quality of life of people.

(3) Preparing all employees to be knowledgeable and capable with suitable skills for their life and work conditions in the digital age.

(4) Reforming the government working paradigm and public services by using digital technology, utilizing information to ensure transparency, efficiency and effectiveness of digital development for the Thailand economy and society and focusing on sustainable long-term development in correspondence to the 20-Year National Strategy.

Furthermore, this Thai Digital Economy and Society Development Plan has also designated digital landscapes to determine the development direction and goals in four phases as follows:

Phase 1: Digital Foundation: investing and building foundation for economic and social development within 1 year and 6 months.

Phase 2: Digital Thailand: ensuring all sectors of Thailand will engage in digital economy and society consistent with the civil state guidelines within 5 years.

Phase 3: Digital Thailand: Full transformation: driving Thailand with digital technology and leveraging the full potential of digital innovation within 10 years.

Phase 4: Global Digital Leadership: applying digital technology to create economic and sustainable social value as exists in developed countries.

These phases are described in Figure 1 below.

Figure 1. Thailand's digital economy and society development strategies (2018-2037).
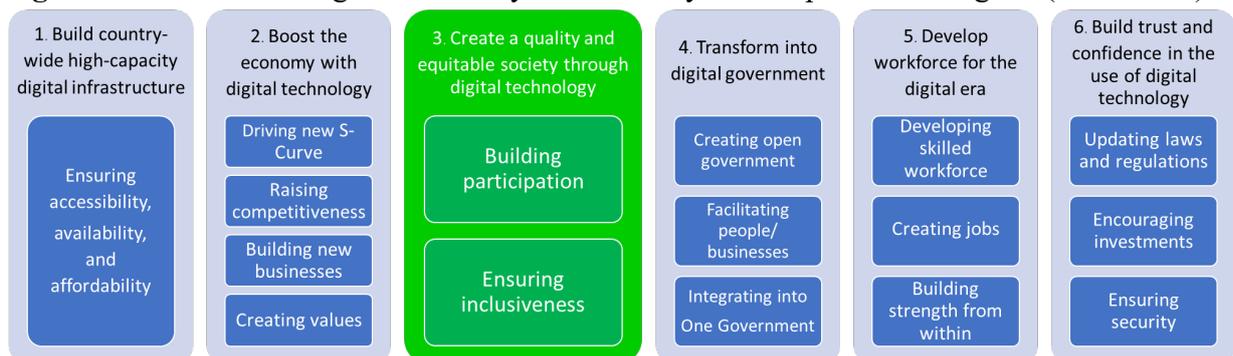
The study that is the topic of this paper focuses on Strategy 3 which aims to create a quality and equitable society through digital technology.

The Thailand Digital Economy and Society Development Plan consists of six main strategies as shown in Figure 1 above. It sets mechanisms to drive digital development strategies for economics and society as follows:

(1) Initiate concrete drive in urgent phase by setting activities and priority projects (projects within 18-month time frame) focusing on investing in digital infrastructure and establishing digital development foundation in the six digital development strategies.

(2) Change institutional structure by improving patterns and working processes in the government sector, integrating working processes across government departments, enhancing the efficiency of the government system, diminishing the government sector role and decentralization. This mechanism includes the arrangement of the central department that is responsible for defining policy, coordinating and complying digital development for the result of efficiency and effectiveness.

(3) Integrate budget and operational resources by collaborating or coordinating tasks and data in a holistic manner. A key account of each mission must be assigned to improve regulatory and budgeting systems and facilitate the collaboration of government for public services.

(4) Apply progress a tracking mechanism in order to monitor, investigate and continuously assess possibility. When a problem is encountered in implementation stage, there must be troubleshooting aid or adequate additional resources allocation and review results from monitoring in order to improve operation. In addition, all sectors should have the opportunity to participate in the consultation process, public hearing and auditing operational progress which will lead to transparency and a result-oriented approach for government sector operation.

Research Methodology

This section discusses the methodology in research activities on Thailand digital inclusion for the digital economy and society development plan.

Survey Research Procedure

In probing the needs of each group surveys were conducted as follows.

1) **Interview Design**: Instruments in this study are developed from collecting relevant secondary documents and research. The procedures in drafting the interview form are as follows.

   Step 1: Draft the interview form by reviewing relevant local and international literature and secondary research.

   Step 2: Collect expert opinions from academic groups related to the development plan and qualified experts in the target group to review the interview draft and feedback.

   Step 3: Revise the interview draft and use it in the pilot test of samples at no less than 5 percent of the total sample size, or at least 80 samples, to test and evaluate the accuracy of the tools used in the study with Cronbach's Alpha Coefficient. If

Cronbach's Alpha Coefficient has a value approaching 1, this indicates that the questionnaire is highly reliable and accurate.

Step 4: Collect expert opinions again on the revised draft to find conclusion and develop the final interview form.

Step 5: Summarize expert opinions and revise to produce the final interview form to be used in data collection.

Step 6: Create a code guide and a survey manual for collecting data in the field work.

2) **Interview Structure**: The research tool in this study is an interview. There are two sets of interview tools, the pre-test to testing reliability and validity of the survey and the interview form for data collection. The interview form has the following structure.

Part 1	General information
Part 2	Ability to perform daily activities
Part 3	Use and access of IT in daily life
Part 4	Problems in daily life
Part 5	Additional comments

Each part consists of several questions to gather information in all aspects. For example, the survey questionnaire for Part 4 Problems in Daily Life consists of four dimensions: health, economic, social and environmental. Each dimension is measured using different questions for each group and the questions for the elderly in each dimension consist of the following:

Health dimension consists of three aspects:

1)	Physical health:	11 questions
2)	Mental health:	4 questions
3)	Quality of medical care:	5 questions

Economic dimension consists of three aspects:

1)	Occupation:	9 questions
2)	Savings and Investment:	5 questions
3)	Government support:	4 questions

Social dimension consists of four aspects:

1)	Family relationships:	7 questions
2)	Relationship with relatives:	4 questions
3)	Relationship with communities:	6 questions
4)	Relationship with social networks:	3 questions

Environmental dimension consists of five aspects:

1)	Basic needs:	4 questions
2)	Pollution:	5 questions
3)	Public services:	3 questions

4) Risks in daily lives: 4 questions
5) Social quality: 4 questions

In each question, the respondent answered as to whether there was a problem regarding that issue. If there was a problem, the respondent was then asked to identify the level of severity, which has a total of 5 grades, namely:

1.00: The problem is insignificant.
2.00: The problem does not affect daily life.
3.00: The problem affects daily life at moderate level*.
4.00: The problem affects daily life at high level.
5.00: The problem greatly affects daily life.

*Note: Any question with an average of 3.00 points onward implies that the problem is severe enough to affect the lives of the people in this group and calls for attention for solutions.

Then the data was analysed with statistical software SPSS to determine the relationship between factors.

Study Area and Sample Size

To determine the area for the survey study, at least two major provinces from each of 5 regions were selected. For example, a survey for the elderly and disabled was conducted in the following provinces: 1) Bangkok metropolitan region: Bangkok and Nakorn Prathom, 2) Central and Eastern Regions: Ayutthaya and Chantaburi, 3) Northern Region: Chiangmai and Sukhothai, 4) Northeastern Region: Udon Thani and Nakhon Ratchasima, and 5) Southern Region: Nakhon Si Thammarat and Songkhla.

Based on the 2017 census, the population of Thailand consists of 31.62 million males and 33.01 million females. The population of the representative areas in this study is 13.48 million as shown in Table 1 below. Sample sizes were determined for each group using proportionate stratified random sampling method (Scheaffer et al., 2006; Wijetunge, 2016; Ayuningrat, Noermijati., & Hadiwidjojo, 2016). The sample size of each stratum in this technique is proportional to the population of the stratum (proportional allocation). The formula used in estimating a minimum sample size for each subpopulation group, or stratum, is as follows:

$$n_h = nW_h \quad \text{where} \quad W_h = \frac{N_h}{\sum\limits_{\text{all } h} N_h} \qquad\qquad (1)$$

In the case where the population sizes vary greatly, W_h of the group with a smaller population may be estimated with the ratio of the original value. It was required that W_h in each group should have a value greater than 0.1. as reflected below

$$n = \frac{\sum_{all\ h} N_h P_h (1-P_h)}{ND + \frac{1}{N}\sum_{all\ h} N_h P_h (1-P_h)} \quad \text{and} \quad D = \frac{E^2}{Z^2_{\alpha/2}} \qquad (2)$$

where n is a total sample size, n_h is the number of observations in stratum h, N is the population size, N_h is the population size of stratum h, P_h is the population size of stratum h that possess the required attribute, E is the maximum error of the estimate, and $Z_{\alpha/2}$ is the standard score from the table of normal distribution Z at the confidence level of $(1-\alpha)100\%$ or at the significant level of α □

Parameters for sample size were used as follows:

1) The maximum error of the estimate: $E = 5\%$ or $E = 0.05$.
2) The significant level $\alpha = 0.05$ or the confidence level of 95% which yields $Z_{\alpha/2} = 1.96$. Thus we have

$$D = \frac{E^2}{Z^2_{\alpha/2}} = \frac{0.05^2}{1.96^2} = 0.0006507. \qquad (4)$$

3) We do not know the population proportions of the strata P_h. Thus we use $P_h = 0.5$ because $P_h = 0.5$ gives a sufficient estimate and obtain n from (2):

$$n = \frac{877,094}{3,508,377 \times 0.0006507 + \frac{877,094}{3,508.377}} = 384. \qquad (5)$$

In order to probe into the needs of the five groups, the number of samples was set to at least 4,000 subjects. The target population was divided into two groups and the sample size for each subgroup was calculated as shown in Table 1. The sampling plan also kept the number of samples in each province proportional to its population. This ensured that survey results for each group reflected the population distribution of the nation. Further, more subjects were interviewed in the context of the elderly, disabled and disadvantage groups because many of them may not have given accurate responses. The actual number of interviews and the number of responses that used in this analysis are shown in Table 1 below.

Table 1: Number of population in each group and sample size in each subgroup (stratum)

Stratum h	Target group	Total population in target area N_h	W_h	$n_h = nW_h$	Actual number of respondents	Number of samples used in analysis
1	Elderly	2,733,506	0.7070	1,697	2,328	2,297
2	Disabled	290,290	0.1850	444	490	450
3	Disadvantaged	112,855	0.1080	259	305	293
Subtotal[1]		3,136,651	1.000	2,400	3,123	3,040
4	Children and Youth	3,508,377	0.3392	543	603	603
5	Women	6,835,820	0.6608	1,057	1,205	1,205
Subtotal[2]		10,344,197	1.0000	1,600	1,808	1,808
Total		$N = 13,480,848$		4,000	4,931	4,848

Focused Group Discussion

Stakeholders were identified for each group and include the people belonging to each target group, their caregivers and government and private organizations. Discussion sessions with stakeholders were arranged to probe target group needs. Each target group discussion was held separately to ensure its focus on relevant specific issues to the particular group. These finding are presented in the next section.

Research Findings: Situation of the elderly, the disabled, the disadvantaged, children and youth and women

Group needs were identified from interview results of 4,848 subjects from the five groups. During data collection, there are some questions that respondents did not wish to answers or did not have the ability to comment on. This resulted in some unanswered questions. Based on the theory of Enders (2003), survey research acknowledges that the percentage of unanswered questions or missing value should not exceed 15–20% which is a general level that occurred in the survey study in social sciences. This level still makes the analysis results reliable and acceptable. Raymond and Robert (Raymond & Robert, 1987; Mahdieh, 2015; Fan, and Fujimoto, 2018) state that if study information has more than 40% of missing value, that study will not be acceptable and reliable. In this study the missing data did not exceed this recommended limit.

The elderly

The United Nations (UN) does not define a default age as a standard criterion for the elderly. Thailand considers a person aged 60 and over as an elderly person. In 2015, the Thai cabinet approved four measures for the aged in society, proposed by the Ministry of Finance as follows (Fiscal Policy Office, 2016): (1) Employment of the elderly: in this measure, employers will get tax benefit while the elderly will continuous income, (2) Special housing projects: create more special accommodation for the elderly, (3) Reverse mortgage: the elderly can mortgage their houses and use that money for their living expenses until their deaths and (4) Integration of pension systems: the government National Pension Fund (NPF) as a compulsory provident fund for all citizens.

The Foundation of Thai Gerontology Research and Development Institute (2017) reported that Thai elderly faced problems from various perspectives as follows: (1) Health: Public health surveys found that most common diseases in the elderly are hypertension, diabetes, arthritis, osteoarthritis, emphysema, chronic obstructive pulmonary disease, coronary artery disease, myocardial infarction and paralysis. Further, more than one third of the elderly are in a critical health condition due to obesity. (2) Economy: One third of the elderly live below the poverty line and more than half of them rely on their children. There is also inequality between elderly people living in urban and suburban areas from the perspective of healthcare due to difference in economic condition, limitations in transportation and lack of accessibility to information about being in good health. (3) Family and community: The average household size in 2010 was 3.1 persons, down from 3.8 in 2000 and 4.4 in 1990. More households became single families where the elderly live alone without proper care. (4) Environment and accessibility to public services: Many of the elderly live in a house without ergonomic designs for the elderly such as high steps on staircases or squat toilets.

The study found further severe problems as follows. The elderly suffered illness from malnutrition, insufficient support from the community or public sector, mental disturbance, feeling depressed or hopeless, anxiety, insomnia and mental unrest. They faced economic hardship from unemployment and inadequacy of income and were left without access to funding or loans. They were victims of domestic violence and they lived in areas or community areas with pollution, drug use or risk of natural disaster.

The disabled

People with disabilities or the disabled are one of the most vulnerable groups that need support and assistance from government agencies in all aspects such as economy, education and public health, etc. in order to reduce restrictions on living and improve quality of life to meet accepted

normal standards. The disabled are persons who have limitations in daily activities or social involvement due to visual disabilities, hearing and/or speech impairment, physical or movement disabilities, mental or behavioural disabilities, intellectual disabilities, learning disabilities and autism. The National Committee for the Promotion and Development of the Quality of Life of the Disabled, Thailand set up guidelines to improve the quality of life of the disabled in 1970. The committee oversees the operation and revises the plan every 4 years. The current strategic focus of each plan evolved from health to personal development and education, social engagement and human rights. The Department of Empowerment of Persons with Disabilities (2015) reported that there were 1,705,340 persons with disabilities or 2.62% of total population. Only about 25.3% of those were employed or could earn income and about 45% were uneducated. This implied that most of the disabled would not have an opportunity to get into the job market.

This study adopted several guidelines for required technology that would alleviate the obstacles in their daily lives as well as their personal development for employment and career (ITU, 2017) opportunity. The following were considered: social safety, public health, travel and transportation, financial services, housing and social, cultural and environmental aspects. The study confirmed that the disabled still suffer from difficulty traveling in public such as on the street or into any buildings. A general solution is to modify the current infrastructure using universal design principles along with assistive technology. The disabled also had difficulty in receiving medical services due to their limitation in traveling and/or communication. Their quality of lives also worsened through domestic violence, unemployment and lack of caregivers or appropriate assistive devices.

The disadvantaged

The Department of Social Development and Welfare, Ministry of Social Development and Human Security define the disadvantaged as individuals in the following groups: the poor or ones with insufficient income; the homeless or people without primary housing or unregistered status according to Thai civil law; HIV infected or AIDS patients and people affected and ex-convicts. The study of the Office of the National Economic and Social Development Board (2015) found that the poverty situation in Thailand tends to be decreasing. Based on the statistics, the proportion of the poor was 42 percent in the year 2000 but fell to 10.9 percent in the year 2013. Although poverty problems were partly resolved, there was inequality of income distribution between groups of the population.

An earlier study (Thammasat University Research and Consultancy Institute, 2558) reported that most of the homeless people had problems as follows. They do not have access to proper education, sufficient medical services and decent accommodation. Many of them are unemployed due to a lack of household registration and citizen ID cards and they have been

mistreated and or abused by officials (Adroni, & Sitorus, 2017; Balushi, Bulushi, Al-Riyami, 2018). The study found that the problems still remained and worsened due to lack of information about their rights. Several studies showed that the use of digital technology can alleviate these problems (FAO, 2018; FEANTSA, 2013).

Women

Thailand has put emphasis on women's roles in economic development since its Second National Economic and Social Development Plans (1967-1971). Recently the Department of Women's Affairs and Family Development (2017) under the Ministry of Social Development and Human Security initiated the Strategy for Women's Development (2017–2021) to create social equality without discrimination and enable women to have good quality of life, be safe and secure and contribute to the country's development. The study found that women mostly faced economic problems and discrimination in employment. Other severe problems included lack of opportunities in education and self-development, health problem with difficulty to obtain qualified services, sexual harassment and assaults either at workplace or in public, domestic violence, unwanted pregnancy, and inadequate political and community engagement.

Children and Youth

Studies in neurology, psychology and education suggest that natural understanding and brain function is the key to child development in attaining the human capital that will meet new world needs (Buckley et.al, 2018; Destiwati, 2015; Achaleke, 2018). Social preparation and building immunity for youth in a rapidly growing and accelerating society is also important. However, the child and youth situation has worsened in Thailand. In terms of quantity, fewer children were born in recent years which results in smaller future workforce coupled with increasingly ageing population and its societal problems. In terms of quality, Thai children and youth are facing problems in many aspects such as physical health, premature sex, tendency towards corruption and materialism, use of violence, and substandard IQ.

The Ministry of Social Development and Human Security initiated the National Child and Youth Development Plan (2012) as a guideline for child and youth development. The current strategic plan aims for a stable society, the reduction of disparity, social security increase and the development of good quality of life for people from all dimensions including social responsibility and equal access to collateral income and basic services. The study found that most children and youth possess smartphones and have access to the internet. They have the intention to use technology to solve problems in their daily lives. They feel there is inequality in the education provided by different schools. They also fear that the misuse of media and the internet will lead to drug use and prostitution or cyberbullying and other studies have also confirmed this (Wonganantnont, 2014; Purba, & Martono, 2017). Many youth also faced low

self-esteem or depression, sexual harassment, family violence and public safety problems (Sriwattanapongse and Taninpong, 2015; Kongmanus, 2016; Thanasripanitchai, 2017).).

Summary of Research Findings:

Insights were obtained from focus-group discussion sessions with stakeholders from each group. The study found that the most common problems among the five groups were a lack of opportunities in continuing education and personal development, health issues, cyberbullying and family violence and public safety. In summary, most groups experienced economic hardship which was health related and due to inadequate access to medical services and poor living conditions. Other specific problems for each group were sexual harassment and unwanted pregnancy in girls and women, missed opportunity from inadequate access to the right information in a timely manner, the unsanitary environment and lack of caregivers for the elderly and persons with disabilities and the lack of advanced skills for the elderly and women to compete in the job market in the modern world.

These research findings imply a digital divide in Thailand that prompts a search for sustainable solutions to bridge the gap and a strategic plan and action plan are presented in the next Section.

Strategic and Action Plans on Digital Technology

This section presents the strategic direction, policies and plans to promote and develop digital society for groups of the disabled, the elderly, the disadvantaged, children and youth and women.

Vision

Vision and goals of policies and plans for promotion and development of digital society focus on long-term and sustainable development and align with the national strategy:
All groups can access and use digital technology to enhance the quality of life sustainably.
All groups include the disabled, the elderly, disadvantaged, children and youth and women.

Strategy

Policy and planning to promote and develop a digital society for the disabled, the elderly, the disadvantaged, children and youth and women play a primary role in Strategy 3 of the national digital development policy and plan for economic and social development as demonstrated in Figure 1.

Strategic Goals

All groups, especially those who live in remote areas, the elderly and the disabled can access and utilize digital technology.

- A digital community centre that provides connectivity and free-Wi-Fi services covering every district throughout the country.
- The proportion of Internet users who are over 50 years old increases to not less than 25 percent.
- All groups of people (especially the disadvantaged in both space and physical limitations) can use government services without space and time constraints.
- All people have awareness, knowledge, understanding and skills in using digital technology to be useful and creative (Digital Literacy).
- People can access education, public health and public services through digital technology.
- People of all ages across the country can access the public learning system (MOOCs) as needed.
- People in all areas have access to health advice services and basic diagnosis.
- People of all ages in any area can access the One-Stop Service that is related to daily life through digital technology

Action Plan

Plan 1: Create opportunities and equality in accessing and utilizing digital technology for everyone, especially the elderly, disabled people and residents in remote areas.

1.1.	Support digital technology or assistive technology for disabled people. Set regulation for digital media, website development, applications and digital services of the state must be developed in accordance with universal design principles.
1.2.	Expand the community information centre to be a community service centre in every district so that the centre integrates work with both central and local government agencies. It will provide comprehensive public services and serve as a government service point in providing business and careers knowledge through the online community system and community areas in economic and social activities to focus on education, agriculture, health care, trade, tourism services, rights and social welfare.

Plan 2: Develop people's potential to use digital technology for benefits and creativity, including analytical ability of information in an open and free digital society.

2.1.   Increase the people's potential and skills in digital technology use for the benefit and creativity of especially the elderly, disabled and disadvantaged people. Digital community centre and partner organizations serve as a training centre and establish a standard for basic digital technology training for all groups of people.

2.2.   Promote good practices in the digital world by including media literacy standards in all levels of education. Conduct media literacy assessment according to established criteria. Encourage wide-range media literacy with a focus on the ability to analyze media and information, use technology with social responsibility and obey intellectual property rights.

2.3.   Create a mechanism for tracking information online for real-time monitoring of information which is harmful to society, such as misconceptions about food and medicine, child pornography, false information and news which may cause panic, so that this type of information is forwarded to relevant agencies who replace it with accurate information.

Plan 3: Create media, media library and digital learning resources for lifelong learning which people can easily access through the telecommunication and broadcasting system and convergence technology.

3.1.   Require every agency to produce and/or digitize its contents and make them accessible to the people or organization with proper rights. The contents to include important government documents, statistical information, professional knowledge, cultural heritage, local knowledge and various entertainment content.

3.2.   Create and promote digital sources of knowledge both nationally and locally as a reliable source Thai society knowledge with measures such as creating a network of knowledge sources and to support the operation, provide a platform and guarantee the reliability of information and knowledge. Also, to integrate knowledge resources to allow people to easily access information and knowledge.

3.3.   Encourage the private and public sectors to produce digital media that is beneficial to the public. Examples include media production through social responsibility activities or use of local community wisdom. The

new media should serve all groups and cover a wide range of issues such as cultural and economic issues in the ASEAN community and world community.

3.4.　　Develop a platform for collecting information, knowledge and personal profiles, especially from retired personnel, community philosophers, academics and volunteers. The platform serves as a forum for people to exchange experiences, learn together and transfer knowledge and experience from generation to generation or from community to community, leading to a sharing mindset in the economy and society.

Plan 4: Increase learning opportunities and provide high-quality educational services to students and people of all ages, anywhere, anytime with digital technology.

4.1.　　Integrate digital technology in every school including schools in remote areas and areas with high conflicts. The integration will include solar technology, telecommunications technology and broadcasting and education technology via the internet that is conducive to education and learning of not only students but everyone in the community.

4.2.　　Develop and promote learning services through the public open system (Massive Open Online Course: MOOC) that include supplementary curriculum for primary and secondary school systems, vocational courses and university-level courses that students can enrol in from any ASEAN institutions. This also includes courses for the general public who want to engage in interest based life-long learning. Create cooperation mechanisms for government agencies and both the private and public sector to drive this work at the national level.

4.3　　Produce a media library and online media with licensed education or an open copyright system, including training for teachers and those interested in online media production skills in order to increase the production of learning media both within and beyond the education system.

4.4　　Promote the development and integration of electronic education history registration systems which are connected throughout the country and can be accessed under conditions and specific criteria for career benefit and the benefit of lifelong development including acting as a national human resource information source.

Plan 5: Increase the opportunity to receive modern medical and health services equally and equitably to support digital technology use in an aging society.

5.1.   Integrate electronic patient health record systems throughout the country that allow everyone access and management of health information in order to facilitate emergency treatment.

5.2.   Integrate and promote the use of appropriate digital technology including remote medical service systems (telemedicine). Create a forum for consultation and exchanging learning, monitoring and the communication of health and hygiene warnings. This includes the application of new technology to support good health and reduce public health problems for everyone, especially the people in remote areas, mothers and children, the elderly and the disabled.

5.3.   Develop policies and operational plans using digital technology to facilitate understanding and use by an aging society. Integrate the effort with agencies related to medicine, digital technology, science and technology and social development.

The following is a summary of action plans.

Specific Action Plans

A *central platform* is proposed to provide all services to all groups as well as stakeholders and is shown in Figure 2 below. The proposed single platform will consolidate current government services that were developed independently with their own entry points. The current services reside on platforms that were not universally designed for all groups and are inaccessible for special groups such as the disabled. The platform will provide universally designed interfaces that are suitable for each specific group. An individual can choose the most suitable interface. Thus the platform will act as *the* interface to all currently available services and is expandable to future services.

Figure 2. The Central Platform that provides all services to all groups.
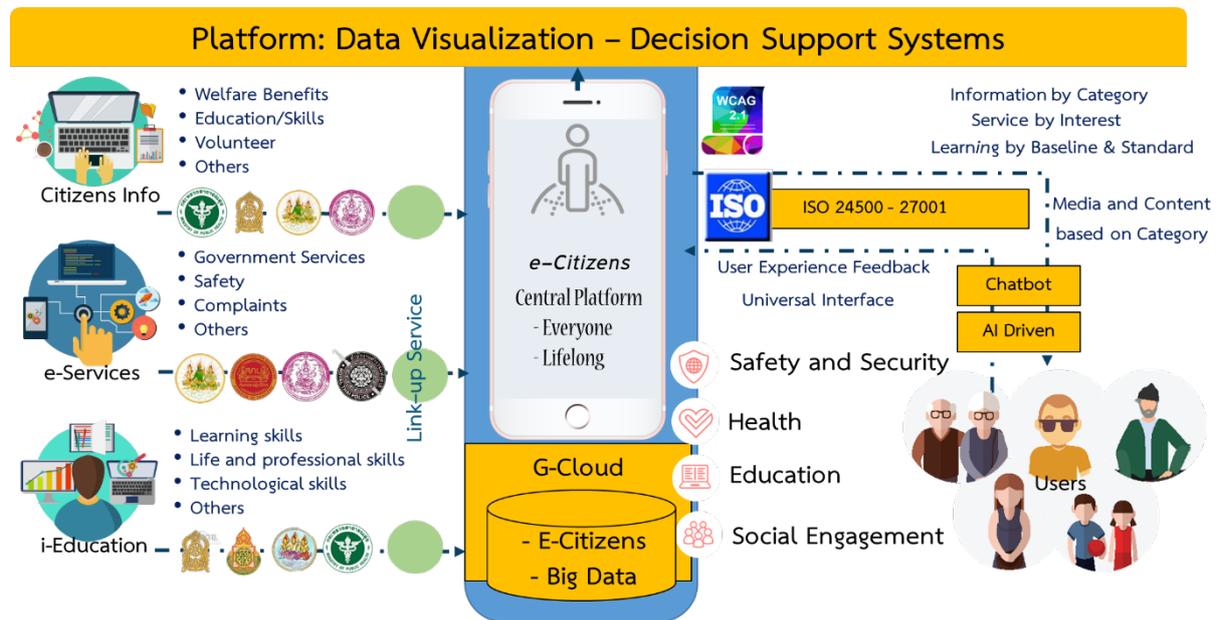
The platform will be equipped with latest technology such as data analytic and artificial intelligence. It will also provide citizens with necessary information and contents in all aspects in an appropriate format for each specific group. The contents can range from personal hygiene to professional development. It will also form a citizen profile of each individual using personal records and other information from all government agencies. Any related system such as a recommendation or notification system can use this profile for specific objectives such as healthcare or other aid. All features and capabilities will enable the platform to truly serve as a one-stop service (as a single-entry point) and it will be easy to maintain and cost effective.

The proposed action plans can help alleviate the problems identified for each of the five groups. One of the findings indicates that disparity in Thai society also stems from the lack of knowledge or information such as government welfare benefit for specific groups or opportunity for personal development. This lack of awareness of one's own rights can lead to welfare fraud where fraudsters intentionally give false information about their identity or status when claiming for the respective welfare benefits. The platform can notify each individual about their welfare benefit so that they can claim the benefit within timelines. It can also provide the citizen profile to related government agencies for eligibility check when an individual files a claim for benefits.

Another specific problem is violence in families and sexual harassment in the workplace for women. The platform can provide easy access when a woman encounters a dangerous situation and requires an emergency service from an available agency in the area. Or she can file a confidential complaint report to then relevant agency when inappropriately approached by a

supervisor at work. An expert or consultant can give her advice on how to appropriately handle the situation and help raise it with the relevant officials if necessary.   All of these services will be implemented on the platform and will be confidently monitored and tracked to ensure the wellbeing of all citizens.

Discussion and Conclusion

The research effort probed the needs of the five identified fragile and vulnerable groups: the elderly, the disabled, the disadvantaged, women, and children and youth. The findings led to the proposition of a digital platform that has appropriate design for each user group. The platform would be equipped with the latest digital technology that can effectively provide all types of services to any user. A person who needs a specific service such as emergency assistance or personal healthcare would be directed to the appropriate agency in a timely manner. The platform could also give an appropriate recommendation to a woman or an elderly person about personal development or offer online courses for continuing education. It can also provide other personal consultation services to troubled youth or the disadvantaged.

The plan includes development of content and media that will be beneficial to people in all groups. The proposed personal development plans include digital literacy for individuals in all groups as well as courses for professional development such as digital media production and digital marketing. All groups can access the on-line training courses and those with special needs can receive face-to-face training. The proposed action plan will serve the identified needs and will eventually empower the Thai people to become a competitive human resource for the Thailand 4.0 era and ensure inclusive and equal access to digital technology.

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