DCT
DIGITAL COUNCIL
OF THAILAND

Quarterly Report Q1/2020

Digital Council of Thailand

PRESIDENT'S MESSAGE

At present, digital technology plays a distinctly important role in everyone's lives. This age of digitalization will be the age of opportunities that lead to an increase in digital gross domestic product. In addition to a number of case studies and interesting innovations that entail. Most importantly, we all need to be well prepared for digital disruption in a sustainable manner.

According to World Digital Competitiveness Ranking of the Institute for Management Development (IMD) for the year 2019, Thailand is ranked 40th from a total of 63 countries ranked. This ranking takes into consideration the potential of each country in three main aspects: knowledge, technology, and future readiness. According to the ranking, Thailand is ranked 27th for its technology, 43rd for its knowledge, and 50th for its future readiness. The foregoing shows that Thailand is still capable of development in many aspects in order to achieve "Thailand 4.0," which is the age of innovation where per capita income truly increases.

Having an ecosystem suitable for the country's digital development is crucial for Thailand's growth in every aspect, including economy, society, and environment. In this regard, we should place importance on the following:

- Lifelong learning, which is essential in this dynamic information age where technology and transdisciplinarity leads to convergence, to bring about new skills or body of knowledge. Educational institutions will no longer be the only learning method;
- Creating new skills according to the demand, reskilling the personnel in the labor market according to the demand, and upskilling and focusing on specialization of the personnel, along with building skills and body of knowledge that is coupled with change of mindset which will sustainably bring the country to the age of digital economy and society;
- Support from the public and private sectors in various forms, including certifying for necessary skills, establishing an excellence center, increasing budgets for promoting research and development, and promoting online learning e.g. digital academy; and
- Encouraging the people to own more intellectual property. In this regard, Thailand filed 128 patent applications in 2019, which is considered a small number compared to Vietnam, with 205 patent applications and South Korea, with 17,000 patent applications. Thailand's entrepreneurs should realize that intellectual property not only protects their inventions, but it also enhances competitiveness of their business against other entrepreneurs around the world.

The aforesaid subjects are merely the beginning of Thailand's journey towards the global stage, which will bring for the country enormous advantages, in terms of economy, society, and environment, through the growth of digital businesses and industry, requiring robust cooperation from all sectors. The year 2019 was a great opportunity where the sectors of digital business and digital industry jointly established Digital Council Thailand. Digital Council Thailand serves as one of the force that encourages Thailand's digitalization under three main goals: enhancement of Thailand's digital competitiveness on the global stage, promotion of the growth of Thailand's digital sector which is a change agent of the digitalization, and employment of digital technologies to eliminate the social divide.

MR.SUPHACHAI CHEARAVANONT

President of the Digital Council of Thailand

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1. INTRODUCTION TO DIGITAL COUNCIL OF THAILAND

The Digital Council of Thailand (DCT) has been established under the "Act of Digital Council for Economy and Society of Thailand B.E. 2562" in 2019, with the promulgation in the Royal Thai Government Gazette on April 30th, 2019. There are seven key objectives of DCT as follows:

1. Be the voice of the digital industry and advocate for public-private collaboration;
2. Provide opinions and advisories for the government on digital-related rules and regulations;
3. Develop the digital industry in order to enhance competitiveness at the international level;
4. Promote skill development of the digital workforce to meet the international standards;
5. Promote and supervise businesses in the digital industry to ensure quality, standards, ethics as well as compliance with the council's guidelines and digital-related laws;
6. Promote the use of digital technology to sustainably uplift the standard of living of the Thais; and
7. Carry out other activities that drive forward Thailand's digital industry.

In accordance with the objectives, DCT has an ambitious vision to “elevate Thailand’s digital businesses and digital industry towards a global leading digital economy as well as social and well-being development among Thai people.” In order to realize this challenging vision, DCT has identified five strategic missions to drive Thailand towards triple goals: to improve Thailand’s digital competitiveness and digital inclusiveness, to promote the growth of Thailand’s Digital Sector which is a change agent of the digitalization, and to employ digital technologies to eliminate the social divide. The success of these goals will bring Thailand into a new economic and social landscape where digital technology is a key enabler for the development. The five strategic missions are as follows:

1. Set up standards and indices necessary to boost businesses and industry towards digitalization;
2. Build partnership among public sector, private sector, and the people to ensure the implementation of relevant policies;
3. Build digital manpower to improve workforce capability and support the national digital competitiveness;
4. Develop digital economy to increase business opportunities in the digital industry, leading up to sustainable value addition; and
5. Become a regional innovation hub with comprehensive ecosystems to attract high quality talent and investment from abroad.

Source: Roland Berger

Vision

"Elevate Thailand's digital business and digital industry towards a global leading digital economy as well as social and well-being development among Thai people."

Strategic missions

- Set up standards and indices necessary for digitalization
- Build partnership among public sector, private sector, and the people
- Build digital manpower
- Develop digital economy
- Become a regional innovation hub

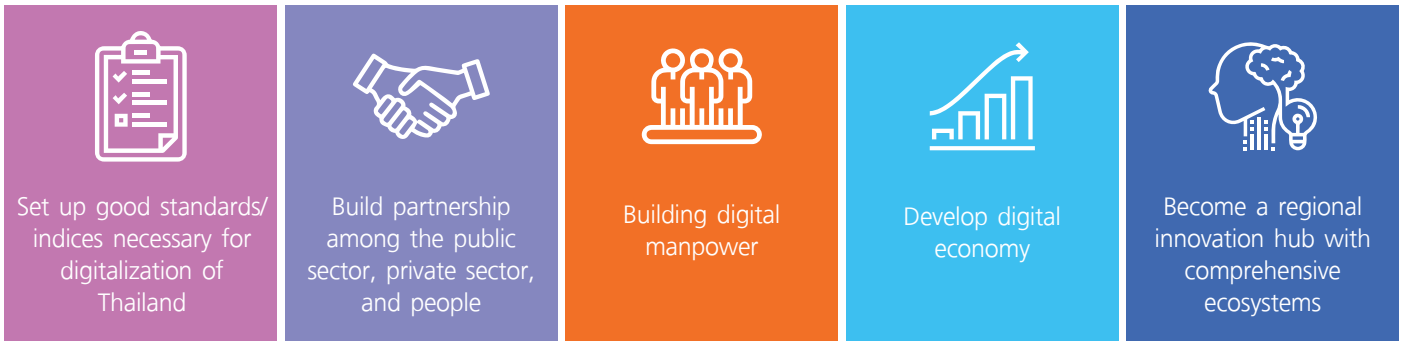
Triple goals

1. Improve Thailand's digital competitiveness and digital inclusiveness
2. Promote the growth of Thailand's Digital Sector as a change agent
3. Employ digital technologies to eliminate the social divide

KPIs of DCT in order to digitalize Thailand

Key Performance indices (KPIs) are required to track on a yearly basis the development of the country according to the five strategic missions. For the purpose of standardization and the ability to benchmark with other countries on a global scale, DCT has carefully selected the most relevant IMD Digital Competitiveness indices as KPIs of the five strategic missions. In addition, a handful of other indices were added to ensure comprehensiveness, and, in areas where a global index does not exist, new indices will be developed to track the progress of the national digitalization. The figure below summarizes the indices assigned to each of the strategic missions.

As a guideline, since Thailand is the world's 25th largest economy by GDP (according to World Bank data in 2018), the target is to be within the top 25 for any KPI, and for KPIs within the top 25, the target is to achieve the top 10 by the year 2025.



Improve Thailand's digital competitiveness and digital inclusiveness

Development of national quality certification for the digital business

Define and track "Digital Economy" and its contribution to GDP

- Public-private partnerships (IMD)
- Scientific & Tech. Employment (IMD)
- Attitudes toward globalization (IMD)
- Total expenditure on R&D (IMD)
- E-participation (IMD)
- Total R&D personnel per capita (IMD)
- Agility of companies (IMD)
- High-tech patent grants (IMD)
- Ease of doing business (The World Bank)
- Foreign highly- skilled personnel (IMD)
- Digital transformation in companies (gen.) (IMD)
- Use of big data & analytics (IMD)
- Tax attractiveness (LMU TAX)
- English proficiency (EF Education First)
- Collect data on the size of Digital Economy (OECD)
- Knowledge transfer (IMD)
- Digital literacy and workforce for the future index (The Economist, Economist Intelligence Unit)

Promote the growth of Thailand's Digital Sector as a change agent

- Define, collect data, and track the size of Digital Sector in Thailand (OECD)
- Digital intensity of sector indices (OECD, The Economist, EDB Singapore, DELL)

Employ digital technologies to eliminate the social divide (Inclusive Internet Index)

- **Availability** of internet & digital services (The Economist)
- **Affordability** to everyone (The Economist)
- **Relevance** of content & language (The Economist)
- **Readiness** in literacy, safety & policy (The Economist)

= IMD's digital competitiveness criteria = criteria from other indices = DCT's own index

Source: Roland Berger

Explanations of goals and aspirations for each of DCT's strategic missions

Set up good standards/ indices necessary for digitalization of Thailand

A key to ensure a successful Digital Transformation in Thailand's economy and society is to have transparent and internationally comparable KPIs. The first mission is an enabler to the other missions: to create indices and set standards to guide development directions in the four other missions. DCT aspires to define and track the value of digital sector and digital economy, capturing the direct digital value as well as digitalization across other industries, and to develop a national quality certification for digital products and services.

Build partnership among the public sector, private sector, and people

Participation of all parties is essential to achieve the transformation. **Public-private partnership** criteria were selected based on IMD Digital Competitiveness Index to indicate the level of PPP support in the technological development. **E-Government** was chosen to reflect the progress of digitalization by the public sector, while **E-participation** highlighted on the citizens' engagement in the policy through digital technologies. PPP also reflects the conduciveness of the policy for Digital Transformation. In this regard, **"ease of doing business"** by the World Bank and **"tax attractiveness index"** by Ludwig-Maxillion University were used to measure the government's effort to provide assistance and support for the private sector with regard to policy and tax.

Building digital manpower

To reflect Thailand's performance in building digital manpower, three criteria from the IMD Digital Competitiveness Index have been selected: **"Scientific & Technical Employment"**, **"Total R&D personnel per capita"** and **"Foreign highly skilled personnel"**. These three criteria combined allows us to gauge the level of skill and quality of workforce in the digital sector. In this regard, digital manpower includes upskilling and reskilling of existing workforce to be ready for the digital era. English proficiency, measured with **EF English Proficiency index**, is fundamental for Thai citizens to be equipped with, in addition to new knowledge from global communities. Digital literacy, which refers to the ability to use digital technology for one's own economic, career, and well-being development, should be gauged with an index to be developed based on OECD framework for digital literacy and on The Economist's index for educating future workforce.

Develop digital economy

Digital economy is a broad subject, and therefore requires a number of different criteria and indices to track. From the IMD Digital Competitiveness Index, two criteria were selected – **attitudes toward globalization** and **agility of companies** – to measure how open-minded and informed companies are regarding adapting to the future. From the general IMD Competitiveness Index, **"Digital transformation in companies"** criterion was selected for the same reason. In addition, taking into consideration the social aspect of the economy, the **"inclusive internet index"** by The Economist measuring the public accessibility and quality of the internet was also selected; this is elaborated more in Social Digital Index Section. Finally, DCT believes that it is important to be able to measure the growth of digital economy as a part of GDP, another index which DCT intends to create and measure with.

Become a regional innovation hub with comprehensive ecosystems

To become a regional innovation hub, Thailand needs a complete ecosystem providing an all-encompassing platform for R&D activities to launch startups. As various elements are essential in becoming an innovation hub, five different criteria from the IMD Digital Competitiveness were selected to gauge the innovation. In this regard, **"Total expenditure on R&D"** and **"High-tech patent grants"** were selected to measure R&D and innovative creations. **"Use of big data & analytics"** is also considered an appropriate criterion to measure Thailand's progress in the information age. Finally, **"Knowledge transfer"** and **"Starting a business"** criteria will capture the necessary supporting ecosystem for startups, SMEs, and enterprises.

Source: Roland Berger

Size of Thailand's Digital Sector and the Social Digital Index

Increase the size and the growth of Thailand's Digital Sector

In addition to the indices DCT intends to develop within the in-house sector with the five missions, DCT is committed to developing two other indices. The first one is to **"define, collect data, and track the size of digital sector in Thailand,"** which will be created based on OECD's existing index. The other is **"Digital intensity of sectors index,"** measuring the use of digital technologies in various sectors; this index will be created based on the concept of various international methodologies by OECD, The Economist, EDB and DELL. The foregoing missions are still in the planning stage, of which additional details will be disclosed in later quarterly reports.

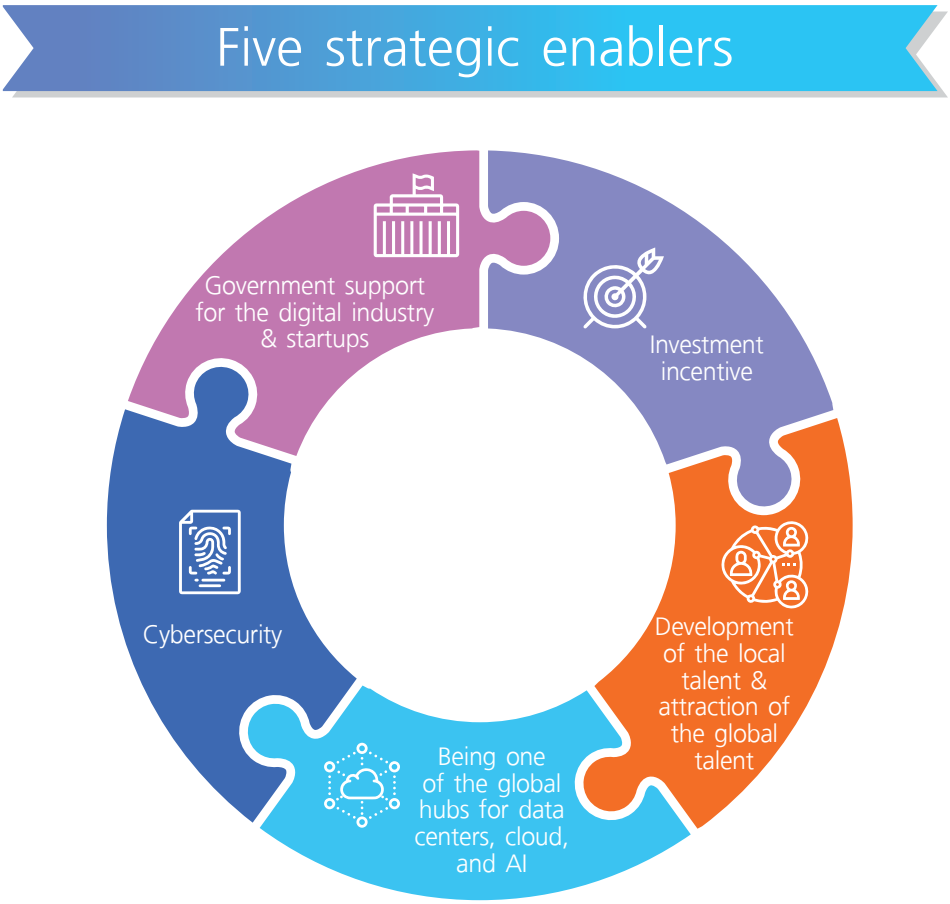
Social digital index

One of the most important defining values of DCT is the mandate to use digital technology in tackling the social divide and improving the well-being of all Thais with technology. We believe that appropriate use of the internet and accessibility to digital services for Thai general public is a key for Thailand to thoroughly drive towards the digital era. In order to gauge the progress and development of the foregoing, we have selected a number of indices under one roof: the **"Social Internet Inclusiveness Index,"** from The Economist. This consists of the following four key sub-indices. Firstly, **availability of internet & digital services** measures the coverage of internet and digital services for the general public. The index covers various aspects from gender equality in accessibility to electricity reliability in rural areas. Secondly, **affordability to everyone** measures how affordable internet services are to the people, based on the prices of both internet/ mobile packages and prices of handsets. Thirdly, **relevance of content & language** assesses whether or not the key e-services are available to the public; this includes fintech, e-commerce, e-health, etc. Furthermore, the index looks into the existence and extent of local language content. Finally, **readiness in literacy, safety & policy**—arguably one of the most important indices—examines a number of key elements in digital literacy of the citizens, level of accessibility for the disabled group or those with special needs, safety and trust in the use of digital services and policies of the government in supporting the advancement of digital/internet services.

It is not trivial to cover the aspect of the social divide in Thailand; however, we believe that the indices selected above are most relevant to the values and duties of DCT as an entity supervising digital technology and elevating the quality of life through the use of digital technology.

Source: Roland Berger

In order to fulfill and achieve the five missions, 12 strategic transformations have been identified, together with the support of five essential strategic enablers to ensure the success of the council's digital development journey. DCT has envisioned these 12 strategic transformations to be the areas where Thailand shall strive to transform in order to become one of the successful leading nations in the digital field within the region.



Government support for the digital industry & startups – policy and tax, together with monetary and non-monetary support provided by the government for businesses in the digital industry and for attracting and growing startups in Thailand

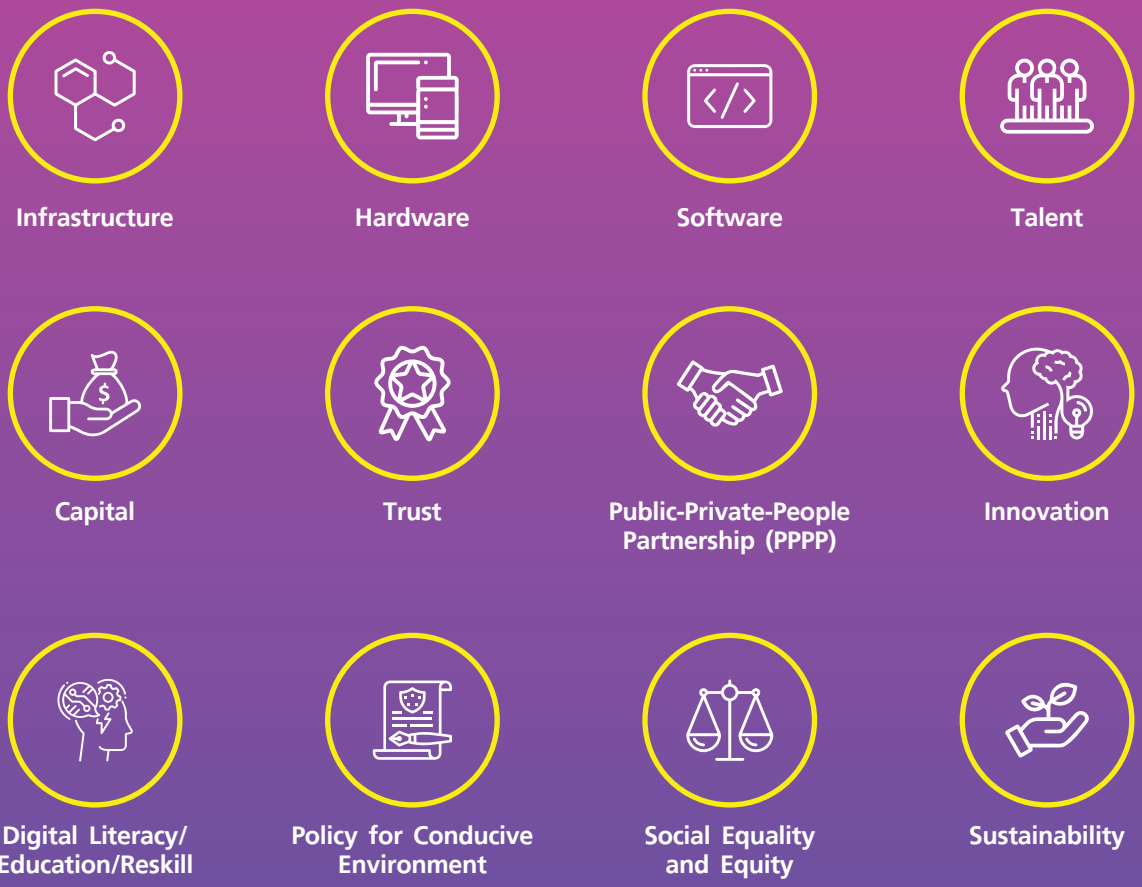
Investment incentive – monetary and non-monetary incentives provided by the government and the private sector for both Thai and international businesses to invest in Thailand's digital industry

Development of the local talent & attraction of the global talent – development of the local talent, from educational to professional levels, coupled with practical training, namely internships and on-the-job training, while creating an environment that attracts international talent and encourages knowledge transfer to local talent

Being one of the global hubs for data centers, cloud, and AI – readiness of infrastructure, quality talent, future-ready businesses and adaptive local consumers to encourage Thailand to become a digital hub in the region. The hub will leverage its strategic position in the heart of the region to attract local and global businesses for experimenting and developing deep technologies such as cloud technology, machine learning, and Artificial Intelligence (AI)

Cybersecurity – promotion of strong cybersecurity culture among Thai businesses and users and advocacy of robust cybersecurity legal framework with the government to build sustainable trust in Thailand's digital industry

12 Strategic transformations



Source: Roland Berger

Infrastructure – advocate the development of high quality, easily and efficiently accessible digital infrastructure, both driven by the private sector and the government, towards a well-connected digital society

Hardware – support the growth of Thai digital hardware and robotic businesses by creating business opportunities and ensuring high quality products for the competitiveness in the international arena

Software – support the growth of Thai digital application and software businesses by creating business opportunities and ensuring high quality services for the competitiveness in the international arena

Talent – boost the development of new skills, upskill the existing digital workforce, reskill the workforce with risks of being substituted by digital technology, and attract international talent to uplift the expertise of digital workforce in Thailand

Capital – advocate funding from the private sector and support the government in the allocation of public budget to best support the growth of Thailand's digital economy and society

Trust – build trust and confidence among the general public, businesses, and international investors through strengthened cybersecurity and disciplined personal data protection atmosphere, contributing to strong national security

Public-Private-People Partnership (PPPP) – facilitate and advocate the public-private-people partnership to inclusively involve all parties in implementing initiatives and to create synergy and ownership in the national Digital Transformation

Innovation – create an environment that encourages innovation and supports Thailand's creative digital businesses in order to add value to the digital industry

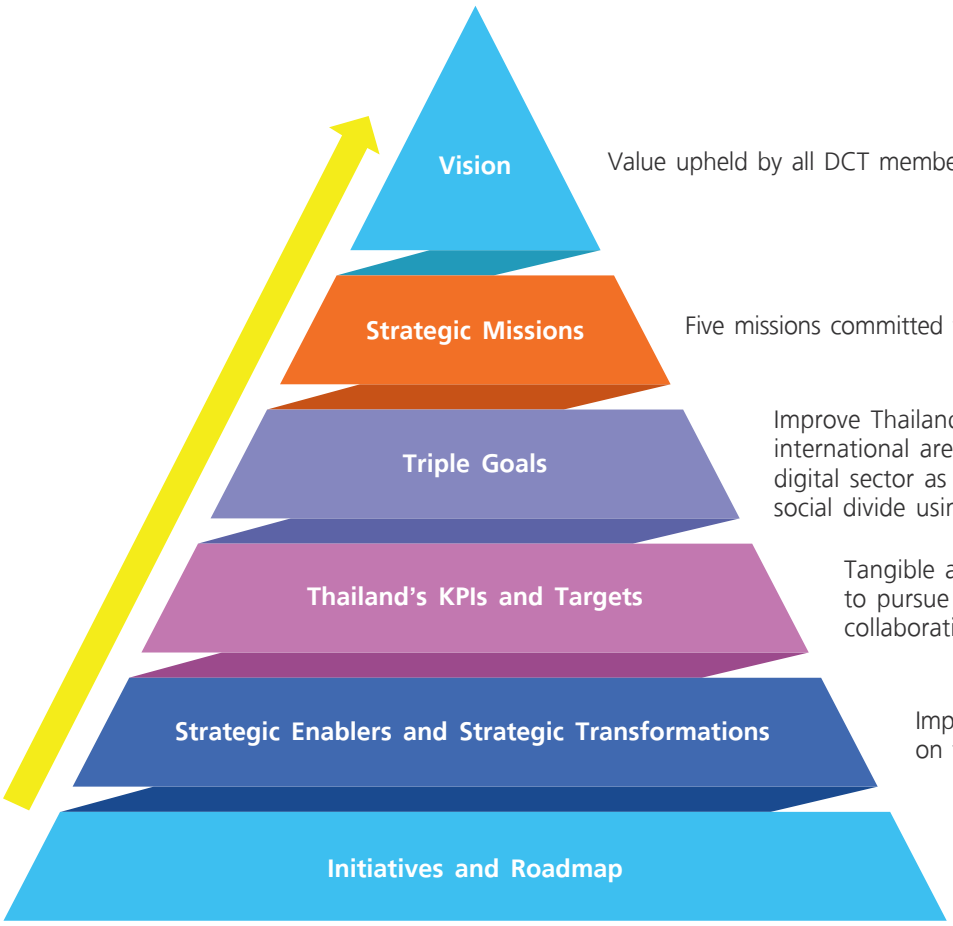
Digital Literacy/Education/Reskill – train people on digital literacy (i.e. how to use the internet and technologies in a fruitful manner), advocate for better and up-to-date education, as well as reskill the people to adapt to a new competitive landscape, i.e. update skills, to ensure competency according to the present skill requirements

Policy Support for Conducive Environment – participate in the public committee to design and implement digital economy and social promotion policies, advocate and encourage collaboration between the public and private sectors to introduce regulatory support, and eliminate any legal obstacles

Social Equity and Equality – utilize digital technology to ensure that basic needs (e.g. education, opportunity, healthcare) are met for everyone regardless of background or identity, while promoting equity by tailoring initiatives to specific needs of the minorities or any underprivileged group

Sustainability – ensure that implemented initiatives create sustainable outcome in various aspects, including environment, ethics, fair competition, transparency, and compliance

Digital Council of Thailand's Strategic Framework Pyramid



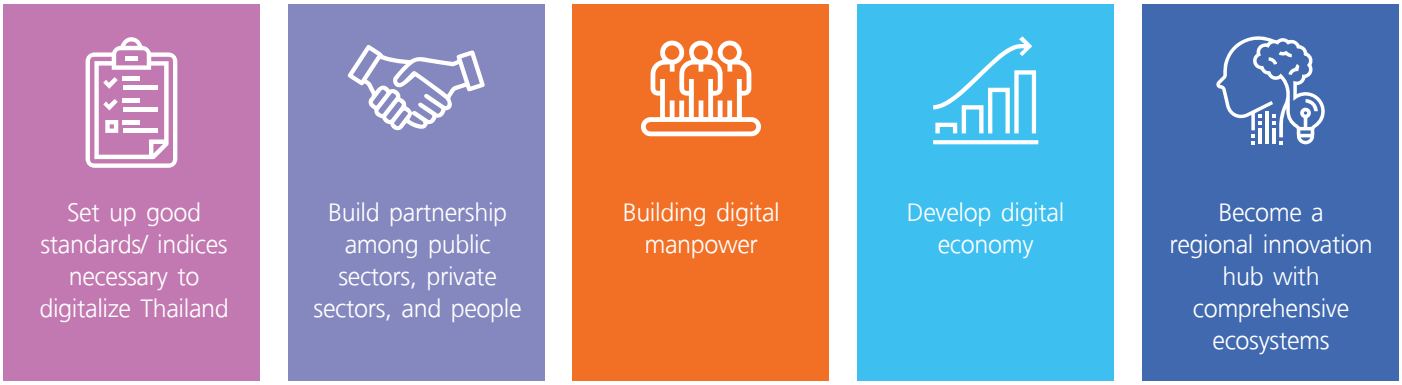
Actionable initiatives and roadmap are the foundation of DCT's strategic framework pyramid. At the top of the pyramid is the **Vision of DCT**, which is to be achieved by the **5 Strategic Missions**, aimed at tackling 5 key areas of the digital realm in Thailand. The foregoing is supported by the **Triple Goals**, aimed at improving the digital competitiveness of Thailand, boosting the growth of the digital sector, as well as eliminating the social divide through digital technology.

Once the visions and goals have been set, it is crucial to tackle and measure the performance of the country in order to reflect and identify any necessary improvement. In this regard, **Thailand's targets and KPIs** shall be integrated into the core spirit of DCT.

In order to take tangible actions, the **Strategic Enablers and Strategic Transformations** have been developed to create concrete impact on the digital economy and society. Finally, the **Initiatives and Roadmap** are the projects to be implemented to execute the vision of DCT.

Source: Roland Berger

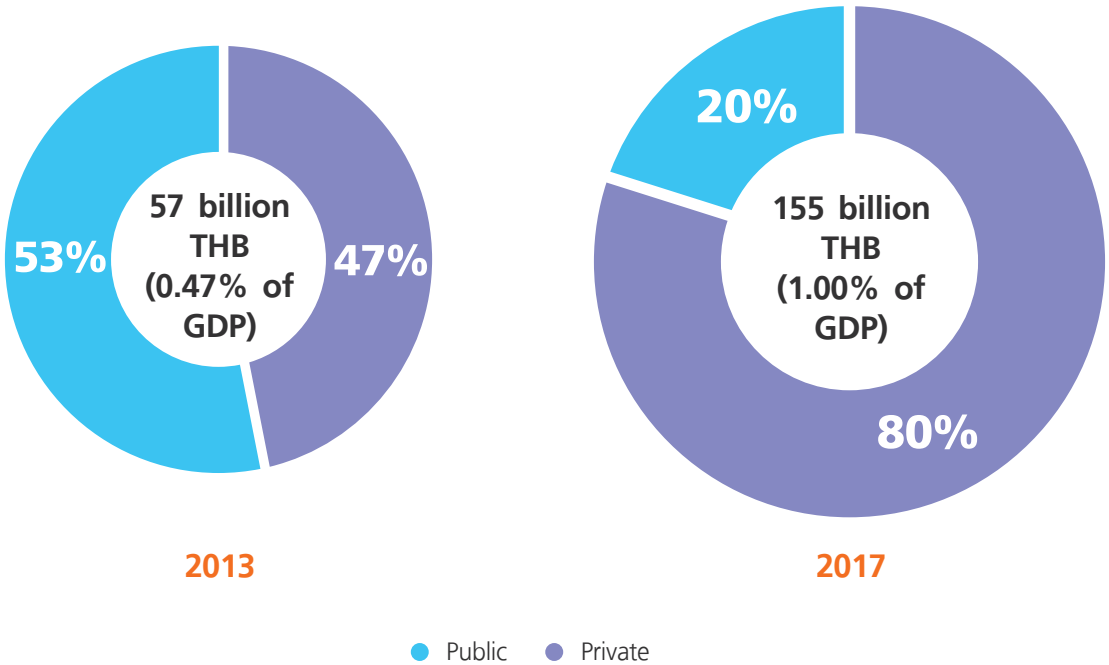
Promoting R&D is the key to making Thailand a regional innovation hub



One of DCT's key missions is to transform Thailand into a regional innovation hub and, ultimately, a global hub, through the development of a comprehensive, best-in-class ecosystem. Arguably, a key ingredient to making Thailand an innovation hub as well as tackling many of the nation's economic and development pain points is R&D. Therefore, it is crucial to establish a solid understanding of the current R&D landscape in Thailand, as well as relevant indicators i.e. intellectual properties. In this regard, the following section will attempt to explore facts and figures of Thai R&D in order to render preliminary recommendations to be carried out either by DCT or through partnership.

Why is R&D an essential part in transforming Thailand into an innovation hub?

R&D expenditure breakdown of Thailand from 2013 to 2017 [THB]



- Private R&D expenditure increased by **47% CAGR (Compound Annual Growth Rate)**, whilst public R&D expenditure increased by only **1% CAGR**
- Total R&D expenditure increased by **28% CAGR** from 2013 to 2017

Fig. 1: R&D expenditure contribution by public and private sectors, 2013-2017

Using R&D to Measure Innovation

Thailand is currently facing the middle-income trap—unable to compete with countries of cheaper labor force, such as Vietnam, in agriculture or manufacturing. However, Thailand is still not as advanced as Singapore nor Taiwan to compete in the hi-tech and high-value products. This leaves Thailand stagnated, unable to move forward. In this regard, the key to unlocking this tangled situation is innovation.

Innovation can be a perplexing concept to facilitate, let alone a measure. However, as the famed scientific philosopher Karl Popper suggested, it would be wise to quantify such abstract-by-nature ideas by referencing their implications. In this case, measuring R&D would be most appropriate and practical. This is why, in order for Thailand to innovate, the country needs strong R&D.

Thailand's progress on R&D

R&D in Thailand has been relatively dynamic over the past years. The country's R&D landscape has changed drastically from public-led R&D expenditure in 2013 to private-led in 2017. Over 5 years, Thailand's total R&D expenditure increased by 28% CAGR (Compound Annual Growth Rate). The private R&D expenditure has increased immensely by 47% CAGR while the public R&D expenditure increased by only 1% CAGR. The difference in the growth shifts the public-private contribution from about 50:50 to 20:80. This shift is attributed to two major factors.

Being faced with incremental competition, the private sector, especially the corporates, is placing huge importance on R&D to boost competitiveness. The leading sectors in R&D expenditure in the manufacturing industry are automobiles, food, and petroleum.

Nevertheless, it is important to give credit to the government for providing ranges of measures to promote the private sector's R&D. These measures included provision of funds for SMEs and start-up, promotion of measures according to BOI (up to 300% tax exemption for R&D activities), expansion of economic zones i.e. 'Food Innopolis,' and imposing favorable funding conditions for private investors.

Situation regarding IP registration in Thailand

Another important element to indicate the level of innovation possessed by a country is the number of patents filed by individuals or companies in such country. Although there are multiple types of patent, with regard to boosting the digital economy, the patent of best interest is estimated to be of scientific and technical type.

Figure 2: Patent filing in Southeast Asia by locals [2018]

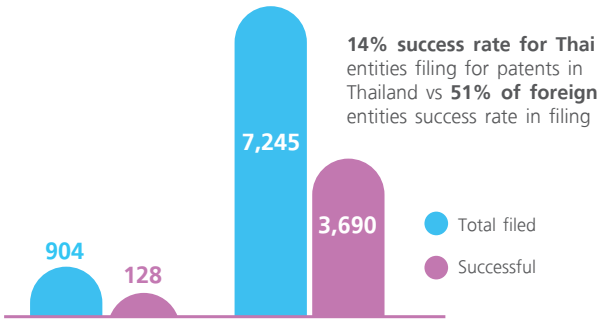
	Successful patents [#]	Success rate [%]
	469	42%
	312	20%
	205	32%
	128	**14%**

In 2018, WIPO (World Intellectual Property Organization) reported that Thai entities successfully filed 128 patents; this is lower than many other neighboring countries in Southeast Asia including Singapore (312), Malaysia (469), and Vietnam (205).

Furthermore, it is worth noting the success rate of the patent filing in each of the selected Southeast Asian countries by locals. Thailand notably performed poorly in this regard at 14%, compared to Malaysia, for instance, of which success rate is 42%. This is an important observation as the success of filing IPs directly correlates with R&D activities and thus innovation. Without IPs, there would be no incentive to conduct R&D activities and no reason to innovate since an innovator would not be able to derive any return or possess any ownership of the product or service.

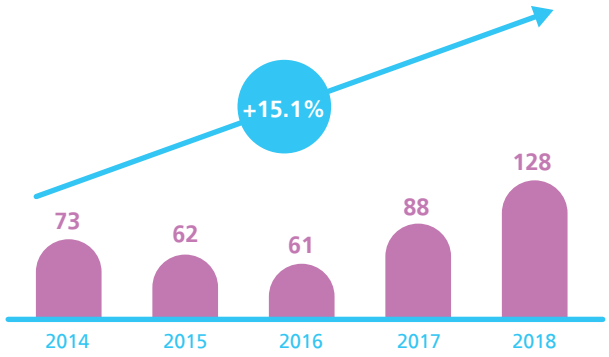
Additionally, an interesting observation is that the success rate of foreign entities registering for IPs in Thailand is much higher than the local.

Figure 3: Patent filing in Thailand 2018 [#]



In 2018, WIPO reported that over 900 patents were filed by locals in Thailand; however, only 14% of those were successful. On the other hand, foreign entities see a much higher success rate at 51% out of the 7,245 patent requests filed. In this regard, the next step to take would be to investigate the phenomenon and pinpoint the root cause in order to consider whether or not the low success stems from the quality of filed IPs or simply from the lack of know-how and experience in the long-winded process.

Figure 4: Number of patents filed by Thai entities, 2014 – 2018

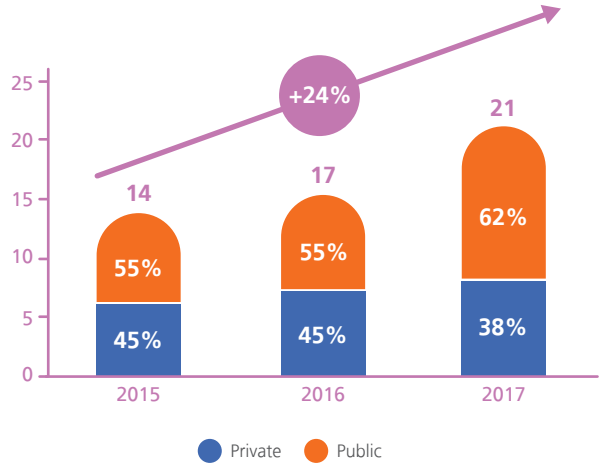


With that said, the situation is not irremediable. The number of patents filed by Thai entities has been growing steadily over the past few years, and even made almost a 50% leap in a single year from 2017 to 2018. Although promising, Thailand needs a swift reform thereof in order to catch up with the peers in Southeast Asia.

R&D personnel statistics and status in Thailand

Thailand's R&D personnel moved in the same direction as the total R&D expenditure, growing at a fast pace with a strong push from the private sector. From 2015 to 2017, R&D personnel per capita grew by 24% CAGR. Moreover, the number of R&D personnel in the private sector increased to 62% of total R&D personnel, while the public sector only accounted for 38%.

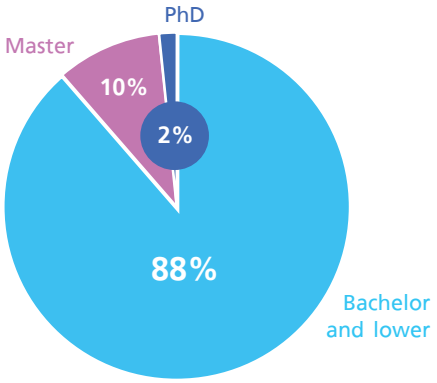
Figure 5: R&D personnel per capita in 2017 [personnel per 10,000 people]



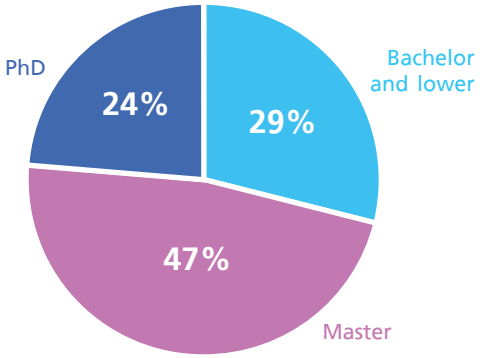
In addition to quantity, it is also important to note the qualitative difference between the R&D personnel in the private and public sectors. The private sector relied heavily on the R&D personnel with bachelor degree and lower level, representing 88%, while master degree and PhD only accounted for about 12%. On the other hand, the public sector used the opposite model, with master degree and PhD accounting altogether for approximately 71%, while bachelor degree and lower level accounted for only 29%.

Source: NXPO, NSO, WIPO, Roland Berger

Figure 6: Breakdown of degrees by the private sector R&D personnel, 2017 [%]



Breakdown of degrees by the public sector R&D personnel, 2017 [%]



Recommendations

Based on the observations and statistics previously mentioned, three main recommendations are rendered in order to further improve R&D in Thailand as follows:

- To continue to promote R&D activities, especially on the part of the private sector, by ensuring that any benefit offered by the government are fully utilized. A good starting point would be to make alterations to the 300% R&D tax exemption scheme, which is currently under-utilized due to complicated processes and strict requirements on private R&D information. The strict requirements regarding information disclosure may require revision for the purpose of inducing more utilization of the incentive. This would not only add to R&D expenditure, but also encourage companies to declare their R&D expenditure, consequently better representing actual expenditure;

- To increase the success rate of patents filing for the locals via peer-to-peer knowledge transfer program by connecting, for example, DCT member companies experienced in filing patents, with SMEs or startups who may lack the experience; and

- To leverage personnel at all levels of education for R&D activities, regardless of whether or not they have PhDs. R&D personnel benefits and incentives should be made available for all, not just for graduates with a certain degree level.

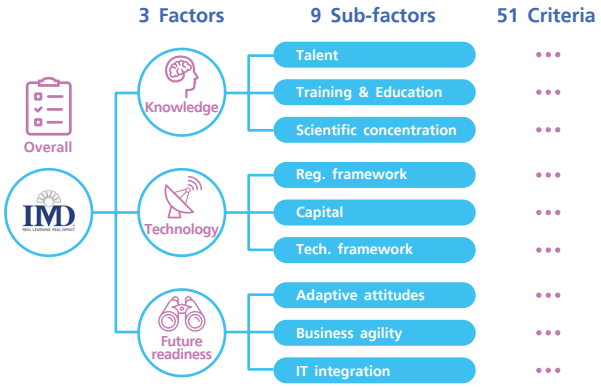
3. IMD DIGITAL COMPETITIVENESS RANKING ANALYSIS

Introduction to IMD Digital Competitiveness Ranking

IMD World Digital Competitiveness Ranking assesses the capacity of 63 economies to adopt and explore digital technologies leading to transformation in government practices, business models and society in general.

The Digital Competitiveness Ranking can be mainly categorized into three parts: Knowledge, Technology, and Future Readiness. The three main factors can be further categorized into nine subfactors and 51 criteria.

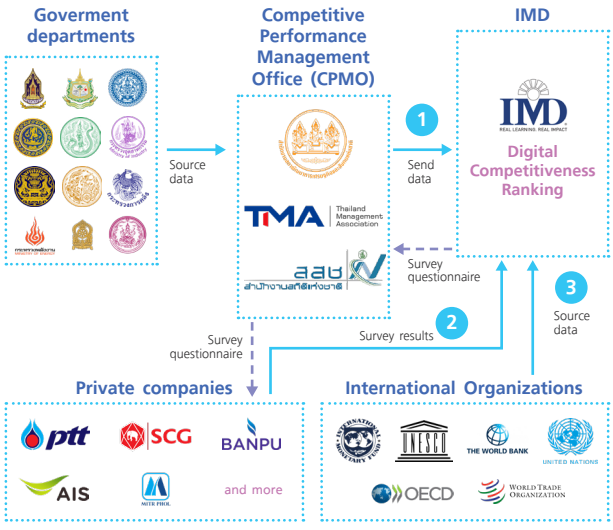
Figure 7: Breakdown of IMD Digital Competitiveness Ranking



Source: IMD

Of the 51 criteria, 31 are hard data collected from international organization (e.g. UN, World Bank) and national sources, while 20 are survey data collected through IMD's local counterpart. Thailand Management Association (TMA) is the local counterpart of IMD.

Figure 8: Data sources of IMD for Thailand



Source: TMA

Thailand's current performance in the ranking

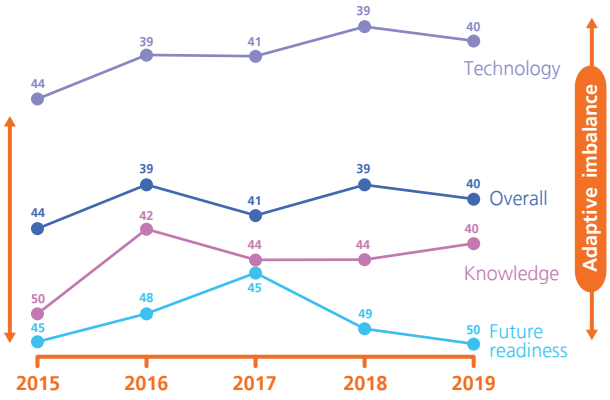
Figure 9: World Digital Competitiveness Ranking 2019

Rank#	(2018)	Country	Score[1]
1	(1)	USA	100.0
2	(2)	Singapore	99.4
10	(14)	S. Korea	91.3
15	(10)	UK	88.7
17	(18)	Germany	86.2
22	(30)	China	84.3
23	(22)	Japan	82.8
24	(26)	France	82.5
26	(27)	Malaysia	82.4
40	(39)	Thailand	68.4
55	(56)	Philippines	59.4
56	(62)	Indonesia	58.0

Source: IMD

Although Thailand ranking improved by 4 points (2015-2019), technology improvement is not supported by future-ready attitude and digital knowledge on the part of the citizens. This "Imbalanced Adaption" indicates that resources invested in technological advancement were not optimized in the socioeconomic development. In this regard, DCT should assume a role in solving such imbalance as a middle entity between the public and private sectors.

Figure 10: Thailand historical performance in digital competitiveness ranking – 2015-2019



How the IMD Digital Competitiveness Ranking can help Thailand

The ranking not only represents how international investors regard Thailand, but also reflects Thailand's relative strengths and weaknesses. By looking into each criteria, Thailand can benchmark solutions against other countries' standards and adapt the solutions to fit Thailand's situation – ultimately improving Thailand's overall digital competitiveness.

IMD Digital Competitiveness Criteria Shortlisting

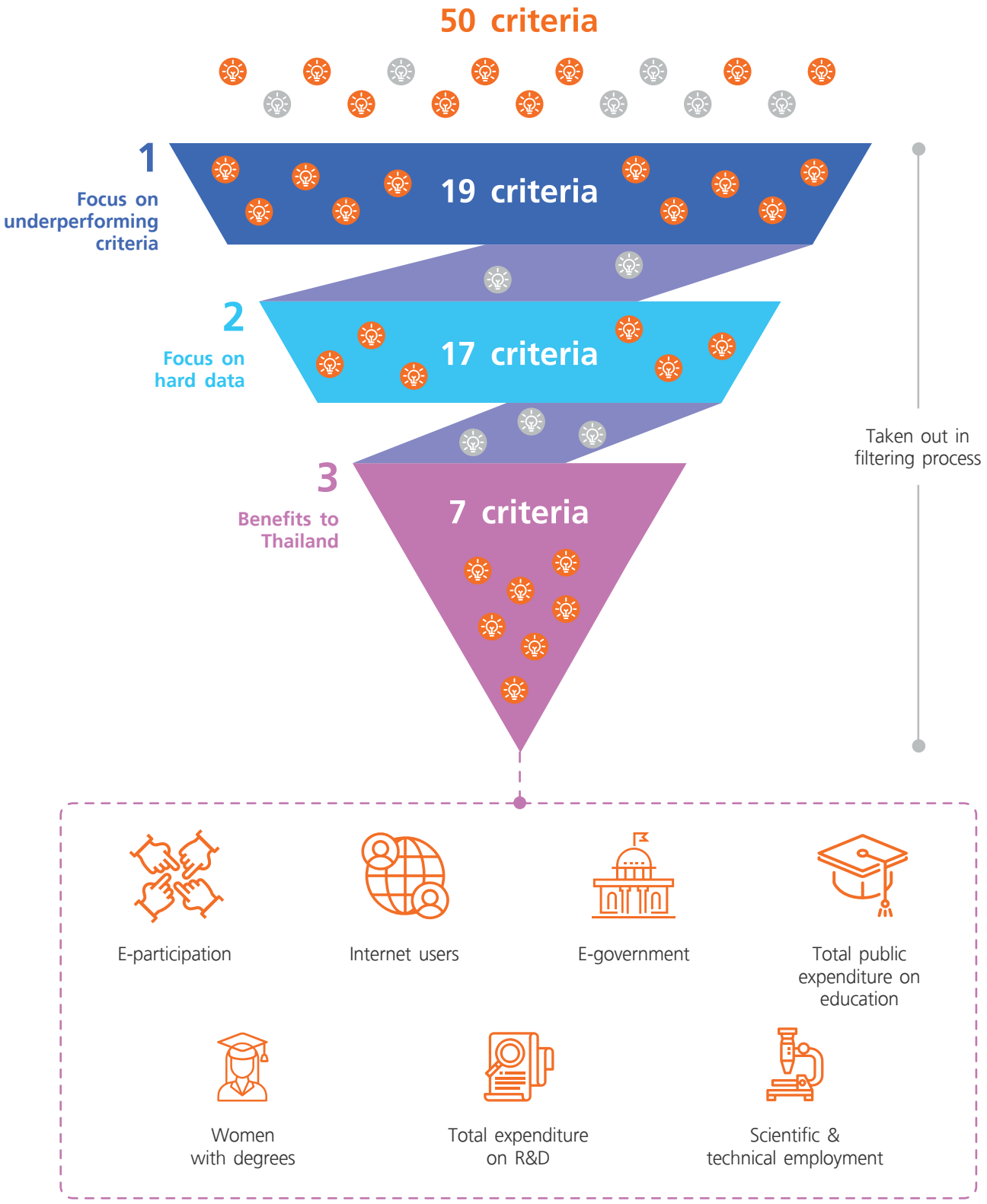


Figure 11: Filters are used to select underperforming criteria which will likely have high impact on ranking improvement and benefit to Thailand (filtering conducted using IMD Digital Competitiveness 2018)

Filtering criteria for shortlisting what to focus on

In order to effectively utilize resources to improve the IMD Digital Competitiveness Ranking for Thailand, three filters have been introduced to systematically select the first set of criteria, elaborated as follows:

1. Focus on underperforming criteria - These criteria are ranked below 39th, which is Thailand's overall ranking. Scoring better in the foregoing would have a more positive impact on the overall ranking as these criteria are undermining the country's average.

2. Focus on hard data - Hard data has more weight on the overall scoring than survey data. Focusing on the hard data would yield greater impact on the overall scoring of the country.

3. Benefit to Thailand - Filter criteria by taking into consideration the country's benefit; the criteria that would directly address Thailand's pain points. This filter will be explored in further details.

The third filter: Benefit to Thailand

It is important to note that rankings and indices are merely indicators and should be used with caution. Therefore, DCT believes that this final filter is crucial to prioritize based on criteria which, if improved accordingly, will address Thailand's actual pain points and yield substantial benefit to the country. The benefit to Thailand will be evaluated in three main areas: society, economy, and governance. IMD criteria which satisfy the three main areas will be shortlisted. The main areas are specified as follows:

i. Society – Tackle the social divide; this will result in more equal opportunities in education, basic needs, and regulatory protection. The objective thereof is to give equal voices and rights to all members of the community, regardless of their status, as well as to advocate for equality in gender, religion, etc.

ii. Economy – Provide an environment which accommodates businesses, especially the local businesses, in order to thrive in the digital realm; facilitate better cross-border trading for local businesses regardless of size; and help ease business operations and protect the same from various threats

iii. Governance – Ensure a more transparent conduct of government activities; facilitate collaboration between the private and public sectors; enhance the efficiency of public service processes; and encourage international collaboration with governments of other countries

Result of the shortlisting

After the shortlisting process, seven pilot criteria have been selected to focus on. The criteria selected as follows:

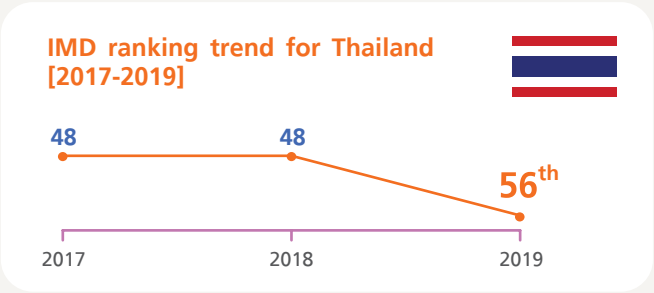
- E-participation
- Internet users
- E-government
- Total public expenditure on education
- Women with degrees
- Total expenditure on R&D
- Scientific & technical employment

The analysis of these criteria, including engagement with relevant agencies and final recommendation, will be shown over the next few pages.

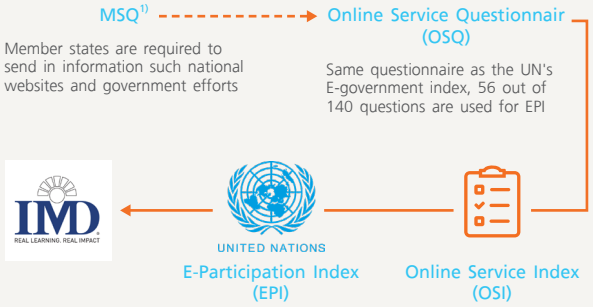
E-participation

Description – Use of online services that facilitate public's interaction with government. The e-participation index (EPI) measures the use of online services to facilitate provision of information by governments to citizens ("e-information sharing"), interaction with stakeholders ("e-consultation"), and engagement in decision-making processes ("e-decision making").

Data provider: United Nation



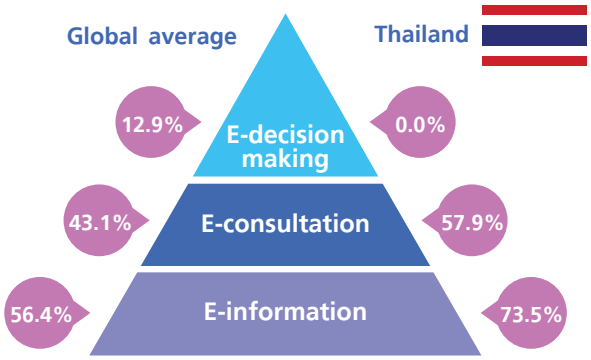
Methodology – IMD directly refers to the UN's e-participation Index. The index is derived from part of the Online Service Questionnaire (OSQ) survey. This survey is completed by UN volunteers as they assess each country's national websites, including national portal, e-services, e-participation portal, and other websites as applicable.



Source: UNDESA

Current situation

83rd out of 193 countries – In 2018, UN ranked Thailand's e-participation index at 83rd (with score 0.6517), a decline from rank 67th in 2016. Thailand is currently performing well above the global average in e-information (level 1) and e-consultation (level 2) aspects of e-participation, but it has zero presence in the e-decision making level (level 3).



Pain point analysis

Despite good performance in e-information and e-consultation, Thailand has zero presence in the e-decision making level (level 3). This indicates that Thai citizens have very low engagement in the decision-making processes.

The UN e-participation index is derived from their Online Service Questionnaire (OSQ) survey, which is completed by UN volunteers; therefore, the Thai public and private agencies have limited control over the survey outcome. The OSQ survey evaluates the relevant national websites and Thailand's official government website (i.e. www.thaigov.go.th), which has limited content and function.

International best practices

Estonia – 26th

Estonia created "X-Road", a shared environment for exchanging data between the citizens & public agencies

- The system is designed to integrate all citizens' data and public data in one place.
- The World Bank conservatively estimated that, in 2014, X-Road saved the country a total of 2.8 million working hours, or 3,225 years of time

X-ROAD

Taiwan

"E-decision-making" platform to propose initiatives and PPP platform for cooperative policymaking

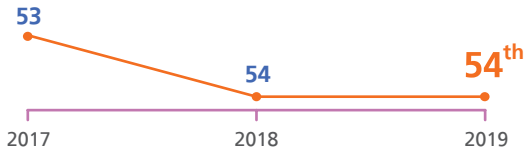
- People can initiate proposals on this website provided that the proposal gets 5,000 signatures within 60 days.
- In addition, "vTaiwan," an on-line to off-line PPP platform, facilitates stakeholders to collaborate on consensual issues.

vTaiwan

Internet users

Description – Number of internet users per 1000 people. According to TMA, Computer Industry Almanac only counts desktop users and not mobile internet users.

IMD ranking trend for Thailand [2017-2019]



Data provider: Computer Industry Almanac

Methodology – According to TMA, Computer Industry Almanac employs their own "survey" to globally determine "desktop" internet users. From engaging with IMD in October 2019, the following information is shared. Computer Industry Almanac has since closed down; however, IMD still continues to refer to the "survey" for the time being. The following year (2020), the new source will likely be the International Telecommunications Union (ITU), which provides clear information on its methodology and the breakdown of each components of internet users. The definition of "Internet Users" as per new source of data shall be studied in the future.

Current situation

94% uses the internet – According to National Statistical Office of Thailand (NSO)'s survey in 2018, 94% of participants (sample size of 36 m citizens) use the internet to access social media and instant messaging platforms. Moreover, Thailand has one of the highest mobile internet penetration in the region.

Pain point analysis

Thailand is currently performing well with respect to overall (mobile & desktop) internet users. However, the use of internet by the general public is fairly limited to a handful of applications and purposes—mainly for social media and instant messaging. Low digital literacy, and cybersecurity risk are key challenges.

Currently, IMD refers to Computer Industry Almanac, employing their own survey to globally determine "desktop" internet users. Despite having one of the highest mobile internet penetration in the region, Thailand's desktop internet usage is low as the people generally skip straight to mobile, resulting in poor ranking. For the upcoming 2020 edition, IMD stated that they will change their data source to ITU statistics, which not only includes "desktop" internet users.

International best practices

Myanmar

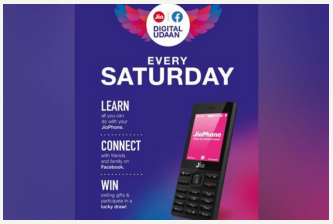
Ooredoo Myanmar, with Facebook and GSMA, jointly launched the Internet 1O1 digital literacy campaign

- The campaign aims at raising awareness and increasing adoption of mobile internet.
- One-on-one trainings (with subjects e.g.cybersecurity) are offered at Ooredoo retail points and exclusive stores across the country, particularly in rural areas.

India

Digital Udaan digital literacy initiative for the first-time Internet users in the country

- Train-the-trainer sessions, training videos (in 10 regional languages) and information brochures are provided.
- Launched by Reliance Jio, in collaboration with Facebook; "every Saturday" campaign educates users on JioPhone features & safety use of internet.

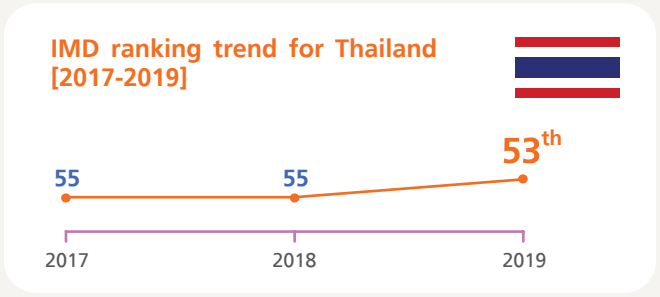


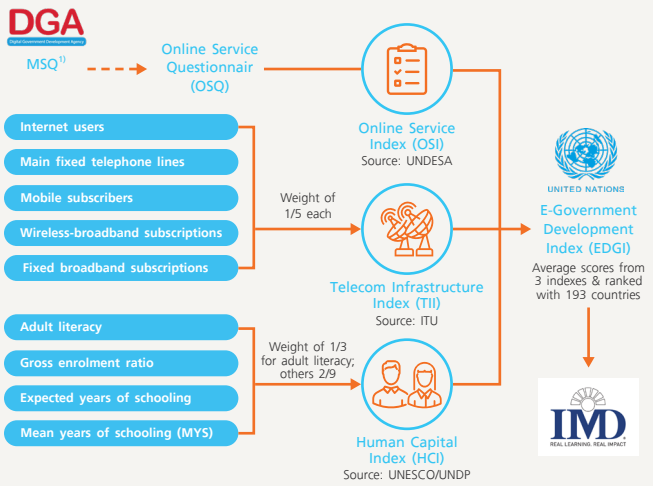
E-government

Description – Provision of online government services to promote accessibility and inclusion of citizens

Data provider: United Nation

Methodology – IMD directly refers to the UN's e-government development index (EGDI). The EGDI index is derived from three indices including Online Service Index (OSI), Telecom Infrastructure Index (TII), and Human Capital Index (HCI), with reference to the illustration of the breakdown. Moreover, the OSI is derived from the Online Service Questionnaire survey, which at least two of the UN personnel assessed each country's national website in the native language, including the national portal, e-services portal, and e-participation portal, as well as the websites of the related ministries of education, labor, social services, health, finance, and environment as applicable. The selection of national website to be assessed is based on the Member States Questionnaire (MSQ). In Thailand, Digital Government Development Agency (DGA) is responsible for filling the MSQ and improving Thailand's e-government.





Current situation

73th out of 193 countries – In 2018, UN ranked Thailand's e-government development index at 73rd (with the score 0.6543), an improvement from rank 77th in 2016. Thailand scored better in all three categories comparing from the year 2016 to 2018.

- Online Service Index: 0.64 (from 0.55)
- Telecommunication Infrastructure Index: 0.53 (from 0.41)
- Human Capital Index: 0.79 (from 0.69)

Despite the absolute improvement in the scores, Thailand's IMD E-government criteria improved just by two positions from 2017 to 2019. This is because other countries have been improving as well. Moreover, the same ranking of 53th can be expected as the UN EGDI is conducted every two years unless data collection scheme is changed.

Pain point analysis

Thailand's government is currently investing heavily in E-government through various initiatives e.g. data integration among government agencies. However, the lack of ICT experience and digital capacity among the Thai public servants and the resistant organization cultures are hindering the transformation.

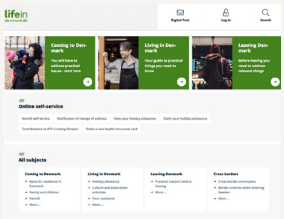
The Online Service Questionnaire survey, which represents one-third of the EGDI index, evaluates the national websites of each country. Currently, Thailand's national portals have limited content and function. Furthermore, according to DGA, Thailand's Telecommunication Infrastructure Index is low. In this regard, an improvement in this area will likely boost the ranking.

International best practices

Denmark – 1st

Denmark's government provides a single point of access to the authorities' digital self-service solutions and information

- The foundation of Denmark's digital strategy is the use of digital IDs (called NemIDs), allowing residents to access both public and private services on the same account. - e.g. file taxes, buy a telephone plan, visit the doctor



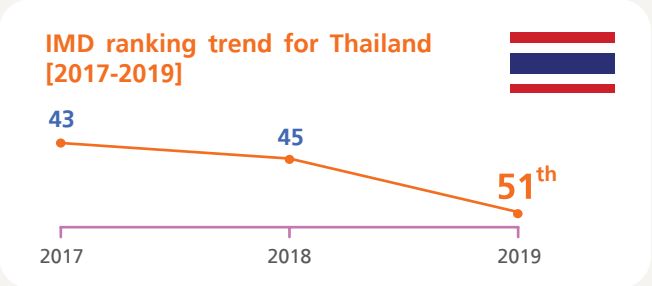
Korea – 3rd

South Korea developed the national e-government mechanism to deliver information and services and introduced the following networked relationships:

- Government-to-Government (G2G)
- Government-to-Business (G2B)
- Government-to-Citizens (G2C)

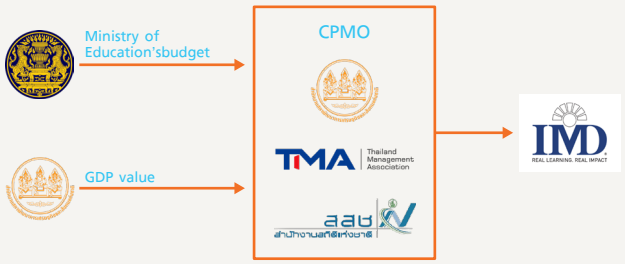
Total public expenditure on education

Description – Total public expenditure on education as a percentage of GDP, i.e. expenditure by all public entities, including ministries other than the ministry of education, local and regional governments and agencies



Data provider: Budget Bureau

Methodology – Thailand is to send the Ministry of Education's budget to the IMD. Although this methodology is clear and simple, it fails to incorporate the education expenditure of other government agencies.



Current situation

3.8% of GDP – In 2018, Thailand spent approximately 523,570 m THB on education, accounting for the largest portion of the total expenditure. Thailand's education budget has been decreasing every year since 2016, from 550 bn THB in 2016 to 511 bn THB in 2019. The IMD ranking of this criteria fell by 8 positions from 2017 to 2019, moving in line with the actual statistics.

Pain point analysis

Fundamentally, Thailand's public expenditure on education accounts for the largest portion of the government budget. However, the expenditure is inefficiently used and allocated. Budget allocation among provinces could have up to three times the difference and is not catered for the different economic and social needs of each area/student. Moreover, the budget is spent on primary/basic education for about 70%, but only 4% on vocational level, which is considered low compared to other countries.

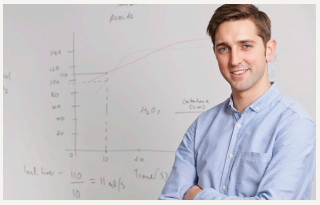
With respect to data, Thailand currently sends only the data on the budget allocated to the Ministry of Education to IMD. This understates the actual education expenditure as there are other government agencies (e.g. Department of Provincial Administration) that also spend on education. Data collection from related government agencies can better reflect Thailand's education situation and improve the ranking.

International best practices

Australia – 21th

Australia provides incentives for teachers who are willing to teach in rural area

- Australia introduces scholarships worth $10,000 per year for top school achievers who pursue pedagogy.
- Recipients are required to work in public schools for a number of years.



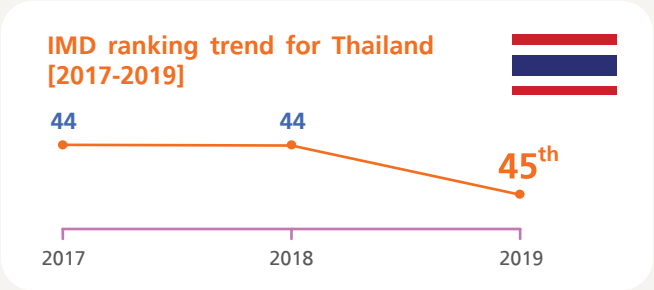
Norway – 15th

Governance of the education system is shared between the central government and local authorities

- The central government sets goals and frameworks, while municipalities run primary and lower secondary schools and counties run upper secondary schools.
- Tertiary institutions are mostly autonomous in their decisions, including how they allocate resources.

Women with degrees

Description – Educational attainment in tertiary education of 25-64 year-old females is expressed as a percentage of the female population from the age of 25 to 64. The data refers to International Standard Classification of Education (ISCED) 2011 (codes 5/6/7/8), including vocational, bachelor, master, and PhD.



Data provider: Office of Education Council (OEC)

Methodology – Thailand uses the survey of 200,000 households as the main methodology to collect data. To ensure realistic representation of the figures, OEC double-check the data with its database, randomly selecting specific age groups in the particular year to compare the numbers. Note that OEC database is very limited and only gives accessibility to the information for the people in the education in the particular year. There is no data collection from the previous years.

Current situation

22% of women have a degree – Although nearly 60% of degree holders are women, only about 20% of all Thais have higher education qualifications, resulting in a low percentage of women with degree. The percentage is expected to increase gradually over the years as the new generation (high percentage with degrees) is counted, while the older generation (low percentage with degrees) is no longer counted. Thai women with degrees ranking on the IMD has been highly stagnant, failing by 1 positions from 2017 to 2019.

Pain point analysis

Thailand is currently performing well in terms of producing female degree holders, but the overall number of degree holders is still low. Only about 20% of the Thai population received higher education. Less women are taking on STEM subjects. Funding is still one of the biggest obstacles to have access to higher education.

With respect to statistics, the Office of Education Council refers to surveys to determine the number of women with degrees as hard statistics are extremely difficult to collect. The overall percentage of people with higher education is still low; therefore, the same applies for women with degrees, regardless of the comparison with their male counterpart. In this regard, the Office of Education Council database is limited; it not only lacks historical data for people with degrees, but no data collection has also been conducted over the years. Thus, Thailand has to still rely on survey methodology.

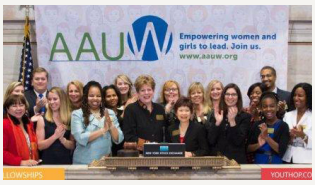
International best practices

USA – 11th

American Association of University Women advances equity for women through advocacy, education & research

- Each year, AAUW has provided $USD 3.5 to 4.0 million in fellowships, grants, and awards for women and for community action projects.
- The organization has a nationwide network of 170,000 members and 800 college and university partners.

AAUW empowering women since 1881



Korea – 3rd

Upstart, a crowdfunding site, uses crowdfunding to support university students with their tuition fees

- The website allows people to fund the students in need of tuition support for their undergraduate degree.
- In return, the contributors get paid a portion of a student's future earnings for a fixed period through a "human capital contract."

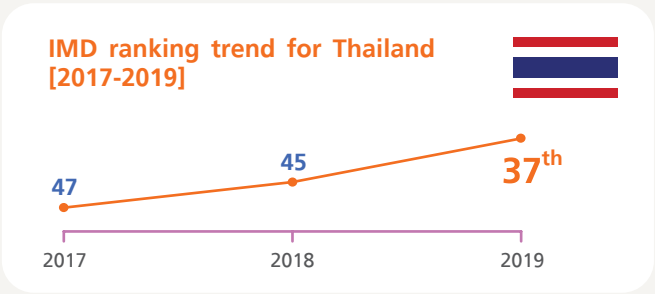
Upstart

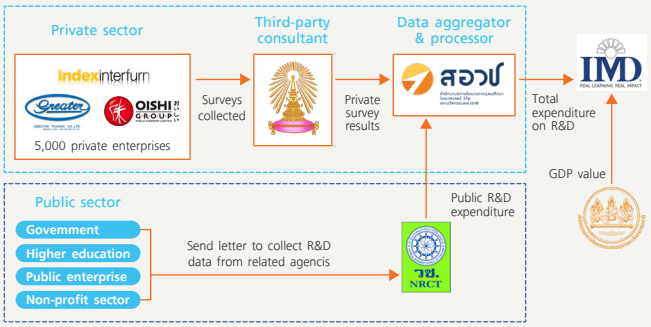
Total expenditure on R&D (%)

Description – Total R&D expenditure as a percentage of GDP. The total expenditure on R&D (%) measures the R&D expenditure of both the private and public expenditure. It can be broken down into many types, i.e. expense for R&D personnel, expense for machinery and equipment.

Data provider: Office of the National Higher Education, Science, Research and Innovation Policy Council (NXPO)

Methodology – Currently, Thailand uses the survey method to collect data. NXPO is responsible for collecting data from the private sector's R&D as well as aggregating data from National Research Council of Thailand (NRCT), which collects data from the public sector's R&D. The public sector comprises the government, the higher education, the public enterprise, and the non-profit sector. Also, note that due to different timing of data collection by NXPO and IMD, there is a two-year data lag e.g. IMD 2019 referring to 2017 R&D data.





Current situation

1% of GDP – Thailand's R&D expenditure rose tremendously in the recent years, pushing the IMD criteria ranking by 10 positions from 2017 to 2019. The main leading sectors are automotive, food, and petroleum. Going forward, the government is aiming for R&D expenditure of 1.5% of GDP by 2021 and 2% by 2026.

Strong push from the private sector – The private sector, accounting for 80% of the total R&D expenditure, increased its expenditure by 47% CAGR (2013-2017), while the public sector, accounting for 20%, increased by just 1% CAGR. Facing an intense competition, the private sector continued to promote innovation as a result of its necessity to create differentiation by offering high-value products. The public sector, too, are responding by providing attractive incentives for R&D expenditure, particularly in the sectors in line with the country's vision.

Pain point analysis

Thailand's public and private sectors are placing huge importance on R&D. The public sector has introduced various schemes (e.g. a 300% tax reduction) to promote the R&D investment. However, some companies are not aware of the existing scheme and others say the process is too complicated. The lack of qualified R&D personnel also limits the investment.

As survey methodology is used, one of the key challenges is that many organizations, particularly the private sector which represents about 80% of the total figure, do not answer the survey. The short of data renders it difficult for NXPO to extrapolate the data to best represent Thailand. The data is believed to be underestimated—a more complete data set will likely improve the ranking.

International best practices

Japan – 6th

Japan's "R&D promotion tax system" deducts part of experiment and research expenses from corporation taxes

- Encourage R&D cooperation between industry-universities and national research institute
- Provide tax credit of 20% to 30% for the research project expenditure, increasing R&D expenditure of the corporates

METI Ministry of Economy, Trade and Industry

Singapore – 18th

Singapore's Technology for Enterprise Capability Upgrading directly assists SMEs in their R&D projects

- In each T-Up effort, a company initiates an R&D project; scientists and engineers with the required expertise are deployed at the company to carry out research projects up to a period of two years.
- T-Up subsidizes up to 70% of the secondment costs.

Agency for Science, Technology and Research SINGAPORE

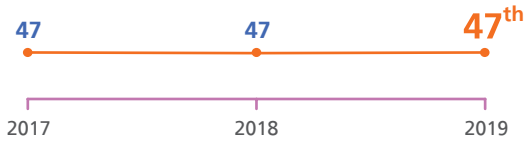
Scientific and Technical Employment

Description – Scientific and technical employment as a percentage of total employment; it is defined as formal employment within the 'scientific and technical' sector (according to NACE2 category M (or equivalent) - Statistical classification of economic activities in the European Community).

Data provider: Business Monitor International (BMI)

Methodology – BMI referred to NSO for the statistics. NSO, with support of NXPO, conducts labor force surveys (~80,000 sample size) to collect the data. Despite the relationship aforesaid, there is a mismatch between the figures.

IMD ranking trend for Thailand [2017-2019]



Current situation

4 million people – In 2018, the National Science, Technology and Innovation Policy Office (now NXPO) announced that over 4 million citizens are employed in the field of science and technology. The IMD ranking for this criteria has remained stagnant over the three years.

Pain point analysis

Thailand's scientific and technical employment is on par with the neighboring SEA countries (Singapore, Malaysia, Philippines). Despite various initiatives to promote technical skill training, Thailand will benefit by having more highly trained scientists and engineers to foster innovation and encourage R&D effort.

With respect to the index, IMD refers to BMI as its data source and BMI refers NSO as its local source provider. Despite the relationship aforesaid, there is a mismatch of data between BMI and NSO. Furthermore, for the local sources, employment in the field of science and technology in the private sector is the key factor; however, the said organizations are not obliged to declare their data, leading to incomplete statistics.

International best practices

UK – 8th

UK's communities, institutions, and government are establishing programs to increase STEM skills supply

- Degree apprenticeships have been developed by Tech Partnership employers and higher education institutions, allowing students to gain an integrated honors degree, providing both academic learning and on-the-job training.
- Coding is commonplace in schools and community centers.

Australia – 6th

Australia launched extensive STEM training and internships to promote related employment

- The Supporting Artificial Intelligence in Schools initiative aims at equipping future workforce with in-depth understanding of AI.
- The Australian government has allocated over $64 million to fund early learning and school STEM initiatives.

Common data pain points for Thailand's ranking

Through multiple engagement with both the public and private sectors with respect to each criteria of focus, we have observed that in many cases, poor ranking stems from poor data acquired. In addition, we have noticed several common data pain points, some of which are shared by more than one criterion. After identifying these data pain points, we leveraged international case studies, researches and analyses to devise troubleshooting strategies for these data issues. The foregoing can serve as quick-wins in improving Thailand's ranking in each criteria to the position where Thailand should be provided that the data had been accurate in the first place. The pain points, together with their corresponding strategies, are highlighted in the figure below.

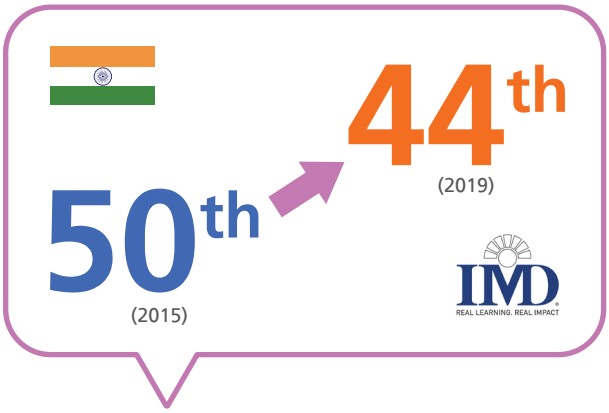
Common data pain points	Potential corresponding strategies
Use of survey due to the lack of hard statistics Surveys do not usually represent the entire population.	**Offer ways to consolidate hard stats or alternative survey** DCT may promote awareness among the private sector to respond to survey and ensure reflective results.
Data dispersed amongst multiple agencies Alignment between multiple agencies can be challenging.	**Connect various agencies; DCT can become the coordinator** DCT can contact various agencies to get more complete data – mediating data alignment.
No alignment between local and international data providers Differing figures for the same data observed.	**Arrange annual meetings to align on the statistics** DCT can arrange annual meetings to facilitate the alignment.
Lack of participation of the private sector in surveys Private sectors are not obliged to cooperate.	**Leverage the member company network as survey respondents** DCT may distribute surveys on behalf of the public agencies.
Unreliable international data source Certain international source may lack presence in Thailand.	**Contact IMD to explore possibilities of changing data sources** Some exceptions were made for a number of countries.
Incomplete data resulting in poor ranking Lack of historical data or provincial level statistics.	**Consider forwarding the information to IMD only once data compilation is complete** Incorrect information will not reflect the actual progress of Thailand's improvement and may misdirect any future improvement plan.

4. INTERNATIONAL CASE STUDIES ON DIGITAL TRANSFORMATION

International Case Study: Digital India

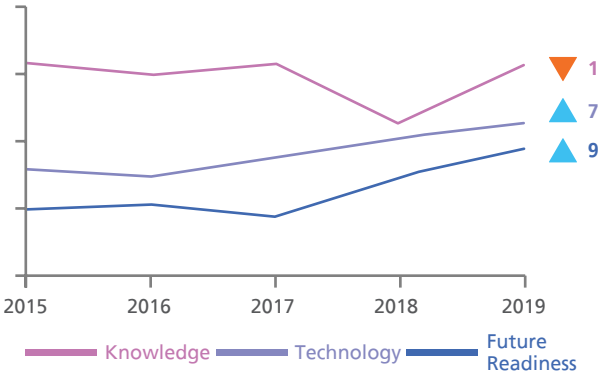
India's performance on the IMD Digital Competitiveness Ranking

Despite the fall in Knowledge ranking, improvement in Technology (49th) and Future Readiness (46th) boosted India's IMD overall Digital Competitiveness Ranking by six positions. India's top improved criteria are: Graduates in Sciences, R&D Productivity by Publication, Investment in Telecommunications, and E-participation. Graduates in Sciences (Knowledge) ranked 4th in 2019. R&D productivity by publication (Knowledge) ranked 2nd in 2019. Investment in Telecommunications (Technology) improved from rank 42nd to 1st (2017-2018). E-Participation (Future Readiness) improved by eight positions from rank 23rd to 15th in 2018-2019.

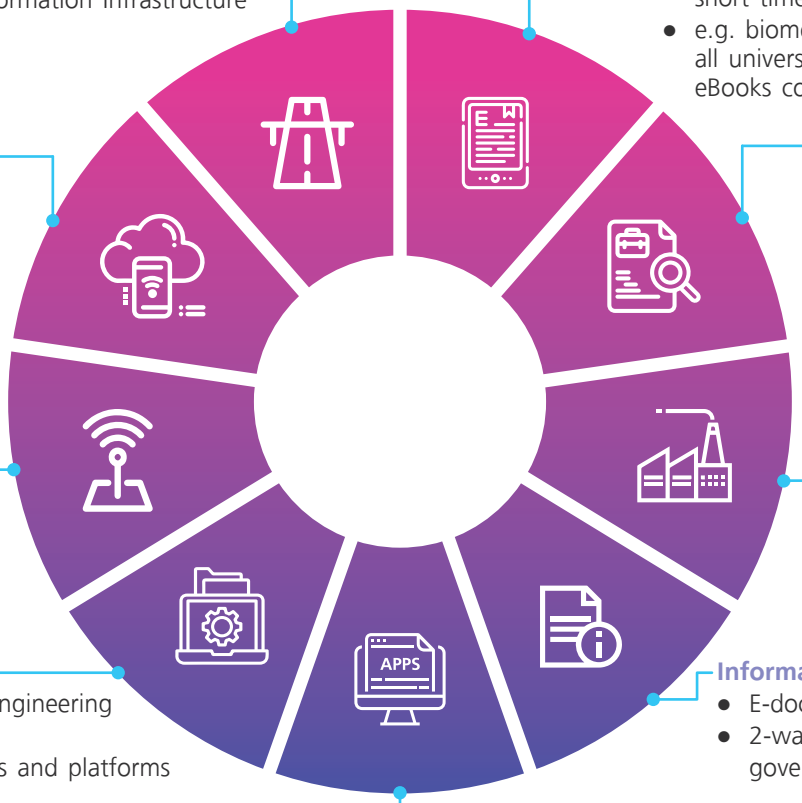


Country	2019	△ from 2015
China	22	▲ 11
Korea	10	▲ 8
India	44	▲ 6
Thailand	40	▲ 2
Singapore	2	▼ 1
UK	15	▼ 3
France	24	▼ 4
Malaysia	26	▼ 5

Figure 12: India's Digital Competitiveness Ranking over the past five years



Nine key pillars of the Digital India initiative



Broadband highways
- Broadband for all rural areas
- National Information Infrastructure (NII)

Early Harvest Program
- Projects to be implemented within short timeframe
- e.g. biometric attendance, wi-fi in all universities and public places, eBooks conversion

Universal access to Mobile Connectivity
- Increases network penetration and coverage of gaps

IT for jobs
- IT training in smaller towns and villages for IT sector jobs
- Setting up office to facilitate ICT enabled growth

Public Internet Access Program
- Common Services Centres (CSCs)
- Post Offices as multi-service centres

Electronic Manufacturing
- NET ZERO Imports by 2020
  - Taxation Incentive, big ticket items, R&D in electronics

E-Governance
- Business process re-engineering
- Electronic databases
- Integration of services and platforms

Information for All
- E-documents
- 2-way communication between government and citizens

e-Krati: Electronic delivery of services
- E-education; E-healthcare; technology for planning, security, farmers, financial inclusion, justice and security

Overview of Digital India
Digital India's vision is to transform India into a digitally empowered society and knowledge economy. The key areas of the initiative are digital infrastructure, governance & services, and digital empowered citizens. The Digital India initiative aiming at providing the support to the nine pillars of growth areas, as illustrated above. Some of the key initiatives under Digital India are as follows:

Integrated digital payment/transfer
The Jandhan-Aadhaar-Mobile initiative is a national biometric digital identity program linking bank accounts to digital identity. Currently, 1.2 billion Indians and 870 million bank accounts are linked. This initiative enabled the integrated digital payment and transfer, encouraging consumer digital adoption in India.

National optical fiber network
The initiative aims at providing strong, affordable, and wide-spread telecom services that will facilitate the delivery of e-governance, e-health, e-education, e-banking, and other services on a non-discriminatory basis to all Indian citizens. Affordability is created by discounting the bulk government's BharatNet bandwidth rates to the commercial telecom operators by 75%.

"MyGov" crowdsource platform
"MyGov" is a crowdsource platform for citizens to share ideas on governance for various government projects and plans and, subsequently, strengthening the e-participation.

UMANG single point of access
The UMANG or Unified Mobile Application for New-age Governance is an all-in-one mobile application that facilitates an access to all 1200+ government services in multiple Indian languages.

IT training to IT illiterate citizens
This initiative aims at making one person in every family in India digitally literate, reaching 40% of digital literacy in rural households by 2020.

In addition to the foregoing, there are many other important initiatives, i.e. National Agriculture Market (eNam), Government eMarketplace (GeM), and Digital Locker.

Selected digital-focused PPP success cases in India

Aside from the public sector, India's private sector also plays key roles in transforming India, especially through the public-private partnership projects.

Cisco Smart City
Cisco, in collaboration with the state governments, develops the Cisco Smart City as a blueprint for India's future smart communities. The Digital India initiative aims to digital transform 14 cities and connect 100 cities in five to seven years.

Digital Nerve Centre (DiNC)
Tata Consultancy Services, with support of India's Ministry of Health, provides e-healthcare service using telemedicine, improving accessibility to healthcare and reducing cost. In over 6 months, DiNC has brought more than 500,000 patients under primary healthcare transformation and reached out to more than 6 million people.

Passport Seva Project
Through the PPP model, technology is implemented to address outdated and inconvenient passport application process. This resulted in a drastic reduction in the average issuance time for Normal Passports from 60 days to now 7 days

Positive spillover from intense competition
Aside from the various PPP projects mentioned, the private sector on its own account also helped in digitalizing India. Particularly in the telecommunication sector, many vendors, aside from offering competitive price and packages, offered special promotion schemes such as providing bundled near-free smartphones and voice plans to anyone who subscribes to their internet services. This intense competition brought down the data costs by more than 95% since 2013, while consumption quadrupled.

Key learnings from India's success
Four major success factors can be extracted from India's success story as follows:

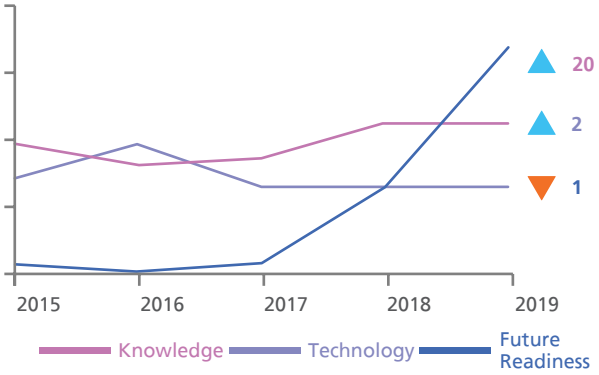
- Public-private collaboration can speed up the digital adoption and development, especially in the advanced technology area such as smart city, e-healthcare.
- Solid e-Government and its supporting services (e.g. BharatNet program, National Agriculture Market (eNam), and UMANG) are a strong foundation to facilitate digital adoption, bridge digital divide gap, and improve the citizens' quality of life.
- Digital technology can help create transparency, which also helps reduce corruption.
- Workforce upskilling and reskilling is crucial and is one of the most important keys to sustainably increasing competitiveness.

International Case Study: South Korea nationwide Digital Transformation

South Korea's performance on the IMD Digital Competitiveness Ranking

Korea's overall ranking increase mainly resulted from the future readiness improvement of 20 positions, which is largely pushed by 'world robots distribution', a new IMD criteria in 2019. Korea's top criteria are the total expenditure on R&D% (1st), world robots distribution (3rd), e-participation (1st), and e-government (3rd). In addition to its top strengths, improvement in other criteria also boosted the ranking. One example is employee training, which improved by 11 positions from 46th to 35th in 2017-2018, partially boosted by the government's heightened regulations, requiring employers to conduct training for the disabled.

Figure 13: Korea's Digital Competitiveness Ranking over the past five years



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South Korea's 20-year Digital Transformation

1987	1995	2001	2008	2013	2017-present
Digitalization	Informatization	E-Government	Integration	Creative economy	Intelligent information society

Initiatives

1987	1995	2001	2008	2013	2017-present
• Digitalization Project for Public Administration • National Basic Information System Project	• Basic Plan on Informatization Promotion • Comprehensive e-Gov't Implementation Plan	• e-Government Roadmap • Basic Plan on U-Korea	• 4th Basic Plan on National Informatization	• 5th Basic Plan on National Informatization • Government 3.0	• Consolidation of the Startup Ecosystem • Intelligent Informatization to Preemptively Address the Fourth Industrial Revolution

Legislations

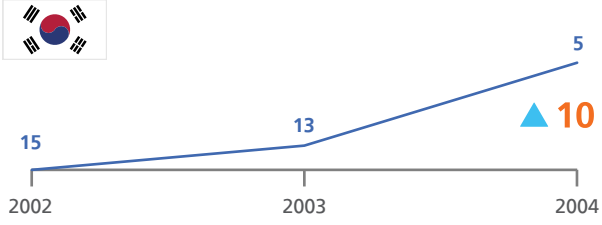
1987	1995	2001	2008	2013	2017-present
• Act on Digital Network (1985)	• e-Government Act (2001) • Act on Resolving Digital Divide (2001)	• Presidential Committee on Government Innovation (2003)	• Framework Act on National Informatization (2009)	• Act on Disclosure of Public Data (2013) • Special Act on ICT (2013)	• Framework Act on National Intelligent Information (to cover Artificial Intelligence)

South Korea's digitalization success is not an overnight miracle, but long-term development with continuous and evolving plans. Over the 20-year Digital Transformation, various digital initiatives and legislations have been implemented, ranging from building a solid foundation in the early years to promoting creative economy and advanced technology.

e-Government in South Korea

After launching the e-Government in 2001, Korea's e-Government ranking improved by 10 positions in three years after its launched. In this period, the government focused on 11 initiatives, such as e-procurement, and enacted various laws on e-government. The key success factors to Korea's e-government are clear and consistent objectives, performance-based program management and strong stakeholder engagement. With continuous efforts by the government, Korea is currently a global leader in e-government.

Figure 14: Korea's UN E-Government Readiness Index, 2018



Some of the best practices of South Korea e-government services are the e-procurement services, electronic customs clearance, comprehensive tax services, internet civil services, e-patent service, e-people: online petition and discussion portal.

South Korea's Media Industry

Noting the importance of digital content, the South Korea's government established the Korea Creative Content Agency (KOCCA) as a designated expert organization to specifically promote Korea's digital content. The agency supports gaming, animation and characters, comics, music, broadcasting, and fashion. The key initiatives of KOCCA include providing financial support and assistance, Contents Korea Lab, and organizing events and competitions. Financial support and assistance are provided for local content production, marketing promotion, overseas expansions, investment attraction, and creative talent recruitment and development.

Global Digital Media Revenue 2019

	Country	Revenue [m USD]
	USA	46,591
	China	28,533
	Japan	16,552
	UK	6,805
	Korea	4,592

Private sector's role in driving digitalization in South Korea

The Contents Korea Lab supports the entire process from mentoring to networking, funding, and marketing to combine ideas with imagination and develop the same into startups. Lastly, KOCCA hosted at least six events and competitions annually to help businesses market their products at home and abroad, as well as attract investment

Case study: IP protection framework for South Korea by Lazada

Lazada entered into a MoU with Korea IP Protection Agency to establish a framework that aims at protecting Korean brands and stemming the trading of illegal goods on online marketplace. This aims at facilitating the reporting and removal of product listings that breached IP rights of Korean brands. As a result, this helps establish best practices of safeguarding IP rights and engage with stakeholders, including IP rights owners, trade associations and government.

Case study: Hyundai's joint project with ITU-T in creating standards for connected cars

Hyundai will support the development of intelligent transport systems that will improve passenger experiences, road safety and reduce traffic congestion and emissions, building cohesion in ICT innovation. Its participation in ITU will also assist the company in building its "hyper-connected intelligent cars" platform, including smart remote maintenance services, autonomous driving, smart traffic flow.

Key learning from South Korea's success

Four key lessons can be derived from Korea's Digital Transformation as follows:

- Continuous and evolving plans, performance-based management with designated organization, designated funding and strong stakeholder engagement are the key to Korea's continued success;
- Promotion of digital content creation is critical; software, content, and services will be more important than hardware in the future;
- Private sector involvement in making policy/regulation can help accelerate the digitalization process, build cohesion, and promote the digital ecosystem;
- Public-private partnership can play a huge role in boosting R&D and strengthening the digital infrastructure and ecosystem (e.g. PPP startup fund).

Lazada

특허청
Korean Intellectual Property Office

HYUNDAI

ITU

Special scoop from the former Minister of Innovation & Digital Affairs of France on the key success of the French Digital Council

French digital economy is changing its course. The country has witnessed many of its companies successfully undergoing Digital Transformation within the past years. More and more companies are becoming digitally mature, resulting in improvement of the employees' well-being, as well as overall increase in the business growth which helps boost the country's economy. However, there is also another factor contributing to the improvement, i.e. the government.

French government has viewed the openness of public and government data a key factor in the successful adoption of Digital Transformations. It has since focused on implementing digital government strategies to achieve transparent democracy, modernize the government, and drive the country towards a stronger digital economy. Data.gouv.fr and SIRENE are the two prime examples that illustrate the country's effort on this front. Fast forward to the present day, France is at the forefront of open data in Europe, achieving the world's fourth ranking in the 2018 Open Data Barometer by the World Wide Web Foundation. This poses a question on how France managed to achieve such a transformation.

One of the key persons behind the success was no other than Axelle Lemaire, the former French Minister in charge of Innovation and Digital Affairs. Currently, she is a Partner at the Paris Office of the world-leading strategy consulting firm, Roland Berger. Since joining the firm back in 2018, she has also been the Global Head of Terra Numerata, a unique and open in-house platform comprising more than 90 players from the digital ecosystem, including startups, technology providers, data scientists, digital agencies and many more. Under this platform, she has successfully supported many of the firm's clients in their Digital Transformation journeys by leveraging a wide range of services from best-in-class digital partners together with deep expertise in digital and growth strategies from the Roland Berger's network of international experts.

Axelle has been very active in the French political scene. She was a member of the French Parliament and served as the Minister in charge of Innovation and Digital Affairs between 2014 and 2017. One of her most successful achievements during the term was the launch of the "Digital Republic Bill" in collaboration with the French Digital Council (CNNum) as well as other independent administrative authorities. The bill aims to improve the accessibility of public data and therefore mandates the government to publish public data and documents by default, benefitting both startups and companies during their Digital Transformation journey. The bill was also well-recognized in that it was the first time a government bill was co-developed by leveraging a public consultation approach where participants' suggestions and opinions were submitted online and taken into account to amend and revise the bill. In this regard, CNNum has played a key role in supporting the draft of the bill by organizing public online consultation to select relevant digital subjects to be included in the bill. Thus, it can be said that the success of the bill depended on strong collaboration between the government and the private sector.

As CNNum has been established by the presidential decree, its works and achievements rely heavily on the collaboration with the government. In general, CNNum acts upon mandates directly given by the government on requested subjects regarding potential social and economic impact of digital technology. CNNum's role is to examine the requested subjects in detail and render independent opinions/recommendations accordingly in the form of public documents, essentially acting as the "eye of the government". These proposed recommendations are, therefore, key to obtaining the government's approval and full support for successful implementations at the later stage by the private sector. Therefore, CNNum can be viewed as the key enabler in strengthening France's digital economy.

"Successful council needs diverse capabilities from a wide range of members from all aspects of the digital world, as well as robust working team to develop publications that accurately convey members' recommendations to both the government and the general public"

Axelle Lemaire on key success factors of CNNum

6. DIGITAL COUNCIL OF THAILAND PROJECTS & PERFORMANCE

12 strategic transformations of the Digital Council of Thailand

For each of DCT's 12 strategic transformations, discussed earlier in chapter 1, flagship initiatives are assigned to be carried out by DCT during the course of five years (a strategic transformation may have more than one flagship initiative). In coming up with the flagship initiatives, multiple workshops were conducted amongst DCT members. Furthermore, DCT also engaged with other organizations, both public and private, to understand their pain points; engaged organizations include the Federation of Thai Industries, the Thai Chamber of Commerce, the Office of the National Digital Economy and Society, etc. As a result, over 30 initiatives were formulated, aimed at tackling economic and social issues which the digital technology can offer solutions. Out of all the initiatives, 18 initiatives were selected as flagship, which are to be given full support and opted as top priority. Nevertheless, it should be noted that the other initiatives are also to be implemented, but due to practicality in implementing and feasibility of making the initiatives sustainable, they may be carried out as a supplement to the flagship initiatives.

The 18 flagship initiatives are :

1. Shared digital infrastructure
2. Competition for hardware & robotics pitching
3. E-internationalization platform
4. Digital accreditation & credit
5. Improvement of English literacy
6. Government matching fund for digital businesses
7. Publication of DCT quarterly report
8. "Thai-made, Thai-use" in the digital industry
9. Promotion of available online educational resources
10. Digital tax study
11. Agricultural big data
12. Ecology award & accreditation
13. Government-endorsed DCT certification
14. Creation of sustainable startup ecosystem
15. Digital Academy
16. Excellence Center for Innovation
17. Cloud Data Center
18. Definition and Tracking of Digital Sector & Economy

Initiatives selected for the first-phase implementation

Shared digital infrastructure

Initiate alliance among ICT infrastructure companies is to advocate for shared infrastructure in the digital industry e.g. fiber optic network, and to provide consultation for the regulator to enforce shared infrastructure regulations.

This also includes the establishment of **cloud data center**, under the alliance of private councils (DCT, TCC, FTI, TBA) as a catalyst for cloud service adoption among Thai businesses, a basis for national digitalization. The aim is to provide high quality, flexible, scalable, and secure cloud infrastructure for Thai businesses, to capture knowledge and technology from global cloud providers for the development of local talent and expertise in cloud computing and analytics, and, finally, to advocate for data residency in Thailand. Sharing of digital infrastructure will bring down the national cost, increase efficiency, ultimately making any related services more affordable to the general public.

Incentives

This initiative aims for the following: digital tax study and creation of sustainable startup ecosystem.

Promotion of the **study on economic and trade impact of levying digital tax** on companies benefiting from the information of their users is aimed for in order to provide consultation to the Thai government on regulation definitions. The study will allow analyses of the economic impact of imposing taxation on digital companies, in order for the relevant government officials, namely the Revenue Department, to be well equipped to make a well-informed decision.

Advocating for changes in incentive, law, etc. will allow Thailand to create a sustainable startup ecosystem, attracting international talent and startups. Currently, Thailand, in comparison with countries like Singapore and Hong Kong, offers less attractive tax schemes, incentives, and support. To create a startup ecosystem in Thailand, many key areas need to be addressed, i.e. incentives for private companies to invest in startups, and attractiveness of the capital gain for privately-owned companies compared to that of other countries.

Digital Academy

To create a space for digital literacy education for the members and the public.

This is an area for hosting classes, seminars and trainings, as well as a public library on digital technology. The academy will host upskilling and reskilling classes for people of all ages, in order for them to remain relevant in the future job market. Classes will be hosted, either physically or online, by partners of the academy, with the ultimate goal of upskilling, reskilling and increasing digital literacy of Thais.

In addition, Digital Council also aims to **improve English literacy** of Thai citizens. Thailand's overall English literacy and proficiency is low compared to the neighboring countries. This prevents Thai talent and citizens to fully embrace digitalization as useful and up-to-date content is mainly in English.

Defining and Tracking Digital Sector & Economy

DCT aims at establishing a knowledge team that will be responsible for quantifying and tracking the size of the digital sector and Thailand’s digital economy.

In doing so, DCT is to collaborate with the relevant public entity (i.e. Ministry of Digital Economy and Society) for data and funding. The expected outcome may be annual reports, whitepaper, or articles on definition, size, and trends of Thailand's digital sector and economy.

7. DIGITAL COUNCIL OF THAILAND EVENTS

Introduction of DCT to FTI

October 15th, 2019 marked the first official meeting between The Federation of Thai Industry (FTI) and Digital Council of Thailand (DCT). The two organizations shared their vision and discussed the potential joint initiatives to drive Thailand toward being a leading digital nation. In collaboration, DCT and FTI will be working together to transform Thailand into a digital innovation hub in ASEAN through the development of data center and artificial intelligence capability.

To become a digital innovation hub, the country first needs to have a carrier-neutral data center which possess AI analytics capability. The establishment of data center will reduce the cost of data transfer and attract back big tech companies to Thailand. These tech companies will boost the advancement of talent and innovation in analytics for Thailand.

FTI highlighted three programs in which DCT and FTI can collaborate. The programs include the development of curriculum in partnership with universities, data center, and e-marketplace. On the other hand, DCT wishes to assist FTI members in digital and industry transformation. FTI, as the digital users, can share their development priority and pain points while DCT can develop digital solutions to solve the particular area.

Nevertheless, cooperation from the public and private sectors is crucial to transform Thailand. Mr. Suphachai said the government can set aside 10% of the country's reserves, equivalent to 668 billion baht, as incentives for SMEs to invest in automation, improving capacity and upskilling and reskilling the workforce. Additionally, the government should support online self-learning or university courses related to engineering, data analytics and science.

Introduction of DCT to TCC

On November 11th, Thai Chamber of Commerce (TCC) and DCT held their first official meeting. The two organizations aimed at jointly collaborating on various initiatives to enhance the competitiveness of Thai businesses and ultimately transform Thailand into the regional innovation hub.

Both organizations discussed their existing initiatives and shared their views on the potential collaboration. Among those, the highlighted ones are the development of e-learning center in each province, the development of regional cloud data center, and the advocacy of investment schemes provided by the government.

DCT believed that through collaboration with TCC's network of universities in each province, e-learning center that is catered to each local area can be developed. DCT and TCC assigned its education-related members to jointly further investigate the matter.

Both organizations agreed on the limitations of BOI in providing incentives and funding. TCC believed that BOI should give incentives to service businesses. Other limitations include BOI's inability to draw out the SME fund. In this regard, TCC invited DCT to join in its meeting with BOI.

In the future, TCC and DCT has planned to arrange workshops between the two organizations to further discuss a joint plan to enhance Thailand's competitiveness on both local and national levels.

In the short run, TCC believed that collaborations between the two organizations can be seen through the 'Thai-Te' and 'TAGTHAi' initiatives, and the advocacy of incentives schemes with BOI.

8. PUBLIC RELATIONS

During October 28th-31st, 2019 the Digital Council of Thailand (DCT) participated in the exhibition to showcase a variety of innovations by its members at "Digital Thailand Big Bang 2019: ASEAN Connectivity" event at BITEC International Trade & Exhibition Center, Bangkok. At the same event, which has been held for the third time, on October 28th Mr. Suphachai Chearavanont, the president of DCT was honored to be a keynote speaker under the subject of "Bring Digital Future to Everyone: Making Changes to Remap Thailand in the Digital World."

The talk addressed digital technologies and innovations of the present day, and their important roles in transforming Thailand. In this regard, Mr. Supachai focused on Thailand's competitiveness in the digital business and on IMD Digital Competitiveness Ranking, as a guideline for developing Thailand's digital knowledge, technology, and readiness for the future in order to meet international standards.

On October 28th, 2019, Mr. Nontawatt Saraman, a committee member of Digital Council of Thailand, was invited as a representative of the Council to join the panel discussion of "Digital Mega Trends in Thailand Context" event, held by the Telecommunications Association of Thailand under the Royal Patronage at BITEC International Trade & Exhibition Center, Bangkok. The panel discussion was on the topic of "5G National Development in Thailand - The Way Forward." Mr. Nontawatt and other honored panelists, including Ms. Wannaporn Thephassadin Na Ayutthaya, Deputy Permanent Secretary of Ministry of Digital Economy and Society, and Mr. Pisut Ngamvijitvong, Senior Equity Research Analyst at Kasikorn Securities PCL, focused on providing useful information on 5G Technology, its benefits, its testbeds in Thailand, opportunities for Thai businesses.

On November 5th, 2019, Mr. Suphachai Chearavanont gave the opening speech of "OIIO Thailand Techland 2019" event, held by ATSI association and Social Lab Company Limited, on the topic of "Thailand Techland Futurist for Thais," at Royal Paragon Hall, Bangkok. This tech exhibition aimed at creating a new phenomenon in developing technology and innovation in every industry, which is in compliance with Industry 4.0 policy. A variety of modern technologies and innovations were perfectly provided for the event attendees to experience a glimpse of the future world. Mr. Suphachai focused on the measurement of capability and readiness of the economy to adopt and explore digital technologies, with reference to the IMD Digital Competitiveness Ranking, and also on the development of Thailand's digital industry in order to enhance national standard to ensure quality and international recognition. Furthermore, the Digital Council of Thailand was introduced for its visions and missions as a private organization which is coordination among the private sector, the government sector, and civil entities for the purpose of increasing digital competitiveness, developing digital manpower, and enhancing the application of digital technologies for sustainable development and prosperity of Thailand.

On November 18th, 2019, Dr. Veera Veerakool, a vice president of DCT, was invited to be a keynote speaker for an academic conference, held by the Association of Private Higher Education Institutions of Thailand under the Patronage of Her Royal Highness Princess Mahachakri Sirindhorn (APHEIT), on the topic of "Digital Age Learning: The Changing Face of Learning," at Century Park Hotel, Bangkok.

On November 28th, 2019, Ms. Tidarat Thanapakpawin, a vice president of DCT, was honored to be a representative of the Council to join the panel discussion of "Thailand Local Government Summit 2019" event, together with representatives from Digital Government Development Agency (Public Organization), National Statistical Office Thailand, and the Ministry of Public Health at Centra by Centara Government Complex Hotel & Convention Centre Chaeng Watthana, Bangkok. Under the topic of "Setting the Right Digital Ecosystem to Support Local Government", the discussion was intended to be a forum for sharing and exchanging opinions, resulting in Thailand becoming "Green Society" and transforming "Smart Province" to "Smart Thailand."

On December 3rd, 2019, the committee of DCT convened a meeting with two other main councils of private entities and a banker association: Board of Trade of Thailand, the Federal of Thai Industries, and the Thai Bankers Association, at AIA Capital Center Building, Bangkok, to discuss the approach to develop national cloud data center in Thailand. The purposes of the meeting were to help enhance Thailand's standards in Cloud Data Center industry, developing the skill of Thai workforce in cloud data center as well as in other related industries, and to create a conducive environment for foreign investors to invest in Thailand's cloud data center industry.

On January 16th, 2020, the committee of Digital Council of Thailand convened a meeting with Board of Trade of Thailand, the Federal of Thai Industries, Tourism Council of Thailand, and the Thai Bankers Association, at Grand Mercure Bangkok Fortune Hotel. The objectives of the meeting were to discuss how law and regulations impact Cloud Providing Services and Cloud Data Center, and also to review law and regulations directly related to digital industries, i.e. Cyber Security Act B.E. 2562 and Personal Data Protection Act B.E. 2562. The meeting was to compile opinions and present them to the government in which the Digital Council of Thailand acted as a representative of the private sector.

On January 15th, 2020, Prof. Dr. Wichian Premchaiswadi, a vice president of the Digital Council of Thailand, joined "The Economic Reporters Association Forum 2020" event, as a keynote speaker at Grand Hyatt Erawan, Bangkok. The objective of this forum was to develop the cooperative environment between the private and government sectors in order to enhance the economics-related knowledge of civil society. On the topic of "Distinguished Industries of 2020 to Drive Thailand Economy", Prof. Dr. Wichian focused on the digital trend of 2020 and Thailand's potential benefits of utilizing 5G technology in industrial sectors.

On February 6th, 2020, Mr. Lak Techawanchai, a vice president of DCT, was honored to be a keynote speaker on the topic of "Career Development and Consolidation of Artisanal Fishery Community Network" at Nakorn Si Thammarat Provincial Fisheries Office, along with Mr. Songpon Ku-nok, from Thai Digital Entertainment Content Federation (TDEC). Both of the speakers aimed at how to impart the body of knowledge on marketing through appropriate digital media, modern technology, as well as setting up a business via platforms and generating income through global buyers.

CLOSING REMARKS

DCT is committed to “elevating Thailand’s digital businesses and digital industry towards a global leading digital economy as well as social and well-being development among Thai people”. In addition to the strong vision, five strategic missions have also been developed to drive the council towards the new economic and social landscape where digital technology is a key enabler of the development.

This quarter, DCT has embarked on a number of monumental events, from the establishment of and alignment with the Ministry of Digital Economy and Society, to forming alliances with the Federation of Thai Industries and the Thai Chamber of Commerce. Furthermore, the planning and brainstorming between the members of the council has bore fruit, yielding 18 flagship initiatives to be implemented as an immediate priority with more to follow. These initiatives are intended for the development of the Thai digital economy to the global standard and for the elimination of the social divide through the creative use of digital technology.

With the flagship initiatives soon to be implemented by the members of DCT, aspirations must be made and goals must be set. As for the aspiration of the country, the DCT has selected a set of criteria by various international indices, notably the IMD Digital Competitiveness Index, to serve as a guideline and reflection of the country's performance in relation to the world’s leading digital nations. With that said, it should be emphasized that rankings are for the purpose of reflection and inspiration; tangible impact capable of tackling local social and economic issues with technology still remains at the core of the council.

Going forward, DCT will continue to represent the digital sector of Thailand, supporting local entrepreneurs to grow and flourish on the increasingly competitive world stage. In addition, tackling social issues through the use of digital technology is also a top priority for the council. Through the collaboration with the public and private sectors, as well as the general public, the Digital Council of Thailand is determined to bring digital development to Thailand, advancing the country to new heights, while at the same time leaving no one in the society behind.

EDITORIAL

DCT
DIGITAL COUNCIL
OF THAILAND

ART

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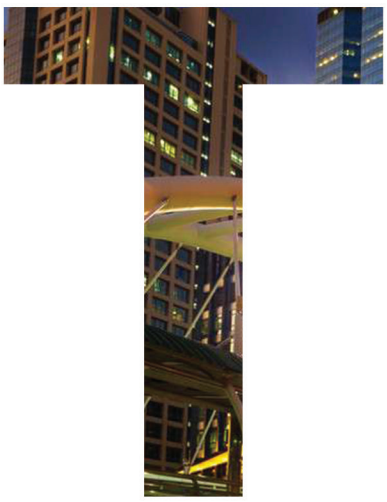

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