(Draft)
Thailand National Data Strategy
The 5-year Action Plan

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Project to Formulate Regulations for the Accommodation
of the Central Government Cloud System Services and
Draft an Operational Plan for Advancing Thailand's Data Strategy

Office of the National Digital Economy and Society Commission

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Chapter 1 Executive Summary

Today, data has emerged as an increasingly vital factor that drives the economy and enhances the quality of life of a country's citizens. Data that is systematically generated and recorded data can be utilized to boost business competitiveness and can serve as a crucial foundation for data analysis to support policy-related decision making and public service development. This, in turn, leads to a higher quality of life for the populace.

This trend has prompted numerous countries to prioritize data development. For example, the United Kingdom has consistently supported, promoted, and driven data-related initiatives, resulting in a modern and highly capable data ecosystem, with the most valuable datasets in the European Union. Similarly, Australia has made significant strides in promoting open data and data visualizations, such as dashboards and summary reports, which enable users with limited data proficiency to derive substantial benefits from the data. The Australian government estimates that these initiatives will contribute up to 2% of the country's Gross Domestic Product (GDP).[1]

In Thailand, the enactment of the Development of Digitality for Economy and Society Act, B.E. 2560 (2017), has given rise to national policies and plans in digital development for the economy and society. This legislation includes the disclosure of beneficial data and the utilization of data resources. Additionally, the enactment of the Digitalization of Public Administration and Services Act, B.E. 2562 (2019), has led to the formulation of the national Digital Government Development Plan and the standards, regulations, and criteria for digital government systems, as well as the implementation of public sector data governance.

Moreover, Thailand currently has a comprehensive legal framework, including various laws, regulations, and directives related to data, such as:

- Official Information Act, B.E. 2540 (1997)
- Electronic Transaction Act B.E. 2544 (2001)
- Digitalization of Public Administration and Services Delivery Act, B.E. 2562 (2019)
- Personal Data Protection Act B.E. 2562 (2019)

[1] Australia Government, "Australian Data Strategy," accessed December 8,2023, https://www.finance.gov.au/sites/default/files/2022-10/australian-data-strategy.

- Cybersecurity Act B.E. 2562 (2019)

Thailand has taken several initiatives, commencing with the 20-Year Thailand Digital Economy and Society Development Plan. The plan, announced in 2019, aims to ensure the continuity of Thailand's digital policies

Subsequently, in 2020, Thailand announced the Digital Government Development Plan to outline the trajectory for the nation's digital governance. Additionally, the Digital Government Development Agency issued decrees pertaining to data ethics within the public sector and established the Government Data Exchange (GDX), a platform facilitating inter-agency data linkage. Furthermore, the National Statistical Office developed the Government Data Catalog (GD Catalog), serving as a comprehensive repository of the names and descriptions of all datasets and metadata held by the government. These endeavors collectively serve to organize Thailand's data ecosystem, facilitating easy search and retrieval, and establishing clear ownership among government entities.

In 2021, the Digital Government Development Agency launched a platform to consolidate open data from various governmental entities into a single repository known as the Open Government Data of Thailand (data.go.th). This initiative aimed to streamline the accessibility of publicly disclosed data, facilitating easy search and retrieval and fostering the use of data for public benefits.

In 2023, the Digital Government Development Agency announced the establishment of core dataset (Master Data) repositories, urging relevant government agencies to consolidate the data and link it with other agencies to improve service delivery to the public.

Furthermore, the Digital Government Development Agency has established various data-related digital government standards, which covers several areas of data development, namely, data management, data sharing, metadata standards, data governance principle, and data interactions framework.

As outlined above, Thailand has made significant strides in numerous aspects regarding data management. However, at present, it still lacks an overall strategy that addresses persisting challenges. The issues that necessitate the formulation of a data strategy reside in the following areas:

(1) Data Disclosure:

(1.1) The Official Information Act, B.E. 2540 (1997) and the Digitalization of Public Administration and Services Delivery Act mandate that government agencies disclose data held in digital format to the public. However, these regulations cover only specific categories of data such as concession contracts, cabinet resolutions, and laws and regulations, thus omitting other vital data categories such as statistics.

(1.2) Despite the existence of data dissemination platforms, some government agencies disclose information only through their own platforms. This results in fragmented data distribution and exacerbates the difficulty of data search and retrieval.

(2) Guidelines and Standards for Data Exchange: While there are existing guidelines and standards for data exchange, the lack of enforcement and incentives undermine their application. Moreover, these standards mainly facilitate data exchange among government agencies and do not cover the data exchange and integration between the private and public sectors, which is essential for Thailand's data development.

(3) Data Collaboration with the Private Sector: Thailand's public and private sectors has been collaborating on some projects such as Health-link and Travel-link. However, participation remains limited, and data links are still problematic owing to the different data storage standards used by each sector.

(4) Data Security and Protection: Despite having comprehensive laws and regulations in place, data owners and data processors still lack the understanding of these laws. Thus it can be concluded that Thailand is missing the tools that would allow the general public to easily and effectively exercise their rights under the Personal Data Protection Act B.E. 2562, and for the relevant officials to enforce those rights with ease.

(5) Identification of High-Value Datasets: The Digital Government Development Agency has identified the country's high-value datasets. However, the identification is based on disclosure frequency and viewership, not value and utility such as that of the EU, leading to the omission of some important datasets.

In summary, despite some progress, Thailand's data initiatives still have significant gaps and issues. The (draft) National Data Strategy intends to unify and advance the data ecosystem, increase private sector involvement to enhance competitiveness, and promote an open

government principle regarding the roles and responsibilities of the agencies involved. It outlines the rules and regulations related to data, supported by a strategic five-year action plan for concrete implementation.

The (draft) National Data Strategy aims to "Utilize data to establish precise policies, improve the quality of public services, improve efficiency, and add value to Thailand's society and economy." This aligns with the goals of the National Strategy, related master plans, and the 13th National Economic and Social Development Plan (2023-2027). The Strategy is based on three key principles:

(1) People-Centric Development: This principle emphasizes designing systems, creating datasets, and setting data usage goals with a focus on the end user. It includes designing user-friendly systems, creating datasets that meet user needs, using data to improve quality of life, and ensuring that legal and regulatory frameworks protect each citizens' data rights.

(2) Standardized and Interoperable System Design: This principle involves designing data recording, storage, and dissemination systems using uniform standards to ensure interoperability with other systems. It also includes ensuring systems meet cybersecurity and data privacy standards.

(3) Data Governance: This principle outlines a framework for managing data and specifying the roles and responsibilities of relevant parties throughout the data lifecycle. It encompasses managing data security, ensuring compliance with data standards, and maintaining data quality.

The three core principles will serve as the pillars for driving Thailand's Data Strategy Action Plan. Embedded across all strategic dimensions of the plan, the objectives of the draft Data Strategy are as follows:

(1) Ensure government agencies have comprehensive data, leading to informed policy decisions.

(2) Enable government agencies to use data to enhance public services.

(3) Disclose valuable data to create added value and enhance competitiveness.

The goals of Thailand's draft Data Strategy include two main objectives: (1) To increase digital competitiveness and the utilization rate of government data, and (2) to achieve a high level of data user satisfaction.

Table 1: Goals and Key Performance Indicators under the Action Plan

Goals	Key Performance Indicators	Target Values (by 2029)
(1) Enhance digital competitiveness and improve utilization of government data	Thailand's Digital Competitiveness Ranking	30th ranking
(2) Increase in data user satisfaction	User satisfaction percentage	Above 80% satisfaction rate

The overall summary of the (draft) National Data Strategy Framework is shown in Figure 1.1.

Figure 1: Overview (Draft) of Thailand's Data Strategy Framework

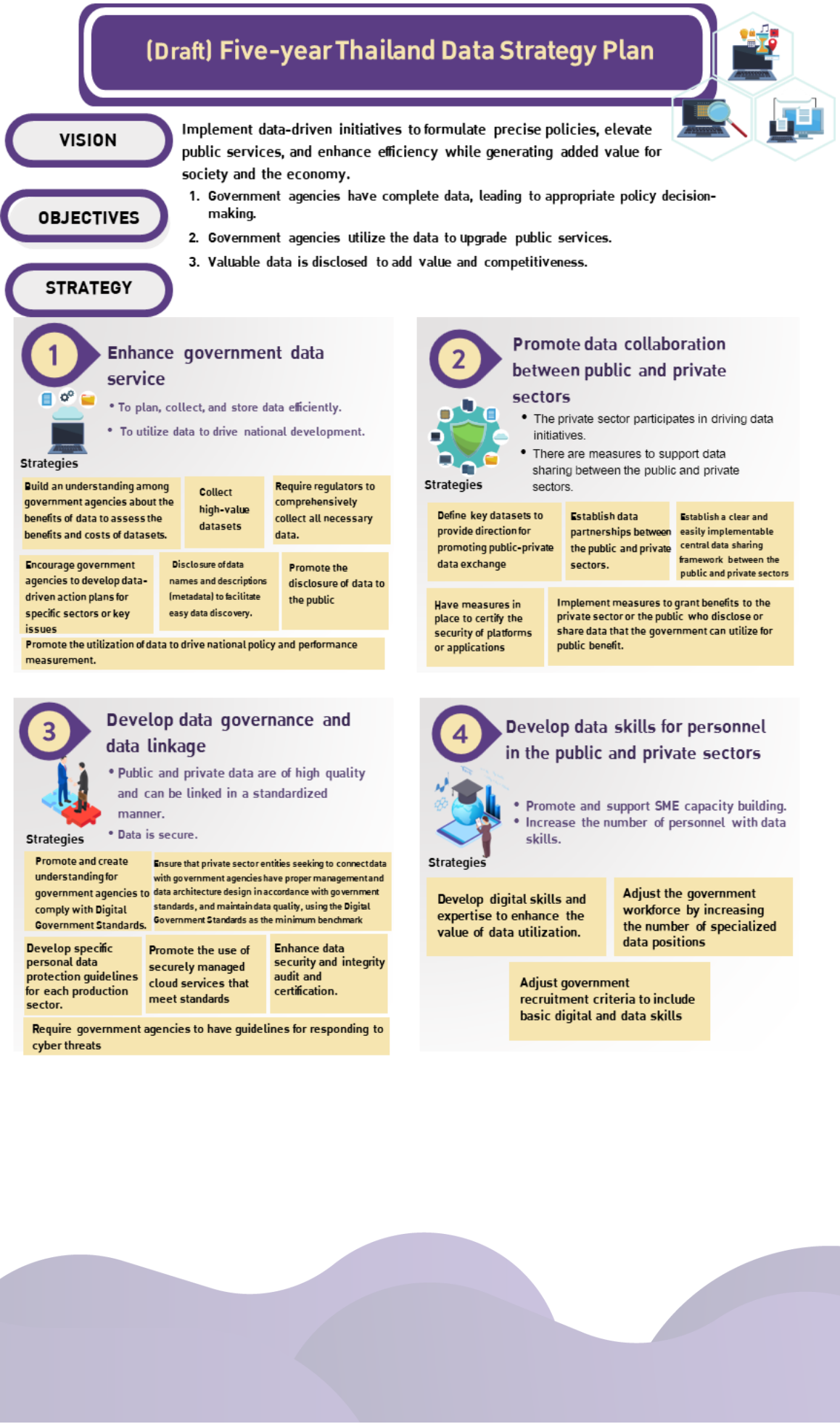


Table 2: Overview of the strategy, strategic goals, and key performance indicators of the action plan.

Strategy	Goals	Key Performance Indicators	Target for 2029
(1) Enhance Government Data Services	(1.1) Plan, collect, and store sensible data cost-effectively (1.2) Utilize data to drive national development	Percentage of government agencies (at ministry level) assessing the cost-benefits of their datasets annually	70%
		Percentage of development topics with data-driven plans out of the total number development topics	70%
		Percentage of high-value datasets (HVD) effectively utilized	70%
		Ratio of disclosed datasets to the total number of datasets held by the agency	100%
		Ratio of disclosed datasets to the total number of datasets held by the agency	100%
		Official announcement on public data disclosure	Implemented by 2026
(2) Promote Data Collaboration between Public and Private Sectors	(2.1) Private sector participation in data initiatives (2.2) Having measures to support data sharing between public and private sectors	Ratio of datasets obtained from the private sector	90%
		Ratio of private sector participation in data partnerships to the total number of target groups	90%
		Number of digital solutions/platforms/applications developed for data collection, dissemination, or utilization between public and private sectors	6 Digital solution/ Platforms/ applications
		Framework for central data sharing between public and private sectors	Completed by 2026
		System for certifying cybersecurity and personal data protection standards	Completed by 2026

Strategy	Goals	Key Performance Indicators	Target for 2029
(3) Develop Data Governance and Integration	(3.1) High-quality, standardized data integration between public and private sectors (3.2) Data is secure with good data governance	Percentage of government operating systems assessed to be compliant with digital government standards	100%
		Operational framework for evaluating data governance in private businesses aiming to link databases with the government	Completed by 2026
		Operational guidelines for personal data protection across various production sectors	Completed by 2027
		Ratio of government agencies utilizing cloud services	100%
		Annual increase the capacity of the country's auditing and accreditation units to meet data security and safety standards	20% per year
		Ratio of government agencies with cybersecurity threat response strategies	100%
(4) Develop Data Skills in Public and Private Sector Personnel	(1) Enhance digital skills and expertise to maximize data utilization (2) Increase the number of data-skilled personnel	Percentage of SMEs with digital skills for data utilization	30% by 2029
		Annual increase in the proportion of public sector personnel with digital and data management knowledge and skills	5% per year (starting in 2028)

Additionally, recommendations have been developed for applying the strategies derived from various sectors such as industry, agriculture, public health, transportation, finance and banking, tourism, and other economic and social sectors. These are collected and aggregated from studies, analyses, and in-depth interviews with relevant agencies, resulting in a national draft data strategy that is both responsive to the nation's needs and flexible enough to be applicable to different agency contexts, maximizing overall benefits.

Chapter 2 Framework for Developing Thailand's Data Strategy

Thailand has been actively pursuing digital transformation and digital government initiatives since 2018 with the adoption of policies and national plans aimed at advancing the country's digital economy and society. Plans have been drawn up for the period between 2019 to 2037. This is to ensure the continuity of these digital policies that would lay a crucial foundation for developing Thailand into a country advanced by digital technology.

By 2020, significant progress has been made, including the launch of the Digital Government Development Plan to improve online government services for the public. This digitalization effort has led to various government agencies accumulating more data from the public and from the private sector.

As it turned out, different government agencies began to accumulate diverse datasets for their specific objectives. For instance, agencies such as the Office of Industrial Economics under the Ministry of Industry have started utilizing various platforms to gather data from the public. This increased data production in the public sector prompted the Digital Government Development Agency to release guidelines for data governance for the public sector in 2020. These guidelines serve as a framework for maintaining data quality and security, enabling government agencies to efficiently manage the growing volume of data.

Despite the framework and government agencies producing vast amounts of data, if this data is not utilized or disclosed to the public to create benefits, its potential cannot be fully realized, hence the need to develop the Government Data Catalog (GD Catalog) by the National Statistical Office. This system is akin to creating a Yellow Pages directory that consolidates the names and descriptions of various datasets produced by government agencies in one place, making it easy to search.

The creation of the GD Catalog is a collaborative effort by three key agencies: the National Statistical Office--responsible for managing government data catalogs; the Office of the Public Sector Development Commission--responsible for setting agency performance indicators to encourage data submission to the National Statistical Office; and the Digital Government Development Agency--responsible for setting mandatory standards and recommendations such as the Digital Government Standard (DGS) and the Digital Government

Development Agency Standard (DGAS), which is a best practice guideline for use within the digital agency that is also recommended for adoption by other agencies.

The Digital Government Development Agency also oversees the Government Data Exchange Platform (GDX), which was established in 2020. This platform facilitates data exchange among government agencies, preferably through end-to-end APIs, eliminating the need to send datasets back and forth. This reduces maintenance costs for unnecessary datasets and helps maintain data confidentiality. Through the GDX platform, government services become seamless, allowing agencies to connect databases without the need for data requests, serve the public more efficiently, and move closer to a complete digital government.

Following the establishment of the GD Catalog by the National Statistical Office and the GDX platform by the Digital Government Development Agency, the agency recognizes the need to maximize the value of the available data. To achieve this, datasets need to be repeatedly utilized to achieve economies of scale. Data is considered a non-rivalrous goods, meaning its consumption doesn't diminish its value or quality, allowing for multiple uses.

Additionally, datasets with high value can serve multiple purposes, often beyond their initial objectives. For example, tracking people's travel data may, at first, aim to ensure safety or enforce driving regulations. However, this data can be utilized for other purposes as well, such as for choosing the best locations for promoting government or private sector projects. This reusability of data leads to economies of scope, making such datasets cost-effective.

Despite having the GD Catalog, data collection in Thailand remains distributed and unconsolidated. Users often must download or access data through numerous government websites or ministries, causing inconvenience. To achieve economy of scale and economy of scope, data utilization must be able to provide the most benefits. To address this issue, the Government Open Data Portal was established in 2021 by the Digital Government Development Agency to enhance accessibility.

Government Open Data refers to government data that meets conditions for disclosure. The government currently holds large volumes of data, both digital and legacy (data from older recording methods). Legacy data must be imported into digital systems, requiring clear practices or guidelines on which types of data can be disclosed and what recording formats to use. In this regard, the Digital Government Development Agency has issued various practices and guidelines, both mandatory standards and best practices.

One relevant document is the Digital Government Standard's updated Data Governance Framework: Guideline (DGS 6:2566). This standard classifies data into five types: (1) Public Data, (2) Personal Data, (3) Internal Use Only Data, (4) Classified Information, and (5) National Security Information. Most of the data in the GD Catalog is public, personal, or internal use only data, each with specific access guidelines. For classified and national security information, agencies can choose whether to register them in the GD Catalog.

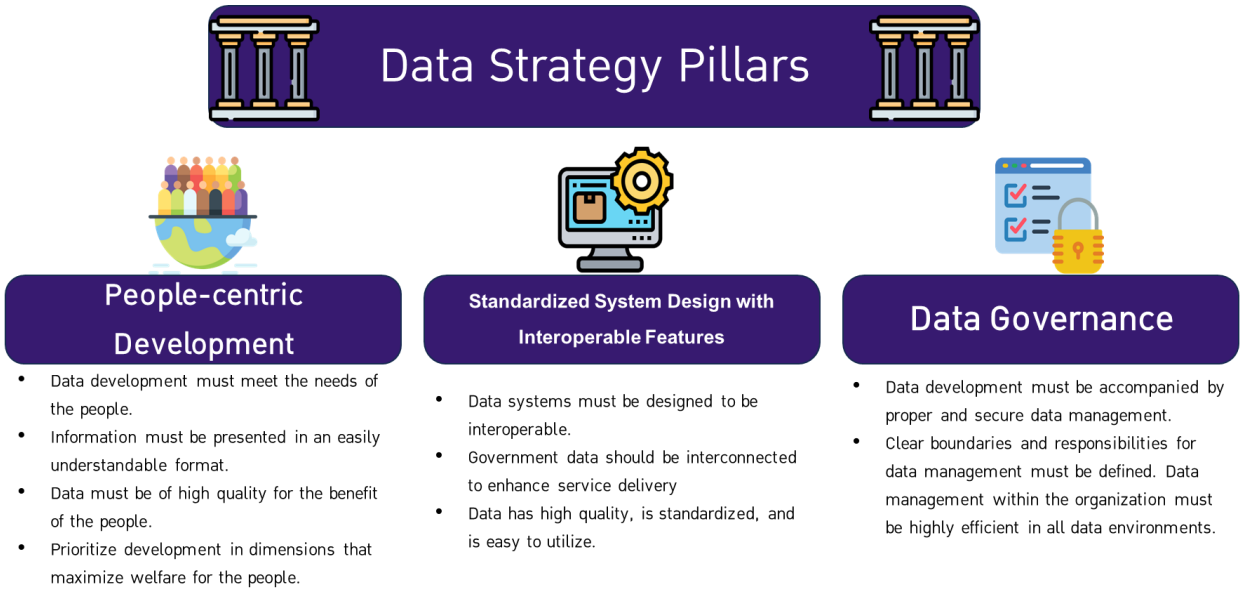
Additionally, DGS 3-1:2565 specifies the creation of metadata that meets international standards. Metadata helps to inform users about how to request access to specific datasets from the relevant agency. Good metadata provides insights into the actual data, such as coverage areas and storage formats. Maintaining metadata is less expensive than the long-term storage of actual data, reducing costs for agencies. This is especially useful for high-potential datasets with low usage, which are typically suited only for specialized users. In these cases, maintaining only the metadata is a cost-effective solution.

As previously mentioned, the data ecosystem in Thailand is quite comprehensive. However, there are still some issues within the ecosystem itself, such as the siloed nature of data collection. The Office of the Public Sector Development Commission requires every government agency to maintain its own data catalog, leading to a proliferation of department-level and ministry-level data catalogs nationwide. Not all of these are registered in the central government data catalog. Some data is stored within each individual ministry. As a result, data

linkage often relies on the use of Memoranda of Understanding (MoU), resulting in a complex data ecosystem that makes information difficult to search and access.

Given these circumstances, the advisory committee has developed a set of principles or pillars for the strategic plan to provide a framework that maximizes the benefits of the data within the ecosystem and formulates a strategy for efficiency and results. These pillars are essential for data management across all organizations and sectors. After studying both domestic and international practices, it has been concluded that data management in Thailand's context must incorporate three key pillars to effectively drive the data strategy and achieve results. The three pillars are as follows:

Figure 2: Data strategy pillars



(1.1) Human Centric Development. The development of data, databases, and related technologies must be human centric. This means that the implementation of each strategy must involve gathering feedback from the public, the private sector, and government agencies that use the data. This ensures that the datasets align as closely as possible with user needs.

Furthermore, the human-centric development approach also applies to data infrastructure. The design of the data architecture must prioritize user convenience, ensuring that datasets are practical and machine-readable. Additionally, the dissemination of datasets should be comprehensive, catering to all user groups. Examples include presenting data in

the form of dashboards for users without technical expertise and providing access to raw data files for more skilled users.

Human-centric development also includes empowering data users, data owners, and the public to easily exercise their data legal rights. This is achievable through tools designed to simplify the process for individuals to use those rights. The development of human-centered strategies needs to prioritize data utilization skills among workers in the public sector, the private sector, and the general public. This ensures that the dissemination of data provides maximum benefit.

Finally, human-centric development focuses on maximizing benefits to the public. Data in critical sectors that impact people's lives must be given priority, including: (1) Industry--this sector affects quality of life, national wealth, and employment; (2) Agriculture--this sector is related to food security and the grassroots economy of farmers; (3) Public Health--this sector is crucial for the well-being and health of the population; (4) Transportation--this sector is central to people's mobility and is core to economic development; (5) Finance and Banking--this sector is related to the money and capital markets, and is essential for financial stability and economic prosperity; (6) Tourism--this sector significantly impacts people's lifestyles and well-being.

As mentioned above, the human-centered approach is essential and should be the core principle driving strategies in all dimensions. This ensures that each step of implementation meets the needs of data users across the public, private, and governmental sectors.

(1.2) Standardized and Interoperable Systems Design. Maximizing the value and security of data usage requires clear data standards and interoperability that facilitate data access, exchange, usage, and reuse, ensuring that the data is fit-for-purpose. Long-term integration planning should encompass all sectors at the regional and international levels.

This second pillar, focusing on designing standardized and interoperable systems, has been well under way in Thailand. The Digital Government Development Agency has issued mandatory standards, including the Digital Government Standards (DGS), and best practice guidelines in the form of Digital Government Development Agency Standards (DGDS). Adhering to these ensures that public data conforms to standards, is easy to use, and provides benefits. Moreover, good data architecture designs allow seamless interconnectivity between

government agencies, thus enhancing public service delivery, meeting citizens' needs, and improving user experience.

(1.3) Data Governance. Effective data management and utilization by the public and private sectors and citizens requires a data governance framework. Adhering to data governance principles ensures that data held by each agency or governmental entity is organized and standardized for usability, thus maximizing its benefits. Following the government's data governance framework helps to define clear responsibilities and duties, promotes transparency, and fosters confidence in data usage and exchange at all levels and sectors. This leads to data integration between the public and private sectors and can extend to cross-border data integration in the future.

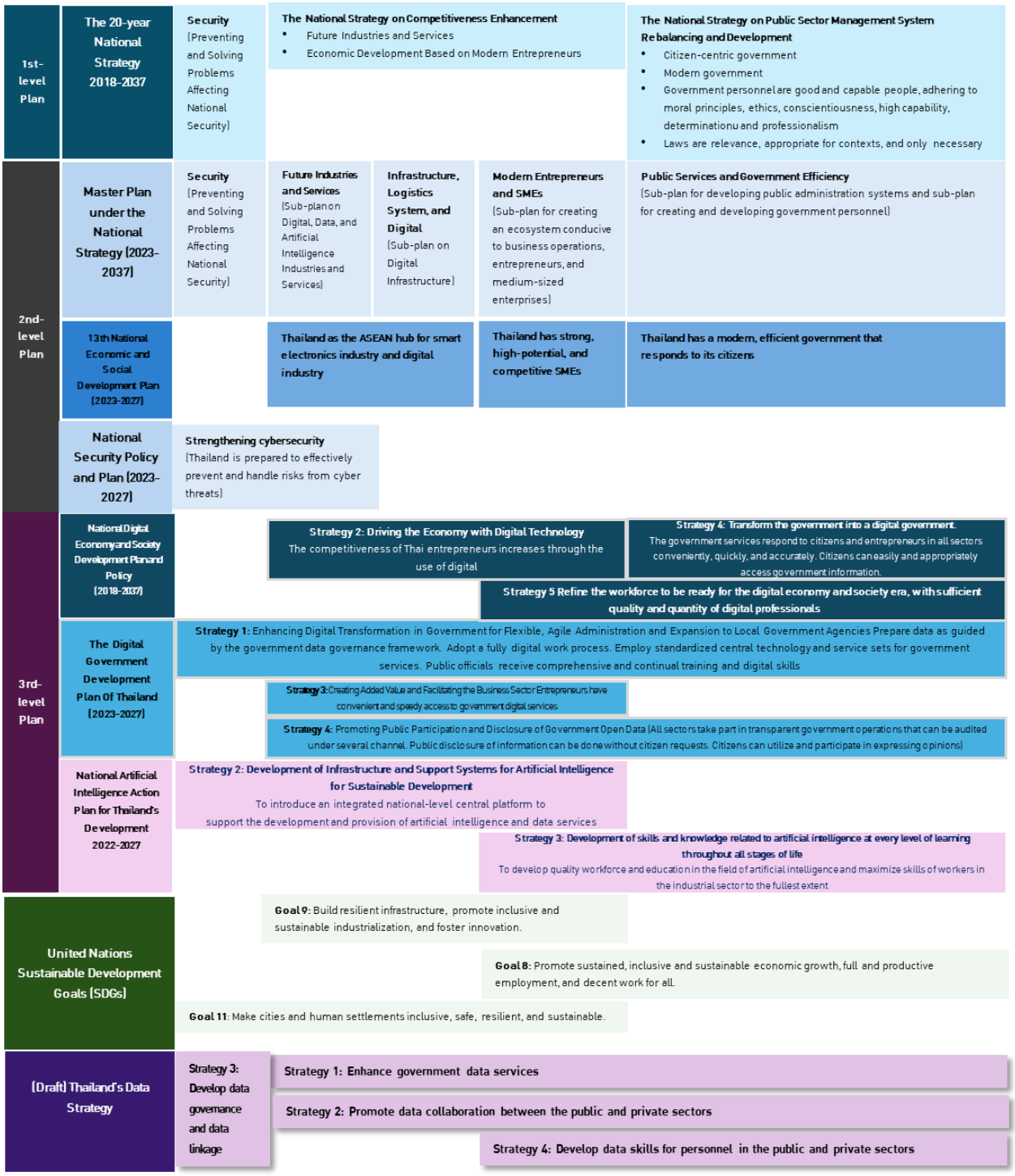
Chapter 3 Plan Alignment at Various Levels

The 5-year National Data Strategy Plan is aligned with the implementation of national plans and policies at all three levels, which comprise the first level plan--the 20-year National Strategy (2018-2037)--specifically the strategies for national security, competitiveness enhancement, and public sector management system rebalancing and development.

The second level plan has been undertaken in accordance with the national strategic master plan in five out of the twenty-three aspects. The five aspects are (1) security; (2) future industry and services; (3) infrastructure, logistics and digital systems; (4) modern entrepreneurs and SMEs; and (5) people service and government competency. The 5-year National Data Strategy Plan aligns with the 13th National Economic and Social Development Plan's three key development goals: (1) Milestone 6: Thailand as the ASEAN hub of intelligent electronics and digital industries, (2) Milestone 7: Thailand has strong, high-potential, and competitive SMEs, and (3) Milestone 13: Thailand has a modern, efficient, and citizen-centric government. Additionally, it is linked to the 2023-2027 National Security Policy regarding cybersecurity enhancement.

Furthermore, the 5-year National Data Strategy Plan is aligned with other third-level national-level plans and policies, such as the National Digital Economy and Society Development Plan (2018-2037), Thailand’s Digital Government Development Plan (2023-2027), the 5-year Operational Plan of the National Digital Economy and Society Commission, and the Thailand National AI Strategy and Action Plan (2022-2027). The 5-year National Data Strategy Plan aligns with the United Nations' Sustainable Development Goals (SDGs), specifically focusing on three key goals, namely Goal 8: Promote sustained, inclusive, and sustainable economic growth, full and productive employment and decent work for all; Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation; and Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable, as depicted in Figure 3. Details are as follows.

Figure 3: Summary diagram of alignment with the three-level plans and Sustainable Development Goals



3.1 Alignment and Correlation with the First-Level Plan (National Strategy)

The 5-year National Data Strategy Plan aligns with and supports the three national strategies: national security, competitiveness, and public sector management system rebalancing and development.

(1) The National Strategy on Security

Goal: To develop a large-scale database system capable of withstanding all types and levels of threats and disasters, while simultaneously preventing and addressing current and future security issues. Employ an integrated problem-solving mechanism that involves government agencies, the private sector, civil society, non-governmental organizations, as well as neighboring and friendly countries worldwide, based on the principles of good governance.

Strategic issue

Prevent and resolve issues that impact security

Achieving the Goals per National Strategy

Issue 2: Preventing and resolving issues that impact security involve addressing cybersecurity issues, monitoring, surveillance, prevention, and resolution of emerging problems. The 5-year National Data Strategy Plan can contribute to this by mandating relevant government agencies to develop cybersecurity response plans and elevate data security and data integrity audits.

(2) The National Strategy on Competitiveness Enhancement

Goal: To enhance Thailand's competitiveness potential through a multi-dimensional development strategy that focuses on "adapting the present" to pave the way for the future. This involves developing infrastructure across various sectors, including transportation, science and technology, and digital infrastructure, as well as creating an environment conducive to the growth of future industries and services. In addition, “creating new value in the future” should be based on empowering modern entrepreneurs, adapting business models to meet market demands, and implementing forward-looking strategies that build upon the past and adapt to the present. With government support, Thailand aims to simultaneously generate new revenue and employment opportunities, expand trade and investment opportunities on the global stage, raise income levels, improve quality of life, expand the middle class, and reduce inequality.

Strategic issues

- Future industries and services
- Economic development by modern entrepreneurs

Achieving goals under the National Strategy

Issue 2: Future industries and services involve creating future industries and services that drive Thailand towards becoming a developed country through innovation and future technologies. The 5-year National Data Strategy Plan can contribute to the development of digital, data, and artificial intelligence industries and services, particularly in the area of data through the development of a data ecosystem comprising: (1) data collection (planning, defining, and collection); (2) data storage, such as cybersecurity development; (3) data sharing, covering legal disclosure guidelines, development of a central data platform to connect government and private sector data, and (4) data utilization to leverage open data for creating added business value. This will promote and support data-driven innovation, elevate the country's competitiveness, improve business efficiency, and reduce overall production costs.

Issue 5: Economic development by modern entrepreneurs involves fostering the growth of new-generation entrepreneurs with competitive skills and unique entrepreneurial spirit. The 5-year National Data Strategy Plan can contribute to creating smart entrepreneurs, provide access to data, and transform government data services, with a focus on enhancing the digital skills of SMEs and developing comprehensive, accessible, and practical government data services to maximize the value of data utilization.

(3) The National Strategy on Public Sector Management System Rebalancing and Development

Goal: The key development goal is to transform the public sector into a "government of the people, by the people, and for the public good". This involves leveraging big data and digital technologies to deliver services that are efficient and comparable to international standards. It also emphasizes an open and interconnected approach, encouraging participation from all sectors to meet citizens' needs in a convenient, timely, and transparent manner.

Strategic issues

- A people-centric public sector effectively delivers responsive, fast, and convenient services with transparency.
- The public sector is modern.
- Public personnel exhibit morality, ethics, virtues, dedication, and professionalism.
- Laws are in accordance with existing national contexts and are enacted only to the extent of necessity.

Achieving goals under the National Strategy

Issue 1: A people-centric public sector effectively delivers responsive, fast, and convenient services with transparency, aiming for world-class and region-leading public services. The government will leverage digital technology to integrate various public services. The 5-year National Data Strategy Plan focuses on developing high-value datasets crucial for the economy, society, and welfare, particularly in public health, transportation, agriculture, natural resources, finance, tourism, industry, and commerce. These datasets will be used for policy analysis and for improving the efficiency of public service delivery.

Issue 4: The public sector is modern, adaptable to change, and highly capable. It can operate efficiently and cost-effectively, meeting international standards, adaptive to increasingly complex, dynamic operating environments, and responsive to future changes. The 5-year National Data Strategy Plan will contribute to the development and modernizing of government operations through the use of big data, both intergovernmental and public-private sector data, to inform evidence-based policymaking and management.

Issue 5: Public personnel exhibit morality, ethics, virtues, dedication, and professionalism. The government has an adequate number of qualified personnel and a system for managing and developing its workforce to meet operational needs, promote career advancement, and attract talented and ethical individuals. There is a system in place for developing the capabilities of public servants to adapt to changing development contexts. The 5-year National Data Strategy Plan will contribute to improving the mechanisms for human resources planning, recruitment, and selection by focusing on creating specialized positions in data and adjusting recruitment requirements to include basic digital and data skills, thereby increasing the number of data-skilled personnel.

Issue 7: Laws are in accordance with existing national contexts and are enacted only to the extent of necessity, serving as a tool to support development, enhance national competitiveness, and mitigate problems and obstacles leading to inequality. The 5-year National Data Strategy Plan will promote awareness and understanding of laws, particularly those related to personal data, digital government standards, and cybersecurity, and ensure their effective and equitable enforcement to drive national strategies.

3.2 Alignment and Linkage with Relevant Second-level Plans

3.2.1 Master Plan under the National Strategy

The 5-year National Data Strategy Plan is linked to the National Strategy Master Plan in five out of the twenty-three issues, as follows.

(1) Major Issue 1: Security

The objective of the master plan at the issue level: The nation's security is elevated in all dimensions and at all levels, and security issues are resolved to the extent that they no longer impact the administration and development of the country.

Security Problem Prevention and Mitigation Sub-plan

Aims to remedy current security problem such as cybersecurity.

Development Approach: Cybersecurity prevention and remediation approaches focus on developing strategies and/or tactics to address cybersecurity threats, encompassing a comprehensive understanding of the cyber threat landscape and its potential impact on national security. Key initiatives include: (1) Defining a conceptual framework, measures, standards, and management systems for overall cybersecurity prevention and remediation; (2) Establishing organizational structures, roles, responsibilities, and capabilities for cybersecurity defense and remediation; and (3) Defining clear management systems at various levels.

Sub-plan Goal: To effectively remedy current security threats (such as narcotics, cybersecurity threats, human trafficking, etc.) to a level that does not impede the country's administration and development.

Achieving the sub-plan's goal under the Mater Plan: The 5-year National Data Strategy Plan can enhance governance and data integration by promoting the use of

secure managed cloud services, mandating cybersecurity response plans for relevant government agencies, and elevating data security and integrity assessments.

(2) Major issue: Issue 4 Future industries and services

Objectives of the master plan at the issue level: (1) To increase GDP in both the industrial and service sectors, and (2) to enhance productivity in both the industrial and service sectors.

Digital Industry and Service, Data, and Artificial Intelligence Sub-plan

The aims are to foster growth in the digital technology, data, and artificial intelligence industries and services, enhance Thailand's digital economy capabilities, and prioritize research, development, and innovation in these sectors to boost competitiveness in the agricultural, industrial, and service sectors.

Development Approach: Develop and enhance the skills and expertise of users, producers, and service providers in various sectors in the areas of digital technology, data, and artificial intelligence. Additionally, raise awareness and support investments in digital technology, data, and artificial intelligence to enhance the competitiveness of businesses and create a market for digital technology, data, and artificial intelligence industries and services.

Sub-plan Goal: To foster growth in the digital technology, data, and artificial intelligence industries and services, and to enhance Thailand's digital economy development capabilities.

Achieving the sub-plan's goal under the Master Plan: The 5-year National Data Strategy Plan can promote the development of the digital technology, data, and artificial intelligence industries and services by fostering a data ecosystem, particularly in data collection and sharing for public and private sector development. This includes promoting public-private data sharing through incentives and developing data governance, integration, and skills for personnel in both the public and private sectors.

(3) Major Issue 7: Infrastructure, logistics and digital systems

The objective of the master plan at the issue level: To enhance the country's infrastructure competitiveness.

Digital Infrastructure Sub-plan

This sub-plan aims to enhance public access to the Internet through the country's digital infrastructure development, comprising information and communication technology; broadcasting; testing grounds to accommodate digital innovations; digital personnel; and the stabilization, modernization, and comprehensive coverage of relevant laws, regulations, and standards to ensure continuous service. This will support communication, connectivity, information exchange, trade and commerce, as well as public and private sector services, aligning with future trends in digital technology. The plan also aims to support the country's economic growth, elevate the national economy, and establish the country as a regional digital hub in Southeast Asia in the future.

Development Approach: Support the development of an ecosystem comprising digital infrastructure, international standard data centers, digital personnel, and suitable facilities and environments to foster the growth of a high-potential digital technology industry. This industry will serve as the future foundation for both domestic and foreign high-tech enterprises. Additionally, measures and practices will be established for service providers to protect the personal rights and data privacy of their users to accommodate the future growth of digital technology usage. Furthermore, appropriate cybersecurity surveillance and response measures are aligned with international standards, with a particular focus on protecting critical infrastructure.

Sub-plan Goal: To increase public access to the Internet.

Achieving the sub-plan's goals under the Master Plan: The 5-year National Data Strategy Plan can support related aspects of standardized data collection and storage for both the public and private sectors. This should be based on the minimum standards of the Digital Government. Specific guidelines for personal data in each sector should also be developed. Cloud computing should be promoted with secure management standards. Government agencies should have guidelines for addressing cyber threats to enable standardized and secure data connectivity.

(4) Major Issue 8: Modern entrepreneurs and SMEs

The objective of the Master Plan at the issue level: To increase the number of new SMEs in Thailand with increased competitiveness in the use of digital tools and technologies.

Sub-plan: Creating an ecosystem conducive to modern entrepreneurs and SMEs.

The goal is to elevate the ranking of government policies toward enterprises and entrepreneurs in terms of policy support and consistency through the development of supportive business environments; enhancement of operational efficiency; establishment of a high-quality, integrated, and up-to-date database system; and promotion of access to and utilization of this database to create opportunities for the business sector. Additionally, support shall be given to the creation and development of shared platforms and priority given to the improvement of government support to improve services and facilitate trade and business operations through the use of technology.

Development Approach: Promote the integration of SMEs into a system that allows them to access and utilize databases to create business opportunities, enabling SMEs to process complex big data, including cloud-based processing, into a systematic, integrated, and continuously updated repository of information and knowledge. SMEs, community enterprises, and farmers will be able to access the information necessary to plan their businesses and foster creativity and innovation in product and service development. Furthermore, collaboration among government, private sector, academia, and international institutions will be encouraged to promote and develop entrepreneurship. Additionally, service quality and infrastructure will be enhanced by taking proactive measures to address any weaknesses and strengthen Thailand's innovation system by upgrading the country's quality-related infrastructure.

Sub-plan Goal: To improve the ranking of government policies towards enterprises and entrepreneurs in terms of policy support and relevance.

Achieving the sub-plan's goals under the Master Plan: The 5-year National Data Strategy Plan promotes businesses' ability to access and utilize databases to create opportunities for the business sector by collecting and storing high-value data and promoting data disclosure to the public. It also fosters collaboration between the public and private sectors in collecting data beneficial to national development. Additionally, the plan supports the enhancement of the capabilities of SMEs by developing digital skills and expertise to maximize the value of data utilization. Moreover, it elevates the standards of data security and privacy assurance. This is all part of developing the country's high-quality digital infrastructure.

(5) Major Issue 20: Service to the people and the public sector's efficiency

Objective of the master plan at the issue level: Government services are efficient, of high quality, and well-received by users. The government implements efficient operations through the application of innovative technologies.

Public Sector Administrative System Development Sub-plan

Modernizing a government administration system that aligns with the changes of the contemporary world is a crucial condition for transforming the country into a developed nation. Technological advancements and innovation have transformed government operations. Not only do tasks need to be completed, but their completion also needs to be swift, accurate, appropriate, and efficient, with excellent service delivery. This necessitates the utilization of innovation, technology, big data, and digital governing systems that are in line with Thailand 4.0.

Development approach: Transforming government agencies into "modern, open, and high-performing organizations" through the adoption of digital innovation and technology involves leveraging data and big data for policy development, decision-making, management, service delivery, and public sector innovation. It also requires the automation of inter-agency data sharing and workflows, both within and outside the government. This includes creating shared digital platforms to facilitate convenient and rapid data access. Standardized data linkage across government agencies will ensure data interoperability. The aim is to enable businesses, the private sector, and entrepreneurs to leverage this data to expand domestic and international trade opportunities. Specialized training will be provided to enhance the skills of government personnel to boost organizational performance.

Sub-plan Goal: The government possesses high-level capabilities comparable to international standards and demonstrates agility.

Achieving the sub-plan's goals under the Master Plan: The 5-year National Data Strategy Plan promotes the government's utilization of data for policy development, decision-making, management, service delivery, and public sector innovation development. Initially, the focus will be on developing major socio-economic issues through the creation of high-value datasets, and disclosure of data names and metadata to facilitate data search and utilization. Additionally, the Plan promotes the disclosure of information to

the public, and fosters cooperation and data sharing between the public and private sectors. It also aims to establish a clear and easily implementable framework for public-private data sharing, ensuring platform or application security measures are certified and standardized.

Public Sector Human Development Sub-Plan

The public sector needs to review, develop, and improve its current human resource management systems, mechanisms, and methods. It must redesign and enhance the management and development of public sector personnel across all dimensions to cultivate and champion public servants who are righteous, ethical, and competent, who show strong leadership qualities, are dedicated to their duties, and possess modern skills adequate to the changing world. This will ultimately lead to more efficient public service delivery for the people.

Development Approach: Instill advanced knowledge and skills in public sector personnel of all types. This includes fostering critical thinking, analytical abilities, and the adaptability to stay ahead of changing circumstances. Implement a system to enhance the competencies of public servants, including proficiency in English and a third language, digital skills, and a mindset focused on serving the public and facilitating the private sector and civil society for the benefit of national development. This will ensure readiness to adapt to evolving developmental contexts.

Sub-plan Goal: Public servants adhere to a service-oriented mindset and exhibit morality, ethics, virtues, dedication, and professionalism.

Achieving the sub-plan's goals under the Master Plan: The 5-year National Data Strategy Plan promotes the development of data-skilled public servants through adjustments to the government workforce. This includes increasing the number of specialized data-related positions and modifying the recruitment criteria for government agencies to include basic digital and data skills.

3.2.2 The Thirteenth National Economic and Social Development Plan

The direction of the 13th National Economic and Social Development Plan (2023-2027) comprises four main concepts:

(1) The philosophy of sufficiency economy

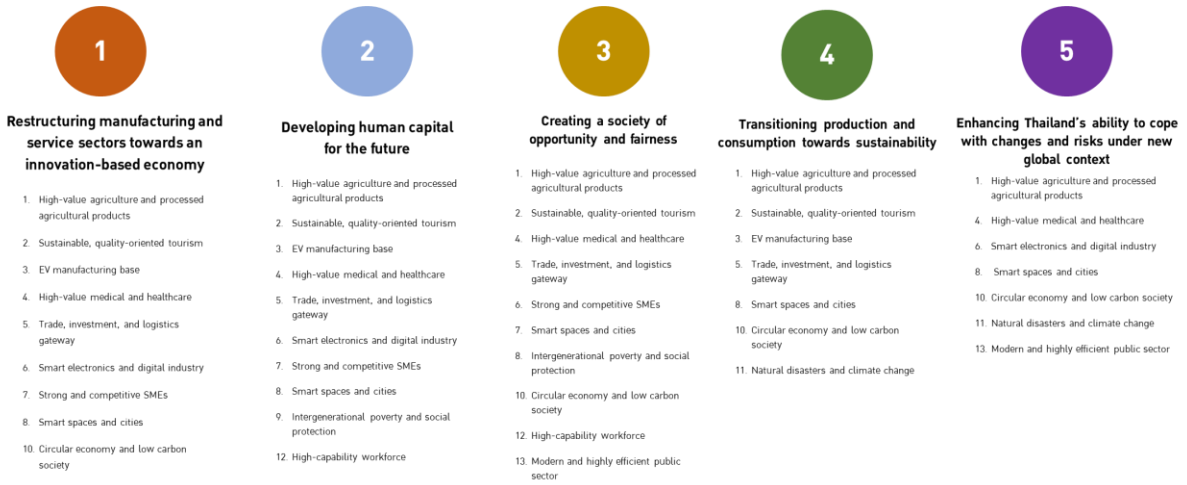
(2) Building resilience

(3) The United Nations Sustainable Development Goals

(4) The development of bio-circular-green economy

To achieve the objectives of transforming Thailand into an advanced society with a sustainable value-based economy, five development goals have been set for the 13th National Development Plan, as detailed in Figure 4.

Figure 4: Alignment between Milestones and The Thirteenth National Development Plan's Objective



Source: NESDC (September, 2022)

The 5-year National Data Strategy Plan aligns with the 13th National Development Plan and has the following main objectives:

The restructuring of manufacturing and service sectors towards an innovation-based economy aims to enhance the competitiveness of key manufacturing and service sectors. This will be achieved by promoting value-adding through innovation, technology, and creativity to address the evolving needs of modern society.

Developing human capital for the new era, with an emphasis on accelerating the preparation of a skilled workforce to meet the demands of the labor market, and facilitating the restructuring of the economy towards targeted, high-potential and high-productivity manufacturing and service sectors.

Strengthening the country's capacity to respond to changes and risks in the new global context involves focusing on building resilience against cyber threats, developing infrastructure and institutional mechanisms that facilitate digital transformation, and improving the structure and administrative systems of the public sector to respond promptly, efficiently, and transparently to changes in economic, social, and technological contexts.

Milestone 6: Thailand is ASEAN's hub for digital and smart electronics industry

Goal: To expand the domestic digital economy and strengthen the country's digital and smart electronics industries.

Strategies

Strategy 1: Driving Thai society and economy with digital technology, such as (1) development of digital services and platforms to support the transformation of public administration into a fully digital government, including full integration and interconnection of data among government agencies. (2) Promotion and development of domestic entrepreneurs to be able to apply digital technology and innovation. (3) Increasing the use of technology in the management of public sector infrastructure and services.

Strategy 3: A domestically competitive digital industry, including a digital infrastructure, that can support Thailand's ability to utilize its geographical advantages to attract digital investments, thereby developing the country into a digital economic hub in Southeast Asia. This also includes upgrading Thailand's digital services to be competitive at both regional and global levels.

Strategy 4: Developing an ecosystem to support the development of smart electronics, other industries, and digital services. This includes developing human capital to support future technological adaptations for entrepreneurs in various industries and services, including the smart electronics industry and digital industries and services of the country, as well as promoting the development of a national cybersecurity system that is aligned with international standards.

(2) Milestone 7: Thailand has a strong, high-potential and competitive SMEs

Goal: To create an environment suitable for the growth and competitiveness of SMEs, and to elevate their potential to operate effectively and adapt to new competitive challenges.

Strategies

Strategy 2: Developing a platform to connect SME databases and encourage them to join the system as well as supporting data sharing among agencies and providing access for related parties to access big data.

Strategy 4: Promoting the development of SMEs as digital entrepreneurs, enhancing youth and entrepreneurs' fundamental business knowledge, especially digital knowledge and skills.

(3) Milestone 13: Thailand has a modern, efficient, and responsive public sector

Goal: To provide high-quality, accessible government services and to create a government that is highly capable and agile.

Strategies

Strategy 3: Transforming the government into a data-driven digital government for national development. This includes digitizing all government data and creating a standardized, secure, and accessible digital database for managing the country's resources, including budgets, human resources, and other data from all government agencies. The data should be integrated, standardized, accurate, secure, ready-to-use, normalized, and pose little to no burden to key data providers. Additionally, there should be interconnectivity between government and private sector data to facilitate data analysis and processing for policy-based decision-making and for public services that align with current development contexts. Furthermore, any necessary data should be publicly available for shared utilization in national development.

Strategy 4: Creating a government administration system that promotes the reshuffling and development of personnel with the necessary skills for digital government services. Digital-related laws, regulations, and government measures are to be revised to facilitate national development.

3.2.3 National Security Policy and Plan, 2023-2027

(1) National Security Policy 10: Strengthening Cybersecurity

Goal: Thailand is prepared to prevent and respond to cyber threats, including defense against cyberattacks and cybercrime.

Strategies

Strategy 1: Prevention of, response to, and mitigation of cyber threats affecting critical information infrastructure, including encouraging information infrastructure agencies to have standards and practices for preventing, responding to, mitigating, preserving, and recovering from cyber threats that are timely and aligned with international standards.

3.3 Alignment and Connection to the 3rd Level Plan (as applicable)

3.3.1 Thailand Digital Economy and Society Development Plan (2018-2037)

(1) Strategy 2: Driving the Economy with Digital Technology

Strategic Objective: The competitiveness of Thai enterprises is enhanced through the adoption of digital technologies.

Strategies/Plans

(1) Enhance the competitiveness of the business sector to create greater economic value. Promote competitiveness through the use of digital technology to transform business processes across the entire value chain. Accelerate the adoption of digital technology for internal management and supply chain management as well as promote the development of a central database that connects and utilizes global product standards.

(2) Accelerate the creation of digital technology startups as a vital engine for the digital economy.

(2) Strategy 4 Digital Government Transformation

Strategic Goal: Efficient, responsive, and accurate public services are delivered to all citizens and businesses while ensuring easy and appropriate access to government information to foster transparency and public engagement.

Strategies/Plans

(1) Enhance the security of government electronic services to foster their public trust.

(2) Transform government operations through digital technology to enhance efficiency and promote good governance.

(3) Promote open data and open government, leading to digital Thailand.

(3) Strategy 5: Developing the workforce towards digital economy and society.

Strategic Goal: To ensure sufficient quantity and quality of digital professionals, particularly in areas with shortages or those that are critical for digital innovation. Additionally, to equip all workers with digital literacy and skills.

Strategies/Plans

(1) Develop digital skills for the workforce, both in the public and private sector across all occupations. Promote the development of working-age and retired individuals to creatively utilize digital technology in their careers or to create new types of income, leading to the creation of value, goods, and services that meet the needs of beneficiaries.

(2) Promote the development of specialized skills to support emerging technologies for digital professionals both in the public and private sectors.

3.3.2 The Digital Government Development Plan of Thailand, 2023-2027

(1) Strategy 1: Elevating the digital transformation of the public sector towards a more flexible and agile administration, and extending those transformations to local government agencies.

Objectives

(1) The government implements data management according to the government data governance framework.

(2) The government connects and shares data among different agencies through a central data exchange.

(3) The government has fully digitalized its operations, with centralized and standardized technologies to serve the public.

(4) Government personnel receive comprehensive and ongoing digital skills training.

Strategies/Plans

(1) Set the standards and guidelines for digital government development.

(2) Manage data according to data governance and data integration principles, and promote the use of big data for policymaking.

(3) Establish digital data connection and exchange among government agencies through a data exchange center.

(4) Develop a central platform and digital infrastructure for seamless operation across government agencies.

(5) Create a common set of digital services for government agencies.

(6) Streamline processes and eliminate the need to submit physical documents through process reengineering and digitalization.

(7) Review, improve, and develop laws, regulations, and measures to facilitate digital government development.

(8) Upgrade the digital skills and the culture of technology use among government personnel.

(9) Promote the cooperation between the public and private sectors in developing digital government.

(2) Strategy 3: Creating added value and facilitating the business sector

Goal: To provide businesses with quick and easy access to government digital services.

Strategies/Plans

(1) Support the development of government online end-to-end service platforms that facilitate digital transactions and cover the entire business development value chain.

(2) Review and improve processes that hinder entrepreneurs in conducting their businesses.

(3) Provide digital tools or work systems to entrepreneurs to increase their competitiveness.

(3) Strategy 4: Promote public participation and disclosure of government open data

Goal: All sectors participate in transparent government operations that are verifiable through various channels. Public information is proactively disclosed, enabling citizens to utilize it and actively participate in providing feedback.

Strategies/Plans

(1) Develop mechanisms to monitor government operations to ensure transparency.

(2) Establish channels to receive public input on the formulation of policies, laws, and regulations, and promote the integration of public opinions into real-world service development at the local level (Strong from the Bottom).

(3) Provide public disclosure of government open data in digital format.

3.3.3 Thailand National AI Strategy and Action Plan 2022-2027

(1) Strategy 2: Developing Infrastructure and Artificial Intelligence Support Systems for Sustainable Development

Goal: To establish a national-level integrated AI and data service platform for Thailand, serving as a central hub for connecting and analyzing large-scale data to disseminate information, exchange services, and support the development of new businesses within the country.

Strategies/Plans

The development of a big data integration center aims to serve as a central hub for the exchange and integration of government data. This data will be used in conjunction with various digital technologies and artificial intelligence to enhance the service capabilities of the government. The big data integration center will primarily undertake two main tasks, as follows:

- Support the linking and collection of large-scale data from multiple agencies and sectors. This includes providing consultations on big data analytics and developing systems to assist in data analysis and connectivity as well as support the use of data in policy decision-making to enhance the government's operational capacity and service delivery.

- Support and provide advice on leveraging big data with digital technologies and artificial intelligence to enhance operations in both the public and private sectors at all stages. This aims to improve service delivery potential and budgetary efficiency, ultimately leading to economic development and elevation in the holistic quality of life for citizens.

(2) Strategy 3: Lifelong Development of AI-related skills and knowledge across all levels of education

Goal: To develop personnel with high-quality AI education, and to enhance the skills of the industrial workforce.

Strategy/Plan: Encourage lifelong development of AI skills and knowledge by promoting education and enhancing specialized skills at all levels of learning (upskilling/reskilling/new skills). This requires targeted development of AI human resources and the promotion of AI literacy among the public. Furthermore, it involves developing and preparing government personnel for AI and empowering future generations to utilize AI for problem-solving.

3.4 Alignment with the United Nations SDGs

The Sustainable Development Goals (SDGs) were established by the United Nations as a universal call to action and adopted by 193 member states in 2015. It was intended as a fifteen-year global development goal and a shared blueprint for a better and more sustainable future for all.

The Sustainable Development Goals consist of 17 goals, 169 targets, and 247 indicators that play a crucial role in monitoring progress towards the targets. When targets are met, it means that the overall goals are being achieved. The 17 Sustainable Development Goals are as follows (and summarized in Figure 5.)

- Goal 1: End poverty in all its forms everywhere.
- Goal 2: End hunger, achieve food security and improved nutrition, and promote sustainable agriculture.
- Goal 3: Ensure healthy lives and promote well-being for all at all ages.
- Goal 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.
- Goal 5: Achieve gender equality and empower all women and girls.

- Goal 6: Ensure availability and sustainable management of water and sanitation for all.
- Goal 7: Ensure access to affordable, reliable, sustainable, and modern energy for all.
- Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment, and decent work for all.
- Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation.
- Goal 10: Reduce inequality within and among countries.
- Goal 11: Make cities and human settlements inclusive, safe, resilient, and sustainable.
- Goal 12: Ensure sustainable consumption and production patterns.
- Goal 13: Take urgent action to combat climate change and its impacts by regulating emissions and promoting developments in renewable energy.
- Goal 14: Conserve and sustainably use the oceans, seas, and marine resources for sustainable development.
- Goal 15: Protect, restore, and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, halt and reverse land degradation, and halt biodiversity loss.
- Goal 16: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all, and build effective, accountable, and inclusive institutions at all levels.
- Goal 17: Strengthen the means of implementation and revitalize the global partnership for sustainable development.

Figure 5: The 17 Sustainable Development Goals

Source: SDG Move (n.d.)

Furthermore, the Sustainable Development Goals (SDGs) are divided into 5 dimensions. The social dimension (people) encompasses Goals 1 to 5. The economic dimension (prosperity) covers Goals 7 to 11. The environmental dimension (planet) includes Goals 6, and 12 to 15. The peace and institution dimension (peace) covers Goal 16. And the partnership dimension encompasses Goal 17.

As a member state of the United Nations, Thailand has a responsibility to promote the implementation of the Sustainable Development Goals. The achievement of these goals should be driven by their specific targets and indicators. This is because high-level Sustainable Development Goals do not provide detailed guidance on implementation.

The 5-year National Data Strategy Plan is directly linked to SDG 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all; SDG 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation; and SDG 11: Make cities and human settlements inclusive, safe, resilient and sustainable. While the aforementioned goals primarily fall under the economic dimension, this action plan is indirectly related to all SDGs at the indicator level. This is because the plan aims to elevate the country's data operations in all dimensions. The specific linkages are as follows:

(1) Alignment at the goal level

- Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment, and decent work for all.
- Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation.
- Goal 11: Make cities and human settlements inclusive, safe, resilient, and sustainable.

(2) Alignment at the target level

- Target 8.2: Achieve higher levels of economic productivity through diversification and upgrades in technology and innovation, focusing on highly value-added and labor-intensive sectors.
- Target 8.3: Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services.
- Target 9.5: Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending.
- Target 9.b: Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, among other things, industrial diversification and value addition to commodities.
- Target 11.3: By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries.

(4) Alignment at the indicator level

The National Data Strategy Plan is linked to the implementation of all 17 Sustainable Development Goals at the indicator level. Since some of the UN's indicators are designed to track progress towards SDG targets at the global level, they may not be directly applicable for national-level monitoring. Therefore, each country needs to define specific indicators to measure progress toward targets that align with its national context. This requires expertise in data management from the agencies responsible for tracking the SDGs.

Furthermore, the issue of indicators is crucial for efforts to track SDGs localization. This requires monitoring progress at the provincial or local level. The quality and availability of data at the provincial level are highly relevant to this issue. Data search has shown that several SDG indicators cannot be tracked at the provincial level due to the inaccessibility of data or the lack of data collection. Some indicators have been collected, but the data collection does not align with the definitions provided in the United Nations' SDG metadata. For example, the data details may not match the UN definitions, or the data may be collected on dimensions that differ from the UN's specifications (e.g., data is required to be categorized by gender, age, and disability, but actual collection is only categorized by gender). Nevertheless, some data that aligns with UN definitions has been collected and made publicly available.

As mentioned above, a major problem beyond driving progress toward the targets of the Sustainable Development Goals is the development of a comprehensive dataset that aligns with the United Nations' data definitions. This dataset is essential for monitoring and evaluating a country's performance. Currently, this remains a problematic issue at the provincial, local, and national levels.

Table 3: A Summarized Alignment of Three Levels of Plan and SDGs

Plan/Policy	Security Aspect	Competitiveness Building Aspect	Rebalancing and Developing Public Sector Management System Aspect
First-Level National Policy and Plan			
20-year National Strategy	Security aspect	Competitiveness building aspect	Rebalancing and developing public management system aspect
Second-Level National Policy and Plan			
Master Plan under the National Strategy	Security	• Future industries and services • Infrastructure, logistics and digital systems; modern entrepreneurs and SMEs	Service to the people and government efficiency
The 13th National Economic and Social Development Plan		• Thailand is the center of smart electronics and digital industries in ASEAN. • Thailand has strong, high-potential, and competitive SMEs.	Thailand has a modern government, effective and attentive to the needs of its citizens.
National Policy and Plan on Security	Enhancing cyber security		
Third-Level National Policy and Plan			
Thailand Digital Economy and Society Development Plan		• Drive the economy with digital technology • Develop the workforce towards digital economy and society.	• Digital government transformation • Develop the workforce towards digital economy and society.
The Digital Government Development Plan of Thailand		• Create added value to facilitate the business sector • Promote people participation and disclose government open data	• Promote people participation and disclose government open data • Elevate the digital transformation of the public sector towards a more flexible and agile administration, and extending those transformations to local government agencies
Thailand National AI Strategy and Action Plan		• Develop AI infrastructure and support system for sustainable development • Lifelong development of AI-related skills and knowledge across all levels of education	Lifelong development of AI-related skills and knowledge across all levels of education

Plan/Policy	Security Aspect	Competitiveness Building Aspect	Rebalancing and Developing Public Sector Management System Aspect
United Nations' SDGs			
Sustainable Development Target	Target 9.b: support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, among other things, industrial diversification and value addition to commodities.	Target 8.2: Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors. Target 9.b: Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, among other things, industrial diversification and value addition to commodities. Target 11.3: By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries.	Target 8.3: Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services. Target 9.5: Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending. Target 11.3: By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries.
The 5-year National Data Strategy Plan			
The 5-year National Data Strategy Plan	Development of data governance and linkage	• Upgrading public sector data service • Promoting data cooperation between the public and private sectors • Data skill development for personnel of the public and private sectors • Development of data governance and data linkage	Data skill development for personnel of the public and private sectors

Chapter 4 Key Points of the Thailand Data Strategy Plan

This chapter will explain the key points of the (draft) Five-year National Data Strategy Plan. It will include the vision, objectives, main goals and indicators, strategies under the strategic plan, the essence of the indicator analysis, details of projects under the strategies, the plan's driving mechanism, and the mechanism for monitoring and evaluating the strategy. The key points of the plan are summarized in Figure 6.

Figure 6: Overview Summary of the (Draft) 5-year National Data Strategy Plan

4.1 Overview of the Action Plan for Driving Thailand's Data Strategy

4.1.1 Vision

Implement data-driven initiatives to formulate precise policies, elevate public services, and enhance efficiency while generating added value for society and the economy.

4.1.2 Mission

(1) Appropriately collect and store important data from both the public and private sectors, with a focus on gathering the most crucial and useful data for decision-making and operations. Make this data accessible and exchangeable between public and private entities effectively and promote continuous data exchange between agencies in both sectors.

(2) Prioritize data security standards by establishing and updating relevant standards and policies to ensure appropriate privacy and data protection. This includes utilizing modern technologies to safeguard data.

(3) Continuously develop data personnel, focusing on meeting agencies' specific needs. Provide training and skill development in data management, understanding relevant standards and policies, and effectively utilizing technologies and tools for data management.

4.1.3 Objectives

(1) Government agencies have complete and comprehensive data, leading to appropriate policy decisions.

(2) Government agencies utilize data to enhance public services.

(3) Valuable data is disclosed to foster value creation and competitiveness.

4.1.4 Key Objectives and Overall Performance Indicators

(1) Key Objectives

(1.1) Increase in digital competitiveness and utilization rate of government data

Data is a crucial factor of production in today's world. Accurate, precise, and complete data, stored in machine-readable formats, can enhance the forecasting capabilities of the government, private sector, and citizens. By utilizing this data, the government can formulate precise policies, the private sector can align business plans with actual situations, and citizens can efficiently make informed decisions in various aspects of

their lives. In other words, data can augment decision-making by increasing its accuracy. However, to leverage data as an economic driver, it must be high-quality and meet specific needs, making it usable for the private sector. For instance, a dataset on voltage drops or power outages across the country could help businesses plan investments or office locations more precisely, minimizing risk and enhancing competitiveness.

In 2023, Thailand's digital competitiveness ranking was 35th, with an average annual increase of 1 rank from 2019 to 2023 (as shown in Table 3). The approach to setting indicators for assessing digital competitiveness and government data utilization is through the target of "**Thailand's IMD World Competitiveness Ranking reaching 30th place in 2029**[2]" with the goal of increased usage of government data. This will be evaluated by how much data is applied in economic activities such as trade and investment planning. Surveys will be conducted to assess data usage by the public and private sectors. By 2029, there should be 10 datasets identified as being used in economic activities by the private sector, at a usage rate of more than 100 times per year.

Table 4: Results of Thailand's Digital Competitiveness Ranking

	2019	2020	2021	2022	2023
Overall Ranking	**40**	**39**	**38**	**40**	**35**
1. General Knowledge	43	43	42	45	41
2. Technological Knowledge	27	22	22	20	15
3. Future readiness	50	45	44	49	42

Source: IMD (2023)

(1.2) User satisfaction level of at least 80%

The level of satisfaction of data users from both government agencies, private sectors, and the public is measured. The overall satisfaction measurement is derived from surveys and evaluations based on these criteria:

- Data is categorized for convenient searches and easy access
- Completeness, accuracy, and credibility
- Database is modern and up to date
- The database can be used effectively

[2] Align with Government Agency's Indicator (by Office of the Public Sector Development Commission) for Office of the National Digital Economy and Society Commission "World Digital Competitiveness Ranking by IMD".

- Appropriate security levels or access rights are in place
- Channels for inquiries and suggestions are available

Currently, there are no indicators in place. Therefore, the agency responsible for managing the central data platform should conduct surveys on user satisfaction and feedback to improve and develop the platform and data. The target should be set as "**By 2029, the level of user satisfaction with the data must be at least 80%.**"

4.2 Strategies under the 5-year Plan are as follows:

Strategy 1: Enhance government data services

Strategy 2: Promote data collaboration between the public and private sectors

Strategy 3: Develop data governance and data linkage

Strategy 4: Develop data skills for personnel in the public and private sectors

Strategy 1: Enhance Government Data Services

This is a strategy with the key objective of enhancing the government's data services. It emphasizes that the government possesses readily available, high-quality, and up-to-date data. This is achieved through well-planned data collection and targeted data development strategies. It also involves the creation and maintenance of valuable datasets in various industrial sectors and development areas. Moreover, it promotes data linkage and exchange to facilitate comprehensive data integration across agencies. Finally, it supports the disclosure of government data, adhering to the principle of openness as the norm and confidentiality as the exception.

(1) Objectives

(1.1) To plan, collect, and store data efficiently.

(1.2) To utilize data to drive national development.

(2) Indicators and target values

Table 5: Target Values and Indicators of Strategy 1

Indicators	Target Values					Total
	2025	2026	2027	2028	2029	
1) Percentage of government agencies (at the ministry level) that have evaluated the benefit-to-cost ratio of their datasets in that year.	30	40	50	60	70	70
2) Percentage of development issues with data-driven action plans that satisfy all designated development issues. [3]	30	40	50	60	70	70

3 Align with Government Agency's Indicator (by Office of the Public Sector Development Commission) for Department of Skill Development "Success Level of the Transformation into Data Driven Organization".)

Indicators	Target Values					Total
	2025	2026	2027	2028	2029	
3) Percentage of high-value datasets (HVD) that are effectively utilized.[4]	30	40	50	60	70	70
4) Ratio of the names of disclosed datasets to the total data held by an agency[5].	60	70	80	90	100	100
5) Ratio of the number of disclosed datasets to the total data held by an agency[6].	60	70	80	90	100	100
6) Announcement by the Office of the Official Information Commission regarding the disclosure of information to the public	Effective in 2026					-

(3) Roles of Relevant Agencies

(3.1) Beneficiaries

Governmental agencies in the data ecosystem, the general public, and the private sector.

(3.2) Directly Responsible Agencies

- The Office of the National Digital Economy and Society Commission in the capacity of Secretary of the Data Strategy Committee, by virtue of the authority of the Committee under Sections 13 and 17 of the Digitality for Economy and Society Act, drives policy initiatives.

- National Statistical Office, as the agency responsible for preparing the Government Data Catalog in accordance with Section 8(5) of the Digitalization of Public Administration and Services Delivery Act.

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4 Align with Government Agency's Indicator (by Office of the Public Sector Development Commission) for National Statistical Office, Office of the National Economic and Social Development Council, Office of Permanent Secretary for Ministry of Labour about collecting the indicators related to IMD's World Competitiveness Ranking which is corresponded to the definition of High-value datasets proposed in this plan; Align with Government Agency's Indicator (by Office of the Public Sector Development Commission) Anti-Money Laundering Office "The Success of Building AML/CFT Database"; Align with Public Organization's Indicator (by Office of the Public Sector Development Commission) for Digital Government Development Agency (Publlic Organization) Benefits of Open Data for Digital Service Development or Decision-Making"

5 Align with Government Agency's Indicator (by Office of the Public Sector Development Commission) for various government agencies "Development of Data Catalog to pathway to Open Data"

6 Align with Public Organization's Indicator (by Office of the Public Sector Development Commission) for Office of the Consumer Protection Board "Percentage of Population aware of Consumers' Protection Data"

- The Big Data Institute (Public Organization) plays a role in promoting, coordinating, and providing services to government and private sector agencies to facilitate the utilization of big data, in accordance with Section 7(1) of the Royal Decree establishing the Big Data Institute (Public Organization), B.E. 2566 (2023).
- The Digital Government Development Agency (Public Organization), as the driving agency, has established the Government Data Exchange (GDX) Center in accordance with Section 15 of the Digital Government Administration and Services Act, B.E. 2562 (2019).
- The Office of the Official Information Commission serves as the authority for reviewing and determining the disclosure of information in specific sectors, in accordance with the Official Information Commission's regulations on the powers, procedures, and composition of the committees for reviewing and determining the disclosure of information, B.E. 2542 (1999), Articles 3 and 4.
- The ministry-level agencies responsible for data development across various dimensions of development.

(4) Strategies under the strategic plan and their implementation

(4.1) Strategy 1: Build an understanding among government agencies about the benefits of data to assess the benefits and costs of datasets. The Digital Government Development Agency (DGA), in collaboration with agencies under the Ministry of Digital Economy and Society, conducts training and awareness programs for various agencies on the utilization of the data they hold. This effort considers development issues that should be prioritized to foster the understanding of the benefits of data and to cultivate a positive attitude towards data. The agencies then assign the Office of the Permanent Secretary in each ministry to assess the benefit-to-cost ratio of datasets. This is done through surveys of data users via the ministry-level data account system. The results of the assessment are summarized to determine whether the data should be retained in the system or removed, based on the economic benefit-to-cost ratio of maintaining and managing the datasets[7].

(4.2) Strategy 2: Collect high-value datasets. Through a top-down approach, identify high-value datasets (HVD) with a focus on addressing social and economic challenges and aligning with international indicators such as those from the World Bank, IMD, and

[7] Details are provided in Annex 3: Examples of Benefit-to-Cost Assessments for Data Set Creation.

the UN's SDGs. This involves analyzing data, identifying the country's high-value datasets, and gathering feedback from government agencies. The process includes storing, collecting, or integrating these datasets through collaborative efforts between government agencies. Additionally, a summary report will be prepared on the datasets that have been completed in relation to the total number of identified datasets and presented to the specialized committees for strategic data initiatives.

In this phase of the plan, the focus will be on developing datasets in the production sector and across seven key development dimensions, with the following agencies serving as the primary responsible entities:

- Industrial Sector Dimension: The primary responsible agencies are the Ministry of Industry and the Ministry of Commerce.
- Agricultural Sector Dimension: The primary responsible agencies are the Ministry of Agriculture and Cooperatives and the Ministry of Natural Resources and Environment.
- Healthcare Sector Dimension: The primary responsible agency is the Ministry of Public Health.
- Finance and Banking Sector Dimension: The primary responsible agencies are the Ministry of Finance and the Bank of Thailand.
- Tourism Sector Dimension: The primary responsible agency is the Ministry of Tourism and Sports.
- Economy, Society, and Welfare Dimension: This dimension involves multiple agencies across the production sector or various development dimensions. The primary responsible agencies are the Office of the National Economic and Social Development Council, in collaboration with the Ministry of Social Development and Human Security.

(4.3) Strategy 3: Require regulators to comprehensively collect all necessary data. By monitoring and assessing the data disclosure practices of regulatory agencies, specific datasets that should be disclosed by these agencies will be identified. Regulatory agencies will then be tasked with collecting this data from private companies, state enterprises, or entities within their respective production sectors to enhance data availability.

(4.4) Strategy 4: Encourage government agencies to develop data-driven action plans for specific sectors or key issues. The Digital Government Development Agency (DGA) and the Office of the National Digital Economy and Society Commission will engage in discussions with relevant agencies on various development issues, such as human capital development and poverty alleviation. These discussions will align with national policies and plans or address development issues critical to the current economic and social landscape. The aim is for the responsible agencies to develop data-driven action plans for these specific development issues, using Thailand's data strategy as a framework for policy formulation. The responsible agencies for each development dimension are as mentioned in Strategy 2 under Strategy Plan 1.

(4.5) Strategy 5: Disclosure of data names and descriptions (metadata) to facilitate easy data discovery. Government agencies are required to submit a list of all datasets they hold to the specialized committees responsible for driving the data strategy. This includes the publication of data (in the case of public data) and the provision of data descriptions or metadata (in the case of non-public data). These actions must comply with relevant standards, such as DGS 12001-2565, which provides guidelines for the disclosure of open government data, and DGS 3-1, which outlines guidelines for creating government data descriptions. Additionally, government agencies at the department level must summarize their implementation results and submit them to the specialized committees.

(4.6) Strategy 6: Promote the disclosure of data to the public. The Office of the Official Information Commission will issue a directive to specify the types of datasets that should be disclosed, aiming to reduce the discretion of officials in deciding whether to open or withhold data. This ensures alignment with the principle of openness as the norm and confidentiality as the exception.

(4.7) Strategy 7: Promote the utilization of data to drive national policy and performance measurement. This strategy builds on Strategy 2 and Strategy 4. After identifying high-value datasets and those critical to national development, it is essential to promote their utilization through data analysis and the disclosure of information in an easily understandable format. This will benefit government agencies in policy formulation, the private sector in enhancing competitiveness or making investment decisions, and the general public. Additionally, it involves providing data related to national performance or conducting

preliminary data analysis to ensure the data reflects existing issues, thereby enabling prompt corrective action.

(5) Projects/Operations

(5.1) Project to Create Understanding of Data Benefits (2025-2026)

(5.2) Project to Develop a Framework for Evaluating the Economic Benefits to Costs of Datasets (2025-2026)

(5.3) Project to Evaluate the Economic Benefits to Costs of Datasets Published on Ministerial-level Data Catalogs (2027-2029)

(5.4) Project to Create High-Value Datasets through Inter-Agency Collaboration (2025-2029)

(5.5) Project for Developing Data Driving Plans in Each Industrial Dimension and Development Issue (2025-2029)

(5.6) Project to Survey All Datasets Held by Each Agency (2025-2029)

(5.7) Project to Develop an Announcement of the Official Information Commission on Datasets to be Disclosed (2025-2026)

(5.8) Project to Develop and Implement Thailand's Data Act B.E. .... (2023 – 2028)

(5.9) Project to Prepare Important Datasets in Easily Usable Formats (2026-2029)

Strategy 2: Promote data collaboration between public and private sectors

This strategy aims for further development by recognizing the importance of datasets held by the private sector, which are crucial for national development, planning, and policy-making. It also aims to enhance public benefits by ensuring comprehensive, complete, high-quality, and well-rounded data. The strategy focuses on creating mechanisms to support data linkage between the public and private sectors, enabling easier scalability of development efforts. These mechanisms will be built on a foundation of good governance, fostering trust between both public and private entities in data linkage and sharing.

(1) Objectives

(1.1) The private sector participates in driving data initiatives.

(1.2) There are measures to support data sharing between the public and private sectors.

(2) Indicators and target values

Table 6: Target Values and Indicators for Strategy 2

Indicators	Target values					Total
	2025	2026	2027	2028	2029	
1) Proportion of datasets received from the private sector	-	70	80	90	90	90
2) Proportion of private sector entities participating as data partners to the total target group	-	70	80	90	90	90
3) Number of digital solutions/platforms/applications developed for data collection, data dissemination, or data utilization between the public and private sectors			4	5	6	6

Indicators	Target values					Total
	2025	2026	2027	2028	2029	
4) Central data sharing framework between the public and private sectors[8]	To be completed in 2026					
5) Cybersecurity and personal data security certification system	To be completed in 2026					

(3) Roles of Relevant Agencies

The roles of the relevant agencies can be classified according to the initiatives under each strategic objective. The operations can be summarized as follows:

(3.1) Beneficiaries:

- State agencies in various specific industrial sectors and the public
- Industries that drive and utilize data for competitive advantage
- Agencies involved in international data operations for commercial and law enforcement purposes

(3.2) Directly Responsible Agencies

- The Office of the National Digital Economy and Society Commission, in the capacity of Secretariat of the Data Strategy Committee, by virtue of the authority of the Committee under Sections 13 and 17 of the Digitality for Economy and Society Act, drives policy initiatives.
- The Digital Government Development Agency (Public Organization), as the agency supporting data exchange and linkage under Sections 17 and 18 of the Digital Government Administration and Services Act B.E. 2562 (2019).
- The Big Data Institute (Public Organization) plays a role in promoting, coordinating, and providing services to government and private sector entities to facilitate the utilization of big data, in accordance with Section 7(1) of the Royal Decree establishing the Big Data Institute (Public Organization), B.E. 2566 (2023).

[8] Align with Government Agency's Indicator (by Office of the Public Sector Development Commission) for Office of Agricultural Economics "Develop Data Standards for Agricultural Goods Registered by Ministry of Agriculture and Cooperatives.".

- The Digital Council of Thailand is responsible for defining the list of datasets required for index development.
- The Office of the Personal Data Protection Committee, as the regulatory body for personal data protection under Section 43 of the Personal Data Protection Act B.E. 2562 (2019).
- The National Cyber Security Agency, as the regulatory body for cybersecurity under Section 22 of the Cybersecurity Act B.E. 2562 (2019)

(4) Strategies under the Strategic Plan

(4.1) Strategy 1: Define key datasets to provide direction for promoting public-private data exchange Relevant government agencies will identify key datasets needed from the private sector to be used in conjunction with government data for analysis and evaluation, leading to the formulation of policies and national development directions. In the initial phase, this may focus on urgent and necessary development issues for the country, along with other important topics, to be used in creating Digital solutions/platforms/applications that leverage data from both the public and private sectors.

(4.2) Strategy 2: Establish data partnerships between the public and private sectors. Seek cooperation from the private sector in data linkage and exchange by creating incentives for access to data or analysis results stored on specific topics, exclusively for private sector entities that join as partners. Alternatively, consider allowing the private sector to sell data to the government, as specified by the government.

From the European Union case study[9], there are several approaches to creating incentives, including: 1) Creating incentives through compensation to the private sector for data sharing. The level of compensation for acquiring data should be linked to the private sector's data investment or efforts to make the data usable, whether it's sharing raw data (or pre-processed data), insights, frequency of access (one-time, periodic, or continuous), potential, and risks to data providers (e.g., loss of business opportunities, competitive potential with commercial data offerings). 2) Creating incentives through non-monetary benefits (such as tax benefits, improved government services, or publicly accepted projects to enhance the company's reputation). Consideration may be given to the reduction of the level of monetary

[9] European Union, "Towards a European strategy on business-to-government data sharing for the public interest", 2020, https://www.euractiv.com/wp-content/uploads/sites/2/2020/02/B2GDataSharingExpertGroupReport-1.pdf

compensation that companies expect from their data. The expert groups considered 4 types of compensation for the government to acquire private sector data:

- Free of charge
- Marginal cost for dissemination
- Marginal cost for dissemination + Return on Investment (ROI)
- Market price. Alternative forms of non-monetary compensation, such as tax benefits for private partners may also be considered.

However, due to the differing tax systems among European Union member states, implementing such incentives might not be feasible at the EU group level. Nevertheless, some member states might choose to adopt this system to acquire personal data for public purposes. This could lead to certain preferential conditions being applied for public interest purposes, which have clear and verifiable social benefits and can justify the resources needed to enable data access. Some justifications include responding to natural disasters or humanitarian crises, in which case data would be shared free of charge. This approach is already common practice in the CSR programs of many companies.

(4.3) Strategy 3: Establish a clear and easily implementable central data sharing framework between the public and private sectors. The Office of the National Digital Economy and Society Commission, in collaboration with the Digital Council and relevant agencies, has established a framework for data sharing between the public and private sectors. This framework must include details on at least the following: the nature of the connections, guidelines for designing data architecture, appropriate technologies, standards, rules, regulations, and relevant central laws related to data sharing. Additionally, the framework must consider the incentives; the objectives of data exchange; criteria for data sharing or linkage; topics that should be specified in data exchange agreements, especially in the case of bilateral or multilateral data exchanges without intermediaries; and guidelines for assessing data service providers who are secure and meet standards.

European Union case study[10]: The data sharing framework will define the minimum level of cooperation to establish best practices for data sharing and collaboration. At the same time, it maintains a degree of flexibility for member states. This will facilitate the sharing of datasets and insights from business sources to public agencies. Additionally, this regulatory framework will not affect the applicable legal frameworks for personal and non-personal data (such as GDPR, e-Privacy Directive, and the free flow of non-personal data regulations), and intellectual property (IP) rights. As a result, the regulatory framework will have 6 pillars:

- Data sharing requirements
- Transparency obligations
- Safeguards to ensure accountability, protection of privacy, and safeguards of the interests of data providers
- National governance of B2G data sharing structures or functions
- Common Standards aimed at ensuring interoperability across borders and sectors, which will help reduce costs for partners in data sharing
- Sustainability

This regulatory framework will apply to stakeholders involved in data sharing collaborations, which include private companies (including platforms, civil society organizations operating in the European Union that collect data from individuals in the EU or have legal representatives in any EU member state) and public sector agencies. Additionally, the specific circumstances and characteristics of SMEs and start-ups should be taken into account. The obligations arising from this framework will only apply to data that has already been collected, such as for internal business purposes or for the development of current or future products and services (e.g., personalized or targeted advertising). It will not impose any new obligations on data providers to collect additional data. Furthermore, public sector agencies will not seize private sector data, as businesses can still generate revenue from the

[10] European Union, "Towards a European strategy on business-to-government data sharing for the public interest", 2020, https://www.euractiv.com/wp-content/uploads/sites/2/2020/02/B2GDataSharingExpertGroupReport-1.pdf

same data in existing or future B2 B data markets, with consideration to the unique characteristics of data as a valuable, non-rivalrous, and infrastructural commodity.

(4.4) Strategy 4: Have measures in place to certify the security of platforms or applications. The Office of the Personal Data Protection Committee and the National Cyber Security Agency will collaborate to audit and certify that data service providers, such as data marketplaces, agencies supporting data donation, and data analysis service providers have appropriate measures in place to protect personal data and maintain cybersecurity standards in compliance with the laws, rules, regulations, and applicable ordinances of the country. These agencies will be allowed to display a Trustmark designated by the Office of the Personal Data Protection Committee and the National Cyber Security Agency.

(4.5) Strategy 5: Implement measures to grant benefits to the private sector or the public who disclose or share data that the government can utilize for public benefit. This strategy aims to incentivize the private sector and the public to disclose data to the government by offering various benefits. For instance, private entities that connect their data with the government could receive budgetary support to develop systems enabling such connections. Additionally, they could be granted free access to standard assessment services. Moreover, both private entities and individuals participating in data-sharing projects between the government, the private sector, and the public could receive complimentary access to services resulting from such projects.

(5) Project/Operations

(5.1) the Project to Define Important Datasets for National Development Issues Requiring Cooperation between the Public and Private Sectors (2026-2027)

(5.2) Data Alliance Project between Government and Private Sector to Support Data Exchange and Services (2025-2029)

(5.3) Project to Develop a Framework for Data Exchange between Government and Private Sector (2025-2026)

(5.4) Project to Establish a Certification System for Cybersecurity Standards and Personal Data Protection Standards to Promote Data Linkage between Government and Private Sector (2025-2026)

(5.5) Project to Develop Digital Solutions for Data Exchange in Each Development Dimension (2027-2029)

Strategy 3: Develop data governance and data linkage

This strategy focuses on building trust in the country's data measures and standards, from establishing data governance to supporting various operations to ensure data standardization, both in terms of data quality and security. This will be achieved through various processes, including measures, policies, guidelines, best practices, rules, regulations, laws, or standards.

(1) Objectives

(1.1) Public and private data are of high quality and can be linked in a standardized manner.

(1.2) Data is secure.

(2) Target Values and Indicators

Table 7: Target Values and Indicators of Strategy 3

Indicators	Target Values					Total
	2025	2026	2027	2028	2029	
1) Percentage of government operating systems assessed as compliant with digital government standards[11]	20	40	60	80	100	100
2) Data Governance Assessment Framework Guidelines for Private Sector Entities Seeking to Connect Databases with the Government[12]	To be completed in 2026					

[11] Align with Public Organization's Indicator (by Office of the Public Sector Development Commission) for Digital Government Development Agency (Public Organization) "The number of government agencies that have undergone training and are able to effectively apply the knowledge gained."

[12] Align with Public Organization's Indicator (by Office of the Public Sector Development Commission) for Digital Government Development Agency (Public Organization) "The number of standards, requirements, guidelines, or manuals developed to promote the advancement of digital government."

Indicators	Target Values					Total
	2025	2026	2027	2028	2029	
3) Best practices for personal data protection in various production sectors	To be completed in 2027					
4) Proportion of government agencies utilizing cloud services*	60	70	80	90	100	100
5) Percentage increase in the capability of domestic audit and certification units to meet data security and integrity standards[13]	20	20	20	20	20	48.83 **
6) Proportion of government agencies with guidelines for responding to cyber threats. [14]	20	40	60	80	100	100

Note: Excludes agencies unable to use cloud services due to security reasons.

(3.1) Beneficiaries

- Government agencies in various specific industrial sectors and the general public
- Businesses in the Information technology industry

(3.2) Directly Responsible Agencies

- The Office of the National Digital Economy and Society Commission in the capacity of Secretary of the Data Strategy Committee, by virtue of the authority of the Committee under Sections 13 and 17 of the Digitality for Economy and Society Act, drives policy initiatives.
- The Digital Government Development Agency (Public Organization), as the agency supporting the linkage of digital services of government agencies under Section 10 of the Digitalization of Public Administration and Services Delivery Act B.E. 2562 (2019).
- The Office of the Personal Data Protection Committee, as the regulatory body for personal data protection under Section 43 of the Personal Data Protection Act B.E. 2562 (2019).

[13] Align with Government Agency's Indicator (by Office of the Public Sector Development Commission) for National Cyber Security Agency "The success of developing policies, plans, laws, regulations, announcements, measures, and standards that support the cybersecurity of the nation."; Align with Government Agency's Indicator (by Office of the Public Sector Development Commission) for Thai Industrial Standards Institute "The percentage of audit and certification bodies, as well as standard-setting organizations, that have been developed to enhance the capacity of the industrial sector."

[14] Align with Government Agency's Indicator (by Office of the Public Sector Development Commission) for National Cyber Security Agency "The success in disseminating, publicizing, and raising awareness about cybersecurity."

- The National Cyber Security Agency, as the regulatory body for cybersecurity under Section 22 of the Cyber Security Act B.E. 2562 (2019).
- The Thai Industrial Standards Institute, under Section 17 of the National Standardization Act B.E. 2551, as the secretariat of the National Standardization Council, is responsible for collecting data to report to the National Standardization Council.

(4) Strategies under the strategic plan and their implementation

(4.1) Strategy 1: Promote and create understanding for government agencies to comply with Digital Government Standards. The Digital Government Development Agency (DGA) will promote and raise awareness among government agencies to comply with the currently enacted Digital Government Standards.

(4.2) Strategy 2: Ensure that private sector entities seeking to connect data with government agencies have proper management and data architecture design in accordance with government standards, and maintain data quality, using the Digital Government Standards as the minimum benchmark. This strategy aims to promote data linkage and exchange between the public and private sectors. Currently, the Digital Government Development Agency (DGA) has already enacted the Digital Government Standard on Data Governance for Government (DSG 6: 2023). However, there is no framework for data governance in the private sector. Therefore, for data linkage between the public and private sectors, the DGA, as the agency that enacted the public sector governance principles, should take the lead in discussions with both public and private stakeholders to develop a government handbook for consideration of the data governance of private sector entities that wish to connect their databases. This is to ensure government agencies that the private sector is operating in accordance with governance principles that align with the public sector data governance principles.

(4.3) Strategy 3: Develop specific personal data protection guidelines for each production sector. The Office of the Personal Data Protection Committee will design, develop, and enforce specific personal data protection guidelines for each production sector. This is to provide clarity on regulatory compliance for both public and private entities in various production sectors.

(4.4) Strategy 4: Promote the use of securely managed cloud services that meet standards. The Office of the National Digital Economy and Society Commission will encourage government agencies to use cloud services certified to meet appropriate security standards.

At a minimum, these services must be certified to ISO/IEC 27017 Cloud Security Controls and ISO/IEC 27001 Information security, cybersecurity and privacy protection information security management systems. This aims to reduce the cost of hiring cybersecurity experts and enhance security by allowing experts to safeguard data within agencies through the use of cloud services.

(4.5) Strategy 5: Enhance data security and integrity audit and certification. The Office of the National Digital Economy and Society Commission will take the lead, in collaboration with the Thai Industrial Standards Institute, the Digital Council of Thailand, the Digital Government Development Agency (Public Organization), the Electronic Transactions Development Agency, the Engineering Institute of Thailand, the National Electronics and Computer Technology Center, and other relevant agencies, to establish a digital standards partnership in Thailand. This partnership aims to promote the adoption of international standards related to data quality, data security, and personal data protection into the Thai Conformity Assessment Standards (TCAS). This will facilitate domestic certification and enhance Thailand's National Quality Infrastructure (NQI) in the data dimension.

(4.6) Strategy 6: Require government agencies to have guidelines for responding to cyber threats. The National Cyber Security Agency will assess and evaluate whether government agencies have developed appropriate guidelines for responding to cyber threats in compliance with the Cyber Security Act.

(5) Projects/Operations

(5.1) Project to Promote Compliance with Digital Government Standards in Government Agencies (2025-2029)

(5.2) Project to Develop a Manual for Assessing Data Governance Principles of Private Sector Entities Seeking to Link Data with Government Agencies (2025-2027)

(5.3) Project to Promote Cloud System Usage in the Government Sector to Tighten Security (2025-2029)

(5.4) Project to Develop Personal Data Protection Guidelines for Each Production Sector (2025-2027)

(5.5) Network Alliance Project to Promote Digital Standards in Thailand (2025-2029)

(5.6) Project to Develop Guidelines for Cybersecurity Threat Response in Government Agencies (2025-2027)

Strategy 4: Develop data skills for personnel in the public and private sectors

This strategy focuses on developing the skills of the Thai workforce in preparation for a data-driven economy by upgrading the skills of SME entrepreneurs and increasing the number of government employees with appropriate data skills to effectively utilize the data available in the country.

(1) Objectives

(1.1) Promote and support SME capacity building.

(1.2) Increase the number of personnel with data skills.

(2) Target Values and Indicators

Table 8:: Target Values and Indicators of Strategy 4

Indicators	Target Values					Total
	2025	2026	2027	2028	2029	
1) Percentage of SME entrepreneurs with digital skills in data usage[15]	-	-	-	20	30	30
2) Percentage increase in government personnel with digital knowledge and data management skills	-	-	-	5	5	10.25*

Note: *Calculated based on compound growth rate, using the formula (1.00 + 0.05)^2, which represents a 5% growth rate for two consecutive years.

[15] Align with Government Agency's Indicator (by Office of the Public Sector Development Commission) for Office of Permanent Secretary for Ministry of Labour "Thailand's Competitiveness Ranking on Labor Productivity."

(3) Roles of Related Agencies

(3.1) Beneficiaries

- Government agencies in various specific industrial sectors and the general public
- Industries that drive and utilize data for competitive advantage
- Agencies involved in international data operations for commercial and law enforcement purposes

(3.2) Directly Responsible Agencies

- The Office of the National Digital Economy and Society Commission in the capacity of Secretary of the Data Strategy Committee, by virtue of the authority of the Committee under Sections 13 and 17 of the Digitality for Economy and Society Act, drives policy initiatives.
- The Digital Government Development Agency (Public Organization), as the agency supporting data exchange and linkage under Sections 17 and 18 of the Digital Government Administration and Services Act B.E. 2562 (2019).
- The Big Data Institute (Public Organization) plays a role in promoting, coordinating, and providing services to government and private sector entities to facilitate the utilization of big data, in accordance with Section 7(1) of the Royal Decree establishing the Big Data Institute (Public Organization), B.E. 2566 (2023).
- The Office of Small and Medium Enterprises Promotion (OSMEP) is the agency responsible for policy setting, overseeing operations, and formulating plans to promote small and medium enterprises.
- The Office of the Civil Service Commission (OCSC) is the agency promoting the development of civil servants and public sector personnel and developing the civil service manpower management system to be an effective mechanism for driving national strategies.
- The Ministry of Labour, as the agency with authority and responsibility for labor administration, labor protection, and skills development. The Ministry promotes employment for the people and participates in developing the workforce's digital skills to meet the current labor market conditions.

(4) Strategies under the Strategic Plan

(4.1) Strategy 1: Develop digital skills and expertise to enhance the value of data utilization. The Office of Small and Medium Enterprises Promotion (OSMEP), in collaboration with the Big Data Institute (Public Organization), will develop training courses for personnel and entrepreneurs of small and medium enterprises on basic data utilization in business operations. Additionally, OSMEP will conduct training effectiveness evaluation programs by assessing the trainees' ability to record data, read data, and interpret summarized data for business purposes.

(4.2) Strategy 2: Adjust the government workforce by increasing the number of specialized data positions. This includes increasing positions and career paths for personnel with specialized data expertise to attract more data professionals, such as Data Stewards, to work in the government sector. It also involves adjusting the staffing structure of government agencies to allow each agency to hire specialized data personnel at a proportion of 5%.

(4.3) Strategy 3: Adjust government recruitment criteria to include basic digital and data skills. Incorporate qualifications related to basic data usage capabilities, including recording data in basic statistical software such as Microsoft Excel, reading and interpreting visualized data, etc. Also, design guidelines for assessing these capabilities through comprehension tests.

(5) Projects/Operations

(5.1) Project to Develop Curricula for Enhancing Important Data Skills for Modern Small and Medium Enterprise Entrepreneurs (2025-2026)

(5.2) Training Project to Develop Digital Data Skills for Small and Medium Enterprise Entrepreneurs (2027-2028)

(5.3) Project to Support Business Development Funding for Small and Medium Enterprise Entrepreneurs Assessed to Have Data Utilization Skills, for Business Modernization (2028-2029)

(5.4) Project to Survey Digital Personnel and Skill Needs in Government Organizations to Adjust Civil Service Workforce in Line with Development Approaches (2025-2026)

(5.5) Project to Adjust Workforce to Ensure Sufficient Data Officers in the Government Sector (2027-2028)

(5.6) Project to Adjust Recruitment Conditions of Government Agencies to Include Basic Digital and Data Skills Requirements (2025-2027)

4.3 Summary of key findings from indicator data analysis

4.3.1 Details of the Indicator Data Analysis of Strategy 1

(1) Percentage of government agencies (ministerial level) that evaluate benefits against the cost of their datasets in a given year. This involves conducting a cost-benefit assessment by each ministry, evaluating the value of the data they hold. The Office of the Permanent Secretary in each ministry shall be the party responsible for assessing the value of each dataset, as the assessment may not fall within the scope of other department-level agencies in the ministry. This process must be carried out annually, at least once a year, and a report on the implementation must be submitted to the Digital Government Development Agency (DGA). The DGA will then summarize and report the results to the Data Strategy Committee.

However, this indicator has never been measured before. Previous data evaluations in Thailand only focused on qualitative aspects of data quality, as per the Digital Government Development Agency's announcement on Digital Government Standards regarding the Data Quality Assessment Criteria for Government Agencies (DGS 5: 2022). This only considered data completeness and adherence to standards, without addressing the cost-benefit dimension of data in terms of comparing the economic benefits of a dataset to the cost of collecting and storing it. This indicator is crucial as it can help reduce unnecessary expenses incurred in storing unwanted data. Therefore, it is recommended that all ministries conduct cost-benefit assessments of their datasets.

(2) Percentage of development issues with data-driven implementation plans out of the total number of defined development issues. This is calculated from the number of development issues whose data-driven plans have been prepared and implemented. The implementation may be carried out by industrial sector based on industry definitions, which correspond with the business categories defined by the Stock Exchange of Thailand, as follows:

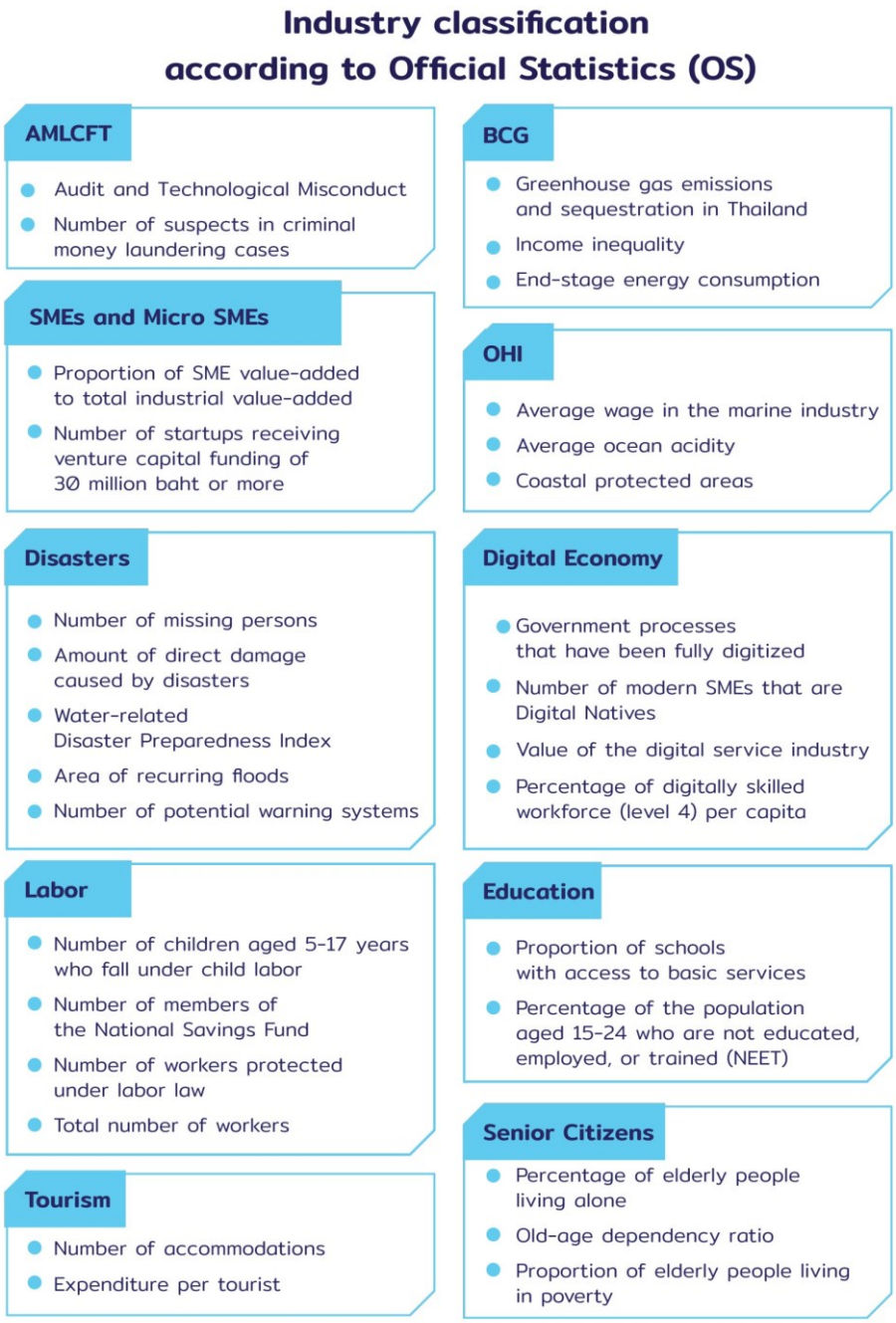
Figure 7: Industry Classification by Business Sector 7:

Note: Details of the coverage of each business type are shown in the document "Industry Group and Sector Classification Structure and Definitions" https://media.set.or.th/set/Documents/2022/Apr/2021-12-01_SET-Industry-Group-Sector-Classification-23070356.pdf

Source: The Stock Exchange of Thailand (2021)

In addition, the grouping of development issues may be carried out according to the Official Statistics (OS) classification of the National Statistical Office as follows:

Figure 8: Industry Classification According to Official Statistics (OS) Grouping



Note: There are numerous indicators or statistical datasets for each issue. More information can be found at https://www.nso.go.th/nsoweb/officialStatistics

Source: National Statistical Office (2022)

Currently, there is no agency that prepares industry-specific data strategies. There are only guidelines for digital system development and personnel skills development.

(3) Percentage of high-value datasets (HVD) put into practical use. After the process of defining datasets, collecting, compiling, and publishing high-value data, there should be an evaluation of the utilization of the datasets. This is calculated from the proportion of the number of high-value datasets (HVD) that are actually put into use in that year compared to the total number of defined high-value datasets. The number of high-value datasets (HVD) that are really put into use in that year is the number of datasets with a user satisfaction level of more than 80%, with satisfaction comprising 4 parts: the level of data impact (Impact), the level of data relevance to the defined objectives or goals (Relevance), the level of timeliness (Timeliness), and the ease of data access (Accessibility). The total number of defined high-value datasets refers to the total number of high-value datasets that the host agency in each dimension has designated for collection, including both published and unpublished datasets.

However, there is currently no such evaluation. There is only the disclosure of some high-value datasets (43 datasets) on the Data.go.th website. The Digital Government Development Agency (Public Organization) (DGA) may collaborate in requesting cooperation in assessing the satisfaction with high-value data to be used in the further analysis of data utilization.

(4) Proportion of an agency's disclosed dataset names to the total data held. All government agencies are required to report dataset names and metadata, which specify data sources and detailed descriptions of the data. This will enable data users to know the origin and format of the data, facilitating data search and utilization in creating data inventories for both the agency and the country. This supports the disclosure, linking, and exchange of government data. The storage format shall adhere to the minimum standards referenced by ISO/IEC 11179 and the Dublin Core Metadata Initiative (DCMI), along with template documents. These standards for government dataset metadata are established by the Digital Government Development Agency in collaboration with other agencies under the Ministry of Digital Economy and Society and the Public Big Data Institute.

This indicator is measured by the average success rate of government agencies in disclosing dataset names to the Data Strategy Committee, and entry into the data

on the GD Catalog. The assessment of the success of dataset name disclosure is conducted by each government agency and explained to the Data Strategy Committee. However, currently, there is no measurement according to this indicator. There is only the disclosure of dataset names and some descriptions.

(5) Proportion of the number of datasets disclosed by an agency to the total data held. This indicator follows on from indicator 4. It is measured by the average success rate of the number of datasets disclosed by each government agency on the GDCC. The assessment of the success of the number of datasets is conducted by each government agency and explained to the Data Strategy Committee. However, currently, there is no measurement according to this indicator. There is only the disclosure of some datasets.

(6) Announcement of the Office of the Official Information Commission regarding the disclosure of information to the public. This indicator is designed to measure the performance of the Office of the Official Information Commission in issuing an announcement on the disclosure of information to the public in the form of a Negative List. This aims to support operations to make the information disclosure process more convenient, enable government agencies to disclose more information, and reduce the presumptions by officials in determining which information can be disclosed. This indicator is set to be completed in 2026.

4.3.2 Details of the Indicator Data Analysis of Strategy 2

(1) Proportion of datasets received from the private sector. This indicator measures the quantity and quality of data received from the private sector. It is calculated by dividing the number of datasets received from the private sector by the total number of defined datasets. A dataset is only counted as 1 if the private sector participant in the partnership has fully delivered the dataset and it meets the specified standards. It is expected that the proportion of data received from the private sector in each issue will increase every year, and by 2029, the number of datasets should reach 90% of the total target data.

(2) Proportion of private sector entities participating as data partners to the total target group. This indicator measures the level of cooperation between public and private partners. It is calculated by dividing the number of private sector operators participating in the partnership by the total number of target private sector operators (as

defined in the partnership establishment guidelines). It is expected that the private sector will increasingly create data connections with the government each year, starting from 2026 (focusing on important and urgent issues) and from 2027 to 2029 with the implementation of data-driven plans in various areas.

(3) The number of digital solutions/platforms/applications developed for data collection, dissemination, or utilization between the government and the private sector. This indicator has never been established before. It is an indicator to measure the performance of the Digital Solution development project that is suitable for the mission of data sharing between the government and the private sector. The target value is set at 6 Digital Solutions in 2029.

(4) Central data sharing framework between the government and the private sector. The indicator in this section will only measure whether a data sharing framework has been developed between the government and the private sector in each production sector. The implementation of these guidelines requires ministerial-level agencies in each production sector to conduct consultations, gather opinions, and hold discussions with all stakeholders in the production sector. This includes relevant parties from government agencies, academia, independent organizations, and private entities. This process should be carried out in 2025 and 2026. The results of these consultations should be reported to the DGA, who will then present them to the Data Strategy Committee. The establishment of the data sharing framework between the government and the private sector should be completed by 2026.

(5) Cybersecurity and personal data security certification system. This indicator measures the progress of the Personal Data Protection Committee and the National Cyber Security Agency in establishing a cybersecurity certification system. The system should be operational and provide certification audits by 2026.

4.3.3 Details of the Indicator Data Analysis of Strategy 3

(1) Government operating systems have been assessed for compliance with digital government standards. This indicator is a new one that arose from the need for a standardized, interconnected, high-quality, and ethical data system. Thailand has already taken several steps in these areas through the Office of the Digital Government Development Agency, by issuing mandatory standards under the name "Digital Government Standards" that include the following currently effective Digital Government Standard on:

- Open Government Data Guideline (DGS 12001: 2020)
- Thailand Government Information Exchange (DGS 2-1: 2022)
- Government Data Catalog Guideline (DGS 3-1: 2022)
- Government Data Catalog Registration Guideline (DGS 3-2: 2022)
- Recommendation for Writing Data Management Policy (DGS 4-1: 2022),
- Recommendation for Writing Data Management Guideline (DGS 4-2: 2022)
- Data Quality Assessment Framework for Government Agency (DGS 5: 2022)
- Data Governance Framework Revised: Guideline (DGS 6: 2023)

Nevertheless, even though these standards have been announced, there is no available data on the proportion of government agencies that have implemented them. Therefore, the Digital Government Development Agency should take on the responsibility of monitoring the implementation of Digital Government Standards by government agencies through a comprehensive survey of compliance. This goal is also in line with the Digital Government Development Agency's own Digital Government Development Plan.

This indicator is a new one that has never been collected before in the country, therefore, it is not possible to set a target value under the principles of the Office of the Public Sector Development Commission (OPDC). However, compliance with Digital Government Standards is very important for the country's data development, as it will help ensure that the collected data is of high quality, disseminated with appropriate characteristics, well-managed, regularly monitored and evaluated for quality, and has standardized dataset descriptions to facilitate data searches for users. Therefore, the target value for 2029 is set at

100%, in other words, all government agencies must fully comply with the current Digital Government Standards.

(2) Operational Framework Handbook for Assessing Data Governance of the Private Sector Linking, Integrating, or Sharing Data with the Government. Currently, government data services have been developed. However, some high-value datasets are not yet collected and disseminated to the public. Additionally, certain indicators under important national policies, such as the 20-Year National Strategy or the National Economic and Social Development Plan, are not collected for monitoring and evaluation purposes. Some of these indicators require cooperation and data from the private sector. Therefore, collaboration between the government and the private sector is crucial for developing government data services, monitoring and evaluating the implementation of national plans, and increasing public benefits from data.

However, there is currently no data governance framework for the private sector. Although some private entities already practice corporate governance, government agencies lack the tools to assess the appropriateness, completeness, and quality of such governance. This may lead to a lack of confidence in government agencies when linking data with the private sector. Hence, it is appropriate to establish this indicator to facilitate the creation of an operational framework handbook for assessing the data governance of the private sector in cases of database linking or data sharing with the government.

(3) Personal Data Protection Practices in Various Production Sectors. Thailand has enforced the Personal Data Protection Act B.E. 2562 (2019), and the Office of the Personal Data Protection Commission (PDPC) has also prepared a general guide for compliance with the Act. However, there is currently a lack of personal data protection practices specific to various production sectors, which may have unique issues that the general guidelines cannot address. Therefore, it is appropriate to develop and publish personal data protection practices for different production sectors, especially those with highly sensitive data, such as the healthcare sector.

(4) Proportion of government agencies using cloud services. This indicator is a newly developed one, aimed at driving government agencies to increasingly adopt cloud services in their system design. Such a system not only helps save on IT budget, but also addresses a critical issue in the government sector, which is the shortage of personnel

and expertise in cybersecurity. Incentivizing these professionals to work in the public sector can be challenging. Therefore, it is advisable to solve this problem by utilizing cloud services and having specialized personnel handle cybersecurity for agencies.

However, cloud services do not have the same level of security across all providers. Therefore, this indicator will only measure cloud services certified with security standards, including at least ISO/IEC 27017 Cloud Security Controls and ISO/IEC 27001 Information security, cybersecurity, and privacy protection Information security management systems. This ensures that the cloud services are secure and aligned with cybersecurity principles.

This is a new indicator that has never been used before, so it's not possible to set a target value according to the principles of the Office of the Public Sector Development Commission. Nevertheless, encouraging government agencies to adopt cloud services is crucial for the country and aligns with the Cloud First Policy. Therefore, by 2029, all government agencies should transition to using cloud systems, except for agencies with security restrictions, such as military agencies or those holding top-secret information that must be kept in paper format.

(5) Percentage increase in the capacity of domestic audit and certification bodies to meet security and information security standards. This indicator is calculated from the increase in the number of security and information security standards that each testing and certification body has been accredited for by an accreditation body, such as ISO 27001 (Information Security Management Systems). However, currently, there are no Thai companies that perform auditing and certification. Therefore, it may be necessary to start by encouraging government agencies to act as audit and certification bodies and to be able to operate according to ISO/IEC 27001, ISO/IEC 27701, ISO 9001, and ISO 20000-1 standards by 2025.

(6) Proportion of government agencies with guidelines for responding to cyber threats (percentage). This indicator is a new one that has never been developed before, but government agencies are increasingly providing services through digital systems. The move towards a fully digital government should encourage government agencies that provide services through traditional systems to transition to digital service delivery. Therefore, the issue of cybersecurity is of paramount importance. Although Strategy 4 under Strategy Plan 3 focuses on

encouraging government agencies to use cloud services to reduce the burden of cybersecurity within the organization, government agencies should still have guidelines for dealing with cyber threats in terms of rapid recovery to normal operations. This is both to maintain security and the interests of the state, and to ensure continuity of service to the public.

To measure performance for this indicator, the National Cyber Security Agency will announce the names of agencies that have prepared a plan to deal with cyber threats within their organization. They will also report the proportion of agencies that have implemented the plan compared to the total number of agencies.

This indicator is new and has never been implemented before, so it's not possible to set a target value according to the principles of the Office of The Public Sector Development Commission. However, cybersecurity is a crucial issue, so the target value for 2029 is set at 100%, to ensure that all government agencies have at least guidelines for dealing with cyber threats.

4.3.4 Details of the Indicator Data Analysis of Strategy 4

(1) Percentage of SME entrepreneurs with digital skills in data usage. This indicator evaluates the number of modern small and medium-sized enterprise (SME) entrepreneurs who possess digital skills for utilizing data. It is calculated by taking the number of entrepreneurs who participated in training programs to develop digital skills for data usage, adding it to the number of entrepreneurs who already have such skills (this data comes from the "Survey of Required Data Skills for Business Operations Among Modern SME Entrepreneurs" conducted between 2025 and 2026), and then dividing the sum by the total number of SME entrepreneurs.

(2) Percentage increase in government personnel with digital knowledge, skills, and data management capabilities. Using data from the survey on essential basic digital skills for data service provision and utilization in the public sector (2025-2027), the number of personnel with digital knowledge and skills will serve as the baseline for evaluation. Then, in 2028, the increase in government personnel with knowledge and skills will be calculated based on adjustments in staffing.

4.4 Details of Projects Under the Strategies

4.4.1 Projects Under Strategy 1

Projects under Strategy 1 aim to elevate government data services to achieve goals in planning, collecting, and storing data cost-effectively, as well as utilizing data to drive national development. This can lead to significant outcomes, namely data availability in high-value datasets, datasets crucial for national development, and the disclosure of government agency datasets. Here are the 8 key projects:

(1) Project to Create Understanding of Data Benefits (2025-2026)

Project Goal: To create an understanding of data benefits, processing methods, dataset value assessment, and guidelines for utilizing data in policy-making and operational efficiency improvement for government officials at operational and management levels.

Project Objectives:

1. To establish understanding among executives in government agencies regarding the importance of data, guidelines to utilize data in policy-making and organizational development. The aim is to cultivate the culture of adopting data to drive organizations within government agencies.

2. To equip public officials with understanding the benefits of data, and establish positive attitudes towards data's value, so that employees realize the importance of data and data quality to drive efficiency of work.

3. To develop skills in using common data processing tools in the market for public officials. This will enable them to apply data processing to support operations.

Responsible Agencies: Digital Government Development Agency and agencies under the Ministry of Digital Economy and Society

Preliminary project budget estimates: 3 million baht

Target Group: public officials at the department level responsible for data management and data collection

Operational Methods/Activities: organize training and develop understanding among agencies through workshops organized by the Digital Government Development Agency and related agencies under the Ministry of Digital Economy and Society. The point will be on utilizing data held by respective agencies. The focus will revolve around developmental issues that should be driven, to create understanding of data benefits and foster positive attitudes towards data (data-driven mindset). This consists of 4 activities as explained below:

1) Cultivating a data-driven strategy mindset in their own organizations. This is the first activity to help participants visualize initial approaches to using data for organizational development. It starts with considering organizational issues, setting goals for data utilization, and approaches to utilizing data. Knowledge will be provided by expert speakers or representatives from the private or public sector equipped with experience in utilizing data in operations. Examples include the National Big Data Institute (Public Organization), Traffy Fondue Company, and the National Electronics and Computer Technology Center.

2) Data analysis tool usage. Trainings and workshops on data analysis programs are comprised of R, Python, Power BI, Tableau, and Xplenty. In addition, it is useful to conduct the exchange of data analysis approaches from each agency's past experiences. Insight will be shared by expert speakers from educational institutions, government agencies, or private sector organizations that use ready-made programs for data analysis.

3) Assess approaches to data utilization under the datasets of the respective agencies. The activities may be held by applying actual dataset from one agency as an example. So, this can allow participants to brainstorm, ignite ideas or approaches of data utilization, and how to qualitatively and quantitatively appraise the impact and benefits of data. Knowledge will be shared by experts at educational institutions, academic sectors, or relevant government agencies.

4) Activities to formulate data-driven strategies for key challenges in the current world setting such as PM 2.5 and the promotion of stability of agricultural products. This involves grouping of agencies relevant to each issue to brainstorm and devise approaches for data analysis that can be applicable to tackle these problems. (This process may be the starting point for the concept of preparing a data-driven plan for specific development issues in future projects.

(2) Project to Develop a Framework for Evaluating the Economic Benefits to Costs of Datasets (2025-2026)

Project Goal: Framework for evaluating the economic benefits to costs of datasets by 2026

Project Objectives:

1. Create understanding among government agencies about methods for evaluating the benefits to costs of datasets

2. Prepare a clear, easy-to-follow framework to facilitate government agencies in systematically evaluating benefits to costs, using similar frameworks and methods that can be compared

Responsible Agencies: Office of the National Digital Economy and Society Commission in collaboration with the Digital Government Development Agency and the National Big Data Institute (Public Organization)

Preliminary project budget estimates: 7 million baht

Target Group: Government agencies that need to evaluate the benefits to costs of data

Operational Methods/Activities: Office of the National Digital Economy and Society Commission (ONDE) will develop frameworks and guidelines for evaluating the benefits to costs of datasets (Cost-benefit Analysis: CBA), which includes the actions as listed below:

Office of the National Digital Economy and Society Commission will collect approaches in evaluating benefits to costs, foreign studies, guidelines, or frameworks from other countries, to use as information for developing frameworks for evaluating the benefits to costs of datasets.

Office of the National Digital Economy and Society Commission will discuss the collected information, principles, and approaches (from step 1) with experts in academia and other relevant agencies, such as the National Big Data Institute, the Digital Government Development Agency, and other agencies under the Ministry of Digital Economy and Society. The aim is to draft a framework for evaluating the benefits to costs of data, which should include at least the following key elements: steps for calculating impacts in monetary aspect,

discounting costs and benefits to identify the current values, methods for calculating net present value of each option (collecting or not collecting data), and sensitivity analysis.

3) Office of the National Digital Economy and Society Commission will present a (draft) framework for evaluating the benefits to costs of data to the Specific Committee on Data Strategy Implementation for approval of the (draft) framework before proceeding to public hearings.

Office of the National Digital Economy and Society Commission will stage public hearings on the (draft) guidelines for evaluating the benefits to costs of data with government agencies and academia to consider the appropriateness of the (draft) guidelines and make further improvements.

5) Office of the National Digital Economy and Society Commission will present the revised draft guidelines for evaluating the benefits to costs of data to the Specific Committee on Data Strategy Implementation for approval and implementation. This framework must be notified by 2026.

6) Office of the National Digital Economy and Society Commission will assess whether it is up-to-date and improve the framework and guidelines for evaluating the benefits to costs of datasets every 3 years, or as per the opinion of the Specific Committee on Data Strategy Implementation, or when significant changes in the economic system arises. This is to ensure that the framework and guidelines for evaluating the benefits to costs of datasets stay updated.

(3) Project to Evaluate the Economic Benefits to Costs of Datasets Published on Ministerial-level Data Catalogs (2027-2029)

Project Goal: Government agencies at the ministerial level understand the value of the data they hold, and the published data that has been evaluated as cost-effective, highly beneficial, and managed to meet digital government quality standards.

Project Objectives:

1. To ensure that government agencies at the ministerial level understand the cost-effectiveness of the datasets they hold and publish, based on an assessment of the economic and social benefits relative to the costs incurred in providing these datasets.

2. To maximize the efficiency of government agencies' budget use by supporting decisions to reduce budgets in storing and maintaining low-value data quality, and to allocate budgets for developing high-value data quality more precisely.

Responsible Agencies: Office of the National Digital Economy and Society Commission in collaboration with other agencies under the Ministry of Digital Economy and Society

Preliminary project budget estimates: 10 million baht

Target audience: the office of permanent secretary in each ministry

Operational Methods/Activities: Office of the National Digital Economy and Society Commission (ONDE) will encourage the office of permanent secretary in each ministry to evaluate the benefits to costs of datasets, which includes the following operations:

Assign the office of permanent secretary of each ministry to evaluate the benefits to costs of datasets they collect, through user surveys via the ministerial-level data catalog system or comprehensive discussions with data stakeholders. This is to initially analyze the benefits of the data to determine how it can be useful for government agencies, or the private and the civil sector. They should summarize the evaluation and decide whether or not to keep or remove data from the systems based on the economic benefit-to-cost ratio in creating and maintaining datasets as specified in the evaluation framework. This should adhere to the guidelines from the framework for evaluating the benefits to costs of data (the outcome of the project to develop a framework for evaluating the economic benefits to costs of datasets).

2) Office of the National Digital Economy and Society Commission will monitor the results of benefit and cost assessments and serve as a consultant in evaluation, management, or improvement. This ensures that high-value data (that meets the evaluation criteria) is effectively managed and stored according to data standards. This requires collaboration with the Digital Government Development Agency and agencies relating to standard on issues related to data standards.

3) Office of the National Digital Economy and Society Commission will report the operational results, progress, and key outcomes from the project to the Specific Committee on Data Strategy Implementation to determine future directions and guidelines.

(4) Project to Create High-Value Datasets through Inter-Agency Collaboration (2025-2029)

Project Goal: The country's high-value datasets are comprehensively collected.

Project Objectives:

1) To ensure that Thailand has high-value datasets that can track the performance of national policies, such as the 20-year National Strategy and the National Economic and Social Development Plan, as well as datasets that can track achievements according to international indicators.

2) To update the criteria for defining high-value datasets to reflect the true value of datasets, and to implement a top-down approach in defining high-value datasets to ensure that high-value datasets that have not yet been published are not overlooked.

3) To ensure that the country adopts a complete set of high-value datasets with clear responsible parties, both in terms of initiating inter-agency data integration and clearly managing data quality, as well as being able to monitor the implementation.

Responsible Agency: Digital Government Development Agency (Public Organization)

Preliminary project budget estimates: 5 million baht

Target audience: the office of permanent secretary in each ministry

Operational Method/Activities: The Digital Government Development Agency (Public Organization) will develop guidelines for considering and evaluating high-value datasets, hear the opinions from relevant agencies, and designate responsible agencies to complete data collection by 2029, with the following steps:

1) Develop a framework, guidelines, or criteria for comprehensively considering high-value datasets from both the perspective of data publishers and data users. A focus should be placed on the utilization of data for social, environmental, and economic

benefits, which may cover high-value datasets, agency master data, and datasets crucial for national performance measurement, such as rankings by the International Institute for Management Development (IMD), World Economic Forum, and World Bank. This also includes developing datasets for Sustainable Development Goals indicators. The framework for collecting high-value data for disclosure must be developed by 2025.

2) Initially define categories or specific scopes of high-value datasets to identify preliminary relevant agencies for public hearing. For instance, the European Union classifies into 6 categories: Geospatial, Earth Observation and Environment, Meteorological, Statistical, Companies and Company Ownership, and Mobility. This should be completed by 2026, with Office of the National Digital Economy and Society Commission reporting the defined categories and scopes to the Specific Committee on Data Strategy Implementation for approval of actions.

3) Collaboratively assess and identify high-value datasets through public hearings from government agencies, designate responsible agencies, and establish monitoring approaches. This must be completed by 2027. Office of the National Digital Economy and Society Commission will report the titles of high-value datasets and relevant agencies to the Specific Committee on Data Strategy Implementation for consideration and announcement as high-value datasets to be collected.

4) Responsible agencies will collect and publish key datasets, both independently and in collaboration with other state agencies (in 2028-2029). They will also summarize project progress, completed and pending datasets (in 2029) to Office of the National Digital Economy and Society Commission.

5) Office of the National Digital Economy and Society Commission will periodically report progress to the Specific Committee on Data Strategy Implementation to consider adjusting operational guidelines, implementation timeframes, and acknowledge the project's achievements.

(5) Project for Developing Data Driving Plans in Each Industrial Dimension and Development Issue (2025-2029)

Project Goal: Host agencies in each development dimension and industrial dimension to prepare data driving plans for each relevant development and industrial dimension.

Project Objectives:

1) To ensure comprehensive and quality datasets, promote data integration both among government agencies and between government agencies and private sector organizations.

2) To establish directions of human capital and labor factor development in both public and private sectors across industrial dimensions and development issues, aiming to enhance data utilization skills.

Responsible Agencies: Office of the National Digital Economy and Society Commission (ONDE) in collaboration with other agencies under the Ministry of Digital Economy and Society and the Digital Government Development Agency (Public Organization).

Preliminary project budget estimates: 10 million baht

Target Group: Government agencies at the ministerial level

Operational Method/Activities: For the development of data driving plans for each development issue, to coordinate data cooperation among agencies in developing and driving important national issues in economic, social, and environmental aspects.

1) Office of the National Digital Economy and Society Commission (ONDE), in collaboration with other agencies under the Ministry of Digital Economy and Society and the Digital Government Development Agency, will organize brainstorming meetings with government agencies at the ministerial level to identify necessary and urgent development issues that require data for problem-solving. They will also designate primary responsible agencies and set timeframes for collecting and gathering crucial data for addressing these issues. This process must be completed by 2026.

2) Jointly organize meetings to discuss and brainstorm with government agencies at the ministerial level, private sector organizations in relevant industrial dimensions or development issues, as well as academic and civil sectors to jointly determine development issues or directions, and goals for data utilization to develop or tackle issues in those areas. This includes designating primary and related agencies for taking actions. An example includes agricultural development issues that aim to generate income of farmers. Data from dimension may be used, such as agricultural product quantity, prices, production costs, and water management from the Ministry of Agriculture and Cooperatives; weather

data from the Meteorological Department under the Ministry of Digital Economy and Society; and water resource data from the Ministry of Natural Resources and Environment.

3) The primary responsible agencies will develop (draft) data driving strategies for each development issue and conduct public hearings with stakeholders from the government sector (both policy-making and operational levels), private sector, and the public. They will then make adjustments to ensure the driving plans are appropriate and can achieve their goals to the fullest extent possible by 2027.

4) Office of the National Digital Economy and Society Commission (ONDE), in collaboration with other agencies under the Ministry of Digital Economy and Society and the Digital Government Development Agency, will push agencies to execute the developed plans, while jointly monitoring operational results through providing some advice on respective issues and supporting technical factors related to data operations.

(6) Project to Survey All Datasets Held by Each Agency (2025-2029)

Project Goal: Detailed metadata of datasets held by agencies each year, including both closed and open data.

Project Objectives:

1) To enable government agencies and data users from both private and civil sectors to easily search and find data.

2) To allow government agencies to check whether any agency has already collected data, in order to reduce redundancy in data operations.

Responsible Agencies: Office of the National Digital Economy and Society Commission (ONDE) in collaboration with the Digital Government Development Agency (Public Organization) and the Government Big Data Institute in seeking cooperation and driving implementation.

Preliminary project budget estimates: 5 million baht

Target Group: Government agencies at the departmental level

Operational Method/Activities: Encourage all government agencies to prepare dataset descriptions (metadata) to inform data users about the source and format of the

data, facilitate data search, and benefit the creation of data catalogs for agencies and the country. This also supports the disclosure, linkage, and exchange of government data.

1) Department-level agencies must survey dataset names and create metadata for all datasets they possess, and submit them to the Specific Committee on Data Strategy Implementation. The metadata consists of 14 items: data type, dataset name, organization, contact name, contact email, keywords, details, objectives, data update frequency, geographic or spatial scope, source, data storage format, data category according to government data governance, and data usage license as specified.

2) The Specific Committee reviews the datasets submitted by agencies to assess the number of datasets and metadata disclosed by agencies in relation to the total amount of datasets they possess.

3) The Specific Committee may order agencies to disclose additional data if the datasets should be public but have not been disclosed. If agencies have reasons for nondisclosure, they must prepare an explanatory report.

4) Encourage relevant agencies to update dataset names annually and notify the Specific Committee after updates and revisions are completed. The Specific Committee may verify the completeness of this information in the system.

(7) Project to Develop an Announcement of the Official Information Commission on Datasets to be Disclosed (2025-2026)

Project Goal: Develop an announcement of the Official Information Commission on datasets to be disclosed.

Project Objectives:

1. To reduce the discretion of officials in considering data disclosure by clearly specifying in the announcement in the form of a Positive List.

2. To ensure the disclosure of data that is important in the current situation to the public.

Responsible Agencies: Office of the National Digital Economy and Society Commission (ONDE) in collaboration with the Office of the Official Information Commission and other agencies under the Ministry of Digital Economy and Society.

Preliminary project budget estimates: 2 million baht

Target audience: Office of the Official Information Commission

Operational Method/Activities: Office of the National Digital Economy and Society Commission (ONDE), in collaboration with the Office of the Official Information Commission, will prepare an announcement to specify datasets to be disclosed in the form of a Positive List Regulation. This is to reduce the discretion of officials in choosing to open or close data, in line with the principle of disclosure as the norm and confidentiality as the exception. The implementation will be as follows:

1) Office of the National Digital Economy and Society will collaborate with the Office of the Official Information Commission to organize brainstorming sessions with agencies involved in big data management, other agencies under the Ministry of Digital Economy and Society, and government agencies at the ministerial level. The purpose is to determine the types of data to be disclosed, in line with the current economic and social conditions, as well as to survey the data needs of users from both public and private sectors. Office of the National Digital Economy and Society Commission will collect opinions and information from these brainstorming sessions to propose to the Specific Committee on Data Strategy Implementation for approval in determining the datasets to be disclosed.

2) Office of the National Digital Economy and Society Commission will present the information collected from the brainstorming sessions, which has been approved by the Specific Committee on Data Strategy Implementation, and consult with the Office of the Official Information Commission to prepare a (draft) announcement of datasets to be disclosed. This (draft) announcement should be prepared by 2025.

3) The Office of the Official Information Commission will submit the (draft) announcement of datasets to be disclosed to the Official Information Commission for approval or to make improvements based on the Commission's feedback.

4) The Office of the Official Information Commission will take the approved (draft) announcement of datasets to be disclosed to gather opinions from data users in the government, private, civil, and academic sector. This public hearing process must be completed, and the announcement of the Office of the Official Information Commission on additional datasets to be disclosed must be announced and enforced by 2026.

6) After the announcement has been in effect for a certain period, the Office of the Official Information Commission should review whether the specified datasets are appropriate for the current situation. This inspection must be conducted at least once a year.

7) In reviewing this announcement, Office of the National Digital Economy and Society Commission should monitor the progress of the currency review and report the results to the Specific Committee on Data Strategy Implementation.

(8) Project to Develop and Implement Thailand's Data Act B.E. .... (2023 – 2028)

Project Goal: Enforce Thailand's Data Act B.E. ....

Project Objectives:

1. To ensure that Thailand's laws, regulations, and rules related to data are unified and coherent, and to assist both public and private sector organizations in complying with these regulations with ease, clear guidelines for data sharing and disclosure should be established.

2. To support data development in Thailand, all government agencies should be mandated to publish their data in a centralized database for use within the public sector. Additionally, there should be established guidelines regarding the systems, formats, and methods for data disclosure and sharing within the government.

3. To support regulatory agencies or those responsible for data-related activities in seeking cooperation from the private sector or the public on data matters, with a focus on benefiting the country.

Responsible Agencies: Office of the National Digital Economy and Society Commission (ONDE), in collaboration with other agencies under the Ministry of Digital Economy and Society.

Preliminary project budget estimates: 5 million baht

Target audience: Government agencies

Operational Method/Activities: At present, most of the data in Thailand's economic system is stored and recorded digitally, and data has increasingly become a critical

factor of production in the world, making data development an extremely important development issue.

1) Office of the National Digital Economy and Society Commission (ONDE) is conducting an assessment of the context, needs, and gaps in data development within the country. This includes a comparative study of the laws, regulations, and rules currently in force in Thailand, at least encompassing the Official Information Act B.E. 2540 (1997), the Statistics Act B.E. 2550 (2007), the • Digitalization of Public Administration and Services Delivery Act, B.E. 2562 (2019), the Electronic Government Operations Act B.E. 2565 (2022), and the Regulation on Government Confidentiality B.E. 2544 (2001), as well as data-related laws in other industries. The purpose of this study is to analyze the necessity of enacting the Data Act B.E. .... (Year).

2) Office of the National Digital Economy and Society Commission (ONDE) is conducting a comparative study of data legislation practices in other countries. This includes analyzing the alignment of the proposed Data Act B.E. .... with the national strategy and the country's reform plan, as well as assessing the issues arising from Thailand's current situation and context. The study also considers the potential costs and burdens that might be imposed on the public sector, citizens, and the private sector because of implementing the law. Furthermore, it evaluates the effectiveness of the existing laws, regulations, and rules studied according to the methodology in Section 2 and prepares a summary report on the evaluation of the law's effectiveness. The report will include recommendations for amending, revising, or repealing any laws to avoid redundancy with the proposed Data Act B.E. ....

3) The Office of the National Digital Economy and Society Commission has set the objectives for the Data Act B.E. .... and is considering the primary responsible agency. This may involve expanding the powers of the National Statistical Office to cover broader data management activities beyond just statistical data. The commission is tasked with drafting the Data Act B.E. .... and, alongside the draft law, will conduct data analysis according to the operations outlined in Sections 1 and 2. The draft law and analysis will be presented for public consultation through at least three public hearings. Additionally, the draft law and analysis will be submitted for feedback via the central legal system. A summary report of the public consultations, including both the meetings and feedback received through the central system, will be prepared.

4) The Office of the National Digital Economy and Society Commission is responsible for preparing an impact assessment report based on the activities conducted in Sections 1 through 3, following the format prescribed by the Office of the Council of State. This report will be submitted to the Secretariat of the Cabinet for review to ensure its completeness. Once the report is deemed complete, it will be forwarded to the Cabinet for further consideration.

5) Once the Cabinet approves the impact assessment report, the Office of the National Digital Economy and Society Commission is required to submit the approved impact assessment report and the draft of the Data Act B.E. .... to the Office of the Council of State. The Council of State will then review both the draft law and the impact assessment report for further consideration.

6) Once the Council of State approves the draft of the Data Act B.E. ...., the National Digital Economy and Society Commission is required to revise the impact assessment report to align it with the approved draft law.

7) The National Digital Economy and Society Commission shall submit the revised impact assessment report and the draft of the Data Act B.E. ...., as approved by the Council of State, to the Parliament for approval and subsequent enactment.

(9) Project to Prepare Important Datasets in Easily Usable Formats (2026-2029)

Project Goal: Disseminate important datasets in easily-usable formats or as data visualizations, such as images, maps, graphs, tables, videos, infographics, and dashboards.

Project Objectives:

1. To present data in visual formats or summary dashboards, allowing data users to easily understand the characteristics and data insights of the data, and to conveniently use it for considering and selecting raw data.

2. To enable data users who lack skills in processing data to benefit from the data.

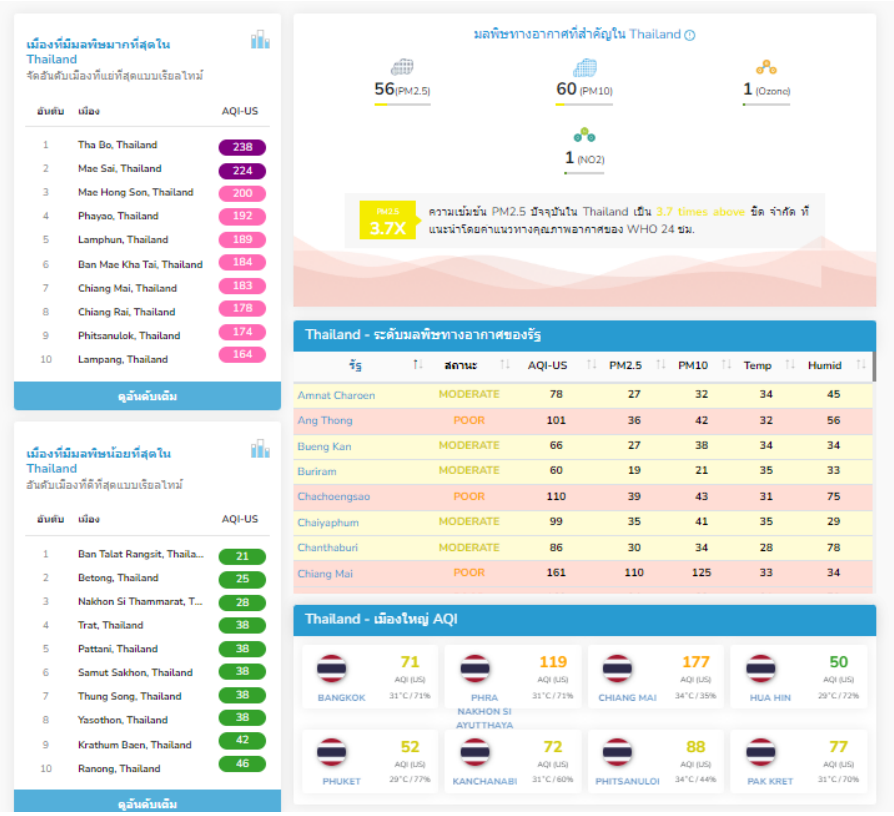
Responsible Agencies: Office of the National Digital Economy and Society Commission (ONDE) in collaboration with the Digital Government Development Agency (Public Organization) and other agencies under the Ministry of Digital Economy and Society.

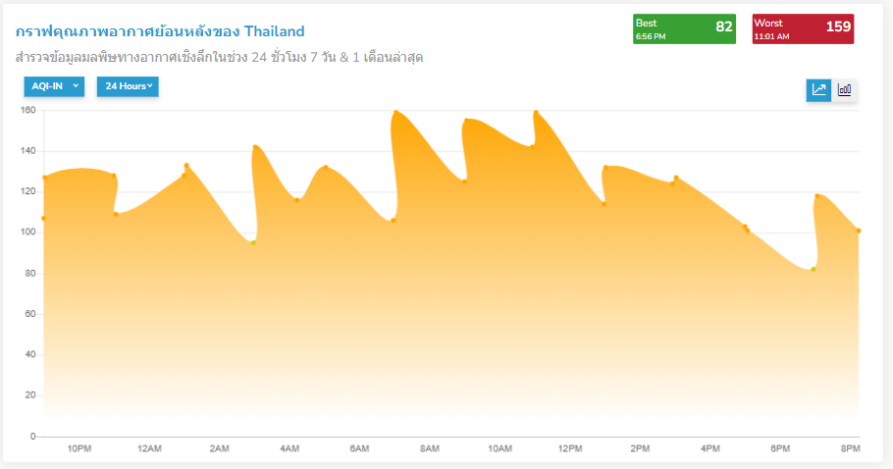
Preliminary project budget estimates: 10 million baht

Target Group: Government agencies at the ministerial level

Operational Method/Activities: After collecting and gathering important data for national development on urgent issues in 2026 (as specified in the project to develop data driving plans for each development issue (2025-2029)), relevant agencies should disclose this data in easily understandable formats (data visualization) such as images, maps, graphs, tables, videos, infographics, and dashboards. Furthermore, after implementing the data driving plans for each development issue, data should be disclosed and managed in data visualization formats as well.

Figure 9: Examples of disclosure in dashboard





Source: AQI (2024) https://www.aqi.in/th/dashboard/thailand

Furthermore, policy-making agencies or agencies involved in submitting data for measuring the country's competitiveness ranking should be encouraged to analyze comprehensive data in various ways to assess problems and obstacles, in a bid to find solutions or establish policies to address issues in a timely manner.

4.4.2 Projects under Strategy 2

Projects under Strategy 2 seek to promote data cooperation between the public and private sectors to achieve the goal of private sector participation in data driving. They also involve the formulation of measures to support data sharing by the private and the public sectors. This can lead to significant outcomes such as Digital Solutions, platforms, and applications that can utilize data between the public and private sectors. The key projects consist of 7 main projects as listed below:

(1) the Project to Define Important Datasets for National Development Issues Requiring Cooperation between the Public and Private Sectors (2026-2027)

Project Goal: List of important datasets required from the private sector, with prioritization

Project Objectives:

1. In order to provide the entities responsible for the development of information in each industry dimension and development issue, the direction of the information drive can be easily determined.

2. To allocate budgets for developing datasets with higher priority first, which will help increase operational efficiency.

Responsible Agencies: Office of the National Digital Economy and Society Commission (ONDE) in collaboration with the Digital Government Development Agency (Public Organization)

Preliminary project budget estimates: 2 million baht

Target Group: Government agencies at the ministerial level

Operational Method/Activities: Office of the National Digital Economy and Society Commission (ONDE), in collaboration with the Digital Government Development Agency (Public Organization), will define datasets and prioritize them. The operational action is divided into two phases according to national development issues as described below:

1) The first part of this project will be conducted in parallel to the project to develop data driving plans for each development issue (2025-2029). In the first phase (2025-2026), the Office of the National Digital Economy and Society Commission and the Digital Government Development Agency will identify necessary and urgent development issues that require data for problem-solving, assign responsibilities to the main responsible agencies, and define the timeframe for managing, collecting, and gathering important data for addressing these issues.

2) After defining the development issues, the main responsible agencies in each development dimension will determine important datasets, distinguish between datasets from government agencies, data from private sector organizations, and data that needs to be integrated between the public and private sectors.

3) After determining important datasets for each issue, the main responsible agencies in each development dimension will create metadata that represents the data structure, agencies responsible for the datasets, data collection agencies, data owners, data sources, and data collection methods clearly. This is to enable agencies responsible for data preparation to operate efficiently. In this step, Office of the National Digital Economy and Society Commission and the Digital Government Development Agency will provide consultation on creating appropriate metadata and data structures.

4) Continue from the project to develop data driving plans for each development issue (2025-2029) in phase 2. They need to identify the types of datasets and target groups required from the private sector through joint meetings among key responsible

agencies (as specified in the project). This is to assess the necessity and mutual benefit of the data. The datasets required from the private sector in each issue should be prioritized to determine incentive approaches to encourage the private sector to link data in the future

(2) Data Alliance Project between Government and Private Sector to Support Data Exchange and Services (2025-2029)

Project Goal: Establish an Alliance between the public and private sectors to drive data collaboration in various development areas.

Project Objectives:

1. To concretely drive data initiatives in each development area through a collaborative framework in the form of alliance between government and private sectors, offering incentives to participating private entities.

2. To align government data development directions with private sector and academic trends, ensuring market-relevant data development that enhances the private sector's competitiveness.

Responsible Agencies: Office of the National Digital Economy and Society Commission (ONDE) in collaboration with the Digital Government Development Agency and government agencies developing data-driven plans for specific development areas.

Preliminary project budget estimates: 10 million baht

Target Group: Private sector entrepreneurs

Operational Methods/Activities: Office of the National Digital Economy and Society Commission (ONDE), together with the Digital Government Development Agency, will establish public-private alliance in various development areas as follows:

1) Establish incentive conditions or guidelines by offering government and private sectors with privilege in data usage or data purchase-sale terms. Privilege of data usage may vary based on data importance or utility, as determined by relevant agencies. For instance, data crucial for national development might allow alliance members access to raw or analyzed data, but prohibit further dissemination of raw data. For data pricing, further research is needed to establish fair prices based on data importance and quality.

2) After establishing appropriate criteria of privilege, conduct consultations with relevant agencies to refine and communicate the terms, to be completed by 2025.

3) Establish alliances for urgent issues by 2026 and for all other issues outlined in the development area data plans by 2029. The first step is to hold meetings to determine data linking approaches, conditions, and standardized procedures, possibly using the private sector data governance assessment manual for government data linkage as a guide.

4) Responsible agencies in relevant development areas will continuously coordinate, monitor, and evaluate data linkage within the alliances.

(3) Project to Develop a Framework for Data Exchange between Government and Private Sector (2025-2026)

Project Goal: Establish a framework for data exchange among government agencies and the private sector to facilitate integrated data projects by 2026.

Project Objectives:

1. To provide government agencies and private sector organizations with a framework for efficient, secure, and data governance-compliant data exchange between entities.

2. To establish a data management framework for integrating data between government and private sectors, fostering confidence in inter-organizational data exchange.

Responsible Agency: Office of the National Digital Economy and Society Commission

Preliminary project budget estimates: 2 million baht

Target Group: Government agencies and private sector organizations engaged in data exchange

Operational Methods/Activities: Office of the National Digital Economy and Society Commission will support data sharing between government and private sectors by developing a data sharing framework to clarify factors to consider in data sharing. The process includes:

1) Office of the National Digital Economy and Society Commission will draft a framework for data exchange between government agencies and the private sector for stakeholder consultation.

2) Office of the National Digital Economy and Society Commission will present the draft framework for feedback from relevant government and private sector

entities, such as the Digital Government Development Agency, Electronic Transactions Development Agency, government production agencies, the Digital Council of Thailand, and private sector organizations interested in data integration with the government.

3) Office of the National Digital Economy and Society Commission will publish the finalized data exchange framework between government agencies and the private sector, with completion by 2026.

4) Office of the National Digital Economy and Society Commission will continuously review the data exchange framework to ensure its relevance to current situations. A review should be at least triannual.

(4) Project to Establish a Certification System for Cybersecurity Standards and Personal Data Protection Standards to Promote Data Linkage between Government and Private Sector (2025-2026)

Project Goal: Establish a certification system that is easy to follow for service providers and easily verifiable for service users.

Project Objectives:

1. To establish a clear and practical framework of standards for personal data protection and cybersecurity in Thailand, ensuring that certified service providers comply with relevant laws in these dimensions.

2. To facilitate the selection of service providers with appropriate security measures for data integration, linkage, sharing, or donation services across government, private sector, and public domains.

Responsible Agency: Office of Personal Data Protection Committee and National Cyber Security Agency

Preliminary project budget estimates: 10 million baht

Target Group: Data providers, such as data marketplace service providers, services supporting public data donation, and other types of data intermediary service providers.

Operational Methods/Activities: The Personal Data Protection Committee Office and the National Cybersecurity Committee Office will establish and announce necessary standards for certification of these service providers.

1) Office of Personal Data Protection Committee will prepare a (draft) personal data protection standards in line with the Personal Data Protection Act B.E. 2562 (2019). This may involve consultations with the Thai Industrial Standards Institute, the Engineering Institute of Thailand, academic institutions, the Electronic Transactions Development Agency, the Digital Government Development Agency, and other relevant agencies to jointly develop the (draft) standards.

2) Office of Personal Data Protection Committee will conduct stakeholder consultations on the draft personal data protection standards before officially announcing them.

3) National Cyber Security Agency will establish cybersecurity standards in compliance with the Cybersecurity Act B.E. 2562 (2019). The formulation of standards may involve consultations with the Thai Industrial Standards Institute, the Engineering Institute of Thailand, academic institutions, the Electronic Transactions Development Agency, the Digital Government Development Agency, and other relevant agencies to jointly develop the (draft) cybersecurity standards.

4) National Cyber Security Agency will conduct public hearings on the (draft) cybersecurity standards before officially announcing them as cybersecurity standards.

5) National Cyber Security Agency will collaborate with the Personal Data Protection Committee Office to develop an assessment framework based on both personal data protection and cybersecurity standards, in order to establish a certification system for both standards.

6) National Cyber Security Agency and Office of Personal Data Protection Committee will provide certification services for both standards. Data service providers who fully comply with both standards will be authorized to display the Data Protection Trustmark logo.

(5) Project to Develop Digital Solutions for Data Exchange in Each Development Dimension (2027-2029)

Project Goal: To formulate appropriate digital solutions to support data development in each industry or development dimension.

Project Objectives:

1. To provide comprehensive and up-to-date data services aligned with development goals in each industry dimension by consolidating relevant data into a single, easily searchable source.

2. To support data exchange among government agencies, private sector, academic sector, and public data in each development dimension by consolidating data into a single source, enabling organizations seeking to develop data to easily select data sources and datasets for supporting development.

Responsible Agencies: Government agencies owning the project, participating private sector organizations, or private sector organizations responsible for system development.

Preliminary project budget estimates: 20 million baht

Target Group: Data users from government, private sector, and public sector.

Operational Methods/Activities: As data is a crucial resource for public services, economic promotion, and monitoring of key national policies, developing Digital Solutions for data exchange, integration, and promoting utilization as a data hub between government and private sectors is important. The focus is on developing key datasets identified in the project for determining crucial datasets for national development issues. The process for implementing this project is as follows:

1) Agencies responsible for data development in various industry dimensions and development issues will consult with stakeholders from government, private sector, public sector, and academia to select appropriate Digital Solutions. These may be in the form of data exchange marketplaces, central data integration systems, or single dataspaces in each development dimension, ensuring the services are suitable for achieving data development goals in the respective industry dimensions and development issues.

2) Agencies responsible for data development will consult with stakeholders to establish terms and conditions, data policy, necessary data governance frameworks, access restrictions, and data quality and security management.

3) Agencies responsible for data development will either develop the system themselves or select suitable contractors for system development. These contractors must, at minimum, be certified with the Data Protection Trustmark.

4) System development will run from 2027 to 2029. The system must be able to work in conjunction with existing central data platforms and display the list of datasets published on the system in the National Statistical Office's GD Catalog to facilitate data searches. Progress reports on the development will be provided to agencies responsible for data development in various development or industry dimensions at least on quarter basis.

5) Upon completion of system development by 2029, the system developers will conduct user satisfaction surveys and collect feedback to continually improve the system to meet user needs.

6) Office of the National Digital Economy and Society Commission will monitor the progress of digital solution development in each production sector and development issue, and periodically report progress to the Specific Committee on Data Strategy Implementation.

4.4.3 Projects under Strategy 3

(1) Project to Promote Compliance with Digital Government Standards in Government Agencies (2025-2029)

Project Goal: Government agencies comply with standards, can easily integrate and link data, have secure data management, operate in accordance with government data governance principles, register standardized dataset descriptions to support data searches, and have quality data that can be utilized effectively.

Project Objectives:

1. To bolster the efficiency of government agencies' operations, enabling other agencies to link data and utilize it more effectively, and support data searches and access by providing standardized and shareable data descriptions.

2. To tighten the security of data management and storage in government agencies and ensure operations align with government data governance principles.

Responsible Agency: Digital Government Development Agency (Public Organization)

Preliminary project budget estimates: 6 million baht

Target Group: Government agencies

Operational Methods/Activities: The Digital Government Development Agency has announced several mandatory digital government standards covering issues of data and service design, including data disclosure, interoperable data system design, dataset description creation, data management, data quality assessment, and government data governance principles. However, there has been no monitoring of compliance with these standards in the recent past.

1) The Digital Government Development Agency will organize training courses for executives in various agencies regarding current mandatory digital government standards to raise awareness of the importance of each standard and promote the implementation of digital government standards in data operations within government agencies.

2) The Digital Government Development Agency will monitor agencies implementing digital government standards by creating criteria and indicators for standard compliance to measure performance in each area, such as data disclosure, dataset creation, and data system design. It will also prepare annual progress reports on standard compliance, possibly using a predetermined report format, to publish a list of agencies and summarize the results as a ratio of fully compliant agencies to non-compliant ones. But the agency assessment format may include creating an audit team by the Digital Government Development Agency, external audits, or establishing a real-time monitoring system.

3) The Digital Government Development Agency will assess the needs and requirements of digital government standards to expand into new standards covering issues not currently addressed, such as quality standards for agencies' core datasets (ISO/TS 8000 Part 100-199) and standards for Data Profiling (ISO 8000 Part 61).

(2) Project to Develop a Manual for Assessing Data Governance Principles of Private Sector Entities Seeking to Link Data with Government Agencies (2025-2027)

Project Goal: The government sector has a tool to facilitate the assessment of private sector governance principles, supporting decisions on data linkage, exchange, and integration.

Project Objectives:

1. To provide government agencies with clear tools and guidelines for assessing private sector entities' compliance with data governance principles when they want to integrate, link, or share data.

2. To promote safe, high-quality, and standard-compliant data linkage and exchange between government and private sectors.

Responsible Agencies: Digital Government Development Agency in collaboration with the Digital Council of Thailand

Preliminary project budget estimates: 3 million baht

Target Group: Government agencies

Operational Methods/Activities: The Digital Government Development Agency, as the creator of government data governance principles, should be responsible for developing a manual for assessing governance of the private sector. This manual will be used by government agencies to determine whether private entities seeking to integrate, link, or share data are following appropriate governance principles. The process will include:

The Digital Government Development Agency will collaborate with the Digital Council of Thailand to establish a joint working group, define the group's roles in data collection and analyze demand to prepare a (draft) manual for assessing data governance principles of private sector.

2) Analyze differences and demands in data governance systems of the public and private sectors, review relevant laws and regulations, and study international practices.

3) Develop a (draft) manual for assessing private sector data governance principles by 2025, considering differences in public and private sector data governance

systems, private sector needs, government requirements, and relevant laws and regulations. Also, establish clear criteria, indicators, and processes for data collection and assessment.

4) Gather feedback on the (draft) manual of the data governance principles of the private sector from both public and private sector stakeholders regarding current problems, obstacles, and concerns. This should at least cover issues including data quality, data security, data lifecycle management approaches, data linkage and integration, and data architecture. The feedback process should be completed by 2026.

5) The Digital Government Development Agency will use feedback to refine the draft manual for assessing data governance principles of the private sector. The finalized manual will be published as a guideline for government agencies when deciding on data linkages with the private sector. This should be completed by 2027.

(3) Project to Promote Cloud System Usage in the Government Sector to Tighten Security (2025-2029)

Project Goal: To reinforce the security of government agency data through the use of certified secure cloud systems, roll out a guide for cloud selection, and list certified cloud service providers.

Project Objectives:

1. To support government agencies in transitioning to efficient and secure cloud systems, promoting more effective resource and data management while keeping costs low if associated with traditional operating systems.

2. To formulate cloud selection standards through the development of guidelines and standards for government agencies in choosing appropriate cloud services.

3. To tighten the security of government agencies' data and operating systems through the use of cloud systems with comprehensive cybersecurity standards.

Responsible Agencies: Office of the National Digital Economy and Society Commission in collaboration with National Cyber Security Agency

Preliminary project budget estimates: 6 million baht

Target Group: Government agencies

Operational Methods/Activities: Office of the National Digital Economy and Society Commission will promote the use of cloud systems in government agencies to tighten the security of their data and operating systems through the use of cloud systems with comprehensive cybersecurity standards. The process includes:

1) Office of the National Digital Economy and Society Commission will encourage government agencies to adopt cloud systems by promoting the benefits of transitioning to cloud usage, such as reducing IT operational costs and increasing flexibility and safety in data management. They will also provide consultation on the transitional phrase, for examples, steps in change and architecture improvements, to cater to the needs and goals of each agency.

2) Office of the National Digital Economy and Society Commission, in collaboration with National Cyber Security Agency, will prepare a cloud selection guide for government agencies. At least, the guide will be discussing necessary security standards appropriate across wide range of types of government agencies, covering cloud security governance and cloud infrastructure security and operation standards as minimum.

3) Office of the National Digital Economy and Society Commission will list certified cloud service providers who are accredited with comprehensive security standards, categorized according to their suitability for government agencies holding various levels of classified data.

4) Office of the National Digital Economy and Society Commission will monitor and assess the proportion of government agencies at the department level that have transitioned to cloud systems against the total numbers. This will be categorized by the type of cloud being employed. Later, this will be compared to the total number of government agencies. This will exclude agencies that cannot migrate to cloud systems due to security reasons.

(4) Project to Develop Personal Data Protection Guidelines for Each Production Sector (2025-2027)

Project Goal: To devise personal data protection guidelines for personal data controllers and processors in accordance with the Personal Data Protection Act B.E. 2562 (2019). This will revolve around industries in public and private sectors.

Project Objectives:

1. To establish suitable guidelines and tools as part of personal data protection for government agencies and private sectors across all industries. This will be done by providing meaningful advice to data controllers and processors to ensure proper compliance with relevant requirements across all industry sectors.

2. To promote understanding and knowledge about compliance with personal data protection laws by adopting appropriate training tools for entrepreneurs and data processors. The highlight will be on how to harness user-friendly and clear infographics.

Responsible Agency: Office of the Personal Data Protection Committee.

Preliminary project budget estimates: 10 million baht

Target Group: Private entrepreneurs, government agencies providing services to the public

Operational Methods/Activities:

1. Office of the Personal Data Protection Committee will prepare and disseminate the personal data protection guidelines for personal data controllers and processors. The project will serve several industries in both public and private sectors. This will begin with analyzing and collecting data related to personal data protection from various industries. It will be taking into account the needs and effectiveness of the guidelines to be prepared. Additionally, meetings or seminars will be organized to hear opinions and disseminate the guidelines.

2) Training activities will be conducted to deepen knowledge and understanding of personal data processing approaches throughout the data lifecycle. Target groups will be divided by industry, covering both government agencies and the private sector. Participants' knowledge and understanding will be assessed before and after the training to ensure future activities will be better in quality.

3) Office of the Personal Data Protection Committee will produce easy infographics explaining personal data protection guidelines for each industry. These materials will be found on the Office's website or shared with many other government agencies.

4) Office of the Personal Data Protection Committee will disseminate a list of agencies that have completed the preparation of the guidelines and appraise performance

by comparing the proportion of agencies with such guidelines against the total number of agencies. This information will be disseminated for monitoring and evaluation purposes.

(5) Network Alliance Project to Promote Digital Standards in Thailand (2025-2029)

Project Goal: To establish a network alliance to promote digital standards in Thailand that align with the needs of both government agencies and the private sector.

Project Objectives:

1. To support the formulation and dissemination of key digital technology standards that are accepted and adopted as digital standards with the ultimate goal of greater competitiveness of domestic businesses and industries.

2. To help with the implementation of digital standard certification processes within Thailand.

3. To materialize knowledge and understanding of digital standard usage in industries and government organizations.

Responsible Agencies: Office of the National Digital Economy and Society Commission in collaboration with the Thai Industrial Standards Institute, Electronic Transactions Development Agency, Engineering Institute of Thailand, DEPA, NECTEC, and Digital Council of Thailand

Preliminary project budget estimates: 15 million baht

Target Group: Private entrepreneurs, certification bodies, government agencies providing services to the public

Operational Methods/Activities:

1) Office of the National Digital Economy and Society Commission will team up respective public and private sector organizations in digital technology to promote important and market-demanded standards. They will consider selecting international standards such as ISO, IEC, NIST, etc., to be adopted as National Inspection and Certification Standards (NICS) by 2025.

2) The Digital Technology Standards Alliance Network will survey needs and identify standards that require urgent development to be announced as NICS for Thailand. This process should be completed within 4 years.

3) Activities to support the implementation of digital standards certification within Thailand. Office of the National Digital Economy and Society Commission, together with the Thai Industrial Standards Institute, will support Thai entrepreneurs in digital standards certification businesses by waiving accreditation fees for inspection bodies that provide digital standards certification services.

4) Training activities to disseminate knowledge and understanding of digital standards. Office of the National Digital Economy and Society Commission will collaborate with the Thai Industrial Standards Institute, Digital Government Development Agency, and private sector representatives such as the Digital Council of Thailand to formulate training courses on standards. The content will consist of, at least, the benefits of standards, the importance of each type of standard, and recommendations on choosing service providers as per standards. The goals are to raise awareness on these issues and encourage standards infrastructure in Thailand.

(6) Project to Develop Guidelines for Cybersecurity Threat Response in Government Agencies (2025-2027)

Project Goal: Government agencies are ready to respond to cybersecurity threats and conform to the guidelines of cybersecurity threat response.

Project Objectives:

1. To enrich understanding among government agencies about the importance of cybersecurity and appropriate methods for responding to cybersecurity threats.

2. To encourage government agencies to prepare and revise policies for efficient readiness and responsive measures when cybersecurity threats arise.

Responsible Agency: National Cyber Security Agency

Preliminary project budget estimates: 6 million baht

Target Group: Government agencies

Operational Methods/Activities: National Cyber Security Agency has already undertaken various cybersecurity initiatives and published cybersecurity guidelines. However, there has been no follow-up assessment of whether government agencies have devised the guidelines of cybersecurity threat response. For this reason, the following actions should be taken to promote understanding of the development and Operational of these guidelines:

1) Hold training activities to deepen understanding among government agency employees about cybersecurity threat response. The sessions will explore, as minimum, the criteria of selecting secure cloud services, such as checking cloud service criteria for data security, encryption, and access control. They should also discuss methods for designing cybersecurity threat response guidelines, which may include steps for network security checks, hacking incident detection and response, data recovery after incidents, and approaches for returning systems to normal operations.

2) Government agencies will establish cybersecurity threat response guidelines at the department level. National Cyber Security Agency will assist with consultation and advice on the best steps and processes for formulating policies and guidelines for cybersecurity threat response aimed at the greater stability of agency systems.

3) National Cyber Security Agency will publish a list of agencies that have successfully put in place the guidelines and employed inspection mechanisms to measure and evaluate the success of cybersecurity response policies and guidelines. This will be done by checking the proportion of agencies that have implemented these guidelines compared to the total number of agencies.

4.4.4 Projects under Strategy 4

Projects under Strategy 4: Developing data skills for personnel in both public and private sectors to achieve the goals of promoting and supporting the enhancement of SME potential, as well as increasing the number of personnel equipped with data skills. This can ensure a significant outcome. That is, government and private sector personnel can be more effective when utilizing data. The vital projects comprise of the 6 main projects as listed below:

(1) Project to Develop Curricula for Enhancing Important Data Skills for Modern Small and Medium Enterprise Entrepreneurs (2025-2026)

Project Goal: Training courses for important data skills for modern small and medium enterprise entrepreneurs by 2026.

Project Objectives:

1. To prepare curriculum, create understanding, and improve data skills of modern small and medium enterprise entrepreneurs to reinforce their potential in using data to ensure efficient business management.

2. To assess the data usage needs of modern small and medium enterprise entrepreneurs. This is intended to analyze and prepare information for developing training curricula to take entrepreneurs' data skills to a new bar.

Responsible Agencies: Office of Small and Medium Enterprises Promotion (OSMEP) and Big Data Institute (Public Organization)

Preliminary project budget estimates: 3 million baht

Target Group: SME entrepreneurs

Operational Methods/Activities: This project focuses on surveying to analyze the data skill needs of SME entrepreneurs in order to develop training curricula for enhancing important data skills. The Operational focuses on the following:

The Office of Small and Medium Enterprises Promotion (OSMEP) will identify target groups of SME entrepreneurs across fields. The start is entrepreneurs who have high data usage needs, such as SMEs in businesses related to digital platforms and e-commerce, entrepreneurs in agriculture and food industries, tourism, etc. A survey will be

conducted to explore needs, data skills and current data utilization in terms of both government and private sector data usage, by 2025.

2) Analyze the survey results and organize brainstorming meetings to discuss the analysis results and preliminary training course topics.

3) Offer training curricula to intensify entrepreneurs' skills, such as data analysis, data utilization, and data security protection. In addition, participation targets will need to be arranged with a focus on activities that encourage participation, opinion sharing, and analytical thinking.

4) Promote the training curricula and publicize through lots of communication channels to invite entrepreneurs to participate in the training and raise awareness about the curricula.

(2) Training Project to Develop Digital Data Skills for Small and Medium Enterprise Entrepreneurs (2027-2028)

Project Goal: Small and medium enterprise entrepreneurs are equipped with effective skills in utilizing data.

Project Objectives:

1. To promote higher level of knowledge and skills by offering suitable training for small and medium enterprise entrepreneurs to sharpen skills in utilizing data for maximum benefit in business operations.

2. To adapt and develop businesses that highlight the skills of data use to help reinforce potential for business development and competitiveness in markets.

3. Entrepreneurs will have a chance to voice their opinions and analysis in curriculum development, leading to better understanding and support from small and medium enterprise entrepreneurs.

Responsible Agencies: Office of the National Digital Economy and Society Commission (ONDE) in collaboration with the Office of Small and Medium Enterprises Promotion (OSMEP)

Preliminary project budget estimates: 5 million baht

Target Group: SME entrepreneurs

Operational Methods/Activities: This project focuses on trainings to ensure that small and medium enterprise entrepreneurs acquire digital data skills according to the curriculum established in the project to develop curricula for greater key data skills among modern small and medium enterprise entrepreneurs (2025-2026). The relevant agencies will take actions as explained below:

Office of the National Digital Economy and Society Commission (ONDE) and the Office of Small and Medium Enterprises Promotion (OSMEP) will determine the roles and responsibilities of relevant agencies and the management structure. They will organize training sessions led by expert speakers for each business group, targeting at least 2,000 participants, with a clear number of sessions and venues. They will also promote the training courses, which may be divided by business groups to provide a better understanding of the business overview and clearer examples of data usage.

2) Conduct activities according to the training curriculum. Evaluate the training program in the areas of benefits and the practical application of skills, along with any problems or obstacles during the training.

3) Analyze and evaluate opinions and satisfaction after each session to plan improvements for future training sessions.

(3) Project to Support Business Development Funding for Small and Medium Enterprise Entrepreneurs Assessed to Have Data Utilization Skills, for Business Modernization (2028-2029)

Project Goal: SME entrepreneurs are equipped with greater skills in utilizing data.

Project Objectives:

1. To support small and medium-sized businesses in utilizing digital data, such as innovation and development of new products or services.

2. To support small and medium enterprise entrepreneurs in adapting to digital transformation by providing guidance and control in several operations related to data usage.

Responsible Agencies: Office of the National Digital Economy and Society Commission (ONDE), Office of Small and Medium Enterprises Promotion (OSMEP)

Preliminary project budget estimates: 20 million baht

Target Group: SME entrepreneurs

Operational Methods/Activities: This project focuses on supporting SME entrepreneurs who participate in training courses to acquire data utilization skills for modernizing their businesses and better aligning with Smart City concepts. The actions include:

1) Office of the National Digital Economy and Society Commission (ONDE) will set forth qualification conditions, evaluation criteria, and support measures for SME entrepreneurs in data utilization. Target groups of SMEs eligible to submit proposals range from tourism, food and beverage production, agriculture, and digital platforms to e-commerce. The emphasize will be placed on encouraging interested private sector entities to submit proposals according to specified criteria, such as goals, objectives, implementation methods, timeline, and funding amount for relevant development, by 2028.

Table 9: Example of the conditions of financial support for business development for SME entrepreneurs

Groups	Annual income	Status	Support	
			Subsidy Ratio (%)	Maximum Subsidy (Baht)
Micro Enterprise	Not exceeding 1.8 million baht	Legal entity or individual registered with government agencies	80	50,000
Small Enterprise (SE)	Manufacturing sector not exceeding 100 million baht; Other sectors not exceeding 50 million baht		80	100,000
Medium Enterprise (ME)	Manufacturing sector not exceeding 500 million baht; Other sectors not exceeding 300 million baht	Only legal entities	50	200,000

2) Promote the project through training programs for developing digital data skills for small and medium enterprise entrepreneurs, and conclude the promotion and support project by 2029.

3) Build networks and partnerships with public and private sectors involved in developing and implementing the project. Promote collaboration and cooperation across development and implementation activities. Jointly develop and recommend clear project management plans with systematic methods for measuring and evaluating success. Carry out monitoring and evaluation of performance against the pre-existing goals.

(4) Project to Survey Digital Personnel and Skill Needs in Government Organizations to Adjust Civil Service Workforce in Line with Development Approaches (2025-2026)

Project Goal: Analysis results of digital personnel and skill needs in government organizations

Project Objectives:

1. To survey important digital skills for data services in the government sector.

2. To utilize the information in adjusting recruitment conditions for public officials, with clear and systematic operational guidelines.

Responsible Agencies: Office of the National Digital Economy and Society Commission (ONDE) in collaboration with the Office of the Civil Service Commission (OCSC)

Preliminary project budget estimates: 6 million baht

Target Group: Officials at government agencies at the department and ministry levels

Operational Methods/Activities: This project focuses on exploring key basic digital skills for data services and utilizing data in the government sector to adjust recruitment conditions for public officials, along with surveying the demand for personnel with data skills. The operation focuses on the following:

1) Office of the National Digital Economy and Society Commission (ONDE) and the Office of the Civil Service Commission (OCSC) will join hands to devise the survey's approach. Possible target groups can cover personnel in data management-related sectors at operational, professional, or executive levels. The points of the survey will discuss required skills and additional data management skills to align with future technological and innovative

developments, as well as the current needs of agencies for personnel with data skills and the number of personnel in this field. The questionnaire and timeframe must be finalized by 2026.

2) Seek cooperation from all government agencies to complete the surveys, while creating incentives and understanding to ensure accurate and complete questionnaire responses.

3) Evaluate the surveys' results to analyze problems and skill gaps in data skills among government personnel in each agency. This will serve as a guideline for revising workforce capacity to ensure the government has sufficient personnel equipped with data skills and the compulsory skills, to be completed by 2026.

(5) Project to Adjust Workforce to Ensure Sufficient Data Officers in the Government Sector (2027-2028)

Project Goal: the supply of workforce for data management and analysis in the government sector is sufficient.

Project Objectives:

1. To plan for the increase of positions and career paths for personnel with specialized data expertise.

2. To incentivize data experts, such as Data Stewards, to work in the government sector.

3. To refine the workforce of government agencies to allow each unit to recruit more officers with specialized data expertise.

Responsible Agencies: Office of the National Digital Economy and Society Commission (ONDE), and Office of the Civil Service Commission (OCSC)

Preliminary project budget estimates: 6 million baht

Target Group: public officials

Operational Methods/Activities: This project involves planning for the increase of positions and career paths, incentivizing data experts to work in the government sector, and revising the workforce of government agencies so that each unit can recruit more personnel with specialized data expertise. The Operational approach includes:

1) Planning to revise the government workforce using analyzed survey data to design the size of workforce and the key data-related skills, knowledge, experience, and competencies required by each agency. This will be part of developing government workforce management measures (2028-2029) and future practices of the Office of the Civil Service Commission.

2) Jointly conduct analytical studies on key factors that may affect the increase in data workforce, such as AI systems in data processing. In addition, analyze the competencies of existing personnel to respond to influential factors so that more efficient personnel management is put in place.

3) Collaboratively analyze the long-term overview to assess potential future personnel losses, such as resignations, transfers, relocations, and retirements, to prepare response plans. This analysis process should be completed by 2027.

4) The OCSC, in collaboration with the ONDE, will prepare the manual of management guidelines of data officers for government agencies and central human resource management organizations. They will also organize meetings to explain the implementation approach to executives of government agencies, directors, and officers responsible for human resource management in government agencies and relevant central human resource management organizations. This is to ensure common understanding among those involved. They will also monitor the results of workforce increases and evaluate manpower utilization at the end of each fiscal year to ensure maximum efficiency.

(6) Project to Adjust Recruitment Conditions of Government Agencies to Include Basic Digital and Data Skills Requirements (2025-2027)

Project Goal: Digital and data skills are part of qualifications in public official recruitment.

Project Objectives:

1. Reinforce readiness in applying digital and data skills by revising recruitment conditions to strengthen basic digital and data management skills for those in government agencies. The emphasis will revolve around applicants' knowledge and skills related to efficient use of digital technology and data management in their work.

2. Develop personnel equipped with expertise in data management in government agencies to maximize efficiency in using data as part of government decision-making and operations.

3. Transform organizational culture by introducing a culture that emphasizes the use of digital technology and data management in government agencies' operations. This will offer more efficient operations and resource conservation.

Responsible Agencies: Office of the National Digital Economy and Society Commission (ONDE), Office of the Civil Service Commission (OCSC), and Thailand Professional Qualification Institute (Public Organization)

Preliminary project budget estimates: 3 million baht

Target Group: public officials

Operational Methods/Activities: add qualifications regarding basic data usage abilities. They include recording data in basic statistical programs such as Microsoft Excel, reading and interpreting visualized data, etc. Similarly, approaches will be designed to assess competencies by using comprehension tests, with the following actions:

1) Office of the National Digital Economy and Society Commission (ONDE), in collaboration with the Office of the Civil Service Commission (OCSC) and the Thailand Professional Qualification Institute (Public Organization), will jointly analyze surveys of data needs across dimensions. This includes analyzing skills categorized by the readiness of agencies and personnel to improve or offer new data skills, such as initial stage, developing stage, and mature stage. This analysis will be used to modernize recruitment conditions. Skills can be divided into three levels: personnel with general data skills (generic skills), intermediate level, and high level (professional skills).

2) Design assessment approaches of each skill level and identify the minimum number of personnel required to have skills at each level for each government agency to ensure efficient management of data personnel. This should be completed by 2027.

3) After presenting the assessment approaches and personnel ratios for each government agency, opportunities should be offered to these agencies to express

opinions and suggestions to improve the assessment approaches as deemed appropriate. This is to ensure the most efficient management of data personnel.

4.5 (Draft) Data Strategy Implementation Roadmap

This section categorizes the projects under the plan's strategies based on their priority. It consists of 3 main parts:

(1) Foundational Projects: These projects lay the groundwork for development both within the timeframe of this plan and in the future. They focus on creating a suitable environment, collaboration, and tools to support Thailand's data development.

(2) High-Impact Projects: These projects bring significant benefits to the economy and society, aiming to accelerate the resolution of problems or address important development issues and yield tangible benefits within the plan's timeframe.

(3) Quick Win Projects: These projects must be implemented first to lay the foundation for other projects under this data strategy. They have low costs and can be executed immediately.

As mentioned above, this section will divide the projects into these 3 groups and specify the years they need to be implemented, as shown in the following diagram.

Figure 10: Foundational Projects Classified by Strategy and Implementation Timeline

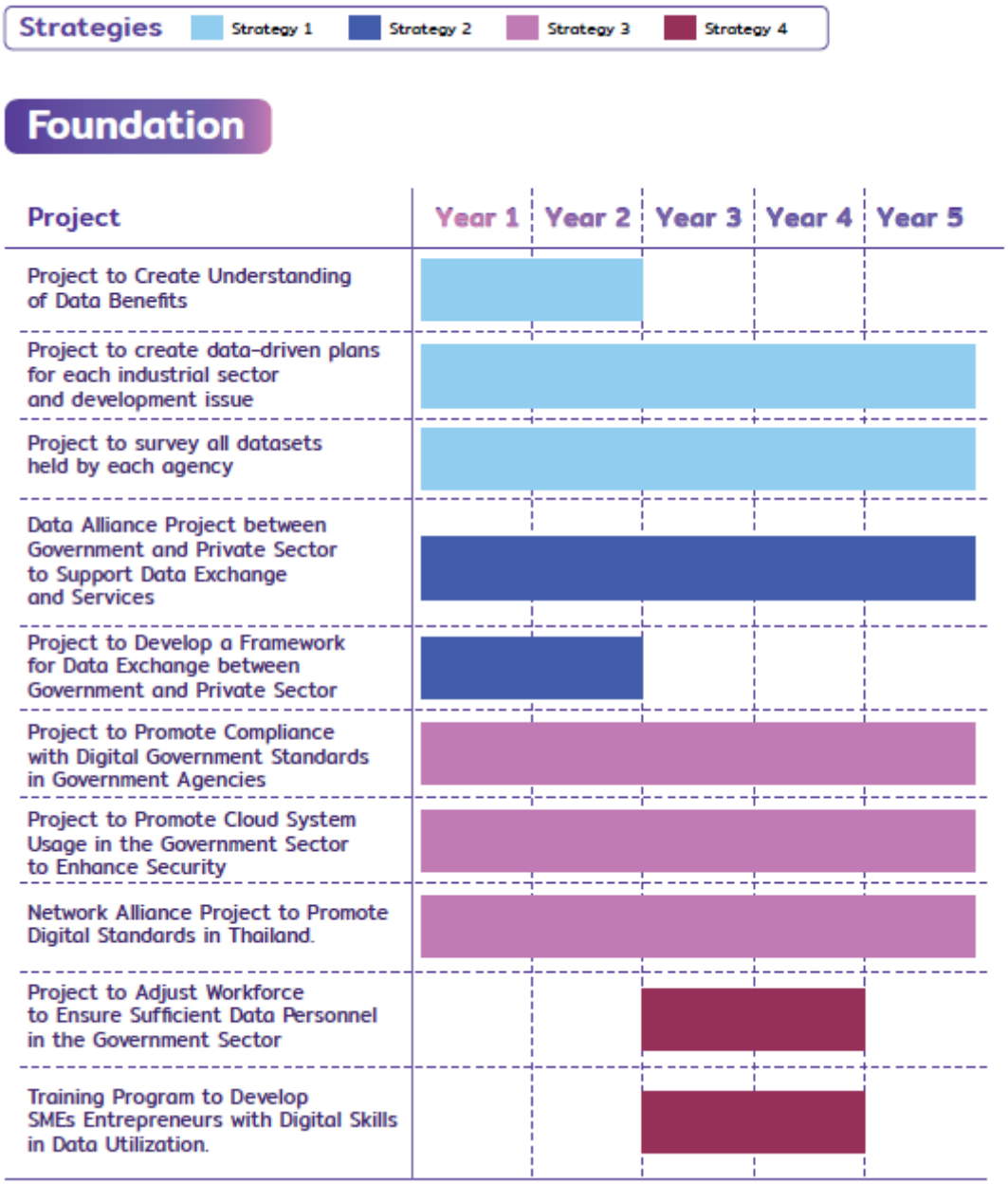
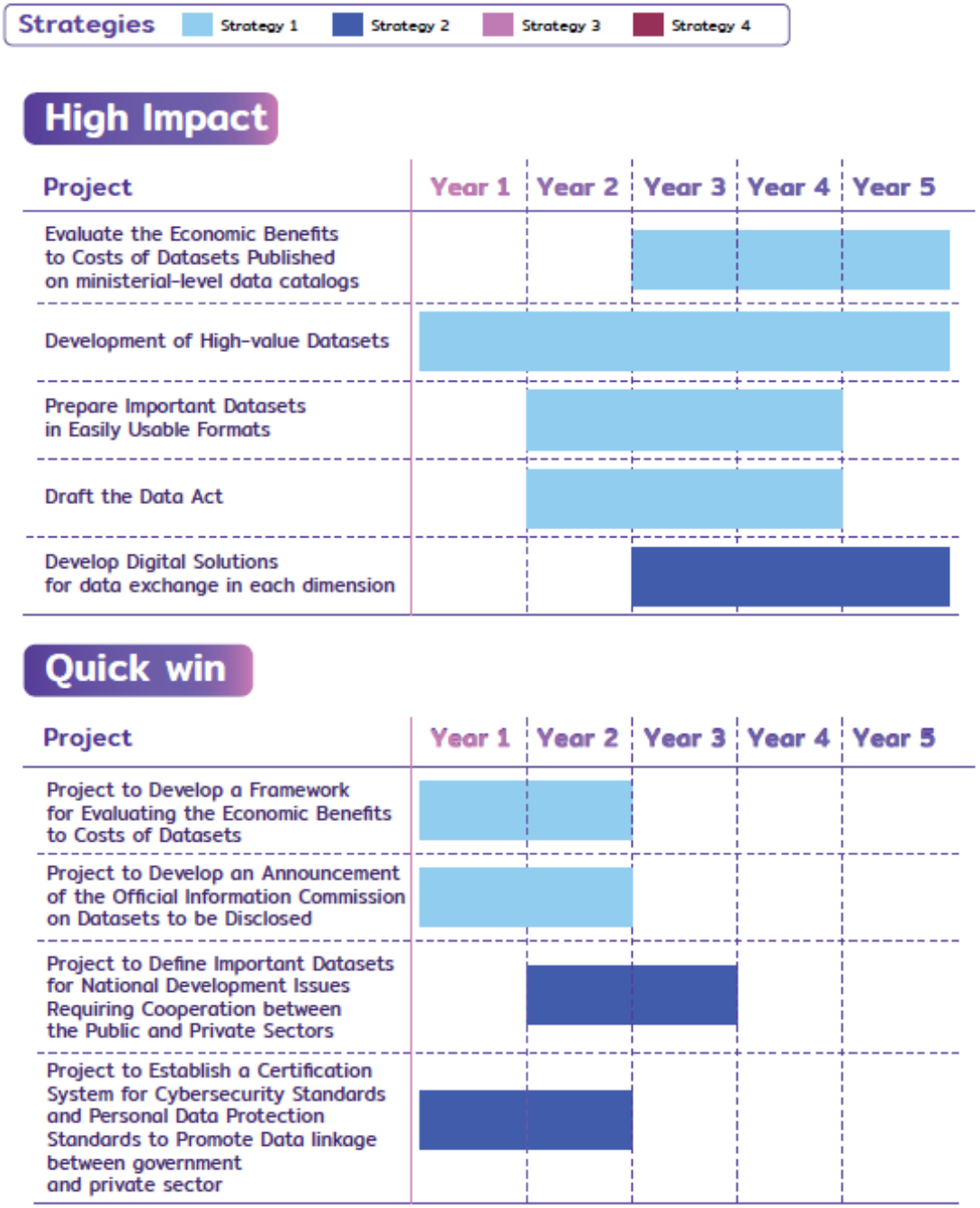
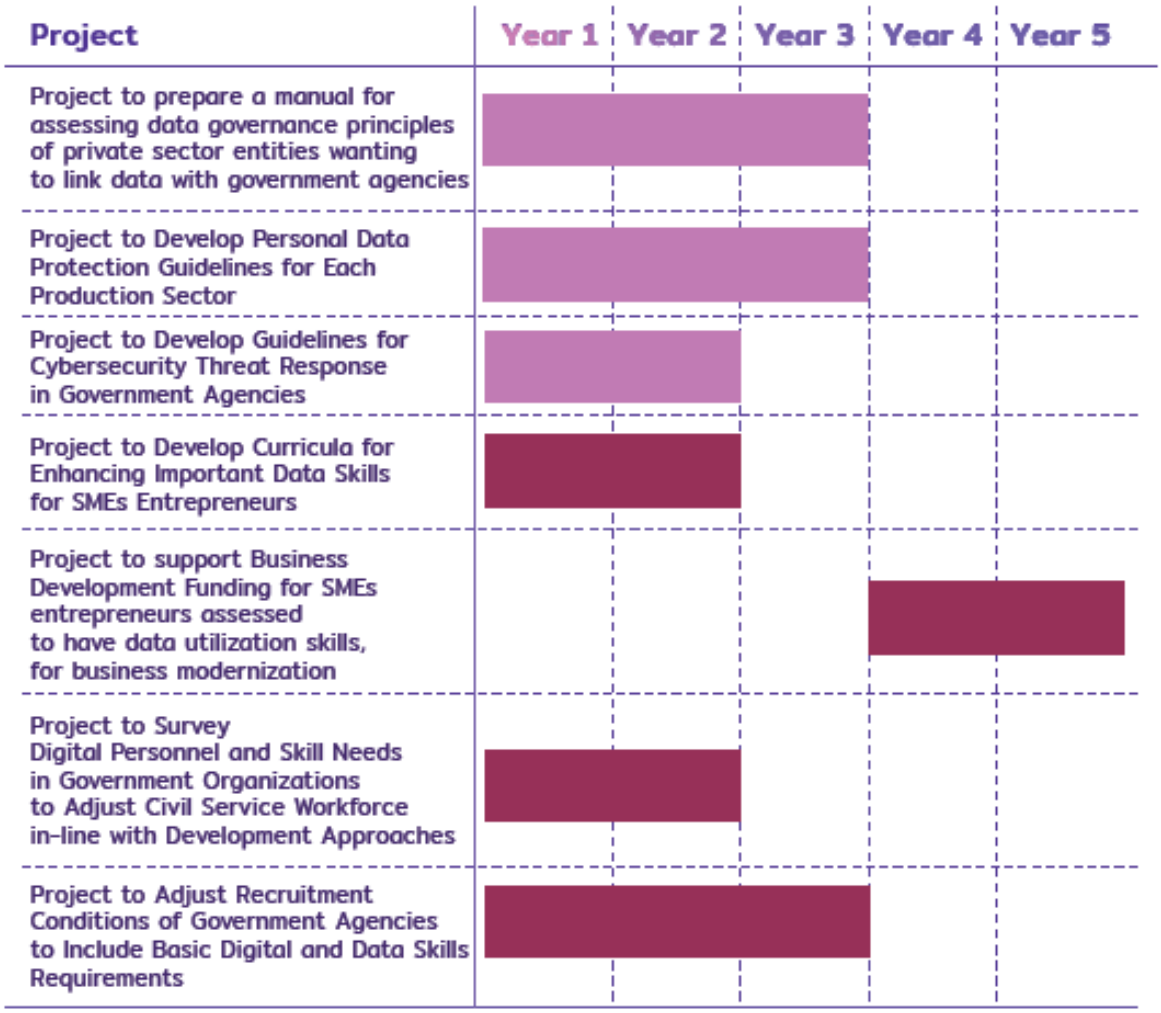


Figure 11: High-Impact Projects and Quick-Win Projects and their Implementation Timelines



Quick win


Project
Year 1
Year 2
Year 3
Year 4
Year 5
Project to prepare a manual for assessing data governance principles of private sector entities wanting to link data with government agencies
Project to Develop Personal Data Protection Guidelines for Each Production Sector
Project to Develop Guidelines for Cybersecurity Threat Response in Government Agencies
Project to Develop Curricula for Enhancing Important Data Skills for SMEs Entrepreneurs
Project to support Business Development Funding for SMEs entrepreneurs assessed to have data utilization skills, for business modernization
Project to Survey Digital Personnel and Skill Needs in Government Organizations to Adjust Civil Service Workforce in-line with Development Approaches
Project to Adjust Recruitment Conditions of Government Agencies to Include Basic Digital and Data Skills Requirements

From the detailed classification of projects into 3 groups based on project characteristics, cost, and importance, along with the defined project implementation timelines, it is possible to summarize the key goals and outcomes of the 5-year National Data Strategy Plan, categorized by different strategies, as shown in Table 10. Additionally, a summary of the implementation of the 5-year National Data Strategy Plan is presented in Table 11

Table 10: Summary of Key Goals and Outcomes of Thailand's 5-Year National Data Strategy Plan

Milestone	2025	2026	2027	2028	2029
Strategy 1 Enhance government data service		• Determine High-value datasets for urgent and essential development issues. • Complete description of metadata of government agencies • Notify the Announcement of the Official Information Commission on Datasets to be Disclosed (2025-2026) b.e.	Strategy for driving data in specific development issues	High-value datasets	Results of the evaluation of cost-benefit analysis of data
Strategy 2 Promote data collaboration between public and private sectors		• Public-private alliance on urgent and necessary issues • framework for data exchange between public and private sectors • Certification system for cybersecurity standards and personal data protection standards	• Public-private alliance on development issues according to the strategic data-driven plan • Digital solutions/platforms/applications that can utilize data between public and private sectors		
Strategy 3 Develop data governance and data linkage	Guidelines for the protection of personal data by industry	• Guide for cloud selection for government agencies • Guidelines for cyber threat response at the department level	Guide for assessing data governance in the private sector	Digital standards certification unit in Thailand	-
Strategy 4 Develop data skills for personnel in the public and private sectors		Courses to enhance critical data skills for SME entrepreneurs	Guidelines for assessing data competencies and the (minimum) number of skilled personnel in public agencies by level	Guidelines for managing data personnel in the public sector	Provide data grants to entrepreneurs based on specific eligibility criteria

Table 11: Summary of the implementation of Thailand's 5-Year Data Strategy Plan.

Strategy	Operation (year)				
	2025	2026	2027	2028	2029
Strategy 1 Enhance government data service	Foster understanding of the benefits of data.		Evaluate economic benefit of data		
	Develop frameworks, guidelines, or criteria for evaluating high-value datasets	Define categories or specific scope for the country's high-value datasets	Assess and identify high-value datasets through opinion hearing	Collect and publish high-value datasets	-
	Identify urgent development issues that require data for problem solving	• Collect and store critical data for problem solving in specific areas and present it in simple formats (data visualization)	-	-	-
	Define issues, directions, and objectives for data usage in development and problems solving		Prepare (draft) strategies for data-driven initiatives in specific development areas and conduct public hearing	Start implementing data-driven strategies for specific development areas	Disclose data in easy formats (data visualization)
	Survey and create metadata for all datasets held by agencies	Review submitted datasets and issue instructions to agencies to disclose additional information (when data should be public but hasn't been disclosed yet)	Encourage relevant agencies to annually update datasets titles		
	Draft a regulation for prohibited datasets using a negative list approach	Review submitted datasets and issue instructions to agencies to disclose additional information (when data should be public but hasn't been disclosed yet)	-	-	-

<table>
<tr><th rowspan="2">Strategy</th><th colspan="5">Operation (year)</th></tr>
<tr><th>2025</th><th>2026</th><th>2027</th><th>2028</th><th>2029</th></tr>
<tr><td rowspan="4">Strategy 2
Promote data collaboration between public and private sectors</td><td></td><td>Identify required datasets for the private sector in urgent development areas (within the 2nd quarter)</td><td>Identify required datasets for the private sector in development areas under the strategic data-driven plan</td><td></td><td></td></tr>
<tr><td>Establish criteria and conditions for offering incentives to private sector entities sharing data</td><td>Form collaborative alliance for key issues that require urgent solutions</td><td colspan="3">Identify required datasets for the private sector in development areas under the strategic data-driven plan</td></tr>
<tr><td colspan="2">Consult with stakeholders to select suitable digital solutions to achieve objectives</td><td colspan="3">Develop digital solutions system to support data disclosure and display</td></tr>
<tr><td colspan="2">● Prepare a (draft) framework for data exchange between public and private sector agencies
● Formulate systems for certifying cybersecurity standards and personal data protection standards</td><td colspan="3">-</td></tr>
</table>

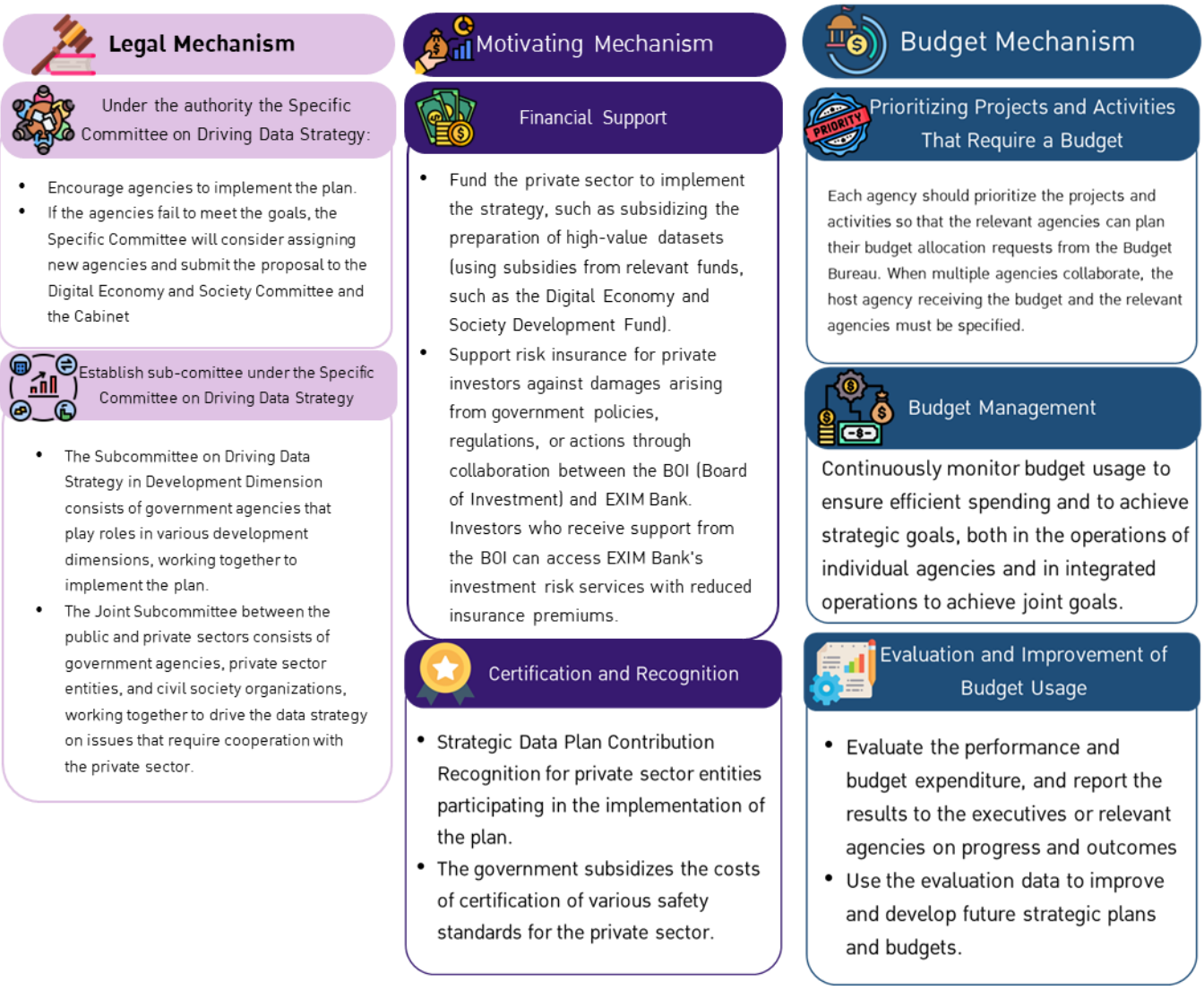
<table>
<tr><th rowspan="2">Strategy</th><th colspan="5">Operation (year)</th></tr>
<tr><th>2025</th><th>2026</th><th>2027</th><th>2028</th><th>2029</th></tr>
<tr><td rowspan="7">Strategy 3 Develop data governance and data linkage</td><td>Offer training courses on digital government</td><td colspan="4">● Monitor agencies that conform to digital government standards
● Assess needs and requirements for digital government standards to extend to new standards for currently-unaddressed issues</td></tr>
<tr><td>Prepare a (draft) guide for assessing data governance in the private sector</td><td>Gather feedback and make improvements</td><td>Notify the guidelines</td><td>-</td><td>-</td></tr>
<tr><td>Promote the benefits of migrating to cloud services</td><td>Develop a guide for cloud selection for government agencies</td><td>Compile a list of cloud providers certified for comprehensive security standards</td><td colspan="2">Monitor government agencies migrating to cloud systems</td></tr>
<tr><td>Provide consultation on migrating to cloud services</td><td colspan="2">Training on understanding and implementing personal data processing guidelines</td><td>Infographics on industry-specific personal data protection guidelines</td><td>Publish the list of agencies that have implemented guidelines</td></tr>
<tr><td>Select international standards for adoption as national inspection and certification standards</td><td>Survey needs and develop urgent standards to be issued as national standards</td><td></td><td>Support the inspection of digital standards certification in Thailand</td><td>Training activities to enhance knowledge and understanding of digital standards</td></tr>
<tr><td>Educate public officials on handling cyber threats</td><td colspan="2">Develop guidelines for handling cyber threats at the department level</td><td>Publish the list of agencies that have implemented guidelines</td><td></td></tr>
</table>

Strategy	Operation (year)				
	2025	2026	2027	2028	2029
ยุทธศาสตร์ที่ 4 การพัฒนาทักษะทางด้านข้อมูลให้กับบุคลากรในภาครัฐและเอกชน	Conduct a survey to assess the current needs, data-related skills, and the utilization of data, focusing on both the use of public sector data and private sector data.	Analyze survey results and hold brainstorming meetings; complete course development	Conduct training according to the established course, and analyze and evaluate feedback and satisfaction		
	-	-	Develop criteria and conditions for SMEs to qualify for funding	Select entrepreneurs To be granted	Offer funding
	Roll out the guidelines for surveys on workforce needs and digital skills in government agencies	Request cooperation and assess survey results	• Planning adjusted government workforce • Set guidelines for assessing data competencies and establish (minimum) skilled workforce levels for each agency	Guide on data workforce management practices	-

4.6 Implementation Mechanism for Thailand's 5-Year National Data Strategy Plan

Implementation from all sectors, both public and private, is crucial. Government agencies must systematically connect and integrate data, working together on policies, plans, and projects in a coordinated and interconnected manner that genuinely reflects development goals. This includes engaging with other sectors, both private and public, as development partners who are key drivers in achieving successful development outcomes. At the same time, the successful implementation of this data strategy plan requires effective and participatory monitoring and evaluation. This will provide relevant agencies with beneficial information to improve their work plans and methods to better meet their goals, ultimately leading to the plan's successful implementation. The principles of driving the plan into action are as follows: Since the (Draft) 5-Year National Data Strategy Plan covers the operations of all government agencies and involves the private sector in terms of building partnerships for data linkage, the principles for driving the plan into action may be implemented based on two key mechanisms: legal mechanisms and incentive mechanisms for the private sector, as shown in Figure 12, with the following details:

Figure 12: Overview of the Implementation Mechanism for Thailand's Data Strategy Plan



(1) Legal Mechanisms

(1.1) Utilize the authority of the Data Strategy Committee to support the implementation of the 5-Year National Data Strategy Plan using Section 14(1) of the Digitalization of Public Administration and Services Delivery Act, B.E. 2562 (2019) and to drive the relevant agencies to carry out their roles and responsibilities as assigned. In cases where any task or project lacks a responsible party or if an agency fails to meet its goals and responsibilities, the Data Strategy Committee may propose guidelines for assigning responsible agencies and implementation approaches to the National Digital Economy and Society Commission, which can then submit these proposals to the Cabinet in accordance with the authority granted by Section 14, Paragraph 2 of the Digitality for Economy and Society Act B.E. 2560 (2017).

(1.2) Establishment of subcommittees under the Data Strategy Committee for joint data development between government agencies in various developmental dimensions, and joint data development with the private sector, relying on the authority of the Data Strategy Committee (as per Section 18 of the Digitality for Economy and Society Act B.E. 2560 (2017)). These subcommittees will consist of government agencies driving data development in various dimensions to jointly implement the defined plan. Additionally, roles and responsibilities must be defined for government agencies responsible for implementing the strategic plan to ensure clarity for driving the data strategy to achieve the set goals. Meanwhile, the inter-ministerial and public-private subcommittees aim to foster collaboration with the private sector and the public to ensure participation and cooperation in collecting or sharing data with relevant government agencies in economic, social, and environmental development areas, as per the defined goals. This will help to promote effective collaboration.

(2) Incentive Mechanisms for the Private Sector

(2.1) Financial Support. For instance, financial support for data-related development from the Digital Economy and Society Development Fund can help reduce the costs associated with data and technology development. As the implementation of government plans may incur costs, such as data storage costs and personnel costs for coordinating, collaborating, or processing data for the government, the government may provide assistance in this regard. Additionally, risk insurance can promote private sector investment by mitigating financial risks that may arise from implementing government plans, such as risk insurance for companies investing in data infrastructure development, like data center development or data storage systems.

(2.2) Certification and Recognition. This includes providing certifications and recognition to private sector entities with outstanding performance or significant contributions in implementing the data strategy action plan. An example is the Strategic Data Plan Contribution Recognition that acknowledges private organizations' collaboration in data system development, data training support, data consultation, and data storage system certification. This will enhance data storage standards in the private sector to ensure quality and security in alignment with government objectives. The government will subsidize the cost of obtaining this certification.

(3) Budgetary Mechanisms

(3.1) Prioritization of projects and activities requiring budget allocation for each agency. This enables relevant agencies to plan their budget requests from the Budget Bureau. However, in cases where more than 2 relevant agencies are requesting the budget, and they are not within the same ministry, the primary agency should be the one to request the integrated budget and allocate the budget according to the desired outcomes in that strategy or project.

(3.2) Budget Management. Through continuous budget expenditure monitoring, the main goal is ensuring budget utilization aligns with the plan and resources, and are managed efficiently so that operations achieve their set targets.

(3.3) Evaluation and improvement of budget utilization. Performance and budget expenditure evaluations should be conducted to understand the efficiency and effectiveness of the projects. Progress and performance results should be reported to management or relevant agencies. Additionally, improvements and developments should be made by utilizing evaluation data to enhance future strategic plans and budgets.

4.7 Monitoring and Evaluation of the Strategy

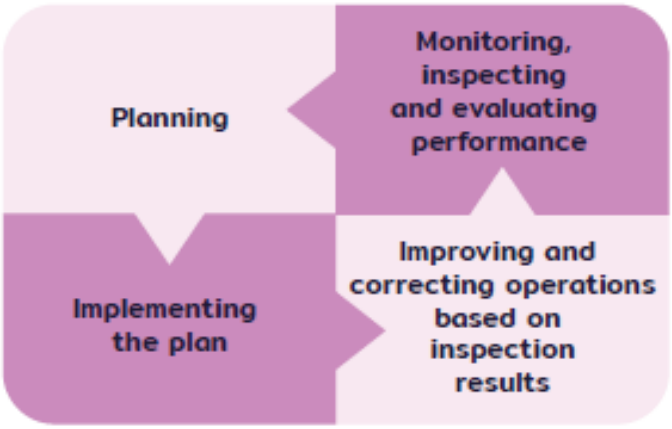
Monitoring and evaluation of the data strategy implementation covers monitoring and evaluation at both the program and project levels. This is to provide feedback to relevant agencies and development partners to review and improve plans and implementation methods in order to achieve the goals. It also includes measuring the overall effectiveness of the strategy's development and the main goals according to the indicators specified in the plan. In monitoring and evaluation at all levels, it is necessary to promote integration and participation to ensure efficiency and transparency. The monitoring and evaluation of the plan's implementation consists of:

4.7.1 Monitoring and Evaluation Mechanisms for Thailand's 5-Year National Data Strategy Plan

(1) Using the Quality Management Cycle as a framework for monitoring and evaluation to establish a systematic workflow with continuous improvement, encompassing 4 interconnected stages: 1) Planning, 2) Implementation according to plan, 3)

Monitoring, inspection, and evaluation of operations, and 4) Modification and improvement of operations based on audit outcomes.

Figure 13: Quality Management Cycle



(1.1) Planning involves strategic planning for monitoring and evaluation by setting clear objectives, goals, and success indicators. It also includes analyzing the environment and factors that may affect operations, along with planning strategies and defining monitoring and evaluation methods, as well as allocating necessary resources.

(1.2) Implementation according to plan involves carrying out actual operations by effectively following the processes outlined in the plan, along with systematic monitoring and recording of operational results.

(1.3) Performance-based strategy monitoring and evaluation prioritizes measuring the success of operations using tangible goals, indicators, and target values in terms of both efficiency and effectiveness.

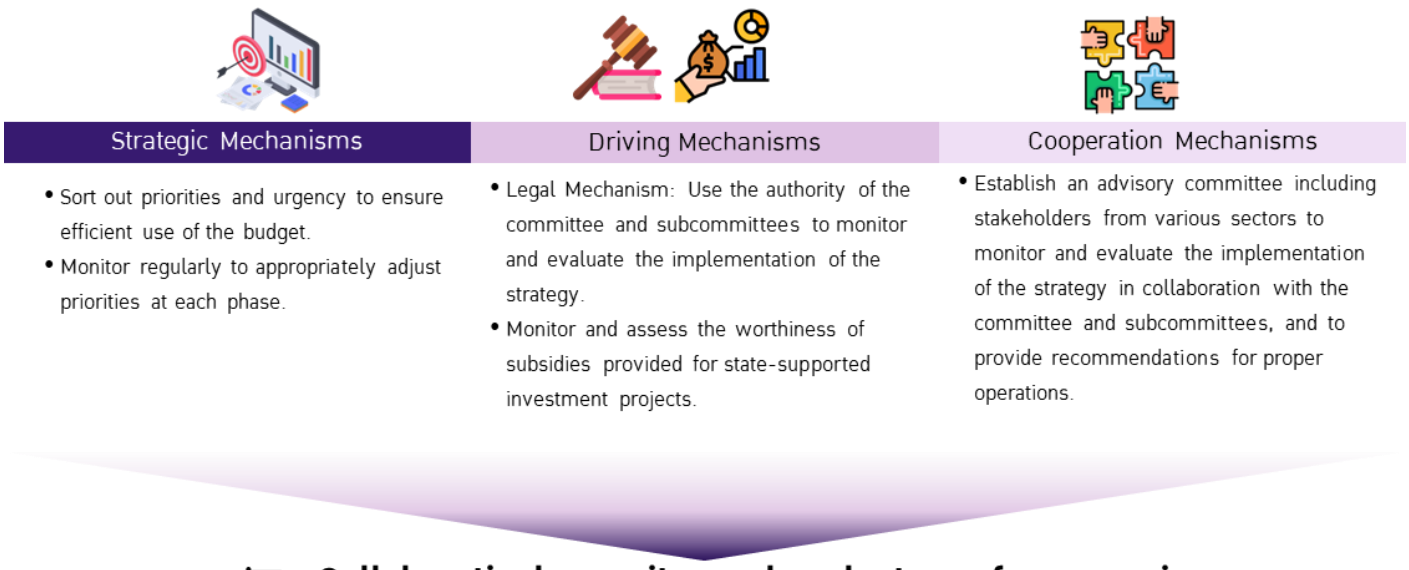
- Continuous monitoring and evaluation by collecting data related to the indicators and using data management systems or tools that facilitate effective monitoring.
- Periodic inspection and analysis of collected data to assess progress towards achieving goals and comparing results to set targets for preliminary success checks.
- Preparation of clear and useful reports for related parties, such as the Data Strategy Committee, to inform all relevant parties of operational results and changes.

(1.4) Modification and improvement of operations based on audit outcomes by using the evaluation results as a guide to improve and refine operational

processes, establish measures to address problems, enhance operations, and review and update plans based on the evaluation results to ensure continuous development.

(2)Integration of multi-dimensional mechanisms to ensure comprehensive, transparent, and properly audited monitoring and evaluation. The multi-dimensional mechanisms should include:

Figure 14: Integration of multi-dimensional mechanisms



(2.1) Strategic Mechanism. This focuses on prioritizing tasks based on their importance and urgency, allowing for appropriate resource and time allocation. It also includes monitoring and evaluating the implementation of the strategy to determine its success and identify any operational issues. The information will be used to adjust the prioritization and urgency of plans in each phase as circumstances change.

(2.2) Plan Implementation Mechanism. By utilizing legal mechanisms, operation monitoring, and result evaluation through reports to the Data Strategy Committee, joint sub-committees between government agencies, and joint sub-committees between government agencies and the private sector, the progress of operations can be monitored according to the missions of various responsible agencies based on the authority under Section 14 (3) of the Digitality for Economy and Society Act B.E. 2560 (2017). This is to assign new

responsible agencies in case action was not carried out according to the plan. In addition, these committees and sub-committees also have the duty to monitor the effectiveness of various incentive mechanisms, which may be measured by the return on investment from the funding compared to the benefits realized from projects that received financial support, as well as review the direction of operations of private sector agencies and the response and cooperation of the private sector based on the recognition and certification mechanisms.

(2.3) Cooperation Mechanism. Operations will be conducted through collaboration from all sectors to build acceptance and reduce limitations arising from operations by a single agency or solely by the government. Emphasis will be placed on coordinated operations with shared goals through the appointment of an advisory committee (utilizing the authority under Section 14 (5) of the Digitality for Economy and Society Act B.E. 2560), with representatives from various sectors to provide diverse and comprehensive opinions and recommendations across multiple dimensions. The committee will also oversee operations in conjunction with various sub-committees. This approach ensures monitoring and evaluation are based on facts, transparency, and diverse perspectives.

4.7.2 Monitoring and Evaluating Strategies under Different Strategy Plans

From the monitoring and evaluation mechanisms of Thailand's 5-Year National Data Strategy Plan, which are the overall operational mechanisms of the plan, the approach to monitoring the effectiveness of each strategy under the plan divides the goals and expected operational outcomes into 3 phases: Phase 1 (2025-2026), Phase 2 (2027), and Phase 3 (2028-2029). The details of the progress in each phase, the main responsible agencies, and the supporting responsible agencies can be summarized as follows.

Table 12: Monitoring and Evaluation Guidelines for Each Strategy

Strategy	Phase 1 (2025-2026)	Phase 2 (2027)	Phase 3 (2028-2029)	Lead Agency	Support Agency
Strategy 1: Enhance Government Information Services					
(1) Data planning, collection, and storage					
(1.1) Foster understanding of data benefits among government agencies.	Activity completion 100%	Evaluation 100%		• Digital Government Development Agency • Agencies under the Ministry of Digital Economy and Society	Government personnel at the department level
(1.2) High-Value Data (HVD) Storage	Develop framework and guidelines for evaluating the cost-benefit of datasets 100%	Cost-benefit evaluation 100%	Track evaluation results 100%	• Office of the National Digital Economy and Society Commission • Other agencies under the Ministry of Digital Economy and Society	Permanent Secretary Offices in each ministry, especially those related to social, environmental, and economic affairs
(1.3) Define and Promote Data Storage by Regulators	Develop framework or guidelines, and define criteria and categories 100%	Asses and identify high-value datasets 100%	Store, disseminate datasets, and evaluate 100%	Digital Government Development Agency	Government agencies at the ministerial level
(1.4) Encourage government agencies to create data-driven plans by branch or on key issues.	Identify necessary and urgent development issues 100%	Create plans 100%	Promote, implement, and monitor results 100%	• Office of National Digital Economy and Society Commission (ONDE) • Other agencies under the Ministry of Digital Economy and Society • Digital Government Development Agency	Government agencies at the ministerial level
(2) Data Utilization					
(2.1) Disclose data names and metadata	Survey and organize metadata 100%	Review datasets and disclose data 100%	Promote and monitor 100% (annually)	• Data Strategy Committee • Office of National Digital Economy and Society Commission (ONDE) • Digital Government Development Agency (DGA)	Government agencies at the departmental level

Strategy	Phase 1 (2025-2026)	Phase 2 (2027)	Phase 3 (2028-2029)	Lead Agency	Support Agency
(2.2) Promote data disclosure to the public	Define data categories, draft announcements, propose, and enforce 100%	Utilization 100%	Utilization 100%	• Office of National Digital Economy and Society Commission (ONDE) • Office of the Official Information Commission • Other agencies under the Ministry of Digital Economy and Society	Office of the Official Information Commission
(2.3) Promote data utilization	Collect and gather 100%	Disclose data 100%	Utilize and evaluate 100%	• Office of National Digital Economy and Society Commission (ONDE) • Digital Government Development Agency • Other agencies under the Ministry of Digital Economy and Society	Government agencies at the ministerial level

Strategy	Phase 1 (2025-2026)	Phase 2 (2027)	Phase 3 (2028-2029)	Lead Agency	Support Agency
Strategy 2: Promote data collaboration between the public and private sectors					
(1) Private sector participation in driving data.					
(1.1) Define key datasets	Define development issues and timeframes 100%	Prepare a data-driven plan 100%	Implement, evaluate, and monitor results 100%	• Office of the National Digital Economy and Society Commission (ONDE) • Digital Government Development Agency	Ministries and government agencies
(1.2) Establish public-private partnerships	Define conditions or guidelines for creating incentives and establishing partnerships 100%	Coordinate 100%	Monitor and evaluate 100%	• Office of the National Digital Economy and Society Commission (ONDE) • Digital Government Development Agency • Government agencies responsible for preparing data-driven plans for each development issue	Private sector entrepreneurs
(2) Measures to support data sharing between the public and private sectors					
(2.1) Develop a central data sharing framework for public-private sectors	Develop a data exchange framework 100%	Utilization 100%	Evaluate and improve 100%	• Office of the National Digital Economy and Society Commission	Government agencies and private sectors that will exchange data with each other
(2.2) Have security certification measures for platforms or applications	Announce and set standards 100%	Utilization 100%	Monitor usage 100%	• Personal Data Protection Committee • National Cyber Security Agency	Data providers
(2.3) Have measures to grant benefits to the private sector or the public who disclose or share data	-	Consult with stakeholders and prepare agreement 100%	Implement and evaluate user satisfaction 100%	• Government agencies owning the project • Private agencies participating in the project or private agencies responsible for system development	Data users from both the public and private sectors

Strategy	Phase 1 (2025-2026)	Phase 2 (2027)	Phase 3 (2028-2029)	Lead Agency	Support Agency
Strategy 3: Develop data governance and data linkage					
(1) Standards for data linkage between the public and private sectors					
(1.1) Promote and create understanding for government agencies to implement Digital Government Standards	Organize training courses 100%	Audit and monitor 100%	Check for additional needs and improve 100%	• Digital Government Development Agency	Government agencies
(1.2) Standardized data management and storage, adhering to the Digital Government Standards as the minimum criteria	Prepare a manual 100%	Announce and implement the manual 100%	Monitor and evaluate 100%	• Digital Government Development Agency • Digital Council of Thailand	Government agencies
(2) Data Security					
(2.1) Develop specific personal data guidelines for each production sector	Prepare and publish 100%	Training activities 100%	Evaluate results and monitor 100%	• Personal Data Protection Committee	Private entrepreneurs, government agencies that provide services to the public
(2.2) Promote the use of cloud services that are managed securely according to standards	Publicize and develop 100%	Utilization 100%	Monitor and audit 100%	• Office of the National Digital Economy and Society Commission • National Cyber Security Agency	Government agencies
(2.3) Enhance data security and reliability verification and certification	Drive standards and survey needs 100%	Organize support activities and training 100%	Follow up on results 100%	• Office of the National Digital Economy and Society Commission • Thai Industrial Standards Institute • Electronic Transactions Development Agency • Engineering Institute of Thailand • Digital Economy Promotion Agency • National Electronics and Computer Technology Center	Private entrepreneurs, verification and certification entities, government agencies that provide services to the public

Strategy	Phase 1 (2025-2026)	Phase 2 (2027)	Phase 3 (2028-2029)	Lead Agency	Support Agency
				• Digital Council of Thailand	
(2.4) Require government agencies to have guidelines for dealing with cyber threats	Training activities 100%	Prepare guidelines 100%	Monitor and evaluate results 100%	• National Cyber Security Agency	Government agencies
Strategy 4: Develop data skills for personnel in the public and private sectors.					
(1) Promoting and supporting the enhancement of SME capabilities					
(1.1) Develop digital skills and expertise	Define target groups, survey, and develop training courses 100%	Conduct training 100%	Analyze and evaluate training results 100% Prepare promotion conditions and implement 100%	• Office of Small and Medium Enterprises Promotion (OSMEP) and Big Data Institute (Public Organization) • Office of the National Digital Economy and Society Commission (ONDE)	SME entrepreneurs
(2) Increasing personnel with data skills					
(2.1) Adjust Government Workforce	Survey personnel and skill needs 100%	Plan operations 100%	Prepare a management practice manual 100% Implement and monitor results 100%	• Office of the National Digital Economy and Society Commission (ONDE) • Office of The Civil Service Commission (OCSC)	Personnel of government agencies at the department-ministry level
(2.2) Adjust government recruitment conditions to include basic digital and data skills requirements	-	Survey needs and design implementation guidelines 100%	Use, monitor, and improve 100%	• Office of the National Digital Economy and Society Commission (ONDE) • Office of The Civil Service Commission (OCSC) • Thailand Professional Qualification Institute (Public Organization)	Government personnel

Appendix 1: Glossary

Terms	Definitions
Data Governance	The establishment of rights, duties, and responsibilities in data management. The scope covers creation, storage, categorization, processing, usage, disclosure, auditing, and erasure of data. This includes the formulation of measures to control and improve data quality to ensure accuracy and usability, keeping data up-to-date, as well as setting clear rules for data access and utilization with appropriate security measures in place.
Data Alliance	A collaboration of organizations to prepare data through cooperation in setting policy directions, integration, and data exchange among alliance members. The pros include the host organization being responsible for all infrastructure costs. Meanwhile, alliance members have access to raw data owned by other members, or only alliance members can use the alliance's data services.
Interoperability Framework	This is a principle for designing data architecture to enable interoperability in terms of system design, system structure, and semantic standards for data recording. When organizations adhere to these principles, data linkage becomes easier.
Semantic Standards	The establishment of methods and rules for recording data in which systems can understand, such as specifying methods for recording product codes by industry number or country codes.
Data Architecture	The design and layout of data management systems across all processes. This concerns planning the workflow of data circulation within an organization. This may include processes in both software and hardware.
Government Data Catalog	The government data catalog is referred to a central digital catalog for government data that conforms to the government data governance framework and guidelines for creating government data catalogs. Data-owning agencies manage their own data catalog systems, input ready-to-use datasets into their own agency's data catalogs and register important datasets into the government data catalog. Thanks to this, users can search and access government data from the original sources. Datasets are categorized for easy access by users such as government officials and the general public. The system also forwards data to the government data catalog service system to provide API services and services to various data centers, such as the Open Government Data Center (data.go.th), as well as other platforms. This fosters the culture of collaboratively

Terms	Definitions
	sharing and utilizing government data. It results in a digital government that drives the country with data towards the goal of public well-being.
Metadata	Information that is used to describe datasets, specifying details about the data source and providing explanations about the data. This helps users understand where the data comes from and its format. It also promotes data searches and supports the creation of data catalogs for organizations and the country. It bolsters data disclosure, linkage, and exchange.
Digital Solution	The application of digital tools or technologies to solve problems or improve the efficiency of services provided by agencies or organizations. This covers a wide range of digital services, from creating data dashboards to providing intermediary data services and establishing data marketplaces.
Data Sharing	The process of making data available for use by other agencies, organizations, or individuals under agreed conditions, or referencing for sharing, exchanging, and extending data to support the community infrastructure of user groups or platform users.
Data Integration	Data integration, sometimes referred to as data linkage, is when two or more agencies agree to cooperate in linking data, whether raw or statistical, to generate new datasets. This can be automatic or manual.
Data Marketplace	A platform or service that acts as a central market for buying, selling, and exchanging data. It consists of data from lots of agencies in many forms, allowing data users to select and purchase data from these markets.
Data Visualization	The presentation of complex data in a user-friendly format such as charts, images, graphs, tables, or videos.
High-value Datasets	Datasets that are in high demand, meet user needs, and can generate significant economic and social benefits. These datasets can also be used to monitor and evaluate the implementation of national plans and policies, such as the 20-Year National Strategy and the National Economic and Social Development Plan. Additionally, they can be used to assess the country's performance according to international indicators, such as the Sustainable Development Goals indicators.
Data rule	The establishment of rules for recording data within an organization to ensure consistency in data recording across the organization. This involves specifying methods for recording data in each section, such

Terms	Definitions
	as recording dates in the format dd-mm-yyyy or using N/A for missing data.
Data Profiling	The process of inspecting data quality within an organization against the organization's data rules. This assessment determines whether data recording adheres to these rules and includes generating summary reports to enable employees or departments responsible for the data to improve the quality of datasets as appropriate.
Social welfare	The total sum of utilities of individuals in society. That is to say, higher social welfare indicates that various interest groups such as producers, consumers, and the government are more satisfied with the current economic landscapes. It can be calculated in monetary terms when considering willingness to pay and willingness to accept.
Sum-of-cost approach	A method of evaluating the value of a project, product, or anything by calculating the sum of costs involved in its creation or implementation.
Discount Rate	The rate used to convert future values into present ones.
Economic Internal Rate of Return (EIRR)	The rate of return used to evaluate projects or investments that impact the economy. The factors to be considered include capital costs, income, expenses, and positive and negative benefits stemming from the project. EIRR is the rate at which the total value of returns equals the total value of capital costs after calculating with a project-specific interest rate.
Benefit-Cost Ratio: BCR	A ratio used to assess the cost-effectiveness of a project or investment. This divides the total benefits generated by the project by the total investment costs. Generally, if BCR > 1, it indicates that the benefits outweigh the investment costs. So, the project is regarded as cost-effective. If BCR < 1, the investment costs exceed the benefits to be from the project.
Sensitivity analysis	This type of analysis assess the potential impact on the outcomes or benefits of a project or investment amid changes in key variables or factors, such as interest rates, investment costs, or environmental factors that may affect the operation of the project or investment.

Appendix 2: High-Value Datasets of First Priority

In preparing the action plan for driving Thailand's data strategy, one of the key mechanisms is the creation of high-value datasets. These datasets are in high demand, meet user needs, and can be used to monitor the country's performance according to international indicators.

Listed below are the 5 steps in the process of preparing high-value datasets:

(1) Prioritizing and identifying the urgency of promoting datasets to become high-value datasets. In this step, high-value datasets are prioritized so that the first dataset can be created among all high-value datasets. The criteria are as follows:

Table A.1: Recommendations on Criteria for Prioritizing Datasets to be Promoted as High-value Datasets

Priority	Criteria	Importance and Necessity
Rank 1	• Datasets that respond to the needs for utilization in operation according to the National Strategy 2018-2037 • Datasets vital for maximizing the country's competitiveness and catering to the needs of the government, private, and civil sectors. • Datasets used for monitoring and measuring the country's competencies according to international indicators formulated by IMF, IMD, World Bank, and SDGs.	These datasets satisfy the needs of the government, private, and civil sectors. They are also aligned with Thailand's development contexts. The sets can also serve to measure the country's competencies against the international levels. For this reason, they should be urgently promoted as the top priority.
Rank 2	• Datasets that respond to the needs for utilization in operations according to the National Strategy 2018-2037 • Datasets that are key for strengthening the country's competitiveness, meeting the needs of the government, private, and civil sectors.	These datasets respond to domestic needs of data utilization among the government, private, and civil sectors. They may be specific to Thailand's contexts and may not align with datasets in other countries. However, they should be promoted to primarily meet local needs.
Rank 3	• Datasets used for monitoring and measuring the country's competencies according to international indicators formulated by IMF, IMD, World Bank, and SDGs. • Datasets that fulfill the needs of the private and civil sectors.	These datasets are used to measure the country's competencies at the international level and meet the needs of the private and civil sectors for data utilization. Its extent of priority is lower.
Rank 4	• Datasets used for monitoring and measuring the country's capabilities according to international indicators formulated by IMF, IMD, World Bank, and SDGs.	These datasets are used to primarily measure national competencies. But they have lower conformity with Thailand's development contexts. So, they are important and should be promoted, but may be implemented after promoting datasets that are more important and aligned with Thailand's development context.

(2) Considering the impact and utilization approaches of datasets. After prioritizing high-value datasets, data subjects or responsible agencies of each development issue should evaluate the impact and utilization approaches of all datasets designated as the top priority. This should look into the economic and social benefits of the datasets. There are 6 dimensions for impact assessment:

Environment: high-value datasets offer value in terms of (1) fostering public participation in climate change management, (2) creating environmental management, (3) boosting

energy management efficiency, and (4) increasing efficiency of natural resources and environmental management.

Economy: high-value datasets help promote added value for the economy at both private sector and overall levels by expanding value in terms of (1) accommodating competition, (2) maximizing economic productivity, (3) ensuring consumer benefits, (4) supporting efficiency in economic monitoring, (5) bolstering employment, (6) magnifying productivity and promoting trade, (7) fueling international competitiveness, (8) increasing efficiency in coordination between public and private sectors, (9) driving market dynamics of goods, and (10) strengthening credibility in business operations and transactions.

Innovation: high-value datasets help foster new innovations that benefit the government, private sector, public, and civil society by creating value in terms of (1) promoting innovations related to the civil sector, (2) expanding innovations related to government operations, (3) spurring innovations in the private sector, and (4) achieving coordination between public and private sectors.

Public service: high-value datasets offer positive results regarding access, efficiency, and quality of public services in dimensions such as (1) promoting access to public services, (2) increasing efficiency of public services, (3) spurring competition in government procurement, (4) expanding government revenue, (5) boosting management efficiency of public services, and (6) improving transparency and participation in public administration.

Social: high-value datasets can ensure transparency and benefits to society. Value can be found in several dimensions such as (1) lowering crime and maximizing social justice, (2) promoting disease forecasting and prevention, (3) bolstering access to transportation and travel systems, (4) fostering efficiency of transportation and travel systems, (5) developing transportation and travel planning, and (6) designing transportation and travel systems for all groups of people.

Potential for dataset reuse: high-value datasets refer to those that are in high demand and have the potential to be utilized in conjunction with other datasets. In fact, datasets cannot be considered high-value if they cannot be reused and connected with other datasets for utilization. Their value include (1) demand for dataset use from private and civil sectors, as measured by indicators such as number of data accesses, number of reuses, and data requests, (2) datasets have credibility of reuse, and (3) datasets have a high volume of downloads.

Additionally, after the impacts across dimensions are assessed, agencies should evaluate the costs of creating each dataset. It can be divided into one-off costs (e.g., costs for data collection and connection) and recurring costs (e.g., system management costs, annual

dataset quality improvement costs). These should be compared with expected benefits from each dataset. Datasets with the highest value should be prioritized for creation.

(3) Assessing the readiness of datasets to be promoted as high-value datasets. This step is done after the prioritization and the impact assessment of the data. At this stage, agencies can identify datasets that are of high-value and deserve urgent actions. Therefore, in the next step, agencies will have to assess the readiness of datasets. Different scenarios as shown in Table A.2.

Table A.2: Scenarios of dataset readiness in Thailand

Readiness of Dataset	Scenario	Details and Initial Recommendations
(1) The government has collected and stored the dataset	Scenario (1.1) The dataset is currently designated as a high-value dataset	Consider the completeness and quality of the dataset to make it as up-to-date as possible
	Scenario (1.2) The dataset is public data but has not been designated as a high-value dataset	Criteria and guidelines for determining high-value datasets need to be revised to label important datasets as high-value datasets
	Scenario (1.3) The dataset is a core dataset of the agency but has not been made public.	Personal data's details must be restricted and beneficial parts of the data should be unlocked to become public data
	Scenario (1.4) The dataset has been collected and stored but has not been disclosed as public data	Consider the readiness to link data between agencies or release as public domain
(2) The government has not collected and stored the data	Scenario (2.1) The dataset is collected and stored by the private and civil society sector	Case 1: For datasets under the scope of supervision of the regulatory agencies, the said agencies should formulate regulatory conditions of data submission to the government applied to the private sector Case 2: For datasets not under government regulation, it is advisory that parties create cooperation to link data between the government, private, and civil society sectors
	Scenario (2.2) The dataset has not been collected. Collection is required.	These are datasets that government agencies can collect under the current operational context but it has not happened yet. Relevant agencies should proceed with additional data collection, possibly in conjunction with data impact assessment to reflect the importance of data collection.
	Scenario (2.3) The dataset cannot be collected. They must be gathered through surveys.	These are datasets that government agencies cannot collect under the current operational context. If the datasets are required, they must be gathered through surveys, possibly in conjunction with data impact assessment to highlight on the importance of data surveying

(4) Developing standards for high-value datasets. After determining datasets to be promoted or created, and assessing the readiness of datasets, the creation of datasets should involve defining standards and guidelines for data recording in a consistent manner. The responsible agencies should identify the metadata of the high-value datasets to be created, so that data subjects or agencies responsible for creating datasets can proceed according to the needs of using those datasets. For international-level indicators such as SDGs and IMD World Competitiveness, agencies should adhere to the metadata of international organizations, such as the United Nations' SDG Indicators Metadata.

(5) Linking data between agencies to create high-value datasets. In cases where datasets require data from many sectors, it is ideal that the host agency for each dataset be the focal point in linking data to prepare high-value datasets. This must be done according to interoperability standards in integrating and linking data between agencies.

According to the guidelines of pointing out the importance of datasets, this section will describe examples of datasets with first priority in 7 dimensions of industrial sectors and development issues, namely (1) agriculture and natural resources, (2) public health, (3) transportation, (4) finance and treasury, (5) tourism, (6) industry and commerce, (7) social, economic, and welfare development. Examples of datasets that should be promoted as high-value datasets of first priority importance across dimensions are listed in Tables A.3- A.9.

Table A.3 Examples of datasets that should be promoted as high-value datasets of top priority in the Agriculture and Natural Resources sector

Dataset Type	High-Value Dataset	Dataset Details (Key Variables)	Dataset Readiness Status
(1) Datasets used for driving operations			
(1.1) Mobility and datasets for statistical preparation	Agricultural product traceability system (Data Traceability)	Product details	No data collection found
		Products' standards and guarantees	
		Manufacturers' description	
		Raw material suppliers	
		Production farms or plots	
		Importers/distributors	
		Supply chain logistics data	
(1.2) Datasets for statistical compilation	Production cost dataset	Crop seed prices	Intermittently-collected and disclosed through agency information systems
		Animal breeding stock prices	Collected and disclosed through agency information systems
		Agricultural product transportation costs and methods	No data collection found
		Animal feed prices	Collected and disclosed through agency information systems
		Fertilizer prices	Collected and disclosed through agency information systems
	Water dataset	Water volume stored by area and time period	Collected and disclosed
		Rainfall amount	Collected and disclosed
		Forecasted rainfall	Collected and disclosed
	Agricultural product price dataset	Agricultural product prices	Collected and disclosed
		Agricultural price forecasts	No data collection found
(1.3) Geospatial	Fundamental Geographic Data Set (FGDS)	Fundamental Geographic Data Set (FGDS)	Partially collected and disseminated
	Soil dataset	Soil quality	Collected and disclosed
	Disaster dataset	Historical disaster occurrences	Compiled and disseminated
		Disaster forecasts	Compiled and disseminated
		Recurrent flood areas	Compiled and disseminated
(2) Datasets used for monitoring operations			
(2.1) Datasets for statistical compilation	Production productivity and efficiency cost dataset	Value of local identity agricultural products	Collected and disseminated, separated by product type, and no data on livestock products (Phon Yang Kham beef, Chaiya salted eggs, Betong chicken)

Dataset Type	High-Value Dataset	Dataset Details (Key Variables)	Dataset Readiness Status
		Value of safe agricultural products	Collected and disseminated for livestock products, lacking data on crops and fisheries
		Value of bio-agricultural products	Collected and disseminated
		Value of processed agricultural products	Collected and disclosed
		Value of products using modern technology	No data collection found
		Agricultural production data	Compiled and disseminated
(2.2) Statistics	Production productivity and efficiency cost dataset	Gross Domestic Product in the agricultural sector	Compiled and disseminated
		Agricultural sector production productivity	Compiled and disseminated
		Net income per agricultural household	Collected and disseminated
		Agricultural labor productivity	Collected and disseminated
	Food security dataset	Quality and safety index under the Food Security Index	Collected and disseminated
		Food insecurity	No data collection found
		Malnutrition	Collected and disseminated every 3 years (only among children)
		Plant and animal resources in conservation plans and proportion of animals at risk of extinction	No data collection found
		Prevalence of malnutrition	No data collection found
		Income of small-scale food producers	No data collection found
		Abnormal food price indicators	No data collection found

Dataset Type	High-Value Dataset	Dataset Details (Key Variables)	Dataset Readiness Status
(2.3) Earth observation and environment data	Water dataset	Water volume in reservoirs	Collected and disclosed
		Irrigation system efficiency	No data found
		Water reuse	No data found
		Water source quality	Data collected
		Water stress level	No data found
		Wastewater treatment	Collected and disclosed
	Protected area dataset classified by ecosystem	Boundaries of protected areas related to marine areas	Collected and disseminated
		Boundaries of natural protected areas	Collected and disseminated
		Important biodiversity areas	Collected and disseminated
		Forest areas	Collected and disseminated
		Total land areas and degraded land areas	No collection and dissemination found
		Mountain area index and proportion of degraded mountain areas	No collection and dissemination found
		Green area dataset	Being Collected
		Average pH of seawater	No data dissemination found
		Plastic waste density	No data dissemination found
	Comprehensive water management dataset	Percentage of households with clean drinking water	Collected and disseminated
		Percentage of households with hygienic toilets	Collected and disseminated
		Proportion of safely treated domestic and industrial wastewater	No dissemination found
		Proportion of water sources with good surrounding water quality	Collected and disseminated
		Water stress level	Collected and disseminated
		Changes in water-related ecosystems over time	No collection and dissemination found
	Waste management dataset	Proportion of urban solid waste regularly collected and with appropriate final disposal	Collected and disseminated
		Recycling rate	Collected and disseminated
		Hazardous waste per capita and proportion of treated hazardous waste	Collected and disseminated
	Dataset on actions to combat climate change and its impacts	Greenhouse gas emissions classified by economic activity, industry type, and province	Collected and disseminated but not comprehensive
		Air quality dataset	Collected and disseminated but not covering all areas
(2.4) Geospatial	Agricultural area dataset	Areas with sustainable agriculture practices Data	collected but inconsistently disclosed
		Organic farming areas	Collected and disseminated

		Areas certified for Good Agricultural Practices	Collected and disseminated
		Unsuitable cultivation areas	Data found but not systematic
		Areas at risk of flooding and drought	Collected and disseminated

Table A.4: Examples of datasets that should be promoted as high-value datasets of first priority importance in the Public Health sector

Dataset Type	High-Value Dataset	Dataset Details (Key Variables)	Dataset Readiness Status
(1) Data used for driving operations			
High-Value for statistical preparation	Mortality dataset	Number of deaths classified by cause, age, and gender	Collected and disseminated
	Public behavior and knowledge dataset	Health knowledge	Collected and disseminated
		Collected and disseminated Location of parks and community recreational areas	Partially collected and disseminated
	Health risk dataset	Daily PM 2.5 levels	Collected and disseminated
		Road accident locations	Collected and disseminated
		Diseases and symptoms	Collected and disseminated
		Survey data on Thai behavior in 5 disease groups	Collected but no dissemination found
	Healthcare facility resource dataset	Resources in each service unit	No data collection found
	Healthcare access dataset	Number of healthcare personnel by areas	Collected and disseminated
		Healthcare personnel demand by area	No data disclosure found
(2) Data used for monitoring			
Statistics	Life expectancy and mortality dataset	Mortality rates for major diseases	Collected and disseminated
		Road traffic injury mortality rate	Collected and disseminated
		Premature mortality rate from NCDs	Collected and disseminated
		Healthy life expectancy	Collected and disseminated
		Healthy Ageing rate	Collected and disseminated
	Public behavior and knowledge dataset	Health literacy rate of the population	Collected and disseminated
		Health behaviors of Thai people	Collected and disseminated
		Public knowledge level about emerging and re-emerging diseases	No data disclosure found
		Prevalence of risky behaviors	Collected and disseminated as reports
	Healthcare coverage dataset	Target poor groups identified by TPMAP data who are lacking in health dimension and received care	No data collection found
		Proportion of primary care units (PCCs) with family medicine teams	No data collection found
		Number of specialized medical centers in 4 main fields across 12 health regions	No data collection found

Dataset Type	High-Value Dataset	Dataset Details (Key Variables)	Dataset Readiness Status
		Overall bed-to-population ratio and distribution across areas	Collected and disseminated
		Waiting time for outpatient department treatment	Collected but no systematic dissemination found
		Rate of referrals outside the health region	Collected and disseminated
		Health workforce to population ratio	Collected and disseminated in reports and infographics
		Doctor to population ratio across areas	Collected and disseminated
		Competency of health personnel	No data collection found
		Job satisfaction level of health personnel	Collected but not disclosed in machine-readable format

Table A.5: Examples of datasets that should be promoted as high-value datasets of top priority in the Transportation sector

Dataset Type	High-Value Dataset	Dataset Details Dataset Details (Key Variables)	Dataset Readiness Status
(1) Data used for driving operations			
(1.1) Datasets for statistical compilation	Public transportation dataset	Volume of travel by public transportation systems by areas	No data collection found
		Number of public transportation users classified by travel modes	Collected and disclosed
	Freight transport dataset	Volume of transportation and logistics by transport modes	Collected and disclosed
		Data on export volume of goods/services in areas connected to neighboring countries	No data collection found
		Data on international export volume of goods/services via transportation systems	Collected and disclosed
		Data on transportation costs of goods/services by transport modes	No data collection found
	Road safety dataset	Data on road traffic fatalities	Collected and disclosed
(1.2) Geospatial	Freight and passenger transportation	GPS tracking data for buses and trucks	Collected and disclosed, but in statistical format
(2) Data used for monitoring			
Statistics	Freight transport dataset	Proportion of rail freight volume to total freight volume	Collected and disclosed

Dataset Type	High-Value Dataset	Dataset Details Dataset Details (Key Variables)	Dataset Readiness Status
	Travel dataset	Proportion of public transportation users for travel in Bangkok and surrounding areas	Collected and disclosed
		Proportion of public transportation users for intercity travel	Collected and disclosed
	Road safety dataset	Road traffic fatality rate	Collected and disclosed
		Ratio of fatalities from public transportation accidents to total number of passengers using public transportation	No data collection found

Table A.6: Examples of datasets that should be promoted as high-value datasets of first priority importance in the Finance and Treasury sectors

Type High-Value	High-Value Dataset	Dataset Details Dataset Details (Key Variables)	Dataset Readiness Status
Statistics	Financial system stability	Non-performing Loans (NPLs) outstanding balance data over 3 months	Collected and disseminated
		Financial Soundness Indicators	Collected and disseminated
		Regulatory capital ratio	Collected and disseminated
	Financial market depth data	Domestic credit to private sector	No data collection found
		SMEs' access to finance	No data collection found
	Financial stability indicators	Tier 1 capital to assets	Collected and disseminated
		Tier 1 capital to risk-weighted assets	Collected and disseminated
		Non-performing loans after deducting expected credit loss provisions to equity ratio	Collected and disseminated
		Non-performing loans to total gross loans	Collected and disseminated
		Return on assets	Collected and disseminated
		Liquid assets to short-term liabilities	Collected and disseminated
		Net open position in foreign exchange to capital	Not yet disseminated
	Access to financial services	Number of commercial bank branches per 100,000 adults	Number of commercial bank branches collected and disseminated
		Number of ATMs per 100,000 adults	Number of ATMs collected and disseminated
		Growth rate of new business loans for non-large enterprises (average percentage)	Data not yet disseminated
	Public finance dataset	Government expenditure budget structure	Collected and disseminated
		Government expenditure budget	Collected and disseminated
		Budget disbursement results	Collected and disseminated
		Monitoring system for evaluating the effectiveness of national strategy implementation and project outcomes	No collection found
		Government revenue collection results	Collected and disseminated
		Fiscal balance	Collected and disseminated
		Public debt	Collected and disseminated
		State enterprise operations	Collected and disseminated
		Economic, financial, and trade early warning system	No collection found

Table A.7: Examples of datasets that should be promoted as high-value datasets of first priority importance in the Tourism sector

Dataset Type	High-Value Dataset	Dataset Details (Key Variables)	Dataset Readiness Status
(1) Datasets for statistical preparation	Tourism flow data	Proportion of tourists by country of origin	Data collected
		Geospatial data of tourist attractions	No data collection found
(2) Statistics	Tourism Gross Product	Tourism Gross Product	Data collected

Table A.8: Examples of datasets that should be promoted as high-value datasets of top priority in the Industry and Commerce sectors

Dataset Type	High-Value Dataset	Dataset Details Dataset Details (Key Variables)	Dataset Readiness Status
(1) Datasets used for driving operations			
(1.1) Mobility and datasets for statistical compilation	Product traceability system (Data Traceability)	Product details	No data collection found
		Products' standards and guarantees	
		Manufacturers	
		Raw Materials Suppliers	
		Raw Materials Suppliers	
		Importers/distributors	
		Supply chain logistics data	
(1.2) Datasets for statistical compilation	Government support dataset	Amount of research and innovation development support by industry	Collected and disseminated
		Amount of personnel skill development support	Collected and disseminated
		Investment promotion value in regional special economic zones and border economic zones	Collected and disseminated
		Effectiveness of projects to enhance Thai enterprise competitiveness	No data collection found
	High-Value Employment dataset classified by industry type and labor skills	Number of employees	Collected and disseminated
		Working hours	Data collected but not disseminated
		Wages, salaries, and employee benefits	Data collected but not disseminated
		Job vacancy data	Collected and disseminated
	Product manufacturing standards dataset classified by industry type	Data on products/parts meeting international standards in each industry aspect	Additional definition of standards for each industry is needed
		Data on entrepreneurs or factories by Thailand Standard Industrial Classification (TSIC)	Collected and disseminated
	Data infrastructure dataset	Number of datasets imported into the central data storage system and dataset details	Collected and disseminated
		Small and Medium Enterprise database system	Collected and disseminated

Dataset Type	High-Value Dataset	Dataset Details Dataset Details (Key Variables)	Dataset Readiness Status
(1.3) Companies and company ownership	Business registration dataset by industry types	Number of registrants by type of registrant and industry	Currently collected and disseminated as a high-value dataset
		Registered capital value	Collected and disseminated
		Registration date, cancellation date	Collected and disseminated
		Employment statistics of establishments	Collected and disseminated
		Number of SMEs registered with Social Security Office/VAT registered/registered as juristic persons/registered as commercial entities	Collected as core dataset of agencies but not yet made public
		Startups	Collected and disseminated
	Factory dataset	Factory registration dataset	Currently collected and disseminated as a high-value dataset
(1.4) Environment	Environmental dataset by industry types	Greenhouse gas emissions by industry types	Collected and disseminated
		Carbon dioxide emissions per value added by industry type	No data collection found yet
		PM 2.5 emissions from industrial sector	No data collection found yet
(2) Datasets for monitoring operations			
(2.1) Statistics	Macroeconomic dataset	National income of the industrial sector	Collected and disseminated
		Gross Domestic Product by industrial sector, business organization type, and economic zones	Collected and disseminated
	Production productivity and efficiency dataset by product types and industry types	Production volume	Collected and disseminated
		Sales volume	Collected and disseminated
		Production capacity and capacity utilization rate	Collected and disseminated
		Selling price	Collected and disseminated
		Production cost	Collected and disseminated
		Industrial production index	Collected and disseminated
		Industrial labor productivity	Collected and disseminated
		Industrial sales value	Collected and disseminated
		Inventory	Collected and disseminated
		Value-added of goods by product types and industry groups	Data collected and disseminated but not covering all industry groups
		Value-added of SME industries	Collected and disseminated
	International trade statistics dataset by product types, industry types	Import statistics	Collected and disseminated
		Import statistics by SMEs	Collected and disseminated
		Import prices	Collected and disseminated
		Export statistics	Collected and disseminated
		Export statistics of SMEs	Collected and disseminated
		Export prices	Collected and disseminated
	Investment dataset by industrial sectors	Domestic investment volume	Collected and disseminated
		Foreign direct investment volume	Collected and disseminated
		Government investment volume	Collected and disseminated

Dataset Type	High-Value Dataset	Dataset Details Dataset Details (Key Variables)	Dataset Readiness Status
	Competitiveness ranking	Competitiveness ranking in each aspect	Collected and disseminated

Table A.9: Examples of datasets that should be promoted as high-value datasets of top priority in the Social, Economic, and Welfare Development dimensions

Type High-Value	High-Value Dataset	Dataset Details Dataset Details (Key Variables)	Readiness of High-Value
Statistics	Macroeconomic indicator dataset	National income	Collected and disseminated
		Gross Domestic Product by economic activities	Collected and disseminated
		Factor productivity	Collected and disseminated
		Labor productivity	Collected and disseminated
		Price index	Collected and disseminated
		Cost of living index	Collected and disseminated
		Foreign direct investment value	Collected and disseminated
		Investment value	Collected and disseminated
		National accounts	Collected and disseminated
		Input-Output table of the country	Collected and disseminated
	Labor market dataset	Number of employed population	Collected and disseminated
		Job vacancies	Collected and disseminated
		Unemployment rate	Collected and disseminated
		Child labor statistics	Collected and disseminated
		Number of population in labor force	Collected and disseminated
		Number of population not in education, employment or training	Not yet collected and disseminated
		Number of working hours	Collected but no dissemination found
	Special economic zone and economic city development dataset	Gross Regional Product by economic activity	Collected and disseminated
		Investment value by special economic zone and province	Collected and disseminated
		Import-export statistics by special economic zone and province	Collected and disseminated
		Number of cities developed as smart cities	No collection found
	Digital telecommunications infrastructure statistics dataset	Digital telecommunications infrastructure investment value	No collection found
		Number of fixed telephone numbers in service	Collected and disseminated
		High-speed internet service fees	Collected and disseminated
		Internet bandwidth	Collected and disseminated
		Number of households connected to the Internet	Collected and disseminated

Type High-Value	High-Value Dataset	Dataset Details Dataset Details (Key Variables)	Readiness of High-Value
		Fixed Internet broadband subscriptions per 100 inhabitants, by speed	Collected by service providers
		Number of areas with high-speed mobile internet	Collected by service providers
		Internet usage volume	Collected by service providers
		High-speed internet network access rate per population	No collection found
		Proportion of population in areas with mobile phone signal by technology	No collection and dissemination found
		Number of mobile phone owners	Collected and disseminated
	Competitiveness ranking	Economic and infrastructure competitiveness ranking	Collected and disseminated

Appendix 3: Examples of Cost-Benefit Assessment in Dataset Preparation

This section provides examples of approaches for assessing the cost-benefit of dataset creation. In conducting such assessments, evaluators or responsible agencies should understand the approaches to cost-benefit assessment of datasets, as well as the economic characteristics of datasets.

The Organization for Economic Cooperation and Development (OECD) prepared a report on measuring the value of data and data flows. The following economic characteristics of data are discussed:

- Non-rivalry and excludability: data is a resource that can continuously be reused by multiple user groups simultaneously. Furthermore, this is non-rivalrous in consumption. However, access can be restricted due to data access rights.
- Spillovers and externalities: data has high external effects, meaning the benefits of data can accrue to others beyond those responsible for collecting it. Thus, unrestricted public disclosure of data can greatly benefit social welfare.
- Economy of scale: data presents economies of scale because when data has been produced, replication costs approach zero. Consequently, the value of data is determined by the demand for that particular dataset.
- Increasing return to scale: data is a resource that, when used, produces continuously increasing returns to scale. Using data for production or services allows

users to collect additional datasets, enabling the use of other data in economic activities. This spurs continuous increases in returns and a positive feedback loop.

- Synergies: when used in combination with other datasets or technologies, data is a resource that increases in value. For example, a national ID number dataset with limited standalone utility can be coupled with other datasets to improve government services.
- Low specification: all datasets have low specificity. This means that data can be used for purposes other than those of collection. For example, telephone call data can be used to track the spread of COVID-19.

Based on the above-described properties, the OECD suggests that assessing the true value of data is highly challenging due to its low specificity but high external effects. This often results in underestimation or overestimation of data's benefits and costs. It is so because data may be used beyond the scope. According to the report, OECD only proposes a sum-of-cost approach for cost valuation. It uses the sum of values in the data production steps as explained below:

- Planning and strategy development for data production
- Accessing, collecting, or recording the data to undergo value assessment. This includes purchasing existing data or investing in systems to collect new data
- Designing, managing, testing, and processing data to draw conclusions (in case of report publication) or to prepare datasets for further use

However, this method is a simplified variation of data valuation. The approach may be useful as an initial unit of measurement when comparing data values. Nevertheless, the OECD suggests that a measurement of the economic benefits of data should be carried out to pinpoint a clearer cost-benefit assessment.

An example of assessing the value of GPS data collection by the Department of Land Transport adopted a Cost-benefit analysis method. The implementation of mandatory GPS tracking devices for passenger transport and freight vehicles allows the Department to use the data to look into violations and control driving behavior, such as detecting speeding, driving beyond allowed hours, and failure to identify drivers. The project began in 2016 with the announcement requiring passenger and freight vehicles to install tracking devices. In 2017, the system was developed to automatically alert violations (Active system), and regional GPS

management centers were established to improve road safety supervision efficiency (Research and Development Project on GPS-based Vehicle Management System for Public Transport and Truck Safety, King Mongkut's Institute of Technology Ladkrabang (2017)). The evaluation period is 8 years, running from 2016 to 2019, with projections for the period of 2020-2023.

Costs include those of the project implementer (Department of Land Transport), such as research and system development costs, automatic operator alert system project costs, system efficiency improvement project costs to accommodate various agencies, GPS center construction and maintenance project costs, and staff management costs. Meanwhile, the operator's costs include GPS tracking device and air time costs, as listed in Table A. 10.

Table A. 10. Costs of promoting GPS data collection

Unit: Million Baht

Years	2016	2017	2018	2019	2020	2021	2022	2023
Costs of the Department of Land Transport (DLT)								
Research and system development project	15.00	-	-	-	-	-	-	-
The automatic operator alert system project	-	5.00	-	-	-	-	-	-
The system efficiency improvement project to accommodate various agencies	-	-	-	45.00	-	-	-	-
GPS center construction and maintenance project	-	-	-	14.32	2.86	2.86	2.86	2.86
Staff management costs	-	2.93	2.93	2.93	2.93	2.93	2.93	2.93
Total DLT costs	15.00	7.93	2.93	62.25	5.79	5.79	5.79	5.79
Operators' Costs								
GPS tracking device costs	-	531.87	197.48	326.29	330.14	334.03	337.97	341.95
Air time costs	-	1,934.06	718.11	1,186.52	1,200.51	1,214.66	1,228.98	1,243.46
Total operator costs	-	2,465.92	915.59	1,512.81	1,530.65	1,548.69	1,566.94	1,585.41
Total costs	15.00	2,473.85	918.52	1,575.06	1,536.44	1,554.48	1,572.73	1,591.20

Source: Thailand Development Research Institute Foundation (2021) Study on Economic and Social Impacts of Road Accidents

The benefits to be evaluated for this safety measure are the reduction in fatalities and injuries from accidents caused by speeding from 2016 to 2023, based on data from the Department of Land Transport, as shown in Table A. 11.

Table Phor 11: Table Phor 11: Calculation of benefits from reducing the number of fatalities and injuries

Unit: Million Baht

Years	2016	2017	2018	2019	2020	2021	2022	2023
Life value before the project In case of death	1,075.27	1,123.75	1,173.34	1,215.81	1,221.03	1,280.76	1,331.93	1,385.21
Life value before the project In case of injury	1,572.83	1,643.74	1,716.28	1,778.40	1,786.05	1,873.41	1,948.26	2,026.20
Total life value before the project	2,648.09	2,767.49	2,889.62	2,994.20	3,007.08	3,154.17	3,280.20	3,411.41
Life value after the project In case of death	1,075.27	1,342.27	875.94	610.91	560.63	488.58	422.16	364.78
Life value after the project In case of injury	1,572.83	867.78	462.90	223.55	167.47	88.12	45.97	23.98
Total value of life after the project	2,648.09	2,210.04	1,338.84	834.47	728.10	576.70	468.12	388.76
Drop in value of life loss In case of death	0.00	-218.52	297.40	604.89	660.40	792.18	909.82	1,020.48
Drop in value of life lossin case of injury	0.00	775.96	1,253.38	1,554.84	1,618.57	1,785.29	1,902.38	2,002.30
Total	0.00	557.44	1,550.78	2,159.74	2,278.98	2,577.47	2,812.20	3,022.78

Source: Thailand Development Research Institute Foundation (2021) Study on Economic and Social Impacts of Road Accidents

From the benefits and costs, the results of the benefit and cost assessment using cost-benefit analysis are as shown in Table 8. It suggests that the benefits received from the drop in value of life loss are worth the cost of implementing the project and collecting data over the 8-year operational period from 2016 to 2023. According to the study, the net present value of the project is 1,619.28 million baht at a discount interest rate of 10 percent, the economic internal rate of return (EIRR) is 34 percent and the benefit cost ratio (B/C) is at 34 percent. is at 1.22. The figures indicate that the project can reduce road accidents and create value for the project, the society and the economy.

Table Phor 12 : Calculating the benefits and costs of GPS data collection

Unit: Million Baht

Years	2016	2017	2018	2019	2020	2021	2022	2023
Total project costs	15.00	2,473.85	918.52	1,575.06	1,536.44	1,554.48	1,572.73	1,591.20
Project Benefits : Drop in value of life loss	0.00	557.44	1,550.78	2,159.74	2,278.98	2,577.47	2,812.16	3,022.74
Net Cash Flow Value	-15.00	-1,916.40	632.26	584.68	742.54	1,022.99	1,239.42	1,431.53
Net present value (NPV)	1,619.28 million baht							
Internal Rate of Return (EIRR)	34%							
Cost-benefit ratio (B/C ratio)	1.22							

Source: Thailand Development Research Institute Foundation (2021) Project to Study the Economic and Social Impact of Road Accidents.

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