Over the past half a century, dynamic advances in automation and robotics have been transforming both business and society. Automation and robotics were initially used to increase productivity on the production floor of factories and utilized simple technologies. Now however, many corporations around the world are transitioning into Industry 4.0, making use of artificial intelligence, big data management, and the Internet of Things (IoT) to seamlessly work together, to exponentially increase both production and productivity.

Since 2010, the demand for industrial robots has substantially increased as a result of factories’ continuous shift toward automation and innovative technical improvements. There is immense potential for Thailand to expand its market to address rising global demand, since Thailand’s total supply of approximately 3,700 robots only accounted for less than a quarter of total global robot installations in 2014.

“Thailand Ranked 8th in Global Supply of Industrial Robots in 2014”
THAILAND: RISING AUTOMATION AND ROBOTICS INDUSTRY

Factories in Thailand have been investing heavily over the past few years in machineries and systems in order to increase the level of process automation and remain competitive in the global manufacturing arena. This has driven market growth in the automation and industrial robot industries in Thailand.

In the past decade, an increasing number of factories in the automotive, electrical and electronics, food and agricultural industries have been shifting towards automation, driving up the size of Thailand’s automation industry. The machinery and technology in this market that have top demand are conveyors, packing systems, and specialized operations.

Types of Demand for Automation in Thailand

- Conveyer: 32%
- Packing: 17%
- Specific Task: 22%
- Robot Arm: 15%
- Others: 14%

Import Value of Thai Automation Industry

- 2010: 5.69
- 2011: 6.29
- 2012: 8.51
- 2013: 7.66
- 2014: 7.71

Note: *Exchange Rate = THB 35.14/ US$ as of 1st April 2016; **Compound Annual Growth Rate 2010-2014; ***The spike in 2012 is due to extra machine replacements after Thailand mega-flood

Thailand Industrial Robot Market

The industrial robotics industry in Thailand has expanded dramatically over the past decade due to a strong customer base. The size of Thailand’s shipments of industrial robots is estimated to increase by 133% from 2,131 units in 2013 to 7,500 units in 2018.

Major Automation and Robotics Companies in Thailand

Manufacturing

- NACHI
- ABB
- DAIKFU
- Celestica

Sales Office

- YASKAWA
- FESTO
- KUKA
- FANUC

Source: FIBO

Note: *International Federation of Robotics
WHY THAILAND?

High Demand Driven by Well-Established and Growing User-base

The International Federation of Robotics (IFR) considers the Automotive and Electrical and Electronics industries to be the two major industries that are responsible for driving global automation and robotics growth; together, these industries have a market share of 64%.

Automotive Industry

Since 2010, the automotive industry has considerably increased investments in industrial robots worldwide, with an impressive average sales growth of 27%\(^1\). This highlights the huge opportunities present in Thailand as it is currently the largest producer among the ASEAN countries and is one of the world’s largest production bases with respect to the automotive industry.

Electrical and Electronics Industry

In 2014, robot sales with respect to the electrical and electronics industry increased by 34% to 48,400 units, reaching a new peak due to the rising demand for electronic products and the need to automate production processes. Immense opportunities exist in Thailand as it is the global production hub for electrical and electronics.

Statistics of Automotive Production in Thailand\(^1\)

Growing number of production of passenger cars in Thailand, despite the slowdown in the global economy reflects the country’s strength in the automotive industry, which drives the strong demand in automation and robotics industry.

Source: \(^1\)International Federation of Robotics, 2016; \(^2\)Automotive Intelligence Unit, Thailand Automotive Institute, 2015

Note: \(^*\) Compound Annual Growth Rate 2010-2014

Over US$12 billion and 7% growth** in export value of electrical & electronics\(^2\)

2nd Largest global producer and exporter of hard disk drives\(^2\)

Source: \(^1\)Thai Automotive Institute, 2016, \(^2\)Electrical and Electronics Institute

Note: \(^*\) Compound Annual Growth Rate 2010-2015; **Growth 2010-2015;
Untapped Area with Great Demand

Currently, the biggest companies in Thailand in many hard industries are investing heavily in automation. More than 98% of Thai businessmen in the automation and robotics industry are in the business of system integration and mechanical brain & software development. There are massive opportunities for foreign companies to invest in parts & components manufacturing, given the high value and rising demand reflected in the constantly rising imports of machinery and parts.

Supply Chain of Thai Automation & Robotics Industry

- System Integrator
- Mechanical Brain & Software Developer
- Parts & Components Manufacturers
- Automation & Robotics users
  - Automotive manufacturers
  - Electrical & Electronic manufacturers
  - Food manufacturers
  - Etc.

Availability of Capable Human Resources

With 76 universities and 83 vocational schools, Thailand produced approximately 82,250 Thai graduates from engineering and related courses in 2015. The country has plenty of highly skilled engineers and researchers specializing in automation and robotics and is ready to capture this fast growing market.

Thai Team as World Champions

**RoboCup** is an annual global robotics competition founded in 1997. With an aim to promote robotics and AI research, the competition is divided into different stages, including RoboCup Rescue, RoboCup Soccer, RoboCup Home, etc.

Over the past decade, Thai student teams have won the following competitions:

- **RoboCup Rescue**
- **RoboCup Soccer**
  - 3 years Champion: 2009-2011
- **RoboCup Home**
  - 8th place, with Best Mobility Award

Source: ¹Ministry of higher education

Specialized Education Program

FIBO at King Mongkut's University of Technology, Thonburi, offers Undergraduate and Graduate Programs in Robotics and Automation Engineering, which seamlessly integrates knowledge in mechanics, electronics, and computers through Project-Based Learning.

With 20 years of experience and 16 best-in-class professors, FIBO has created successful engineers, researchers, professors, and entrepreneurs that specialize in this field.

Source: ¹Ministry of higher education
**Excellent Infrastructure and Institutional Support**

As one of the government targeted future industries, Thai government and education centers provide continuous support to develop the automation and robotics industry as well as enhance the capabilities of the country’s workforce. Thailand offers various resources for research and development and human resources training.

**Research Centers**

**FIBO**
The Institute of Field Robotics, King Mongkut’s University of Technology, Thonburi

**BART LAB**
Center for Biomedical and Robotics Technology Faculty of Engineering, Mahidol University

**SKUBA**
Intelligent Robotics and Mechatronics Laboratory Kasetsart University

**Regional Center of Robotics Technology**
Faculty of Engineering, Chulalongkorn University

**Associations and Institutions**

**Thai Robotics Society**
Supports research and networking within robotics community and provide public information related to robots

**Thai Embedded Systems Association**
Developer’s network for electronic design industry for developers, by developers

**Thai-German Institute**
Assists transformation of Thai manufacturing technology and automation system to meet with International standards

**National Science and Technology Development Agency**
Supports R&D on five target areas, including agriculture & food, health & medicine, energy & environment, bioresources & community and manufacturing & service Industries

**Thai Machinery Association**
Facilitate Thai machinery market, and support research and development of Thai manufacturing system

**National Innovation Agency**
Support R&D of innovative products and embed innovative strategic direction of firms

**Asian Institute of Technology**
Promotes technological change and sustainable development in the Asia-Pacific region through higher education, research and outreach

**National Metal and Materials Technology Center**
Create and enhance capabilities in materials technology through R&D, technology transfer, HRD and infrastructure development

**National Science and Technology Development Agency**
Supports R&D and product testing of electrical and electronic products
**PREMIER THAI ROBOTS**

Thai Medical Robotics

Other than the flourishing industrial robot market, Thailand also offers opportunities to develop service robots capable of successfully integrating with people’s lifestyles. As the medical hub of Asia, Thailand is one of the best destinations to develop medical robotics.

**DINSOW**

*Elderly Care Robot*

- 1st Authentic Thai Robot
- In the process to obtain ISO9001 and CE Mark.
- Equipped with a camera, infrared and thermal sensors and artificial intelligence

1st Thai company to manufacture and develop commercial service robots that are being exported to Japan and Sweden

Developer: CT Asia

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**SENSIBLE TAB**

*Arm Rehabilitation Robot*

- In the process to obtain ISO 13485 certification

Developer: TCELS

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**FHASAI**

*Robot-assisted Therapy for Children with Autism Spectrum Disorders*

Winner of medical robotics idea contest, MedBot 2014

Developer: MAHIDOL UNIVERSITY

Note: “Today, Dinsow is considered to be number one in the world among elderly care robots,” says Mr. Chalermpol Punnotok, founder of CT Asia Robotics Co., Ltd

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**BUMBEE**

*Pharmacy Automation System to refill medicines at a rate of 20 seconds per prescription*

Developer: Sensible Tab

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**B-HIVE**

*Medical Dispenser Robot*

Developer: TCELS

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Non-Tax Incentives

These activities also receive the following non-tax incentives:

- Permit to bring in expatriates
- Permit to own land
- Permit to take or remit foreign currency abroad

INVESTMENT INCENTIVES

BOI Incentives

BOI recognizes the importance of automation and robotics, and offers a wide range of tax and non-tax incentives for projects that meet national development objectives.

<table>
<thead>
<tr>
<th>GROUP</th>
<th>ELIGIBLE ACTIVITIES</th>
<th>INCENTIVES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Corporate income tax exemption</td>
</tr>
<tr>
<td>A1</td>
<td>Software development and service provision as follow: - Big data and business process management - IT and Cyber security - Use for controlling and/or connecting advanced technology equipment. E.g. aerospace, robots, automation, medical devices - Research and Development - Engineering Design - Scientific Laboratories - Calibration Services</td>
<td>8 years without cap</td>
</tr>
<tr>
<td>A2</td>
<td>Automation machinery and/or automation equipment with engineering design</td>
<td>8 years</td>
</tr>
<tr>
<td>A3</td>
<td>Assembling of robots or automation equipment and/or automation parts</td>
<td>5 years</td>
</tr>
</tbody>
</table>

Note: *Exemption of import duty on raw or essential materials and machinery used in manufacturing export products

Unmanned Vehicle System

With respect to importing machineries, most Thai companies in the automation and robotics industry are **system integrators**, which presents further investment opportunities for foreign robot manufacturers.

HiveGround Co., Ltd.

Successful System Integration Projects

**TIGER SHARK II TYPE 3 UAV**

An autonomous unmanned aerial vehicle (UAV) with automatic takeoff and landing functions, for Royal Thai Air Force.

**ZEABUS AUV**

A medium size unmanned aerial vehicle (UAV) for RoboSub 2015 Competition for Kasetsart University & PTTEP PLC.

**FLARE STACK INSPECTION DRONE**

A safety enhanced flare stack inspection drone for REPCO Corporation Co., Ltd.