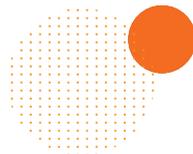




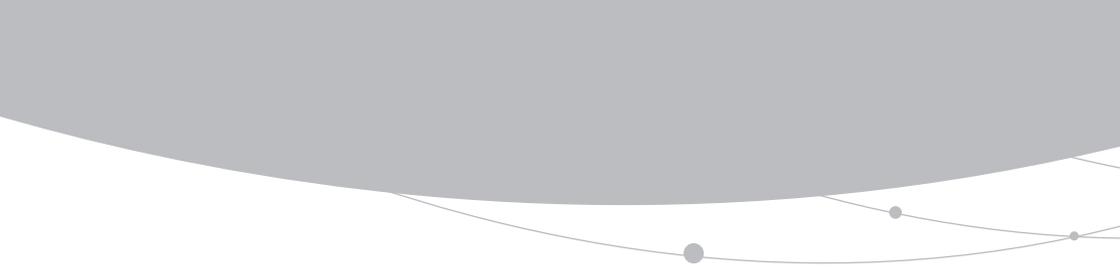
TAIWAN



The Internet of Things

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Policy Initiatives — Asia Silicon Valley Development Program

Taiwan's government began implementing the Asia Silicon Valley Development Program in 2016. The plan has two themes: "promoting IoT innovation and R&D" and "strengthening the innovative entrepreneurial ecosystem." The plan aims to link together advanced technology R&D capabilities, world class talent, capital, and markets worldwide, leading the way for a new economic development model and driving the comprehensive transformation and upgrading of Taiwan's industries through the IoT.¹

As for specific promotion strategies, Taiwan established the Major League IoT, ASVDP and the Hutoushan Innovation Hub in Taoyuan City; relaxed talent-related regulations; and provided funding to build a demonstration site, which brings in international R&D capabilities to create a robust innovative entrepreneurial ecosystem for IoT innovation and R&D.

The Major League IoT, ASVDP was established in December 2016 by Acer, MediaTek, and Advantech. Mr. Stan Shih, founder of the Acer Group, is the honorary chairperson, and the CEO of ASVDA is Deputy Minister Cheng Chen-Mao of the National Development Council. The Major League IoT, ASVDP addresses industry needs and engages in technology R&D, site verification, and international market exploration. It aims to nurture even more innovative industries by establishing a platform that will accelerate collaboration between experts, start-ups, and system integrators. The League currently focuses on smart transportation, smart logistics, smart manufacturing, smart energy efficiency/environmental monitoring, smart commerce, smart home, smart farming, smart healthcare, and IoT information security. At present, over 380 associations and corporations are members of the League. So far, it has received 100 proposals from corporations, with a total investment amount of NT\$ 4.72 billion.

Construction of the Hutoushan Innovation Hub in Taoyuan began in October 2018 and covers an area of 4.7 hectares. The hub is located near major industrial parks, such as Gueishan and Hwaya, and is at the core of Taoyuan with convenient transportation. The hub will provide IoT innovation capabilities and serve as a gateway to international innovation centers, such as Silicon Valley, becoming a site for verifying innovative applications and technologies of the information security, IoT, and self-driving car industries. The phase one part of the hub was formally opened in June 2019, and will mainly develop "self-driving car R&D and tests," "information security industry" and "smart manufacturing industry."

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https://drive.google.com/file/d/1jswOXDfRVGadldjrj_qaHzi1hJuOvD9_/view



Overview of Industrial Development

1 | Production Value |

Under the collective efforts of the public and private sectors, the output value of Taiwan's IoT industry grew from US\$27.7 billion in 2016 (accounting for 4.02% of global output value) to US\$39.1 billion (approx. NT\$1.17 trillion) in 2018, surpassing the NT\$1 trillion mark for the first time and accounting for 4.24% of the global output value (Figure 1).

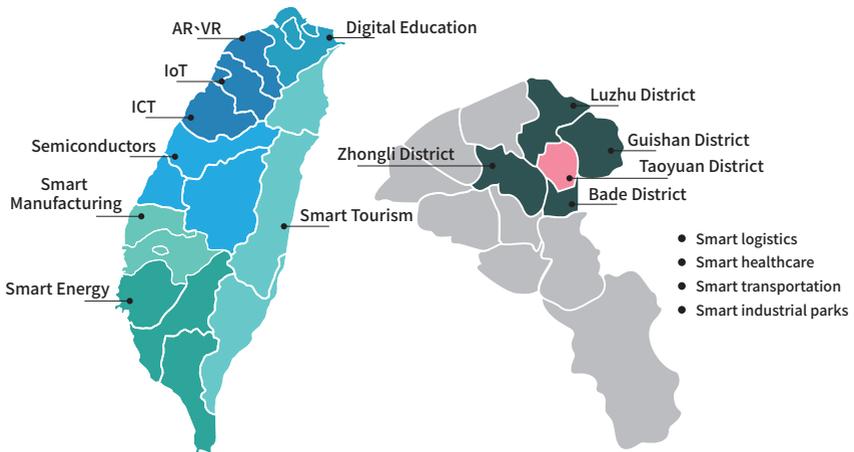


Source: National Development Council "Asia Silicon Valley Development Program Progress and Results" (2019.2.14).

Figure 1 Production value of Taiwan's IoT industry in 2016-2018

2 | Industrial Clusters |

The IoT industry spans the IT manufacturing industry, equipment manufacturing industry, and software and information service industry, and involves multiple fields of technology, including computers, communications, networking, computing, sensors, embedded systems, and microelectronics. Due to the extensive fields involved in the IoT industry, the industry has not formed a specific industrial cluster, but rather exists in the form of test sites developed based on local demand and industrial development (Figure 2).



Source: Asian Silicon Valley Development Plan (2016.09.08).

Figure 2 IoT demonstration site in Taiwan



The IoT involves the integration of software and hardware of cross-disciplinary, complex systems, Therefore, major telecom operators (such as Chunghwa Telecom and Taiwan Mobile) in Taiwan have been actively playing the role of system integrators in recent years, engaging in cross-disciplinary vertical integration and cross-industry alliances (such as Chunghwa Telecom's IoT Smart Platform and Taiwan Mobile's IoT Ecosystem), while searching for domestic and overseas partners to establish a common platform. These system integrators have developed and tested innovative application services and products that are able to satisfy people's demand for greater convenience in life.

In addition to major telecom operators, system equipment manufacturers (such as Advantech and MiTAC) are also actively playing the role of system integrators. For example, Advantech established an IoT and smart city application experience center in Startup Terrace, and promoted this model at its overseas locations. Advantech also built a true smart factory in Startup Terrace. MiTAC Information Technology Corp. established and provides the MiOGC platform that complies with OGC standards, developing a smart city IoT system.

Moreover, software and information service providers are using their IT advantages in the development of cutting-edge technologies and smart applications, providing customers with system integration services. For example, Acer Being Communication Inc., a member of the Acer Group, specializes in business IoT solutions, which can be applied to agricultural monitoring stations, water quality monitoring stations, water meter systems, street light applications, residences and communities, and factories. The Syscom Group developed a variety of smart application solutions for customers in different industries in response to IoT developments. These solutions cover smart applications in the field of healthcare, offices, energy, and security control.

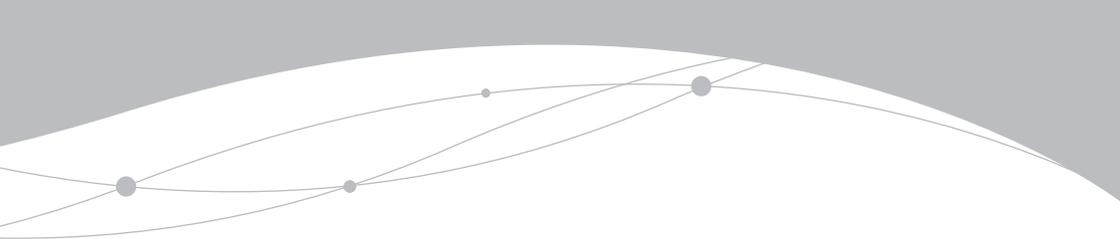
Potential Investment and Collaboration Opportunities in Taiwan

1

Utilizing Taiwan's dominant industries to develop innovative IoT applications

Taiwan has a complete semiconductor supply chain, an abundance of engineering talent for R&D and design, and is close to emerging markets in Asia. System application/assembly companies in the ICT industry are recognized by international brands for their manufacturing ability. The companies have recently expanded beyond conventional 3C (computer, communications, consumer electronics) into vertical IoT applications and system integration solutions. Through investing in Taiwan, foreign companies are able to increase the depth of their partnership with Taiwan's semiconductor and ICT industries, implement high-end parts/components/software design and development technologies, and find module, subsystem, and application developers with whom they can work and jointly develop targeted vertical application markets.

To drive the development of the artificial intelligence and IoT industries, the government implemented the "IC Design & Semiconductor Technology R&D and Application Program" in 2018. This covered six key areas: 1. IoT IC integrated services, 2. IoT cutting-edge semiconductor technology, 3. IoT subsystem development and promotion, 4. Industry-academia-research institute collaboration / IoT smart manufacturing sites, 5. Sites for developing the practical abilities of engineering talent from industry, academia and research institute, 6. A complete ecosystem of Taiwan's IoT industry based on the "Industrial Upgrade and Innovation Platforms (Industrial Development Bureau, MOEA)," which can produce the IoT product prototypes for a pilot run.



2

Joint development of key sensor technologies for the IoT

The IoT framework consists of a sensor layer, network layer, and application layer. Sensor technologies in the sensor layer play a crucial role, not only involving the integration of hardware sensor components/circuit design and integration, but also software technologies for integrating multiple sensor signals and special algorithms for integrating AI/edge computing. Foreign companies that invest in Taiwan can invest in optical/3D vision sensors, biomedical sensors, or gas sensors for environmental/food safety. They can partner with smart vehicle and smart manufacturing test sites in Taiwan to jointly develop key sensor technologies that meet demands particular to the Taiwan/Asia market.

3

Reducing the risks and costs derived from changes in the international trade situation

Network information security and government control policies are important factors that will affect the development of the IoT industry at the location where an investment is made. Taiwan is deeply trusted by international corporations due to complete regulations that fully protect intellectual property rights and information security. Next, Taiwanese companies are fully aware of trends in the global industry, and flexibly adjust their supply chains based on changes in the international economic and trade situation. Foreign companies that invest in Taiwan or partner with Taiwanese companies will be able to reduce the risks and costs brought about by the U.S.-China trade and technology conflicts.



Investment Incentives

1 | Tax incentives |

The corporate income tax rate of Taiwan is 20%. To encourage foreign companies to invest in Taiwan, support industrial innovation, and promote industry-academia collaboration, foreign companies are eligible for the following preferential taxes (Table 1):

Table 1 Preferential taxes

Encouraged operational activities	Incentives
Establishing operational, R&D, or manufacturing sites in Taiwan	<ul style="list-style-type: none">• Up to 15% of the company's R&D expenditures may be deducted from its corporate income tax that year.• Imported machinery that local-manufacturers cannot produce is eligible for duty-free treatment.• Royalties paid to foreign companies for new production technologies or products imported from overseas that have patent rights, trademarks, or various concessions are exempted from income tax after gaining approval from the Industrial Development Bureau, MOEA.• Royalty payments to foreign companies for imported new production technologies or products that use patents, copyrights, or other special rights owned by foreign companies is, with the approval of the Industrial Development Bureau, MOEA, exempt from the corporate income tax.

Encouraged operational activities	Incentives
Investment in smart machinery/5G	<ul style="list-style-type: none"> • Smart machinery: Automatic, flexible, or mixed-model production that utilizes big data, AI, and IoT. • 5G: Related investment projects include 5G communication systems, new hardware, software, technology, or technical services. • For investments of no less than NT\$1 million and no more than NT\$1 billion, either “5% of investment spending deducted from corporate income tax (current FY)” or “3% of investment spending deducted from corporate income tax, if total spending spread over three years” may be selected, but the total amount deducted may not exceed 30% of corporate income tax that year. • The applicable period is from January 1, 2019 to December 31,2021 (smart machinery)/January 1,2019 to December 31,2022 (5G).
Promoting industrial innovation and industry-academia collaboration	<ul style="list-style-type: none"> • Individuals and creators who receive shares via technology investment, hold the shares for 2 years, and meet conditions for serving in Taiwan may choose to pay taxes based on the price of shares when they were acquired or transferred, whichever is lower. • Limited partnership venture capital that makes a larger lump sum investment may be taxed using the transparent entity concept. • Parent company employees that obtain shares of subsidiaries and vice versa are also eligible to be taxed based on the lower share price. • Companies or limited partnerships that use undistributed earnings to make real investments may deduct it from their undistributed earnings.
Moving into industrial parks	<ul style="list-style-type: none"> • Companies that move into export processing zones, science-based industrial parks, and free trade zones are exempted from import tariffs on machinery and equipment, raw materials, fuel, supplies, and semi-finished products. • The business tax rate is zero for exporters of goods and labor services.

2 | Subsidies |

1. Global Innovation Partnership Initiatives

To encourage foreign companies that complement and mutually benefit Taiwan's industries to engage in R&D and innovation activities in Taiwan, those that: (1) have technologies not yet mature in Taiwan and overseas and will produce strategic products, services, or industries in future industrial development; (2) have potential to let Taiwan produce leading technologies or significantly enhance the competitiveness and increase the added value of important industries; or (3) engage in key and common technology R&D, vertical or horizontal technology integration, and can create an industrial value chain; will be eligible for subsidies of up to 5% of total R&D expenditures after gaining approval from the MOEA.

2. Integrated R&D Program

Companies that (1) engage in key and common technology R&D, vertical or horizontal technology integration, and can create an industrial value chain; (2) establish industry standards, protocols, or platforms; or (3) establish applications, services, and innovative business and marketing models with technological content and increase the industry's added value; will be eligible for subsidies of no less than 40% but no more than 50% of total project funding after gaining approval from the MOEA.

3. Industrial Upgrade & Innovation Platform Program

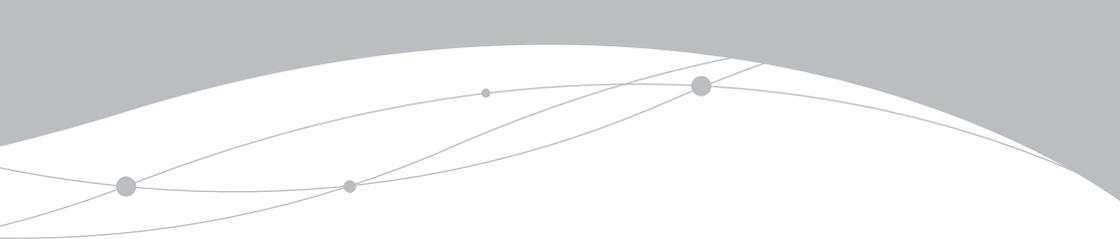
The Industrial Development Bureau, MOEA and Ministry of Science and Technology jointly implemented the Industrial Upgrade & Innovation Platform Program" to guide industries to develop towards greater value, and encourage companies to enter high-end product application markets to increase the industry's overall added value. The program provides companies with R&D teams in Taiwan with 40-50% of funding required for theme-based R&D projects, and up to 40% of funding for R&D projects proposed by companies.

Successful Examples of Foreign Companies

1 | Development of smart applications |

The cloud computing service platform of Amazon – Amazon Web Services (AWS) is optimistic about Taiwan's flourishing innovation capabilities, complete industrial supply chain, and abundance of technology talent, and therefore established the New Taipei City-AWS Joint Innovation Center in New Taipei City in 2018. It further announced that the first AWS IoT Lab in Greater China will be established in Taipei in 2019, and AWS Partner Network (APN) will help customers accelerate the design and deployment of IoT applications. Current partners include the Industrial Technology Research Institute, SoftChef, QNAP Systems, CEC, LiteOn, and Sinomos.

Microsoft teamed up with startups in Taiwan and its partners in the industry in the development of smart city applications, such as working with Osense Technology, an AR startup in Taiwan, and BTS, the largest railway group in Thailand, to make rail stations a destination for tourists and citizens through precision positioning and AR technology.



2 | Cooperative use of testing facilities |

Dassault Systèmes established an R&D center in Taiwan and formed an alliance with the Fair Friend Group to seize business opportunities of smart factories. It also signed an MOU with the Taichung City Government to collaborate on projects relating to the IoT, startup ecosystems, and innovation and R&D hubs.

Cisco values Taiwan's innovation capabilities, digital talent, and complete industrial chain, and thus signed an MOU with the Taoyuan City Government to utilize Cisco Technology in jointly promoting AI, IoT, and 5G demonstration applications and a verification platform.

Siemens is working with the Taichung City Government in building a site for smart manufacturing trial operations, and established a digital experience and R&D center. Siemens will also move into the Hutoushan Innovation Hub of the ASVDA in Taoyuan City in 2019, and established the IoT user organization MindSphere World, collaborating with experts from industry, government, and academia in creating an ecosystem for the IoT industry.

3 | Cooperation in talent development |

Microsoft established the first Microsoft IoT Innovation Center in Asia in Taiwan in 2016. Microsoft further established the AI R&D Center in Taiwan in 2018 and brought new R&D capabilities to Taiwan. It further moved into Startup Terrace in 2019, and has made plans to actively invest resources into Taiwan's excellent startup teams through Microsoft's startup accelerator.

Google launched its AI talent training program in Taiwan in March 2018, and continued to implement Intelligent Taiwan in 2019 to develop talent, the economy, and ecosystems. Furthermore, Siemens signed an MOU with the Department of Education, Taipei City Government for the "Digital Vocational Training Pilot Project," working together to strengthen industry-academia collaboration and improve the employability of Taiwan's vocational talent in the international market.



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