SEMICONDUCTOR-X

PLATTFORM INDUSTRIE 4.0

SEMICONDUCTOR-X PART OF MANUFACTURING-X



"Semiconductor-X" develops a new ontology to digitally represent the critical planning segment of the semiconductor value chain

Funded by the European Union
NextGenerationEU

Supported by:
Federal Ministry for Economic Affairs and Energy
on the basis of a decision by the German Bundestag

Semiconductor-X: Demonstrate a Novel Data Ecosystem for the Semiconductor Supply Chain Accelerating TTM and Improving Resilience

HARALD GOSSNER, INTEL

Enable Global Collaboration Across Value Chain by a Sovereign Data Ecosystem

Accelerate TTM by tight collaboration of value chain partners

Protect IP and assets in a global data ecosystem

Efficiently **manage disruptions** and optimize efficiency of supply chain based on data

Address sustainability and changing regulatory constraints

Create a sovereign semiconductor supply chain **data ecosystem**

AI Supercycle requires a leap in collaboration

The Building Blocks of a Data Ecosystem

Storyline













A Demonstrated Concept: Semiconductor-X Dataspace

Key Features

Interoperability
global, cross domain connectivity

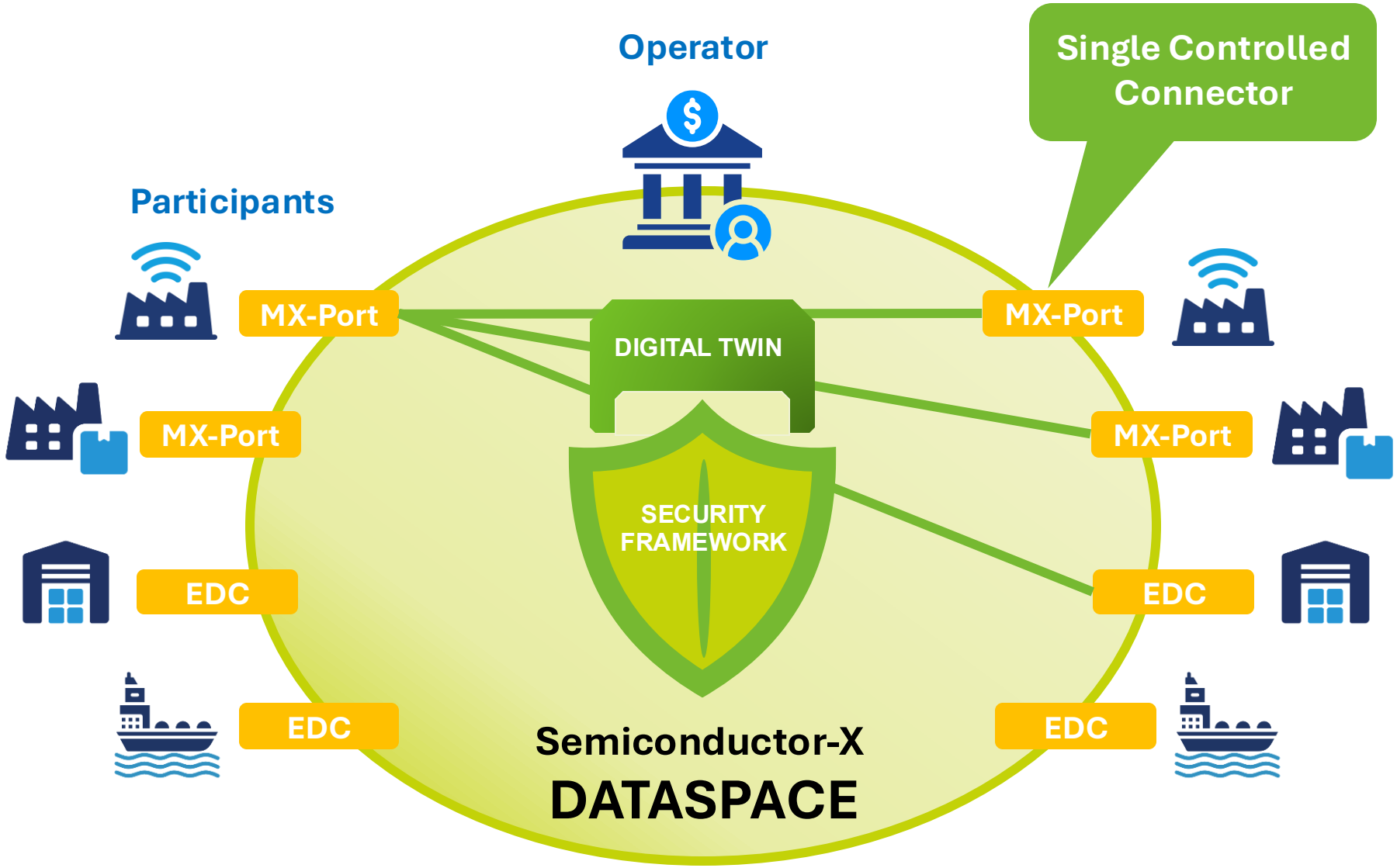
Identification
Recognizing and verifying users, devices, or systems

Confidentiality
protected from unauthorized disclosure

Integrity
Maintaining the accuracy, consistency

Availability
Ensuring system operations

Data Criticality
Understanding and classification of data criticality



images: AdobeStock, DC Studio, Icon Studio

Use Cases Implemented By Semiconductor-X



01 PCF & Digital Product Pass



02 Traceability

Backward traceability of components.



03 Cross-Industry Domain Data Exchange



04 Equipment & Fab Ops

Maintenance and optimization of equipment in fab operation.



05 Resource Optimization

Cross-supply chain optimization and disruption mitigation.

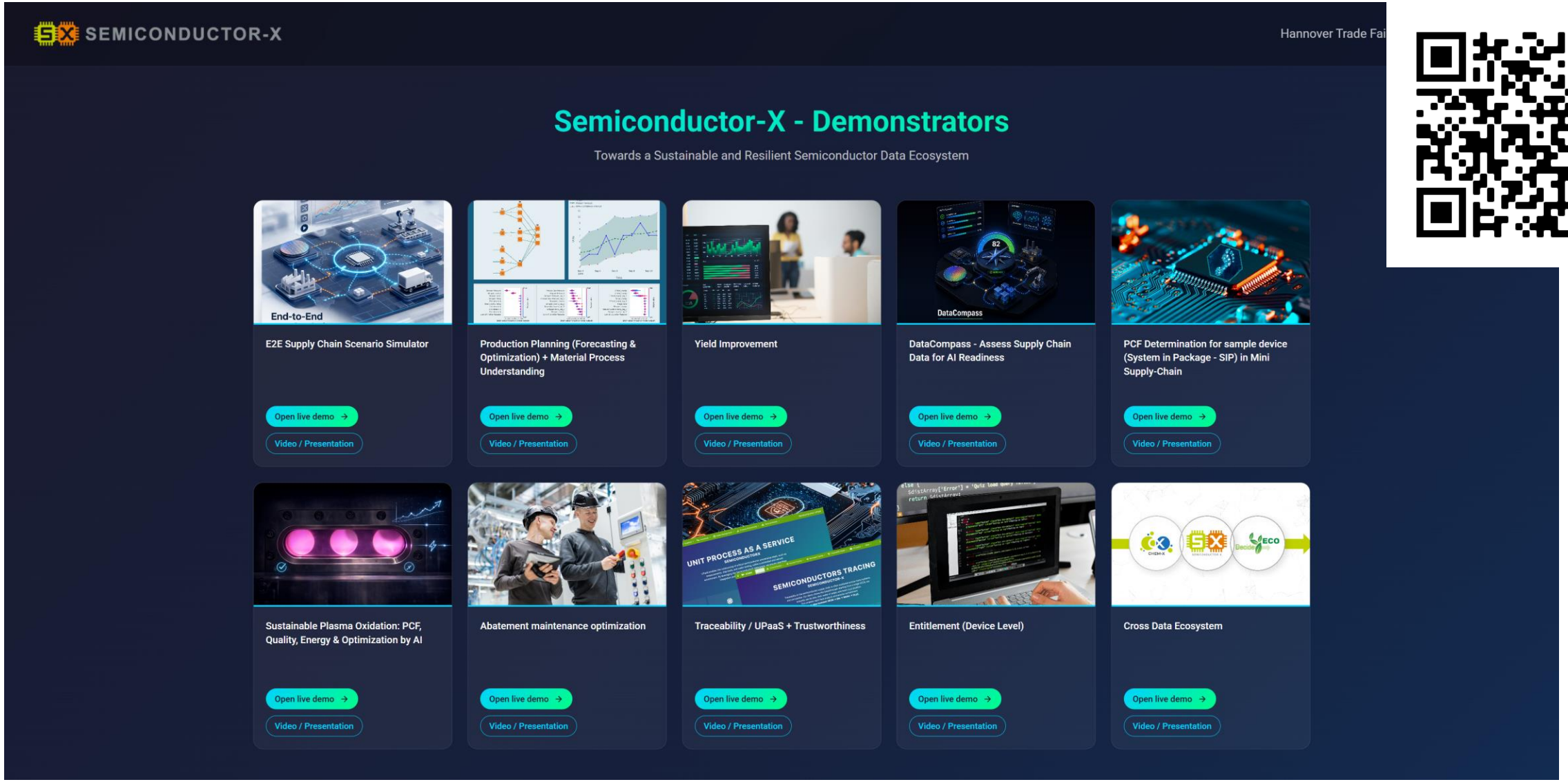


06 Business Processes

Business transactions


Unit Processing As a Service
Wafer testing bottleneck

Semiconductor-X Demonstrators - Get an Hands-on Experience



A Three-Phase Rollout

1 Introduce where tools are missing

PCF & DPP, export-control documentation, traceability for quality excursions, and maintenance documentation. Builds the global network, delivers proof points, earns trust.

2 Optimize across value chain

Implement use cases that optimize resource usage and alignment between supply-chain partners.

3 Incorporate core business processes

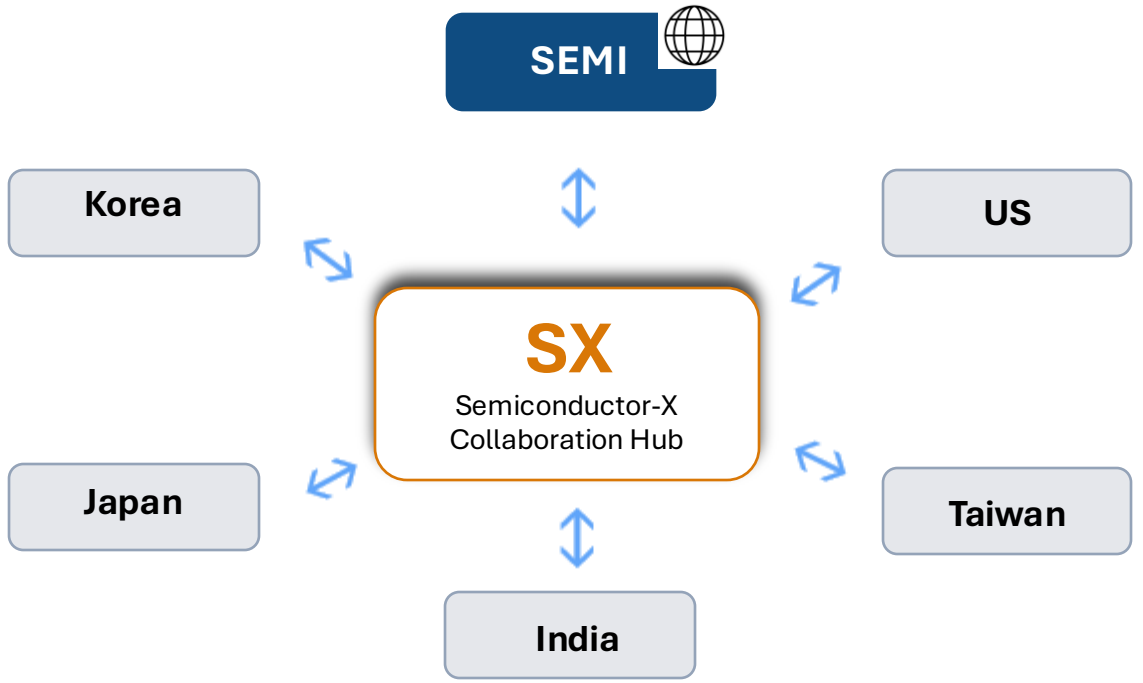
Move transactions such as purchase orders onto the data space — embedding or replacing established exchange formats (e.g. EDIFACT).

Semiconductor-X Industry Collaboration & Standardization Ecosystem

Connecting Global Semiconductor Manufacturing Standards with Industry 4.0 Data Ecosystems

Goals

- Interoperability Digital Twins & Data Spaces
- International Collaboration on Identity Management
- Harmonized Security Standards



First Steps

- Connect to regional industry partners
- Connect to government and industry associations
- Initiate PoC use cases

SX is connected to Germany Industry 4.0 & Data Space Alliances

ZVEI • IDTA • VDMA • IDSA

Let's scale sovereign data exchange across the semiconductor value chain

Standardized digital twins · federated data space · end-to-end trust

website

linkedin

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