Skalierung von industrieller AI für Digital Manufacturing

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With an excellent PhD student and three years of time you can solve almost every challenge

…but how to scale?

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Your examples of scaling AI applications excluding Large Language Models (LLMs)

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Your examples of scaling AI applications

Image processing:

Scaling parameters

- Engineering: zero
- Customization: zero
- Applications domains: many
  E.g. parking, toll, speed…
- SaaS offerings and
  complete solutions with camera
- Error rate close to zero
- If ticket is issued due to
  wrong detection – no safety issue:
  human as backup

license plate recognition system

→ Austria: W 66337 F

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Does your AI Usecase have similar scaling properties?

Time-Series Models ☹

Image-Recognition Models 😐

Large Language Models ☺?

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1 Scaling Strategies

2 Examples

Large Language Models (LLMs): a genius scaling approach for hyperscalers but the “last-mile-problem” remains in the industrial context

Hyperscalers
provide **general** purpose LLMs

AI Solution Providers
(e.g. Siemens)
provide **finetuned**[2)] LLMs and agents

Manufacturer
provide their domain knowledge (RAG[1)])

Applicable as **copilots** for general language tasks incl.programming

Perfect scaling parameters:
- Everybody can use it
- Set-up costs → 0
- Time-to-first-benefit: 30s
- Human-in-the-loop

Model training costs: G€

Applicable as **copilots** for the products of this company

Good scaling parameters:
- Customers can us it
- Set-up costs → 0
- Time-to-first-benefit: 30s
- Human-in-the-loop

Model training costs: M€

Applicable as **copilots** in their domain for design/engineering production/operation…

Scaling parameters:
- Can used it in different factories
- Human-in-the-loop

Augmentation costs: k€

simplified

1) RAG: Retrieval-Augmented Generation

2) E.g: using intensive GPU-power from so-called AI-factories

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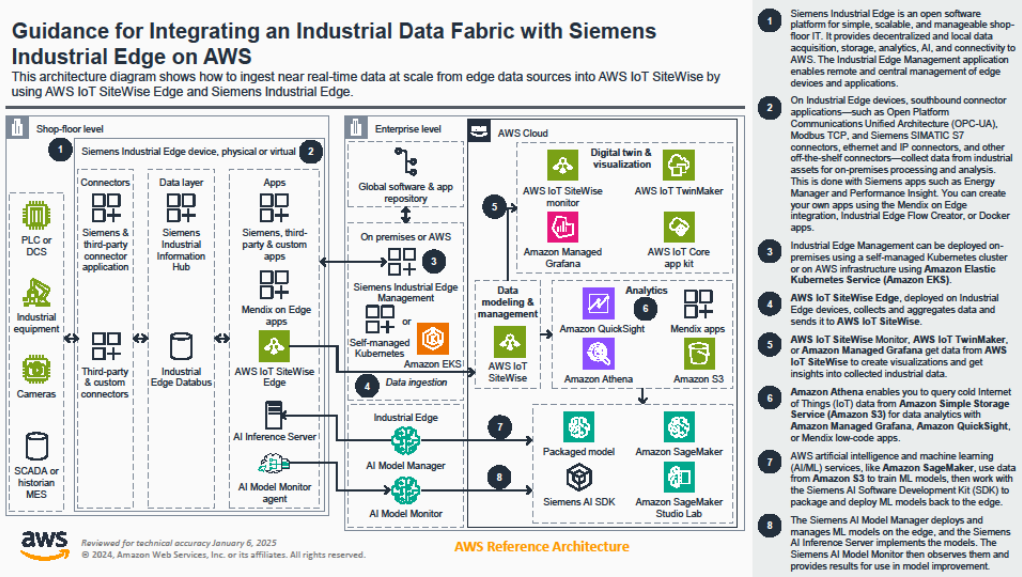
And how will the time-series models scale?

Two scaling strategies for industrial AI (time-series…) : short term and long term

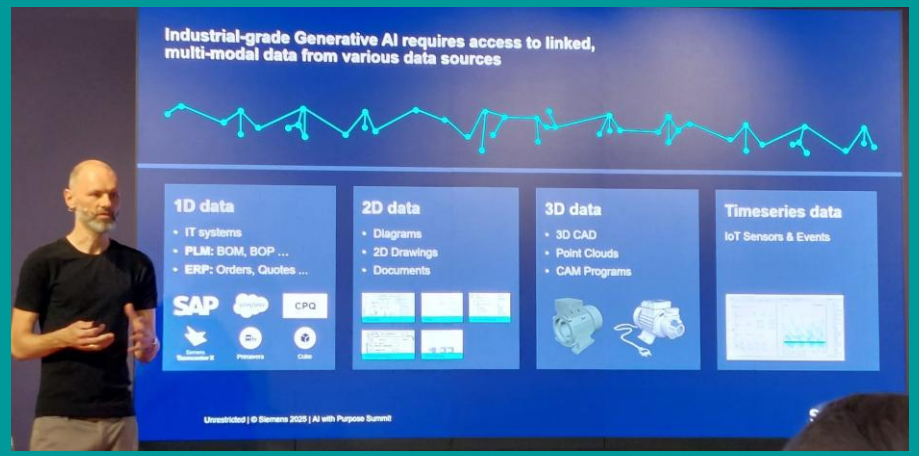
Blueprints

Already available
e.g.: Siemens with Amazon on AWS IDF[1)]



Industrial Foundation Model
"Recharge Europe"

Work in progress



Industry data and context

1) IDF…Industrial Data Fabric

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1 Scaling Strategies

2 Examples

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Benefits of AI in Digital Manufacturing

VIRTUAL
CONCEPT & ENGINEERING

PRODUCTION
DEVELOPMENT

PHYSICAL
MANUFACTURING & OPERATIONS

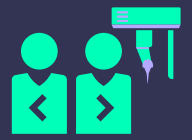
Engineering *productivity*

Reduce expertise and time required for manufacturing engineering, planning and development via Co-Pilots:

Reduce extensive training

Minimize button clicks

Develop production programs with minimal expert Industrial coding knowledge.



Generate, minimize need for code expertise

Optimized production

Reduce downtime and increase productivity using advanced prediction capabilities

Solve complex production problems faster

Predict quality defects

Accelerate troubleshooting and optimized production configuration. Take proactive and corrective action for quality:

Rework and resources optimization

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AI in Siemens Digital Manufacturing Portfolio

VIRTUAL
CONCEPT & ENGINEERING

PRODUCTION DEVELOPMENT

PHYSICAL
MANUFACTURING & OPERATIONS

MANUFACTURING BOM

SERVICE BOM

PROCESS ENGINEERING

Bill of Process (BOP)

Part manufacturing

Assembly planning

Recipe management

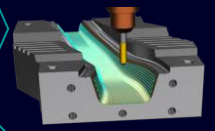
Factory / Asset Bill of Equipment (BOE)

Production simulation

COMMISSIONING

Process simulation and validation

Work instructions and orders



PRODUCTION / EXECUTION

Production planning and scheduling

Research and lab management

As-built

As-maintained

Analytics and intelligence

Service planning

Service execution

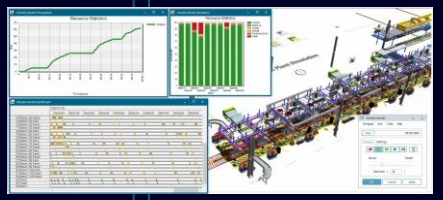
Quality planning

Quality execution

Supply chain / logistics planning

Supply chain / logistics execution

USAGE / OPERATION



Factory maintenance

Field service

DECOMMISSIONING

Available AI capabilities

Innovation Roadmap

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Tecnomatix Process Simulate Copilot

Challenge

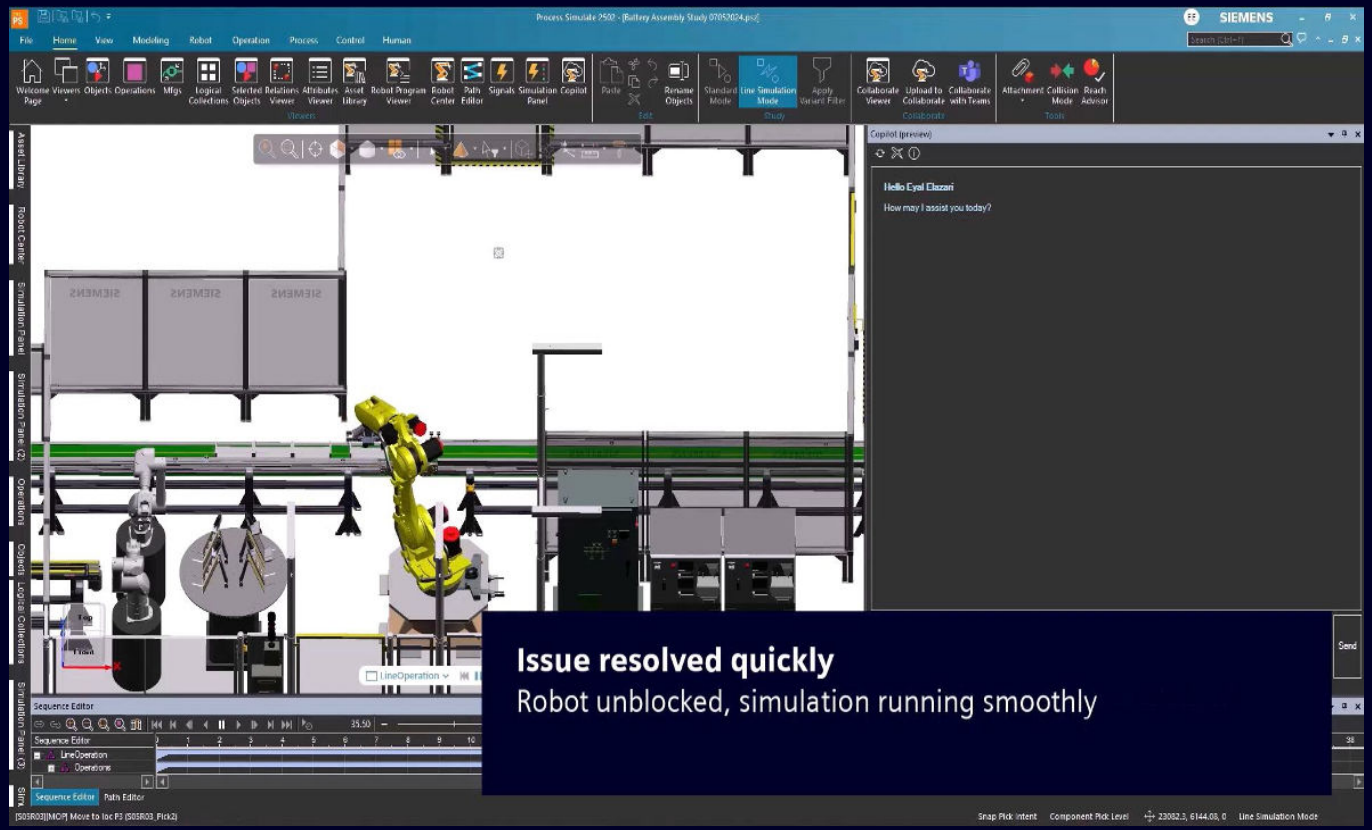
- Optimized Efficiency: Faster, more accurate troubleshooting in manufacturing.
- Simplified Analysis: Easier simulation study and data evaluation.

Solution

- Leveraging Generative AI (LLM), it analyses simulation data to provide insights, streamline troubleshooting, and suggest optimizations.

Benefit

- Enhanced Efficiency: Boosts productivity with quick, data-driven insights.
- Optimized Operations: Identifies and resolves issues for better performance.



Preview

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Tecnomatix Process Simulate Collaborate Ergonomics

Challenge

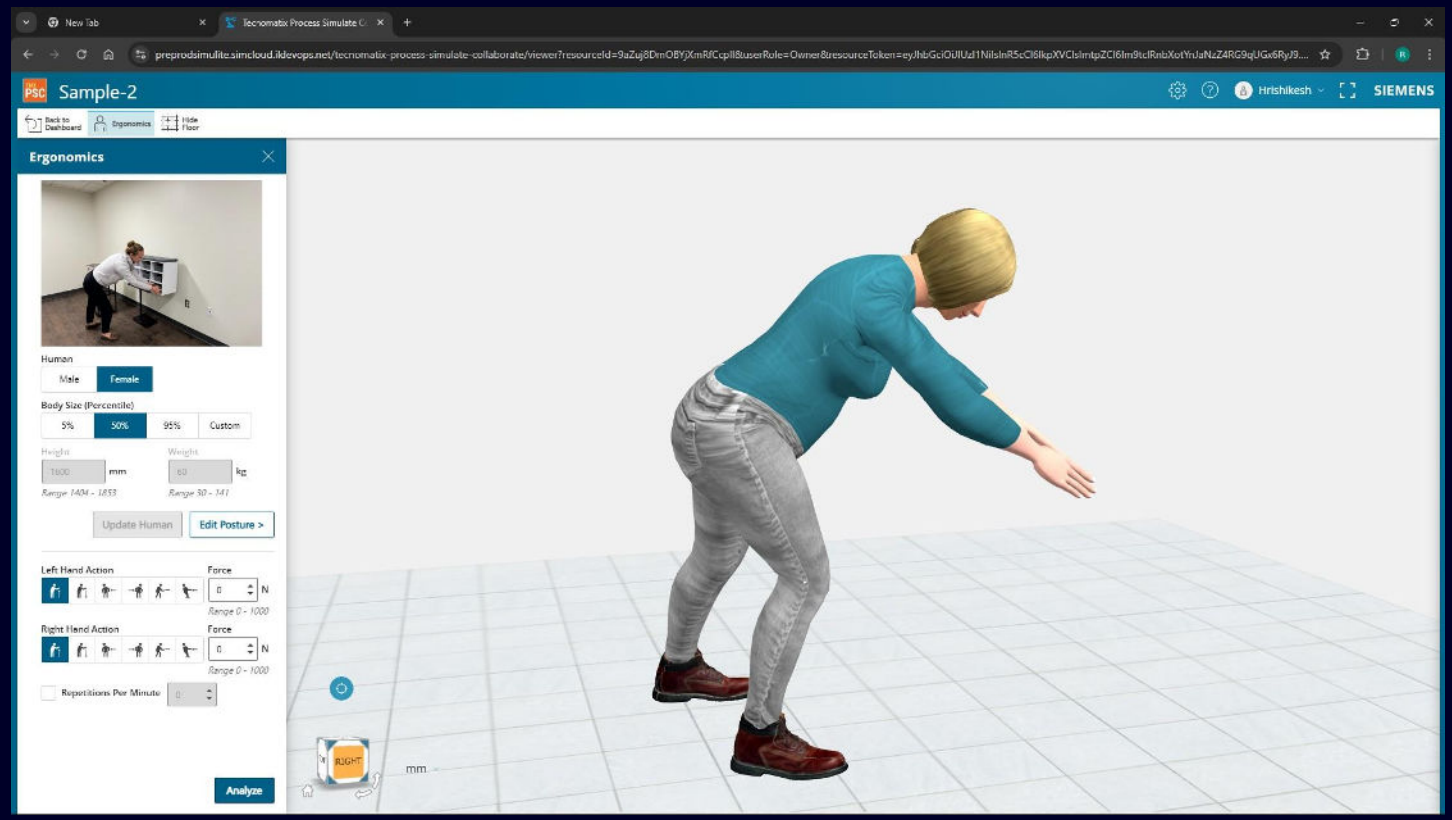
- Accurate 3D posture modelling is vital for valid ergonomic analyses but can be time-intensive & requires expertise.

Solution

- An AI-based tool to automatically generate 3d human poses from a basic photograph

Benefit

- Advanced posture modelling with minimal time and effort.
- Instant access to detailed results online.



Link to Learn more

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Teamcenter Copilot

Challenge

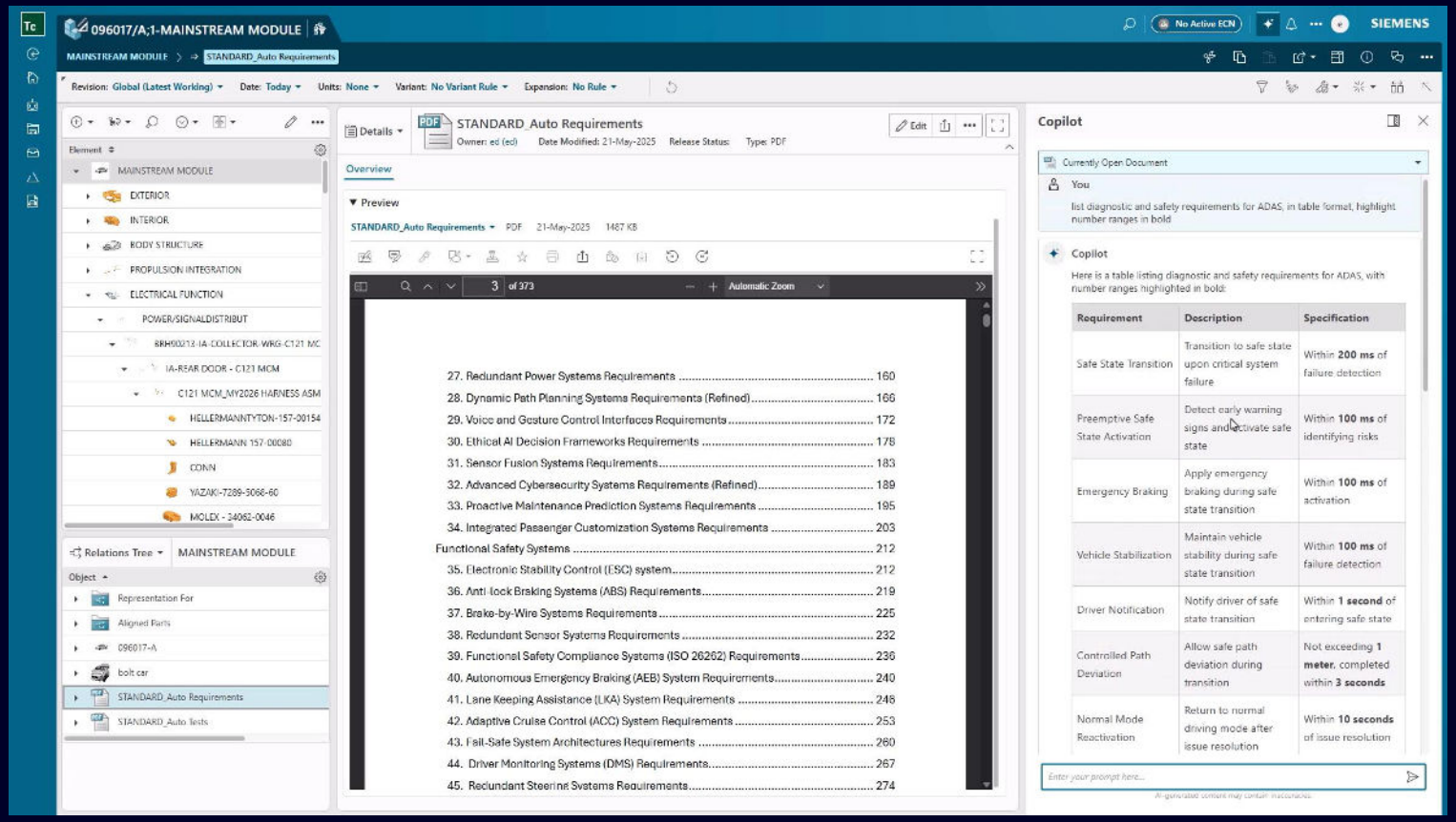
- Searching for information
- Analyzing dense documents

Solution

- Teamcenter Copilot brings document intelligence, BOM exploration, and conversational search into a single, intuitive interface
- Fast, intelligent, context-aware assistance
- Secure, integrated, and grounded in your data

Benefit

- Improve engineering productivity



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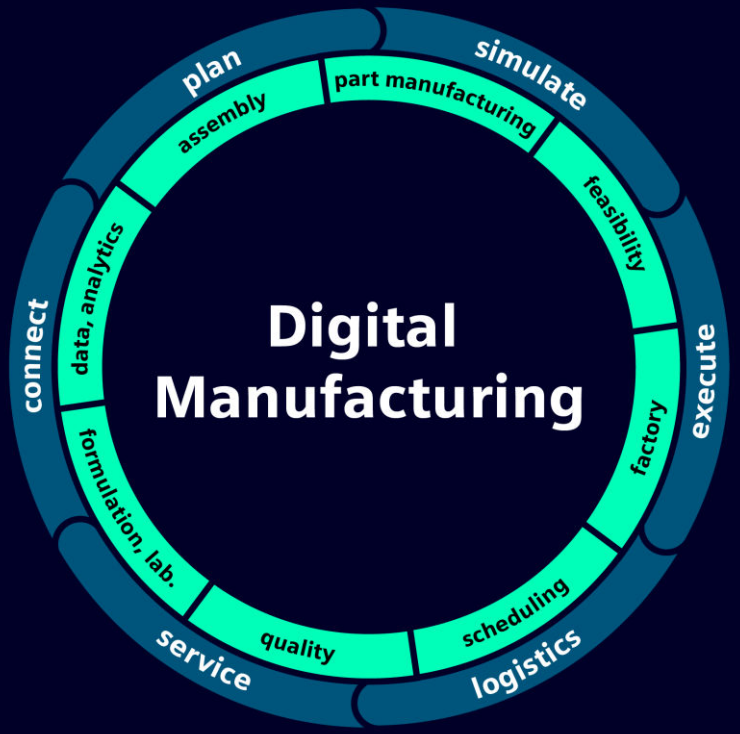
Contact



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