



Industrial Automation classroom – visit to B&R

We met with Mr. Sivaram P, Non-Executive Chairman of B&R Industrial Automation (An ABB group company). B&R makes products for machine and factory automation since 1996 in India and has a turnover of ~Rs 1.5 bn. While facing slowdown due to weak IIP/ manufacturing, automation has a strong future in India with no new manufacturing investments without automation solutions. The sector is expected to grow 2x of manufacturing sector with degree of automation rising amongst large industries. We have **REDUCE** rating on Siemens (SIEM) and ABB India (and Honeywell is not under our coverage) on high valuations/ near-term growth hiccups, but digitalization business offers strong long-term growth opportunity in India.

Key takeaways

- ◆ **Industrial Automation (IA) market is linked to the manufacturing sector** of the country. It is ~USD 2 bn industry in India (~1% of global automation business) and expected to grow at 20-25%. IA is likely to grow faster (>2x) than India's manufacturing growth, given no new manufacturing unit is without automation now, though the degree of automation may vary.
 - Auto, Pharma and FMCG/ packaging sector account for 60-70% of automation applications in India; some textile and plastics industry have also started adopting automation.
 - Low labor cost, few skilled operators and high capex cost remain key hindrances for its adoption in the developing countries. Hence, few large manufacturers have adopted higher degree of automation, while others are deploying application-specific automation solutions (like painting/ welding). In the developed world, automation is more widespread due to manpower shortage as well as its high costs.
- ◆ **IA market has slowed down** recently owing to weak economy. Companies expect it to revive by mid-2020. Income tax cuts have not yet spurred the demand, which is the single most important factor for new investments.
- ◆ **Distribution model in India:** Most of the automation products are currently imported like sensors, robots, actuators; engineering, programming and logic control is the value addition done in India. Big system integrators as well as suppliers like Siemens, ABB, Rockwell, Honeywell, etc. have lesser competition. B&R Industrial Automation, Mitsubishi Electric, etc are product makers, which in our view, has high competition. Lowest level is sensors which are a commodity with multiple suppliers from China, Taiwan, Japan, India, etc.
- ◆ **Margin earned by ABB and Siemens in India** has been lower than their foreign counterparts. This is largely because larger players follow a distribution model unless critical mass is achieved in India for undertaking an investment/ localization decision.
- ◆ **Automation is West's answer** to counter the Low Labour Cost (LLC) advantage. Developing countries such as China and India have long benefitted from LLC and India is still trying to balance automation and LLC.
- ◆ **Predictive maintenance** is gaining more traction followed by Adaptive Manufacturing and Digital Twins in India.

Exhibit 1: Comparative valuation

Company	Mkt Cap (USD bn)	Reco	CMP (Rs)	TP (Rs)	EPS (Rs/share)			PE (x)			RoE (%)		
					FY19	FY20E	FY21E	FY19	FY20E	FY21E	FY19	FY20E	FY21E
Siemens	7.7	REDUCE	1,527	1600	25	32	37	61	48	41	13%	14%	15%
ABB	4.2	REDUCE	1,427	1,400	24	29	34	59	50	42	15%	17%	18%
Honeywell Automation*	3.5	NOT COVERED	28,000	NA	406	558	692	55	50	40	23%	25%	24%

Source: Axis Capital, Bloomberg, *Honeywell automation is not covered company

Automation basics

1. Types of Automation

Machine data collection and automation exists since the 1970s.

A **SCADA** (Supervisory Control And Data Acquisition) system is an event driven system wherein data collected from a plant (or plants) is collated and analyzed by the concerned person for anomalies.

A **DCS** (Distribution Control System) system works on the principle of Programmable Logic Control (**PLC**) and is a process oriented approach wherein a closed loop process is run based on predetermined set of rules / parameters.

Use of electronics is increasing with online interfacing, leading to improved detection and data analysis.

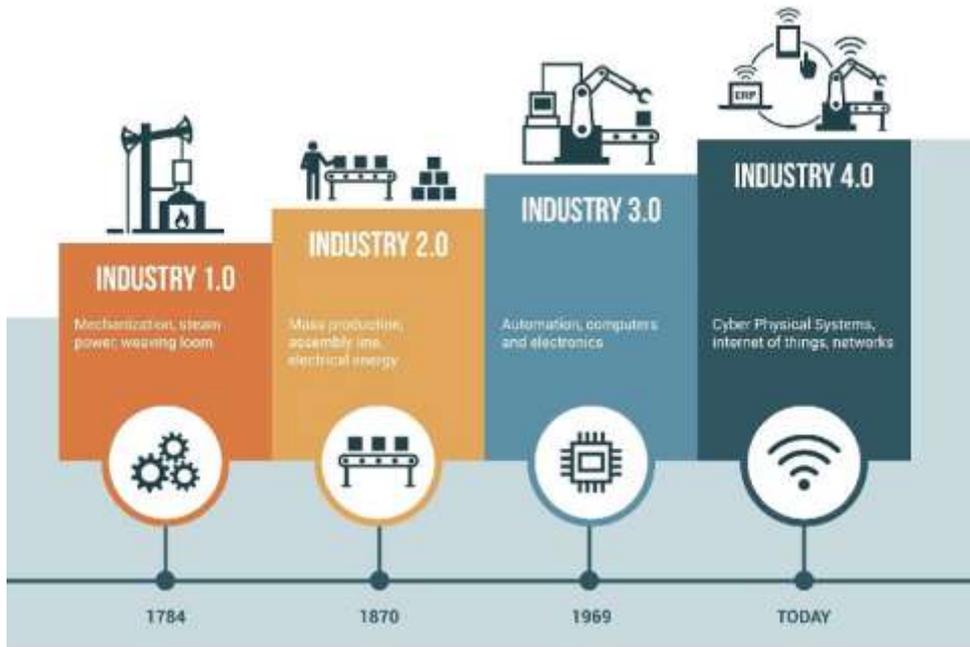
- ◆ **Machine Automation** is used for (1) **Quality** – reduces product defects during manufacturing process (hence in a way improves quality); and/or (2) **Productivity** – increases and streamlines the throughput process. In recent times, machine automation and data collection has gained traction to increase the level of safety and reduce environmental damage.
- ◆ **Building Automation** – involves efficient control and result in savings for energy costs, safety, etc. e.g., temperature, energy and light controls.
- ◆ **Factory Automation** – while machine automation is specific to machines on the shop floor, the Factory Automation is used for the overall synchronization of different machines as well as the entire process. The final purpose is to increase the efficiency of the factory as a whole.
- ◆ **Internet of Things (IoT)**: Connection between physical devices and the internet – eventually helps in data collection and analysis. A more comprehensive concept is Industrial Internet of Things (IIoT) – connecting people, machine, and data.
- ◆ **Digitalization** is the process of collecting and converting machine data into a digital format to take informed business decisions.

2. Industry 3.0 vs. Industry 4.0

India has not fully adopted Industry 3.0 in many segments, but like the technology adoption wave via smartphone, Industry 4.0 is being adopted well for all new manufacturing and Industrial capex.

There is an occasional confusion between the understanding of Industry 4.0, which to a large extent is associated with the ongoing automation through robots, sensors etc. Industry 4.0 in layman terms is the use of vast quantities of data generated on the shop floor through such products as sensors, valves, robots etc.

Industry 3.0 + Data analysis = Industry 4.0



3. Why Industry 4.0 is important?

LLC a big barrier to manufacturing – Developing countries such as China and India have long benefitted from **LLC (Low Labour Cost)** – a big reason why China is the global manufacturing hub today. However, recently Europe and America have realized the importance to boost local manufacturing. However, high wages in these countries make manufacturing an unviable option (unless high value added goods such as cars etc. are manufactured which Europe is already leading in). Complete automation with Industry 4.0 is crushing the low labour cost advantage through productivity and quality boosts. However, an important point to note here is that even though human intervention is minimal in Industry 4.0, cerebral activity for data analytics is still an important component; hence, countries like India are still at an advantage if policy frameworks are strategically designed.

Mean Time to Respond to Change in Customer Demand (MTRCCD) – with time the confluence of social media and the production planning process has become all the more important to predict well in advance the changing customer preferences. This can be only achieved with aggregation of granular data points and its analysis.

100% visibility – Industry 4.0 promises 100% visibility to the CEO of a company – a rather important tool in cut-throat competition.

Untouched data – data when manipulated by human intervention can impact business decisions. Industry 4.0 to a large extent promises real time data, real life simulations, and the best available options at a given point in time.

Complete automation with Industry 4.0 is crushing the low labour cost advantage through productivity and quality boosts.

4. Is India 4.0 ready?

Currently, India is an under-penetrated market when it comes to automation. However, with changing customer demands (social media influence), quality parameters and environment/ safety regulations, etc. consumer movements to a large extent could force industries to adopt automation and Industry 4.0.

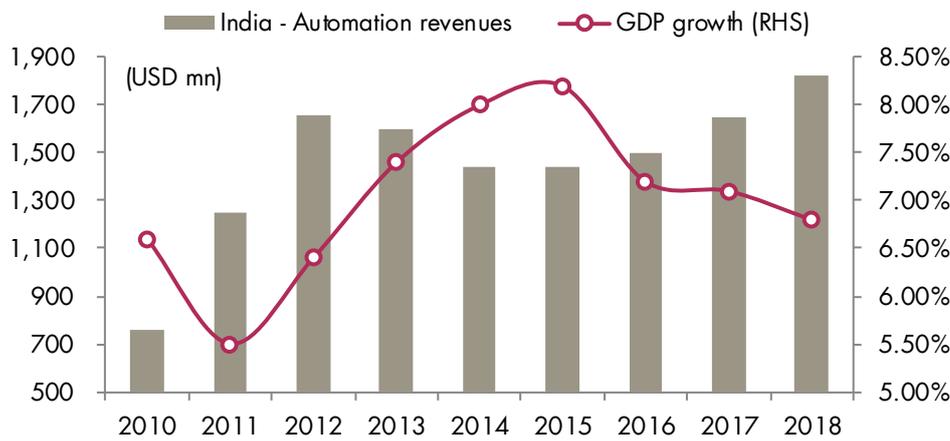
Indian scenario

Industrial Automation industry in India is estimated to be at ~Rs 120 bn (USD 1.7 bn) in FY19, ~1% of global automation business. Our discussions with experts and companies point out that the industry is expected to grow at a CAGR of ~20-25% over FY19-25 if new age manufacturing comes to India for cell phones, batteries, EVs, data centers, etc. At this estimated rate of growth, the industrial automation industry in India can grow to ~USD 7 bn by 2025.

Auto, Pharma and FMCG/ packaging sector account for 60-70% of automation applications in India, some textile and plastics industry have also started adopting automation.

Automation is a highly under-penetrated market in India. Low labor cost, few skilled operators and high capex cost remains key hindrances for its adoption; hence, few large manufacturers have adopted higher degree of automation, while rests are deploying application-specific automation solutions (like painting/ welding). In the developed world, automation is more widespread due to manpower shortage as well as its high costs.

Exhibit 2: Automation sector is cyclical in nature – but adoption rate is increasing in existing operating industries



Source: Bloomberg, Axis Capital

Key players in India

International players – are big system integrators as well as suppliers: Siemens, ABB, GE, Rockwell, Honeywell, Endress+Hauser, Schneider Electric, Omron, IFM Electronic. International players face lesser competition.

B&R Industrial Automation, Mitsubishi Electric, etc. are product makers, which in our view has high competition. Lowest level is sensors which are a commodity with multiple suppliers from China, Taiwan, Japan, India, etc.

National players – Enpro Industrial Automation Pvt. Ltd., Larsen & Toubro, Brabo (Tata Group cos), Titan Automation Solutions, SMEC Automation, Adage Automation, etc.

Exhibit 3: Global performance of key players

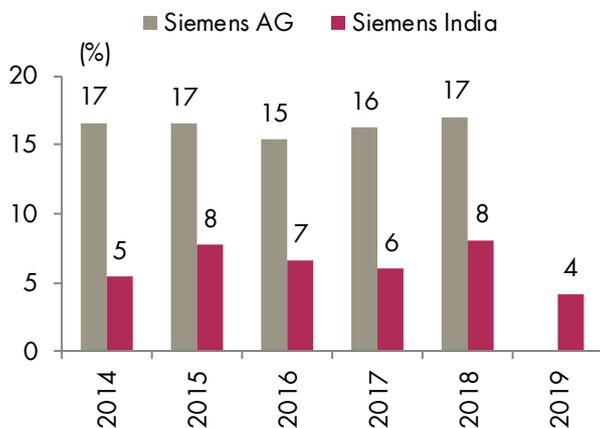
Company	Segments considered	Key products	Year	Revenue contr. (%)	Margins
ABB	Robotics & Motion	Motors, Drives & Controls, Robots	2018	32.4%	15.8%
ABB	Industrial Automation	Complete solutions for process automation, energy management, safety, predictive maintenance	2018	26.0%	13.8%
Siemens	Digital Factory	Factory/Process automation, Software, motion control	2018	15.57%	17.0%
Emerson	Automation Solutions	Valves, Actuators & Regulators, Measurement & Analytical Instrumentation, Process Control Systems & Solutions, Industrial Solutions	2018	65.70%	16.5%
Rockwell	Control products & solutions	Intelligent motor control and industrial control	2018	53.50%	15.2%
Schneider	Industrial Automation	Motion controllers, variable speed drivers, sensors, software etc	2018	24.10%	18.0%
Honeywell*	-	-	2018	-	19.5%

Source: Axis Capital, Bloomberg,

*Entire business operations have been considered - only automation revenues are not available, Operating margins have been compared

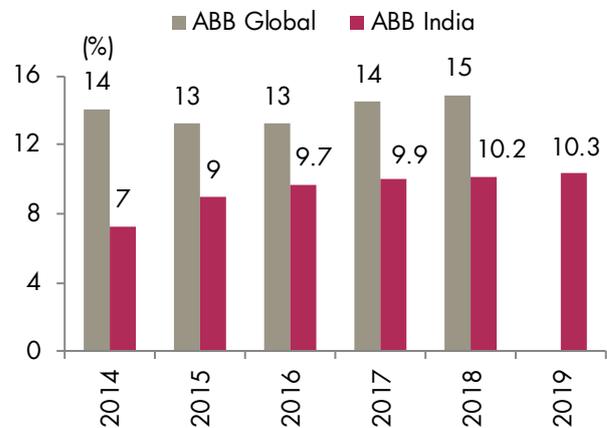
However, historically the margin earned by ABB and Siemens in India has been lower than their foreign counterparts. This is largely because the larger players follow a distribution model, unless the critical mass is achieved in India for undertaking an investment/ localization decision.

Exhibit 4: Margin comparison – Siemens



Source: Axis Capital, Bloomberg, 2019 Siemens AG data yet not available

Exhibit 5: Margin comparison – ABB



Source: Axis Capital, Bloomberg, 2019 ABB Global data yet not available

Revenue model in India

Bundling of IoT-enabled software and hardware to create managed services and software as a service is being offered as annual subscriptions or pay per use models. These managed services are increasingly becoming outcome-based, where users pay based on desired outcomes instead of paying upfront for just the service. Desired outcomes can include continuous hours of control availability or cost savings related to predictive maintenance of field instrumentation.

The transformation of the automation business into annuity could mean much more cut-throat competition among automation suppliers. In many cases, suppliers are slashing margin on new systems installations in the hopes of capturing this annuity.

Hence, access to funding will be a key differentiator in offering automation solutions and broad-base the user network.

Adoption of automation by Indian factories

- ◆ **Thermax** facility in Sri City, Andhra Pradesh (Rs 1.5bn) – completely automated to cut the production cycle to 15 days from 40 earlier.
- ◆ **Mahindra and Mahindra's** 70% of the total body shop works are undertaken by robots, from the earlier manual-only workflow.
- ◆ **Maruti Suzuki** has over 2,000 robots working at its weld shop in the Manesar facility.
- ◆ **Ashok Leyland** automated its cab panels pressing plant in Hosur, Tamil Nadu. It upgraded the existing dies and presses with automated solutions with output increasing two-fold.
- ◆ **L&T**, for its construction business, has connected more than 9,600 pieces of equipment at over 400 project sites by installing sensors and gateways which give real time data and visibility to optimize the asset mobilization and utilization.

What are global companies doing?

Siemens is combining its Digital Factory and Process Industries and Drives businesses, and embedding its MindSphere cloud-based, open operating system for IoT in its strategy and solutions portfolio. Globally, Siemens has also collaborated with Bentley emphasizing a full Digital Twin of entire value chains for the engineering and construction world.

ABB released its integrated industrial Internet platform, ABB Ability in 2016, with Cloud infrastructure based on ABB's expertise in technologies, industries and digital. ABB acquired Austrian automation supplier B&R in 2017 and GE Industrial Solutions in 2018 to strengthen its machine and factory automation portfolio.

Honeywell, leading the digital transformation of the process industries is shifting competitive advantage away from physical machinery and toward information, through Connected Plant program – connected legacy hardware to software.

Rockwell Automation and PTC formed a partnership in which Rockwell Automation is investing USD 1bn in PTC. They will align smart factory technologies and combine

Annuity models are gradually accelerating the adoption of Automation despite cheap labour cost in India

PTC's ThingWorx IoT, Kepware industrial connectivity and Vuforia augmented reality (AR) platforms with Rockwell Automation's FactoryTalk MES, FactoryTalk Analytics and Industrial Automation platforms.

Schneider Electric – with the reverse takeover of AVEVA, Schneider continues its focus on digitalization solutions through its EcoStruxure platform. It is a portfolio of energy, automation and software in packaged solutions. It lets users leverage opportunities created by digitalization, and provides an integrated framework to solve complex industrial operations, further optimize assets and adapt to changing business conditions.

GE Digital built and uses Predix in its own operations, improving its ability to use GE as a test bed and demonstrate proof of outcomes. It has a strong base of Power plants connected globally.

Emerson, US, has been strengthening its portfolio with targeted acquisitions since 2017 in Oil & Gas, PLCs and Industrial PCs. Emerson's Plantweb Digital Ecosystem, delivered via Microsoft Azure, plays to its premier position at the sensor/actuator level of the IIoT stack.

Yokogawa's vigorous acquisition activities included industrial software technology and consulting expertise in the forms of Industrial Evolution (cloud-based), KBC Advanced Technologies (oil and gas), and Sotetica Visual MESA (energy management and optimization solutions).

About B&R Industrial Automation

B&R formed in 1979, headquartered in Austria, started India operations in 1996, and has operations in 74 countries. ABB Group acquired it in 2017.

B&R is a vendor, not a system integrator, and manufactures products. It has installed nearly 5 million PLCs, drives and industrial PCs worldwide.

As part of **ABB's Robotics & Discrete Automation business**, B&R will be introducing **ABB robots** as an integral feature of its automation landscape. Machine builders will be able to buy robots and their machine control system from a single source.

Integration of ABB robots into the B&R automation system eliminates the need for dedicated robotics controllers, separate control cabinets and programming specialists. The new solution reduces complexity and optimizes synchronization.

Exhibit 6: B&R automation offerings – machine and factory automation



Source: Company

Exhibit 7: B&R automation offerings – IoT solutions, B&R has an open source IoT platform



Source: Company

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BUY	More than 15%
ADD	Between 5% to 15%
REDUCE	Between 5% to -10 %
SELL	More than -10%

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