Digital Government Program 2.0 of Taiwan (2021-2025)

Embracing Digitization

Putting People First

Digital Government Program 2.0 of Taiwan (2021-2025)
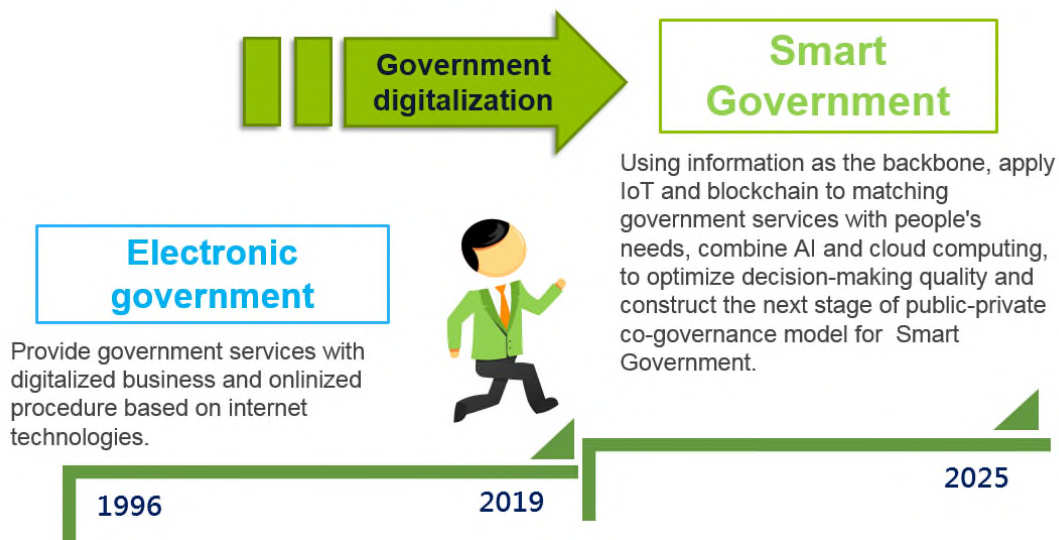
National Development Council
July, 2020

Chapter 1. Preface

I.   Origin

In the digital era globally, smart government, data governance and enhancing national development momentum have become trends for many governments. The "smart government" concept refers to all action taken by the government to improve services provided to citizens and businesses and emphasizes the use of Taiwan's technology advantages with data as the backbone to strengthen government effectiveness and national security, linking government services and needs of the public and optimizing decision-making quality. Looking at the e-government development trends of advanced countries, the role of ICT application in public governance has evolved from the "assisting with management of public affairs" early on to today's "innovating public governance effectiveness" and, as the digital economy develops, it is gradually transforming to "creating public service value". Using new technology to optimize government service processes, innovating service patterns for the public and satisfying the requirements of the public have become the directions for refinement of smart government promotion. The Executive Yuan launched the Digital Nation and Innovative Economic Development Program (DIGI+ 2017-2025) in 2017, planning the national level transformation strategy for the development of Taiwan's government, industry, talent and society. The National Development Council (NDC hereafter), in line with the aforementioned program, drew up the Digital Government Program of Taiwan (2017-2020) to accelerate the promotion of various response measures for digital transformation of government.

Source: NDC Smart Government planning report
Fig. 1-1 Building a smart government that people trust

As the world has entered the AI era, Taiwan's advantages and dangers faced are different to the past and new thinking is needed to re-mold the government's operating

mode. New thinking can't be generated overnight, it requires a long period of professional nurturing and the building of a complete global technology view and can help government agencies face the challenges of the new generation. To deepen the effectiveness of the promotion of smart government, following the smart government policy objective of President Tsai's technology policy, the NDC planned the Digital Government Program 2.0 of Taiwan (2021-2025). The aim is to implement government digital transformation related work in the next five years.

II. High-level plan
(1) The smart government policy objective of President Tsai's technology policy

At 2019 Future Tech, President Tsai announced national technology policy for the next four years, including entering the space industry and discussing the establishment of a ministry/council for digital development. With regards to the policy direction for smart government, she clearly stated "Using open data to enhance the governance capability of smart government and opening it up for diverse use by the public to create data economy". In the digital era, the government must work hard to make Taiwan a digital nation. This policy concept is effectively using the digital power of data and emerging technologies to improve government governance effectiveness and raise the level of life quality of the people, while at the same time keeping abreast of new technology trends and taking advantage of opportunities so that Taiwan continues to have a place in the world.

Source: Tsai Ing-wen's Facebook page
Fig 1-2 President Tsai tells you about two technology visions

(2) Digital Nation and Innovative Economic Development Program (2017-2020)

To welcome the digital wave, advanced countries around the world have all established a digitization promotion strategy that promotes the transformation of society, the economy, politics and culture. The Executive Yuan launched the Digital Nation and Innovative Economic Development Program (DIGI+) in 2017; it has seven main programs, including the Online Society Digital Government action program the NDC is responsible for promoting the implementation of data governance by every level of government to build a requirement-oriented one-stop smart cloud service, realizing the vision of "Open government smart governance people can feel".
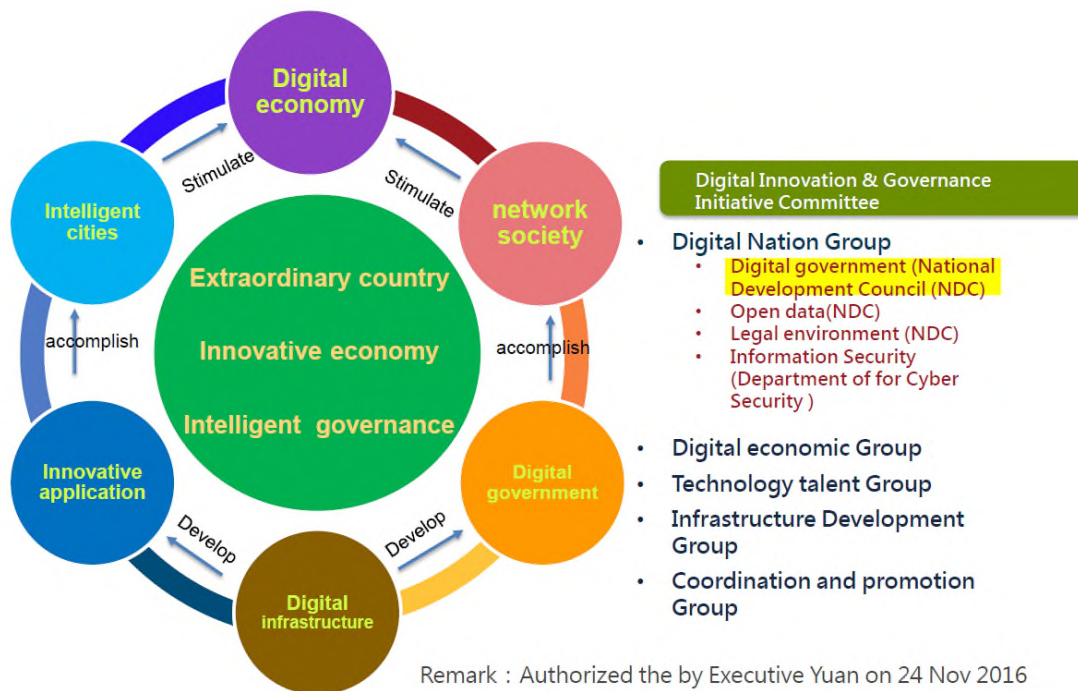
Fig. 1-3 Digital Nation and Innovative Economic Development Program (DIGI+)

With respect to the development of government digital transformation, the government will continue to expand the scope of release and application of open data and go on to lead various agencies to use data to simplify the process of government and pubic interaction, to reduce unnecessary administrative procedures and resources waste and realize government services that people can feel.

(3) Smart government

In June 2019, the Executive Yuan approved the Smart Government Action Program, setting the three main objectives of "transparency of open data, maximum added value application", "link to governance network, optimize decision-making quality" and "integrated service function, innovative smart service"; seven promotion strategies were set; they were: "maximize the provision of government open data for value added application", "promote citizen participation and social innovation", "optimize decision-making quality through data-oriented calculation and analysis", "provide the GIS national land spatial data base for decision-making reference", "introduce innovative technology to provide customized livelihood services", whole process mobile digital online application" and "enter data one time and use all over". Also, through the three accompanying measures of "establishment of the regulatory adjustment platform", "implement monitoring of privacy protection" and "strengthen data security defense in depth" were formulated.

Goals：Convenient, efficient, 24/7 services

Basic framework

- New eID as a key to access entire government services
- Build secured- trust T-Road

Three major goals

- Open and transparent data, maximize added value
- Chained governance network, optimize the quality of decision making
- Integrated services functions, create innovative smart services

Three supporting measures

LAW

- Build regulatory adjustment platform
- Implement supervision on privacy protection
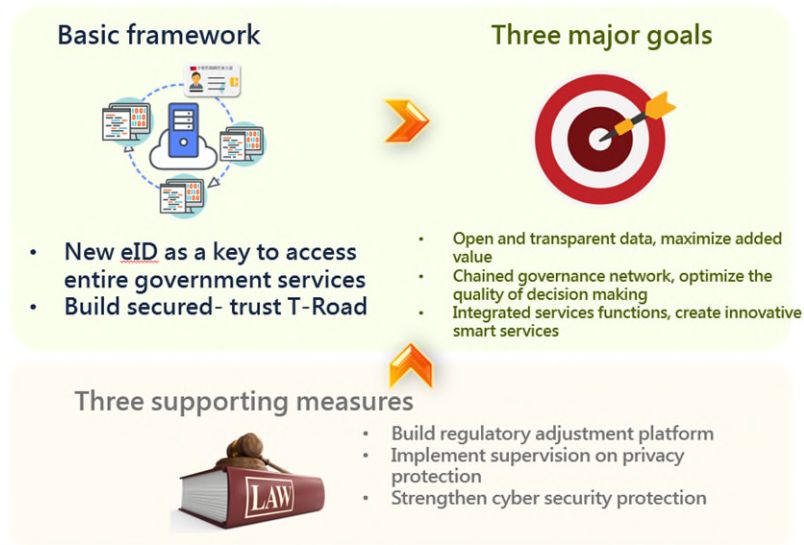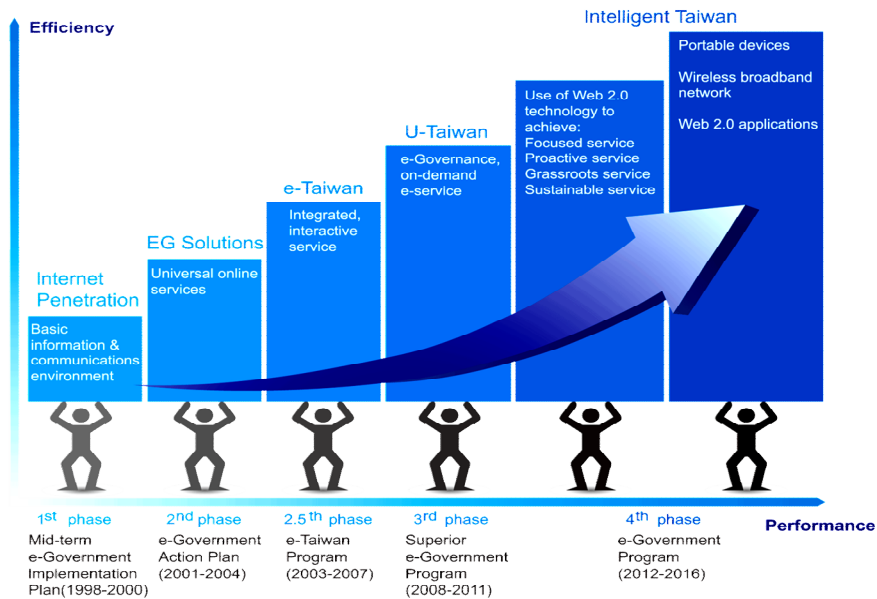- Strengthen cyber security protection

Fig. 1-4 Smart Government Action Program framework
Source: NDC Smart government program

Chapter 2. The Development Course of E-Government in Taiwan

With changes in the subjective and objective environment such as globalization, internationalization, decentralization, marketization and the rise of the digital citizen, the e-government development trend of advanced countries has moved from "assisting with management of public affairs" early on to today's "innovating public governance effectiveness" and is gradually moving towards "creating public service value". At the same time, the effect of e-government has moved from government administration gradually to the levels of politics, society and economy. The universal application of government e-services will have a definite influence on promoting the development of civil society, pursuit of a just society and building a quality network society.

I.   Summary and results of past e-government

Since planning of e-government first began in 1998, various stages of e-government program have been completed. At present, the Digital Government Program of Taiwan is being implemented; it focuses on the two main objectives of "developing one stop digital services" and "building a diverse cooperation environment". Priority is given to promoting digital services for issues that the people care about to meet their needs and raise the level of national competitiveness. In the e-government related programs implemented to date, significant results have been achieved in terms of the services provided by the government both for increase in efficiency and service quality; of these, the My e-Government single portal website has been completed and provides online application for around 25000 services; a service integration platform has been established, providing single sign-on, online payment and other modules; data centers have been merged, with integrated data centers used to reduce the number of machine rooms/data centers by about 44;shared administration systems provide inter-agency document electronic exchange, government open procurement platform and large scale data bases (household registration, land, tax, industry and commerce, motor vehicle inspection, national health insurance, labor insurance);household registration, land and tax convenient one-stop services provide full-process service; iTaiwan free wireless Internet connection; guidance has also been provided to 6271 government and civil website on meeting barrier-free regulations.

Source: Drawn by NDC staff

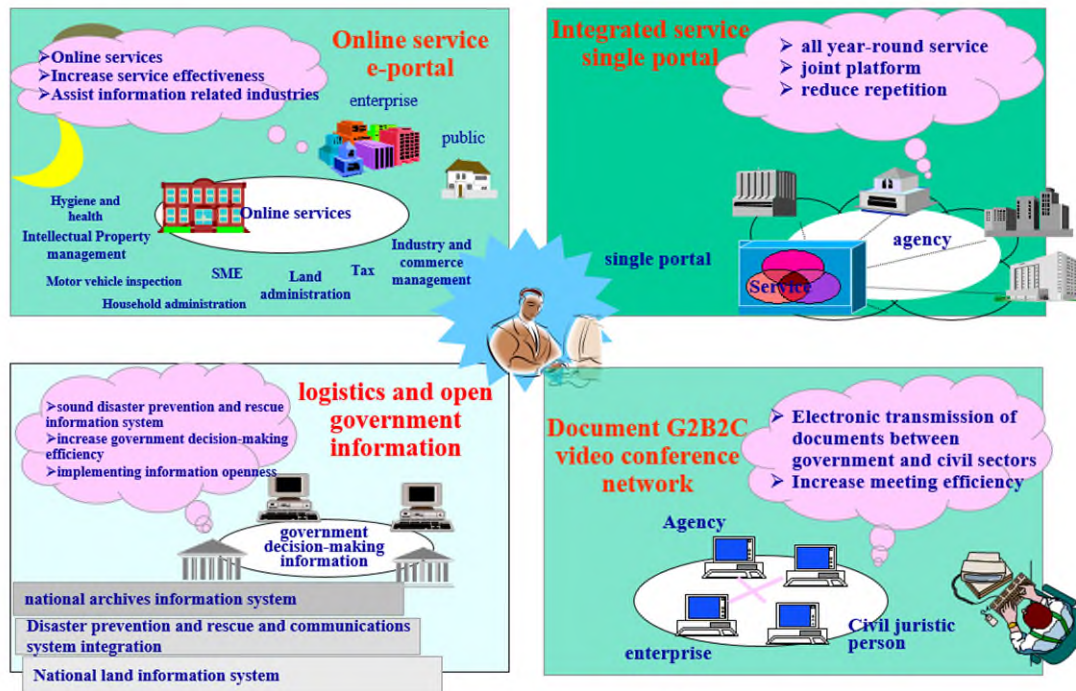Fig. 2-1 Stage 1 to 5 E-government Program (1998-2020)

Stage 1 of Taiwan's e-government operations was the 1998-2000 E-government / Networked Government Medium Term Plan. It made an effort to build infrastructure including a government backbone network, develop convenient and administration applications, accelerate government information flow, and establish e-authentication and a network security mechanism.

Fig. 2-2 Stage 1 E-government Program development framework

Stage 2 was the E-Government Program 2001-2004, the objectives of which were establishing a smooth and secure and trustworthy information environment, promoting the move fully online of government agencies and civil servants, implementing document electronic exchange across the board, online application for 1500 government services, government information exchange and reduction of document

copies. Also, in the sixth sub-item of the e-Taiwan program of the Challenge 2008 National Development Plan, there were 18 e-government key programs.

Source: Drawn by NDC staff

Fig. 3 Stage 3 E-government Program- e-Taiwan Program development framework

The third stage was the Ubiquitous Government Network program implemented 2008-2011. It had "increasing public service value and establishing social trust and connections" as its vision and had the three main objectives of "developing proactive services, creating quality life, "popularizing information services, increasing social care" and "enhancing network interaction" to realize proactive, targeted, continuing and rooted services.

Fig. 2-4 Stage 3 E-government Program- Ubiquitous Network Government development framework

Stage 4 was the stage 4 E-government Program implemented 2012-2016. It developed portable mobile device services and used the WEB 2.0 social network to develop innovative services that better met the needs of the public. The focus was on providing proactive e-government services and targeted services and thinking from the angle of those who benefit to develop full-process service and across-agency coordination.

Fig. 2-5 Stage 4 E-government cloud service promotion key points and framework

Stage 5 E-government Program implemented 2017-2020 has the core ideas of data driven, public private partnership and people first. Through Big Data, the needs of the public are collected; government openness and transparency are promoted through Open Data and My Data effectively used to provide services that fully meet people's needs.
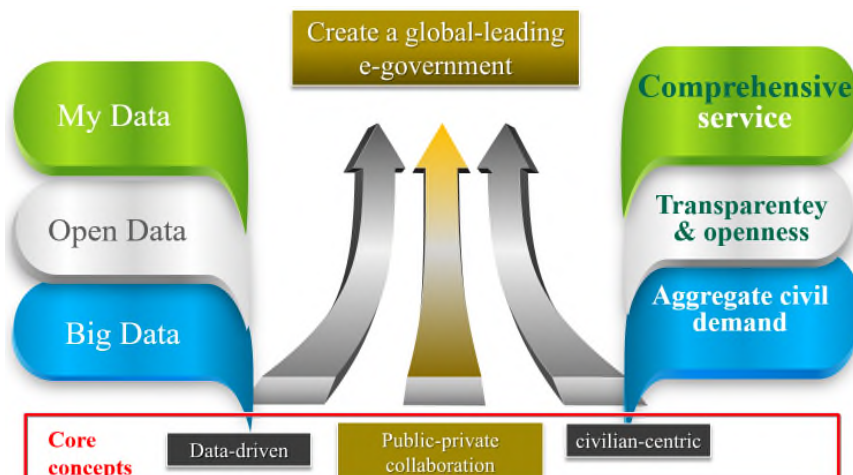

Fig. 2-6. Stage 5 e-government planning key points

II. Digital Government Program of Taiwan

The Executive Yuan launched the Digital Nation and Innovative Economic Development Program (DIGI+) in 2017. As well as leading Taiwan's industrial and economic development, importance is also attached to enhancing foundation construction development an equal and lively network society and building a service-oriented government. In accordance with the aforementioned program, the NDC formulated the Digital Government Program of Taiwan to transform the Digital Government Program of Taiwan, promoting e-government service transformation in combination with international development trends to achieve the vision of Digital Government Program of Taiwan.

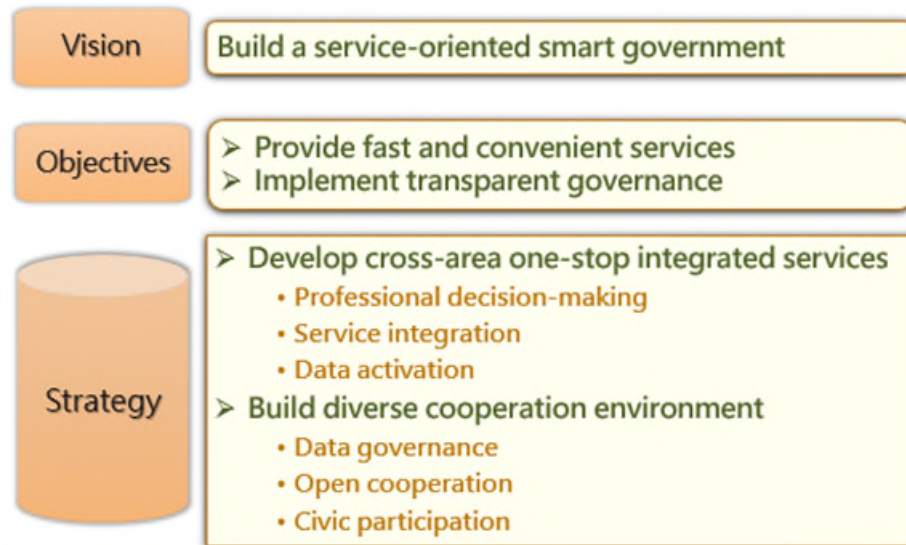| Vision	Build a service-oriented smart government
Objectives	➢ Provide fast and convenient services ➢ Implement transparent governance

Strategy	➢ Develop cross-area one-stop integrated services
	  • Professional decision-making
	  • Service integration
	  • Data activation
	➢ Build diverse cooperation environment
	  • Data governance
	  • Open cooperation
	  • Civic participation

Fig 2-7 Digital Government Program of Taiwan framework

The Program gives priority provision of digital services according to key government policies and issues of concern to the public, including social administration and welfare integrated services in support of the long-term care policy, industry and commerce one-stop service to optimize business operating efficiency, cross-area housing registration integrated services and promoting of e-write off of government agencies. The scope of promotion continues to be expanded, gradually developing cross-area government digital services that span social administration, health administration, internal administration, industry and commerce. The program has so far achieved various results.

1. Sound e-government cloud infrastructure

Machine room merger has reduced the time required for agencies to obtain hardware and equipment from 2 months to 2 days and saved around NT$1.2 on repeat purchase of equipment by agencies. The replacement of the competent agency new document electronic exchange system of the Office of the President, Judicial Yuan and NDC has been completed. 78 competent agencies have changed to the system, an achievement rate of 88.63% and saving NT$1.609 billion on mailing costs.

2. Simplified administration and public convenience Service-oriented smart government one-stop service

One-stop service for online application for 147 company registration matters has been completed to speed up startup investment; one-stop birth registration service is also provided, when parents register their son or daughter's birth, labor insurance and national pension insurance childbirth payment can be applied for at a household registration office at the same time; a one-stop payment service has been established, allowing mobile payment of water and electricity bills on the single portal E-Housekeeper plus website; with the three modes of home service, counter visit and citizen online autonomy, the Ministry of Health and Welfare has cooperated to provide one stop cross-area services covering allowance/service application, welfare matching, resources referral, reporting and case management with the principle of submission of as few documents as possible. Agencies are assisted to provide user-centered digital services. An e-government satisfaction survey was held in July 2019 and the result was that 75.3% of people are satisfied, up by 3.1% on the year before.

3. Maximize government data opening, accelerate data application

Government open data now totals more than 45,000 data sets, up three-fold on 2015 and more than 80% matched the "machine readable, structured, open format" data standard quality, and drove data service industry chain total output value of NT$93.6 billion in 2019. Also taking the Silver Haired Angle of the 2019 Presidential Hackathon, in combination with open data of the Ministry of Health and Welfare and Ministry of the Interior, old people living alone were found by data forecasting and their needs identified through data analysis, allowing the government to provide services with precision, proactively taking care of the disadvantaged and raising the level of governance.

4. Empowering autonomous application of personal data by citizens

In trials of personalized service of My Data in the area of finance and education, the K-12 Education Administration, Ministry of Education and First Bank respectively completed the development of the Exemption from Incidental Expenses of High School Students from Medium and Low Income Households and Credit Card Online Application systems. It is expected they will be operational in the first quarter of 2020.

5. Expanding public policy diverse communication and cooperation

Local governments are encouraged to introduce the online participation platform. To date, the National Audit Office, all the special municipalities and 17 local governments including Hualien County and Hsinchu County have introduced it. Also, taking on board varied opinions from the public, 55 people's livelihood issues including gradual banning of single use tableware, opening up fishing harbor to anglers and improving the mountain climbing application process have been resolved.

6. Deepening e-government international cooperation and exchange

Under invitation, we took part in four international meetings, sharing the results of digital governance and smart government in Taiwan and engaging in related exchange, raising Taiwan's international profile; they were World Internet Project (WIP) International Council for Information Technology in Government Administration (ICA), APEC EC and Smart Nation Summit 2019 in Singapore. We took part in the TASPAA Annual Conference, presenting the results of five studies, helping with the promotion of digital governance.

7. Digital government implementation results receive international affirmation

In the IMD World Digital Competitiveness Ranking 2019 (DCR) announced by International Institute for Management Development (IMD) on September 26, 2019, Taiwan ranked 13th out of 63 main countries and economies, up by three places on 2018.

III. Analysis of the government digital transformation development situation

ITC consulting organization Gartner's Senior Director Analyst for Digital Government Dean Lacheca pointed out in May 2019 that, in various countries, the process of developing digital transformation, without prior consultation, takes the direction of three basic elements, namely data governance, people first and service optimization. An explanation follows:

(1) Data governance

Before government adopts various new technologies, it must first review the maturity of internal data governance, from lifecycles of data collection, processing, use and deletion, building data management measures, and from the angles of data standards, data transfer, data management, data application, data security and data privacy etc., analyze government "data governance" actions.

(2) People first

To develop the "people's needs driving service reform" digital transformation model, the government must design government services from the angle of different subjects and, according to external need, carry out inter-agency integration of digital services.

(3) Service optimization

Optimization is not just about reducing government administrative costs or increasing operating efficiency, it is about solving the difficulties people face in life, linking the resources of government agencies and integrating service capability. For example, the Ministry of Foreign Affairs and Ministry of the Interior have cooperated to use the single portal to allow people applying for a passport for the first time to complete identification, passport application and pick up at a household registration office; they can then receive their passport in 6-7 working days.

Also, research by international business information company Opentext shows that there has been no change in the operating processes of government in promoting e-government in the past 20 years, with the logic of written operations still used to design digital services, and the effectiveness of implementation is extremely limited. Government digital transformation faces the following challenges:

(1) Government agencies have a low level of digital maturity

The operating processes of e-government need to be re-designed using digital information to enhance the effectiveness of government digital services, for example, inter-agency integration of operating processes and government data analysis supporting decision-making.

(2) Government resources are wasted on repeated work

The orientation of traditional paper operating processes to digital services often stores data separately in different information system, leading to the problem of data

contents being out of sync. E-government must use data online transmission to immediately validate the correctness of data and remove the problem of repeat storage of files.

(3) Data lacks standardization

Digital government emphasizes data interoperability and sharing. Under the same standards, promoting digital services, all interested parties see the same data, avoiding the need for input of more resources for malpractice prevention or management as a result of lack of standardization of operating processes.

(4) Insufficient integration of operational processes

Digital government needs to actively face the challenge of inter-agency process integration, contemplating the problem of inter-agency data sharing and operating process connection from the angle of the full life cycle of public-government interaction.

Unifying the research conclusions of the two international consulting companies above, the NDC thinks that the government must face up to the wave of digital transformation of the government governance model. After reviewing the current implementation situation of the E-Government Program, the following describes the important matters that the government should actively implement in the future based on the government ICT application framework of service, decision-making, data and infrastructure.

Table 2-1. Directions for future government improvement

Application Framework	Improvement Direction
Service	Government public services must be simple and easy to use and meet the needs of the public
Decision-Making	Government decision making model must be rapid and precise and be connected to people's livelihoods
Data	The release force of government data must be increased and compliance use promoted
Infrastructure	Government digital infrastructure needs to be gradually improved in line with technology development trends

Source: Compiled by program staff

1. Government public services must be simple and easy to use and meet the needs of the public

Under the international trends of government digital transformation, government public services must have data as the basic element of policy to achieve "with data as the axis, connecting to public needs and "with technology as the pillar, innovating government operation", effectively using the power of technology to drive reform of public services and build a simple and convenient public service experience. The promotion directions are as follows:

Source: Infotech and Digital Transformation Department, Singapore

Fig. 2-8 Moments of Life, Singapore

(1) Government information must be proactively and precisely presented to the public

In light of the complexity and detailed division of labor of government operations, in the process of interaction between people and the government, it is very likely that they will obtain outdated or inaccurate data online, this affecting their rights and interests. In the UK, Singapore and Australia etc., the government has identified the interaction that people must have in their life moment with respect to child birth, schooling, employment, old age care and the years before death and uses a digital method to proactively provide timely and correct information to people.

(2) Make effective use of technology to innovate the public governance experience

In the digital era, ICT development has been injected into the development of new technology; counter services, application services, mobile services and various channels for coming into contact with the public can all use newer, better, faster and accurate technology; for example, unmanned vehicles, IoT and robots and other terminal equipment with AI, data analysis and other smart applications that assist the government to apply new technology to improve public service under the restrictions of "limited resources, limitless public needs".
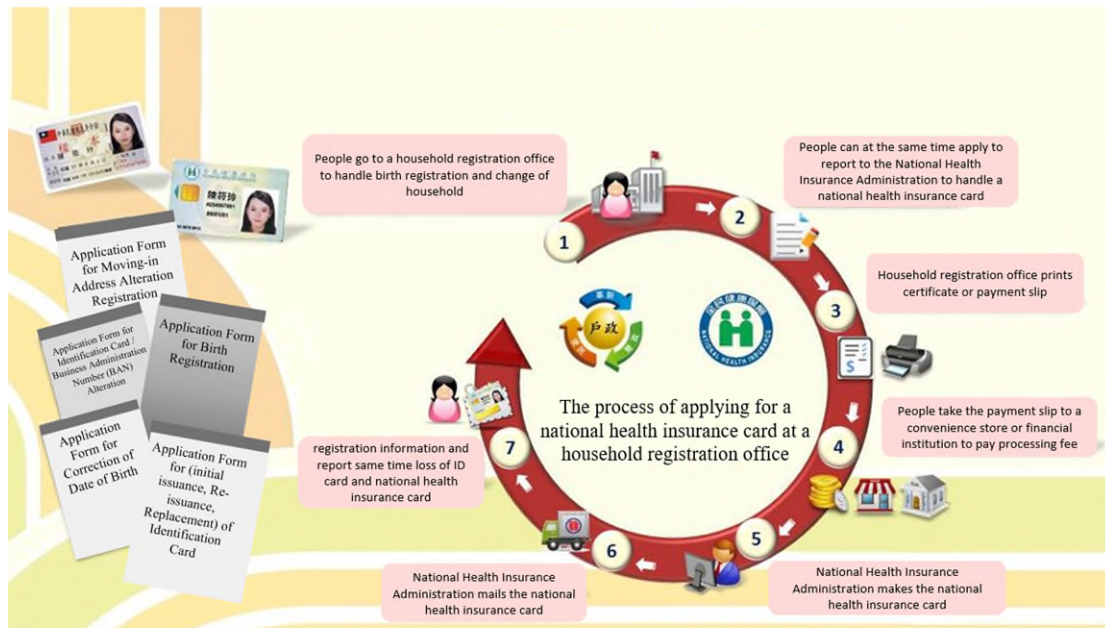
People's livelihood IoT key work			
	Air quality IoT Establish environmental quality IoT smart environmental monitoring Environmental quality monitoring IoT development and enforcement application of <u>air quality IoT industry</u>		**Earthquake monitoring IoT** Shorten earthquake warning time and reduce disaster damage - Sea and land joint earthquake observation - Composite earthquake rapid reporting service
	Disaster prevention and rescue information platform Convenient obtaining of disaster prevention information drives the development of industry ● Establishment of disaster information industry ● Disaster prevention and rescue system information integration		**Water resources IoT** Keep abreast of water resources supply and demand to provide people with an excellent water environment Water resources IoT

Source: Executive Yuan Digital Nation Innovative Economy Promotion Group
Fig. 2-9 People's livelihood public IoT key work

(3) The method of government-public interaction must be simple and convenient

With digital identification as the foundation, Singapore, Estonia and other countries, connect service data, integrate government processes and simplify service application processes, allowing citizens to apply for related government services in one place. Taiwan should, from the angle of citizens, review gaps in the connection between government service processes and, after citizens express willingness and provide their personal data online, activate service application operations to implement the policy objective of simple administration and convenience for the public.

Source: Ministry of the Interior
Fig. 2-10 People now don't have to rush around to change household registration
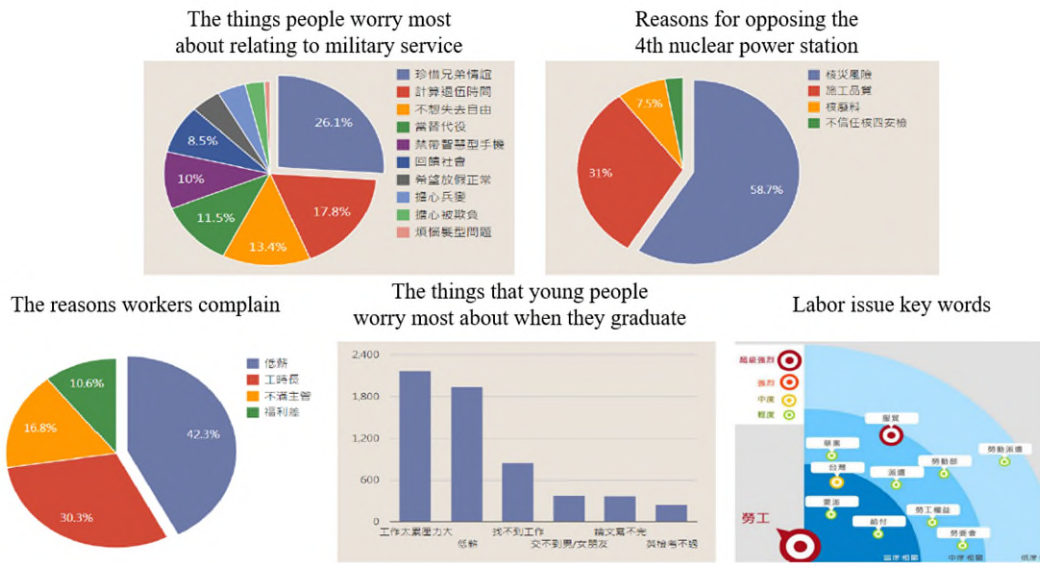
2. Government decision making model must be rapid and precise and be connected to people's livelihoods

ICT development consulting company Deloitte & Touche suggests that the public and private sectors should establish digital analysis decision-making thinking logic. In Taiwan, government agencies have already used big data analysis to achieve meaningful results with regards to public issue decision-making, for example application to disaster prevention and rescue, disease prevention, medicine and heath, environmental protection, life quality and food safety. In future, more importance should be given to it than before, using data to allow the government to do what they couldn't before or use to raise the level of policy effectiveness, even using data as evidence to protect the government.

(1) Fully implement an evidence-based policy decision-making model

Government data analysis should revolve around government policy issues; with solving people's livelihood problems as the starting point, from the full life cycle of government operations from grasping people's needs, analysis of operations, keeping abreast of results to analyzing performance, using big data analysis to ensure that policy effect meets expectations.

Use communities to listen to and understand public opinion

Source: eLand

Fig. 2-11 Analysis of network public opinion

(2) Effectively use geographical information systems to support policy action

In response to a varied governance environment, the government must effectively use geographical information systems in combination with big data analysis to keep abreast of the overall national development direction; and separating into different segment needs by group, area, and age to promote government service transformation and innovation, increase Taiwan's digital competitiveness and increase the quality of life of people in combination with social innovative services.

Source: iThome

Fig. 2-12 Taichung City Government high risk intersection integration platform

3. The release force of government data must be increased and compliance use promoted

Since Taiwan began planning the open data policy in 2012, quite eye-catching results have been achieved, including the setting of various regulations by the NDC and

helping the six special municipalities to sign the Open Data Charter, a first in Asia. The Industrial Development Bureau, Ministry of Economic Development provides guidance to enterprises to nurture the application of open data by startups, funded by the Technology Fund.

In terms of personal data, to lift the restrictions on application of personal data,

the NDC began promoting the application of personal data (My Data) in 2015. The concept follows the requirements of Taiwan's Personal Data Protection Act; if an individual is willing, he/she can give permission to a third party such as a government agency or civil organization to use his/her personal data to allow suitable services to be provided.

In light of the fact that public governance service emphasizes proactive, precise, and suitable development, use of open data and personal data to grasp people's needs is one of the necessary measures. In future, the promotion of smart government will be on the basis of personal data and open data, beginning with building a data autonomous ecology through empowerment of the individual and enhancing democratic accountability to create data economics value. The direction of promotion is as follows.

(1) Promote legal basis for open data

To speed up the promotion of data opening in Taiwan, in 2018 the NDC drew up the Government Open Data Advanced Action Program planning concrete methods for data opening, leading government agencies to maximize government data opening. Looking to the future, data is the most important strategic asset in the digital era. Government open data will follow the legislative footsteps of advanced counties and formulate a special law for open data in Taiwan, focusing on the release of open data that has high use value in the public and private areas and increasing the quality of open data.

(2) Compliance release and application of people's data

To give people autonomy and trustworthy personal data account management with regards to personal data to allow individual people, communities, government, public enterprises, enterprises and nonprofit organizations to compliance use personal data, some advanced countries have actively promoted management and application models for the autonomous use of their personal data by citizens, for example the US medical information application Blue Button. Borrowing international experience, it is the view of the NDC that developing My Data that suits conditions in Taiwan needs continuing in depth discussions, including inter-agency communications on specifications, personal data authorization regulations, adjustment of related regulations and matching of administrative processes.

Source: mydata.org
The core spirit of Finland's promotion of mydata.org

4. Government digital infrastructure needs to be gradually improved in line with technology development trends

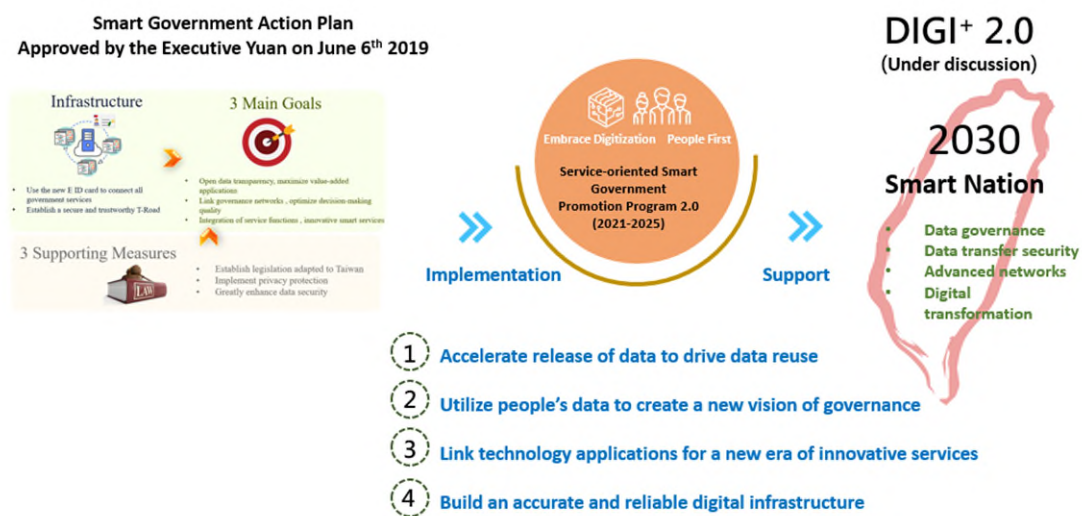In support of the national digital transformation response strategy, whether hardware aspect measures such as network telecommunications or information computing, or regulatory adjustment and personal data protection and often software aspect actions, the government must move with the times and actively carry out cross-border integration. From the direction of digital development internationally, the

government should observe the important technology issues and, through policy promotion, continue to build and optimize the national digital environment for example by constructing the next generation mobile telecommunications infrastructure, making network and data supervision regulations complete and information security protection. This will support industry's digital transformation through digital governance and ensure innovative digital technology can bring into play its maximum value continually in the digital era.

Chapter 3. Program, Vision, Objectives and Strategy

In response to Taiwan's current socio-economic background, international development situation and to enhance work related to data release and re-use according to the President's policies and the Executive Yuan's Smart Government Promotion Program, this program continues to support government promotion of digital transformation as its main mission with the Digital Government Program of Taiwan; linked to the Smart Government Action Program's promotion objectives, every action of smart government promotion is enhanced to embrace a vison of digitization and "people first" and display our government's determination to promote smart government in future.

Source: Drawn by NDC staff

Fig. 3-1 Digital Government Program 2.0 of Taiwan
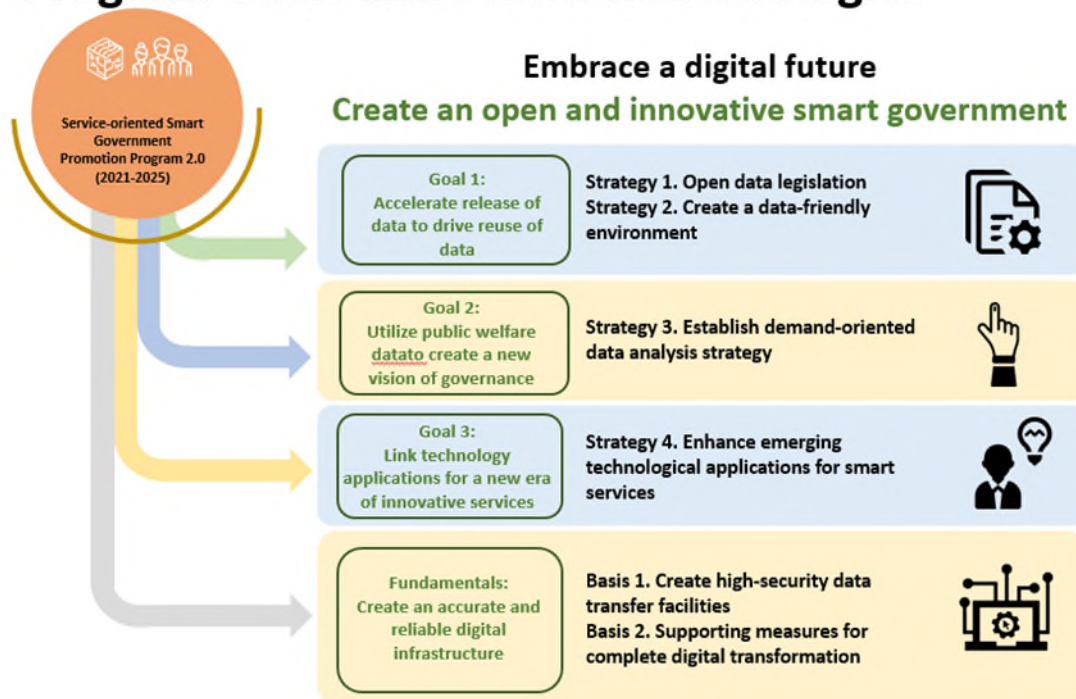
I. Program vision

To take advantage of the national development opportunities offered by the progress of technology and respond to various challenge, this program's vision is "embracing the digital future, build an open and innovative smart government", emphasizing that the government must welcome the digital era by digitizing various government services and, with an open and transparent administration approach and a proactive and innovative service spirit, create a data-friendly environment and accelerate the implementation of smart government. This program will focus on increasing the force of promotion of government open data, making digital services simpler and easier to use and letting the government decision-making model develop rapidly and precisely. To achieve the aforementioned situation, the key is data driving government service reform, through digital governance creating public service value, reducing the information asymmetry between public and the government and raising the level of administrative transparency and innovative government digital services.

II. Program objective

The foundation of this program is execution results of the past E-Government Programs and the Digital Government Program of Taiwan and will make data

governance methods and innovative ICT technology related measures complete to continue to promote government digital transformation. From the angle of serving the people, government data is produced by interaction with the public during government operation; the government should have an open attitude to releasing open data to public agencies, private organization of individual citizens for their use. By opening and sharing data, public-private partnership can enrich value- added application of data and drive the data production, analysis, and service industries, building a complete data economy. As for an individual's personal data, with their permission, it can be given to government and enterprises to use to develop personalized attentive, precise, and proactive digital services so that people's lives are "smarter" and more convenient. From the angle of public governance, government administrative actions must follow international trends, the socio-economic pulse and people's livelihood needs to make the most suitable decisions. Through the public and private domains, data of public interest or which will aid national development can be shared, raising the level of civil participation and developing an overall grasp of data, actively using diverse data to extract governance knowledge, driving the direction of administration and solving people's livelihood problems on a priority basis. In summary of the above, data, decision-making and service complement each other, neglect one and the effectiveness of smart government cannot be fully seen. Consequently, this program's objectives are linked to the three main objectives of the Smart Government Action Program and are set as "speed up data release, drive data re-use", "actively use people's livelihood data, open up a new administrative vision", and "link to technology use, a new era for innovative service". They are explained below:

Source: Drawn by NDC staff
Fig. 3-2. Digital Government Program 2.0 of Taiwan framework

(1) Objective 1 Speed up data release, drive data re-use

The new technology ABCD put forward by academia and the field of practice in Taiwan, is AI, Blockchain, Cloud and Data, four technology development trends that

are based on different technologies but can join to create synergy. They have been actively introduced in advanced countries and used in administrative management, public policy, public services, democratic participation and other aspects of public governance. Today, data is one of the key elements of government administration.

Since the promotion of government open data in Taiwan began in 2012, over 40,000 datasets have been provided on the Government Open Data Platform and downloads exceed 2 million annually. In 2019, the NDC announced that, with The Freedom of Government Information Law as the basis, government open data would be maximized and open data scale and quality increased; for data collection sources, machine readable, standardized and structured means of storage began to be adopted and each agency was urged to establish a mechanism for providing data according to application, making the non-personal data subject to use restrictions held by each agency available for external use following application according to the required procedure. To date, more than 500 datasets have been provided, some of which is high value such as maps and satellite images. Promotion of government open data in Taiwan has now reached a bottleneck and the problems that await resolution include: non-personal data in the private sector has not been released, government high value non-personal data needs to be actively released, government data quality needs to be improved, and the frequency of data updating is relatively low.

In sum of the above, this program will promote operations related to the legalization of open data to maximize open data volume and, at the same time, raise the value and quality of data release; as well as integration of data format in the direction of API interface and machine readability, survey of the needs of the pubic and agencies that are revealed by data use should be enhanced. Data re-use emphasizes active re-use and establishing principle regulations for application, authorization and fee collection, and requiring that government agencies implement them and implement the proceduralization of data re-use, ultimately promoting data high interoperability sharing and use in the public and private areas, to achieve the objectives of promoting data circulation and re-use.

(2) Objective 2 Actively use people's livelihood data, open up a new administrative vision

With the universal application of digital technology, the amount of data produced every day well exceeds that which can be processed manually. Traditional statistics, reports and data banks can no longer process large volume heterogenous data, leading to the appearance of a new data analysis model, Big Data Analytics. From 2015, the Executive Yuan selected seven issues of concern to the public and used big data analytics to find possible programs. Execution was very effective. The analyzed issues included enterprise salary raising, student employment, drug prevention, new immigrant potential vision, analysis of background of low income, promotion of the use of senior manpower and resources integration and career development trends for high school graduates. From this time, government agencies have used a large amount of big data analytics in support of administrative decision-making in their operations.

Government agencies have poured in substantial resources in recent years to establish an environment for big data analytics, however, the expected effect of "supporting government decision making" has not been achieved; the reason for is that most of what claims to be big data analytics is only on the level of statistical reports and is in the scope of existing operations, using single operation data to carry out data

analysis work. In recent years, advanced countries have changed their thinking and, with solving people's pain points as the mission, developed government precision governance models. Government agencies' promotion of big data analytics must remove the frame of traditional statistics so that government administrative issues and people's life pain points are the basis, holding in-depth dialogue between the three aspects of management path, governance structure and policy framework; this is the best way to achieve the objective of government reform in terms of concept, planning and execution.

In summary of the above, the main mission of the data governance of this program is to solve problems related to people's lives; through clarifying policy promotion bottlenecks or focuses of public opinion, then setting issues that are awaiting resolution or pre-setting the value to be created; as well as confirming the scope of analysis, data requirements and analysis methods, carrying out cross-data articulation and connection correctness; through connecting cross-agency and cross-operation data, using the decision making aid of analysis methods and algorithms, then using geographical maps to visually support administrative focuses and effects, setting government administrative actions based on evidence and opening up a new administrative vision.

(3)　Objective 3 Link to technology use, a new era for innovative service

In terms of providing government services, using digital technology to increase the effectiveness of government governance has become one of the key development policies of many countries. For example, AI helps government to find data scale that can't be processed by humans and connections and trends of complex data in a short time. The focus of use of blockchain is ensuing that data is transmitted with a high level of protection. In short, government digital services must move with the times and use technology effectively to solve the overall national challenges.

Also, to balance privacy protection and data economics development, the EU's GDPR gives the data's interested party "the right of data portability", ensuring that people have the autonomous right for application of their personal data. Taiwan's Ministry of Health and Welfare led the way in bringing out the Health Passbook in 2014; it allows people to download their outpatient, image, and other medical data. The NDC formulated Digital Service Personalization (MyData) from 2015; the focus of promotion is allowing people to download their personal data or agreeing to let a government agency or private business access their data to provide then with the personalized service they need. The government should effectively use the public's data to gain an understanding of people's lives. When people face turning points in life, actively connecting cross-agency operating processes, applying technology to simplify the process of interaction between government and people, using digital data on the most basic level to verify people's eligibility for government service, connecting cross-agency operating processes to simplify application procedures and going on to grasp changes in social environment and people's life needs. When people face difficulties, the government can provide government services that are timely, correct and meet need, accompanying people through the hard times.

This program will connect to government operational processes on the online data transmission foundation of T-Road and will compliance use people's personal data through the MyData mechanism, enhancing services in various aspects of people's lives; and, in combination with New eID, simplifying application processes for the public, through smart application enhancing models for serving the people and using

blockchain to increase trust between government and people and provide them with better services and experiences.

III. Strategic planning

To achieve the three objectives of "speed up data release, drive data re-use", "actively use people's livelihood data, open up a new administrative vision", and "link to technology use, a new era for innovative service", the promotion strategies of this program are promoting the legalization of open data, molding a data ecology-friendly environment, building a need-oriented data analysis and decision-making model and deepening the smart services of new technology application. The promotion strategy is explained below.

(1) Objective 1. Promoting the legalization of open data

Grasping data means grasping opportunity and the future, data is the most important strategic asset in the digital era. Since promotion of government open data began in 2012 in Taiwan, results have received international affirmation. However, by reviewing the situation with regards to promotion of open data in Taiwan three problems that are in urgent need of resolution can be seen; they are data opening proactiveness and understanding of the value of data are insufficient, regulations do not clearly stipulate data "use" rights, there is a relatively weak link between data opening and non-governmental application. To resolve these issues, the work planning for execution of this strategy is as follows:

1. Expanding release of high value data

Since Taiwan began promotion government open data in 2012, the focus of strategy has been on actively expanding the number of data sets. Today, the government open data platform has over 40,000 data sets, really rich results. Looking at the use rate of datasets, it is concentrated on transport, tourism, weather, iTaiwan hot spot distribution etc. and other content directly related to people's lives.

In future, the approach of advanced nations such as the EU will be taken as reference to expand the open data of state owned institutions, public enterprises and corporations etc., expanding the scope of opening; a high value data evaluation process special data set determination method will be established, focusing on Taiwan's high value data (transport, tourism, weather) and a data type list produced. Apart from public affairs data, the civil sector should also at the same time release data that is in the public interest, focusing on people's needs and, through innovative thinking and breakthrough, drive the re-use of data.

2. Increasing data set quality

Government agencies must work to change their thinking about data from "what people need to know" to "what people can use". To guide all agencies to actively raise the quality of open data, in reference to international standards, the Regulations Governing Data Standards for Interpretation Data of Data Sets were drawn up by the NDC; the open data of each agencies should be based on the general dataset standards framework of these Regulations, developing interpretation data standards contents that match the nature of operations. Also, the Open Data Opening Excellence Label and Incentive Measures for Enhancing Application have been drawn up to evaluate and reward government agency raising of open data set quality.

In future, this program will make every effort to promote government open data set instantly updated dynamic data with priority given to provision using the dynamic API method; and, together with the Ministry of Economic Affairs and other agencies, formulate an industry data use guide and agreement template to promote free circulation of data, and also promote talent nurturing, make data supply and demand and the requirement environment complete and promote growth and innovation of data economics.
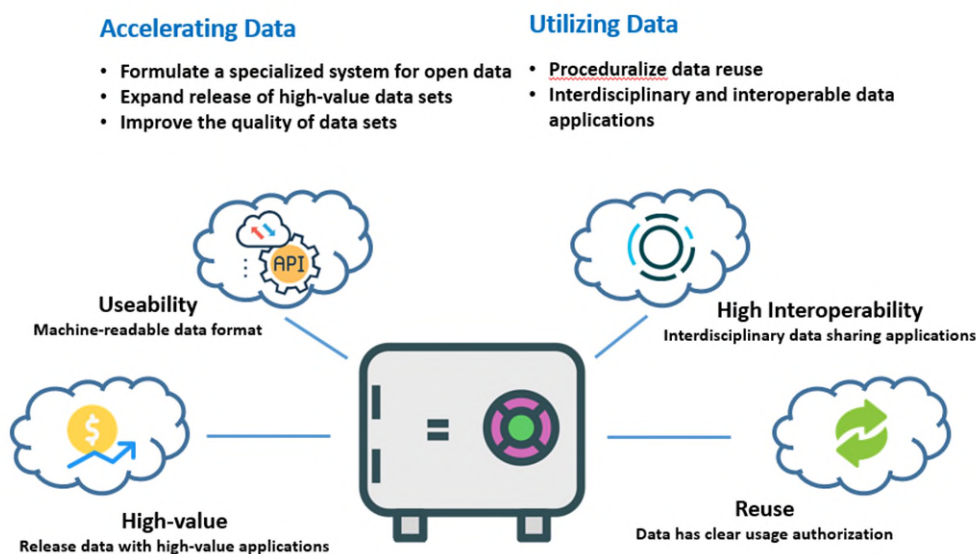
3. Data re-use processization

Some government data is not sensitive in nature (personal privacy, business secrets, national security) but has not been released for external use through the open data mechanism due to need to restrict users and use scope or because a fee needs to be paid. The NDC launched the policy of maximizing government open data policy in 2019, with The Freedom of Government Information Law as the scope revising the Operating Principles for The Opening of Data by the Executive Yuan and Its Subsidiary Agencies, adding "provision of data according to application", stipulating "provision with open format, authorizing use with the methods of compensatable, reserve of withdrawal right or other restrictions. To date, over 500 datasets have been provided, some of which are high value such as maps, transport and weather. With the aforementioned promotion directions as the foundation, government data re-use regulations will be formulated in the open data special law. This program will require that government agencies must stock take the data under their jurisdiction and focus on data items of high application value, setting data re-use management procedures and stipulating data application method, authorized content, use scope and restrictions, and payment method. Under the precondition of control, government data can be released for civil use, making the data economics development foundation complete.

4. Cross-area data interoperable use

There is low interoperability efficiency of government data due to the independent operation of government operations and analysis of the aforementioned problem shows that a basic factor is unclear data definition, with the same data name probably having several definitions. For example, specification, in product inspection operations it means product size, color and power, while, in food inspection, it means food content and appearance. To promote the cross-area interoperable use of government open data, the NDC has drawn up the Regulations on Data Set Interpretation Data Standards to give data providers sufficient interpretation data to describe the characteristics of data, with the aim of promoting the data resources exchange and data value added application of various kinds of data.

This program will continue to guide government agencies and civil organizations to establish area data standards and data set interpretation for open data to assist people understand the definition of the various data of open data sets.

Accelerating Data

- Formulate a specialized system for open data
- Expand release of high-value data sets
- Improve the quality of data sets

Utilizing Data

- Proceduralize data reuse
- Interdisciplinary and interoperable data applications

Useability
Machine-readable data format

High Interoperability
Interdisciplinary data sharing applications

High-value
Release data with high-value applications

Reuse
Data has clear usage authorization

Source: Drawn by NDC staff

Fig 3-3 Strategy 1. Promoting the legalization of open data

(2)   Strategy 2 Mold a data ecology-friendly environment

In the digital era, effectively using data analysis can raise the level of government governance and benefit the development of data economics; and combination with IoT, AI and other technology can promote limitless business opportunities. Since Taiwan launched the promotion of government open data in 2012, it has actively released open datasets at the government end and encouraged government agencies to use data to create all-new public governance services. The government has also invested capital and provided guidance in the use of open data by government agencies and industry to build new type business systems, encouraged enterprises to stock take dataset supply situation in various application areas and gaps and put forward methods for filling in the data gaps and actually verify the usability of data, to supplement industry data and applications and create economic value. In light of the fact that developing the digital economy and promoting digital conversion and service upgrading by government agencies is basic work that will take a long time, the government should continue to make every effort to assist government agencies and enterprises to use data to create a digital operating system and innovative services and products. The work planning for this strategy is as follows:

1.   Promote a data market platform

With the aim of accelerating industry conversion and provision of data services, the Ministry of Financial Affairs Data Economic Ecosystem Promotion Program matches business operators upstream and downstream in the service ecology chain to promote the development of solutions by data service flagship teams. It encourages data operators to actively develop data innovative application services and guides startup teams to become involved in developing data applications, continuing to build a sound data circulation environment and further driving the booming development of data economics added value services. In terms of data matching, at present, Data4Matching, DataYougar and other data markets have been established with enterprises partners, collecting together mass transport, agriculture, business services, media, communities, marketing related issue data markets.

Data is an indispensable asset in the digital economy and, as various applications for new technology arise, enterprises need a large quantity of external data to promote operations. In future, the government will target the establishment of data trading market services in the area of people's lives, including financial products, public enterprises, education services and other areas to form a data industry type, match industry and local governments to autonomously develop open data applications to drive various innovative services and build a data application ecology. The NDC will, with the Ministry of Economic Affairs and others agencies with operations in related areas, cooperate on the promotion of the data market policy, establishing management standards and a guide to encourage enterprises to take part in the data market and go on to mold a data ecology, promoting the growth of Taiwan's digital economy.

2. Stimulate social innovation energy

To advance the development of social innovation and encourage social enterprises, nonprofit organizations and ordinary enterprises to join together to develop social value and influence, the Executive Yuan approved the Social Innovation Action Program (2018-2022) in August 2018. It leads related agencies to jointly expediate social innovation models, actively advocate them, and has introduced financing, resources linking, regulatory relaxation and other measures, providing support to social innovation in Taiwan. In terms of incubating innovation, the MOEA has promoted social enterprise local rooting and empowerment, using open data to define the social issues of each area and assess the key to problems, concretely displaying international promotion results and Taiwan's degree of promotion and resources input with regards to various social issues; through diverse interaction, core problems are found and innovative solutions stimulated. To date there have been a number of successful social innovation cases.
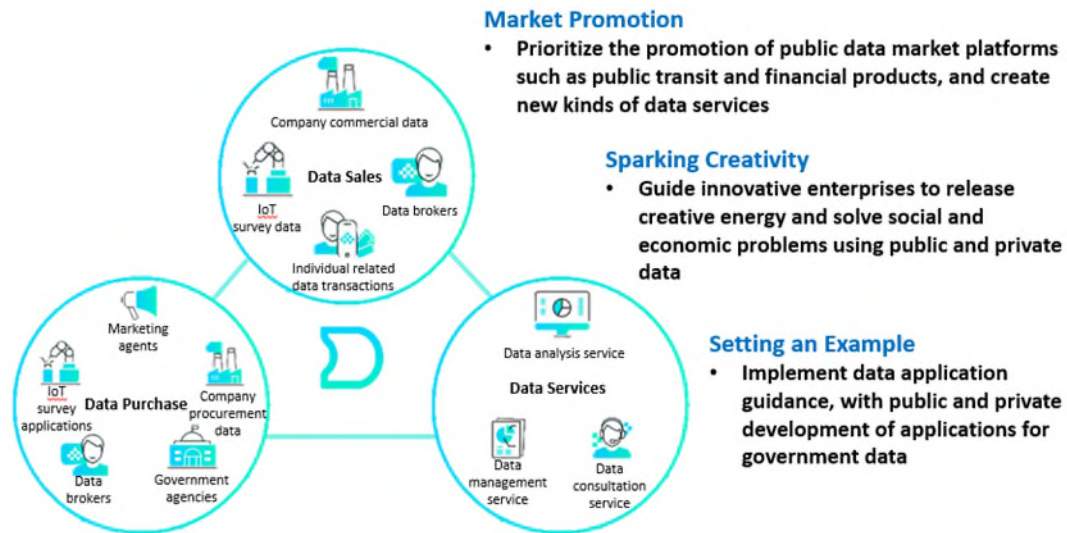
In future, all government agencies will promote social enterprises innovative application service in line with the Social Innovation Action Program, using the operating experience of the Social Innovation Lab to assist local related platforms jointly develop, supported by civic tech, expanding the scope of experimentation, forming an action program in a rolling style; a social innovation incentive mechanism and consumer identification will be promoted to encourage the input of external resources and a social innovation ecosystem built, connected to local Social Innovation Labs attracting external parties to join the ranks of social innovation.

3. Establish data application models

Due to the fact that the understanding of data of most government agencies is limited to statistical reports and graphic representation of data and government agencies' promotion of cross-agency data connection and value added application is still at the enlightenment stage, in line with national social development requirements and to display the importance attached by the government to open data and data use innovation, in 2019 the NDC trialed the Government Agency Data Application guidance service; public affairs agencies, civil enterprises and experts and scholars were invited to form a promotion team to drive three-way exchange between data holders, data scientists and area experts, bringing together public wisdom to jointly speed up optimization of public services and government service innovation effectiveness In 2019, four data application guidance cases were promoted in all, covering four application types, namely shared

transport, location choice for opening a shop, drug sale and transport policy, with results rich.

This program will expand the handling of the data application guidance mechanism, from the viewpoint of the public, finding data application subjects, and, together with groups and representatives from various quarters, establish data application models in life related areas with the industry, government, academic and civil sectors.
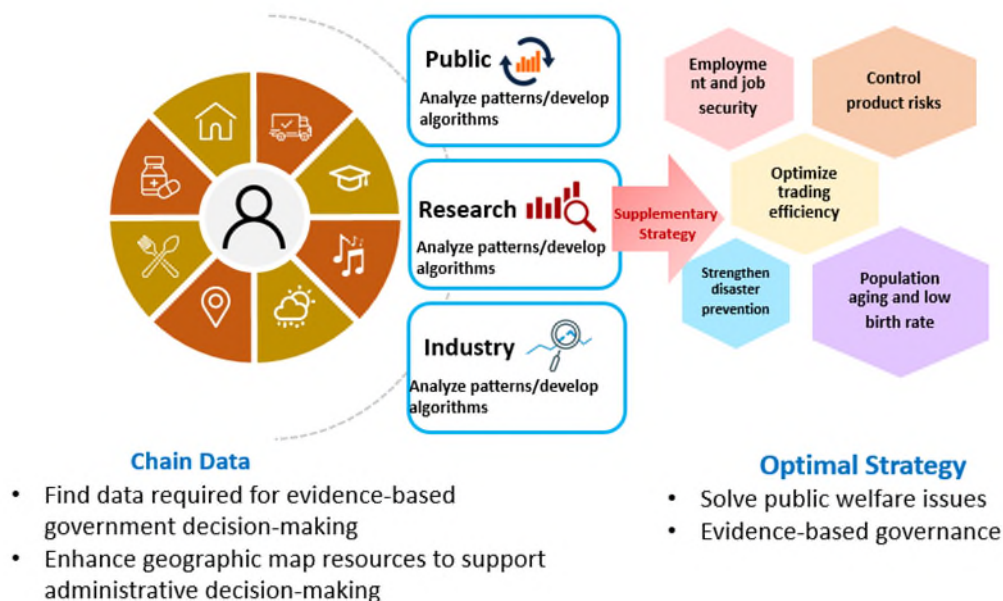

Source: Drawn by NDC staff
Fig. 3-4 Molding a data ecology-friendly environment

(3) Build a need-oriented data analysis and decision-making model

The use of big data by government agencies in Taiwan can be traced bac to 2015 when the Executive Yuan designated seven policy issues of concern to the public at the time and requested related agencies to put forward responses using the evidence-based method. To date, some government operations actively adopt the evidence based decision-making model to assist agencies implement operations; for example, the Internal Affairs Spatial Statistics Big Data Application of the Department of Statistics of the Ministry of the Interior and the Police Administration Big Data Application of the National Police Administration.

Looking at the handling of big data analytics by public agencies, the NDC thinks that successful big data analytics must cast aside the idea of "operational responsibilities" and change to a "problem-oriented" model of analysis; that is formulate big use analytics action from the angle of helping solve government policy issues or issues that the public are concerned about. For example, global climate change and extreme weather is seriously threatening people's lives and property. Government must come up with a response. Big data analytics can help government agencies make objective judgments and formulate suitable policies. According the division of labor of administration in Taiwan, the agencies this issue involves include the Council of Agriculture (forest, land, Ministry of Economic Affairs (water), Ministry of Transport and communications (weather, earthquake), Ministry of Technology (disaster prevention), Ministry of the Interior (disaster rescue), Ministry of Defense (disaster rescue) and the various local governments. If big data analysis is planned from the angle of operational responsibility a "can't be the wood for trees: situation can easily arise. To assist government agencies effectively use data analytics to solve policy problems,

with people' lives related issues as the foundation, this program will invite related agencies to cooperate in data sharing and analysis and problem analysis. The various work items of the program are as follows:

Fig. 3-5 Strategy 3. Build a need-oriented data analysis and decision-making model

1. Link data and maps

The government will, following the principle of personal data protection, link and use public affairs data and civil sector big data, combined with geographical maps, to provide decision-making reference for policy issues connected to people's lives through data analysis.

(1) Collect the data needed for evidence-based decision-making by government

Before promoting government big data analytics, the handling agencies should, with regard the nature of operations, establish data analytics advance assessment and analysis regulations, selecting important issues for analysis from problems related to people's lives such as aging, low birthrate, food safety, social order and disease and sort out the analytical needs with regards to issues relating to people lives; then scan the issues relating to people's lives awaiting resolution and assess the opportunity and feasibility of using data analytics, confirming that related analysis resources are in place and acquire a full understanding of data content and meaning, removing erroneous or useless information and, according to data attributes, adopted corresponding data protection measures and then carrying out data articulation, linking and analysis work.

(2) Enhance geographical map support for policy decision-making

Each agency will establish 3D buildings, roads, railways and MRT etc. maps according to the NGIS 2010 Spatial and Temporal Information Cloud-Implementation of Smart National Land program and with reset to map management and opening promote upgrading of TGOS to Map Asset Interpretative Databank and provide API services for the interface use of each agency responsible for maps The competent agency for maps will set a differential management system for map authorization, use and charge standards. In terms of GIS decision-making model and expansion of

application, each agency will select ley needs connected to people's lives and actively enhance the GIS decision-making model. This program will promote Innovative 3D weather map enquiry and display work. With animation and 3D, the Central Weather Bureau will display weather maps in an intuitive way, increasing readability and accessibility of service.

Source: Central Weather Bureau Weather Innovative Data Services Program
Fig. 3-6 Innovative 3D weather map enquiry and display

2. Optimize policy decision-making

Each agency will establish a public-private partnership mechanism, using civil big data in combination with smart innovative technology to carry out analysis in areas such as public well-being, industrial development and social security, providing reference for government policy decision-making. The priority work for promotion of this program follows.

(1) Aged population and solitary living socio-economic reproducibility analysis

Together with the ministries of economic affairs, finance, education and the social affairs bureaus of city and county governments, the Ministry of the Interior has successively brought police administration, long-term care, low-middle income and physical and mental disability and other data, water, electricity, house tax files, labor insurance files, academic status files and civil telco signal data into the scope of data integration. It is used to assess potential gaps in the needs of the elderly, find those most in need of support so personalized service can be proactively given. Results of analysis can be used as the basis for expropriation, local revitalization policy and employment and medical treatment living sphere establishment.
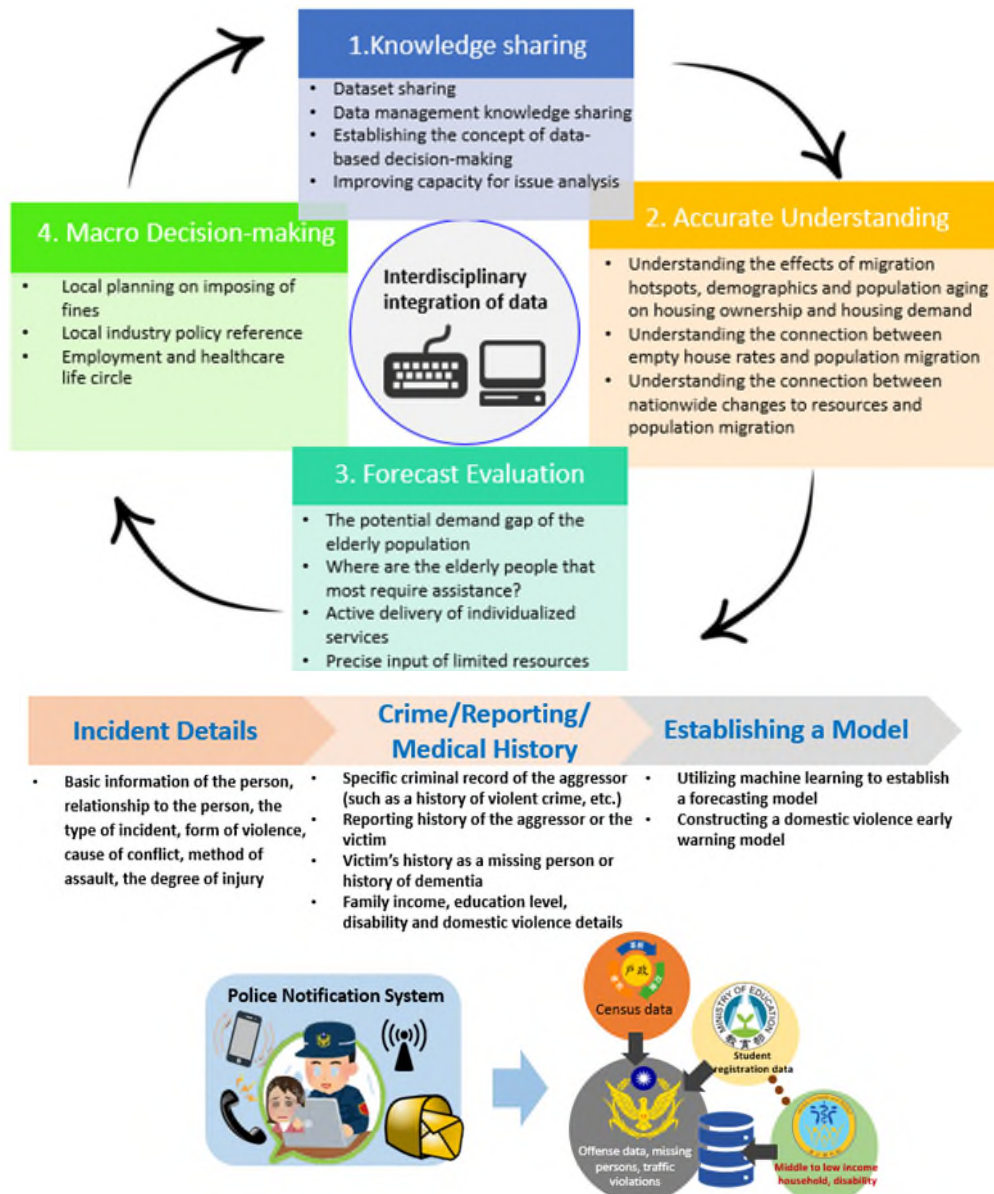
Source: Smart Internal Affairs Service Integration Program
Fig 3-7. Aging population and solitary living socio-economic reproducibility analysis

(2) Prevention domestic abuse involving elderly people

Together with the Ministry of Health and Welfare and Ministry of Education, the Ministry of Education has established domestic violence case patterns according to family relationship between the victim and concerned party , income and educational

level, reason for violent conflict, pattern of violence and degree of injury, unearthing the background outline of domestic violence. With regard to the criminal record, reporting record, medical record of victim and concerned party, machine learning is used to establish a prediction model to build a domestic violence warning model.
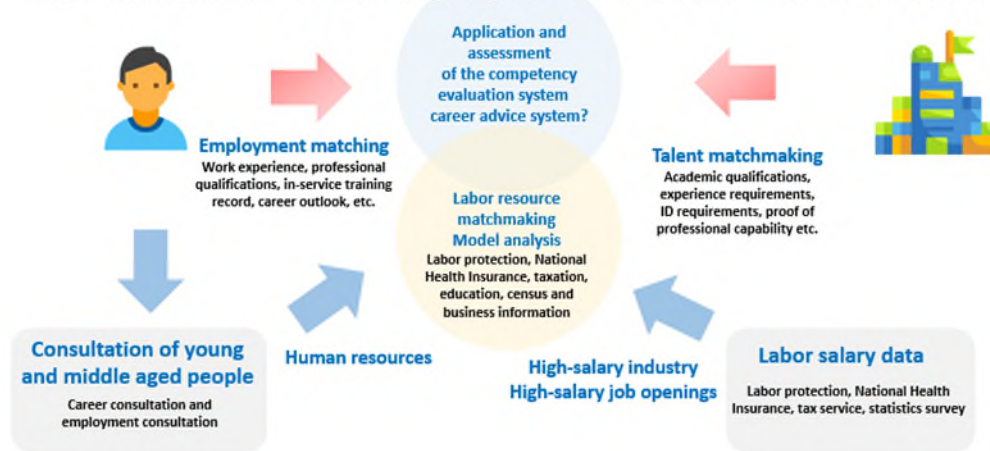

Source: Smart Internal Affairs Service Integration Program
Fig 3-8 Police administration crime prevention analysis

(3) Promoting employment for youth and middle aged and elderly

The ministry of labor, will together with the ministries of education, interior, finance, health and welfare, integrate the data of each agency, such as such as school affairs research databank, university employment competence platform databank, household registration files, national health insurance files, death registration files, cancer registration files, financial tax data and has built a manpower capital smart integration system providing policy reference for labor and education policy formulation. By monitoring labor market information, supply and demand of industry and groups can be adjusted; at the same time, by increasing transparency of the labor

market and reducing information asymmetry, people will be given reference with regards to the direction of raising the level of human capital and the human resources allocation efficiency of policy increased.

- Integrating education and labor information, observing how the young and middle-aged find employment
- Using salary forecast model as a basis, integrating data on industry demand for skills to develop a skills map
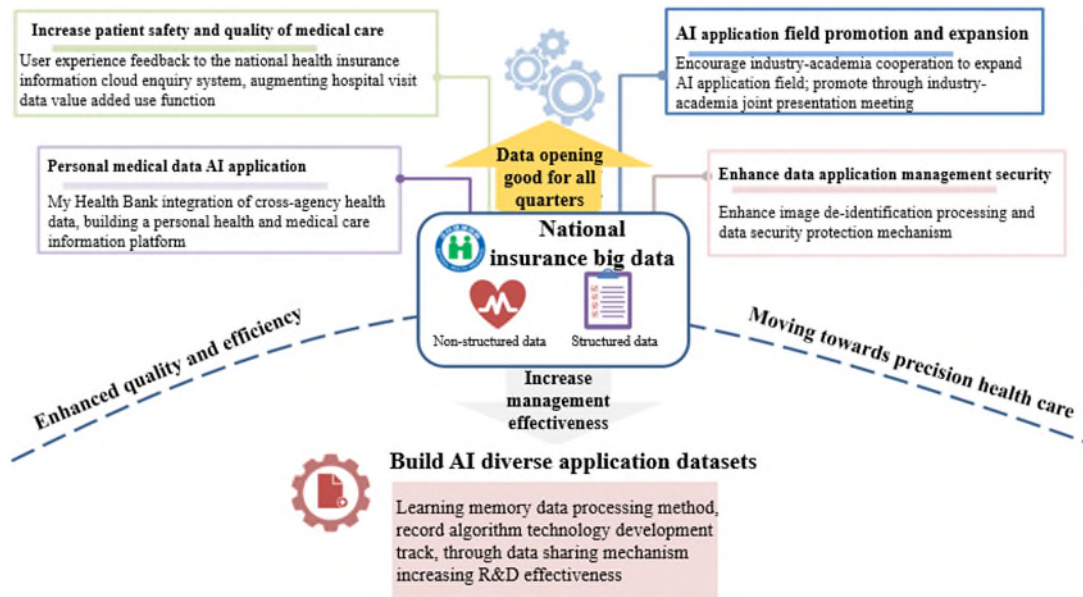

Source: Use labor data to enhance human resources capability—labor data application research

Fig. 3-9 Promoting employment for youth and middle aged and elderly

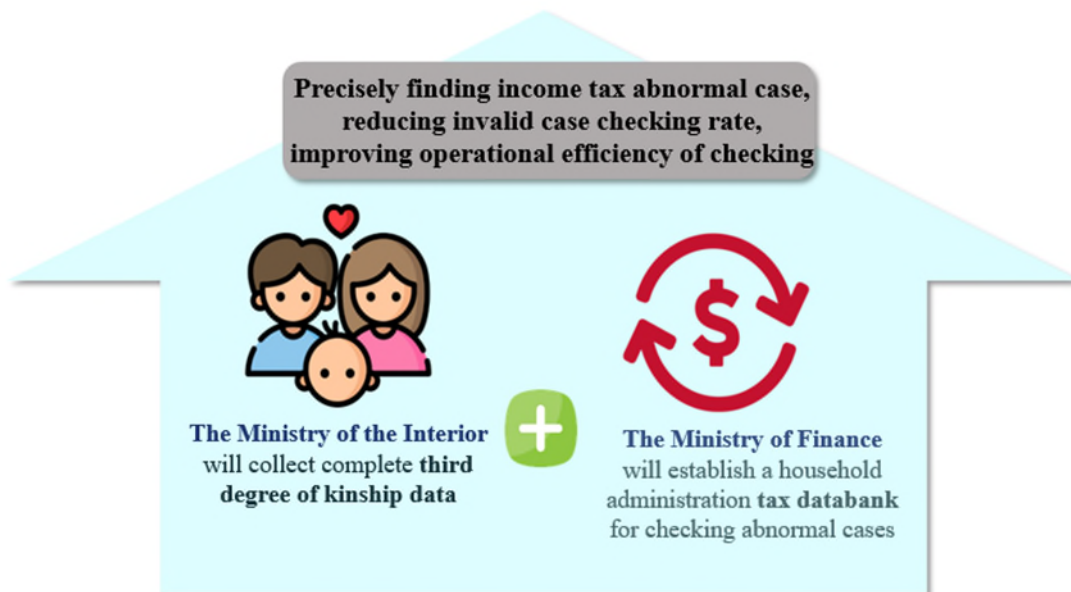(4) National health insurance data AI value-added application services

In recent years, the healthcare industry has used a large amount of big data and AI and has been able to thus make diagnosis more precise, adjust the manpower imbalance between medical personnel and patients, reduce medical costs and promote cross-industry cooperation. To increase the value of national health insurance data AI application, this program will use the learning memory data processing method to collect and record the development course of the data processing and algorithms of various research teams; a data sharing mechanism will also be established, to drive the upgrading of medical diagnosis and service quality in Taiwan and promote the development of the health industry.

Source: National health insurance big data digital application
Fig. 3-10 National health insurance data AI value-added application services

(5) Household administration big data value-added use

The Ministry of the Interior will collect and sort national household administration data, including death, birth, marriage, divorce and adoption etc. and provide complete third degree of kinship data. The Financial Information Agency will then establish a household administration tax databank for reference and use in checking by various related agencies. Establish a related tax information system, develop related income tax abnormal case check list, provided to the examiner for checking or notify the taxpayer to supplement or remind him/her of related data to protect the rights and interests of taxpayers.

Source: Program for Tax and Household administration Big Data Value-added Use
Fig. 3-11 Refined Income tax abnormal case checking operations

(4) Objective 4: Deepening the Smart Services of New Technology Applications

Since the advent of the Internet technology revolution in 1990, the rapid development of communications hardware and software has changed the way in which governments operate, which has also impacted the way in which they interacts with the pubic. Today, as a result of the constant promotion of new technologies in the digital era most advanced countries have shifted from their initial focus on "e business" to "using technology to resolve people's livelihood issues". In this sense, governments must view public issues as "the same thing" and use data and technology to link up government activities.
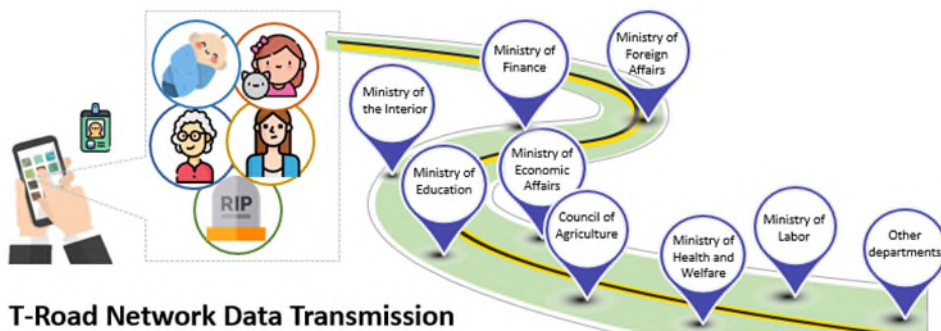
In order to help government agencies better use data and technology to restructure government digital services, this program will promote government agency use of network identification and T-Road to create secure and convenient government digital services. This involves using cross-agency data connectivity and design thinking to design government business processes and digital service operations interface (UI/UX) to simplify processes whereby applications to the government by members of the public require time consuming submission of documents, thereby improving digital services in the fields of food, medicine, housing, transportation and education. There will also be more proactive use of artificial intelligence applications to strengthen the public service model, while also using blockchain technology to enhance trust between government and public. This will also provide the public with better service experiences while continuing to deepen MyData, an autonomous use mechanism for personal data in Taiwan. If individuals agree to the government and enterprises using their data and cooperating with other departments, then if we take the categories of major Executive Yuan policies or departmental policies, then government digital services can be redesigned from the perspective of stakeholders. This strategy prioritizes the promotion of the following:

Enjoy the Experience
- Bring AI into public service models to improve the government service experience
- Utilize blockchain technology to create a tamper-proof data protection mechanism, and strengthen the mutual trust between people and government

Good Service
- Make good use of online identity checks and T-Road to build a cross-agency one-stop digital service
- Use data as the foundation to establish an accurate digital service for individuals

Source: Drawn by NDC staff

Fig 3-12 Objective 4: Deepening the Smart Services of New Technology Applications

1. Enhance experience of public services

This involves using artificial intelligence (AI) and blockchain technology to establish a new government operational model that incorporates AI in the provision of public services to enhance government service experience. The use of blockchain technology to create a tamper-proof data protection system also enhances public-government trust.

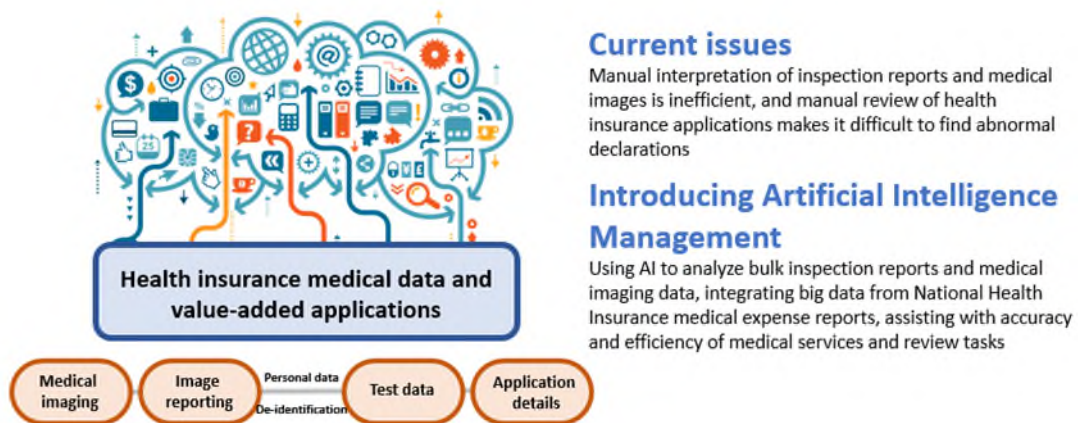(1) Creating prosecutorial documents using AI

The automatic sending of transfer documents and related data between judicial, police and prosecutorial agencies, makes it easier for prosecutors to cite related documents, read court records of questioning etc. when drafting official documents. In addition, the use of AI and big data analysis techniques enables prosecutors to automatically call up frequently used sections of text or laws through voice input, This makes it possible to better use scientific analysis to instantly produce written drafts, as references to assist prosecutors write documents, which effectively reduces the time spent drafting prosecutorial documents and enhances the efficiency with which cases are processed.

Source: Legal Services Smart Transformation Program
Fig. 3-13 AI produced prosecutorial documents

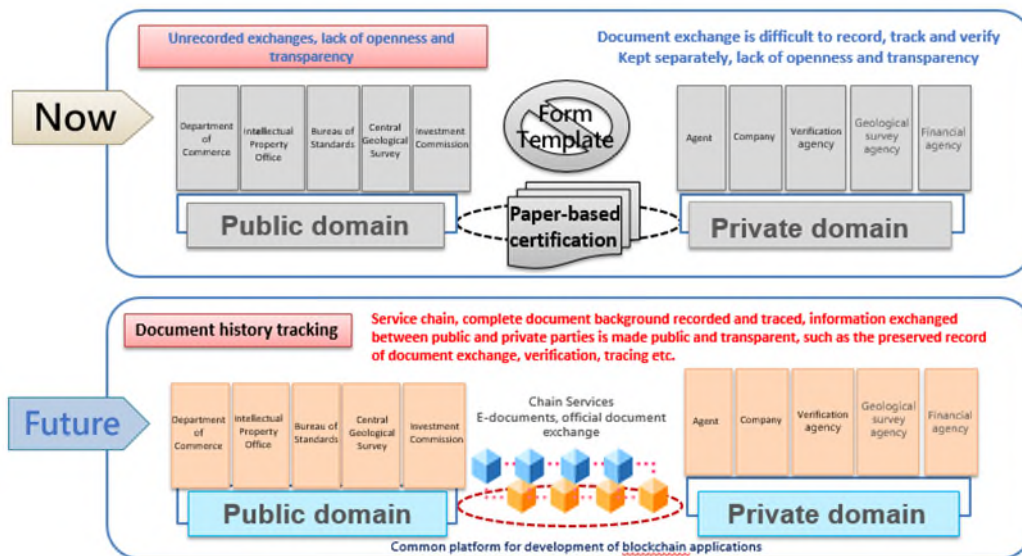(2) Health insurance data AI application value added services

AI technology can be used to analyze a large volume of investigation reports and medical treatment imaging data. Combined with big data on medical expenditure applications it is possible to more comprehensively assess the suitability of medicare services, assist medicare services and examine the precision and efficacy of operations, thereby providing the public with better quality medical care.

Source: Health insurance big data digital application program
Fig. 3-14 Establishing a smart medicare resources sharing and use model

(3) Economic digital documentary evidence blockchain

This involves establishing economic business open data so for example a firm's history of applying for subsidies can be searched cross-agency. Blockchain technology is used to create a mechanism that enables the exchange, storing and tracking of information. By facilitating registration and cross-agency verification, this develops convenient economic application services for the public and also enhances the openness and transparency of data.
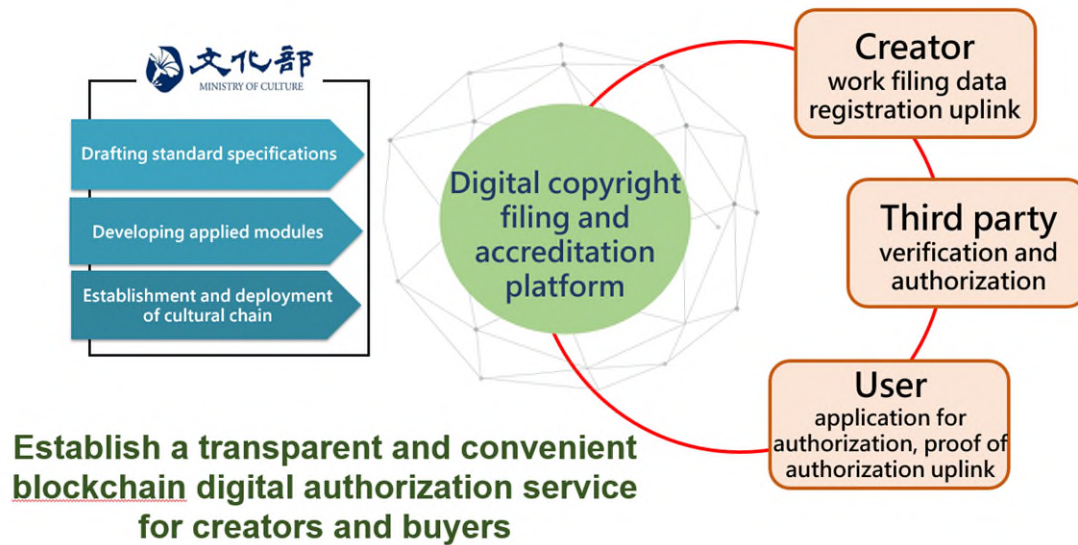

Source: Economic decision making assistance and smart governance program
Fig. 3-15 Economic digital document blockchain

(4) Digital culture content distribution mechanism

Establishing a culture content distribution service platform blockchain open participation mechanism integrates public collections and civil creative platforms that can be searched domestically and from overseas. The use of blockchain technology enables the provision of smart contracts and the building of a secure and reliable authorization system, that clarifies the ownership of collected works; The establishment of a digital collection items identification mechanism and creation of a digital platform

ecosystem vision is intended to encourage digital media, publishers and digital advertising in Taiwan to embrace digital transformation and become smart business capable.
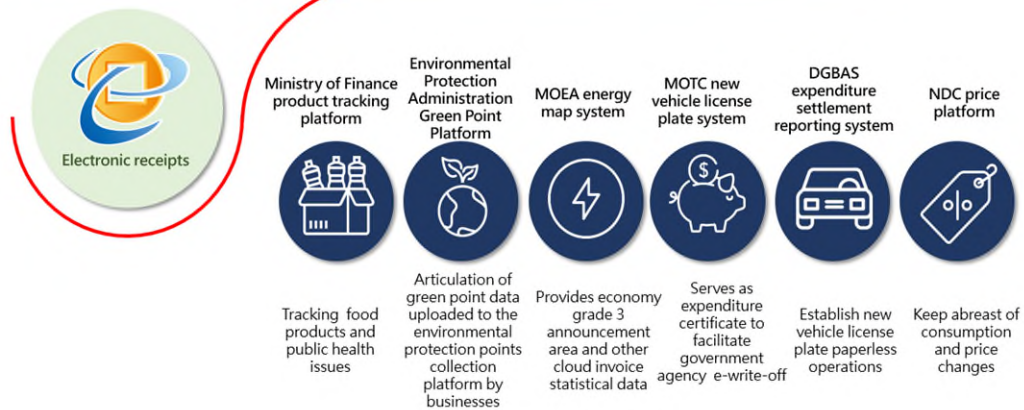
Fig. 3-16 Blockchain digital authorization services

2. Creating fast and convenient services

In the third quarter of 2020, the Ministry of the Interior will start to issue New eID, which will be used to establish a uniform national digital ID mechanism. Government agencies will use the New eID as a foundation and if individuals agree to government using their personal data, use the NDC-developed cross-agency data transmission channel T-Road to connect the business processes of different agencies to establish a full-service online application service. Thereafter members of the public will not have to submit hardcopy documents to complete application procedures, which will simplify the application process and implement a vision of smart government that provides 24-7 services that are faster, more convenient and efficient.

(1) Cross-agency integrated electronic receipt services

In concert with the adjustment of T-Road data exchange standards and norms, a uniform information exchange interface and format will provide cross-agency data exchange services. In future, it is planned to provide electronic receipts as a channel for exchanging data with other agencies. Examples include such comprehensive cross-agency data exchange mechanisms as the NDC's "Pricing Data Platform", the Environment Protection Administration's "Green Points Platform" and the Directorate General of Budget, Accounting and Statistics' "Common Expenditure Settlement Reporting System" etc.
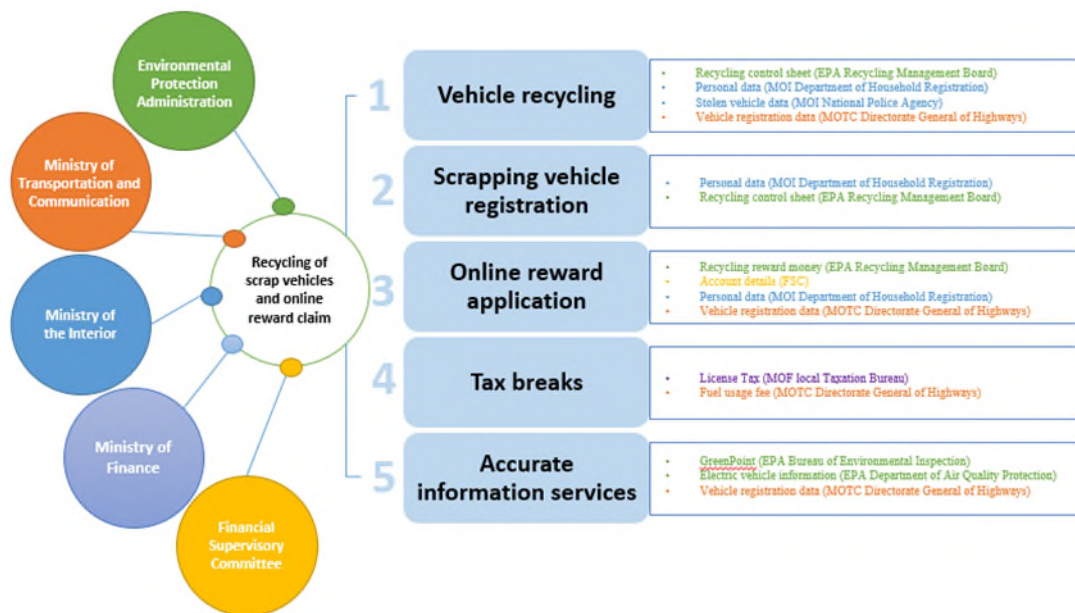
Source: Promoting Cloud Receipt Digital Service Program
Fig. 3-17 Cross-agency integrated electronic receipt services

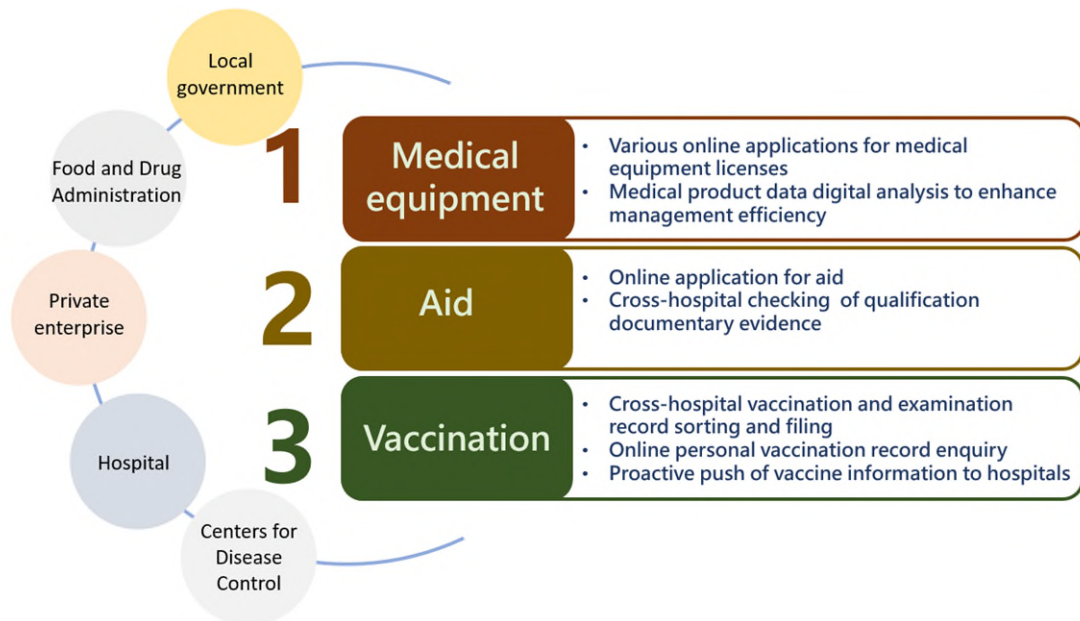(2) Online applications for scrap vehicle retrieval and bonus

There are three administrative procedures to report scrap motorbikes and apply for bonus commissions; the first is the EPA retrieval operator physically takes possession of the bike; the second is the supervisory unit cancels the vehicle registration and once it confirms that all fuel tax and outstanding tickets have been paid the third step is the bonus commission can be claimed. Units involved in the process included the recovery operator, supervisory unit and EPA. Once an online application for scrap vehicle retrieval and bonus commission is completed the payment is remitted within about two weeks. With the New eID and T-Road framework this process is moving in the direction of "one-click completion" by reforming application procedures and eliminating the arduous process of operational declarations.

Source: i-Environment one-stop services
Fig. 3-18 Online applications for scrap vehicle retrieval and bonus commissions

(3) Public-private cross-area cooperation in health and welfare

Such cooperation seeks to strengthen the social security net information services environment and momentum, while deepening cooperation between the social welfare services and public health systems, connect operating data to allow innovative government processes, establish digital data infrastructure, enable the complete digitization of vaccination operational management, improve digital management of medical equipment life cycles, and strengthen food safety incident early warnings and substance abuse prevention, while strengthening the quality and availability of health and welfare policy data, to facilitate data analysis and use by future social welfare service resources.
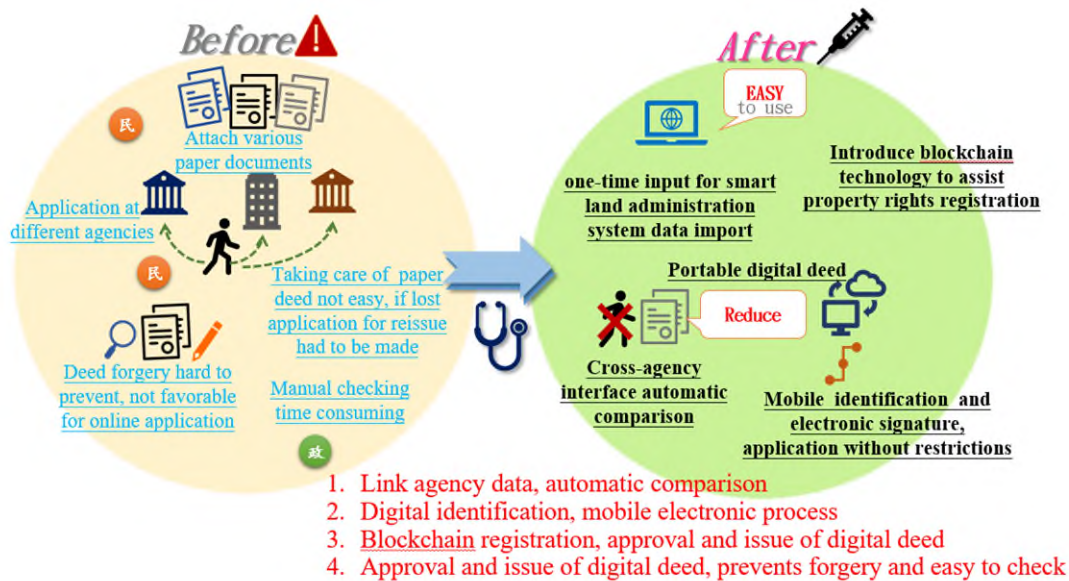

Source: Ministry of Health and Welfare digital transformation services upgrading program
Fig. 19 Ministry of Health and Welfare Online Services

(4) Online and mobile applications for real estate registration

The involves first promoting a partial online application service, with professional agents helping to input related registration application data into the platform, eliminating in-person applications, with hardcopy documents that cannot be digitized sent by post to reduce in-person application. Review the necessity of hardcopy documents appended to real estate registrations, particularly documents approved by government agencies, which could be obtained from the relevant agency's system through an interface, thereby eliminating the need for applicants to send such documents. In addition, the use of blockchain technology means that for important processes a time point data uplink can be used. The advantage of clear and certain data that is tamper-proof and stored in a decentralized manner, together with the automatic smart contract process ensures the data conforms to requirements, thereby reducing verification errors and costs.

Source: Program to promote smart real estate registration

Fig. 3-20 Online and mobile applications for real estate registration

(5) Personalized digital services platform

This involves creating an autonomous data platform, with individuals making decisions on the use of their personal data, with processes whereby individuals agree to the use of their data by others. It also requires drafting a policy guide, operational/technical norms for the release and use of personal data by government agencies as well as a mechanism to manage data security and privacy. Other elements include a framework for the release and use of personal data, including data interface rights and obligations, to promote data economics and service innovations. Trial runs should be prioritized in highly regulated sectors with application value, for example in fields of high public interest such as healthcare, energy, finance, communications etc.

Source: Empower individuals to create their own digital use program

Fig. 3-21 Personalized digitized services platform

(5) Basic skills

In order to achieve the above objectives, this program seeks to promote the "building of an accurate and reliable digital infrastructure environment", with key projects involving "cultivating highly secure information and communications facilities", "supporting measures for the completion of digital transformation" and "building an accurate and reliable digital infrastructure environment". These are introduced in more detail below:

1. Installing highly secure communications facilities

In response to technological development trends such as 5G communications technology, Internet-of-things etc. continued efforts will be made to strengthen information and communications infrastructure and T-road security, to enhance public trust in the government.

(1) Strengthening infrastructure security

Develop a backbone infrastructure network mechanism GSN software-defined network, while enhancing GSN bandwidth, reviewing and adjusting management systems in concert with the needs of 5G mobile communications and new technology developments. Expand T-road transmission service categories to include the use of T-Road transmission data by agriculture, education etc.

(2) Enhancing digital environment efficacy

The computing capacity of cloud computing centers should be enhanced in response to the establishment of a software defined network management mechanism by T-Road, in concert with the increase in data security protections in government digital services and cloud computing capacity. By improving the service experience of the T-Road portal site, collecting and analyze anonymized public browsing histories it is possible to determine the operational processes' breakpoints on the portal site and advanced UI/UX design. In addition, integrating the government service information of all agencies, together with AI learning of browsing habits make it possible to increase the efficacy government service recommendations, using technology to create smart applications

2. Increasing digital transformation promotional capacity

As part of the smart government vision it is important to make the best of enterprise strengths and wisdom of the masses, ensure regulatory flexibility, government service transformation and the training of digital talent training.

(1) Regulatory flexibility

The NDC has a digital application regulatory adjustment platform. This adopts a one-stop window and coordinates with all government agencies in clarifying concerns over regulatory flexibility in the promotion of digital transformation. It also actively collects proposals from members of the public and groups while seeking to eliminate uncertainties in regulatory flexibility. The NDC has also established a Personal Data Protection Project Office, which seeks to ensure uniformity in the execution of personal data protection across agencies, while reviewing Taiwan's Personal Data Protection Act.

(2) Public-Private cross-area cooperation

 The NDC seeks to organize the guidance capabilities of civil sector experts in concert with central government agencies, and local government to promote digital transformation. This involves referencing international data management norms to establish regulations for government agency data lifecycle management; establishing an area expert companion mechanism and assisting all agencies use eID, T-Road, Data, to simplify government operational procedures and deepen the Join "public policy online participation platform". Another aspect is the establishment of an open review mechanism for major government projects, which together with the New eID simplifies identification procedures, adjusting participatory budgeting and image survey processes.

(3) Cultivation of government digital manpower

 Building information competence learning maps provides government agencies at all levels with selective training based on their digital service development needs, while systematically making up for gaps in professional competency. We should also provide cross-area digital governance strategic training for medium to senior level managers in government departments and newly appointed civil servants with Gao Kao grade three and Pu Kao information processing basic professional training, to cultivate digital talent within the government. In concert with the need to transform government services in the digital age, it is necessary to cultivate the digital literacy of civil servants through Digital By Design and Digital By Default. This should also include working with government at all levels to develop a digital skills training mechanism and creating a Digital By Choice government service environment.

4. Program performance indicators

 This program links up with the promotional strategy for the Smart Government Action Plan, establishing three objectives and basic skills, while continuing to promote the smart government plan and implement the smart government vision. As one of the factors behind successful government digital transformation is widespread and popular government-public digital interaction channels, this program will establish innovative applications and services using new technology, with a focus on life events and satisfying people's livelihood needs. It is also hoped that this will promote the digital transformation of Taiwanese society, while encouraging the public to conduct business with the government through digital channels, thereby enhancing the universal nature of digital services and helping the nation achieve digital transformation.

In summary, the prevalence rate of digital services developed by this program can be viewed as a composite index on its execution and performance. As such, the program's New Technology Application Smart Services Public Use Prevalence Rate serves as a performance index. This also makes a comprehensive assessment of the program based on the realization of three main objectives: "accelerated data release as a driver of data reuse", "utilization of livelihood data to develop a new policy vision" and "new era of connecting technological applications and innovative services". Strategy is promoted from the overall objectives of the program in concert with the smart government action plan and DIGI$^+$ 2.0, with a focus on public-oriented service benefits.

Method of calculation: work items relating to the four-program objective until 2025

(number of people engaged in online business [including applications and inquiries] / total number of people engaged in business [including online and in-person]) X 100% >= 60% 。
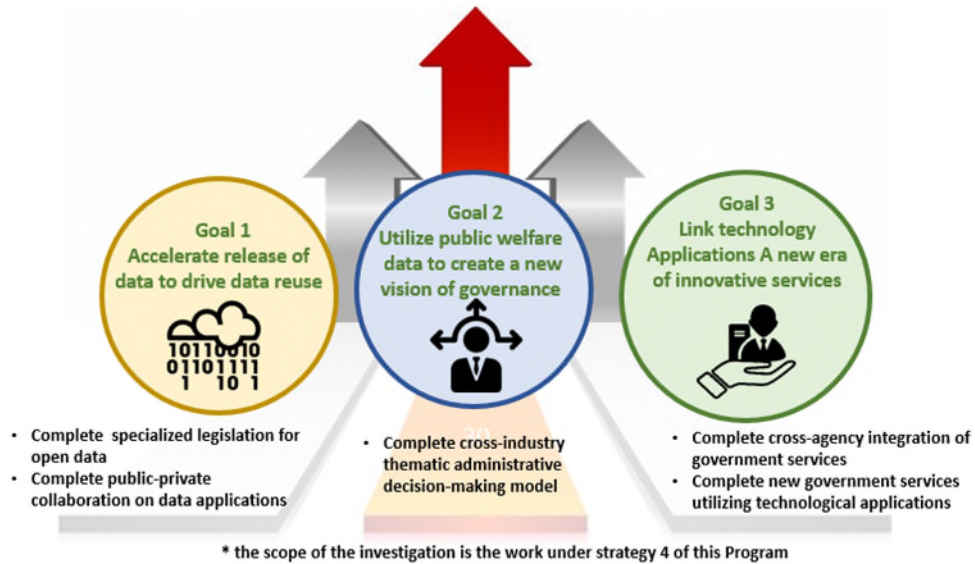

Fig. 3-22 Program comprehensive performance indices

Table 3-1 Performance index and index values 2221-2225

Performance index items	Unit	2221	2222	2223	2224	2225
Public use prevalence of new technology application smart services	%	5%	10%	30%	50%	60%

Source: Arranged by program staff