



Putting AI into Action

Wil van der Aalst





> 95 professors
> 85 institutes

One of our activities: AI Week 2025 - Something for everyone



KI in der Praxis

Erleben Sie bei „KI in der Praxis“ live, wie Künstliche Intelligenz und Industrie 4.0 praxisnah und verständlich echten Mehrwert für Unternehmen schaffen.

Donnerstag, 18.00-19.00

Mai 20
2025





AI in Manufacturing

Das „AI in Manufacturing“-Event vernetzt Industrie, Forschung und Politik zur Anwendung von KI in der Produktion.

Mittwoch, 09.00-12.00

Mai 21
2025





KI im Mittelstand

Die Veranstaltung bietet eine hervorragende Gelegenheit zum Austausch von Erfahrungen in KI im Mittelstand.

Dienstag, 16.00-20.30

Mai 22
2025





KI in der Industrie

Erleben Sie in der Modellfabrik der RWTH Aachen, wie KI Industrielle Prozesse optimiert und unsere Arbeitswelt von morgen verändert.

Dienstag, 17.00-19.30

Mai 22
2025



www.ai-week.rwth-aachen.de



AI MADE IN EUROPE - UND WAS BEDEUTET DAS FÜR UNSERE REGION?

Podiumsdiskussion im Rahmen der Aachener KI-Woche



RALF RASPE
Moderator



HOLGER HOOS
Leiter des KI-Centers der RWTH Aachen



FEE DAMM
CEO von MIRA



BJÖRN FRANKEN
Mik für die CDU NRW



DANIEL FREUND
MSP für die SPD NRW



JÖRG HERBERS
CEO von INFOSIM



THOMAS HISSEL
Beigeordneter der Stadt Aachen

SCIENTIFIC CONFERENCE ON „AI IN ROBOTICS“ AND „AI IN MEDICINE“

21. MAY 2025
8:30 AM – 6:30 PM

VENUE: FIREPLACE, THEATERSTR. 17, 52062 AACHEN

ZUR ANMELDUNG





Sebastian Trimpe
RWTH Aachen University



Alexander Ferrein
FH Aachen



Elena Torta
TU Eindhoven



Nuria Pena Perez
RWTH Aachen University



Oliver Petrovic
RWTH Aachen University



Bastian Leibe
RWTH Aachen University

AI IN ROBOTICS:

KARRIERE IM BEREICH KI

Das Wort KI ist in aller Munde und wird die Arbeitswelt in Zukunft verändern. Ihre Entwicklungen schaffen schon jetzt neue Karriereoptionen und -wege, in denen KI eingesetzt oder erforscht wird. Finden Sie heraus, welche beruflichen Möglichkeiten Sie haben.

15:00 Uhr

Impuls-Vortrag:
Von astrophysikalischen Neutrinos zur KI-Forschung bei Amazon

16:20 Uhr

Talk:
KI studieren an der RWTH Aachen

15:40 Uhr

Talk:
KI studieren an der FH Aachen

16:20 Uhr

Talk:
KI Startup gründen an der RWTH Aachen

16:40 Uhr

Talk:
„Die Amazon Nova KI Basismodelle“

17:00 Uhr

Talk:
Prozesse intelligent gestalten – KI und Process Intelligence bei Celonis

KARRIERE IN KI

YOUTHFACTORY
Stadtbibliothek Aachen
Coulvenstr. 15, 52062 Aachen
www.ai-week.rwth-aachen.de

20. MAI



AACHENER KI WOCHE



GRAND OPENING CEREMONY!

19:30 – 21:30
Aachener Ludwig Forum

SONNTAG

MONTAG

DINNSTAG

18

19

20



KI-WOCHE FAMILIEN TAG

Freitag, 23. Mai 2025



KI ZUM ERLEBEN UND VERSTEHEN
FÜR DIE GANZE FAMILIE



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Daniel Truhn
RWTH Aachen University



Rehard Lopata
TU Eindhoven



Maarten De Vos
KU Leuven



Carolyn Schneider
UKA Aachen



Stefan Uhlig
RWTH Aachen University



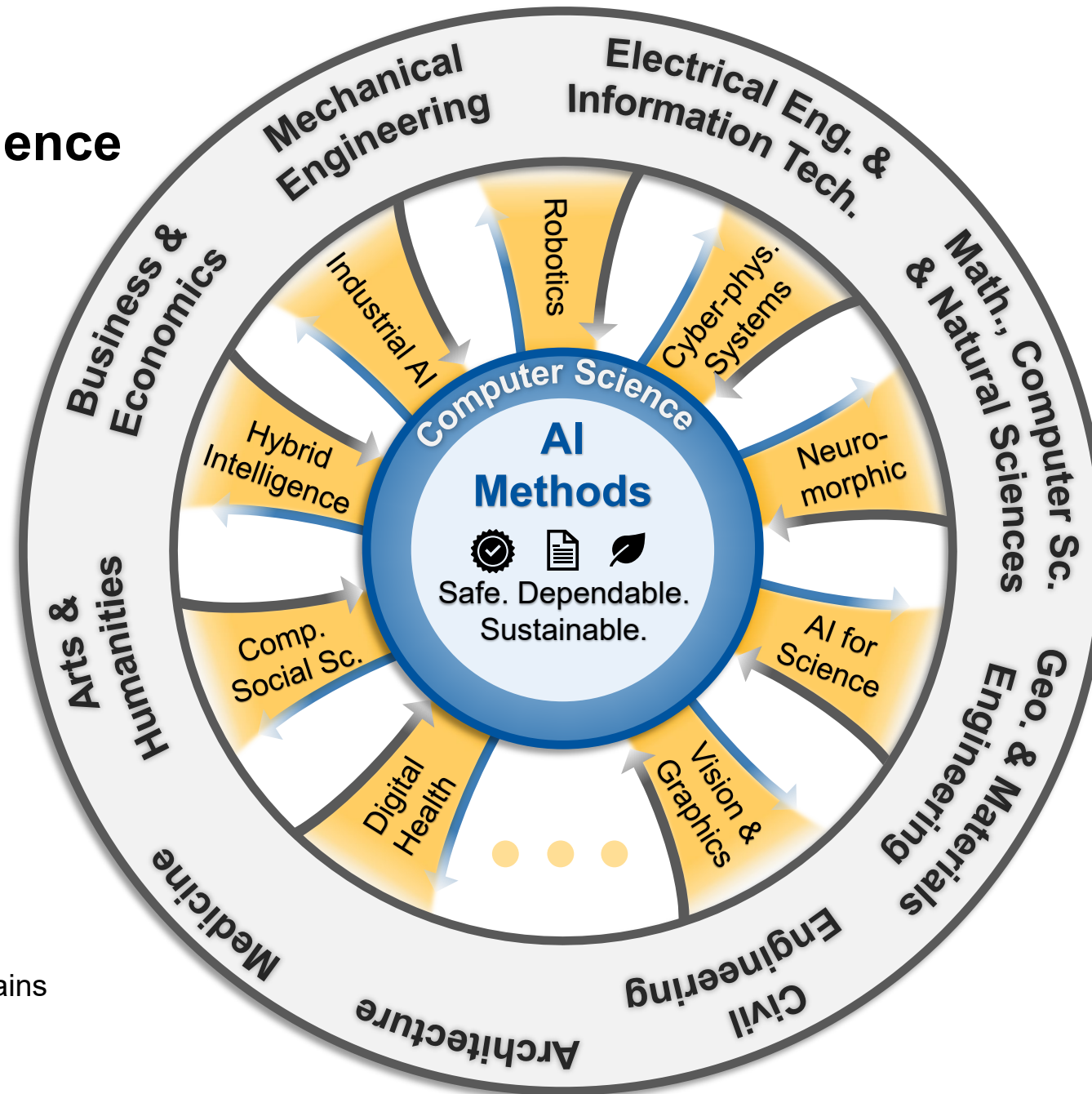
Peter Boor
RWTH Aachen University



Michael Schaub
RWTH Aachen University

AI IN MEDICINE:

“Artificial Intelligence in Action”



- AI methods
- Applications and domains
- Key bridging areas



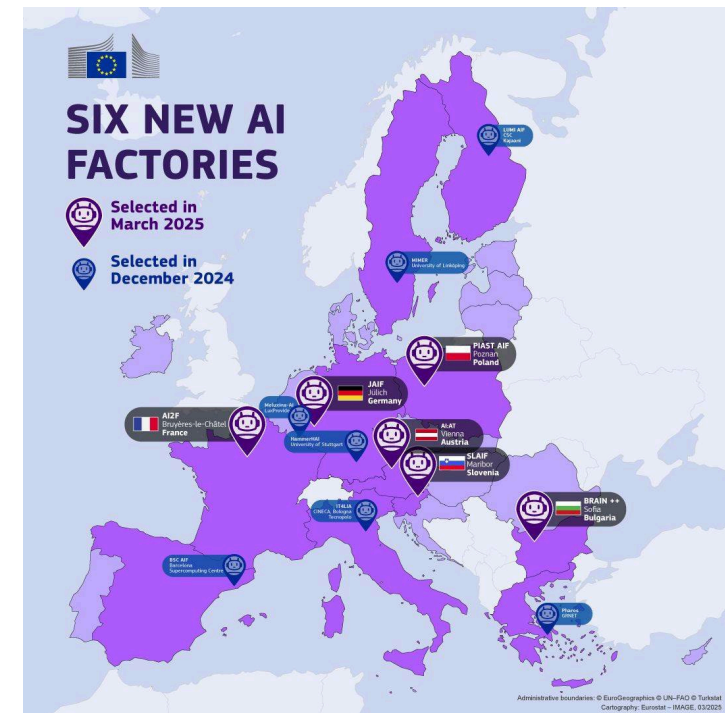
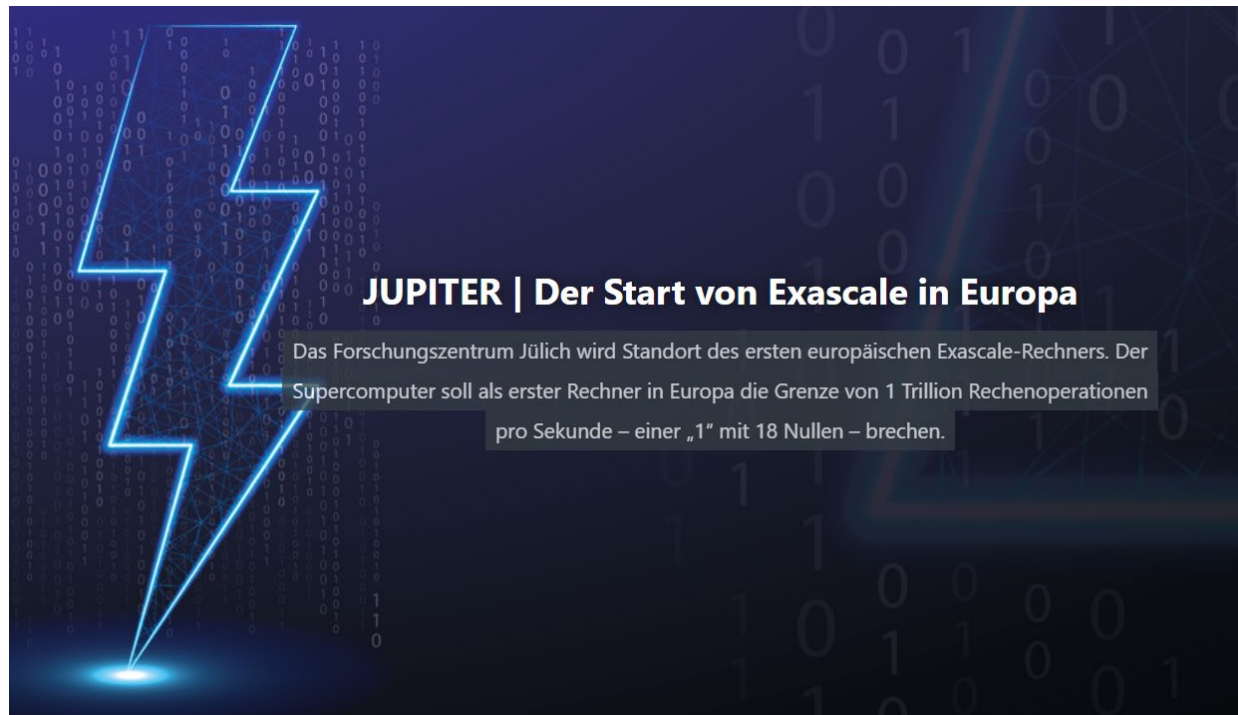
Ecosystem (1/2)

(JAIF & ELA AI Triangle)



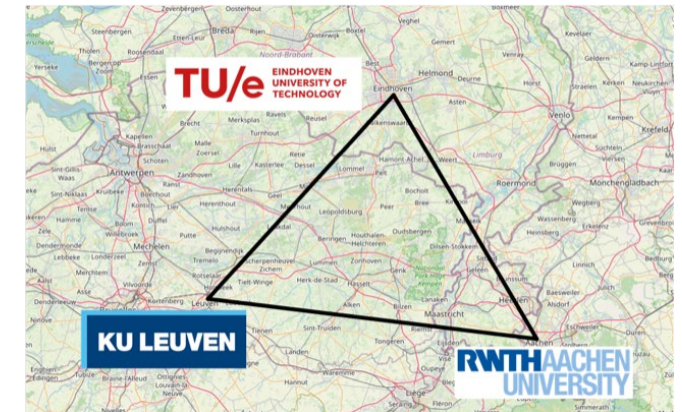
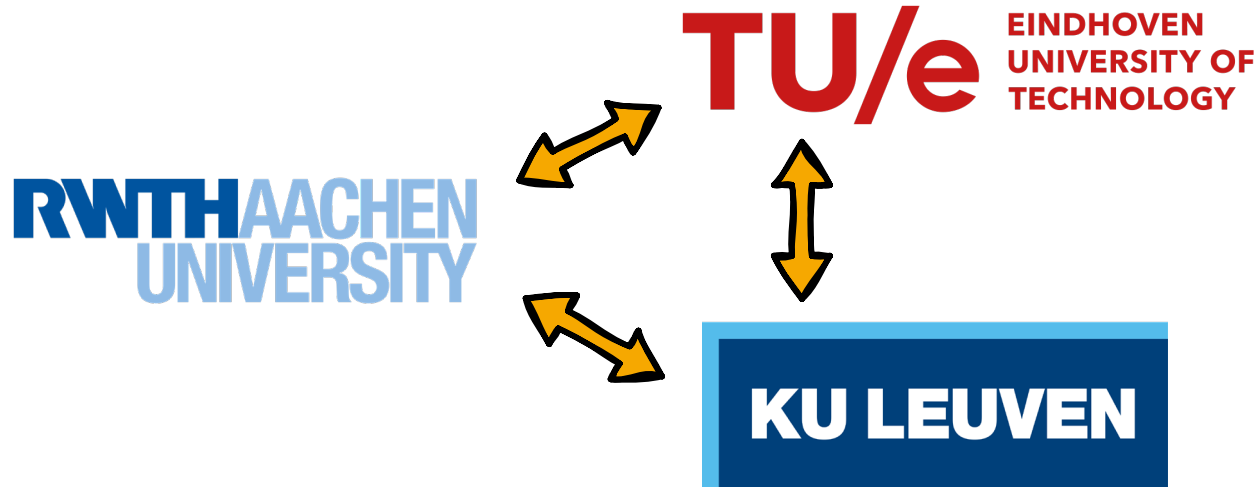
JAIF – Jupiter AI Factory

- Europe's first Exascale operations (10^{18} operations per second)
- The JAIF Consortium includes Forschungszentrum Jülich, RWTH, the Fraunhofer FIT, Fraunhofer IAIS, and hessian.AI.



ELA AI Triangle Region

- Strategic collaboration **TU Eindhoven, KU Leuven, RWTH Aachen**
- Workshops, research exchanges, joint conferences, joint projects, etc.



Together with JAIF, Brainport, etc. an excellent setting for an EU AI GigaFactory (AIGF)!

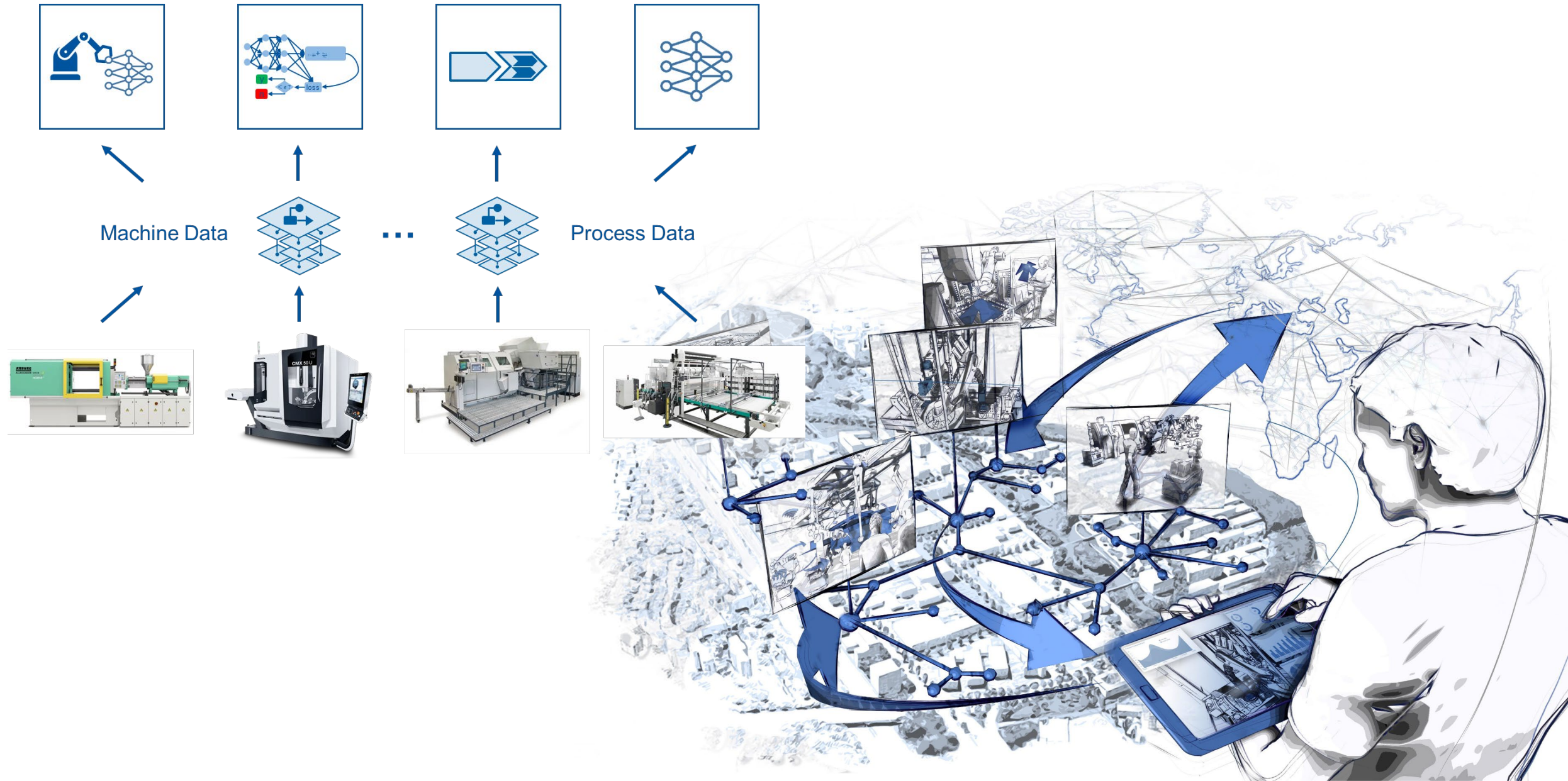


Ecosystem (2/2)

(IoP and beyond)



Internet of Production (IoP): Cluster of Excellence (since 2018)



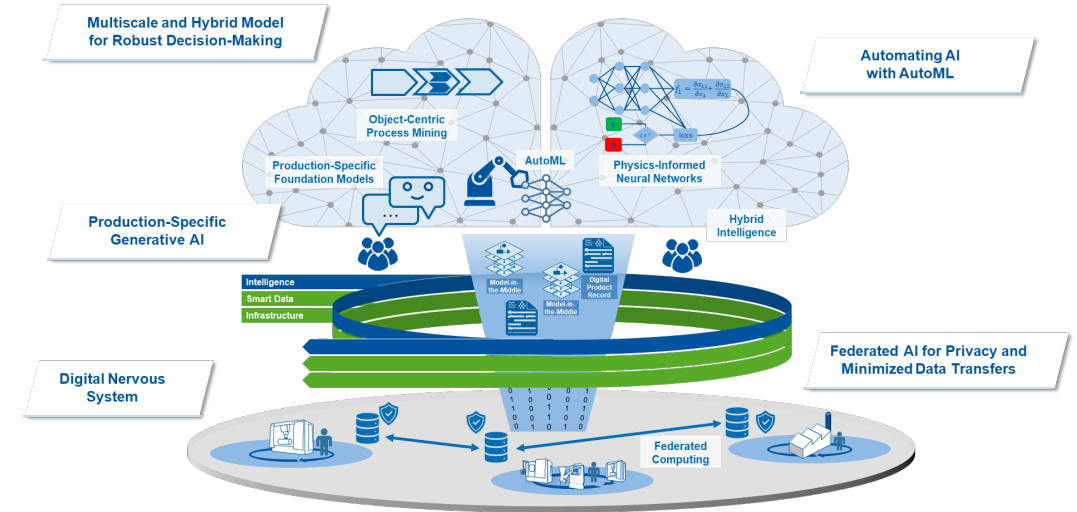
Internet of Production (IoP): Industrial Advisory Board

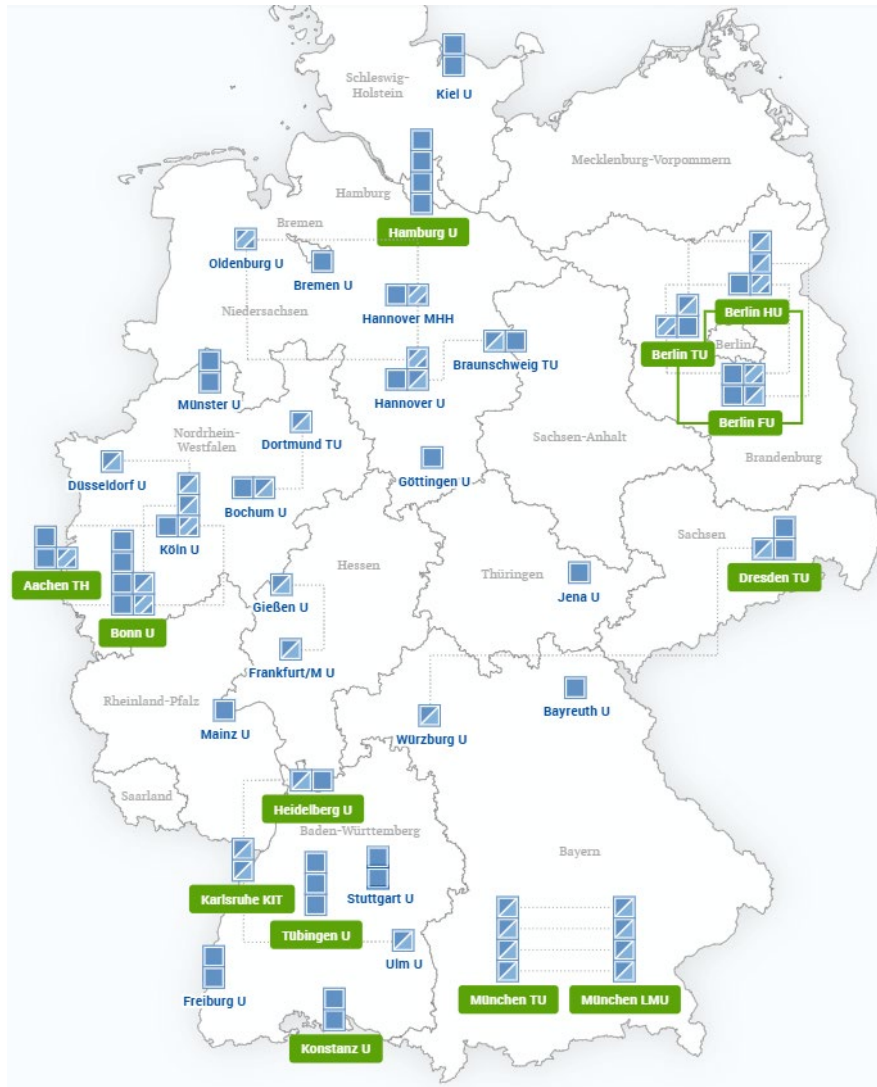
67 MEMBERS

Internet of Sustainable Production (IoP): New proposal (57M€, 2026-2032)

Das **Internet of Sustainable Production (IoSP)** fördert ökonomische, ökologische und soziale Nachhaltigkeit



RWTH Aachen University: We need at least two to apply for University of Excellence status

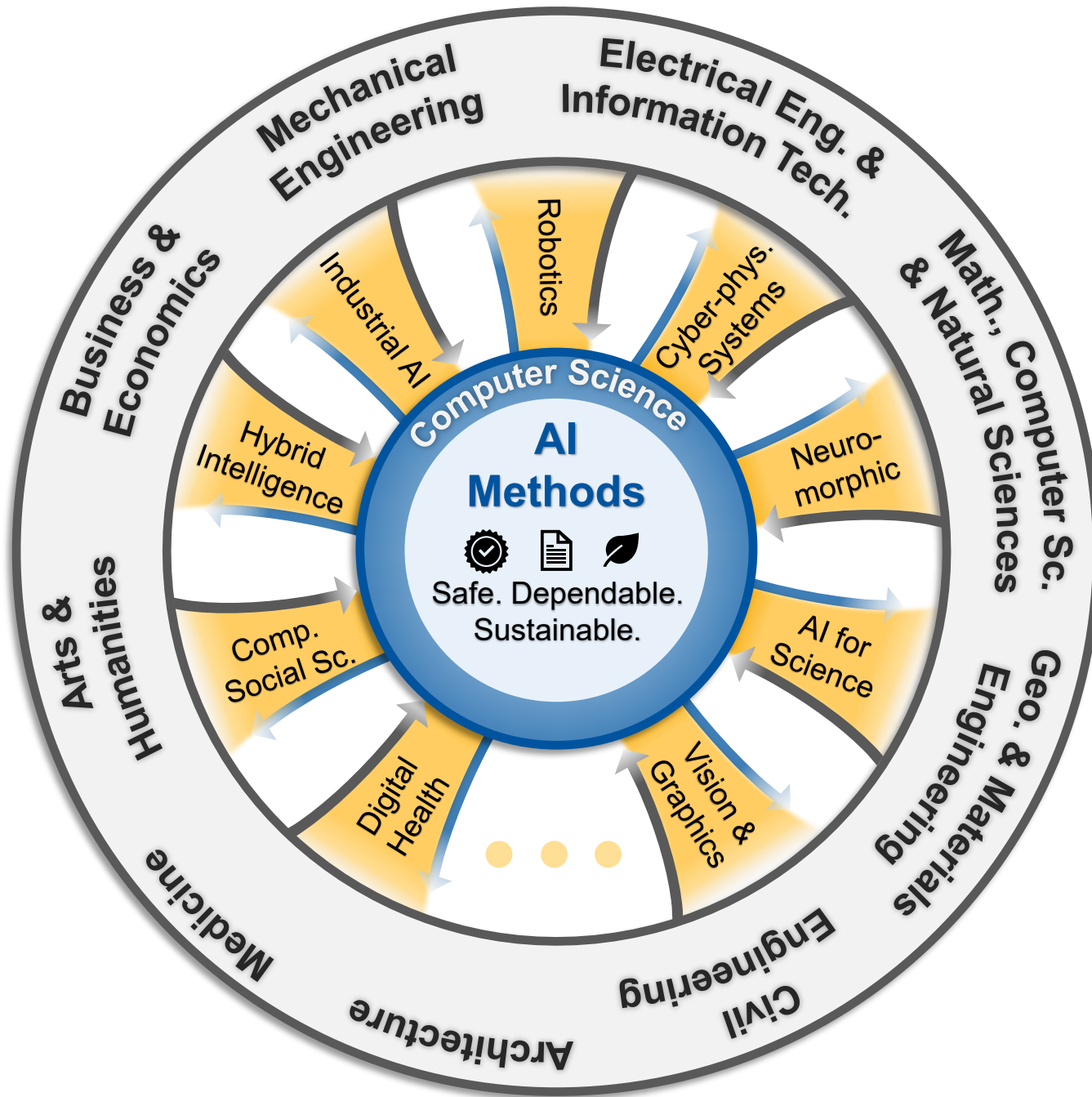


- Internet der nachhaltigen Produktion (IoSP), Aachen
- The Integrated Fuel&Chemical Science Center, Aachen
- Materie und Licht für Quanteninformation (ML4Q), Köln, Aachen, Bonn
- Transformative Materialien für die Medizin – Design, Produktion, Translation (TransMedMat), Aachen
- Klimaneutrales und ressourceneffizientes Bauen (CARE), Dresden, Aachen

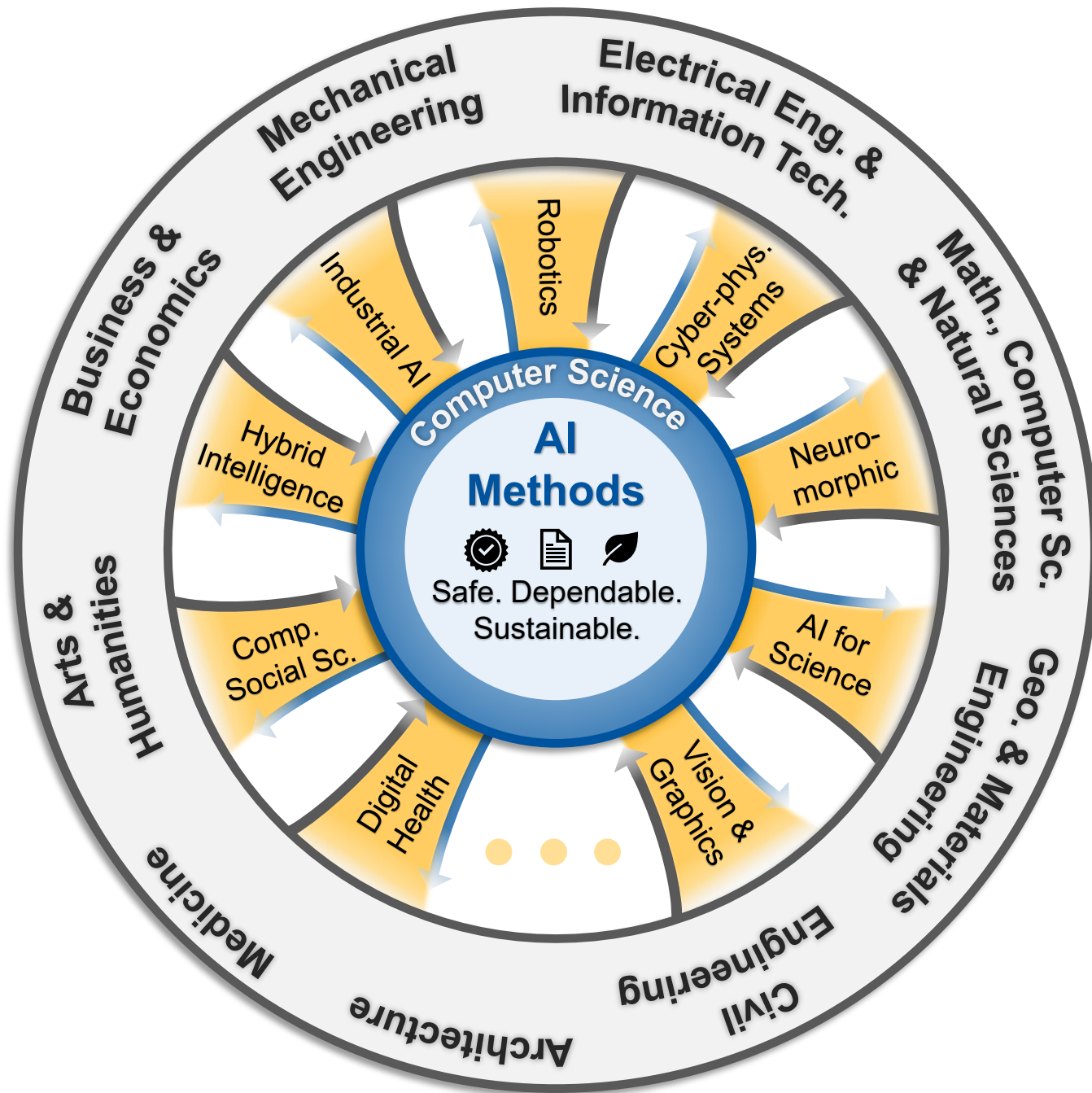


Transfer





+ Industry



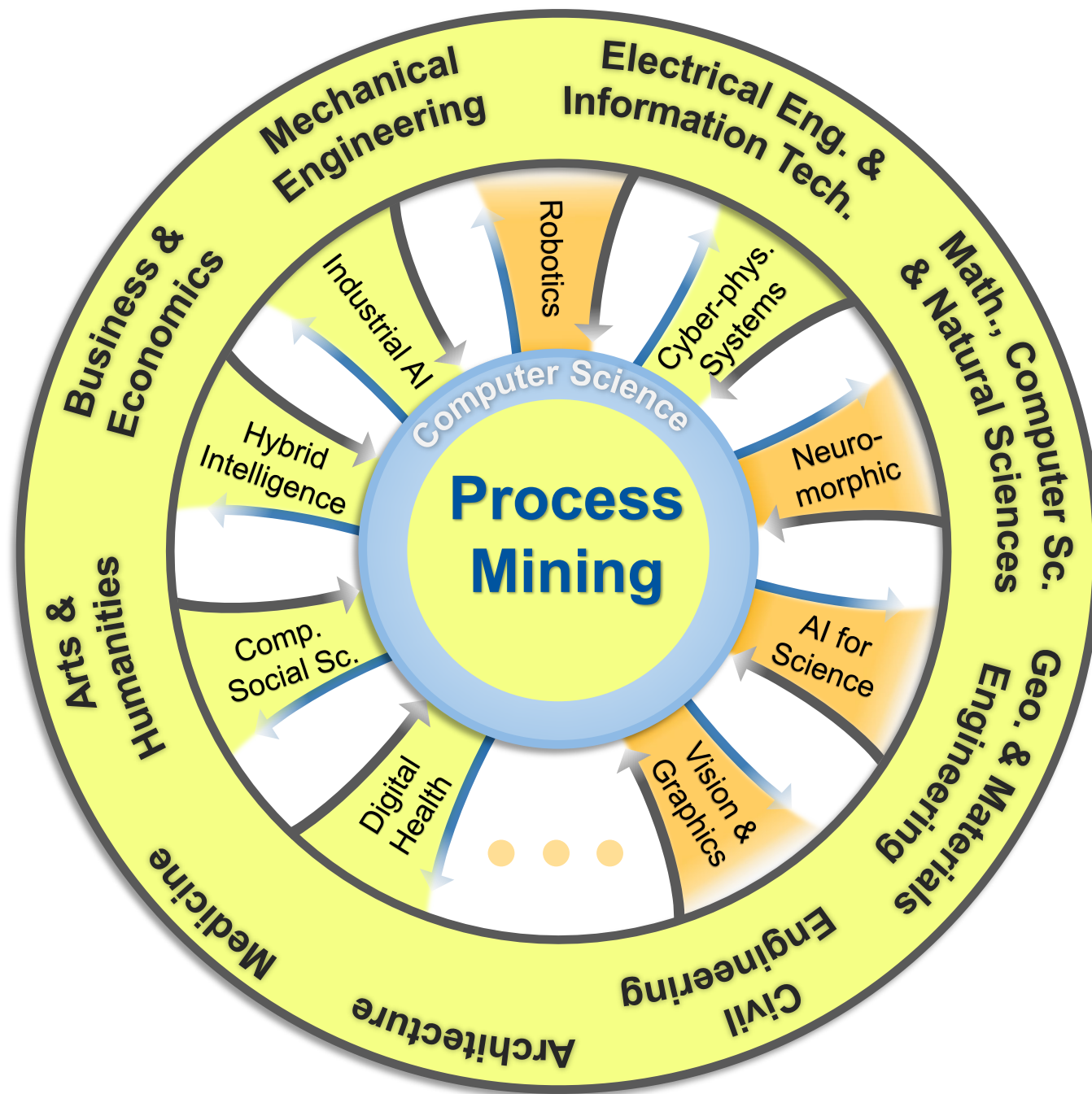
Example:

Process Mining



Example:

Process Mining



celonis

TECHNOLOGY	FINANCIAL SERVICES & INSURANCE	LIFE SCIENCES & CHEMICALS	CONSUMER & RETAIL
Dell Uber ServiceNow HP Cisco Intel Splunk TechData Autodesk Accenture	Credibem ABN AMRO Deutsche Bank Caixa Geral de Depositos Wells Fargo Nationale Nederlanden UniCredit BBVA Zurich	Sysmex Johnson & Johnson Merck Lyondellbasell Döhler Vetter Archroma B. Braun Presenius Kabi Medtronic IQVIA	Aldi L'Oréal Campari Walgreens Kraft Heinz Mars Carrefour Reckitt Albertsons PepsiCo
MANUFACTURING	TELCO & MEDIA	ENERGY & UTILITIES	OIL & GAS
GE ABB Siemens Bosch Hager Group 3M Rational Mann + Hummel Delphi Technologies	Telia Company Nokia Vodafone Elsevier Charter 1&1 Bouygues Dentsu	EDP Statkraft Redoxis SAS UniPer REWAG EnBW Red Eléctrica de España Engie Generac	Ipiranga Mol Group Neste Repsol Equinor

SERVICES PARTNERS

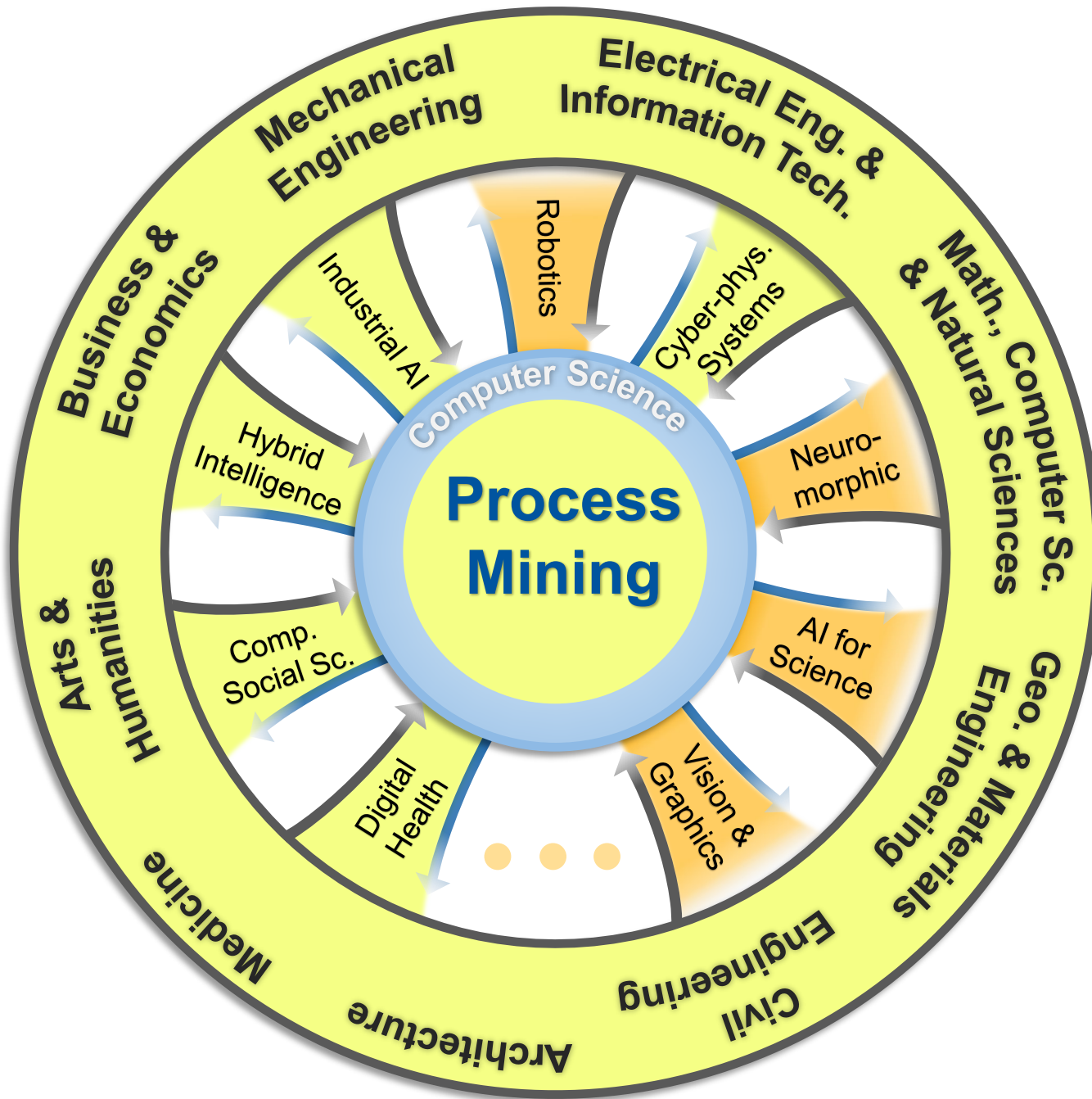
300+ SERVICES PARTNERS

ACADEMIC PARTNERS

700+ ACADEMIC PARTNERS

TECHNOLOGY & ISV PARTNERS

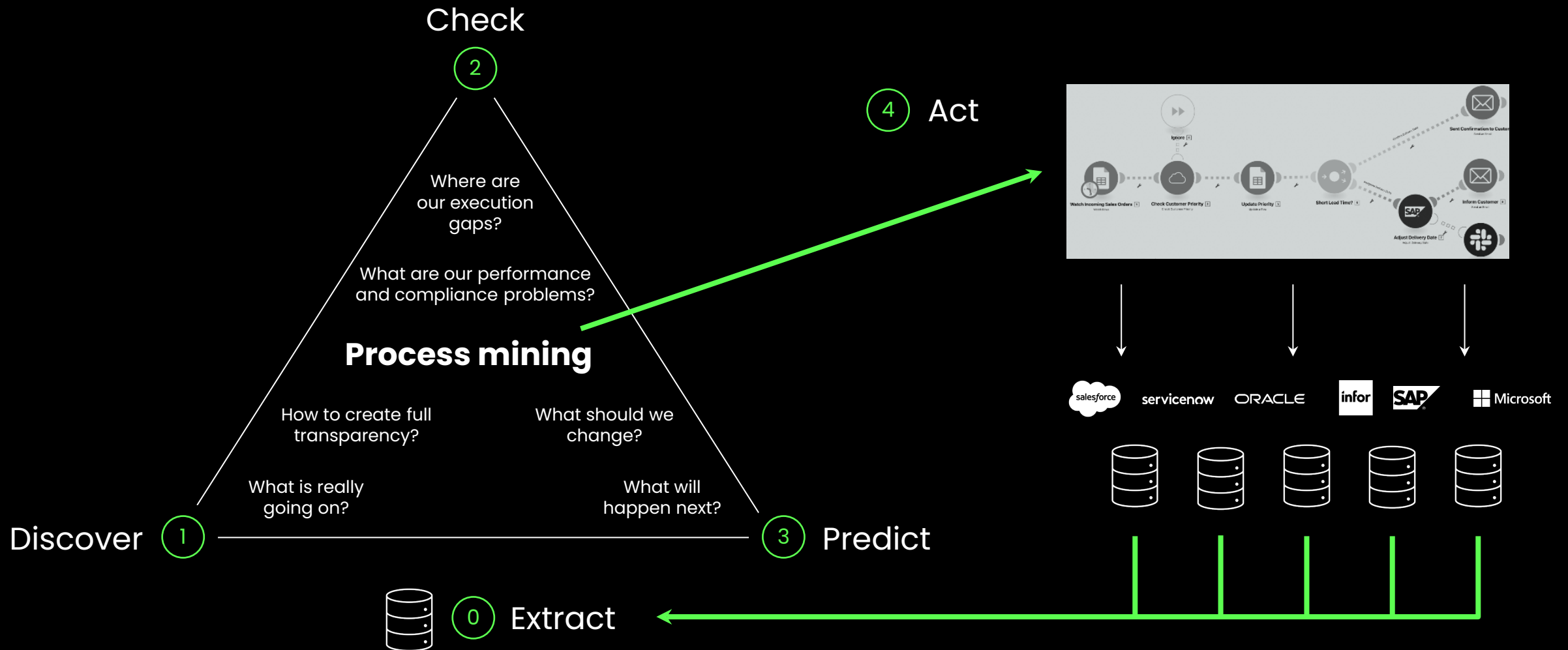
110+ INTEGRATIONS



Gartner®



High-level view of process mining

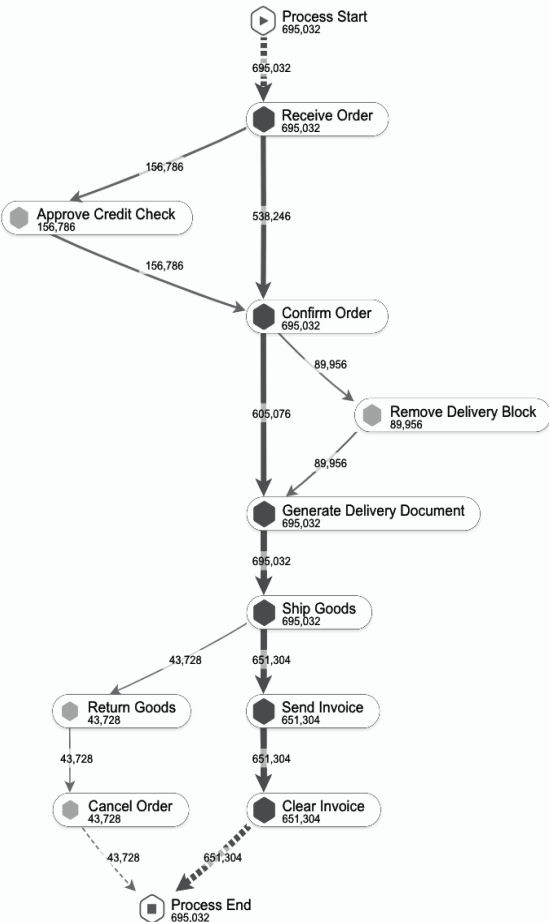


Actual processes are very different from what stakeholders think !

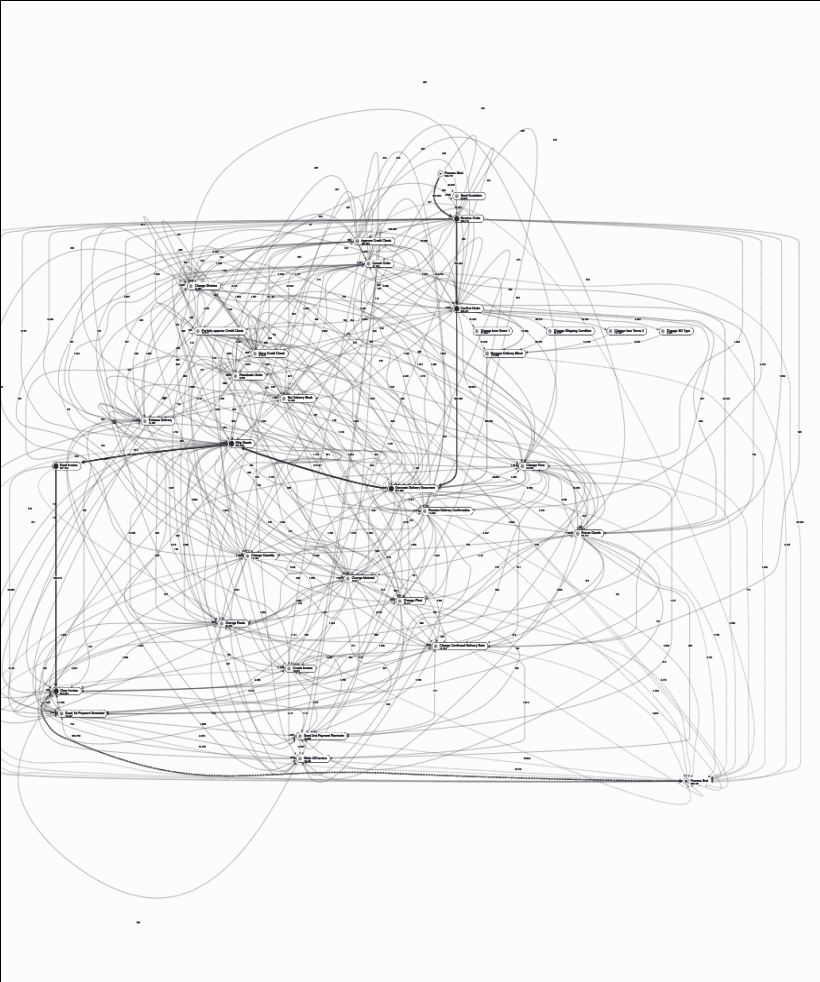
Happy path



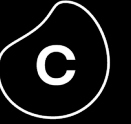
Expected paths



Reality



80/20 rule

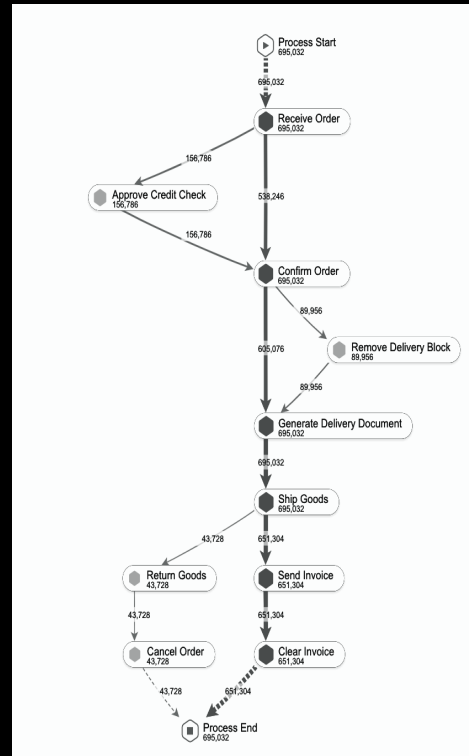


80% of cases

20% of variants

20% of inefficiencies

20% of compliance problems



100% of cases

100% of variants

100% of inefficiencies

100% of compliance problems

AI Without Context

Improving Processes with AI

ChatGPT 4o

How to improve my process using AI?

Improving your process using AI depends on the kind of process and data you have, but here's a structured approach that works across domains:

1. Understand Your Process and Goals

- Map the process: Use process mining to visualize how work actually flows.
- Define objectives: Do you want to reduce cycle time, detect fraud, improve quality, or personalize services?

2. Gather and Structure Your Data

- Identify where event data is generated (e.g., ERP, CRM, sensors).
- Ensure it includes timestamps, activity labels, object identifiers, and relevant metadata.

3. Apply AI Techniques Depending on the Goal

Goal	AI Approach	Example
Anomaly Detection	Outlier detection, unsupervised learning	Detecting skipped steps or unusual behavior
Prediction	Supervised learning	Predict late orders, customer churn, or SLA violations
Optimization	Reinforcement learning, simulation	Optimizing scheduling, resource allocation
Automation	NLP, RPA + AI	Automate document processing, approvals
Insight Discovery	Clustering, association rules	Identify patterns in customer journeys or bottlenecks

4. Use Process Mining + AI Together

- Use Object-Centric Process Mining (OCPM) to deal with complex, interconnected cases.
- Augment discovered models with predictive and prescriptive AI (e.g., when and how to intervene).

5. Experiment and Monitor

- Build MVPs and validate improvements.

Ask anything

Search

Deep research

Create image

...

🔊

ChatGPT can make mistakes. Check important info. See [Cookie Preferences](#)

Improving Processes with AI

ChatGPT 4o

Tell me what to do!

Absolutely — here's a **step-by-step plan** to improve your process using AI:

Step 1: Record What Actually Happens

- Install process mining software (e.g., Celonis, Apromore, or ProM).
- Extract event data from your systems (e.g., SAP, Salesforce, ticketing tools).
- Ensure logs contain:

Step 2: Discover and Diagnose

- Run process discovery to visualize how your process *really* works.
- Identify:
 - Bottlenecks
 - Rework
 - Skipped steps
 - Variants and non-compliance

Step 3: Pick a Use Case for AI

Start with **one** clear goal. For example:

- Predict late deliveries? → Use **supervised learning**.
- Optimize resource allocation? → Use **reinforcement learning** or **simulation**.
- Detect strange behavior? → Use **anomaly detection**.

Step 4: Train a Model

- Extract relevant features from your data.
- Use appropriate AI models (e.g., decision trees, neural networks).
- Train the model on historical data.

Step 5: Integrate AI into Your Workflow

- Show predictions inside your dashboards.
- Use **alerts**, **next-best-action** recommendations, or **automated triggers**.
- Connect back to your ERP or case management system.

Step 6: Monitor and Improve

- Track **accuracy**, **impact**, and **trust**.
- Run **periodic re-training** to keep models fresh.
- Start mining new patterns with enriched object-centric data.

Bonus Tip: Use OCPM

Object-Centric Process Mining helps you go beyond linear case IDs and model **real-life complexity** (e.g., one order → multiple items → multiple deliveries).

Ready to pick a process and run the first diagnostic? I can guide you through that too. What's your target process?

Ask anything

Search

Deep research

Create image

...

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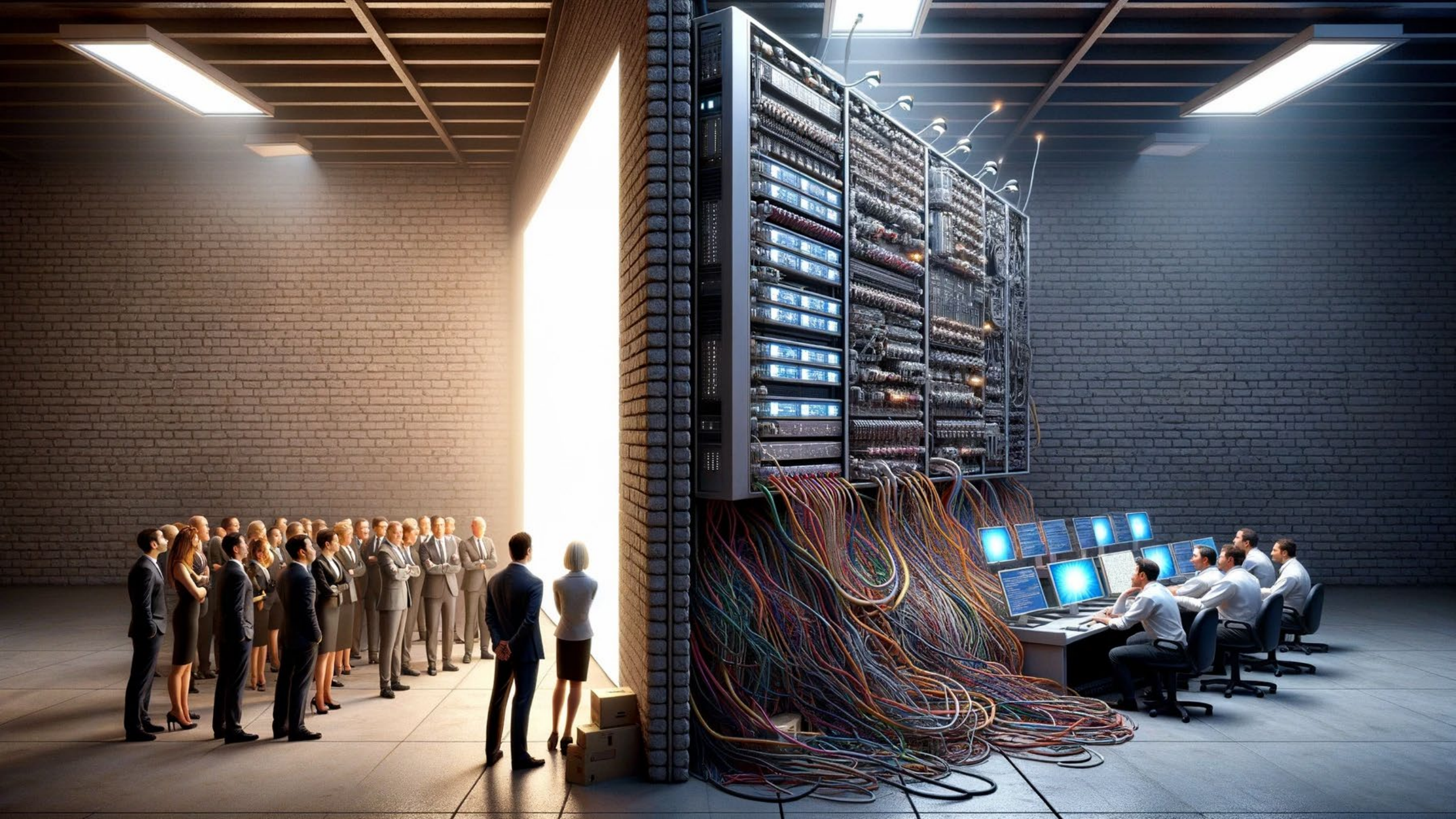
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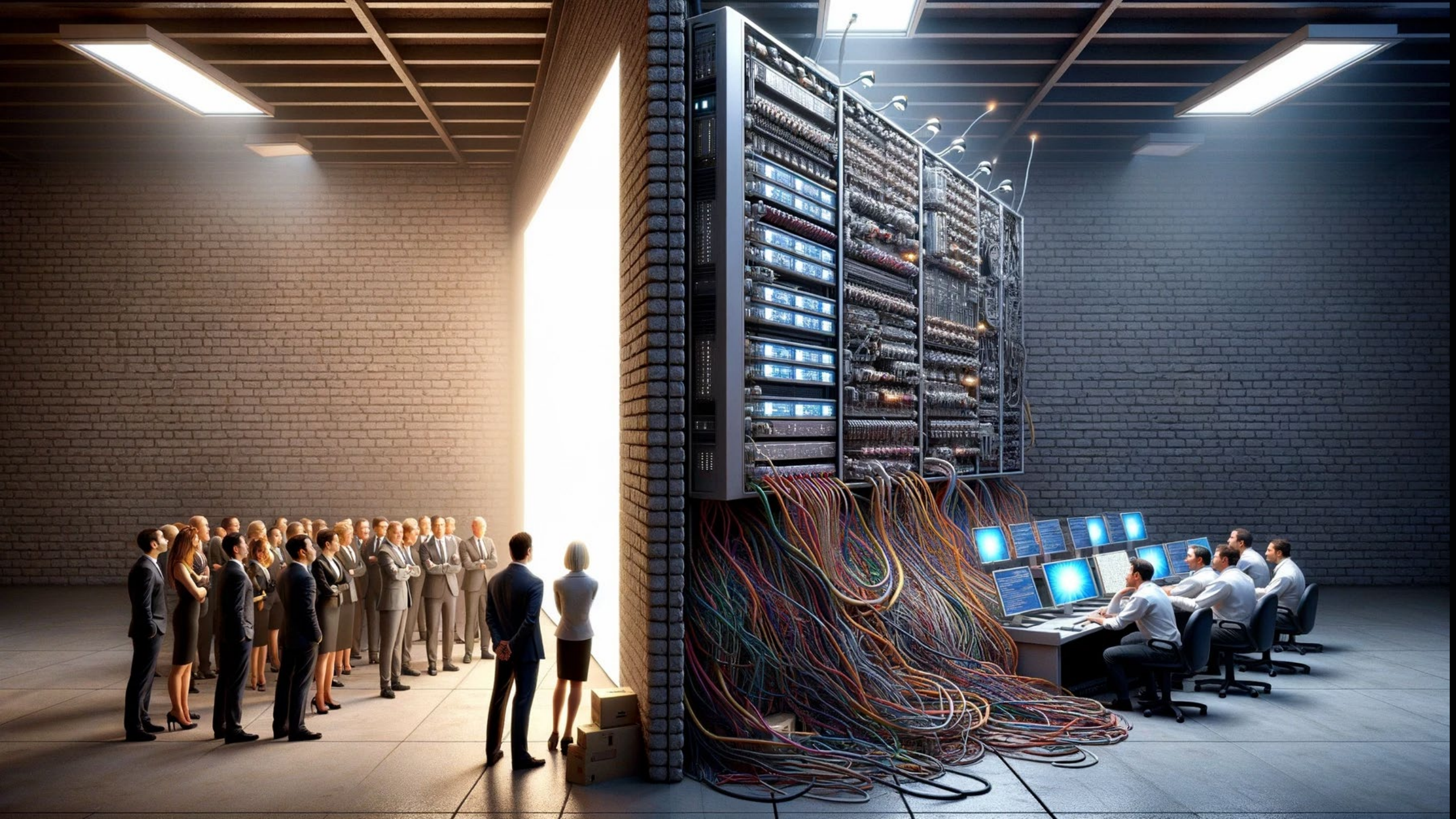
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How to improve my process using AI ?

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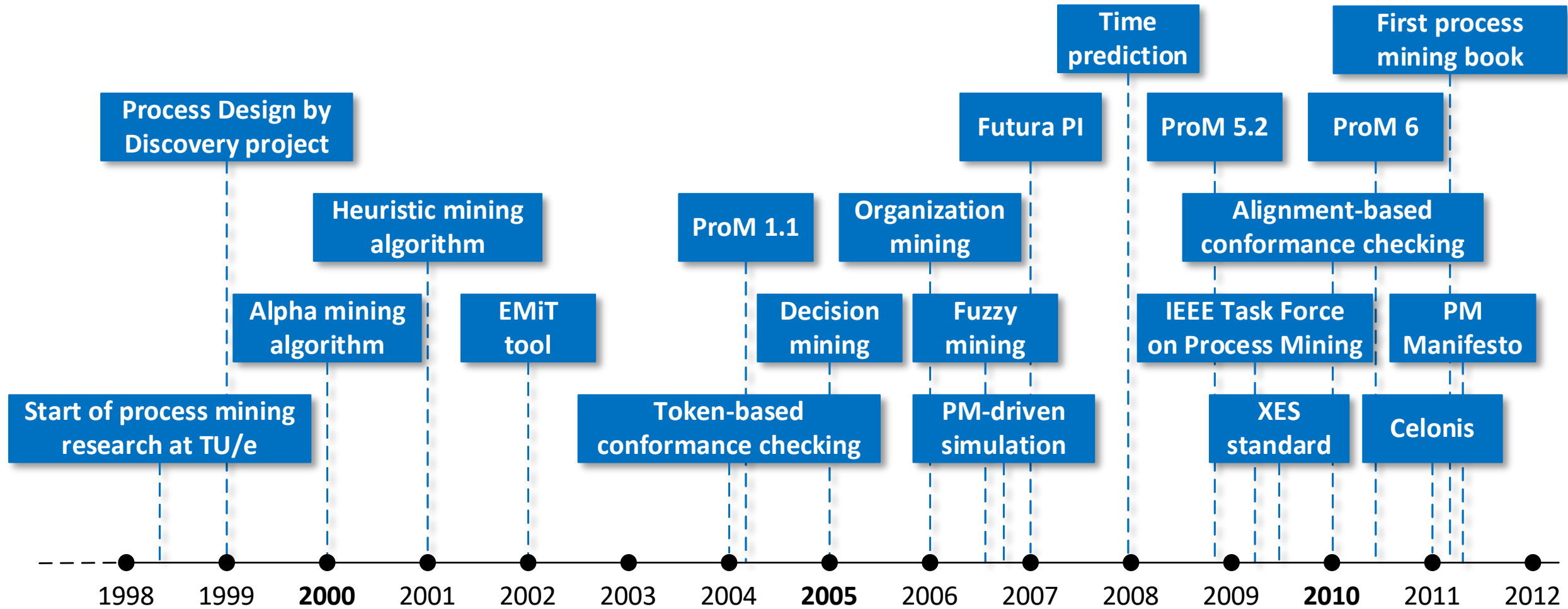




WE ARE TOO BUSY TO APPLY PROCESS MINING



Timeline (1/2)



DIGITAL BULLETIN

Issue 34 | Nov '21

DevOps DEBATE

Industry experts on
how companies can
instill a DevOps culture

BRIDGING THE GAP

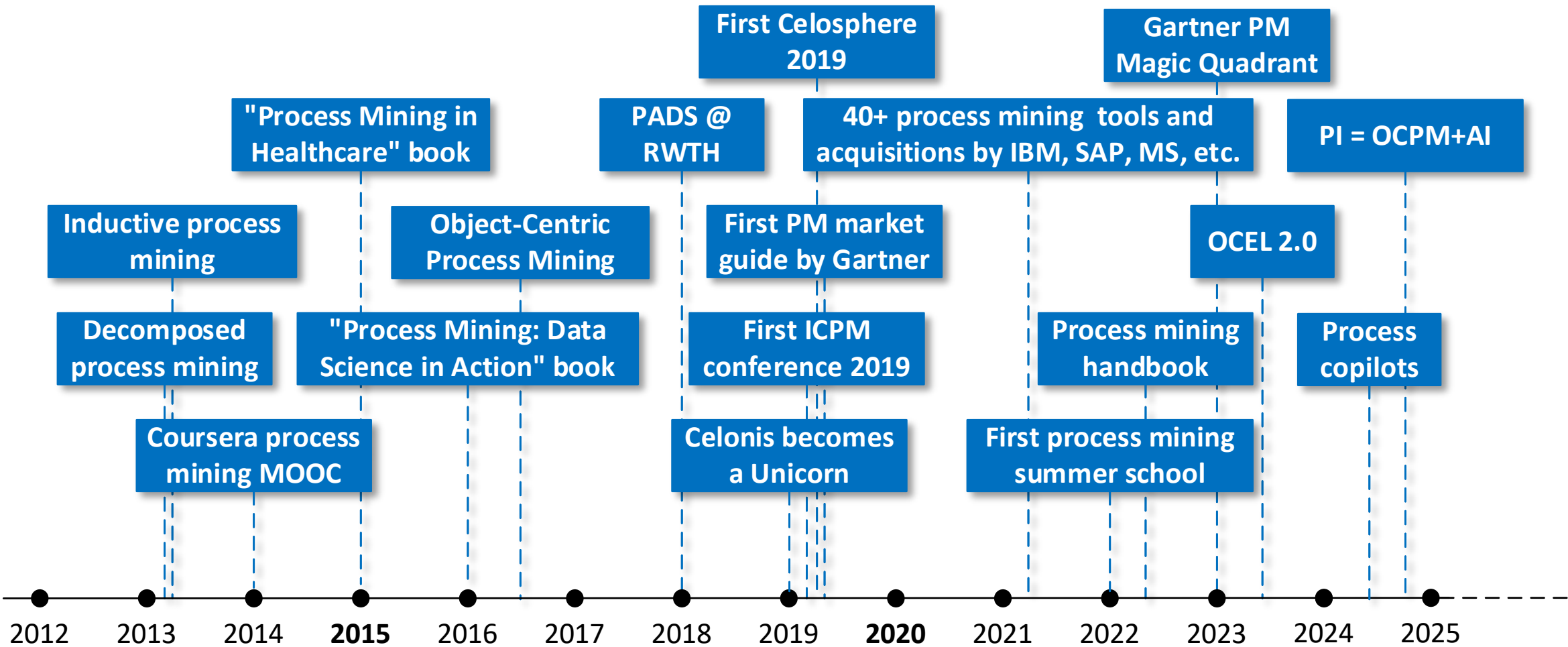
Analysing IBM's
plans to skill 30m
people by 2030

A black and white portrait of Professor Wil van der Aalst, a middle-aged man with light-colored hair, smiling slightly. He is wearing a dark suit jacket over a light-colored shirt. The background is dark with a pattern of small, light-colored dots.

THE GODFATHER

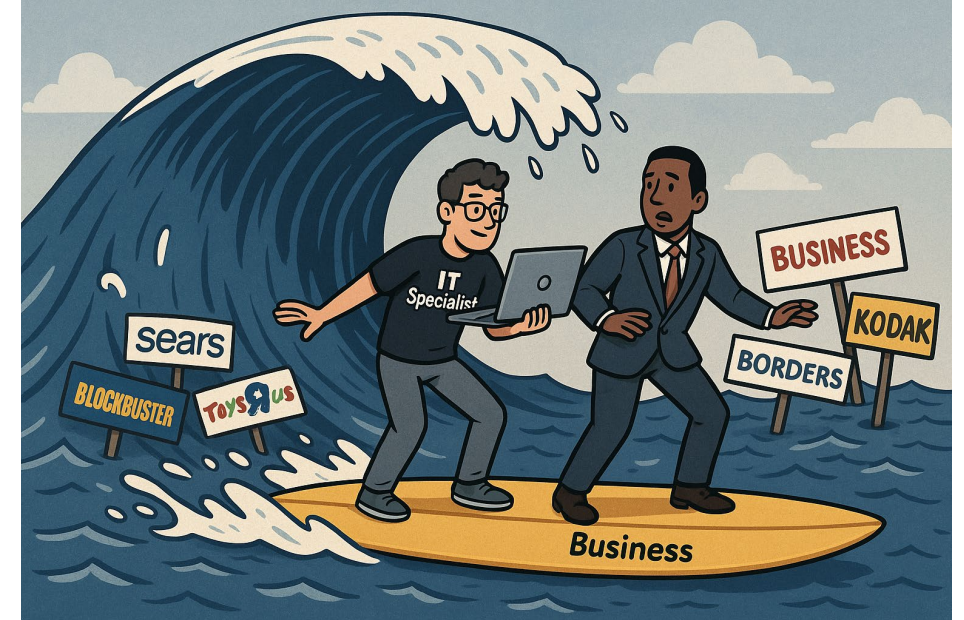
The creator of process mining, Professor Wil van der Aalst, on
joining Celonis as Chief Scientist and why the technology has
only fulfilled a fraction of its potential

Timeline (2/2)



Erfahrungen und Empfehlungen

- Durchhaltevermögen, Beharrlichkeit, Ausdauer, Zähigkeit, ...
- Fokus, Standhaftigkeit, Zielstrebigkeit, ...
- Technologische Entwicklungen frühzeitig antizipieren
- Nicht auf den Kunden warten
- Unterstütze junge unternehmerische Studierende
- Team aus Personen, die einander ergänzen
- Klare Trennung zwischen Hochschule und Startup
- Skalierung erfordert Profitorientierung



Wenn Sie mit uns zusammenarbeiten möchten:

- Seien Sie bereit, Daten zu teilen,
- formulieren Sie Ihre Frage klar (Bitten Sie keinen Herzchirurgen, sich Ihre Füße anzusehen),
- lagern Sie nichts aus, was Sie selbst erledigen sollten, und
- zeigen Sie Interesse an Dingen, nach denen Sie nicht gefragt haben (Zum Beispiel Process Mining).

