



AI with purpose at Siemens – rationale, use cases & exploration opportunities

Excellence Forum, October 10th, 2023

New York City, June 2023



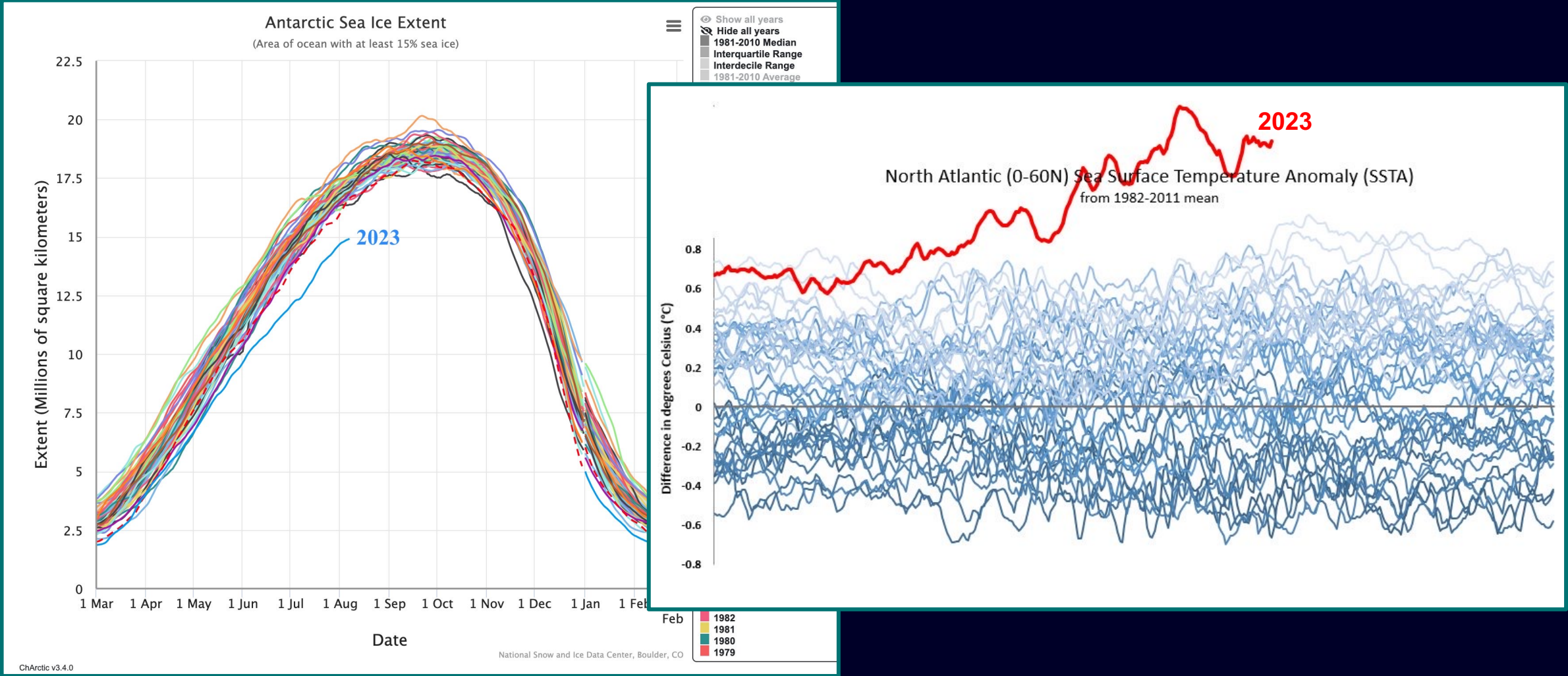
Source: CNNWire / abc7.com

Libya, September 2023



Source: The New York Times

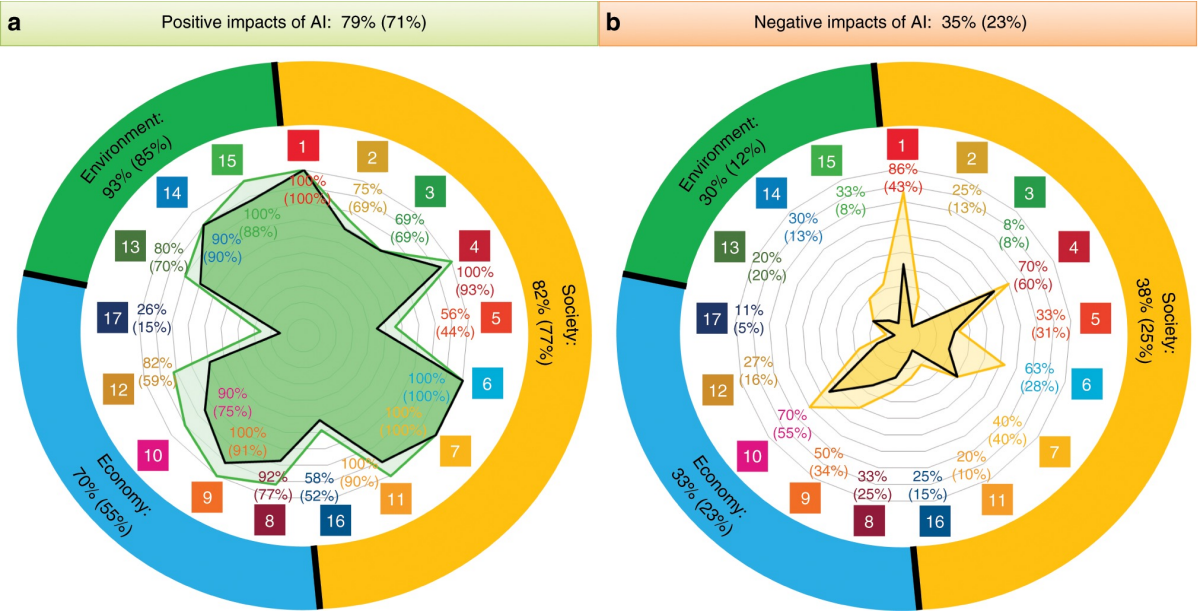
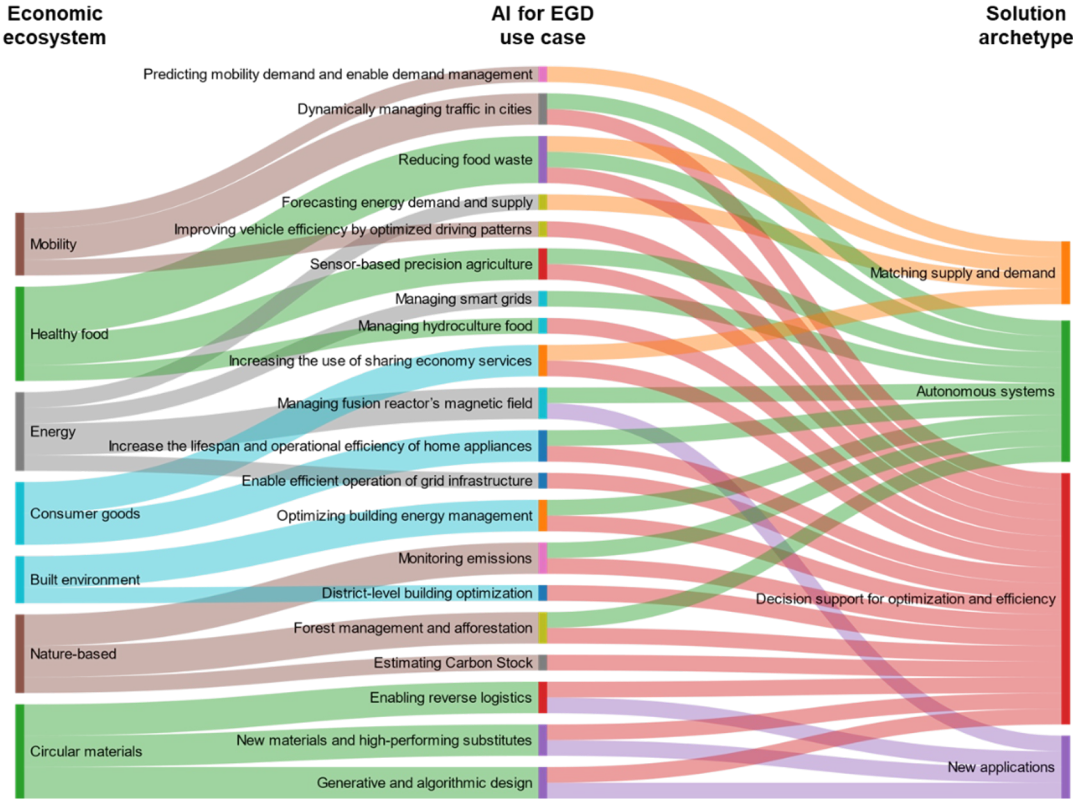
Extreme outliers in the antarctic sea ice coverage and the Atlantic's surface temperature



Source: climatoreanalyzer.org, by Climate Change Institute, University of Maine

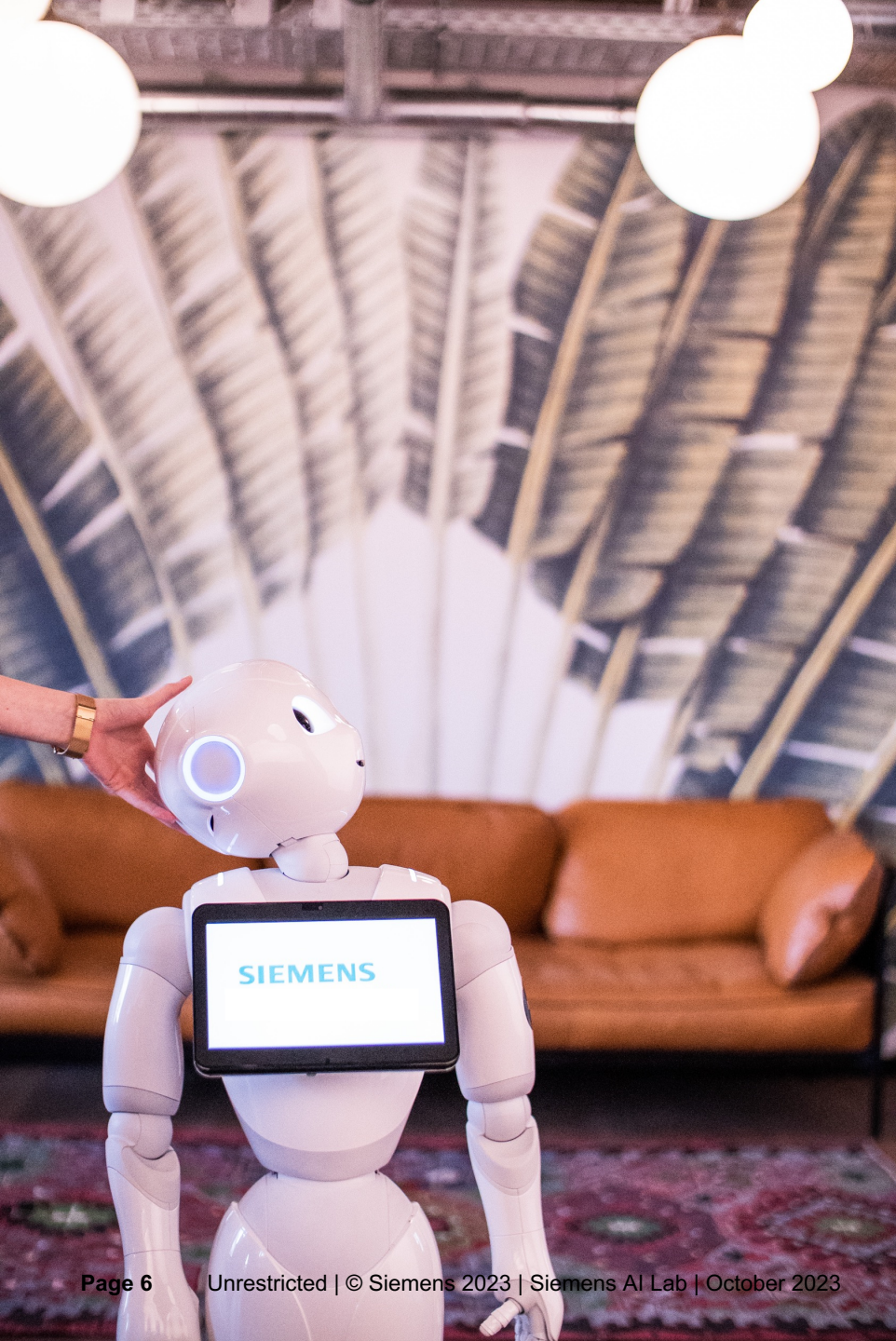


Big hopes: AI could significantly contribute to solve sustainability challenges



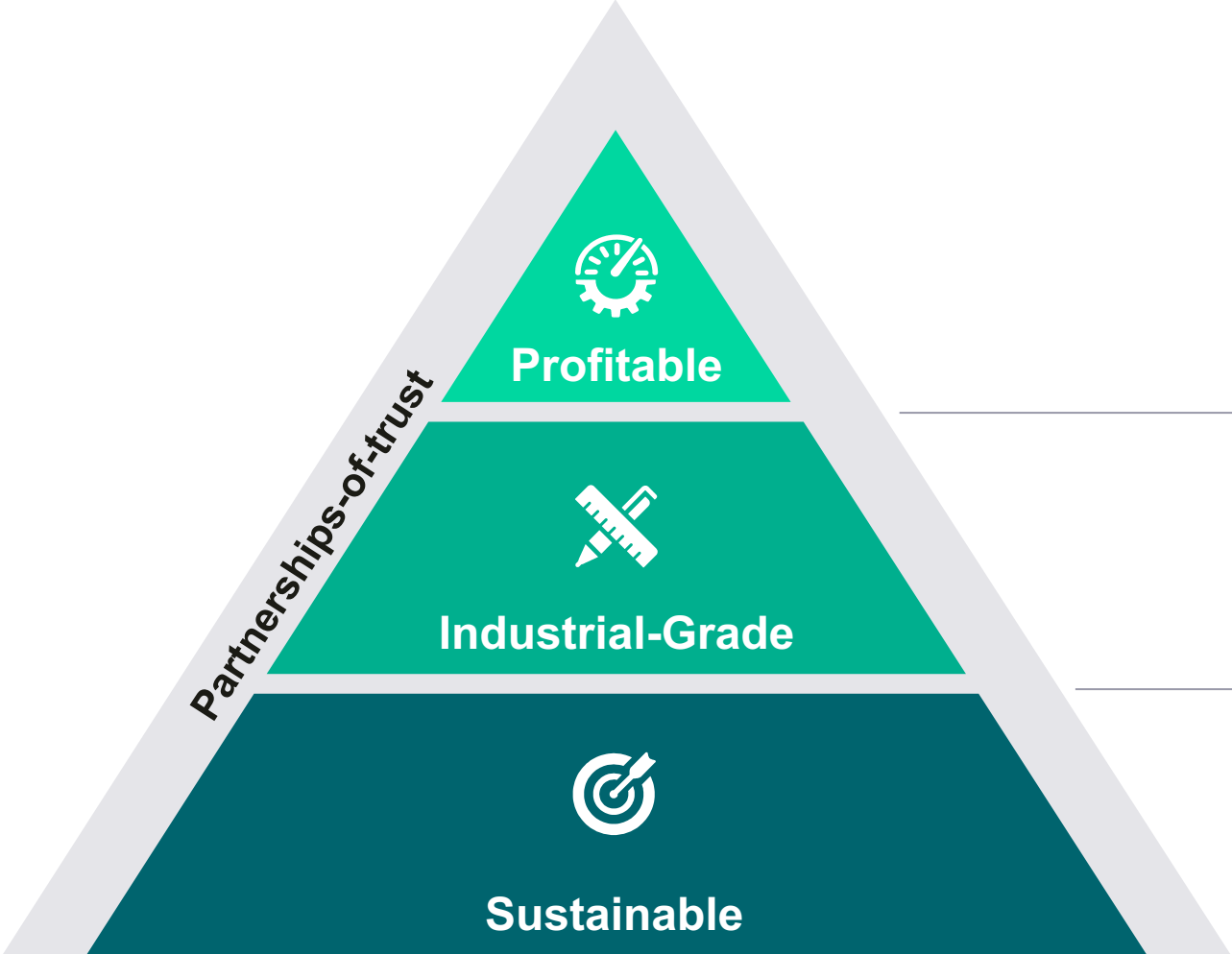
Source: How to leverage AI to support the implementation of the European Green Deal, AppliedAI & Systemiq, 2022





**So, what can
AI@Siemens
contribute to
save the world?**

"AI with purpose": Three layers embedded in a trusted ecosystem



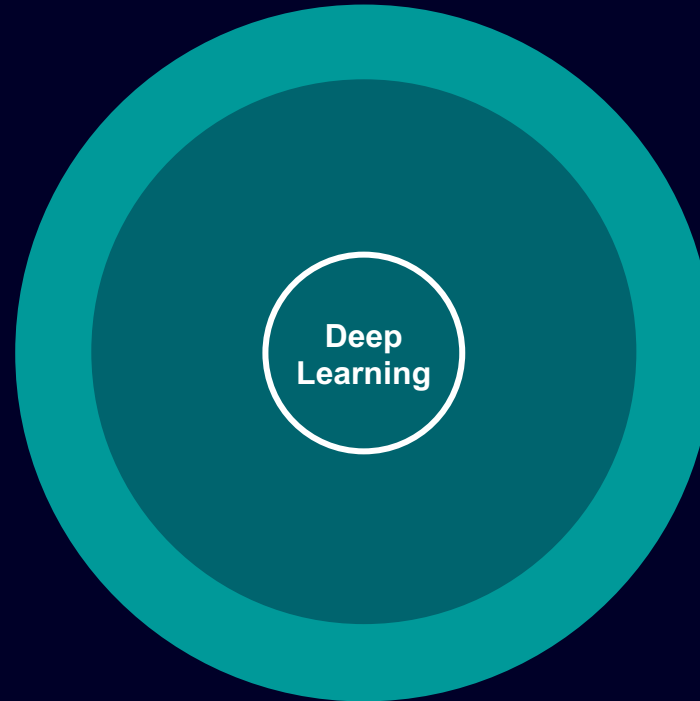


**Pick your
AI choices
with caution!**

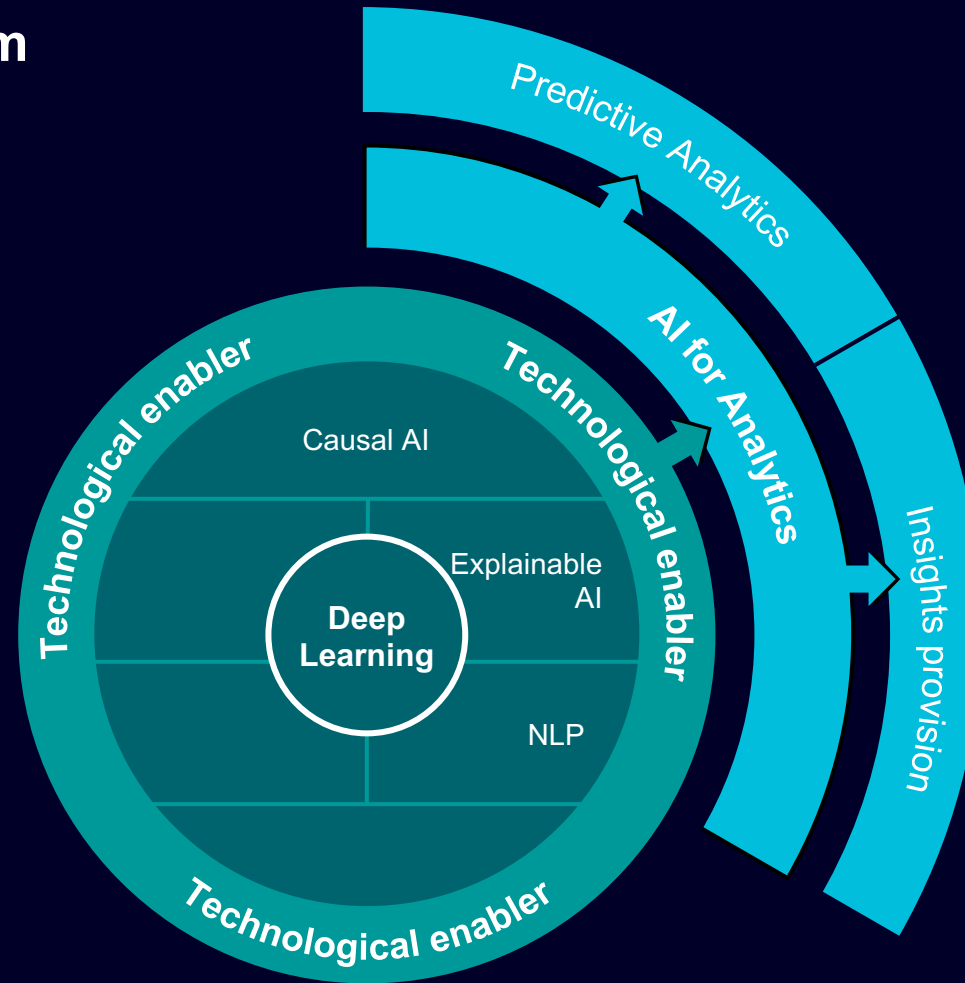
**A brief history of the recent
developments of AI**

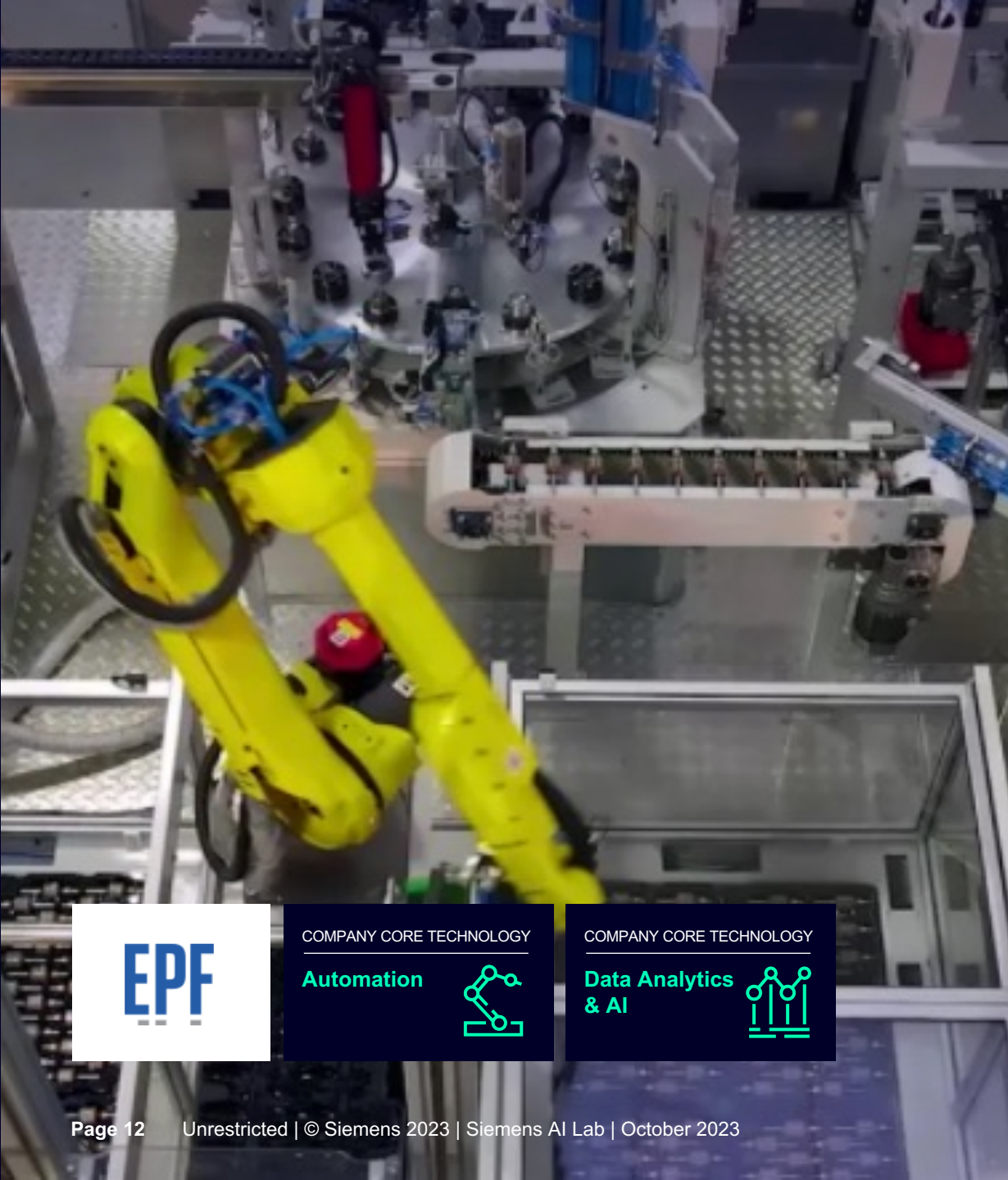
Deep Learning

The technological driver behind most AI applications in the last 10 years has been Deep Learning



AI for Analytics is the mainstream application area of Industrial AI





E.P.F. Elettrotecnica, ITALY

Enhanced manufacturing quality through AI in automotive industry

Customer challenge

- Visual quality inspection of surface structure
- Grouping into **four different classes**
- Copper particles emerging during production

• Solution

- NPU integrated into existing automation system
- Data-based, automated quality classification

• Customer benefit

- 80% reduction of manual quality control effort
- Accuracy of failure detection by up to 100%
- Retrofit: fast integration of AI into existing automation

Source: <https://de.references.siemens.com/reference/?id=/data/Record-15211.xml&searchtext=E.P.F.&sortBy=LastModificationDate>

EPF

COMPANY CORE TECHNOLOGY

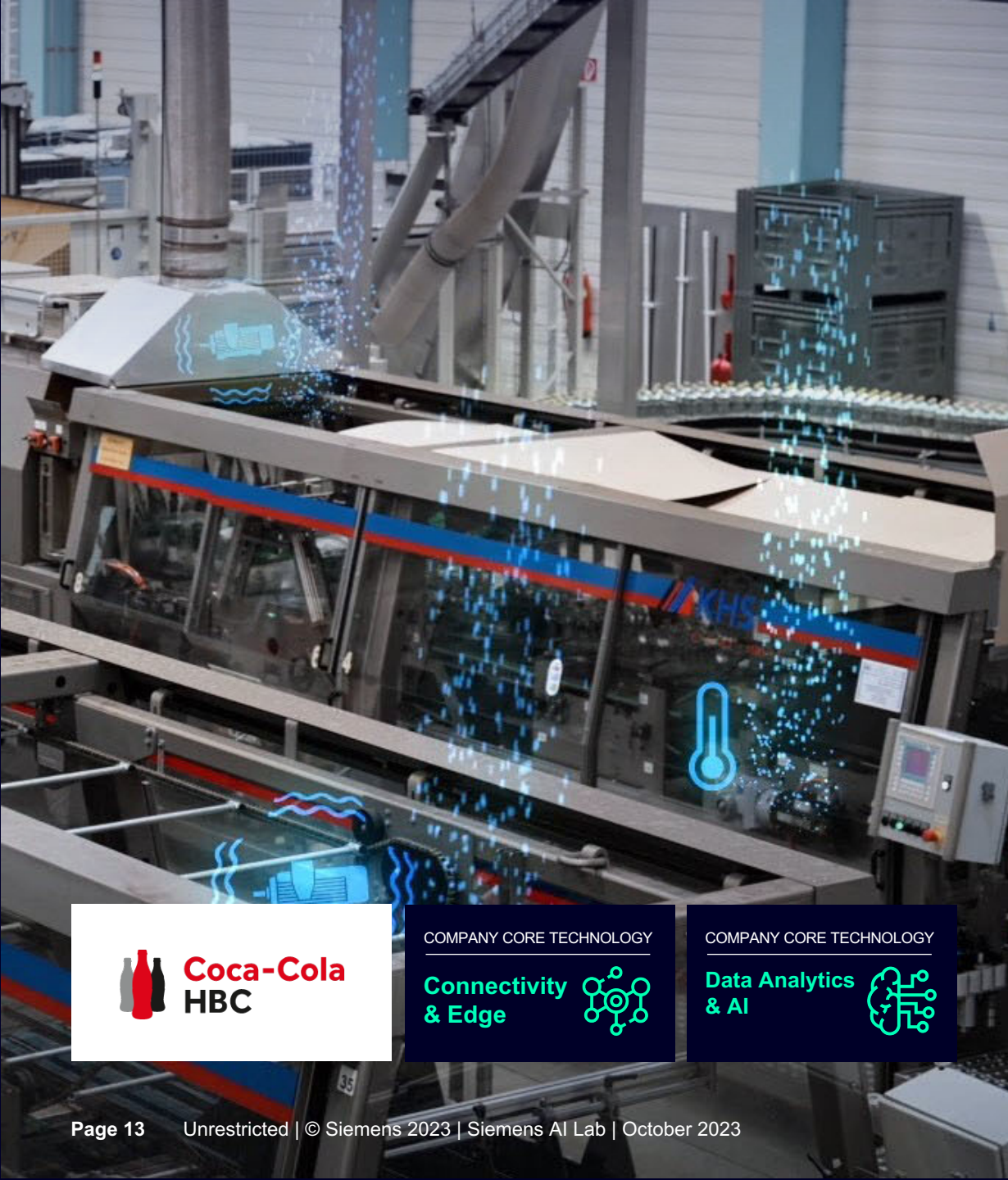
Automation



COMPANY CORE TECHNOLOGY

Data Analytics
& AI





COCA-COLA HELLENIC BOTTLING COMPANY

Turning data into value with Smart Condition Monitoring

Customer challenge

- Early state detection of imminent equipment failures
- Prevent potential plant downtimes in bottling production
- Improve planning of maintenance and spare part inventory

Solution

- AI-based anomaly detection
- Smart condition monitoring solution
- Multisensors on mechanical equipments
- Cloud connection to ensure holistic monitoring 24/7

Customer benefit

- Reducing line downtime by 2% → RoI after 6 months
- Increased transparency of asset condition



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Connectivity
& Edge



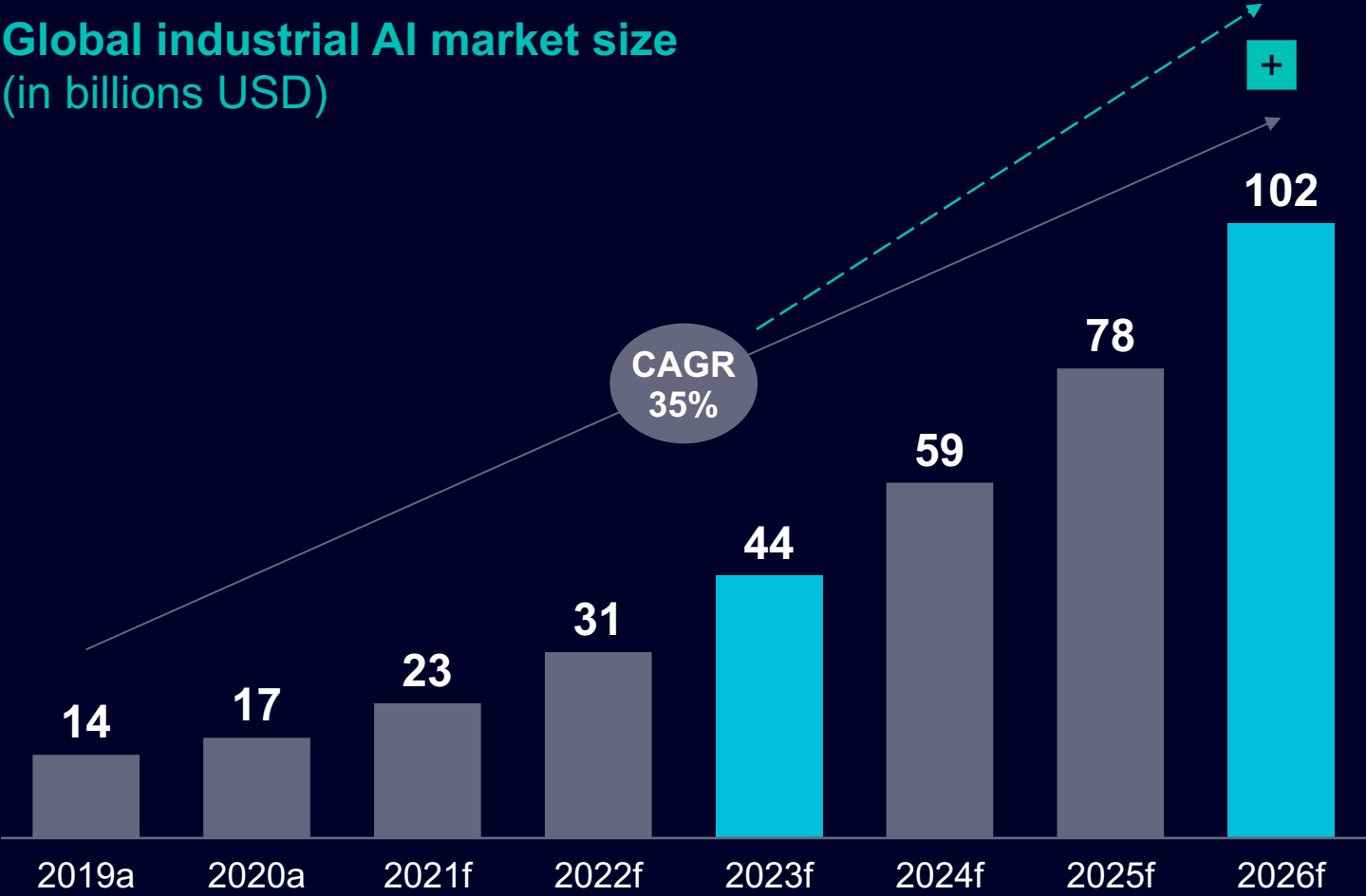
COMPANY CORE TECHNOLOGY

Data Analytics
& AI



Huge market expectations are further fueled through expected Generative AI booster

Global industrial AI market size (in billions USD)



Pending assessment: market booster by +10% through recent LLM breakthroughs?

Possibly: defragmentation of market and use case landscape?

Potentially: markets structures per specific industry domains?

Source: IOTAnalytics, BCG

Innovation has always been our lifeblood –
AI is core in our company's technology portfolio

Siemens invests in the future

Research and
Development

€5.6 bn
R&D expenditures¹

1,400

AI experts (therein
250 AI researchers)

Ingenuity drives
innovation

4,650
Inventions¹

>500

Active AI patent
families

Market
leadership

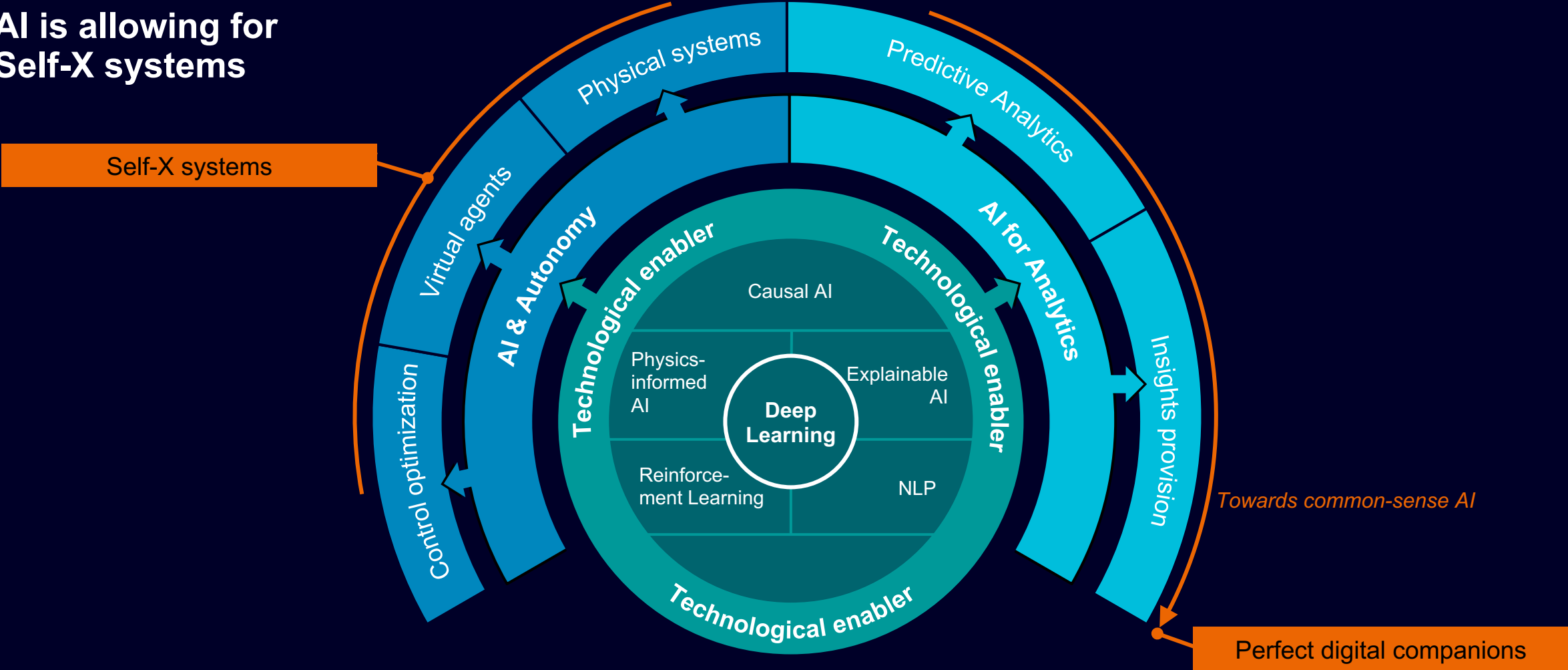
#1
in Automation
in Industrial Software

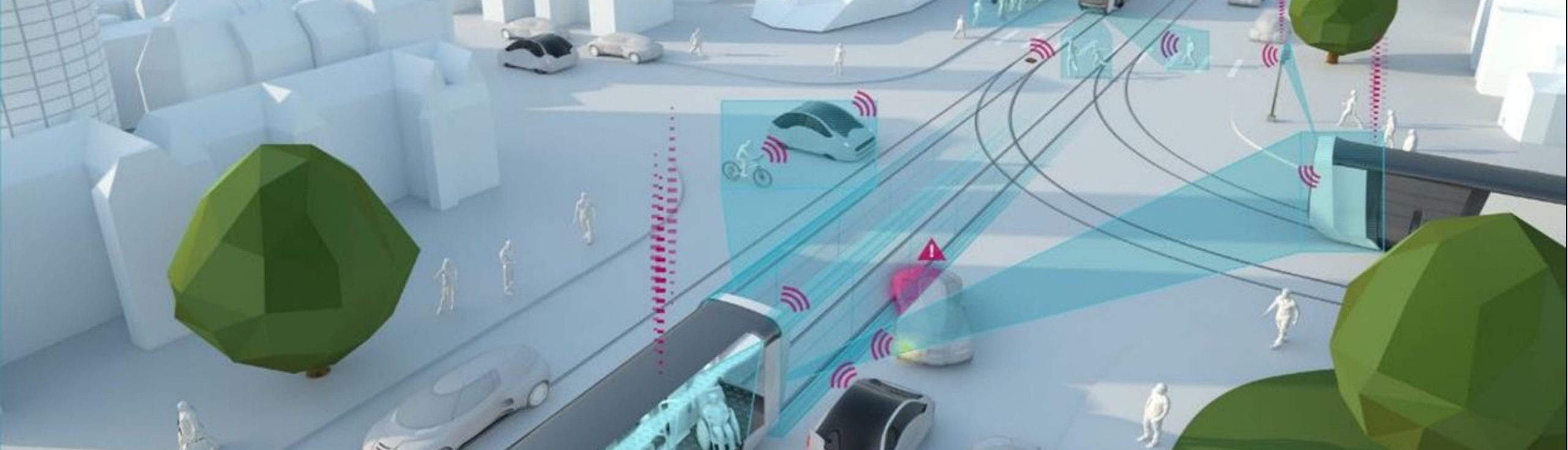
28

Years of experience
of selling AI solutions

¹ In fiscal 2022

AI is allowing for Self-X systems

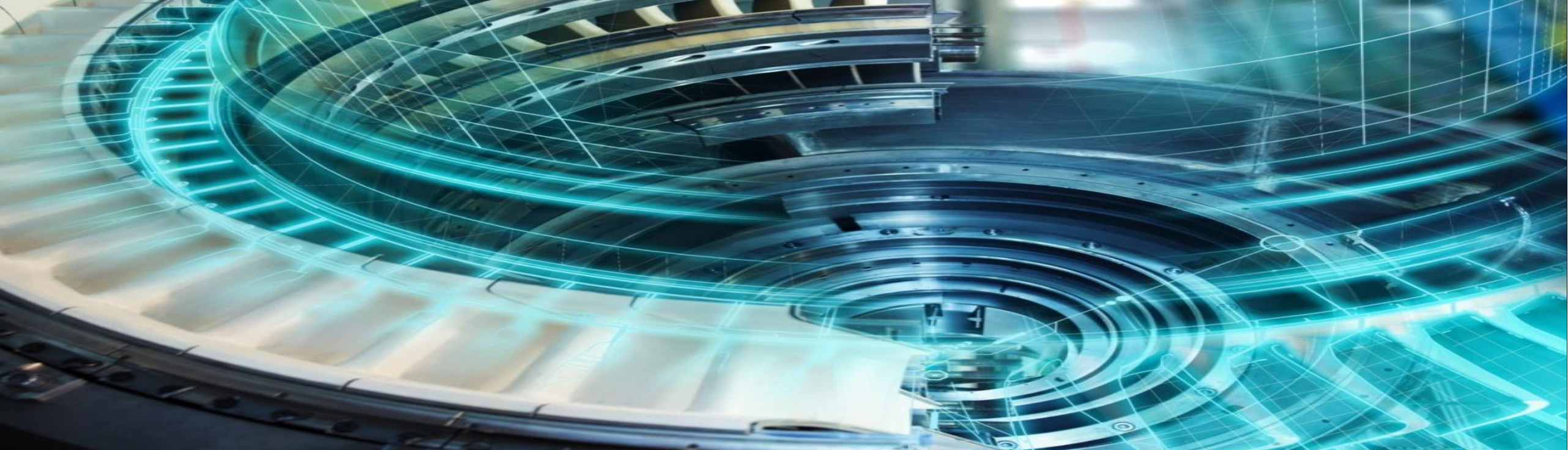




TrainBrain – assisted and driverless driving in rail



Restrictions that become innovation opportunities

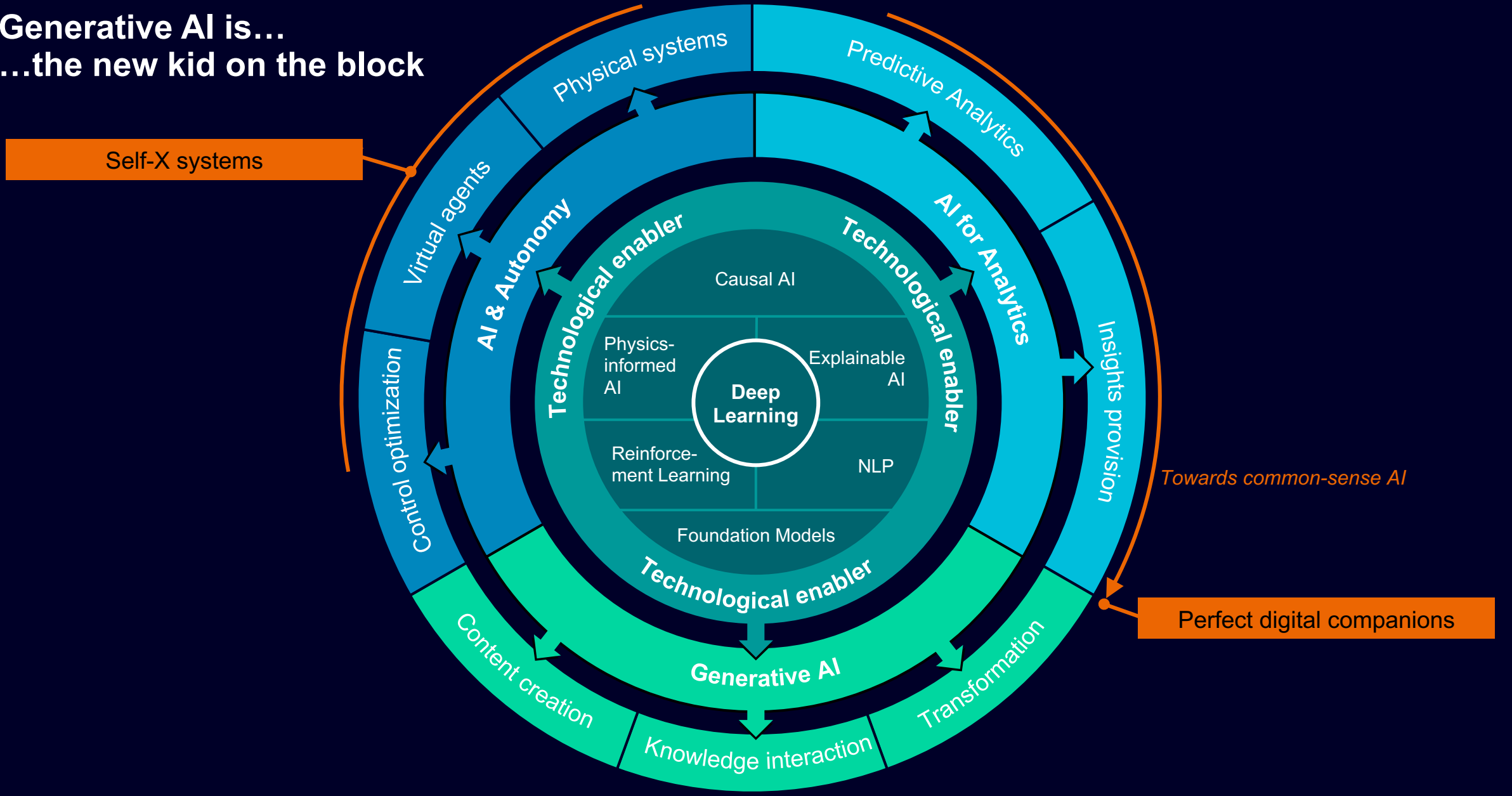


Self-learning Gas Turbines



Unleashing reinforcement learning in strict limits of authority

Generative AI is... ...the new kid on the block



Demo of TIA/AX Copilot to Premier Li Qiang together DI FA and T



The collaborative power of Generative AI to help industrial companies drive innovation and efficiency across the design, engineering, manufacturing and operational lifecycle

1



Error reporting

Add a change request to Teamcenter



2



Industrial automation maintenance

Find the error in an automation solution and get suggestions on how to fix it

3



Industrial automation engineering

Generate, optimize and debug PLC code



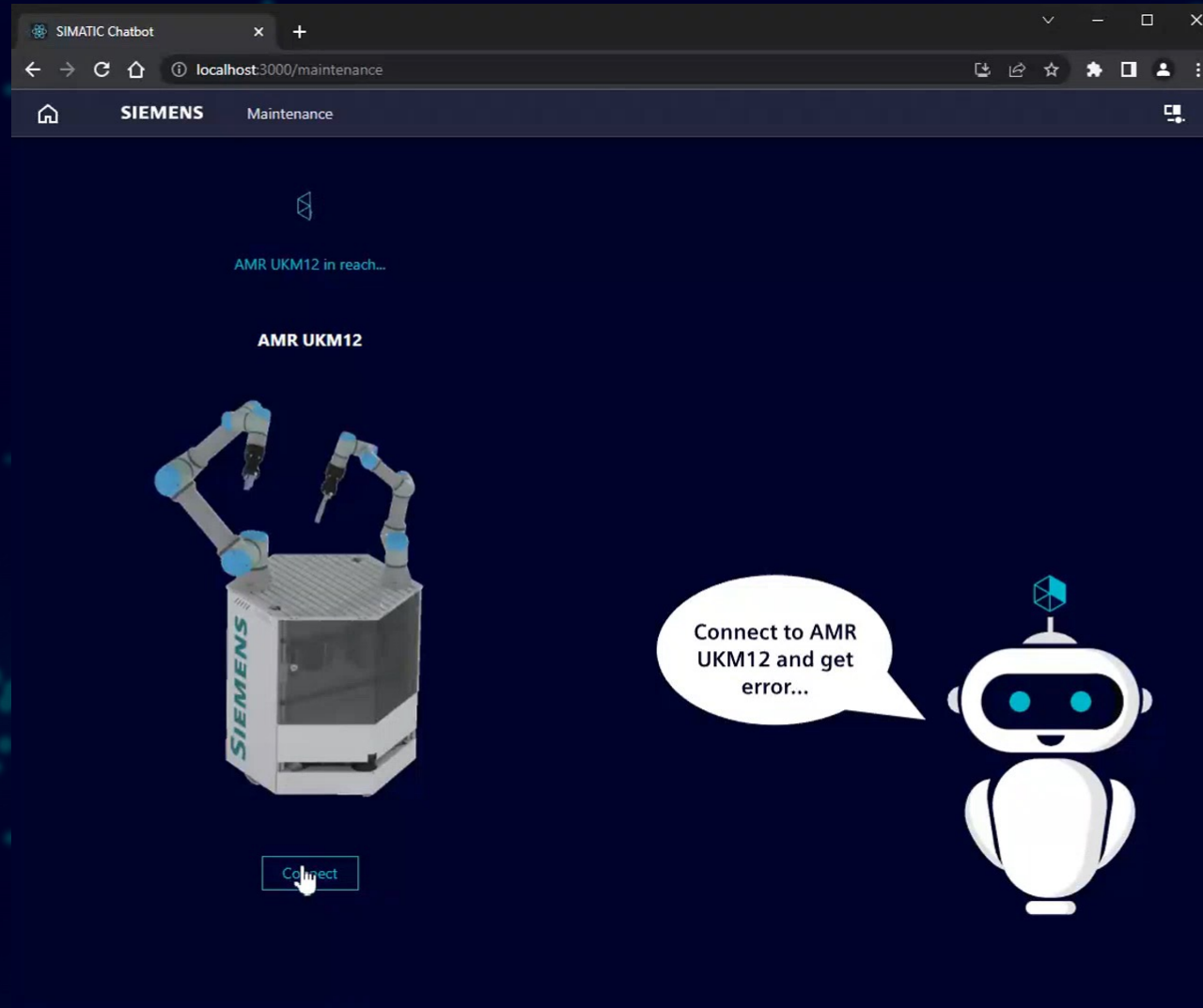
Industrial AI Copilot: When Generative AI meets Industrial AI with the power of partnerships and a single Foundation Model for 9 different tasks at scale

- 1 Speech-to-Text:**
Speech Recognition for Indonesia
- 2 Text Translation:**
Translating Indonesian to English
- 3 Text Summarization:**
Summarizing the service request
- 4 Service Ticket Structuring:**
Structuring the service request
- 5 Question Answering:**
Answering service questions
- 6 Instruct Generation:**
Generating service instructions
- 7 Code Generation:**
Generating PLC code from text
- 8 Code Optimization:**
Optimize existing PLC code
- 9 Code Documentation:**
Document existing PLC code



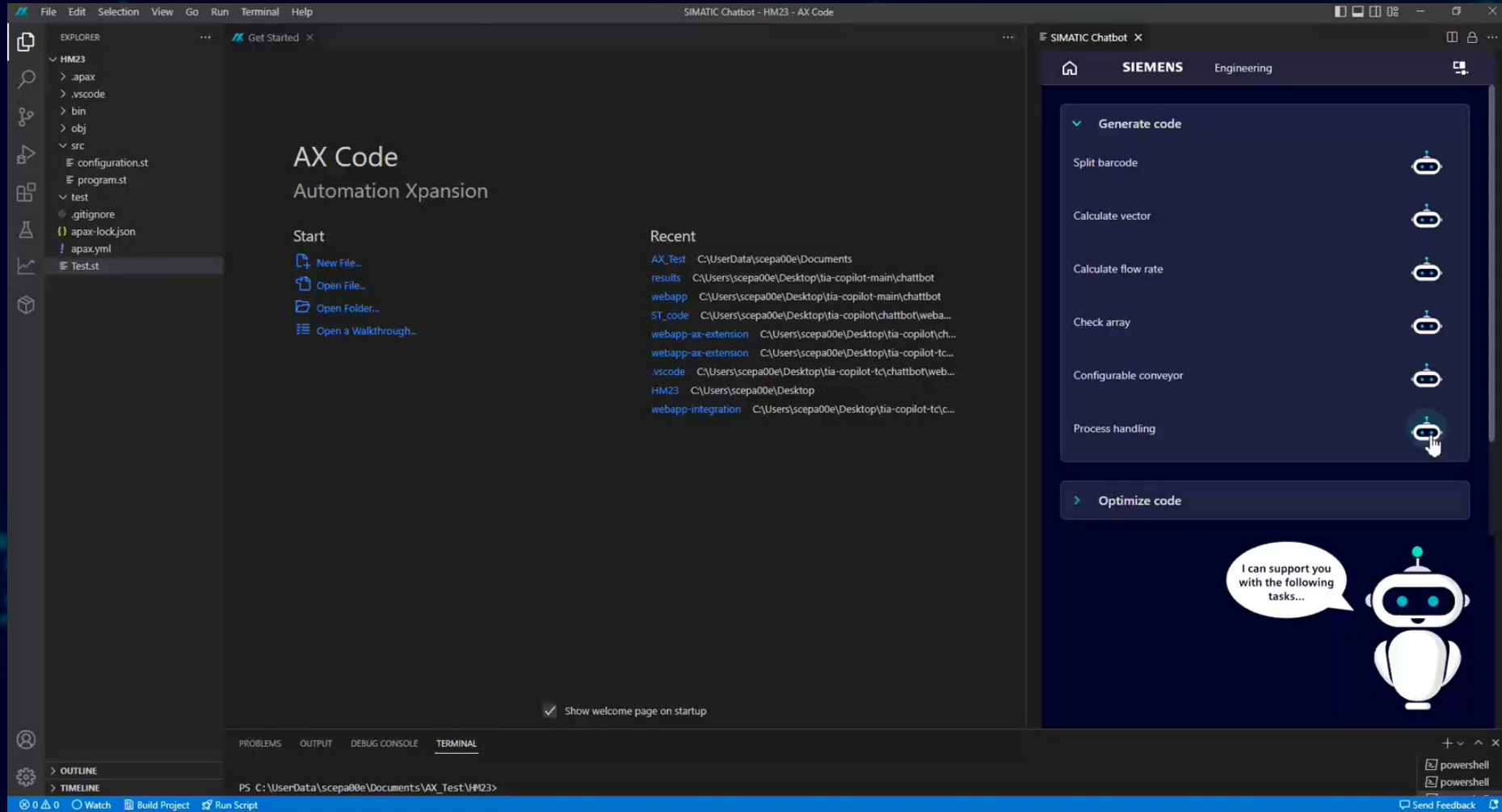
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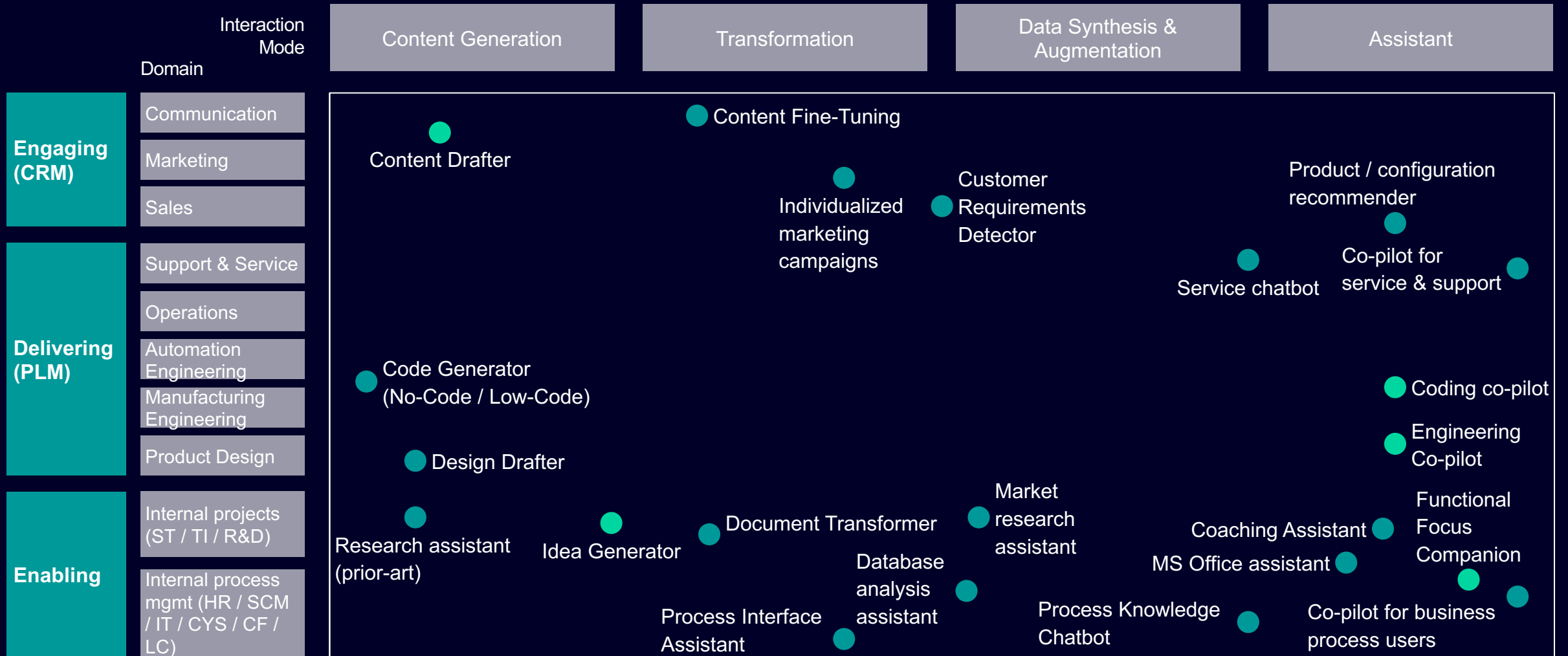


Industrial AI Copilot: When Generative AI meets Industrial AI with the power of partnerships and a single Foundation Model for 9 different tasks at scale

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Framework for use case landscaping



Available Offerings leveraging GPT for Siemens in compliant and secure way



Current IT-Offering

- **All: Playground** access to ChatGPT (3.5 / 4.0)
- **Experts:** API access to develop GPT-based apps / finetuning for sophisticated, high-performance cases
- **ACP2-rated Platform** to work with **confidential data**



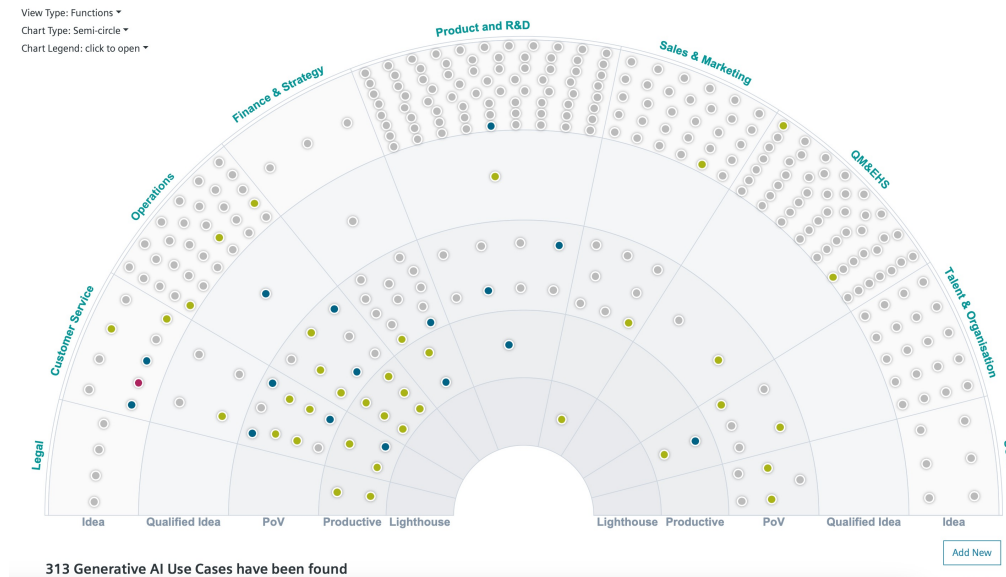
OpenAI at Siemens

People educated incl. “Open AI in a Day”

>5,000

Users reached with Siemens-internal Open AI Services

>11,500

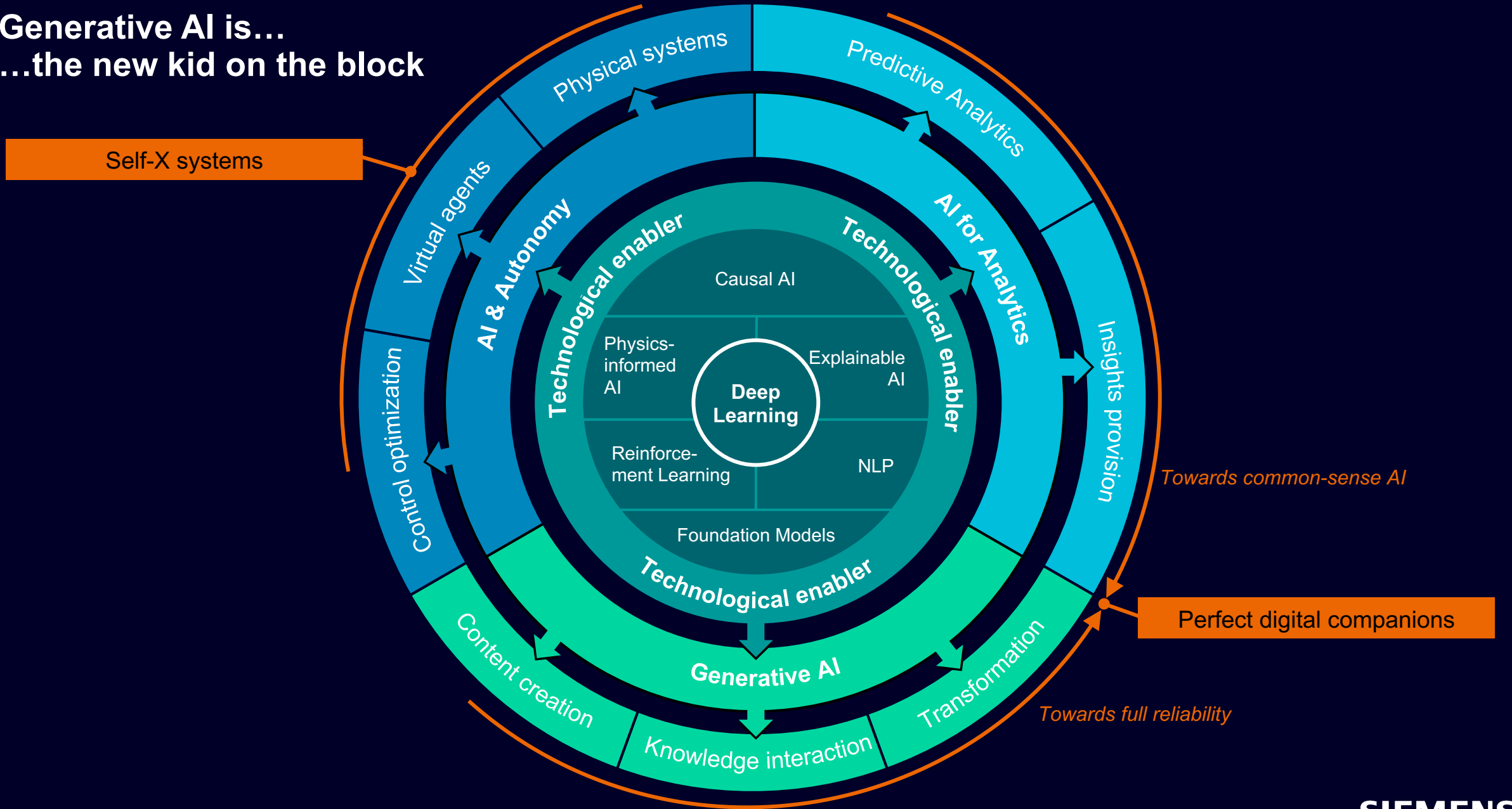


The prompt resonating

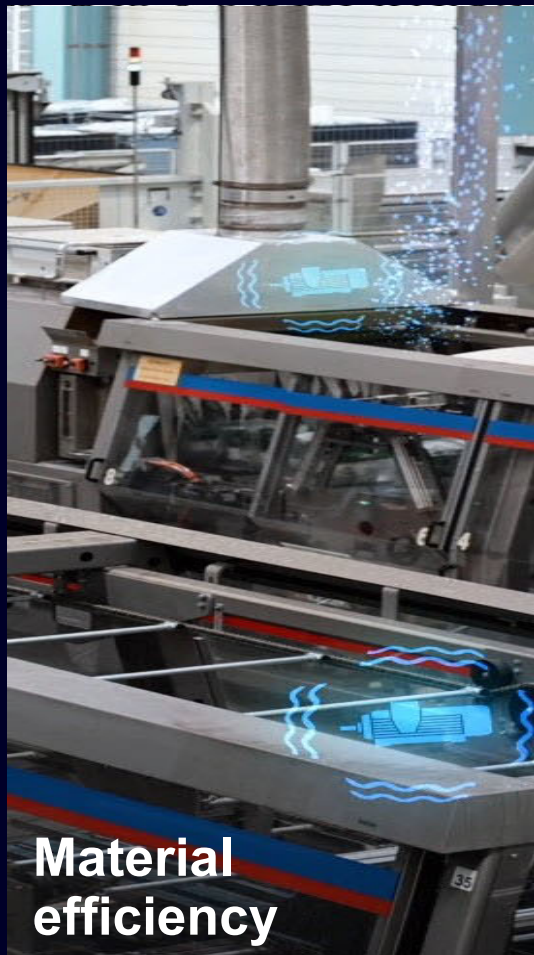
ChatGPT & Co. as emerging focus topic within #SiemensAI

- Creating awareness
- Collecting use cases
- Drafting strategy
- EXPLORE!

Generative AI is... ...the new kid on the block



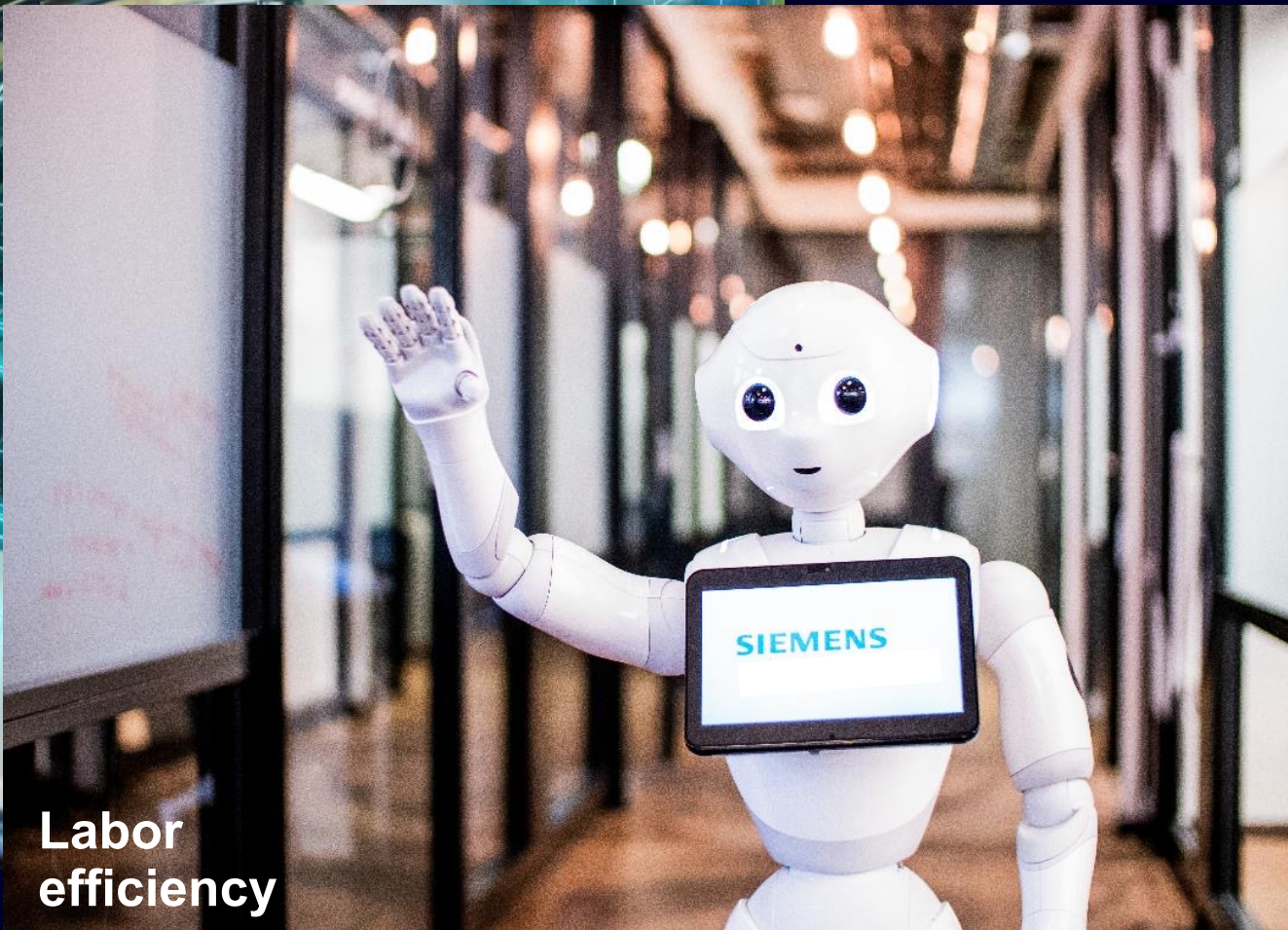
AI is the biggest efficiency driver since the invention of letterpress printing



**Material
efficiency**



**Energy
efficiency**

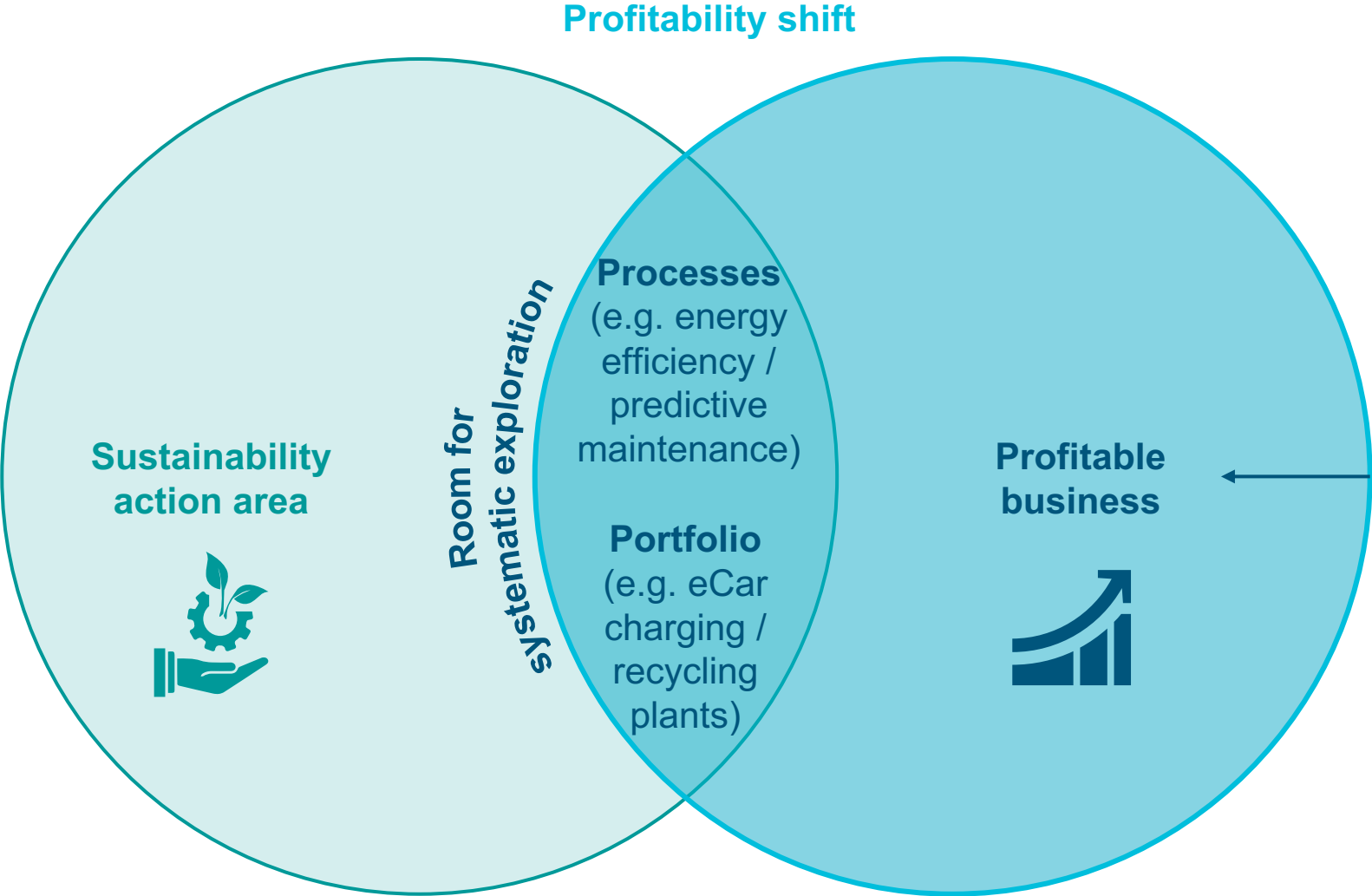


**Labor
efficiency**



**Yes, AI might
help to save the
world!**

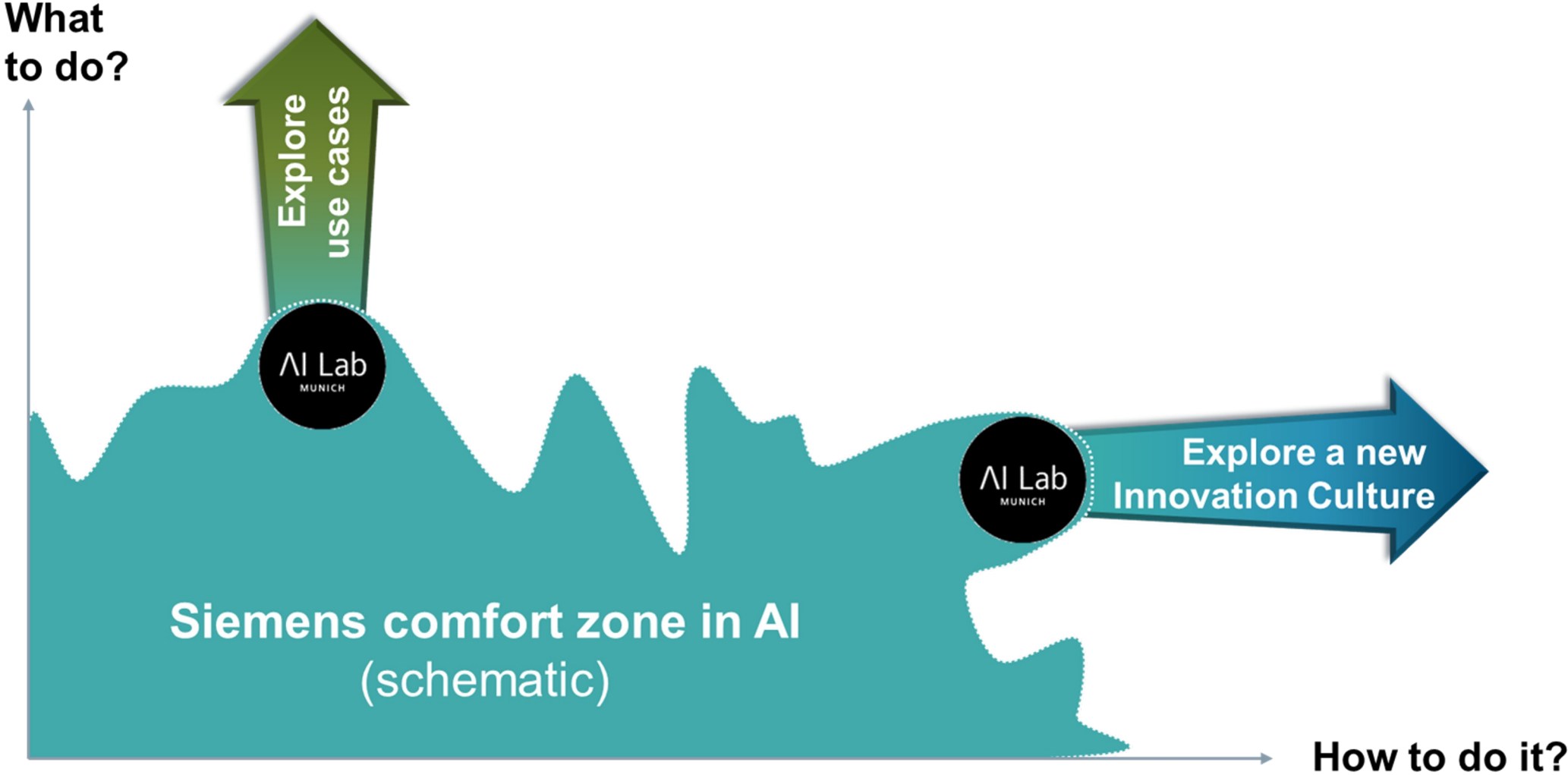
Sustainability and profitability are converging



Areas of profitability moves towards sustainable realms due to...

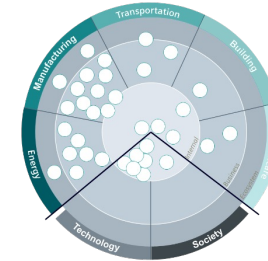
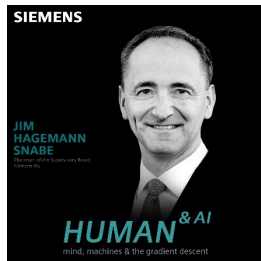
- Collective Awareness
- Emerging & increasing regulations
- Customer requests
- Pressure by investors
- Political willingness towards geostrategic independency

Through the AI Lab, we aim to stretch our comfort zone!



Engagement is easier once we are already known to our target groups

Attraction focus			Innovation focus		
Develop AI narratives <ul style="list-style-type: none"> Responsible AI Sustainable AI Future of Work 	Shout out #SiemensAI <ul style="list-style-type: none"> Meet-ups, podcasts, TOM, conferences, ... 	Engage with target groups <ul style="list-style-type: none"> Trainings, hackathons, showcases, ... 	Understand opportunities <ul style="list-style-type: none"> Orientation sessions to find AI use cases 	Validate AI hypotheses <ul style="list-style-type: none"> Acceleration projects for early PoCs 	Implement & Scale <ul style="list-style-type: none"> Impact: >200' € ...



Increase **#reach** to most relevant target groups

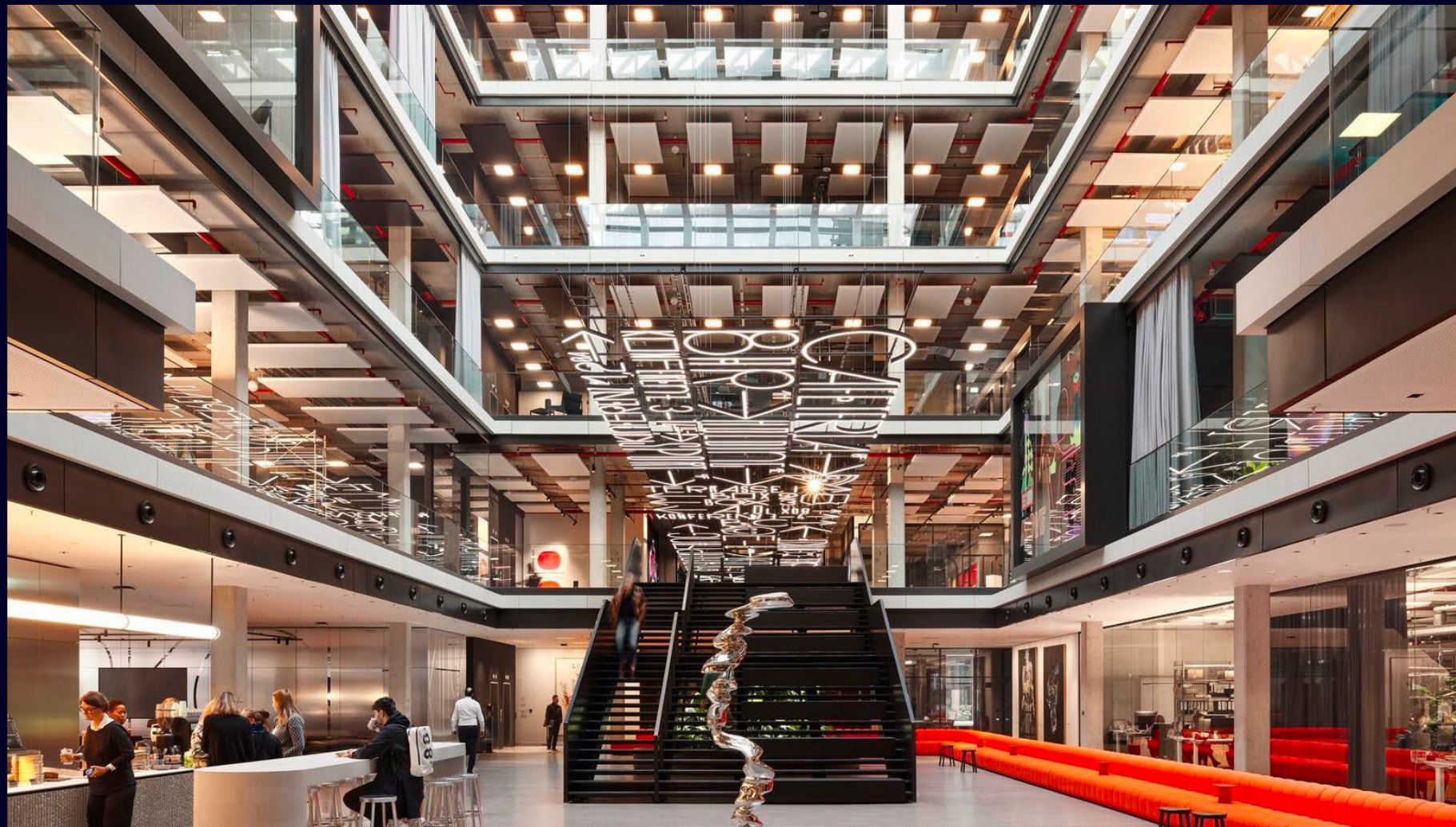
Drive **#leads** with business potential

#bold & **#purposeful**

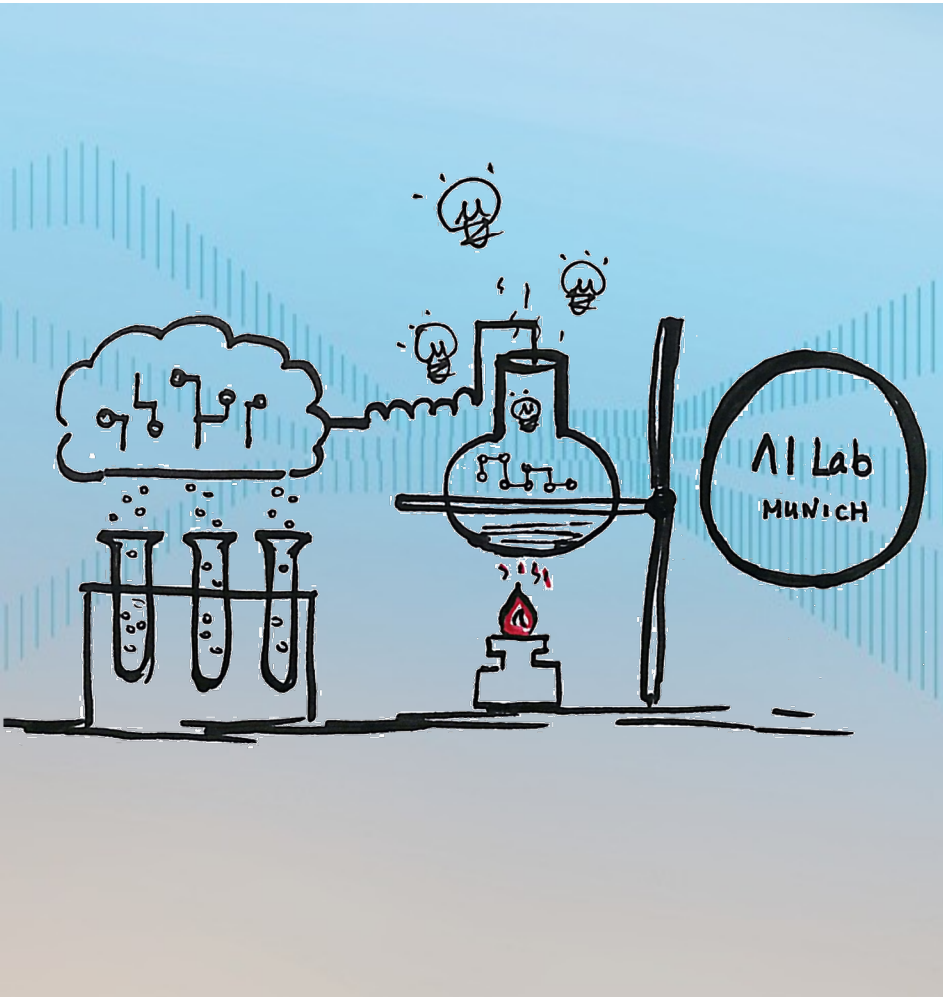
#open-minded & **#expert-driven**

#committed & **#impact-proven**

AI Lab planning to move to new location at “House of Communication” to focus on customer engagement and ecosystem management



Contact and Further Information



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