DIGITAL LEADERSHIP

An interview with
Dr. Per-Vegard Nerseth
Group Vice-President and Head of Robotics at ABB

Rise of the Automatons: ABB and the Evolution of Robotics
Capgemini Consulting: How has the robotics industry performed in the last few years?

Dr. Per-Vegard Nerseth: For many years prior to the global financial crisis, the robotics market was fairly small at roughly 100,000 units. The market was driven primarily by the automotive industry and growth was relatively flat. The industry was badly affected during the crisis. Sales fell by nearly 30-40% and the market declined to about 67,000 units. Since the crisis, however, the robotics market has grown strongly. During 2010 and 2011, the market recovered to above pre-crisis levels. According to the International Federation of Robotics (IFR), the global robotics market stood at close to 160,000 units in 2012. I expect the market to continue to grow strongly going forward.

Capgemini Consulting: What is driving this dramatic growth in the robotics market?

Dr. Per-Vegard Nerseth: Companies need to increase productivity and efficiency, both in mature as well as developing markets. Western countries are looking at automation as a way to compete more effectively against low-cost manufacturing countries as well. There are two reasons for this – rising labor costs and high labor turnover rates. Labor costs in China are rising at 10-15% a year. As a result, the traditional cost advantage that China enjoyed compared to the western world is shrinking. And this is true for other emerging markets as well. These countries are looking at robotics and automation to maintain their competitiveness. China, in fact, is the most rapidly growing market for robots in the world. Between 2005 and 2012, sales of industrial robots in China have grown by about 25% per year on average.

The cost of replacing employees has become one of the key drivers of automation.

Western countries are looking at automation as a way to compete more effectively against low-cost manufacturing countries.

China is the most rapidly growing market for robots in the world.
The Global State of Robot Penetration

The global average robot density* in 2012 = 58

Japan, Germany, Korea and the US – have the highest robot densities.*

Korea 396
Japan 332
Germany 273

The automotive industry accounts for the highest share of automation

Japan has the highest robot density for the automotive sector:

1,562 units per 10,000 employees

Among non-automotive industries, the 2 prominent growth markets for robotics are:

Food and beverage and Electronics industries

* Robot Density: measured as the number of robots per 10,000 employees
The Benefits and Challenges of Automation

Capgemini Consulting: What are some of the key benefits secured by companies that have deployed robots?

Dr. Per-Vegard Nerseth: The cost and efficiency benefits of using robots can indeed be quite significant. This is more so when companies are running high volume productions. A single robot, for instance, can replace several workers on a production line, which brings down operating costs. At the same time, a robot can work faster and with greater efficiency. Franklin Bronze & Alloy Inc. is a U.S-based producer of ceramic shells that has used robots to dramatically reduce costs and increase efficiency. The use of robots has helped the company cut man-hours from 56 hours a day to 32, while increasing daily production from 140 to 200 parts.

Another benefit of investing in robots is increased worker safety and improved working conditions. Robots can perform tasks involving hot, dusty or hazardous conditions that would be difficult and dangerous for humans.

“We need to find ways to make robots easier to use so that they do not require a very highly skilled workforce to operate.”

Capgemini Consulting: What are some of the challenges in increasing the penetration of robots in the EU or US?

Dr. Per-Vegard Nerseth: There are two challenges that I believe the industry will need to address. The first challenge is to find ways to make robots easier to use. The automotive industry has had a long history of using robots and as a result, it has built a skilled workforce that can program and manage robots. But for industries that are new to automation, programming robots can be a challenge. We need to find ways to make robots easier to use so that they do not require a very highly skilled workforce to operate. Ease of use is going to be crucial to drive penetration.

The other issue that will need to be addressed is that of safety. The industry is looking at ways to make robots work more closely with human beings, so that they can actually collaborate.

“A manual paint job for a car usually utilizes 20-30% more paint compared to robotized painting.”

Robots, Digital Skills and Jobs

Capgemini Consulting: Does the increasing use of automation pose a serious skills issue for companies? Do you see a skills gap becoming a hurdle for manufacturers?

Dr. Per-Vegard Nerseth: I do see this as a challenge for non-automotive industries, like the food and beverage and electronics industries. Unlike the automotive industry, these industries do not have in-house expertise in programming and handling robots. I think the solution would be for the robotics industry to develop robots that are easier to use, as I mentioned earlier, because I think in the future we will increasingly serve new customer segments with different skill levels and needs compared to the automotive industry.
**Capgemini Consulting:** Do you think that robots can help the US and Europe bring manufacturing production back onshore?

**Dr. Per-Vegard Nerseth:** Yes, I do think that is a possibility. A few years back the focus was on shifting manufacturing to locations that offered the lowest production costs. But today, we see growing concern about landed costs and the impact of import duties. We also see a growing need for delivering products at the same time across geographies. These factors are driving a shift in mindset among companies toward moving production back onshore. Some leading electronics companies have openly announced that they have already “reshored” some manufacturing work. And we are seeing this trend not only in customized production but also in mass production.

As a result, they have had to employ more people in new downstream functions like sales and distribution. The IFR estimates that 300,000 to 500,000 downstream jobs have been created due to the use of robots during 2008-2011.

“300,000 to 500,000 jobs have been created due to the use of robots.”

**Looking Ahead**

**Capgemini Consulting:** What are your thoughts on the impact of automation on employment? Do you agree with arguments that say that increasing automation has led to a jobless growth?

**Dr. Per-Vegard Nerseth:** No, I do not agree. In fact, the International Federation of Robotics (IFR) published a report last year that shows that countries that invested heavily in automation between 2000 and 2011 actually saw a drop in unemployment. The number of jobs that have been created is far greater than the numbers lost due to automation in manufacturing. This is because companies that have invested in automation are producing more and expanding and entering new markets. I do think that the use of such collaborative robots will grow significantly in the future. But safety will be vital for collaborative robot operation since the robots will need to work in close contact with humans.

**Capgemini Consulting:** What are your views on the evolution of connected robots?

**Dr. Per-Vegard Nerseth:** I believe the future of robotics is closely tied to two aspects of connectivity that the entire industry is focusing on.

The first relates to the application of connectivity to remotely monitor robots. For instance, the ABB Remote Service solution is being used to monitor robots remotely in real time, using biosensors. The solution helps to proactively identify potential issues so that they do not disrupt normal manufacturing operations. For instance, it helps us detect if a robot is in need of service or an upgrade. The customer can then choose to have the issue resolved over the phone or by having a technician visit the production plant. This helps us better support our customers in running trouble-free manufacturing with no loss of production time.

“The market for consumer robots has not taken off in the way it was expected.”
The other aspect of connectivity relates to telerobotics that opens up several new applications for robots. Remotely controlled or telecontrolled robots can be used to perform complex or dangerous functions that would ordinarily be performed by humans. For instance, working on an oil platform requires a lot of training and also involves safety hazards. Remotely operated robots equipped with vision technology can be made to perform actions such as the handling of components which would otherwise require a human worker to be present on the platform. Telecontrolled robots could also be used to assist surgeons in performing complex surgical procedures. Other examples of telecontrolled robots include unmanned helicopters and submarines. Unmanned helicopters are being used for aerial filming while unmanned submarines are being used to close oil and gas leakages. There are several such ways in which connectivity can extend the application of robots.

“**We will increasingly see robots that can program themselves.**

*Capgemini Consulting:* What do you see as the future of consumer or service robots? Is this an area where we might see a lot of traction in the next 5 to 10 years?

*Dr. Per-Vegard Nerseth:* The market for consumer or service robots has not taken off in the way it was expected to. So far, we have seen only limited applications for consumer robots, mainly in the form of lawn cutters and vacuum cleaners. The main applications for service robots are in medicine and surgery. We are also seeing the application of robots in pharmaceutical companies where robots are used to move or blend samples in labs. But this is still a small market. I am not too optimistic about the consumer or service robots market taking off in the short term.

*Capgemini Consulting:* In your view, what does the robot of the future look like?

*Dr. Per-Vegard Nerseth:* I think we will increasingly see robots that can program themselves. At present, we have robots that need to be trained and programmed. We will see sensor technologies, such as vision and force-sensing, playing a bigger role in helping robots do this.

We will also see robots evolve to meet the needs of non-automotive industries. Robots today are built to be highly accurate. But not all industries and applications require high levels of accuracy. For instance, a bakery may not require 0.02 mm accuracy every time a piece of bread needs to be moved into an oven.

Today’s robots are also relatively heavy. But as new applications of robots emerge in new industry segments, we will need robots made of lighter materials.

“**We will see robots evolve to meet the needs of non-automotive industries.**
Dr. Per-Vegard Nerseth
Group Vice-President and Head of Robotics at ABB

ABB is a leading manufacturer of industrial robots and robot systems, operating in 53 countries. Key markets include automotive, plastics, metal fabrication, consumer electronics as well as food and beverage industries. ABB has shipped more than 200,000 robots worldwide. Capgemini Consulting spoke to Dr. Per-Vegard Nerseth, Group Vice-President and Head of Robotics at ABB to understand more about robotics, their evolution and impact on operations.

Contacts  Didier Bonnet, didier.bonnet@capgemini.com  Jerome Buvat, jerome.buvat@capgemini.com

About Capgemini
With around 120,000 people in 40 countries, Capgemini is one of the world’s foremost providers of consulting, technology and outsourcing services. The Group reported 2011 global revenues of EUR 9.7 billion. Together with its clients, Capgemini creates and delivers business and technology solutions that fit their needs and drive the results they want. A deeply multicultural organization, Capgemini has developed its own way of working, the Collaborative Business Experience™, and draws on Rightshore®, its worldwide delivery model.

Learn more about us at www.capgemini.com.

Capgemini Consulting is the strategy and transformation consulting brand of Capgemini Group. The information contained in this document is proprietary. © 2013 Capgemini. All rights reserved.