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Analytics and Al Helping Transformation

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Exponential Increase In Demand for Data and Compute



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Explainable AI: Unlock the black box of data with Analytics and Al Compute Power &



Pervasive Connectivity







Scale

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3

Explainable Data and AI: Integrated data, traceability and algorithms for Analytics and AI



Solutions enabling fast Assembly, Sort to inline Fab correlation analysis

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Explainable Data: Unlock Analytics and AI with a data strategy



Challenge: Making all the data easily accessible for Analytics and Al Fast | Pre-Pivoted | Pre-Joined | Pre-Summarized

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Al-ready data





Intel Foundry Private Cloud: imCloud



imCloud enabling new Al/analytics projects



imCloud enabling virtual metrology

imCloud enabling autonomous equipment control

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In-line real time manufacturing usage Machine learning as a service



3-5x increase in deployment velocity | 15-30% variability reduction with conventional APC models

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Process Variability Reduction

Run-to-Run Control to automatically adjust tool recipes to compensate for process variations and keep Critical Dimensions at targets utilizing linear & Machine Learning models

<u>Goal:</u> Drive variation down to Cpk > 1.33

Base model explains 80% of variation. With APC simulation improves variation by 42% and 23% for APC and ML-APC



 $(\mathbf{1})$

Throughput



Wafer Losses

Al assisted Process Flow Optimization



Result: With data trained AI model - customized correction reduced 1 σ variation by 5X.

This opened many new AI opportunities

Autonomous Machine Learning Discovery & Prediction





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Utilization of LLM models for Labor and Equipment Efficiency



• Internal On Prem using A8

- Our fGenAI platform for serving Large Language Models (LLMs)
- On-prem mode supports hosting LLMs fully within the MFG firewall and is targeted to run on the Intel Gaudi platform
- Leverages ~750K docs across domains (process docs, wiki stores, service tickets, tech manuals, etc.) ~90% accuracy in responses; .
- In development: LLM models for tool error and quality events
 - Tool error response through historical precedent
 - Troubleshooting through maintenance data system accessing
- Expected to provide 4-7% MA benefits







PDF Exensio for Intel Advanced Packaging

Exensio Manufacturing Analytics for Assembly, Test, Advanced Packaging and Substrate

Integrated data from multiple process
Steps and data sources.
Templates standardize, streamline and automate data access and analysis workflows via common user interface.



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