

GO GLOBAL BY TECHNOLOGY

HOW TO LEVERAGE INDUSTRY 4.0 INTERNATIONALLY

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The Fourth Industrial Revolution - integrating information and operations technology - has been a reality for some time now. It creates vast opportunities not only for increased efficiency and productivity, but also for new value chains, services and business models. Any manufacturing company looking to succeed in the era of technological disruption must emphasise Industry 4.0 in their international growth strategy.

DATA IS THE NEW GOLD

Industry 4.0, or the Fourth Industrial Revolution, refers to the global trend of automation and data exchange in manufacturing technologies. From an industrial environment perspective, this translates into smarter and more automated manufacturing. It is about how machines, materials and products are connected and communicate with each other. It comprises the integration of computation, networking, and physical process, often referred to as “Cyber-physical system”. What differentiates Industry 4.0 from the previous industrial revolutions is its vast scope and systems impact, as well as its unprecedented velocity.

Business Sweden has analysed the implications of Industry 4.0 on Swedish manufacturing companies and their internationalisation opportunities. How can organisations and businesses remain competitive as technological progress accelerates? How can Swedish companies leverage the advantages of Industry 4.0 to drive international growth? The analysis is based on interviews with leading Swedish manufacturing companies in combination with

our extensive experience from helping companies worldwide to reach their full international potential.

Industry 4.0 involves components ranging from a variety of new processes (e.g. data-driven production and artificial intelligence), new materials (e.g. nano-based), and digital technologies (e.g. Internet of Things (IoT), advanced robotics, and 3D printing). The machine-to-machine interaction is booming with new, rapidly emerging technologies for connecting sensors and computerised automation. Today, there are more than 16 billion connected devices¹, and forecasts predict there will be 26 billion connected devices by 2020². The number of machine-to-machine connections is expected to grow from 4.9 million in 2015 to 12.2 billion in 2020³. The Fourth Industrial Revolution is here, and it is changing manufacturing as we know it.

“THE MACHINE-TO-MACHINE CONNECTIONS WILL MORE THAN DOUBLE IN 2015- 2020”

¹ Connected device is a physical object that has an IP stack, enabling two-way communication over a network interface.

² Ericsson Mobility Report 3, 2016

³ Cisco's annual Visual Networking Index 2016

Along with the industrial digitalisation emerge new opportunities for both production and business models. This allows for a reorganisation of the value chain, where control is distributed along the chain. Use of real-time data enables a more streamlined production process within and across organisations, and permits for a higher degree of customer-orientation. For example, analytical tools that sort large amounts of data, information and knowledge can be converted into optimised production, new customer value and alternative revenue streams. Big data is a key driver of the development and has been referred to as “the new gold”.

Industry 4.0 is not only about new technologies and processes in the manufacturing itself, but it also covers organisational changes. Products, production and service are becoming increasingly integrated in the refining process, driving closer collaboration across business units. Collaboration between competitive companies are also growing, referred to as “coopetition”.

“THE INDUSTRIAL SECTOR INCLUDING SERVICES ACCOUNT FOR 77% OF SWEDISH EXPORTS AND 20% OF GDP”

For continuous Swedish prosperity, it is critical that Swedish manufacturing companies remain competitive. Going forward, a central part of this will be Industry 4.0. Some companies are already implementing the technologies and tools of Industry 4.0 into their core business, while others lag behind.

There are government driven initiatives to foster industry digitalisation and improve the national competitiveness. The Smart Industry Strategy* was launched in early 2016 and aims to strengthen industrial companies’ capacity for change and competitiveness. It comprises four focus areas; Industry 4.0, Sustainable Production, Industrial Skills Boost and Test Bed Sweden ([read more here¹](#)).

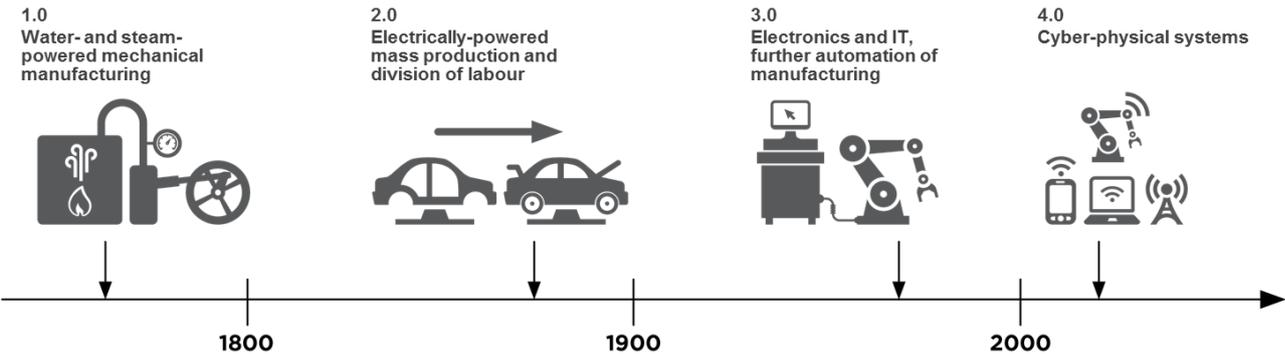
A COMPETITIVE INDUSTRY IS KEY TO SWEDISH PROSPERITY

The Swedish industrial sector plays a significant role in the Swedish economy. The sector, including the industrial services sector, stands for 20% of GDP. The industrial sector including the industrial services sector account for 77% of the total value of Swedish exports, which is equivalent to almost half of our total GDP.

USE TECHNOLOGICAL PROGRESS TO GROW INTERNATIONALLY

To remain competitive in the international arena, Swedish manufacturing companies need not only to understand the new technologies and tools that emerges with Industry 4.0. They also need to sort and prioritise them. This means understanding what brings the most value to their organisation, and what drives the most

FROM INDUSTRY 1.0 TO 4.0



¹ <http://www.regeringen.se/informationsmaterial/2016/01/smart-industri---en-ny-industrialiseringsstrategi-for-sverige/>

sales.

The industrial digitalisation is compelling companies to re-examine the way they do business. It represents an endless variety of opportunities that must be considered and acted upon. Creative companies are exploring and pushing the limits for connectivity, big data, artificial intelligence, and automation. They take industrial production, marketing, sales, after sales and innovation to a whole new level, creating more agile and efficient processes than ever before. To stay successful going forward, continuous adaptation to new technologies and tools will be key.

INDUSTRY 4.0 APPLIED

XMReality is a Swedish forefront runner when it comes to applying Industry 4.0. The company offers remote guidance solutions to industrial service, after market service and field service providers. Clients typically struggle with declining efficiency stemming from higher performance expectations on field service technicians, along with increased service costs. XMReality's remote guidance solution allows for a local service technician to perform the service out on the field, while being guided by a service expert who is not physically present. Remote guidance could be performed by mobile phones, but because of the complexity of many industrial services, the communication tool includes video, smart glasses and augmented reality. The result is decreased costs, improved quality and enhanced resource utility.

Local Motors is an American motor vehicle manufacturing company focusing on low-volume production of open-source motor vehicle designs through localised 3D printing. They currently operate three factories in the U.S. and one in Berlin, but the long-term plan is to establish hundreds of micro-factories globally. Those micro-factories will produce and assemble vehicle designs according to local needs. Olli, a self-driving, electric-powered, and 3D printed minibus took its first drive last year in

Washington D.C. It is soon to take to the streets of Miami and Las Vegas. Olli is geared with the IBM Watson IoT platform for cognitive learning, and communicates with passengers to find out their destination and subsequently shuttles them there. Local Motors CEO and co-founder John Rogers said that they aim to print the vehicle in about 10 hours and assemble it in another hour. By reducing space, energy and materials requirements for manufacturing, Local Motors's operating model can support international growth with lower upfront investments.

Some large Swedish companies are also part of driving Industry 4.0 forward, for example Boliden in terms of digitalising mines. Boliden are currently conducting a globally unique initiative to develop automation in mines with IoT and 5G technology, together with partners such as ABB, Atlas Copco, Ericsson and Volvo. To further improve safety and efficiency in the mines self-driving vehicles are being developed, as well as other equipment to be remotely controlled. The aim is to replace all high-risk work in the mines with robotised and digitalised solutions. Substantial efficiency and safety gains are expected.

LEVERAGE INDUSTRY 4.0 IN YOUR INTERNATIONALISATION

In order to remain competitive and grow revenue in the international arena, Swedish companies need to utilise new technology to create smarter business models. Based on interviews with leading manufacturing companies, Swedish companies should focus on three key factors.

Factor 1: Rethink your offering

The increased connectivity and availability of data create an infinite number of opportunities to develop products and services. Data monitoring programs and platforms that intelligently gather, compare and analyse data can be used to improve services and optimise efficiency. Existing products can be made smarter, the data

“THE BIGGEST THREAT WITH THE TREND OF SMART MANUFACTURING IS THAT WE MOVE TOO SLOWLY. WE NEED TO HAVE THE RIGHT AND CONSISTENT STRATEGY, THE RIGHT COMPETENCE AS WELL AS AGILITY AND SPEED”

James McAllister

President General Industry, Atlas Copco Industrial Technique

itself can be offered as a service, and new products and services can be developed. Draw on artificial intelligence, big data, automation and IoT to rethink your offering.

For example, go from traditional preventive maintenance to smart, predictive maintenance with condition monitoring that automatically triggers service and maintenance work when required. Map the bottle-necks in data flow that hampers opportunities for value creation, and explore how new technology could dissolve them. Understand what new insights can be made from existing or new data, and how the available information can be combined with high-competence, value added services. Add smart service solutions to current products, or improve after-sales service. Leverage smart manufacturing to reach a new level of customised and individualised solutions, and be prepared to develop your business proposition along with new technical tools and opportunities, as well as with changing customer demands.

Factor 2: Connect with your suppliers and customers

Data gathered from smart, connected products and services can be used to create new and improved supplier and customer interfaces with a global reach. Leverage real-time data and connected sensors to communicate and interact along the value chain in a more frequent, transparent and effective manner. Explore new approaches for sourcing, pricing, selling, aftersales experience and distribution.

For example, consider introducing a new, global customer-integrated CRM system that can be shared with distributors. Or explore intelligent pricing methods like e.g. Uber. Uber uses data

from customers and drivers to drive an calculate surge pricing, i.e. a dynamic pricing model that adjust prices upward when the demand is high, and vice versa. Atlas Copco is another example where the product itself has been replaced by a rental capacity service. For their air compressors, they apply a pricing model where customers are billed only for the compressed air that is used. The machines monitors the flow of compressed air and adjust to the specific customer's need.

Industry 4.0 opens up a window of new interaction opportunities on a global level. Evaluate and challenge your existing interaction platforms. Could new technology enable you to communicate directly with customers, and to let go of an agent or distributor layer? Could this create a more transparent, individualised and rapid interaction model that brings you closer to your suppliers and customers? Could it even enable dynamic pricing with direct impact on the top line?

Factor 3: Leverage your ecosystem

Build on big data, real-time analysis, connectivity and automation to optimise operations not only within your organisation and along your value chain, but also horizontally across your full business network.

Form new strategic partnerships that mix competences and create new value and synergies. Go beyond traditional sectors and clusters and cooperate across branches. Embrace your competitors and make them "coopetitors". Become part of a broader ecosystem where interconnection and interaction is part of daily operations. Think of it as "collaborative collision", where parties that normally would not interact create new value and



synergies.

Real-time analysis and unification of data makes borders between companies and industry segments dissolve, and it allows for horizontal integration. If properly prepared, companies can create value within their business networks in a variety of ways, enhancing collaboration and competition. For example, a deeper understanding of unused production or distribution capacity could allow for excess capacity to be shared with partner companies that temporarily need more capacity.

Connectivity, in both operating technology and business relationships, will be key to a fully utilised ecosystem.

KEY QUESTIONS FOR EXECUTIVES

Industry 4.0 has been a reality for some time now. Disrupting technology and its connectivity is changing traditional business models as we used to know them. Instead, it is proposing a new, smarter industry where everyone and everything constantly interacts with each other and the surrounding world. Traditional business models will be challenged, and new strategies will be required to stay competitive, not least in the international arena. Key questions facing the executives for international business are:

- ▶ Are my products creative and viable enough to beat the Industry 4.0 competition?
- ▶ What data do I already have and how to make the most of it? What additional data could I use to further increase customer value?
- ▶ How can I horizontally integrate with competitors to build mutual synergies?

- ▶ What are the blind spots of my ecosystem and how can I actualise untapped potential?

- ▶ What is the cost of not using new technology in my internationalisation?

Industry 4.0 has altered traditional manufacturing, and will continue to disrupt the industry going forward. To stay competitive, continuous adaptation to new technologies will be fundamental. So will the capacity to leverage the new opportunities to your advantage.

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