Siemens EDA+AI

Danny Perng

Senior Vice President

Siemens EDA

Siemens knows AI
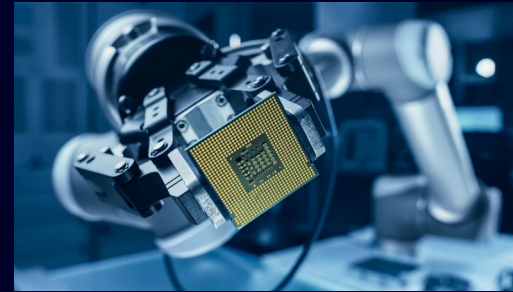Just a few examples of at-scale use of Siemens AI today outside of EDA

Mobility

Schedule & route planning, predictive management

Energy

Optimization of gas and wind turbine installations

Industrial

Automated visual inspection, factory optimization

Medical

Predictive maintenance, diagnostic assistance

Siemens has been deploying AI, at-scale, delivering significant quality of life improvements to people all over the globe with over 1400 AI developers & 3700 patents

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Siemens and NVIDIA partner to build the Industrial Metaverse

A virtual world to solve real-world problems: Siemens and NVIDIA will collaborate to enable the Industrial Metaverse and increase use of AI-driven digital twin technology that will help bring industrial automation to a new level.

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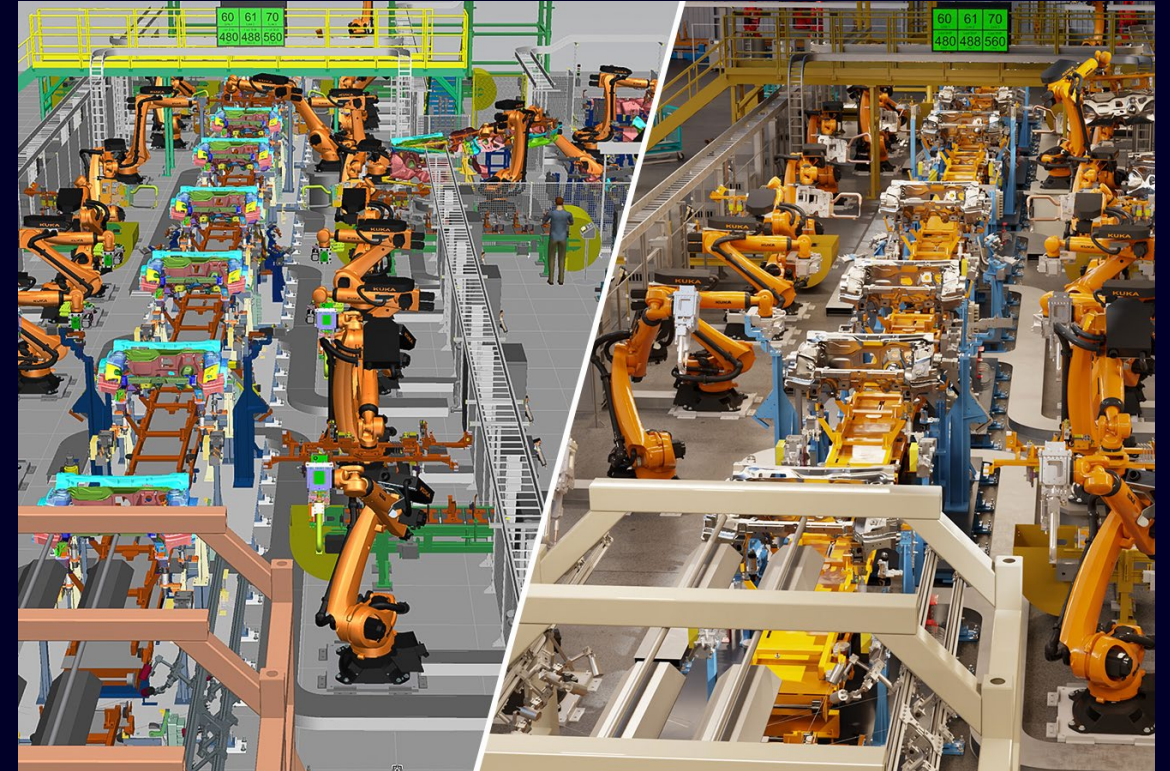
Why does EDA need AI solutions?

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The design productivity gap is a real and growing problem

1 Trillion ↗

Transistors in chiplet based processors by 2030

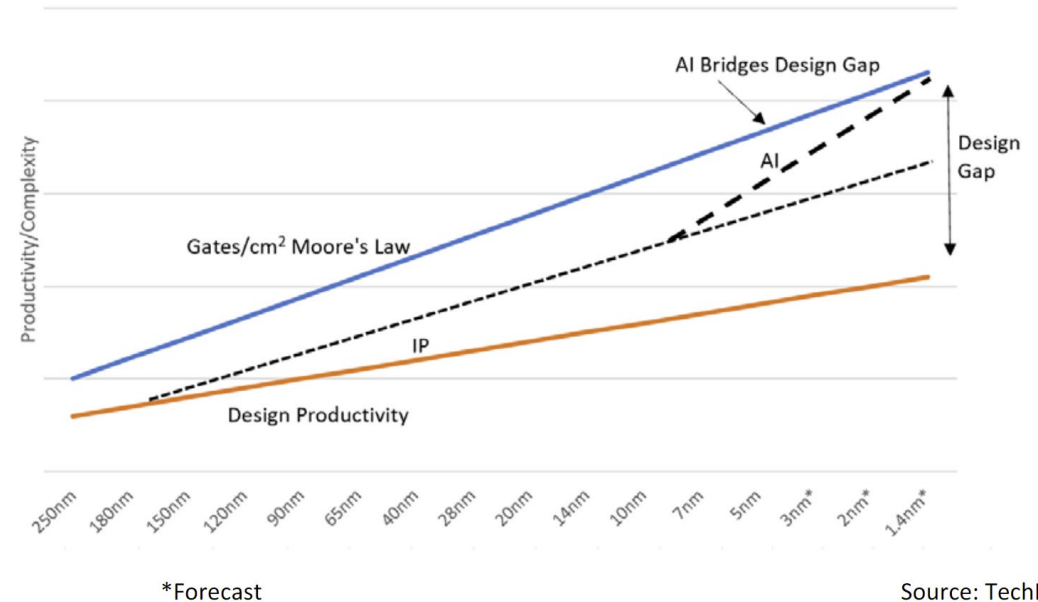*How We'll Reach a 1 Trillion Transistor GPU - IEEE Spectrum*

27.3K ↘

Shortage of **engineers** in the US workforce by 2030

Shortage of Tech Workers - Semiconductor Industry Association (semiconductors.org)

The **capability** and **complexity** of a system is directly proportional to the number of transistors integrated into it

Figure 1: Altering the Design Productivity Gap

Source: TechInsights.

Advanced EDA tools, new methodologies such as "shift left", and SIP blocks (internal or 3rd party) have made it possible to close the gap somewhat … **IT'S NOT ENOUGH**

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The Siemens EDA approach to AI

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Siemens EDA AI solutions delivering next generation productivity

AI-enabled platform to make better, faster, and more informed decisions

Platform

Ai
Solutions

Technology

AI-embedded tools to deliver error-free designs

Processes

AI-automated to streamline end-to-end processes
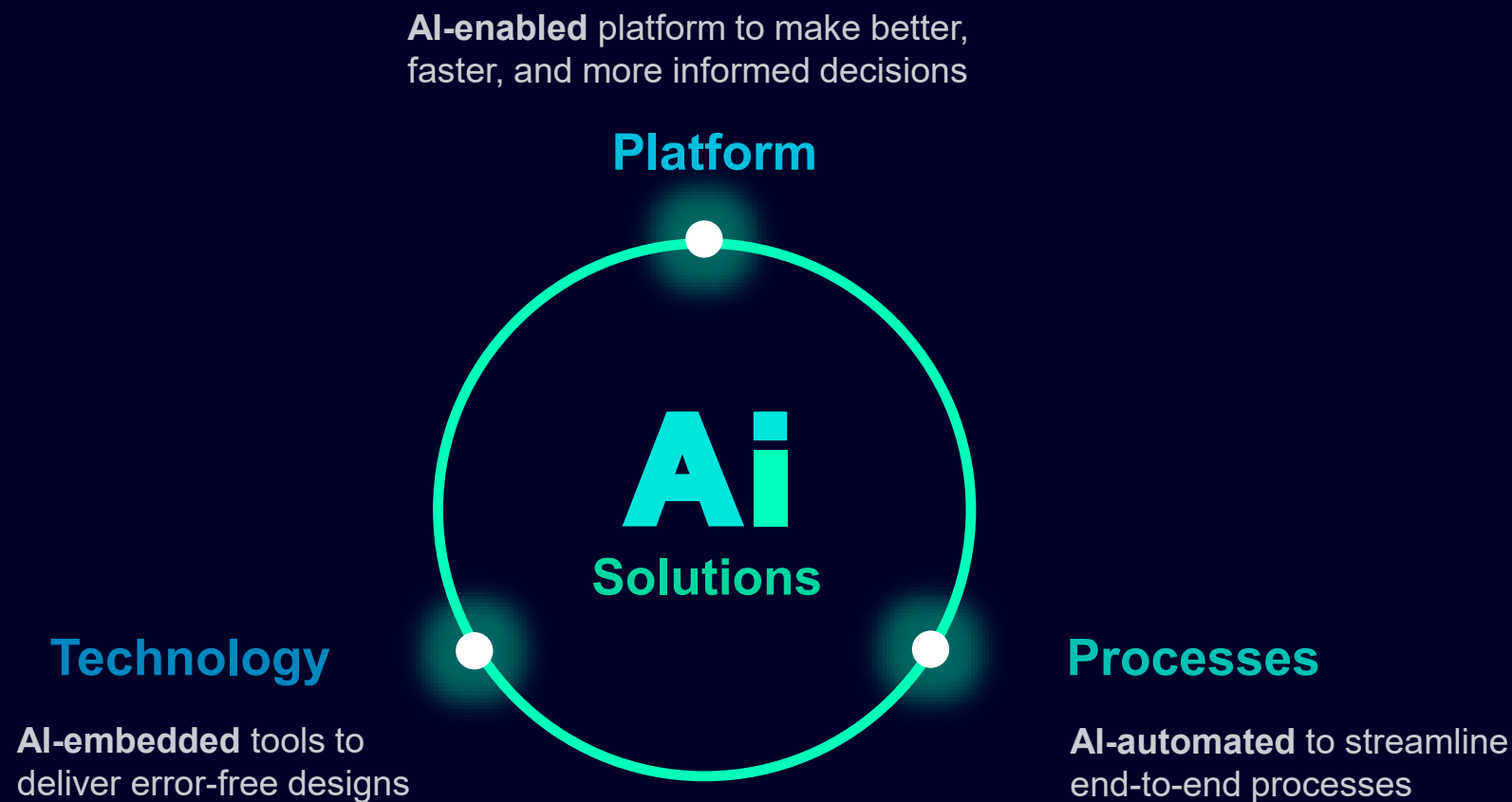
AI based solutions drive organizational knowledge, collaboration and integration

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AI spans modeling technologies to deliver productivity

Analyze
Identification of key data insights not practical with traditional methods

Optimize
Domain specific predictive models to reduce computational requirements and accelerate decision making

Analytical AI

Predictive AI

Generative AI

Ai
Solutions

Generate
Accelerate design creation, system optimization, and model abstraction
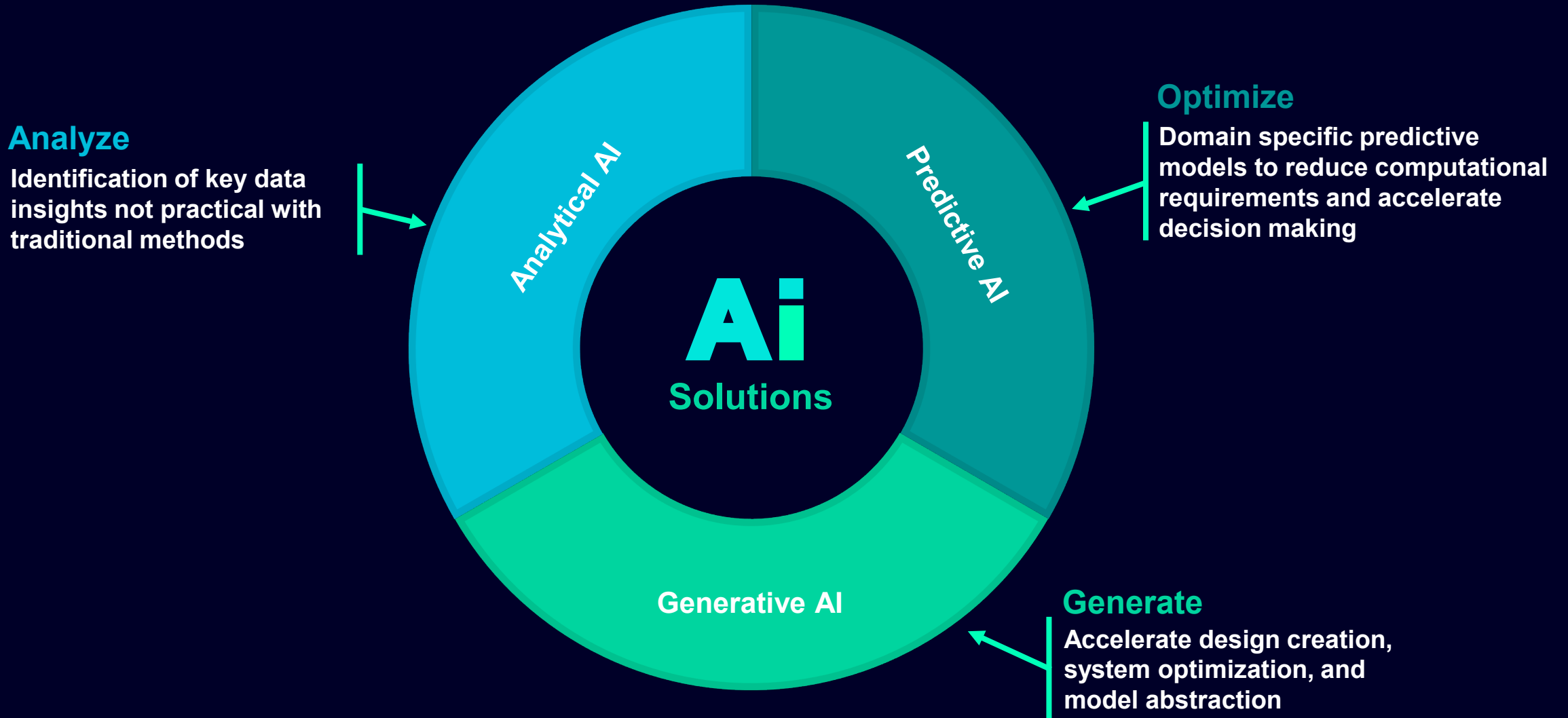
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AI that empowers our users with flexibility and data security
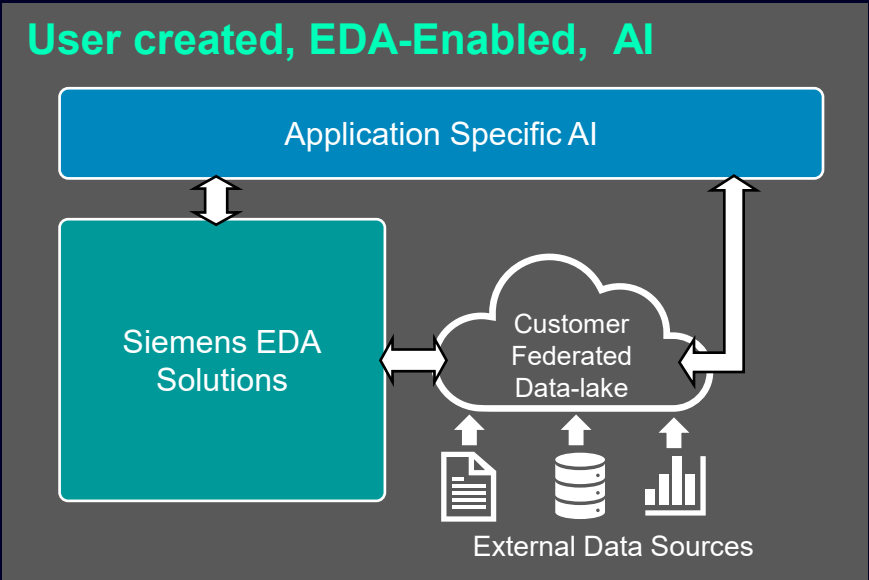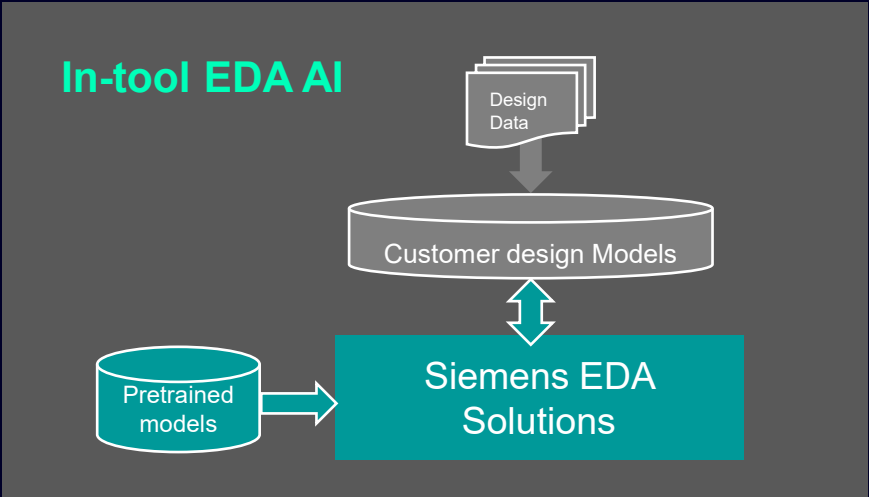## Protection of customer IP is central to our approach

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Ai

Solutions

Acquires data through open APIs where possible

Data Lake support for distributed data

Provides service layer to applications

Comprehensive data security

In-tool EDA AI

Design Data

Customer design Models

Pretrained models → Siemens EDA Solutions

User created, EDA-Enabled, AI

Application Specific AI

Siemens EDA Solutions ↔ Customer Federated Data-lake

External Data Sources

Service layer for Application and Workflows

Data Acquisition & tagging/classification

Collaborative databases

Pre-trained AI/ML Models

Data and user security

Design insights

Supply chain management

Open Standard Data format & APIs

Siemens EDA solutions

	Fabless IC Company					Foundry	OSAT	System Company		
	IC Functional Design & Verification			**IC Physical Implementation**		**IC Mfg**	**IC Packaging**	**Electronic Systems**		To PLM and to analytics
Design Stage	IC Architectural Design	IC Logic Design	IC Logic Verification	IC Physical Design	IC Physical Verification	IC Manufacturing and Test	3D IC Packaging	Electronic Systems Design	Electronic Systems Verification	Electronic Systems Manufacturing
Solutions	Catapult HLS 3D IC	Questa Power Pro Tessent Solido	Questa Austemper Onespin Avery Solido AFS Veloce ProFPGA PowerPro	Aprisa Calibre Tanner Precision	Calibre Tessent mPower	Calibre Tessent	3D IC Xpedition IC Pkg Calibre	PADS Xpedition Supplyframe	HyperLynx	Valor Supplyframe	Tessent Embedded Analytics

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Delivering **significant gains for customers** today

Veloce
"**Saved 13hr Veloce compile** time by optimizing memory usage based on previous compilations"
-Large Mobile Semiconductor Vendor

Aprisa
"Aprisa Macro Placement saved us about **3-4 weeks of floor planning with AI-driven approach**"
-Maxlinear, U2U India

Solido
"6-sigma verification for standard cells, **1,000+ times faster with greater accuracy** and coverage using Solido"
-Arm, AI Siemens

Tessent
"**5x Production test time improvement** with ATPG Adaptive intelligence"
-Amazon, ITC 2023

Solido
"**50% CPU time reduction, 40% reduction in setup time, 60% reduction in debug** time, characterization for .lib verification with Solido Analytics"
-Samsung, U2U 2022

Xpedition
"100,000x faster design space exploration optimization for signal integrity with HyperLynx"

Calibre
"Up to **15x faster DRC iterations** on dirty designs"
-Calibre nmDRC Recon User

Questa
"With Questa VIP, block level coverage closure has been reduced by nearly 70% **reducing weeks off of total schedule**"
-P...2024

Calibre
"ML-DRC+ delivers a **21% improvement in hotspot accuracy** using Embedded Machine Learning"

Tessent
"**10x productivity** improvement for DFT architecture"
-Intel, ITC 2021

Broad portfolio application

More to come...

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Summary

SIEMENS EDA + AI

Productivity built on a Foundation of Artificial Intelligence
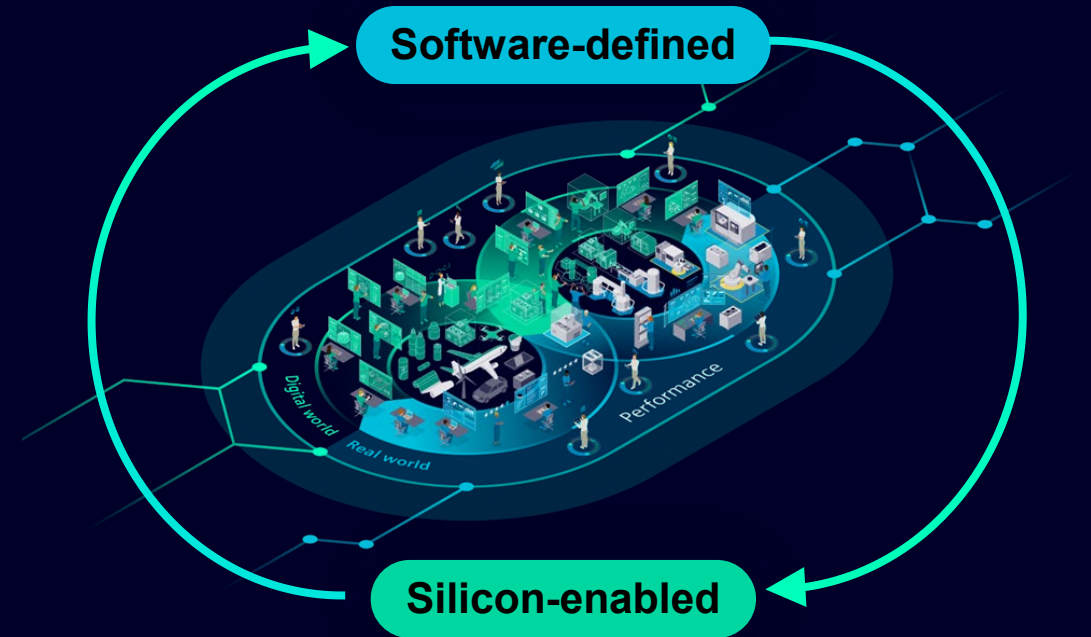
AI-Enabled Solutions

Drive faster results with improved accuracy

AI-Automated Workflows

Drive intuitive tools and increased user productivity

AI-Empowered Engineers

Drive creativity and enable rapid innovation

Software-defined

Silicon-enabled

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THANX

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Published by Siemens 2024

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