From the Smart Industry Readiness Index to the implementation of a safe, secure and reliable Digital Twin in manufacturing using AI. Potential Impact and Considerations

Abstract:
Today's digital revolution, or more widely known as Industry 4.0, is the next watershed in the development of the manufacturing sector and will transform industry's cost structure. The concept of Industry 4.0 should be seen as the next mile-stone in the industry's 100 year technological development. The advent of technologies like IoT and AI heralds a quantum leap in the way we can continue to develop and generate new business models. Even as we climb out of a four-year slump, never before has the industry had the opportunity to revolutionize its affairs in quite such a profound manner.

Key elements of this transformation are extensive data-sharing and connectivity through digital cloud – based solutions. These so – called digital–twins can replicate real – life scenarios with virtual 3D simulations of operations. Improved data analytics for condition–based maintenance (CBMS) of equipment and artificial intelligence (AI) involving machine learning to better understand and interpret data for more effective decision–making, will all contribute to this "Brave New World."
Such digital initiatives are aimed at eliminating reams of paper, making better use of time by stream-lining tasks, thereby boosting operational efficiency and cutting costs.
Lear how the Smart Industry Readiness Index can support your industry in this transformation and prepare a baseline for the implementation of a Smart and Reliable Digital Twin.

Dr Antonio Feraco

Dr Feraco is Managing Consultant Industrie 4.0 and Vice President for TÜV SÜD Asia Pacific Pte Ltd. His activities focus on supporting the manufacturing sector with a focus on the Process Industry (Oil&Gas, Petrochemical, etc.), in adopting digital technologies within the industry 4.0 space to enable end to end integration (OT and IT).

During the last two years he led the development of the I4.0 process industry practice and successfully run several projects focused on Business Processes Optimization, HSE and Workforce Efficiency.

Before joining his actual position, he was Head of Business Development and Technology Transfer for an International Applied R&D Institution, Fraunhofer Singapore, external advisor for KPMG Italy and Adjunct

Professor of Innovation Process Management at the University of Vitez since 2013. After completing his PhD in Artificial Intelligence, he managed various international projects related to IT for Energy Efficiency, Embedded Systems in Robotics and Digital Media. He participated in the development of an ICT Policy Support Program Project of the EC for the Digital Single Market. Apart from his business and management activities, he also delivers for industry and academia in both Technical topics as Predictive Maintenance for Process Industry, and non-Technical like Management of Innovation Processes and Technology Transfer Strategies. He has also been appointed by the European Commission as expert evaluator for the Horizon 2020 R&D program.

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Sensors and AI – How can we trust them?

Abstract:
Sensors are the most critical source of data for the smart factory value chain. Each derived insight, may it be for performance analysis, predictive maintenance, or optimization, inherently depends on the quality of collected data. If those algorithms are fed with wrong or invalid data, the outcome should not be used for mission critical decisions. The major challenge is that sensors are known to be susceptible to a wide variety of errors, e.g. due to de-calibration, misconfiguration, or simply misuse.

Another critical component in the processing chain are AI algorithms. AI has proven extremely valuable in crunching large amount of machine data and generating valuable insights. However, there also have been spectacular failures. Their black box nature currently does not allow to accurately quantify the risks associated with AI components.
This talk with address the challenge of establishing trust in the smart factory value chain. It provides an analysis of the core issues and outlines best practices and technical solutions to establish correctness of sensor values as well as introduces an auditable process to establish quality in AI.

Dr Martin Saerbeck

Dr. Saerbeck leads strategic research and development initiatives of TÜV SÜD Asia Pacific Digital Service. In his role as CTO, Dr. Saerbeck oversees the technology roadmap and key implementation projects of digital testing services, including novel continuous testing services, targeting the demands of a connected smart industry. He has a long track record in academia and industry in the domains of smart sensor networks, robotics, and AI.

After completing his PhD with Philips Research, Dr. Saerbeck started an interdisciplinary research team on human-machine interaction within the Institute of High Performance Computing, which developed novel technologies for several industries, including aerospace, manufacturing and retail.

He is an awardee of the prestigious A*STAR Independent Investigatorship given by Agency for Science, Technology and Research, Singapore. Dr. Saerbeck has a passion for applied research, promoting translation of academic results in formal verification and artificial intelligence to make today's connected smart systems safe, secure, and reliable.

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