



Automation and Robotics in Thailand

On the road towards an advanced economy under the Thailand 4.0 model which entails high technology, the public and private sectors are making concerted effort to accelerate the growth and development of automation and robotics systems. The use of robots in Thailand is expected to rise substantially over the next few years, bolstered by the country's dominance in regional automotive, electronics & electrical appliances, and food processing industries, as well as medical services.

The demand for Automation & Robotics (A/R) in Thailand is edging up and expected to grow continuously as manufacturers and service providers increasingly look to automation solutions to achieve greater production efficiencies amid labour shortage and increasing competition. Many have turned to collaborative robots (cobots) - robots designed to work alongside humans - because of the safety and flexibility they offer.

Most of the Thai companies in the A/R industry are in the business of system integration and mechanical brain & software development. There are untapped areas with demand in parts and components, as well as high-tech robots. According to Thailand Institute of Field Robotics (FEBO), over 260 billion baht is spent annually on importing A/R. The three highest demand are: conveyer systems; computer numerical controls (CNCs), robots, automated storage and retrieval systems (ASRS); and high precision machines.

Opportunities for Dutch Businesses

Industrial Robots

Automation and robotics has played a growing role in the Thai Industry 4.0 era and became an important part of the manufacturing equation of many industries in Thailand, particularly automotive, electrical & electronics (E/E), and food processing.

Thailand's robotics imports are projected to grow by double digits over the next few years as factories recognise that their potential depends on high technology while facing pressure from high labour costs. The 2017 World Robotics Report by the International Federation of Robotics (IFR) also viewed Thailand as a growing market for industrial robots in Asia, with sales projected to reach 5,000 in 2020 from 2,646 in 2016. Thailand is now ranked 10th when it comes to applying A/R technology to the local manufacturing sector, having 45 robotic systems in the industrial sector per 10,000 workers.

The country's dominance in the global/regional production of **automotive and E/E products** is the main contributor for A/R market growth in Thailand. This is in line with the IFR report that showed these two industries as the major drivers of global A/R growth. Thailand is the largest vehicle producer in ASEAN and ranked 12th globally for vehicle production in 2017. It is the world 2nd largest producer and exporter of hard disk drives (HDD) and holds a renowned reputation in integrated circuits (IC), semiconductor and equipment for mobile phones. It is also a regional lead in the production of electrical appliances i.e. air conditioning units, refrigerators, washing machines, and digital cameras.

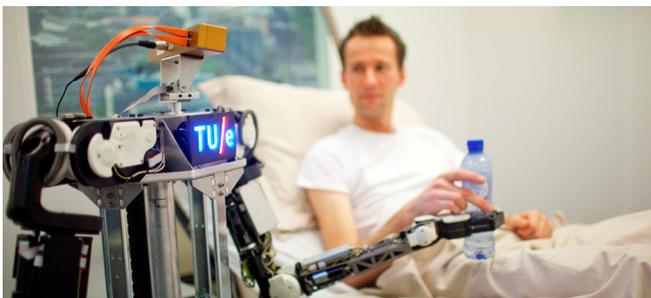
In addition, Thailand's **food and food processing** industries have been integrating A/R at an increasing rate, and the government's promotion of smart farming has also seen the technologies beginning to appear in agriculture. As one of the largest producer of food products and the largest food exporter in Southeast Asia, food manufacturers in Thailand are looking at automation to boost efficiency and offer consumers more choices. Cobots in particular have been deployed to reduce production cost, increase productivity through optimisation of processes to stay competitive, while maintaining world-class quality standards.

Service Robots

A combination of ageing population and the country's world-class medical facilities with more than 1,000 public and 300 private hospitals has also driven the demand for service robots in Thailand. The number of aged people (60 or older) has risen to 11 million or 17% of the total population in 2017 and the country will become a full-fledged ageing society (20% aged population) in 2021. Thailand's working-age population will also begin to decline around 2018.

Medical/healthcare robots are not a stranger to Thailand. Considering its aim to be the medical hub of Asia, Thailand has adopted more and more innovations in medical robotics while welcoming international expertise. The country also offers opportunities to develop healthcare robots capable of successfully integrating with people's lifestyle.

Examples of Thai medical robotics include: DINSOW (which is considered to be number one in the world among elderly care robots); FHASAI (robot-assisted therapy for children with autism spectrum disorders); SENSIBLE TAB (an arm rehabilitation robot); B-HIVE (a pharmacy automation system); and BUMBEE (a medical dispenser robot).



Logistics robotics is another potential area for rapid growth to support the supply chains of Thailand's industrial automation and transport hub. Automating warehouses and picking are on the rise in Thailand. According to the Thai Intralogistics Providers Club, Thailand's market value of intelligent warehouses, which monitor inventories and the inflow/outflow of stock online, is about US\$1 billion annually with an expected expansion between 3 and 5% per year.

Moreover, the expanding e-commerce market and highly competitive retailing businesses have played a significant role for companies in Thailand to enhance the operational efficiency of their distribution centers through robotic deployment in their order fulfilment, warehousing and delivery operations.

Adoption of robots and service automation by **tourism and hospitality** companies are also expected to increase along with Thailand's booming tourism market. In 2017, the country welcomed more than 35 million foreign visitors, growing by 8.8% from 2016. The hotel and restaurant sector also expanded strongly by 8.5% with total tourism revenue increased by RER 9.5%.

Besides robots for professional use, the rising middle-income population in Thailand will stimulate service robotics market in personal/domestic use i.e. **household applications**. Mundane chores such as floor mopping, lawn mowing and vacuum cleaning will be performed more by robots across the residential sector as hiring housekeepers to perform these tasks is becoming more costly. A household robot such as the Netherland's Tinybots could also add value in terms of convenience.

While the automated guided vehicles seem to be a long shot for Thailand, the applications of **drones or unmanned aerial vehicles** have been proliferating in many fields ranging from recreational, scientific, commercial and defence purposes. However, the use of drone in Thailand requires permission from the Civil Aviation Authority of Thailand (CAAT) and the Office of the National Broadcasting and Telecommunications Commission (NBTC).

The Government's Support

The Thai government has identified A/R as one of the new engines of growth and the targeted industries in the Eastern Economic Corridor (EEC)*. A number of supportive measures on both the demand and supply side are aimed at creating the right ecosystem.

On the demand side, incentives are afforded to both new investment projects and existing investments aimed at increasing current production efficiencies. The incentives range from a waiving of corporate income taxes for three years on the current revenues of an existing project as well as exemptions of import duties on machinery when the tax exemption cap does not exceed 50 per cent of the investment capital. In case of at least 30 per cent of the total investment capital has been made on local automation systems, corporate income tax exemptions will be expanded to 100 per cent of the investment capital. In addition, investors will be eligible for other incentives depending on their respective industry.

On the supply side, Thailand's Board of Investment's incentives are offered to a wide range of business activities related to the robotics and automation industries and technologies: conceptual

*See for more information our Thailand Eastern Economic Corridor Factsheet

design solutions; engineering designs and system integration methods to control system configurations; procurement and manufacturing; as well as assembly, installation and commissioning.

Supporting industries eligible for incentive packages include the production of telecommunication equipment and parts; the operation of electronic controls and measurements for industry, agriculture and medicine; the manufacturing of vehicular and scientific tools; the installation of security control systems; and the engineering of high-value software solutions. Incentives provided to these businesses include exemptions of import duties on machinery as well as corporate income taxes, depending on the types of businesses and other incentives involved.

At the same time, other parties are engaged in the nurturing of relevant skills and capacities in order to support a wide-scale adoption of robotics and automation technologies across the nation. The Centre of Robotic Excellence (CoRE) has been established to be a supporting agency for the development of personnel and upgrading A/R technology to accomplish complex robot production.



Key Stakeholders

Research Centres

Thailand offers various resources for research and development and human resource training. These include the following:

- The Institute of Field Robotics (FIBO), King Mongkut's University of Technology, Thonburi:
<http://www.fibo.kmutt.ac.th/>
- Centre for Biomedical and Robotics Technology (BART LAB), Faculty of Engineering, Mahidol University:
<http://www.bartlab.org/>
- Regional Centre of Robotics Technology, Faculty of Engineering, Chulalongkorn University:
<http://www.regional-robotics.org/>
- Intelligent Robotics and Mechatronics Laboratory (SKUBA), Faculty of Engineering, Kasetsart University:
<http://www.ku.ac.th/>

Associations and Institutes

- Thai Automation and Robotics Association (TARA): supports robotics and automation system companies to find the best solutions for businesses and customers (<http://thaitara.org/>)

- Thai Robotics Society (TRS): supports research and networking within robotics community and provides public information related to robots (<http://trs.or.th/>)
- Thai Embedded Systems Association (TESA): develops network for electronic design industry for developers, by developers (<http://www.tesa.or.th/>)
- Thai Machinery Association (TMA): facilitate Thai machinery market, and support R&D of Thai manufacturing system (<http://www.thai-machinery.or.th/>)
- National Science and Technology Development Agency (NSTDA): supports R&D on five target areas, which are agriculture & food, health & medicine, energy & environment, bio-resources & community, and manufacturing & service industries (<http://www.nstda.or.th/>)
- National Innovation Agency (NIA): Support R&D of innovative products and embed innovative strategic direction of firms (www.nia.or.th)
- National Metal and Materials Technology Centre (MTEC): creates and enhances capabilities in materials technology through R&D, technology transfer, human resources development, and infrastructure development (<http://www.mtec.or.th/>)
- Asian Institute of Technology (AIT): promotes technological change and sustainable development in the Asia-Pacific region through higher education, research and outreach (<https://www.ait.ac.th/>)
- Electrical and Electronic Products Testing Centre (PTEC): supports R&D and product testing of electrical and electronic products (www.ptec.or.th/)

Related trade fairs

- Horti Asia & AGRITECHNICA ASIA, 22-24 August, BITEC, Bangkok, (www.horti-asia.com, www.agritechnica-asia.com)
- TILOG LogistiX, 29-31 August 2018, BITEC, Bangkok (www.tilog-logistix.com)
- Thailand Industrial Fair, 13-16 February 2019, BITEC, Bangkok (www.thailandindustrialfair.com)
- Asia Warehousing Show, 27-29 March 2019, BITEC, Bangkok (www.asiawarehusingshow.com)
- Intermach/Subcon Thailand: 8-11 May 2019, BITEC, Bangkok (www.subconthailand.com)
- Manufacturing Expo, 19-22 June 2019, BITEC, Bangkok (www.manufacturing-expo.com)
- Medical Fair Thailand: 11-13 September 2019, Bangkok (www.medicalfair-thailand.com)

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