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FOR LEADERS OF THE NEXT GENERATION

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AI-enhanced Robotics, Disruptive Innovation and Industrial Change

The industrial and digital worlds are transforming at breath-taking speed. Disruptive innovations have become a common and often challenging feature in virtually all industry and service sectors. As a technology leader in the field of industrial transformation, digital solutions and automation, ABB is building the most advanced robot factory in the world. Located in Shanghai, the 67´000 sqm factory will be a fully digitized workplace in which robots will produce robots. In this exclusive stars insights interview, Dr. ***Sami ATIYA****, ABB's President of Robotics and Discrete Automation and a speaker at the stars Switzerland symposium 2019, highlights the prospects and challenges of the AI-enhanced robotics industry.*

Christian VON LUEBKE: How does digital disruption impact ABB and how do you anticipate and approach these challenges?
Sami ATIYA: My entire career and approach is shaped by the fundamental belief that disruption is not a challenge but provides enormous opportunity. If we see it as a positive force driving creativity and changing the way we think, then disruption represents technological progress that's driven by customers, with new technologies being developed due to customer demand and changing requirements. In manufacturing, the shortage of skilled labour and the trend of mass customization – which involves making much smaller lots products in greater variety – are fundamental drivers for change, with manufacturers needing to be increasingly flexible in their production processes. At ABB, we are developing technologies designed to help our clients increase their flexibility, including highly developed collaborative robots which work alongside people. ABB is a disruptor itself. We are contributing to shaping technological transformation in a broad range of industries. We are in a permanent exchange with our customers to learn about their requirements and market developments. We closely collaborate with them to co-develop automation solutions that are tailored to their individual needs.

What are key developments in ABB's Robotics and Discrete Automation division that you were particularly excited about in the past years? And what are salient opportunities and challenges on the road ahead?
In recent years, we have launched several highly innovative solutions, which are making a profound difference for our customers. Last fall, we have presented the world's first fully integrated machine centric robotics solution to be offered by one company. This integrated offering represents a significant step forward for our customers, with robots and machine systems able to communicate at a microsecond level, something unimaginable only a few years ago. This combined solution helps our customers increase their flexibility and performance and is much easier to install and use. The launches of our YuMi family of robots was also hugely significant. YuMi and the smaller Single Arm YuMi are collaborative robots, designed to work alongside people on the factory floor and in a host of other business segments. YuMi is a key element of the Factory of the Future, enabling customers to thrive in the age of mass customization and to increase their efficiency and reliability. Another milestone is the ABB Ability platform, which bundles the entire digital competence of the ABB Group in one offer across all industries. This offering ranges from digitally networked devices to cloud-based digital services. Robots and machines are interconnected via the platform and can be used and monitored flexibly, meaning potential malfunctions are detected at an early stage and production can be modified and optimized without interrupting any ongoing production processes. With ABB Ability, we have brought digitalization into the market long before our competitors. And we are continuing to break further ground. Looking ahead, we are confident that machine learning and artificial intelligence will create a magnitude of new and exciting opportunities. We see a huge opportunity to further develop human-robot collaboration and to make robots more autonomous, within set parameters and we are investing our time and efforts accordingly.

In the field of robotics and automation, China has emerged as one of ABB's key markets. Could you please say a few words about ABB's corporate strategy in China, in particular about the ongoing efforts to expand production and research and development (R&D) sites and to establish a fully automated logistics/production site.
As the world's second-largest economy, China is a key market for ABB, especially in robotics. The country has been the world's largest robotics market for over five years, with promising growth prospects. By 2021, China will be responsible for almost half of the world's industrial robot revenues. ABB is the largest robot manufacturer in the Chinese market. In September, we started building a new robot factory in Shanghai – the most advanced robot factory in the world. We are investing 150 million dollars in this project. Our factory in Shanghai will be a fully digitized workplace in which robots will produce robots and a place where we co-develop factory solutions alongside our customers. Our factory, to be opened in 2021, will be the result of ABB's dedication to combining different state-of-the-art manufacturing processes, including self-learning machines and digital and collaborative solutions. Our aim is to continue the success story we have been writing in the Chinese market for more than three decades. By building our new plant in Shanghai, we are close to our Asian customers. This enables us to develop individual automation solutions alongside our customers. We are also the only multinational to have a complete value chain in China – from R&D, manufacturing, sales, engineering, system integration all the way through to service.

Looking at your longstanding experience at Siemens and ABB, what would you consider essential ingredients of leadership?
While concepts of successful leadership have evolved over time, I am convinced that there are core elements of good leadership that have always applied. Three aspects are particularly important to me:

- **First**, a leader should place the customer at the centre of her/his work. It is key to try to put yourself in his position. The questions are: What does the customer need? What are the challenges? And how can we best help and meet those needs? Successful customer-centric companies excite customers and outperform their expectations. A manager must demand this customer orientation not only from her or himself, but also from employees.
- **Second**, as a leader, you should have a clear vision. This applies especially to uncertain, confusing phases in which employees are looking for direction. A strong vision alone is not enough – there is also the need to communicate it credibly, efficiently and constantly.
- **Third**, leadership also means devolving responsibility to employees. In this way, they are motivated to independently drive projects forward, to break new ground and to innovate. When employees decide to leave their comfort zone, this can engender personal progress as well as fresh ideas and new approaches that benefit the company.

What will determine success in the field of robotics and automation in the years to come? What are the critical factors that will allow ABB to steer the robotics division into the future?
Currently, very different developments are in the process of coming together. In almost all industries we see a trend towards producing different products in significantly smaller batch sizes. At the same time, product life cycles are shortening. Consumer and customer expectations are becoming more demanding: manufacturers have to bring their products to market quickly – that realistically means within a few days, not weeks. Many countries are also struggling with skills shortages, especially those with ageing populations. In some countries, up to 20% of the population has been retired for up to ten years. In China, according to China's State Council on Aging, about a quarter of the country's population will be 60 or older by 2030, which is a little more than just a decade away. Macroeconomic uncertainties, such as Brexit, are forcing companies to adjust their production capacity amid the uncertainty. These developments will continue in the near future and may even intensify. Today and in the future, companies are facing the question of how to meet these challenges. We believe the answer lies in intelligent automation solutions. Success in this field is crucial, and three levers play a major role in delivering this: collaboration, i.e. collaborative robotics, simplification, i.e. easy-to-handle solutions, and digitization, i.e. intelligent robots and machines that are digitally networked with each other. In the long term, we will only be successful if society readily accepts these technologies. We all know that there are also concerns about increasing automation. It is our aspiration to understand these concerns, communicate the benefits of the technological breakthroughs that we are seeing and to create the right framework for these to flourish. This is a multi-stakeholder effort and one business leaders, politicians and regulators need to work on together.

Considering the imminent changes in industrial automation, how would you characterize the "future of work"? What are the key economic, political and social implications? What does this imply for ABB and for policymakers in Europe and beyond?
Young people entering the workforce who have grown up in the digital age are looking for cognitive rather than physical tasks. People do not want to work in dangerous environments, e.g. handling toxic chemicals or transporting heavy objects. Robots can be part of the solution here: they are ideally suited to dirty, dangerous and dull jobs. This enables humans to work in safer, cleaner environments. This means that certain jobs in manufacturing are disappearing while new jobs are being created requiring new skills, such as handling robots and analysing data. There is a shift to more rewarding and higher paid jobs that require a different skill set with creativity and fluency in digital becoming more important. The key focus in this context must be to build bridges by enabling employees to embrace new activities and successfully perform in new positions. Lifelong learning will become the new normal. At ABB we support our employees and our customers in training. At the same time, there is a need for comprehensive solutions and approaches dealing with the transformation of industries and jobs. Mass reskilling employees can only be realized with the cooperation of business, politics, academia and society.

*Dr. **Sami ATIYA** is ABB's President of Robotics and Discrete Automation. He joined ABB in 2016 and prior was with Siemens for 18 years in the US and Europe where he was CEO of the Computer Tomography unit from 2008-2011 before serving as CEO of the Mobility and Logistics division, amongst others. Atiya has an MBA from the Massachusetts Institute of Technology (MIT) Cambridge, US, a PhD in Electrical Engineering, specializing in robots, sensors and artificial intelligence, University of Wuppertal/Karlsruhe Institute of Technology, and a Masters degree in Electrical Engineering and Automation, Karlsruhe Institute of Technology, Germany.*

This exclusive stars interview was conducted by Prof. Dr. Christian VON LUEBKE, International Management Asia, HTWG Konstanz, on the sidelines of the stars Switzerland symposium 2019. The views expressed here are solely those of the interviewee and they do not necessarily represent or reflect the views of the stars Foundation.

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