

THE GROWING NEED FOR

# COLLABORATION

ACROSS THE SEMICONDUCTOR INDUSTRY

GSA

2025 ASIA PACIFIC  
EXECUTIVE FORUM

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KIMON MICHAELS

HOW TO LEVERAGE ↗

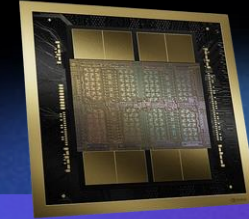
# AI & DATA

## PLATFORMS

# SEMICONDUCTOR INDUSTRY THRIVES ON INNOVATION



intel | IBM | Microsoft



nvidia | SK hynix | tsmc



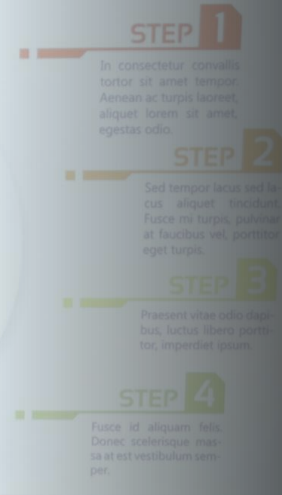
arm | Apple | SAMSUNG | Qualcomm | tsmc

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# TODAY'S STAGE-GATE AND CRISIS DRIVEN COLLABORATION

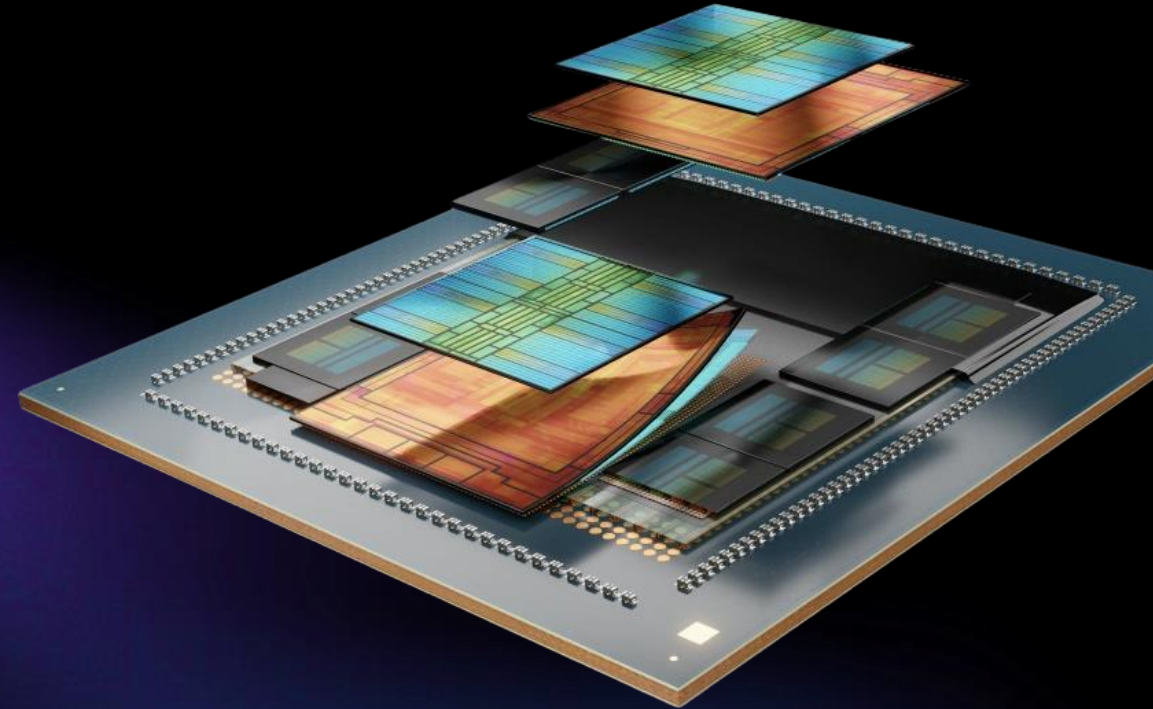
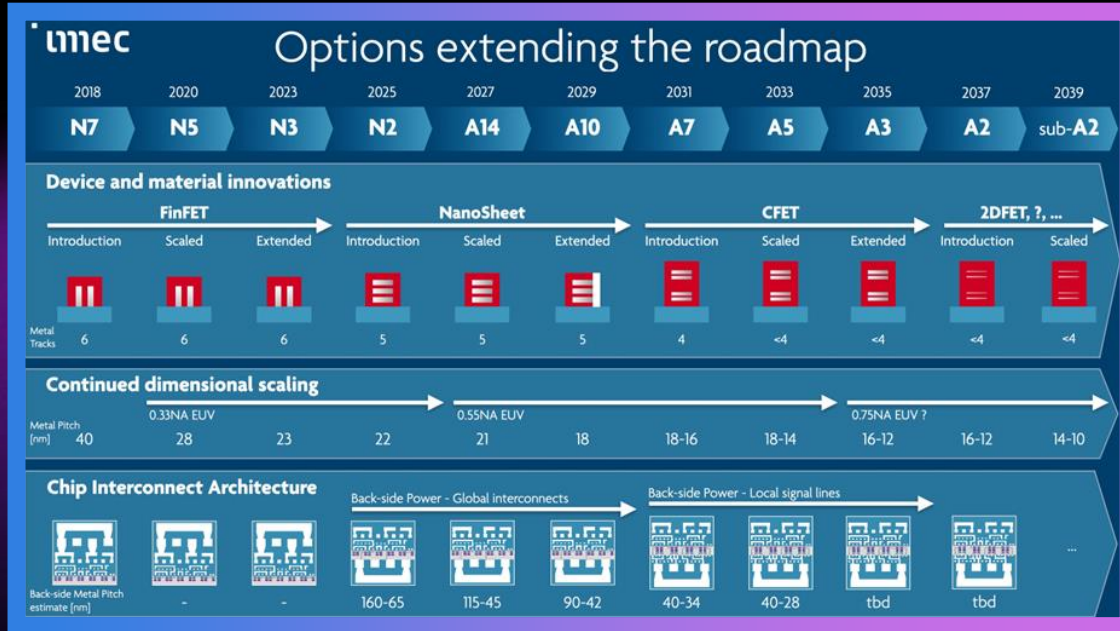
## CONVENTIONAL MODEL

- **Isolated** development and manufacturing
- **Simple, linear handoffs** between partners
- Small amount of data shared in **spreadsheet and graphs**





# In a 3D world what **TYPE OF COLLABORATION** IS NEEDED?



TEST INSERTION  
EXPLOSION



MULTI-VENDOR  
CHIPLETS INTEGRATION



TIGHT ASSEMBLY  
PROCESS TOLERANCE

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# THE INDUSTRY IS CHANGING

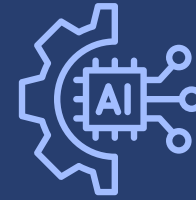
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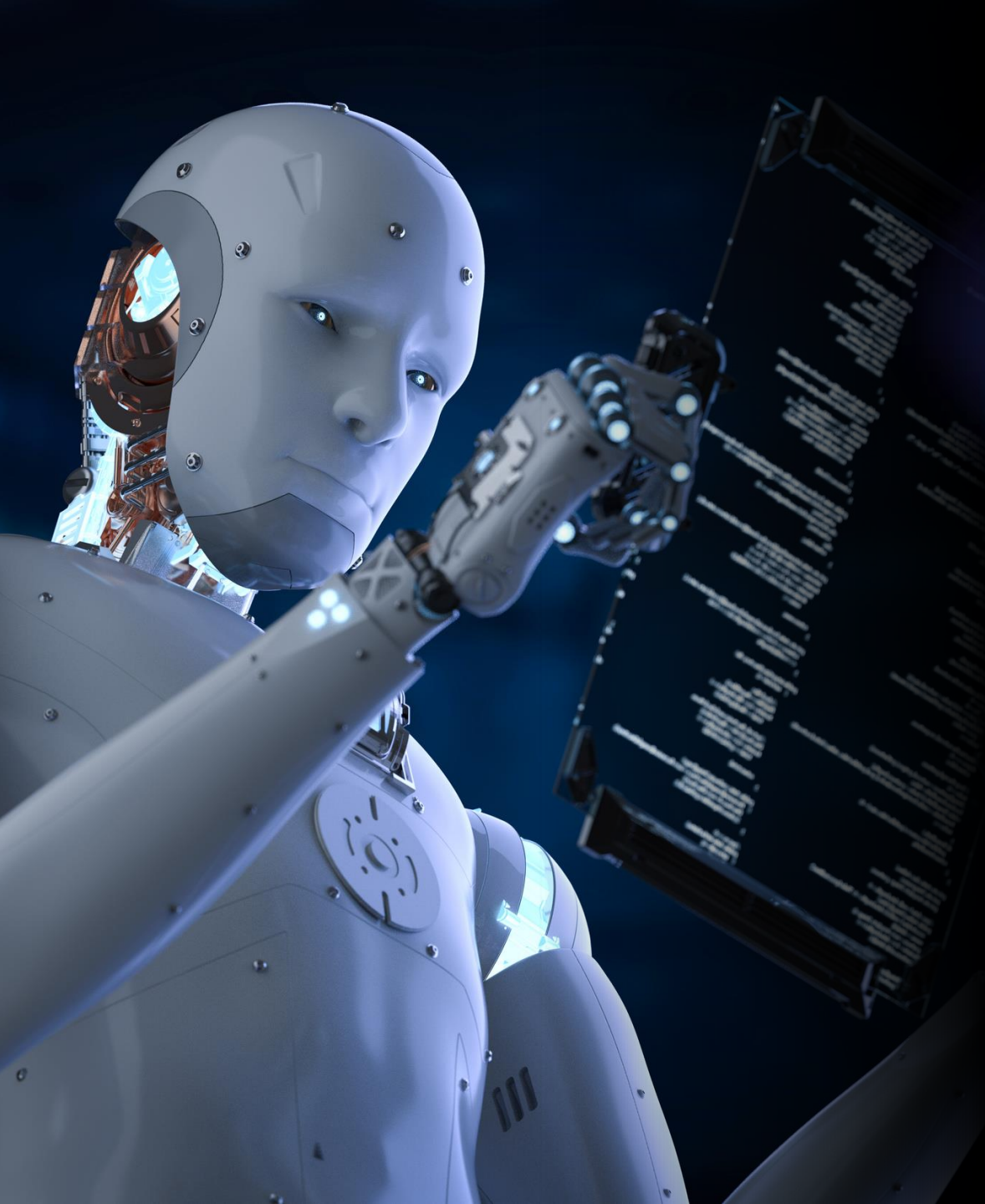
innovations in **3D**



operating  
through a  
**complex global  
supply chain**



**leveraging AI at  
all levels** to drive  
operational  
efficiency



# AI-DRIVEN COLLABORATION

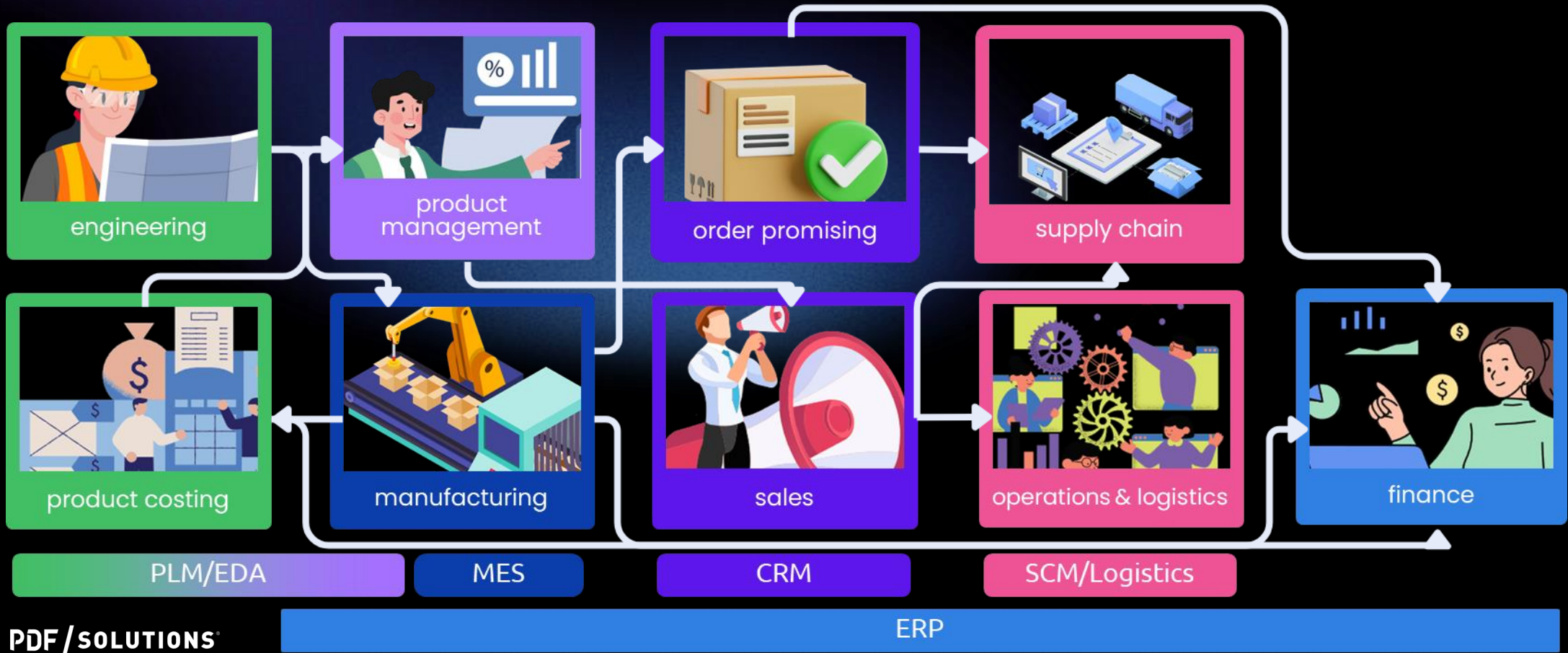
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## NEW REALITY

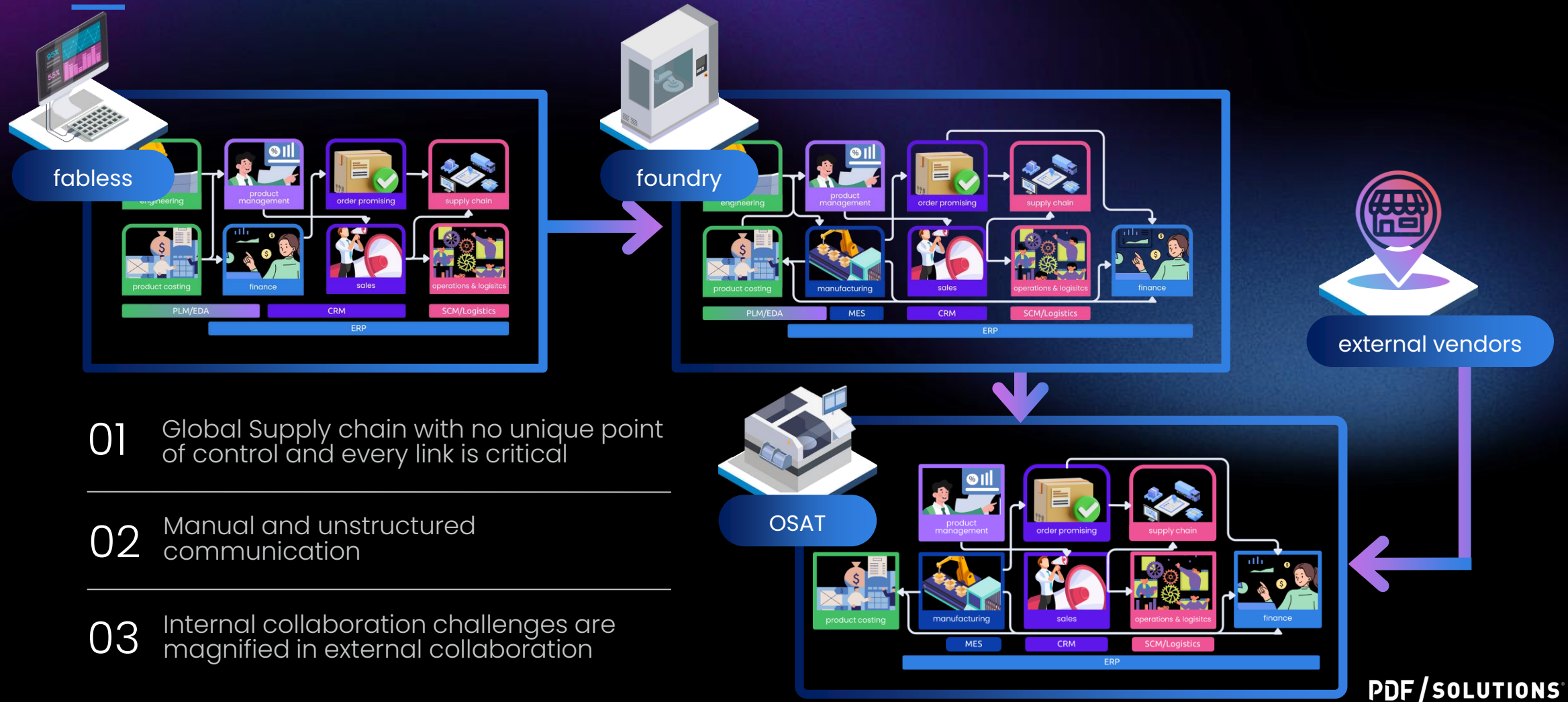
- **Real-time data sharing** across value chain
- **Complex, multi-party** orchestration
- **Ongoing**, automated by **AI**, operational **collaboration**



# COLLABORATION WITHIN THE ENTERPRISE



# COLLABORATION ACROSS THE SUPPLY CHAIN





# FOUNDATION FOR AI-DRIVEN COLLABORATION

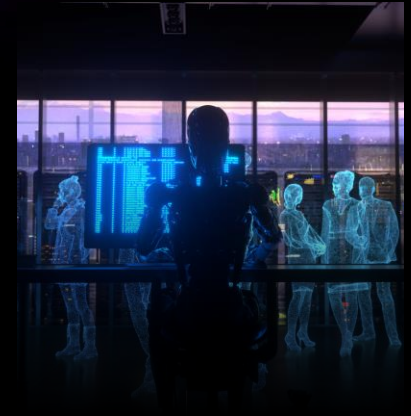
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01 Secure data  
infrastructure



02 Automated  
orchestration



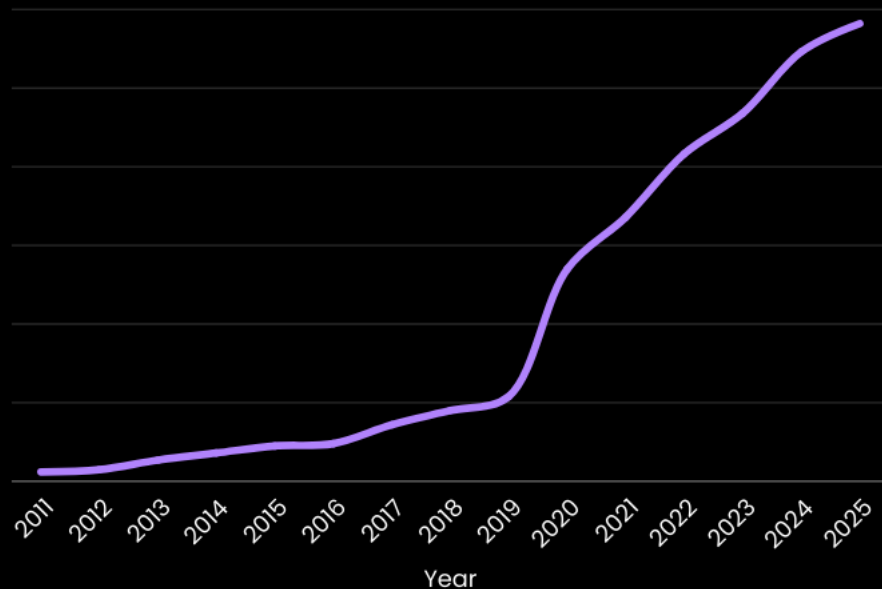
03 AI agents

01

## SECURE DATA INFRASTRUCTURE

Exabytes of data exchanged  
between **Fabs and OEMs** on the

 **secureWISE™** network



**Data exchange  
across the global  
semiconductor  
industry is  
exploding**

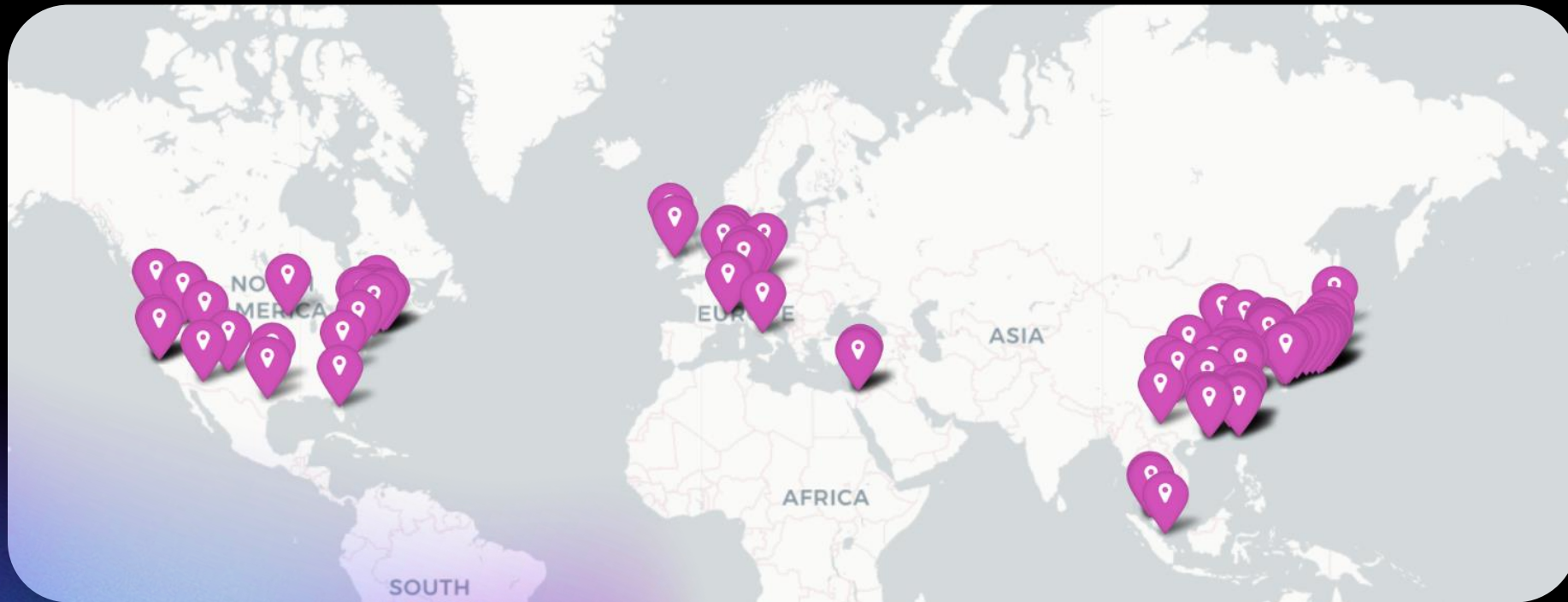
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01

SECURE DATA INFRASTRUCTURE

# THE SECURED DATA ACQUISITION NETWORK IS ALREADY IN PLACE

**+300** manufacturing locations



OVER **100** OEMS  
CONNECTED

ISO: **27001**

**0** SECURITY BREACH  
IN OVER **20** YEARS

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01

SECURE DATA INFRASTRUCTURE



**Secure remote** connectivity for the semiconductor industry

01 End-to-end secure access  
across private networks

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02 Virus scan for secure equipment  
software updates

---

03 Granular user permission for  
remote control & optimization

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OEM BENEFIT

**INCREASE SERVICE  
REVENUE WITH AI**

**SECURE SOFTWARE  
UPGRADES FOR EQUIPMENT**



FAB BENEFIT

**INCREASE FAB UPTIME**

**OPERATIONAL  
EFFICIENCY**

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01

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SECURE DATA INFRASTRUCTURE

# DATA FEED FORWARD



CAPTURE & TRANSPORT



DATA RECALL & ENGINEERING



TRANSFER



EDGE INTEGRATION

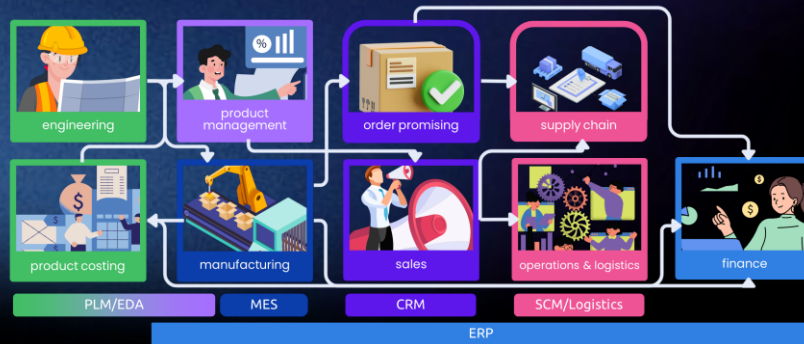
# 02

## AUTOMATED ORCHESTRATION

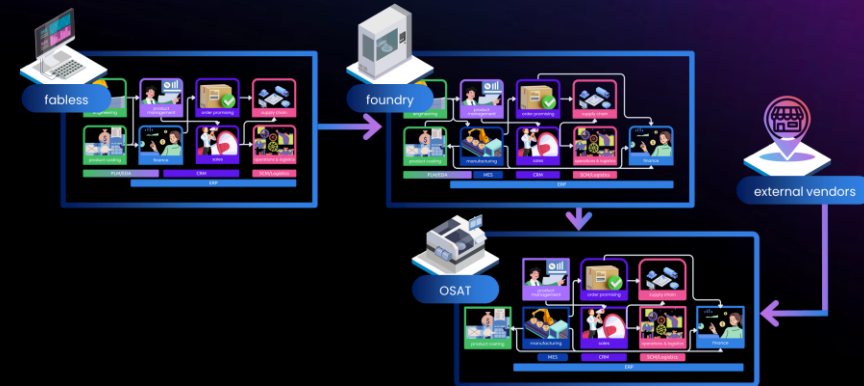
# ORCHESTRATIONS

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### INTERNAL OPERATIONS



### EXTERNAL OPERATIONS / OSAT



01 **Product Costing:** Accurate and up-to-date costing information based on actual resource consumption

02 **Order Status:** Real-time updates on order status and yield

03 **Quality:** Rapid identification and isolation of at-risk materials.

01 **Test Flow:** automate test flow management

02 **Quality:** Streamline & automate quality assurance

03 **WIP:** real time WIP tracking & management





02

AUTOMATED ORCHESTRATION

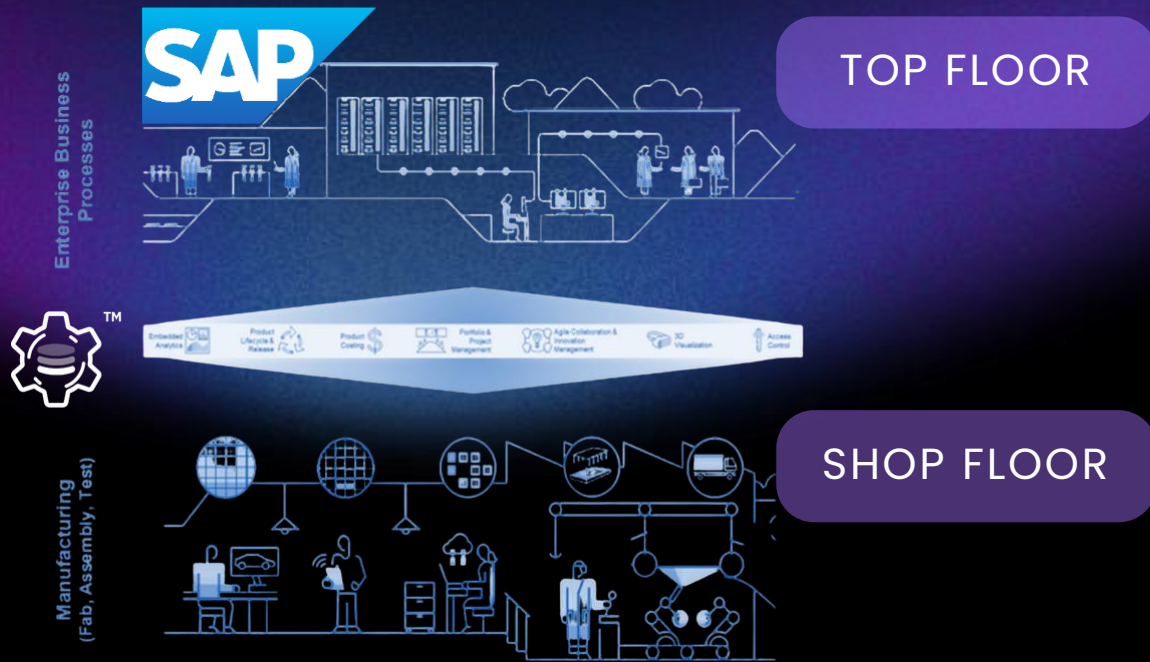
## ALIGN & ABSTRACT DATA TO ACCELERATE DECISIONS

- 01 Use actionable manufacturing data to drive business decisions
- 02 Automate business processes within and across enterprises
- 03 Deploy and orchestrate AI agents to automate and accelerate decisions

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## AUTOMATED ORCHESTRATION

## DRIVE ENTERPRISE PROCESSES WITH MANUFACTURING DATA



- 01 A common data & logical model for Products / Assets
- 02 Extend business processes, logic, and data to the manufacturing edge
- 03 Derive business Insights directly from manufacturing
- 04 Connect, transform, manage, & orchestrate MES & Manufacturing data
- 05 AI-ready manufacturing data repository to accelerate decision making



## 02

## AUTOMATED ORCHESTRATION

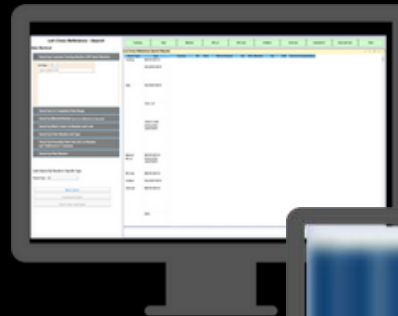
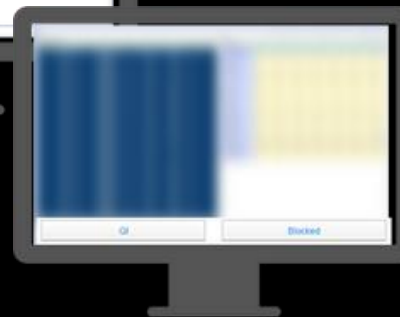
## ORCHESTRATION EXAMPLES

**PRODUCT COSTING**

01. Monitor actual cost at process and equipment level
02. Reduce cost of non quality

Product  
Costing  
DashboardConsumable  
Variance**QUALITY SHIELD & RMA**

01. Reduce defect root cause identification time
02. Contain risky material and Improve customer satisfaction

Lot  
Genealogy  
& RMALot  
Containment**WIP MANAGEMENT**

01. Real-time production control with integration to MES
02. Identify bottle-neck operations and improve on-time order fulfillment

Operation /  
Step TimeOperation /  
Equipment /  
Step Time



03

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AI AGENTS

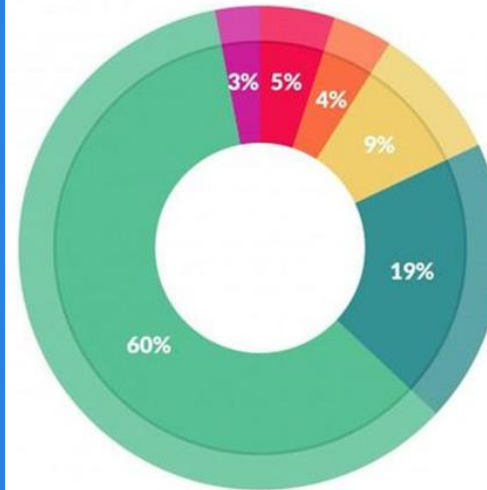
**TODAY 5% TO 10% OF THE MANUFACTURING DATA IS ANALYZED USING CONVENTIONAL METHODS**

### THE AVALANCHE OF DARK DATA



% OF MANUFACTURING  
DATA USED IN ANALYTICS

5%



What data scientists spend the most time doing

- Building training sets: 3%
- Cleaning and organizing data: 60%
- Collecting data sets: 19%
- Mining data for patterns: 9%
- Refining algorithms: 4%
- Other: 5%

80%

OF A DATA SCIENTIST TIME IS SPENT ON DATA  
ALIGNMENT AND PREPARATION

03

AI AGENTS

# HUMAN GOVERNANCE WITH AI EXECUTION



## ENFORCE DATA QUALITY

Humans define standards; AI implements data quality



## HUMANS SET COLLABORATION RULES

Define collaboration principles, data sharing, and security boundaries



## AI EXECUTES AT SCALE

Operates autonomously within those boundaries, handling complex, high-volume tasks



## CROSS-ORG GOVERNANCE

Fabs define vendor access and data protocols; AI manages daily execution

**"Six out of ten enterprises plan to replace people-run services with software-run services before 2030"**

HFS Study 2024

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03

AI AGENTS

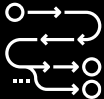
# GUIDED ANALYTICS (GA)



MINES 100% OF THE DATA  
100% OF THE TIME



AUTOMATES UP TO 90%  
OF THE ANALYSIS



ISSUE-BASED FLOW



SEAMLESS INTEGRATION OF DATA TYPES  
HARD BIN, SOFT BIN, PARAMETRIC, PCM, TEST TOOLS, UPH



AI/ML POWERED DIAGNOSIS



RENDERS DATA VISUALIZATION IN  
SECONDS

**RENESAS**  
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Conferences > 2024 8th IEEE Electron Device... ?

**Expediting manufacturing safe launch with Big Data AI/ML analytic solutions on the cloud**

Publisher: **IEEE**

[Cite This](#)

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02

AI AGENTS

# AI-DRIVEN TEST SOLUTIONS

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PREDICTIVE  
TEST

PREDICT FUTURE  
TEST RESULTS

Spend test \$ on units  
that need them most

PREDICTIVE  
BURN-IN

PREDICT WHICH  
BURN-IN WILL PASS

Eliminate costly  
burn-in

PREDICTIVE  
BINNING

PREDICT WHICH  
TESTS WILL FAIL

Find failures early

ENABLED BY SECURE INTEGRATED DATA FEED FORWARD INFRASTRUCTURE



**Connect entire supply chain** with existing global Data Exchange network infrastructure



**Automate business processes**, get humans out of the loop



Deploy **AI** close to the data, make use of **all the data** to drive **insights and actions**

# Thank You

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