III DIGITAL TRANSFORMATION ENABLER

2019

**INSTITUTE FOR
INFORMATION INDUSTRY**

ANNUAL REPORT

DIGITAL TRANSFORMATION ENABLER

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ANNUAL REPORT 2019

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ANNUAL REPORT 2019

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Impacting 40, Advancing for 50

On July 24, 2019, III, marking 40 years since founding, is moving towards a future filled with even more challenges.

On the same day three years ago (2017), the Ministry of Economic Affairs launched the "Legal Person Revolution and Innovation" to help the industry respond to the challenges and demands brought by IoT and AI trends through the new mechanism using the framework of platform-based legal persons and domain-type legal persons. In the last three years, III has continued to improve on this path: In terms of "Revolution", it focuses on the revitalization of personnel arrangement, processes, systems, and organizations to change the traditional constitution of legal-persons for meeting the needs of current rapid changes in digital technology. Regarding "Innovation", it is the new value positioning as a Digital Transformation Enabler that propels the organization to combine its strength of information services with the professional knowledge and technology of domain-based legal persons, integrating resources and cultivating all kinds of cross-industry innovation units.

During this period, internally, III developed the ability to solve unfamiliar problems, promoted the concepts of ROI (Return on Investment) and SROI (Social Return on Investment), and introduced the Silicon Valley BMC (Business Model Canvas) technique. III pursued the new thinking of "business model innovation is more powerful than technical innovation", gathered resources, continued to invest in advanced technology and map out the future, perfected the mechanisms for entry and exit, and improved risk management to ensure that technology leadership is maintained and avoid competition with the public.Externally, III joined hands with academia, information service providers, public associations, and domain-based legal persons to accelerate the expansion of digital transformation services and build a "digital transformation" multi-win cooperation model.

In terms of social responsibility, in facing the unpredictable COVID-19 epidemic, III also fully utilizes the expertise from its four major businesses: think tank consulting, technological R&D, talent cultivation, and industry services. Actively investing in relevant resources, III not only continuously promotes the integration of the government and the industry in the local service industry, but also help accelerate digital transformation. Moreover, it also assists allies, nationals, and new residents and other ethnic groups for free. III seamlessly integrates Taiwan's epidemic prevention resources with experience as well as carries out experiments of digital learning to turn crises into opportunities.

On the third anniversary of Legal Person Revolution and Innovation, III, while looking back on the past and forward to the future, strives to play its role as a Digital Transformation Enabler, continues to facilitate the progress of the government and industry by high-quality digital transformation solutions and application services, and spreads the seeds of technological care and public welfare to all corners.

COVID-19

Read more about III support anti epidemic exhibition area ▶

Read more about III DxBAR Channel ▶

Caption: III held its 40th anniversary celebration event on July 24th, 2019. The picture showed III Chairman Chih-Kung Lee (Right) and III President CH Cho (Left) took a photo together. For the next forty years, III Chairman Chih-Kung Lee even expects that III takes the lead in working with more partners in the fields of industry, university, and academia for the cultivation of more talents and the demonstration of various work types. This is also the task that a "digital transformational enabler" must always keep in mind and actively find ways out for various domestic industries.

Industry Prosperity from Digital Transformation

Digital emerging technologies are continuously developed and governments around the world regard digital transformation as the driving force of economic growth in recent years. IDC and Gartner surveys have shown that global investment in digital transformation (DX) related projects has become a top priority for enterprises. Recently in Taiwan, information communication technology service providers, industrial associations, and government agencies are also eager to actively carry out digital transformation. However, a wide range of issues are encountered during digital transformation, so it is important to effectively gather all forces to face the issues together.

Digital transformation is not just a slogan. The issues and scope are numerous and wide. Demand-side and supply-side (including startups) issues can be summarized as follows: the lack of a collaboration platform that links supply with demand, the short of a new industrial ecosystem, the missing of vertical integration solutions, the need of innovation index sites, the willingness of welcoming business model innovation, lacks of clear digital function training plans, the urge for updated regulations, the calling for sufficient cross-domain digital talent, the necissity of model cases for transformation, the professional skills to outline clear transformation strategies, and the search of channels to international markets. These are key issues that need to be resolved immediately (as shown in the figure). Accordingly, the promotion directions developed by III are as follows:

- The industry has changed. Companies have neither opened their minds to innovation nor connected to and sought external partner resources in a timely manner.
- Digital transformation topics are extensive. Companies fail to effectively grasp the resources required for digital innovation, or lack the ability to develop or apply new products/services.
- The Directorate General of Budget, Accounting and Statistics estimates that there will be more than 300,000 (technical) professionals who will reach the age of retirement in the next 10 years. The market will lack labor productivity and generate a tacit knowledge gap (including second-generation takeovers).
- Industries generally lack the knowledge needed for digital development; over 80% of companies believe that digital transformation is a priority, but they do not know how to proceed.
- Nearly 70% of companies lack digital leaders, digital transformation talents and teams; this is the key obstacle to digital innovation.
- The structure and operating mechanism of current compliance cannot meet the trend of digital economy innovation.

- Technological innovation moves forward quickly. Breakthroughs achieved by companies through new technologies are not integrated with various vertical fields.
- System integrators only focus on specific areas of operation; since the systems cover a wide range of aspects that are beyond the capacity of the system integrators, corporate needs cannot be fulfilled.
- Digital economy is seriously affecting traditional regulatory operations and management thinking. For example, finance is traditionally about preventing fraud, which requires a large investment in legal compliance and therefore increases the cost. Meanwhile, the technology industry is advocating new ideas to make customers feel more convenient.
- The lack of digital innovation experiment or business model environments, such as the environment for new types of services, like risk reduction, threat prevention, and security improvement, etc., which delays the implementation schedule of innovative applications.
- The lack of channels to grasp opportunities for international digital transformation, such as the opportunity of Japan's 2025 Digital Cliff.
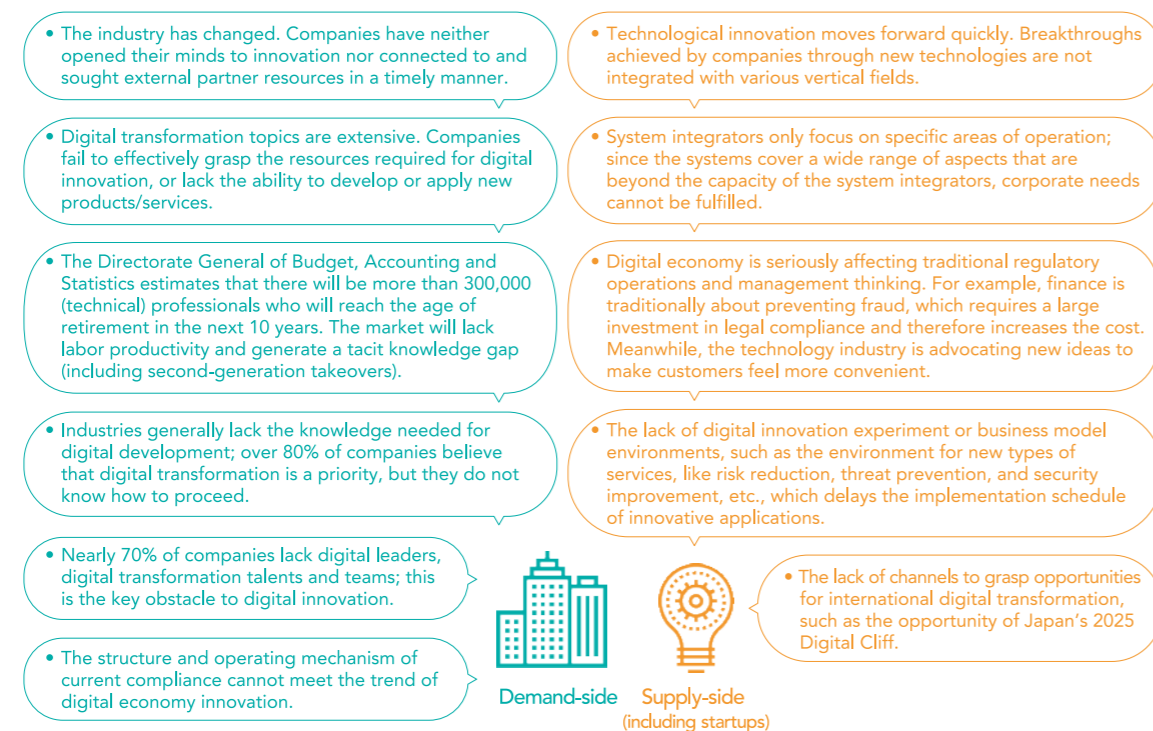
Demand-side   Supply-side (including startups)

Figure 1. Key digital transformation issues to be solved urgently
Source: Interviews conducted by Microsoft, IDC, and the III team; organized by III, November 2019

1. Relaxation of regulations that promote digital development:
The focus is on the adaptation of key regulations, the relaxation of promotional and regulatory norms, and the establishment of a digital sandbox to encourage the development and implementation of innovative applications. The main tasks include the study and deliberation of relevant digital regulations and the Innovative Experimentation Act.

2. Cultivate diverse and innovative digital talents:
The focus is on cultivating business leaders with both digital and decision-making capabilities, developing cross-domain digital talents and their capabilities, and playing a catalytic role in transformation. The main tasks include the development of a digital transformation capability map, the creation of an emerging technologies leadership camp, and the cultivation of corporate digital transformation talents.

3. Create a digital co-creation ecosystem:
The focus is to establish the link between supply and demand through platforms, promote model cases and global expansion, strengthen and improve software R&D, and build a digital development environment. The main tasks include the use of ACE (Architect, Consultant, Evangelist) School as a platform to gather enough resources for guiding industry transformation and the dedication of legal-person resources to the environment improvement of software development.

4. Give birth to new technological industries and a new digital government:
The focus is to use the new ecosystem to lead the transformation of the information services industry into a new digital service industry and use the opportunities and resources from this transformation to assist the government in developing new digital services. The main tasks include the use of ACE School as a platform to help the information services industry transform.

5. Build a digital innovation and startup ecosystem:
The focus is on using innovative governance and regulatory mechanisms to create a new development environment, establishing new ecosystems to help develop youth/technological startups and entrepreneurship. Government should lead the development of innovative products/services to drive the expansion of applications by industry participants. The main tasks include helping the government to complete the amendments of the Statute for Industrial Innovation, promoting the legislation for an innovative healthcare technology and services sandbox, the Renewable Energy Development Act, and artificial intelligence development laws, and assisting in the promotion of startup procurement to drive the development of startups.

Looking to the future, digital transformation is no longer an optional strategy, but an inevitable path. Through the five digital transformation promotion directions mentioned above, III's aims to cultivate cross-domain digital transformation talents, shape the industry's digital ecosystem, drive the expansion of information services to new (international) markets, nurture new digital service industries, activate startups to drive innovation, and optimize the environment for digital innovation and development (regulations). In addition to helping the industry to enhance its digital competitiveness, III will also work with external information service industry partners to jointly set the benchmark for digital transformation and create digital dividends for enterprises.

Re-defining Traditional Paradigms and Refining of Organizational Culture

The Institute for Information Industry (III) is proactively conducting internal reform. Internal reform initiatives related to the Institute's operations, foundation status and organizational structure are aimed at overcoming the existing framework and its constraints to reshape the organizational culture; Step one is the establishment of an internal control system in accordance with the Foundation Act. A code of ethics must also be defined to ensure the soundness of III. Under Paragraph 2, Article 24 of the Foundations Act, a foundation is required to establish an internal control and audit system if its total property registered with the court or annual income reaches a specified amount, which should be submitted to the competent authority for record;the same article also calls for a code of ethics to be defined based on the guidance of the competent authority. III is a foundation charged with the responsibility of making a tangible contribution to the economy and society. Using social enterprise and B Corporations as a reference and given professional assistance by KPMG, III compiled all of the existing regulations collected by personnel from the advisory and legal affairs department.

Read more about the board of directors ▶

Read more about Government Subsidy List ▶

Read more about Financial Statements ▶

Activities in the fields of project management, R&D, personnel affairs, purchasing, accounting, IT and general management were reviewed item by item so that reasonable control systems could be established for the operation of each level. The advice of external experts and the guidance of the competent authority were also sought to ensure the integrity of our internal control system and further enhence the management and operational systems.

To establish an ethical organizational culture and strengthen business integrity; III began developing internal control systems and a code of ethics in 2019. An "Ethical Management Committee" was also set up under the Board of Directors, which is responsible for defining the code of ethics, reviewing and supervising the ethical management development plan, and reporting regularly to the Board on the improvement outcomes. A set of "Ethical Management Principles" was also proclaimed in accordance with the "Ethical Management Principles for Economic Foundations Governed by Ministry of Economic Affairs" issued by the Ministry of Economic Affairs to guard against unethical behaviors as well as strengthen organizational development and operations.

I. **Key resolutions of the Board:** Key resolutions of the Board of Directors are regularly disclosed on the official website. Minutes from the Board meetings are also retained for one year. Related content was made available online in the third quarter of 2019.

II. **Government subsidized projects managed by III:** Information on government subsidized projects being carried out by III is now disclosed on the official website. The information provided is mainly the links to the websites of each project. Disclosure of relevant information is then provided by each project in accordance with The Freedom of Government Information Law. Related content was disclosed on the official website in the fourth quarter of 2019.

III. **Financial disclosure:** Financial statements are regularly disclosed on the official website. Following the example set by Fraunhofer and other international technology research organizations, the presentation will include graphs and tables that balance professionalism with accessibility. Public disclosure is planned in 2020.

III also used the relevant management mechanisms and supporting measures applied by National Institute of Advanced Industrial Science and Technology (AIST) in Japan and other international technology research institutions to define rolling management scheme for medium or long-term visions and goals. The mechanism will ensure the fulfillment of the medium or long-term visions and goals. In the futurre, all relevant short, medium, and long-term development plans as well as information on their current progress will be regularly published or updated on the official website. These will give stakeholders a clear picture on the direction of III.

III will not only continue to promote the concept of ethical management in the future but also implement internal controls by conducting a self-assessment every year to ensure the business performance and efficiency of III. To cope with future environmental and generational changes, the internal control system will be continuously assessed and revised based on the results of internal audits and the revisions of external laws and regulations. Its goal is to ensure the effective operation of the organization.

In addition, during the MOEA press conference on foundation reforms in July, 2017, III took the unprecedented step by stating that "the management of resources including subsidies for managed projects will be strengthened". Over the last three years, III not only continued to communicate with project owners to secure their support and understanding, but also negotiated with each sponsor agency for government projects to disclose information related to government-subsidized projects managed by III.All these measures are to ensure the transparency of information related to the distribution of resources so that external stakeholders can examine the associated information and alleviate any concerns they may have.

At the same time, firewalls to prevent conflicts of interests and related monitoring mechanisms are now being planned. Through measures such as avoiding conflicts of interest, signing of non-disclosure agreements, and regular education, III constantly reminds employees of their ethical/legal obligations and tries to prevent them from conflicts of interest. By information disclosure and firewall mechanism, III aims to optimize rolling reviews in the hope of reducing all of the different types of risks that may impact on the reputation of III.

Deepen the Technical Layout, Promote the Digital Transformation of the Government and Industry

Through research and development strategies such as "intensify technological R&D and industrialization", "enhance the capability of selecting topics to create huge highlights", and "build a cross-industry innovation ecosystem", III will drive R&D and create organizational value such as: promote cross-domain open source cooperation; organize cross-unit special interest groups; promote the top-down proposal mechanism; gather top mentors and strengthen the forward-looking startup layout; link local governments and promote local development. Under the positioning as a Digital Transformation Enabler, III will clarify the needs of both supply and demand, discover problems encountered in transformation, fill the gaps as a third-party, support the service providers and startup teams, and develop solutions and application services that meet the needs of the industry to promote the digital transformation of the government and industry.
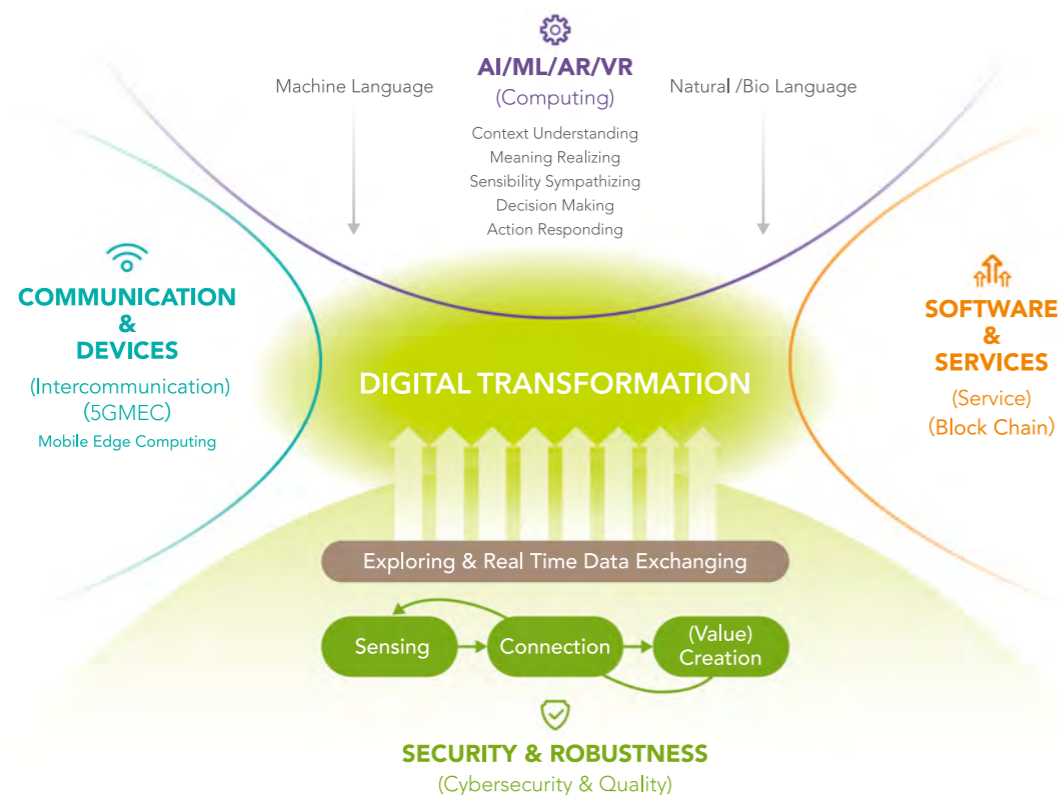
Introduce BMC verification to strengthen the topic selection mechanism

To deepen the topic selection mechanism, III will introduce the Business Model Canvas (BMC) commonly seen in Silicon Valley, and integrate the concepts of customer development and agile development. III will plan proposals through BMC to review the value proposition and future customer demand, and verify these assumptions through interviews, experimental data, and observing and depicting user behavior. III will use these findings to adjust the BMC to confirm the idea of the proposal, thereby deepening the topic selection process and mechanism to continuously discover technologies in Taiwan with potential for future development.

Deploy core technologies in key areas to accelerate the speed of industrial innovation

In terms of the R&D technology layout (see Figure 1), III will continue to focus on and deepen the five key areas of smart manufacturing (manufacturing industry), smart service (service industry), network and communication sensors (national infrastructure), cutting-edge applications (5G), and environmental construction (software engineering) to provide cross-industry digital transformation services and match digital economy development trends by utilizing existing R&D assets and energy such as IoT, 5G communication systems, edge computing, big data, AI, blockchain, and cybersecurity and software testing, and cooperate with other legal persons to establish an open innovation ecosystem to achieve digital transformation of related industries.

Continue to promote cross-industry cooperation to create new value for the industry

Facing the rapid changes of the world, cross-industry cooperation and digital transformation are the keys to future industrial growth. The process of industrial digital transformation will present challenges that are completely new. III will continue to innovate with technology, talent, and service models and promote the upgrading of industrial technology, talent, and business models to create more jobs and enhance the added value of local industries. And through the integration and utilization of R&D resources and energy, III will provide digital transformation education services, assist the industry in flexible use and agile transformation and adjustment, and promote cross-industry cooperation to win amongst the global competition.

Through cross-legal-person cooperation, III will propose solutions for cross-industry and cross-boundary platforms to link the mentored companies to accelerate the development of a cross-industry innovation ecosystem, from a single point (e.g., technology transfer to a single enterprise) to a line (extend technology transfer to specific industries) and then to a surface (expand to cross-industry technology transfer) and finally to an entire area (transferring technological energy to local service providers or system integration providers). For example, III has partnered with the Textile Industry Research Institute Foundation to promote the formation of a cross-industry alliance, which integrates domestic textile companies with electronics, garments, and ICT industries, drives the transformation and upgrade of upstream and downstream domestic textile suppliers, establishes a smart textile national rapid response team, and enhances global competitiveness of all participating units.

Figure 1 III's technology strategy concept

Utilize Patent Portfolio Strategy to Strengthen Technological Autonomy

III actively helps upgrade the technological level of the industry to provided significant positive impact in terms of industrial benefits and follows government policies to position itself as a Digital Transformation Enabler. Based on industry trends and the R&D needs of ICT businesses, and with the foundation of the accumulated patent applications and certifications , III continued the R&D axes of cross-industry digital transformation services of 2018; in 2019, III continued the completion of patent portfolios in cutting-edge applications, smart manufacturing, network and communication sensors, environmental construction, and smart service, which comprise the five key R&D scheme for implementation of cross-industry innovation ecosystem; actively publicized the patent portfolios of III through press conferences, achievements presentations, or seminars, and widened the application of its R&D achievements through technology transfers and patent sharing or transfer.
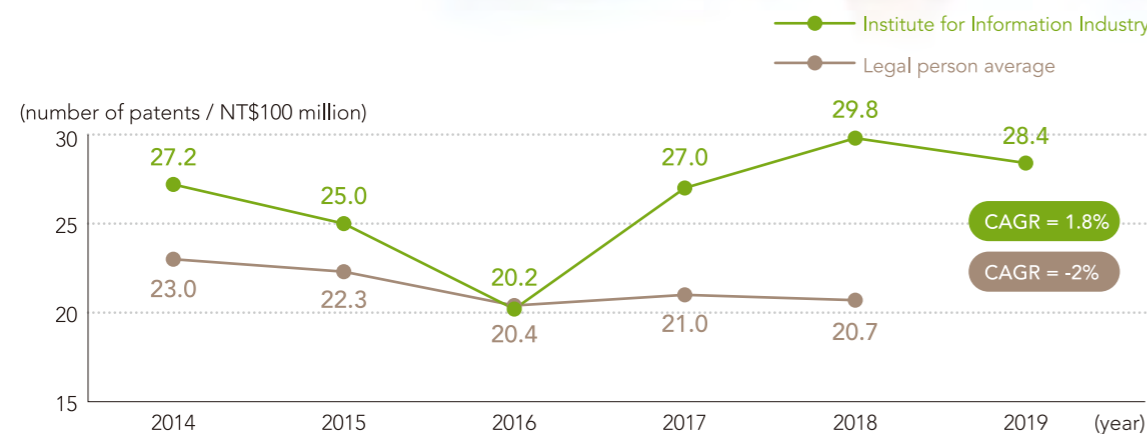

Figure 1. Patent acquisition and application investment rate (investment rate = number of patent acquisitions and applications produced per unit of technology development funding)
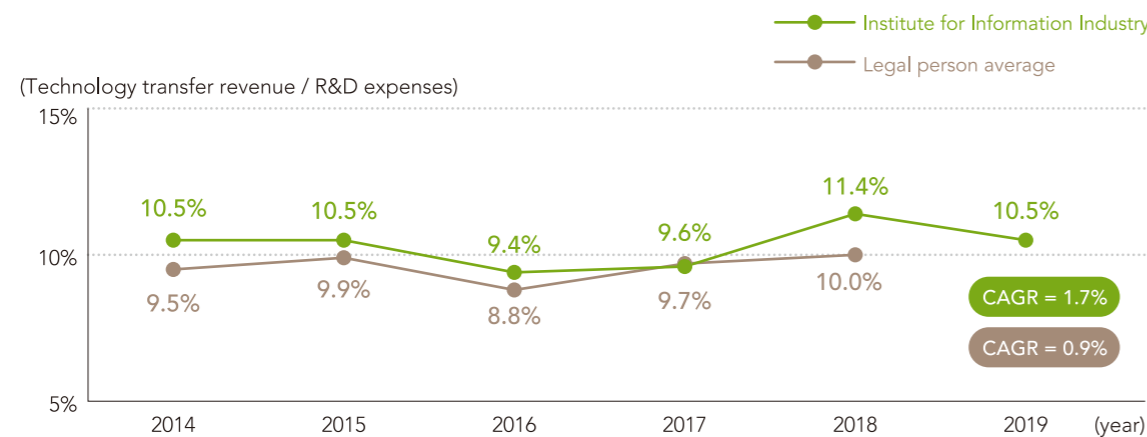

Figure 2. R&D results investment rate (investment rate = technology transfer revenue per unit of technology development funding)
Note: CAGR–Compound Annual Growth Rate

Table 1. Number of patent applications in the past three years

Region	2017	2018	2019
Taiwan (R.O.C)	80	64	57
China	78	61	47
Japan	2	0	5
Philippines	0	1	0
Malaysia	1	1	0
United States	75	58	53
Canada	0	1	0
Europe	4	3	1
United Kingdom	1	2	2
Germany	1	0	0
France	0	0	2
Total	242	191	167

Table 2. Number of patents obtained in the past three years

Region	2017	2018	2019
Taiwan (R.O.C)	86	87	99
China	44	34	24
Hong Kong	0	0	0
Japan	9	3	1
Korea	2	0	0
Philippines	0	1	0
United States	54	44	47
Canada	2	2	1
Europe	1	2	1
United Kingdom	2	1	3
Germany	0	0	2
France	1	1	2
Total	201	175	180

In the past three years, III has completed more than 352 technology transfers and facilitated investments amounting to NT$16 billion. In 2019, the revenue from technology transfers was about NT$126 million, accounting for about 10.5% of the technology development program subsidies.

In 2019, III's ratio of patent application in Taiwan and overseas was approximately 1:2 and all patents were filed for invention patents. The top ten technology sectors included: LTE/LTE-A communication systems, AI, image processing, 5G communication systems, content security and threat management, machinery and ServBox, data algorithm processing, application platforms and software, big data applications, and edge computing. III has applied for an average of 200 patents per year in the past three years. The patent application status in each region per year is shown in Table 1.

III has obtained an average of 185 patents per year in the past three years. The patent obtainment status in each region per year is shown in Table 2. The ratio of patent obtainment in Taiwan and overseas was approximately 1:1 in 2019; invention patents accounted for 99% while utility model patents accounted for 1%. The top ten technology sectors included: LTE/LTE-A communication systems, content security and threat management, image processing, data algorithm processing, application platforms and software, machinery and ServBox, sensor data integration and control platform, demand-side energy management, human–machine interface technology, and big data applications.

01

Spotlight × Digital Transformation

ACE (Architect, Consultant, Evangelist) School of Institute for Information Industry

Driving Taiwanese Industry to New Heights

The coming wave of Industry 4.0 and Digital Economy is posed to bring great changes to the industry. Business managers know that digital transformation is the future but don't know where to start. The "ACE School" launched by the Institute for Information Industry (III) is helping businesses through talent development and consulting services to embrace digital transformation opportunities.

The ACE School was set up by III to assist with the digital transformation of the industry. Starting the service from consulting and talent development, III worked with industry and trade associations to provide the skills and training courses needed by different industries and businesses of various sizes for their digital transformation process. Planning is now under way at III to develop a roadmap for the talents regarding their skills needed for digital transformation. III is now conducting trials to validate ACE School's approach to talent development. In addition to assessing the competency of employees, each department also nominated outstanding trainees to undergo training as ACE (Architect, Consultant, Evangelist) consultants for supporting digital transformation in the industry.

Most engineers came from a technological R&D background so their ability and experience as ACE consultants are in need for reinforcement. A comprehensive analysis

Caption: The picture showed a group photo taken together on III's 40th anniversary celebration event. From the left: III Executive Vice President Ren-Dar Yang, III President CH Cho, III Chairman Chih-Kung Lee, and III Executive Vice President Po Jen ,Hsiao. III strives to play its role as a Digital Transformation Enabler, continues to facilitate the progress of the government and industry by high-quality digital transformation solutions, and spreads the seeds of technological care and public welfare to all corners.

of training III personnel as ACE consultants found that breakthroughs were needed in three key areas. First, most III staffs come from technological R&D background. To be an effective consultant and suggest feasible recommendations, they must put themselves in the customer's shoes and then try to understand the problems encountered by users. Furthermore, figuring out the internal business processes of a company and having clear understanding of the external market challenges are also the basic requirements. In addition, each industry's domain know-how is also quite different. It is impossible for technology consultants to know everything so they need the assistance from their clients. An external eco-system may even be needed to help develop solutions. Finally, the business transformation methodologies and

tools offered by each institute at III also varied. Therefore, a standard for toolkits or guides must be developed so that systematic services could be provided.

At the same time, three types of processes are used by ACE School to assist with the business digital transformation process. Firstly, for small and medium enterprises (SMEs) with inadequate digitization penetration and capabilities, the initial stage of digitization could be easily achieved with a relatively small investment. Just work with a software information service provider and acquire easy-to-use digital services such as ERP, CRM and other similar management systems. Secondly, for businesses that already have digital information systems, the crucial step is to conduct digital optimization. For example, they may need to analyze the data collected from automated processes to find solutions to quality defects or unreliable delivery times. III is better equipped to assist in this area and a significant amount of experience and results have been accumulated so far.

Finally, for those desiring to generate a whole new business model or change their service models, business growth opportunities and profit could be created by digital transformation and technology introduction. Generally speaking, III ACE School mainly provides services for SMEs since large businesses can usually find their own solutions; nonetheless, no matter what the type is, the acceptance and backing of the management, the support of the business unit, as well as the integration of OT (Operational Technology) and IT (Information Technology) are all crucial to the success or failure of the digital transformation process.

The next step for ACE School is the launching of systematic tools. Questionnaire surveys will be used to find out and make records of businesses' digital transformation gaps. By the co-creation process collecting and deducting the final solution, a strategic blue print was mapped out and a concrete and practical digital transformation methodology or toolkit was created.

III hopes to build a digital transformation co-creation and collaboration platform that brings together the domain know-how of each industry to provide an important reference for successors. Last but not the least, how digital transformation can be marketed and promoted through the emerging social network media will be another important direction in the future.

Read more about ACEschool ▶

SPOTLIGHT

02

🏛 Spotlight × Technological R&D

International, Enterprise and Local Connections
Learning from Silicon Valley Entrepreneurs

III Chairman Chih-Kung Lee invited Mr. Cheng Wu, a legendary high-tech entrepreneur, to coach III personnel. Wu, the former independent director of Acer Group and vice president of Arris Networks in the US, led III staffs to conduct the in-depth study and discussion of the innovation economy and trends so that they will be able to make a sustained contribution to the information ecosystem of Taiwan in the future.

One of the top priorities of III is the reform of R&D operations. In addition to establishing new departments such as ARC (Advanced Research Center), SMG (Strategic Mentor Group) and OISC (Open Innovation Service Center), various SIGs (Special Interest Groups) were also formed to conduct technological exchanges and matchmaking activities with other sectors on the topic of digital transformation. III hopes that a stronger constitution will enhance the ability to engage in R&D of advanced technologies.

Faced with the challenges of internal reforms and changes in the external environment, the Innovation and Advanced Research Advisory Committee (ARA Committee) is convened by III every year to stimulate innovation. Mr. Cheng Wu was invited to become a member of ARA Committee and provide III with recommendations on innovation trends through the two review meetings held each year. To maximize the effectiveness

of the ARA Committee, promote mutual interaction and to continue learning from the committee members, a series of initiatives were developed by the III Planning & Promotion Division including: A telephone conference was held every one to two months in 2019 in addition to the yearly two review meetings so that III personnel could brief the Committee on project progress. Mr. Wu would then suggest directions based on the industry trends he had seen. In addition to the telephone conferences, routine correspondence was also used to keep both parties informed on progress and trends.

Mr. Wu has extensive experience as an international entrepreneur and in high-tech management. He was named one of the "Top 25 Unsung Heroes of the Internet" by the US publication Interactive Week. He can be considered a role-model for innovation, entrepreneurship and wealth-creation in the technological innovation sector among the global Chinese community. Mr. Wu's mentoring of III personnel was characterized by clear instructions and all-new perspectives, along with selfless guidance and sharing of the latest trends. The interest he takes in the industrial development of Taiwan is admirable.

Mr. Wu often shared his observations over the years with III personnel as well. He concluded that many entrepreneurs in Taiwan started by developing a technology first before deciding how it was to be applied in the market. However, things should be the other way round. Based on the principle that "innovations in business model should precede technological innovation", these entrepreneurs should first focus on business innovations and start by observing the market and looking for problems that need to be solved. They must get the jump on the market in advance in order to develop technologies that have future potential.

Mr. Wu even recommended ignoring the myths about market size during market analysis and evaluation. It is not market size that determines success, but the market potential, points of entry and keys to victory. As for innovation, it must be "bilingua" (ambidextrous) as in being conversant with technology while also having an understanding of the business environment. A disruptive innovation mindset must be established in order to maximize the returns.

Under the guidance of Mr. Wu, III personnel not only learned how to think about problems but also how to look at them from a market perspective. They must understand the deficiencies in the solution and find the corresponding technologies in order to carve out a niche in the market. At the same time, technological R&D personnel should also focus on the cultivation of cross-domain knowledge. They must recognize that: "A professional role may not exist after ten years but a professional will still be needed. "

Two projects have now been developed by ARC after a year of networking and discussions. They are the "Edge Data Center Infrastructure Systems Technology R&D Project" and "5G Next-Generation TV and Multimedia Contract Project." More emerging and advanced topics are continuing to be developed as well. III is certain that the guidance provided by Mr. Wu based on his previous successful experience will help ARC projects be successful because of the correct view resulting from standing on the shoulders of an entrepreneur giant.

SPOTLIGHT

03

🏛 Spotlight × Think Tank Consulting

32nd "MIC Forum"

Turning the Tables on the Future

The III Market Intelligence & Consulting Institute Forum ("MIC Forum") is an annual highlight of the technology sector. Industry leaders and experts thronged to the event in 2019 with opinion leaders from every sector sharing their own observations and opinions on the global industry and economy, 5G and digital innovation at packed conferences.

The theme of the "MIC Forum" was "Turning the Tables on the Future." The theme was chosen because of massive tremors in global politics and the economy, the rapid convergence and obsolescence of emerging technologies, as well as the US-China trade war showing signs of triggering even more conflicts instead of slowing down; at the same time, Taiwan is going through a presidential election so there are many political and economic variables in play. How can the Taiwanese ICT industry that plays an important role in the global economy look for opportunities to turn the tables and unlock a future of endless possibilities?
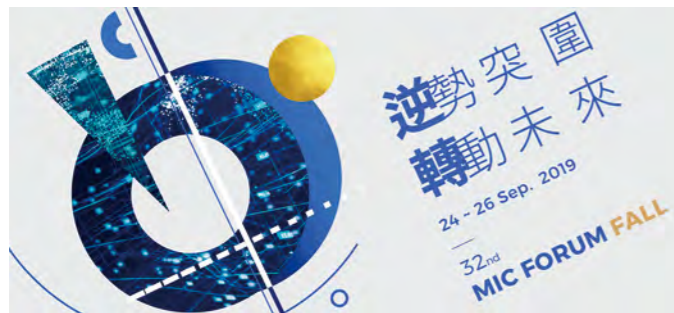
The first Chinese characters of the "MIC Forum" theme also spell out "Turn-Around." The exchange of viewpoints regarding trends and business strategies with industry elites at the end of 2019 served as the stepping stone to the next new age in 2020. The forum was even more meaningful with discussions assessing the current situation and initiatives leading businesses in turning the tables.

The three core topics at the forum were global industry and economy, 5G, and digital innovation. A two-dimensional framework constituting of industrial development and application was used in combination with critical issues and innovative applications in vertical sectors to share pioneering views on industry technology, emerging services, innovative application and development strategies.

The topic for day 1 was the observation and analysis of how the US-China trade war has turned into a war of technology. The emerging trend of global ICT industry supply chain transfer, shortening or fragmentation appeared to be disadvantaged in the short term but, in the long run, provided future opportunities. Carefully choosing the right strategy might create the chance to turn the tables. For example, the return of the production or R&D of high value products to Taiwan may be accelerated And those of other products are moved to New Southbound countries to focus on the local consumer market and speed up the development of new markets. The global supply chain will become more regionalized and localized to build a shipping model based on flexible production.

The topics for discussion days 2 and 3 focused on 5G and AI developments. Now that 5G is gathering the steam, MIC suggested that vendors should look at the opportunities in devices, materials and components brought about by global 5G developments. Special attention should be paid to the manufacturing, medical and energy industries in particular. In some cases, the high bandwidth, high connections, low latency and ultra-high reliability characteristics of 5G may even be integrated with AIoT (Artificial Intelligence of Things) to give birth to a wide variety of innovative applications and services.

MIC observed that new technologies have boundless applications. Participants in the forum have become quite diverse over the last few years and are no longer limited to the ICT industry. The manufacturing, financial, medical, retail and energy industries have become active participants as well. The types of industries were particularly diverse in 2019, a testament to the influence and R&D capabilities of III's "MIC Forum". After the "MIC Forum", a number of vendors asked MIC analysts to meet and talk with their senior executives on company strategies.

In addition, MIC will develop themes for the forum in 2020 based on customer requirements through participant feedback. Focus will remain on the vibrant development of innovative application models for 5G and AI but these topics will be approached from more diverse angles. III hopes to work with businesses and collectively concentrate on pioneering business opportunities in the industry as well as seize the key to victory.

SPOTLIGHT

04

🏛 Spotlight × Industry Services × International Awards

International Partnerships and Awards
International Partnerships

The goal is to assist the Taiwanese ICT industry with international business development and connect them with international R&D organizations. Through partnerships with overseas organizations, international business opportunities for Taiwanese system integrators and ICT security vendors can be expanded. Industry chains are also used to strengthen technology diplomacy, market the technological capabilities of Taiwan, as well as promote international collaboration and exchange.

- The 2019 World System Integrator Conference (WSIC) was hosted to boost the international profile of Taiwan's system integrators. The event was attended by 152 foreign guests from 20 countries and 282 Taiwanese system integrators. The purpose of the Conference included not only learning about each country's requirements on system integration but also successfully established Taiwan as a brand for world-class system integration services. **1**

- The Asia Cyber Channel Summit was co-organized by III and iThome to boost international cooperation and idea exchange for domestic information security vendors. Information security professionals from Thailand, Malaysia and Singapore were invited to visit Taiwan, learn about homegrown information security solutions, and look for joint business opportunities. **2**

- The year 2019 marked the 10th year of the collaboration between III and Kuwait Institute for Scientific Research. The "Taiwan-Kuwait Aerospace Technology, AIoT and Cybersecurity Symposium" was held to introduce Taiwan's aerospace technology capabilities and AIoT solutions, learn about the research capabilities of KISR, and explore directions for future cooperation. **3**

- The Ministry of Foreign Affairs and Industrial Development Bureau issued an invitation to the European Bank for Reconstructionand Development (EBRD) to strengthen Taiwan's cooperation with the bank and assist Taiwanese businesses in taking advantage of the business opportunities arising from the EBRD technical cooperation projects in recipient countries. III hosted a total of 65 people in 5 EBRD consulting groups to help them learn about Taiwan's experience with implementing smart cities and find opportunities to cooperate with Taiwanese vendors. **4**

- To foster domestic smart business innovations and unlock the future of smart commerce in Taiwan by connecting start-up with global markets and start-up resources, III helped 21 start-ups attend Innovfest Unbound in Singapore, Startup Thailand in Thailand, and TechCrunch Disrupt in the US. III assisted the exhibitors in connecting to the local start-up ecosphere along with key contacts and financiers. **5**

- The Taiwan Japan Industry Center (TJIC) was formally relocated from the ITeS Building to the Technology Building as part of its planned business direction. A celebration of Taiwan-Japan Industrial Collaboration Promotion Office (TJPO)'s new relocation was held on the 11F of the Technology Building on January 23. The event was hosted by Director-General Cheng-hua Lu of MOEA Industrial Development Bureau and attended by Mitsuaki Hoshino, Chief Deputy Representative of Japan-Taiwan Exchange Association. III Chairman Chih-Kung Lee made a speech to the TJPO management team to mark the new start to Taiwan-Japan industrial collaboration. **6**

- To take advantage of the trend towards global and regional integration in economic development as well as assist MOEA with expanding Taiwan's collaboration with local Japanese industries, the 8th MOU was signed between CEO LU of TJPO and Director Junichi Nishida from Osaka Prefectural Government on October 4, 2019. The MOU committed both parties to promote trade, investment and other business activities between companies in both regions in order to strengthen their competitiveness and foster international development. **7**

- Collaborative research was launched by III and Japanese information security experts to upgrade the information security threat analysis and protection technologies for Industrial Control System (ICS). The collaboration will help the industry improve the overall integrity of IT protection for ICS. This will in turn prevent and reduce economic damage caused by online cyber attacks. **8**

International Awards

- The Digital Twin Solutions for Smart Farming technology from DSI received the R&D 100 Awards in the US. **9**

- The Manufacturing Anomaly Detector (Anomtor) solution from SSI received the 2019 APICTA Award in the Industrial - Manufacturing & Supply Chain category. **10**

- The Scooter2INfra Safety System from SSI received a Merit in the Public/Private Partnership Award of the 2019 World Information Technology and Services Alliance (WITSA) Global ICT Excellence Awards.

- The Wawa Story Hand Puppet Theater from DSI received the Bronze A'Design Award in Toy, Games and Hobby Products Design Category in Italy

- The Social Innovation Lab Video from Digital Education Institute (DEI) received the 2018 Horizon Interactive Awards.

- DEI received the 2019 Microsoft Taiwan Top Training and Certification Award in Azure.

9

10

SPOTLIGHT
05

Spotlight × Award Recognition

Digital Twin Solutions for Smart Farming and Scooter2Infra Safety System

When Human Intelligence Meets AI

The projects promoted and researched by III are linked directly to the industry and people's livelihoods. Research accomplishments have been recognized with domestic and overseas awards as well. The awards won by "Digital Twin Solutions for Smart Farming" of Digital Service Innovation Institute ("DSI") and the "Scooter2Infra Safety System" of the Smart System Institute (SSI) in particular were the highlights of 2019.

The "Digital Twin Solutions for Smart Farming" was developed by DSI with the support of Ministry of Economic Affairs' Department of Industrial Technology, and Council of Agriculture's Taiwan Agricultural Research Institute. The technology competed against over a thousand innovative technologies from around the world in the very competitive software and service category to win the "R&D 100 Awards" in the US. The "Scooter2INfra Safety System" from SSI also won a merit award in the "Public/Private Partnership Award" of the WITSA Global ICT Excellence Award. The 23rd World Congress on IT is generally considered the Olympics of the ICT industry so this represented double recognition for III's hardwork.

Digital Twin Solutions for Smart Farming ▶

Video/ Scooter2Infra Safety System ▶

Combining Farmer Experience with Artificial Intelligence

The traditional agricultural and fishing industries have always been at the mercy of the weather. Their digital transformation has now been made possible by the "Digital Twin Solutions for Smart Farming" technology that combines HI (Human Intelligence) and AI (Artificial Intelligence). Farmers can use their personal experience and field observations to adjust the parameters of their equipment, run simulation forecasts and make optimal decisions. The AI learns dynamically from the experience and knowledge of farmers to realize collaborative operations and optimize decision-making. The traditional agricultural and fishing industries can not only be upgraded but also pass on their experiences for sustainable management.

The application of "Digital Twin Solutions for Smart Farming" technology to agricultural digitization by the cross-domain team at III is expected to reduce the introduction costs for farmers by 50% and increase productivity by 30%. In the future, this technology should enhance the "smart monitoring" and "precision production " for high-tech farmers. The increased productivity will help newcomers become high-tech farmers with ease.

Building a Low-cost and Highly Safe Traffic Environment

The motor scooter is used by 67% of the Taiwanese population. It also accounted for more than 70% of traffic accidents, injuries and fatalities. III invested in the development of a scooter safety alert system to help solve this problem. Internet-of-Things (IoT) technology was appliedto protect cars and motor scooters by a "vehicular-based" approach to improve traffic safety.

SSI partnered with the industry, university and research sectors to jointly develop the Scooter2Infra Safety System. Active RFID along with radars and cameras are used to detect vehicles and detect traffic hazards. LED warning signs are then used to alert drivers to road conditions. The result is a low-cost V2I (Vehicle-to-Infrastructure) environment that is easy to roll-out.

III began trialing the Scooter2Infra Safety System at National Dong Hwa University (NDHU), National Kaohsiung University of Science (NKUST) and Technology, and Fo Guang University (FGU) in January 2018. The results showed a significant improvement to traffic safety on campus with traffic accidents reduced by 35% at NDHU and by 50% at FGU. Hopefully, more empirical results will enable the introduction of Image recognition and deep learning systems in the future to build a safe traffic environment at low cost.
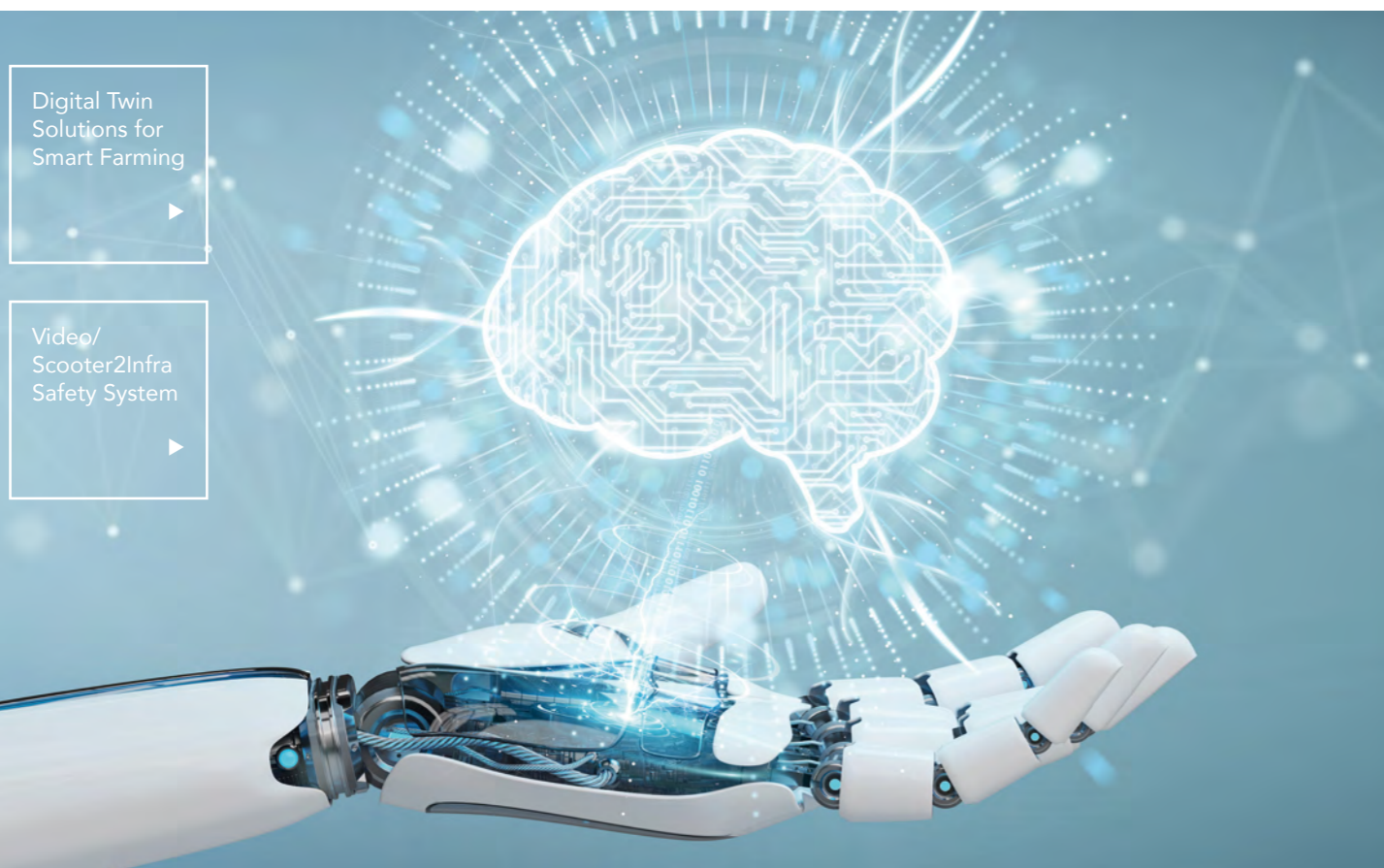
Major Events

Jan. 16 Held the third joint meeting of the 14th directors and supervisors. Approved Dr. Cheng-Hong Cho's role as the new CEO of III.

Feb. 19 To listen to employee opinions, III held the second New Year Reunion, inviting Chairman Chih-Kung Lee and CEO Cheng-Hong Cho to exchange new hopes for the new year together with employees.

Mar. 14 Cheng Wu, member of III's Strategic Mentor Board (SMG), visited again to give guidance. During the 1.5-day meeting, member Wu gave guidance to the Cybersecurity Technology Institute and ARC's innovative forward-looking projects team, and visited potential partners in Taiwan with CEO Cheng-Hong Cho to win early participation opportunities in future projects.

Apr. 24 The 2019 III R&D achievements presentation and the 2019 MOEA tech projects performance evaluation site visit were held on the same day. MOEA members counseled that III should continue to cultivate platform-based cross-domain/soft-hard integration capabilities and help the industry achieve digital transformation together with legal persons to accelerate industrial innovation.

May 14 To further promote industry transformation and innovation, III organized the ACE (Architect, Consultant, Evangelist) School and simultaneously started holding ACE cultivation courses taught by experts and consultants.

Jun. 20 To start III's next phase mid- to long-term strategic planning and at the same time enhance the key functions that progress with time, Michael Chang, Chairman of TASS and Sherman Lee, Executive Vice President and CFO of FET, were invited to give a speech.

24 III convened the midterm meetings of the Advanced Research Advisory Committee for 2019 on June 24 and 25 and invited 10 top experts from home and abroad including entrepreneurial expert Cheng Wu from Silicon Valley, Yushan Visiting Scholar David Du, and NTU Vice President Ming-Syan Chen. Committee Member David Du and Executive Secretary Tsai Chih-Hung were invited to deliver keynote speeches.

28 To help the industry develop the Thai market, III organized the Smart City Forum of the Thailand-Taiwan Industrial Collaboration Summit in Bangkok, Thailand. The two sides exchanged and shared smart city and IoT development strategies and applications, creating the opportunities for collaboration.

Jul. 24 III 40th Anniversary celebration event was successfully held on July 24. Guests including Kung Ming-hsin, Minister without Portfolio of the Executive Yuan; Jong-Chin Shen, Minister of MOEA; Raymond Greene, Deputy Director of AIT; and Mitsuaki Hoshino, Chief Deputy Representative of the Japan-Taiwan Exchange Association delivered congratulatory speeches. Nearly two hundred guests from home, abroad, industry, government, academia, and research were invited to attend, witnessing the advance towards the important milestones of the next 40 years.

Aug. 29 III held a tea party for eliciting suggestions for improving the government information service procurement environment and invited guests from the industry. Positioning itself as a promoter of the information technology industry, III gave suggestions for improving the government information service procurement environment, which is currently facing digital transformation challenges.

Sep. 6 III, Wistron, ARES, and ARM jointly mastered key technologies to enhance the level of Taiwan's smart transportation industry.

Oct. 2 III implemented MOST's Taiwan Tech Arena Project and integrated FITI Program resources. By bringing together TTA startup teams, III brought Trust-U, iCAN, and cultivation programs to help teams exhibit in the Annual Global Pharmaceutical and Medical Meetings Summit held in Boston so that they can make connects to the teams in the U.S. healthcare industry ecosystem.

16 III partners with the Electrical and Electronic Manufacturers' Association to initiate the Smart Manufacturing Digital Transformation School to accelerate the discovery of industry transformation opportunities.

25 Relationship between Taiwan and Japan academia and research units are friendly. III CEO Cheng-Hong Cho and the President of TMU (Japan) signed an MOU to develop forward-looking R&D and cultivate talents, and develop global academia and research exchange events for the ICT industry.

Nov. 5 III joined hands with ADT (U.S.) to hold the largest annual meeting of learning development and talent training in the Asia-Pacific region.

Dec. 16 III convened the closing meetings of the Advanced Research Advisory Committee for 2019 on December 16 and 17 and invited 10 top experts from home and abroad including entrepreneurial expert Cheng Wu from Silicon Valley, AI expert Professor Jay Kuo of USC, and NTU Vice President Ming-Syan Chen. Committee Member Jay Kuo gave a keynote speech on AI Deployment and R&D Strategies for Government and Industry.
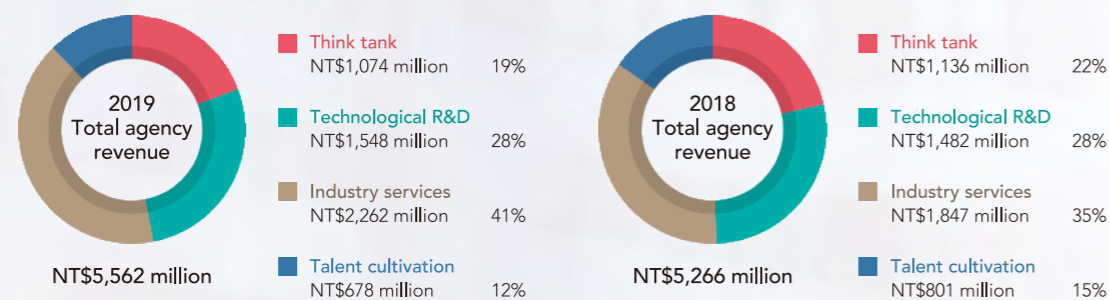
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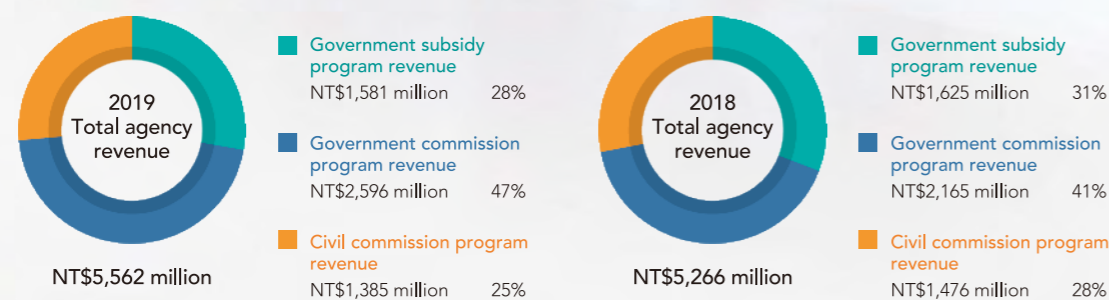
Financial Statements

Comprehensive income statement

Unit: NT$ mill.

Income expenditure item	2019		2018	
Revenue	$	5,664	$	5,373
Agency revenues		5,562		5,266
Service revenues		5,562		5,266
Non-agency revenues		102		107
Expenditures	$	5,612	$	5,327
Agency expenditures		5,591		5,312
Service costs		5,124		4,854
Management fees		467		458
Non-agency expenditures		32		16
Income tax expenses (benefits)		(11)		(1)
Balance of the current period	$	52	$	46
Other comprehensive income				
Confirmed welfare plan remeasurement number		(23)		1
Share of other comprehensive income recognized by the equity method		-		(4)
Income tax related to other comprehensive income components		4		-
Total other comprehensive income of the period	$	(19)	$	(3)
Total comprehensive income of the period	$	33	$	43

• Achievement of annual operating focus

2019
Total agency
revenue

NT$5,562 million

- Think tank NT$1,074 million 19%
- Technological R&D NT$1,548 million 28%
- Industry services NT$2,262 million 41%
- Talent cultivation NT$678 million 12%

2018
Total agency
revenue

NT$5,266 million

- Think tank NT$1,136 million 22%
- Technological R&D NT$1,482 million 28%
- Industry services NT$1,847 million 35%
- Talent cultivation NT$801 million 15%

• Annual agency revenues structure

2019
Total agency
revenue

NT$5,562 million

- Government subsidy program revenue NT$1,581 million 28%
- Government commission program revenue NT$2,596 million 47%
- Civil commission program revenue NT$1,385 million 25%

2018
Total agency
revenue

NT$5,266 million

- Government subsidy program revenue NT$1,625 million 31%
- Government commission program revenue NT$2,165 million 41%
- Civil commission program revenue NT$1,476 million 28%

Balance Sheets

Unit: NT$ mill.

Account	2019		2018	
Assets				
Current assets	$	3,341	$	3,487
Cash		591		415
Financial assets-current		1,012		1,726
Receivables		1,018		949
Prepayments		125		64
Other current assets		595		333
Investments, long-term receivables and reserves		1,503		1,026
Investments accounted for using equity method		565		529
Financial assets-non-current		596		127
Pension payment		342		370
Property, plant and equipment		372		345
Investment property		304		306
Intangible assets		329		310
Other assets		162		128
Total assets	$	6,011	$	5,602
Liabilities and Net Position				
Liabilities				
Current liabilities	$	1,844	$	1,442
Payables		1,349		1,163
Advanced receipts		430		245
Other current liabilities		65		34
Long term liabilities		726		761
Other liabilities		268		260
Deferred tax liabilities		179		173
Miscellaneous liabilities		89		87
Total liabilities	$	2,838	$	2,463
Net Position				
Funds	$	700	$	700
Other net surplus		5		4
Accumulated surplus		2,468		2,433
Other net position		-		2
Total net position	$	3,173	$	3,139
Total liabilities and net position	$	6,011	$	5,602

• 2019 net asset and liability structure

Assets

- Current assets 55.6%
- Long-term investments 19.3%
- Retirement fund 5.7%
- Fixed assets 11.2%
- Intangible assets 5.5%
- Other assets 2.7%

Assets: NT$6,011 million

Liabilities/Net

- Current liabilities 30.7%
- Other liabilities 4.4%
- Pension reserve 12.1%
- Funds 11.7%
- Cumulative surplus (deficit) 41.1%

Liabilities: NT$2,838 million
Net: NT$3,173 million

Organizational Structure

Board of Directors
Chih-Kung Lee, Chairman of the Board

CEO
Cheng-Hong Cho

Executive Vice President
Ren-Dar Yang, Po Jen Hsiao

ID
Vivian Huang, Director General

RISD
Garfield Hung, Director General

TJIC
Long Chen, Director

DSI
Ted Hsieh, Director General

DTI
Harriet Lin, Director General

SSI
Ming-Whei Feng, Director General

CSTI
Ching-Hao Mao, Director General

DEI
I-Chang Tsai, Director General

MIC
Victor Tsan, Director General

STLI
Ray Chang, Director General

ARC
Johnny Huang, Director

CCS
Yomin Hou, Director

FARM
Po Jen Hsiao, Executive Vice President (Acting Director General)

PPD
Wen-Tang Chen, Director General

ATD
Chi-Chuan Shih, Director General

HR
Chin-Her Lin, Director General

ITSD
Chih-Ming Lin, Director General

ADO
Wen-Ling Wu, Director

Read more about III ▶

Statistics: April 22, 2020

Educational structure (unit:%)

- PhD — 9%
- Master's degree — 66%
- Bachelor's degree — 21%
- Associate's degree and other — 4%

Main occupation category (unit:%)

- Research and development — 58%
- Industry promotion — 25%
- Administrative management — 16%
- Not categorized — 1%
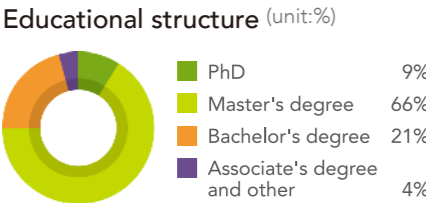
Statistics: March 31, 2020

Root in Taiwan, Lay out the Global

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Human Resource Development Division (HR)
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886-2-6631-8185

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財團法人資訊工業策進會
INSTITUTE FOR INFORMATION INDUSTRY

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ANNUAL REPORT