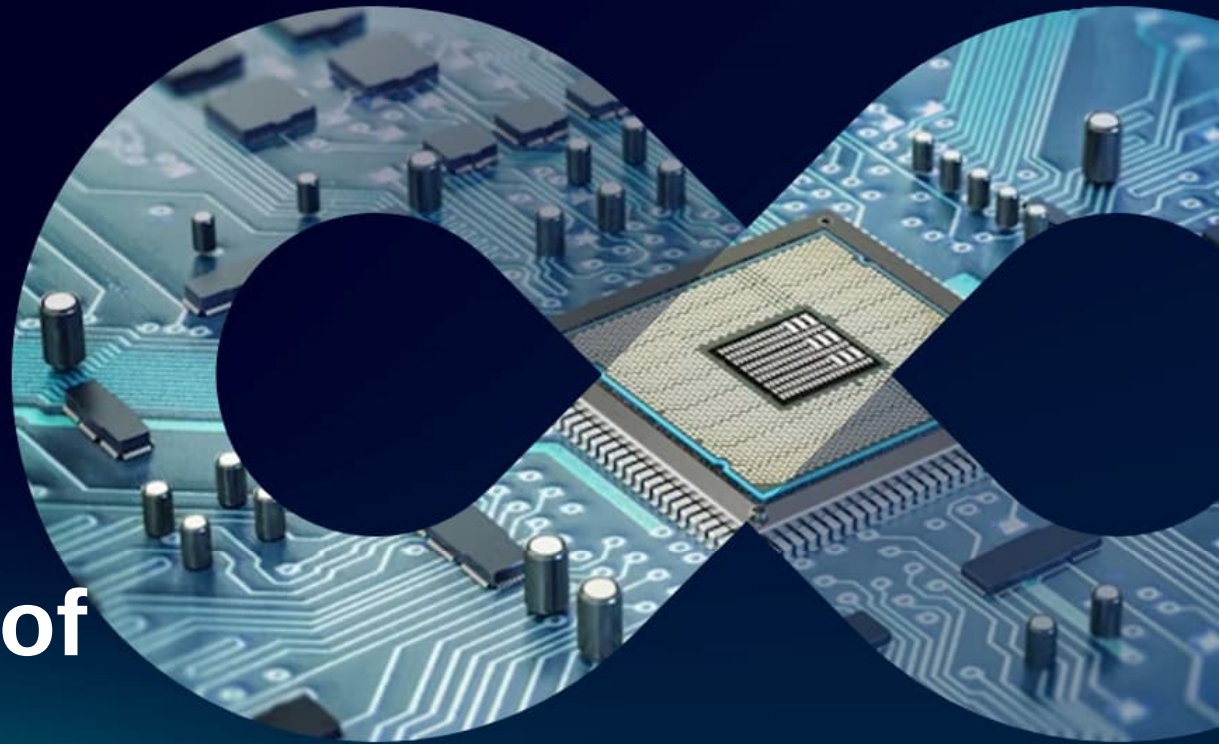
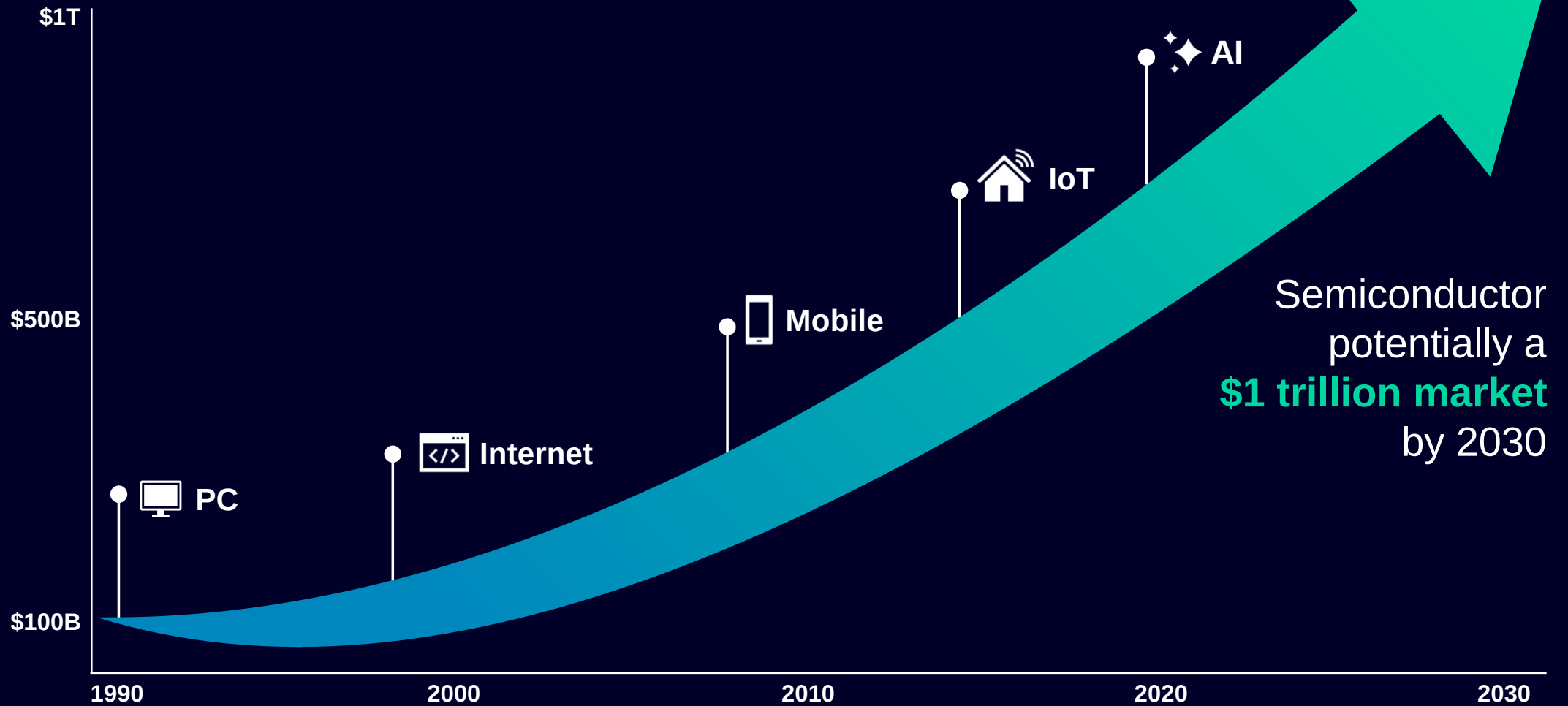


Unlocking the Power of AI in EDA

Lee Harrison
Marketing Director, Siemens EDA, Tessent



Five computing waves drive semiconductor market growth

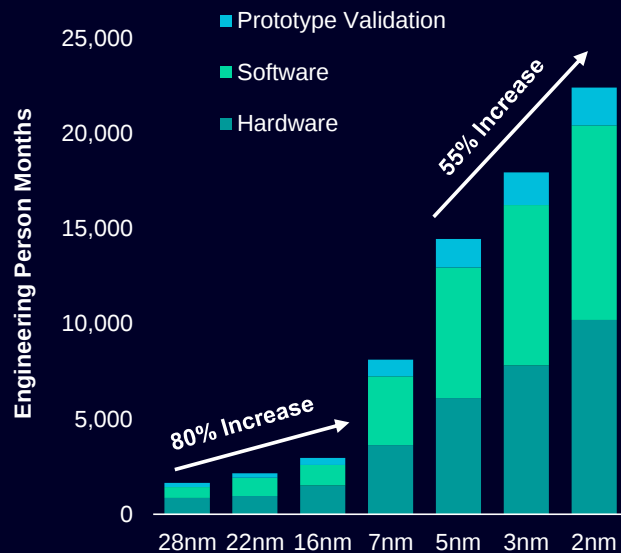


Source: International Business Strategies (IBS), January 2025

Unrestricted | Semisrael | Siemens EDA

Semiconductor companies are facing key challenges

Increasing engineering hours



Shrinking talent base



Shortage of **semiconductor workers** in US by 2030

Increasing development costs

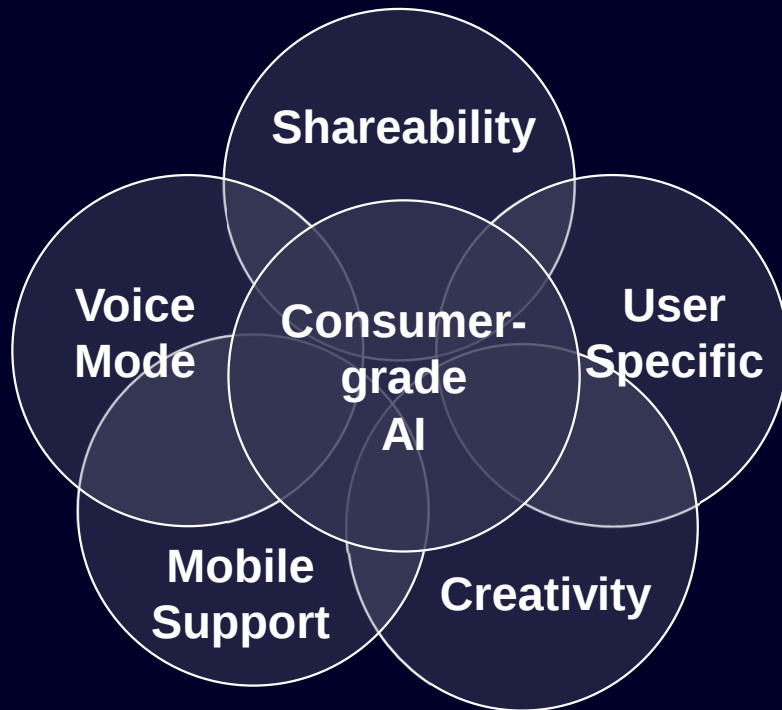


Estimated first-time **total SoC design cost** or 3 nm node

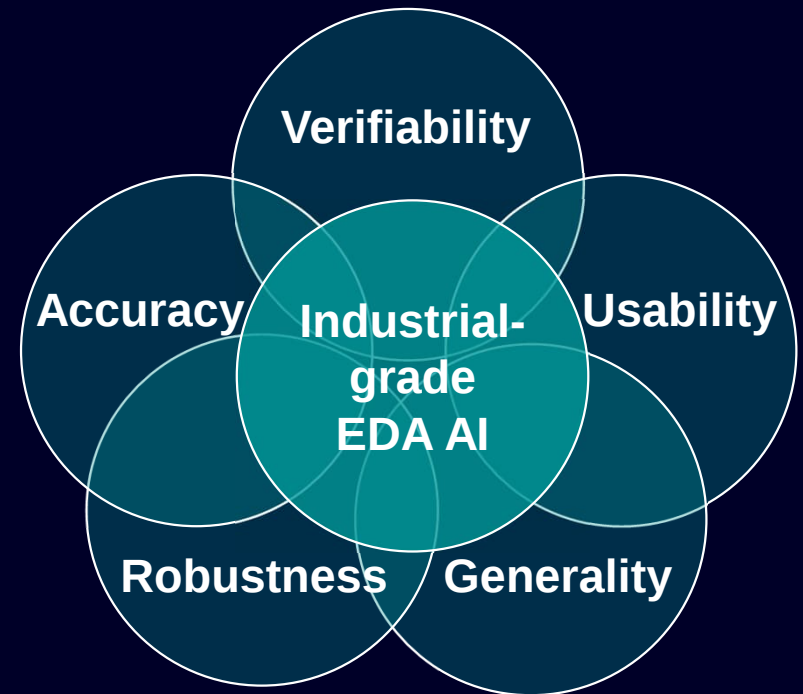
Sources: IBS Design Activities and Strategic Implications (2022), July 2022; SIA Oxford Economics study (2023); Tech Insights AI-Driven EDA: Pushing Boundaries and Redefining Chip Design
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EDA AI needs to be industrial-grade AI for deployment in production

Elements for consumer AI



Elements for EDA AI

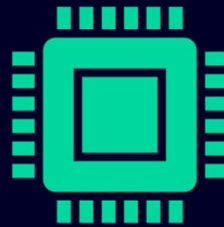


An EDA AI system should be purpose-built



Expertise

Analyze thousands of documents & synthesize critical EDA insights to quickly resolve your queries



Accelerated Design

Generate scripts, configurations, designs, and tool automations for faster design cycles



Faster Verification

Speed up testbench generation, verification, and signoff for shorter time-to-market

An EDA AI system should be augmented to support EDA modalities

Traditional modalities of LLMs



Text



Image



Audio



Video



Code



Tables

EDA-focused modalities (~50 formats)



RTL



Verilog & Netlists
(10+ formats)



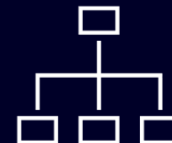
GDSII / OASIS
(5+ formats)



Liberty
(5+ formats)



Simulation Data
(~5 formats)



Proprietary
Design Languages



Binaries
(10+ formats)



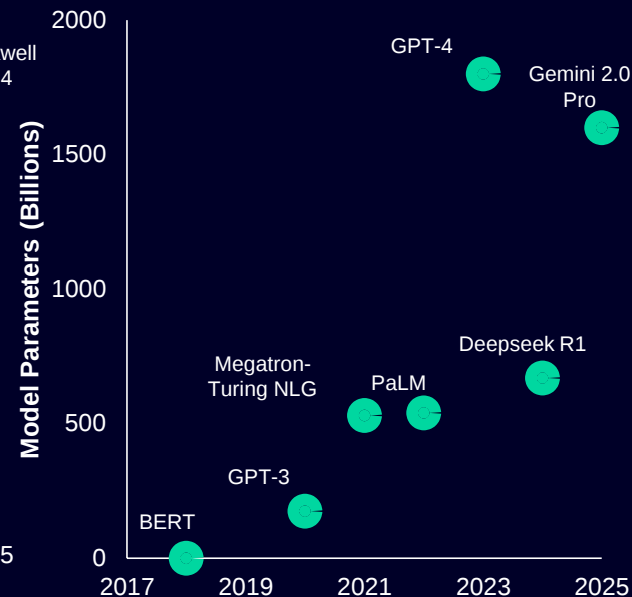
Miscellaneous
(10+ formats)

An EDA AI system should be modular, flexible and quickly adapt to improving foundation technology

GPU compute power has increased 1000X+ in the past decade



Increasing model size, complexity and capabilities



Rapid development in AI service pipeline



An EDA AI system has specific characteristics and needs to be built on three pillars

1 Scalable Intelligence

- Support for multiple LLMs
- Fine-tuning is optional
- ML/RL capabilities
- Fast inference times
- Hardware agnostic deployment

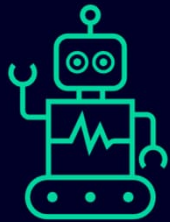
2 Secure and Flexible

- Centralized multimodal data lake
- Able to build custom workflows
- On-premise/cloud support
- Enterprise-grade security
- Customizable access controls

3 User-centric Design

- Integrated with designer workflows (CLI, GUI, web)
- Multiple EDA modality support
- Seamless EDA integration
- Automated workflow capabilities
- Data flywheel

An EDA AI system should have a range of capabilities



Assistants

- Quickly answer queries about EDA documents, tools, workflows, etc.



Reasoners

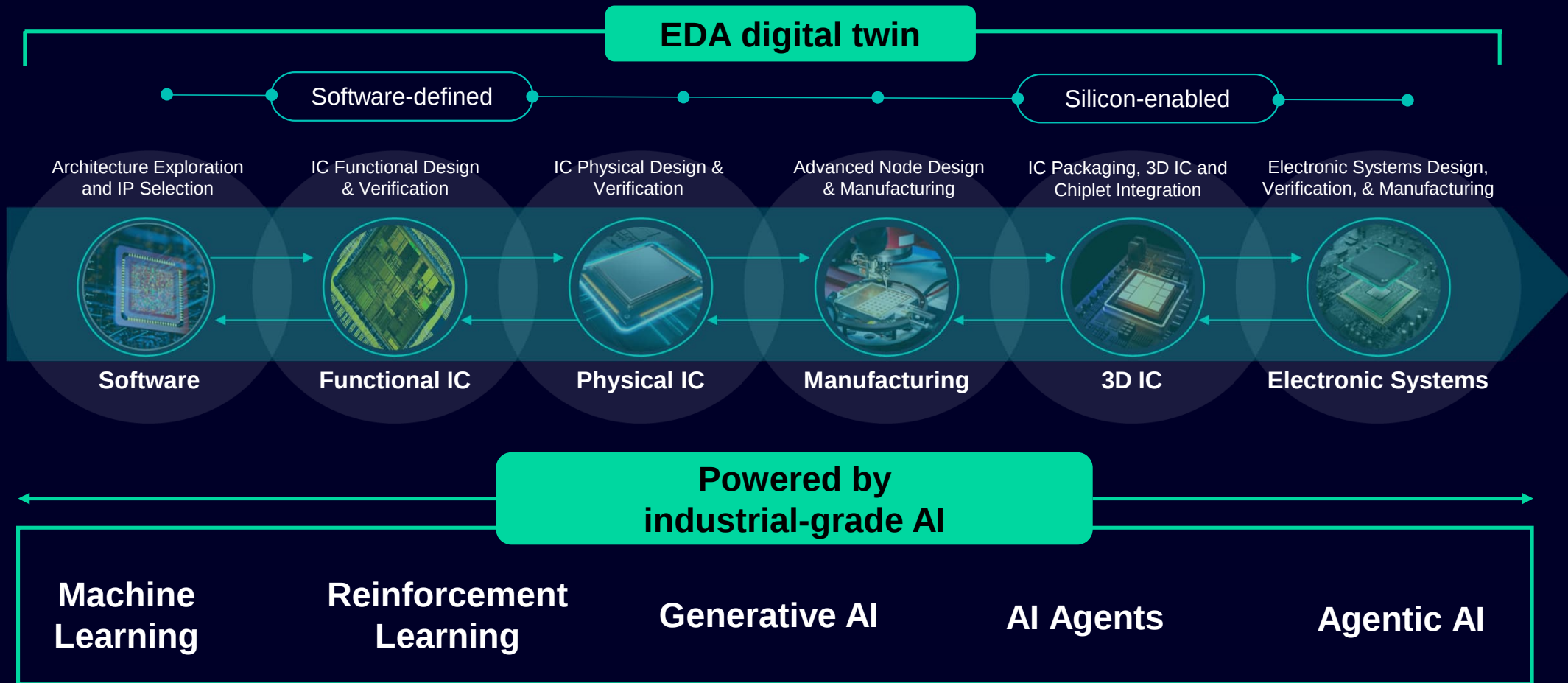
- Follow a multi-step thinking process to intelligently analyze log files, netlists, RTL, etc.



Agents

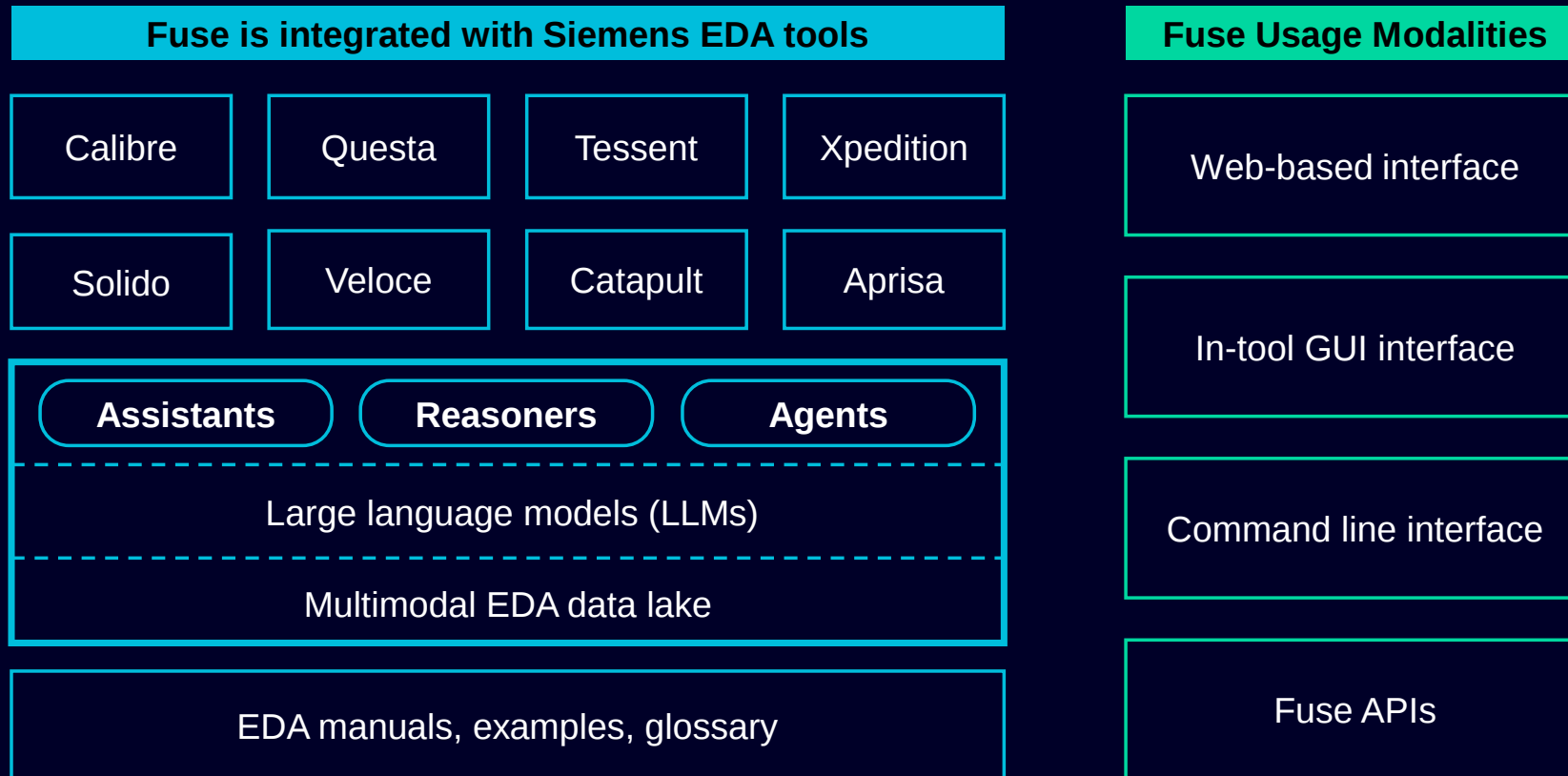
- Natural language-based automation and tool calling for variety of tasks

An EDA AI system should span across the entire semiconductor and PCB systems workflow

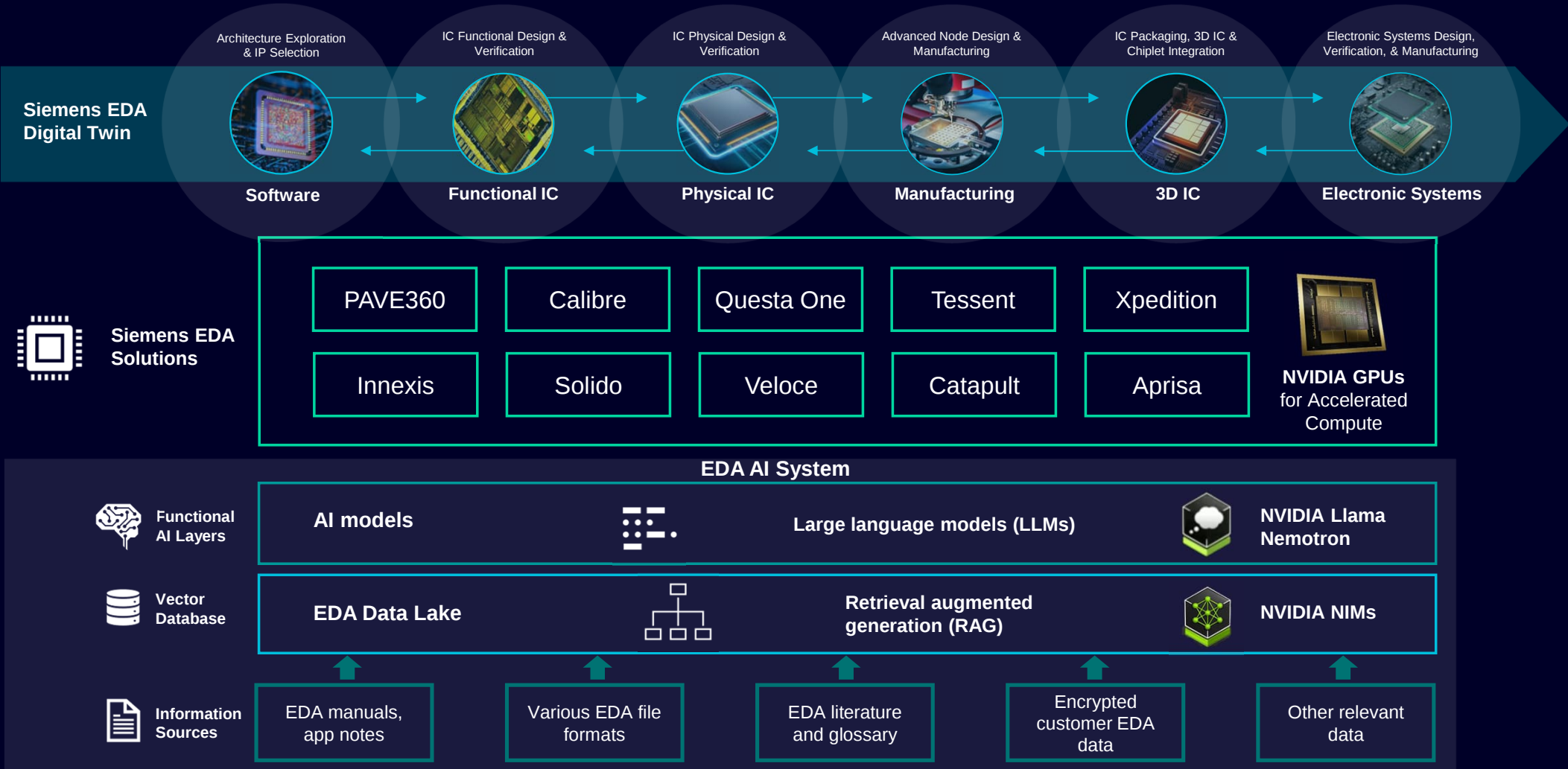


Siemens EDA announces EDA AI System

Enables generative and agentic AI capabilities across the EDA workflow



NVIDIA hardware and software stack turbocharges Siemens EDA portfolio



Aprisa AI

Aprisa AI expands from differentiated ML / RL tools to centralized Gen AI and agentic flows



Aprisa AI delivers 10X productivity boost, 3X improved compute-time efficiency, and 10% better PPA for RTL-to-GDS

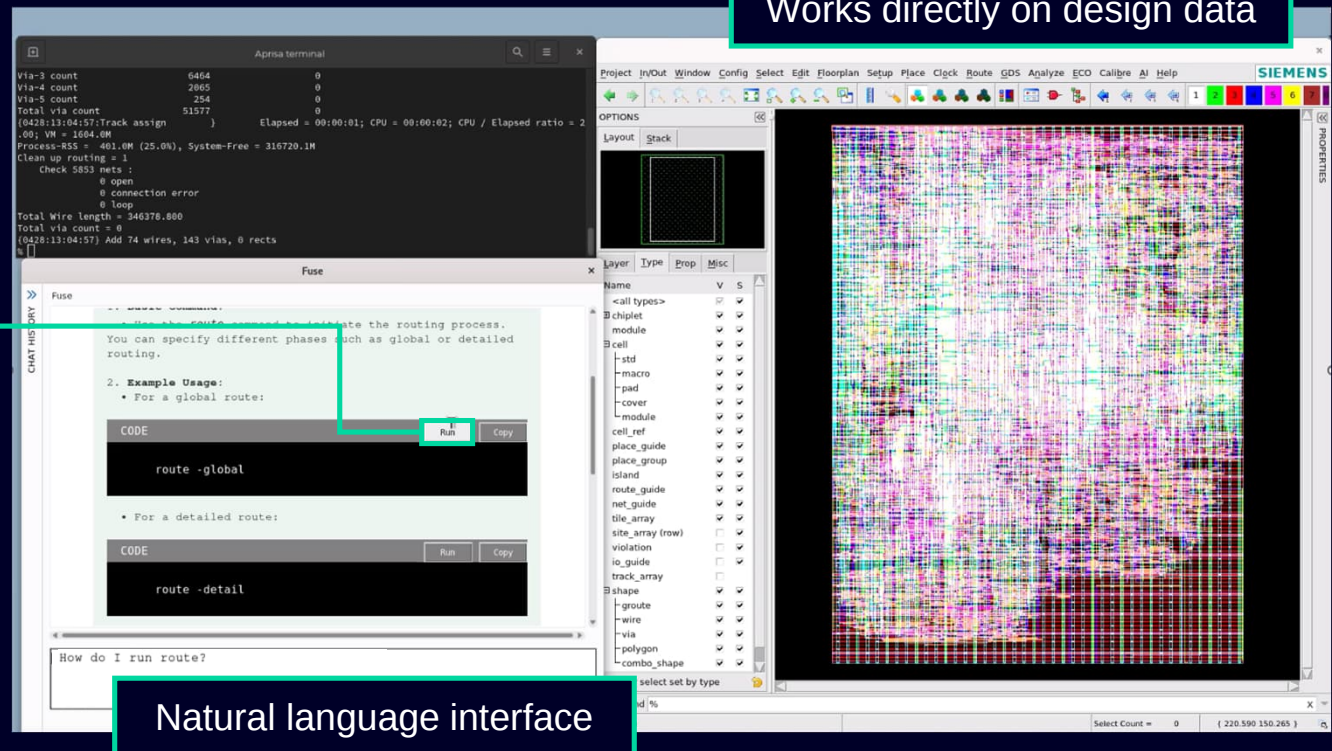
Aprisa's built-in Fuse integration provides a natural language interface to **verifiable answers** within Aprisa

Built-in Fuse integration

- Tool know-how, best practices, commands available via natural language, without leaving Aprisa
- **Realtime command execution:** Directly run commands suggested by Fuse
- All sources displayed at end of answer

Augments design team expertise and enables rapid ramp-up

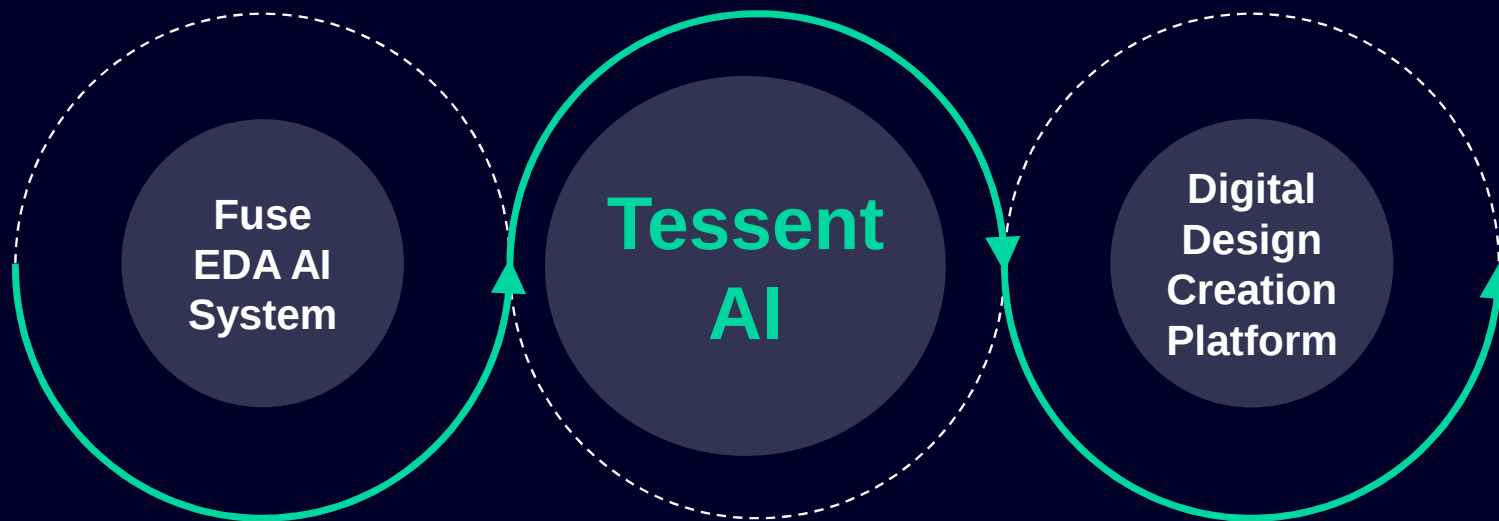
Works directly on design data



Natural language interface

Tessent AI

Tessent AI expands from differentiated ML / RL tools to centralized Gen AI and agentic flows



Core ML / RL: **AI ATPG optimizations** provides fault weighting to reduce test time and test pattern efficiency

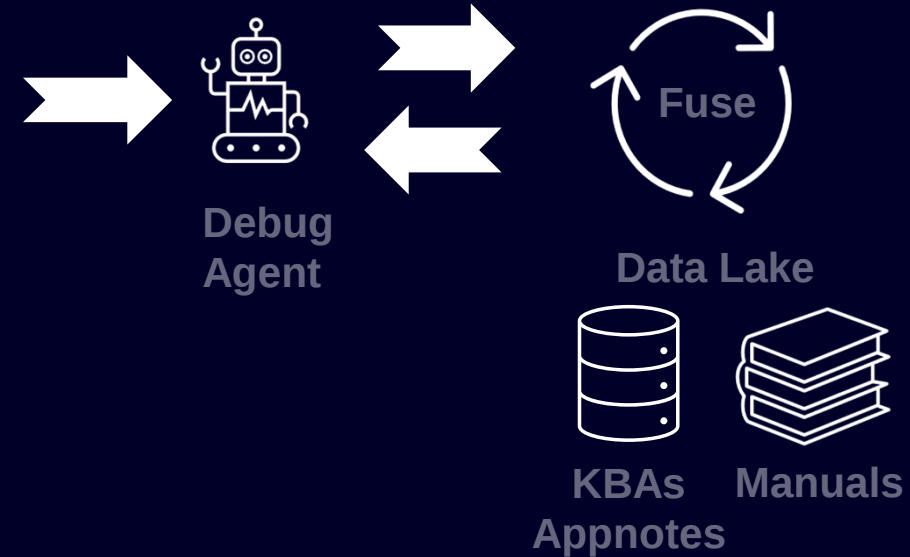
Gen AI: **Fuse integration** boosts productivity, enables rapid ramp up

AI agents deliver detailed DRC feedback and auto DRC fixing

Tessent AI delivers 5X ATPG generation time speed up, and significant reduction in test time

Aid in DFT debug

```
// Begin EDT Finder analyses.
// -----
// === ISO 26262: Tessent TestKompress Pattern Generation
// Finding EDT logic.
// Warning: 1 defined channel input drives no decompressor. (F5)
// Finding internal scan chains.
// Warning: 1 channel output is not driven by a compactor. (F8)
// EDT Finder completed, EDT blocks=2, scan chains=15, CPU time=0.03 sec.
// -----
// Chain = core_gate2_tessent_edt_c10_inst_chain_1 successfully traced with scan_cells = 5.
// Error: clock input of /xtea_0/ts_0_lockup_latchn_clkc1_intno362_i (30118) set to X. (T5-1)
// Error: Scan chain xtea_0_xtea_rtl_tessent_edt_c1_ext_inst_chain_1 blocked at gate /xtea_0/
// ts_0_lockup_latchn_clkc1_intno362_i (30118) after tracing 0 cells. (T3-1)
// Chain = xtea_1_xtea_rtl_tessent_edt_c1_ext_inst_chain_5 successfully traced with scan_cells = 54.
// Error: Rules checking unsuccessful, cannot exit SETUP mode.
// === ISO 26262: None
SETUP> |
```



Traditional method

- Search for error code in documentation
- Determine which set of instructions apply to current design/mode
- Follow instructions - might require running a set of command or tools like Visualizer

With Gen AI agent

- User asks AI debug assistant how to resolve the error
- **Phase I: AI assistant** suggests necessary steps specific to current design/mode. User then follows instructions.
- **Phase II: AI agent** automatically runs some of the commands / tools needed for debugging and presents results

A photograph of three people, two men and one woman, working together in a dimly lit office. They are gathered around a laptop, looking at the screen with focused expressions. The woman is standing and leaning over the two seated men. The overall atmosphere is professional and collaborative.

**AI x Human Engineer =
Massive Productivity Improvement**

Thank you!

For more information about this presentation, please contact
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