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Smart Manufacturing

From Insight to Action: Elevating Employee Efficiency with Smart Detection and Targeted Data Delivery

H. Smith
Director of Technical Marketing
INFICON, Syracuse, United States of America



Abstract

In an era where it is increasingly easy to be overwhelmed by data, timely and efficient decision-making is critical to maintaining optimal factory operations. This talk will highlight the results of a joint collaboration between INFICON and ST Microelectronics. Together, we are developing an innovative application aimed at transforming how factories operate and respond to challenges.

In addition to providing real-time tracking of key performance indicators (KPIs), the application detects various types of operational anomalies. These anomalies are automatically assessed to determine their potential impact, and the application allows workflow management by assigning tasks to the appropriate factory workers, ensuring rapid response and resolution.

Our collaboration is focused on enhancing employee efficiency by delivering data that is specifically tailored to each worker's role, minimizing information overload, and providing actionable insights exactly when and where they are needed. By combining comprehensive operations tracking with smart detection and targeted data delivery, this solution enables semiconductor factories to operate with greater precision and reduced downtime.

Biography

Holland Smith is Director of Technical Marketing for INFICON IMS. Prior to this, Dr. Smith directed Smart Manufacturing systems architecture and installation projects at fabs across the world. Dr. Smith is a semiconductor data systems expert and a contributing developer of the INFICON FPS Digital Twin, which powers optimized Fab Scheduling among other industrial engineering-related applications. Dr. Smith has spoken widely across industry events (like Semicon West, FOA, SEMI Digital Twin Workshop, ASMC, etc.) on topics at the intersection of operations research, data science and computer science. Dr. Smith has a B.S, M.S. and Ph.D in Materials Science and Engineering from University of California, Berkeley, as well as a B.A. From Stanford University.

Thomas Gimmig has twenty-five years of experience in semiconductor manufacturing. After holding various positions in maintenance, engineering, and production management at ST Microelectronics, finishing as

Production Director of the Rousset plant in 2019, he moved to manufacturing central functions in 2022. Initially, he was in charge of Front-End Operational Excellence programs, developing the LEAN leaders community, and leading smart manufacturing transformation programs. He recently became the head of Industry 4.0 programs for ST Microelectronics manufacturing. Thomas Gimmig holds a master's degree in electronics.

References

150-200mm Fab Modernization

J. Schwartzmann
Senior Industrial Strategy Director
Soitec, Bernin, France

Abstract

The European semiconductor industry is at a pivotal moment, where modernization of 200mm fabs is crucial to sustaining exponential growth and maintaining global competitiveness. This presentation will explore how the latest innovations in digitalization, automation, and artificial intelligence (AI) can transform traditional fab operations, making them more productive, agile, and sustainable.

By integrating advanced technologies such as intelligent storage, automated material handling systems (AMHS) like Autonomous Mobile Robots (AMRs), and control room optimizations, fabs can achieve significant improvements in operational efficiency. Furthermore, advanced scheduling algorithms and AI-driven decision-making systems will empower fabs to manage production workflows more effectively, reduce downtime, and improve throughput.

This session will emphasize the importance of collaboration across the European semiconductor ecosystem to enhance fab attractiveness and productivity. By embracing digital transformation, Europe can position itself as a global leader in semiconductor manufacturing, supporting the industry's goals of sustainable, exponential growth.

Biography

Jerome SCHWARTZMANN is Senior Director in charge of Industrial Strategy reporting to Soitec's COO. He joined Soitec in 1998 and served different functions such as manager for industrial engineering, IT & strategic programs (new fab startup, new business diversification, post M&A integration, digitalization). From 2015 to 2017 after the termination of Soitec Solar Business, Jérôme joined Oberthur Technologies (IDEMIA) as Corporate Industrial Strategy Director to deploy Industry 4.0 practices in all fabs across the world (NORAM, LATAM, China, India, Middle East, Europe).

Back in Soitec in 2017 he has been leading the project to restart Soitec Singapore Fab and then took over the head of Information Technology position for Soitec.

Jerome is currently managing growth projects to deliver two new fabs, one in France for SmartSiC business (150/200mm) and one in Singapore to extend SOI 300mm capacity. He is also overseeing the Industry 4.0 roadmap of Soitec.

Jerome earned a master degree in Applied Mathematics and Computer Science from Grenoble University and a strategic negotiations degree from Harvard Business School,

References

New Approaches and Innovations to Improve Effective Use of Vacuum Assets in Cleanroom and SubFab

P. Johnson
Chief Architect
Edwards Vacuum, Business Transformation,
Semiconductor Service, Burgess Hill, United
Kingdom



Abstract

Edwards is developing new technology solutions and business models to minimize risk and uncertainty from maintenance events on process-critical vacuum assets. We are already successfully deploying our domain knowledge with on-prem AI solutions, enhancing tool uptime and efficiency, UD prevention and MTBS extension, and identification of wider vacuum infrastructure issues.

Building on this, we are developing a long-term easily scalable approach to data capture and analysis. This is driven by several innovations including cloud-based technologies addressing data volume, AI scope and accuracy, and a flexible document-based data store, to allow easy extension to additional data sets.

We have also developed a Wi-Fi solution to the first-mile equipment connection problem, allowing for economically viable data collection and analytics will that benefit many fabs.

Together with portable data analytics tools it will accelerate demonstration of AI solutions to process issues, and subsequent deployment at scale for all fabs. In the presentation we will discuss these current and new approaches and technologies, illustrated with relevant case studies.

Biography

Name : MR.Paul Johnson

Job Title: Chief Architect

Department: Business Transformation, Semiconductor Service

Education:

Bachelor of Engineering degree in Electrical & Electronic Engineering, University of Sunderland

Experience:

Paul joined Edwards Vacuum in 2023, he is focused on building new software tools to aid predictive maintenance within the vacuum & abatement space.

He started his career in Semiconductors in 1993 at Fujitsu Microelectronics, before moving to Applied Materials in 2000, working in a range of increasingly senior roles in Field Service.

He then joined Netflix in 2010 as Director of Engineering where he oversaw software development including various projects using Artificial Intelligence to predict failures.

He is now bringing this experience with Artificial Intelligence and big data systems to semiconductor manufacturing.

References

Roadmap for Semiconductor Exhaust Gas Treatment Equipment Towards Carbon Neutrality

A. Morihara
CTO of Kancken Techno
Kancken Techno Co., Ltd., Kyoto, Japan



Abstract

Various efforts are being made across industries to achieve carbon neutrality by 2050. In this context, at semiconductor manufacturing facilities, the abatement of greenhouse gases (GHGs) such as fluorinated gases emitted from manufacturing equipment represents a significant challenge. Additionally, achieving carbon neutrality across the entire supply chain for Scope 1, 2, and 3 is necessary. From Kancken Techno, a specialist manufacturer of abatement systems in Japan, we will present guidelines and recommendations and introduce the technology that addresses these directions.

Biography

Atsushi Morihara
Chief Technology Officer
Headquarters
Kancken Techno Co., Ltd.
Professor, Ph.D
Laboratory for Zero-Carbon Energy
Tokyo Institute of Technology

Education:

- Professor Tokyo Institute of Technology 2012-*
- Visiting Researcher Massachusetts Institute of Technology 1994-1996*
- Doctor Degree Tohoku University 1991-1994*
- Graduate TOKYO University 1977-1981*

Experience:

- CTO KANKEN Techno 2017-*
- CTO Global Environment Group Mitsubishi Corp 2008-2017*
- General Manager Power generation Group HITACHI Ltd. 1981-2007*

References

Fire Risks & Challenges in Semiconductor Manufacturing Environments

M. Donaghy
Business Development Manager
Honeywell, Business Development, Bracknell,
United Kingdom



Abstract

The semiconductor manufacturing process taking place inside the Wafer FAB presents extreme fire risks and challenges. On a FAB facility, there are two main building types - manufacturing facilities (FAB & assembly & test and packaging) and offices. The manufacturing building is typically a large-volume, high-ceiling structure with intricate and convoluted architecture that does not lend itself to traditional smoke detection, maintenance access for regulatory checks may also not be easy to achieve. Within these complex buildings, there are several functional rooms with their own individual fire risks.

Honeywell Building Automation serves the Semiconductor market globally through a variety of life safety solutions including :

Fire Systems & Sensors - Protect people and premises with leading integrated and networked solutions including voice alarm and emergency lighting

Advance Detection - Proactive early warning detection solutions to overcome specific challenges and keep mission critical semiconductor FAB's running

Software Solutions - Provide software that supports remote-assisted inspection and maintenance, alarm transmission, site monitoring, digital compliance

Projects Support - Work directly with end-users, consultants, and system integrators to support the standardization of fully compliant, EU integrated fire systems

Our comprehensive approach to safety can help support increased productivity, performance, and operational uptime.

Biography

Mark Donaghy is an experienced international business development leader currently based in the UK with 13 years' experience in the areas of automation & robotics, battery manufacturing and fire & life safety. Mark holds a construction Bachelors in construction management and a further degree in leadership & management from the Royal School of Military Engineering. Mark spent 22 years in the British Army (Royal Engineers) deploying on global operations throughout his career in UK Armed Forces. Mark began his second professional journey outside of the military in 2012 and has been a part of the Global automotive industry working for companies such as Porsche Consultancy, KUKA Systems Battery BU, ABB Robotics & Honeywell.

Mark is spearheading the business development in Europe for Battery Gigafactory's & Semiconductor manufacturing verticals, supporting clients with life safety solutions strategies & design (fire & gas advanced detection). Mark is also part of a global Building Automation team that provides expertise & guidance in early warning detection solutions to overcome specific challenges and keep mission critical European sites running.

References

Maximizing Equipment Productivity: Harnessing the Power of Alx

B. Eaton
Sr Director Marketing
Applied Materials, Applied Global Services, Santa
Clara, United States of America

Abstract

In the rapidly evolving semiconductor industry, maximizing equipment productivity is crucial for maintaining competitive advantage and optimizing operational efficiency. This presentation will explore the use of the Alx analytics platform to enhance productivity in production semiconductor fabs. Alx leverages predictive component failure models to minimize unscheduled downtime, ensuring continuous operation and efficiency. Additionally, Alx employs advanced AI/ML models to monitor hundreds of process chamber parameters across a fleet of tools simultaneously, effectively managing fleet process matching variability. In the near future, Alx is set to introduce self-diagnosing capabilities, which will significantly expedite repairs and maintenance, further enhancing operational efficiency.

Biography

Brad Eaton is the Senior Director of Strategic Marketing at Applied Global Services. In this role, Brad leads a team responsible for driving capabilities for the Al^x analytics platform utilized by Applied field engineers to enhance and support Applied Materials service contracts. With more than 24 years of extensive experience in the semiconductor industry, Brad has been instrumental in the development of both equipment and integrated circuits (ICs) for the automotive and consumer electronics sectors and holds more than 90 patents and technical publications.

References