

Investment Advantages of the Automation Engineering Service Industry in Taiwan

I. Reasons to invest in the automation engineering service industry in Taiwan

1. The precision machinery cluster that stretches 60 KMs in length has deeply influenced the world economy and is located in central Taiwan (annual gross industrial production is about NTD\$900 billions)
2. Automation enhancement is required for the upgrade of the manufacturing industry and high-end assembly processes in the high-tech industry and is a cure to the labor shortages in the 3K industry
3. Develop service-oriented manufacturing industry and high-tech service industry as the direction to adjust the industrial structure and realize production flexibility (manufacture in small batches and large diversity) for the high-tech industry
4. The automation engineering services can enhance added product values for traditional industries
5. Both solid foundation of the precision machinery industry and complete integration of upstream and downstream technologies offer supportive benefits
6. Development Direction for the Intelligent and Automation Industry for the Next 10 Years Project – initiated by the Ministry of Economic Affairs, R.O.C.
7. The industrial machinery industry and molding industry in Taichung have formed their own clusters, and they feature complete integration between the upstream and downstream technologies in their supply chains
8. The Ministry of Economic Affairs, R.O.C. has announced development strategies for the intelligent and automation industry and invest NTD\$ 8

billion in the industry and its related industries. It is expected to increase the gross industrial production to NTD\$1.7 trillion in 2015, and the gross industrial production for the robot industry, or the key development focus, is estimated to double from NTD\$45 billion to 90 billion.

9. Foxconn announced investment of NTD\$10 billion to build the Intelligent, Automation, Innovation and Research Park in Taichung. The key focus is on development of and manufacturing critical components for intelligent and automation products and equipment for system integration. Within the next three years, Foxconn will produce millions of robots, and this will drive not only the development of the satellite factories for industrial machinery and their supply chains, but also the new clusters of the Central Taiwan. It is forecasted that the total gross industrial production will exceed NTD\$120 billion.

II. Introduction to Major Service Providers in Taiwan:

The precision machinery and ICT technologies that Taiwan manufacturers possess have achieved the world standard. Factors such as the following all facilitate the development of intelligent automation and autonomous systems in Taiwan: 1) a complete supply chain structure, 2) the high level of acceptance that 3C suppliers are willing to try new technologies and 3) a list of automation solution providers with strong RD momentums to develop high end automation system technologies such as IC and FDP are also available. The labor shortage and quick rise in HR cost in China make it more urgent to develop and implement automation technologies. In the post-ECFA era, the market for equipment in both China and Taiwan has been growing rapidly, and this will attract more automation solution providers with strong abilities to commit to developing relevant technologies and equipment. The deployment and development of intelligent automation will sure improve national competitiveness.

Requests for raising minimum wages have directly impacted the 3K industry, and the government should be more supportive for the development of intelligent automation in the 3K industry. In the meantime, the government should consider policies encouraging integration among material processing, manufacturing processes, automation technologies and applications from new technology fields discovered by legal entities to shorten deployment durations of intelligent

automation. Within Foxconn's Intelligent, Automation, Innovation and Research Park project, it is expected to compete constructions of RD facilities and plants in two phases and manufacture CNC controllers, electric injection molding machines, high-end medicare robots, medicare robotic arms, vehicle electronics, power batteries, new energy systems, servo systems, controllers, automation and injection molding machines (including robotics) and relevant industrial RD centers in several phases. It is foreseeable that this project will not only drive the development of satellite factories and supply chains of the industrial machinery industry, but also foster the birth of new clusters within the Central Taiwan Science Park. It is estimated that three to five years later, the gross industrial production for all related development of the project will reach NTD\$120 billion.

The evolution of an industry requires changes in the environment, and changes in the macro-environment are usually the opportunity for the rise of new industries. After the financial tsunamis that lasted from 2008 to 2009, Taiwan has recovered rather quickly, and this distinguishes the unique competitiveness and advantages that Taiwan suppliers possess. In the last decade, the industrial machinery industry has been growing steadily. Except 2009, the net export has exceeded NTD\$ 350 billion each year, and this highlights the advantages of automation engineering services that the industrial machinery industry in Taiwan has.

The labor shortages and rise in HR cost to stimulate demands for automation equipments; according to suppliers of automation equipment, the wages have been increasing in recent years, and China is no longer an ideal location choice for cheap labors if manufacturers are seeking to cost cuts. Moreover, with escalated labor issues in China, most Taiwanese companies are more willing to consider automation equipment. After installing automation equipment, the production efficiency of the plants can be largely enhanced to cut a huge chunk of HR costs. For example, in a plant where thousands of employees are initially required, now only less than one hundred workers are enough, and this can definitely save a substantial amount of HR expenses.

The automation engineering services from the industrial machinery industry in Taiwan are exported primarily to Asia. In 2013, 8 out of top 10 main exporting countries are in Asia, accounting 51.7% of exporting value. China along made up

28.3% of the total exports. This proves the importance of Asian countries (especially China and Hong Kong) to the industry in Taiwan. With the following factors, the industrial machinery industry in Taiwan possess superior industrial advantages (please refer to Table 1): 1) high-tech industries drive development of industrial equipments for emerging industries; 2) intense cluster effects; 3) professional material processing capacity; 4) high CP value; 5) suppliers are mostly small and medium enterprises, and the structure of supply chain is complete; 6) high market potentials of industrial equipment of emerging industries to enter the China market; 7) a huge number of industrial zones and science parks in Taiwan; and 8) the government actively enforces policies encouraging industrial clustering.

Table 1 Exporting Countries for the Machinery Industry in Taiwan

Unit: USD\$ thousand

Rank	Country	2013		2012	2013 /2012
		Export Value	Ratio %	Export Value	Change %
1	China	5,775,656	28.30	5,869,906	-1.60
2	USA	3,225,446	15.80	3,191,442	1.10
3	Japan	1,202,749	5.90	1,248,988	-3.70
4	Thailand	835,287	4.10	949,629	-12.00
5	Indonesia	651,985	3.20	683,928	-4.70
6	Vietnam	623,329	3.10	615,792	1.20
7	Germany	548,490	2.70	589,775	-7.00
8	Singapore	520,058	2.50	460,855	12.80
9	South Korea	510,250	2.50	491,573	3.80
10	Malaysia	437,178	2.10	458,700	-4.70

Source: Department of Customs Administration; TAMI

Many service providers in the automation engineering service industry are very large and their system technologies and integration capacities have achieved the world standard. Major service providers include Formosa Heavy Industries, China Steel Machinery, Marketech International, United Integrated Services, Chung Hsin Electric & Machinery Mfg., Mirle Automation, L&K Engineering, Gallant Precision Machining, Lumax International, Kenmec Mechanical

Engineering, UsunTech, Ace Pillar and so on. Their annual revenue has far exceeded NTD\$2 billion, and they offer customized automation services based on customers' industrial backgrounds, including automated engineering services, automated storage systems, automated inspections and automated assembly lines. Additionally, automated production for electronics, optoelectronics and semiconductor products as well as operations management and inspection equipments are also their products. This indicates that the automation engineering service industry is moving toward providing full-range services. (Please refer to Table 2).

In view of the revenue performance of the automation service providers in Taiwan, all service providers mentioned above have strong solid engineering and integration ability, which empowers them to not only construct complete assembly lines of automation equipments, but also perfect their production ability to manufacture automation equipments (Table 3) This indicates perfectly fostered and competitive markets, and they possess strong competitiveness and quality integration ability.

Table 2 Size for Service Providers from the Automation Engineering Service Industry

Revenue(NT\$ billion)	Company
>2	Formosa Heavy Industry, China Steel Machinery, Maketech, United Integrated Service, Chung Hsin Electric & Machinery, Mirle Automation, L&K Engineering, Gallant Precision, Lumax, Kenmec, Usun Tec., Ace Pillar
1~2	CHANG TYPE, Utechzone, Aurotek, All Ring, E&R Engineering
<1	Favite, Hiwin Microsystems, A-tech system, ChenFull...etc.

Source: ITRI/IEK

**Table 3 List of Quality Service Providers from Automation Engineering Services
Industry in Taiwan**

Unit: NT\$ million

	2013		2012		2011	
	Revenue	Net Profit (%)	Revenue	Net Profit (%)	Revenue	Net Profit (%)
Marketech	14,042	1.56	8,153	3.18	10,802	3.55
United Integrated	11,445	9.91	8,048	6.67	11,323	7.42
CHANG TYPE	1,838	-1.24	1,305	-6.2	1,069	-0.37
Chung-Hsin	10,095	5.76	7,728	7.06	7,500	7.62
Mirle Automation	6,592	5.27	4,751	4.25	5,956	6.06
L&K Engineering	12,266	3.71	3,429	14.83	5,865	10.43
Gallant	2,561	7.12	1,763	-15.46	2,430	4.27
Lumax	6,240	10.24	4,010	16.77	4,411	14.31
KENMEC	7,949	-4.96	1,505	-55.46	2,246	-11.76
ChenFull	2,457	7.63	2,003	7.64	2,092	5.72
Utechzone	1,274	-4.73	799	-26.44	1,554	6.37
Ace Pillar	4,130	0.48	1,354	-1.1	1,594	31.6
Usun Tech	3,425	13.48	1,021	12.29	941	0.26
Aurotek	1,459	1.9	1,190	0.01	1,174	3.15
All-Ring Tech	1,119	10.94	649	-18.71	756	-29.83
Favite Inc	420	-27.64	324	-62.52	497	-1.09
E&R Engineering	868	3.00	952	8.7	587	2.55

Source: Market Observation Post System (2014.06)

As analyzed from the current status of the automation engineering service industry in Taiwan and their integration and manufacturing abilities, the industry in Taiwan is far superior to their counterparts in other countries. Whether it is automated storage and retrieval systems, automated material control system, automated equipment used in manufacturing, product delivery or storage processes, automobile assembling, production of semiconductors and LCD displays, testing

and inspections and automation in dust-free factories, the automation engineering service industry can expand to an ideal level with technological integration, professional task division and integration with ICT technologies. Thus, with production models featuring superior cost advantages, advanced technologies, and integrated applications as well as support from the government for developing the intelligent automation engineering service industry, the automation engineering service industry in Taiwan should definitely be considered as an ideal investment choice.