

HITACHI



Hitachi Digital Services

Accelerating Innovation in Manufacturing

July 2025



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Speakers Today

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aws

DS
Smith



Ganesh Bukka

Vice President & Global Head
Industry 4.0, Hitachi Digital
Services



Peter Brooke

Principal Manager – Smart Factory
Business Development, Amazon Web
Services (AWS)



Vitor Domingos

Lead Solution Architect, EMEA,
Hitachi Digital Services



Rajat Mathur

Director Portfolio and
Delivery, DS Smith

Agenda:

- I. The Future of AI in Manufacturing & Revolutionising Manufacturing with AI
- II. AWS Innovations: How Gen AI is Reshaping the Industry
- III. Agentic AI and the future of AI
- IV. Transforming Manufacturing with AI - A Real-Life Success Story: DS Smith
- V. Q&A

Revolutionising Manufacturing with AI

Ganesh Bukka

Vice President & Global Head Industry 4.0



Industry 4.0 – Is it a success or successful failure?

- 01 70% of Initiatives didn't scale beyond pilot
- 02 Digitisation of Siloed Processes
- 03 Lack of ITxOT Integration due to disconnected systems platforms or protocols
- 04 Lack of Digital skills in Data, AI/ML
- 05 Perceived risk of Cyber security due to ITxOT Integration
- 06 Lack of Integrated Digital, Data Maturity & Governance

Five key tenets for Industry 5.0 @ Hitachi

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Human-AI
collaboration vs
smart factories



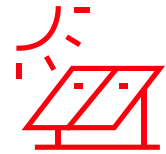
Hyper
personalisation
and resilience



Industrial
edge



Industrial
metaverse



Sustainability
AI

Industrial AI – Agentic AI focus in manufacturing

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01

Automated quality inspection

Agentic Behavior:
Autonomously detects surface defects and assembly defects and perform root cause analysis

Hitachi Rail
Factory
Hitachi Nuclear

02

AI driven robotic process control

Agentic Behavior:
Robots dynamically adjust their motion paths based on real-time sensor input and environmental conditions

JR Automation:
Automotive
Battery Mfg
Robots &
Hitachi Rail car
assembly Spot
Dog planning

03

Intelligent production scheduling

Agentic Behavior:
AI continuously reschedules production plans in real-time based on changes in demand, machine availability, or supply disruptions

Bengala Mines
Rail UK Depot
VSE

04

Self-optimising industrial processes

Agentic Behavior:
AI agents learn optimal machine parameters (e.g., temperature, pressure, feed rate) and autonomously tune operations

HMAX for Rail
Toyota
MDT

05

Maintenance BOTs

Agentic Behavior:
AI predicts failure modes, plans interventions, and triggers maintenance workflows autonomously

TMNA EDC
Reliability
Insights
HMAX

06

Adaptive energy optimisation

Agentic Behavior:
AI continuously monitors energy consumption and autonomously turns off/on devices or optimises process flows

H-Vision
RITA
Ontario Energy
management

ITxOTxAI in manufacturing – Most advanced digital factory

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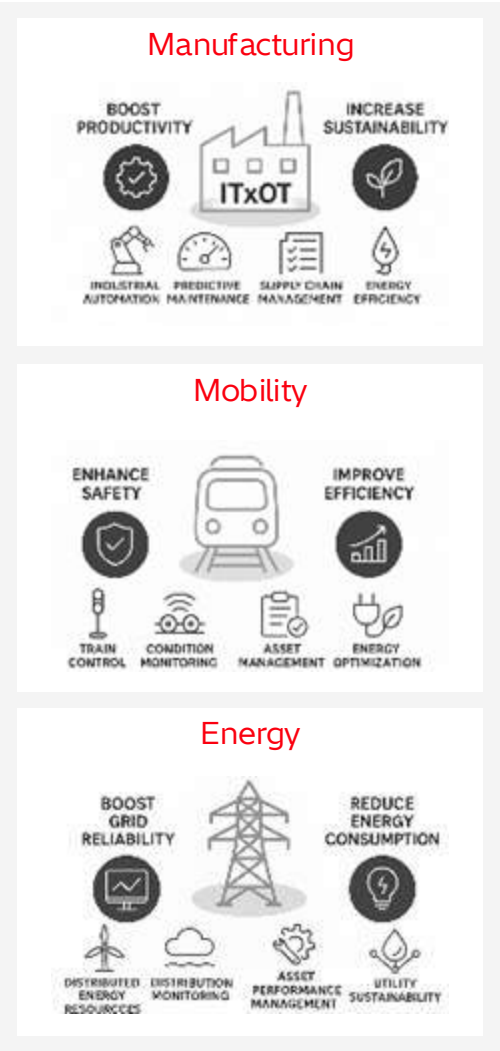
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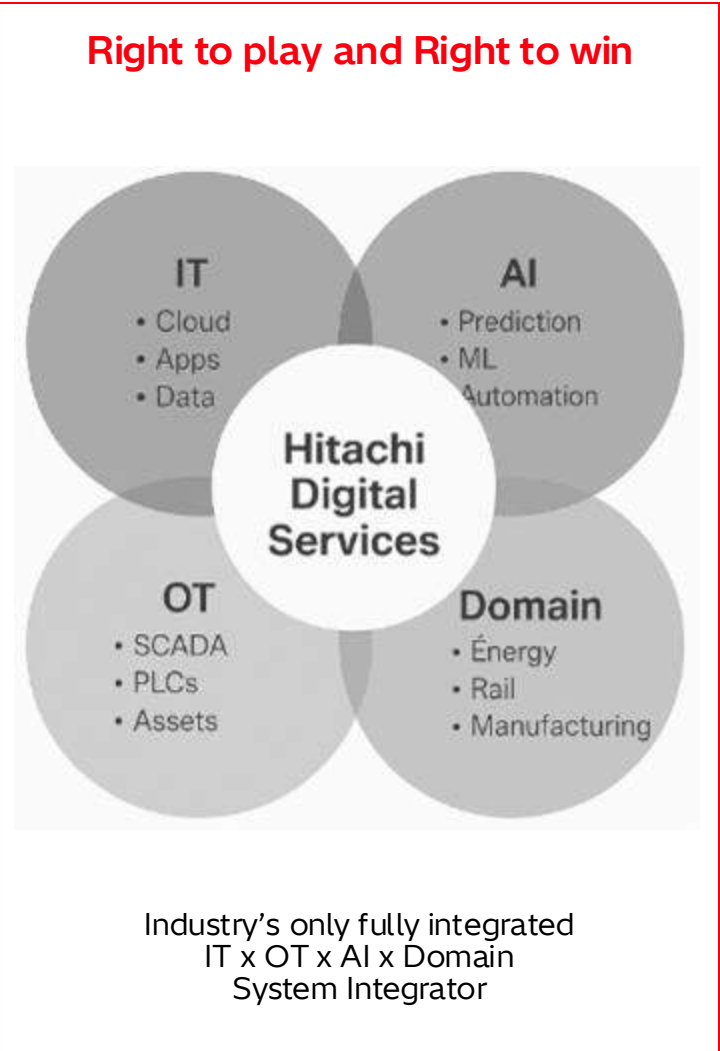


- 1 Gena AI power AQI
- 2 Robotic Spot Dog
- 3 Industrial Metaverse
- 4 Quality Digital Twin
- 5 Supply Chain Control Tower
- 6 Additive manufacturing
- 7 Autonomous HSE
- 8 SAP MES
- 9 SAP EWM
- 10 Sustainability AI (RITA)
- 11 Unified Data layer
- 12 Private 5G

Hitachi pioneering the future: ITxOTxAI integration



Transforming
assets, systems,
people through
integrated
ITxOT Digital
Platform



Creating new OTXAI solutions for growth and scale



AQI Copilot – For automated quality inspections

HDPLM-SmartGPT – PLM chatbot services



GenSeiX – Shopfloor AI assistant

nVidia Ominverse solution for shopfloor digital twin



HIIM – Battery Monitoring, Power insulator inspection, Digital Panel inspection



HMAX – nVidia based solution for pantograph inspections

Virtual System Engineer – Automated guidance for technicians



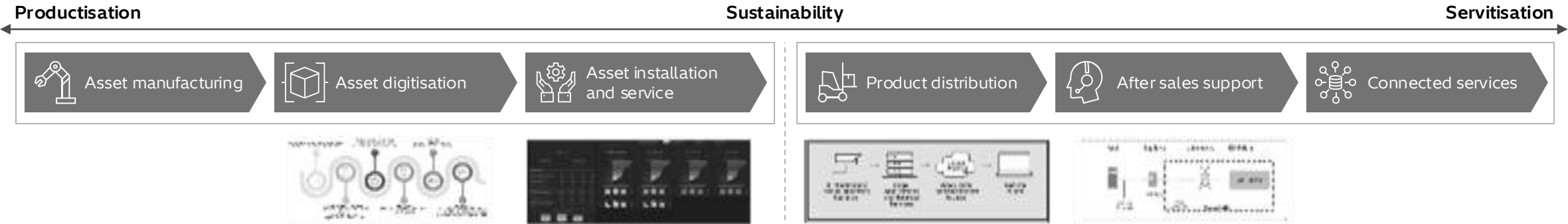
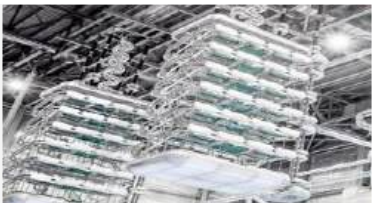
Virtual Planner – Automated assistance for train maintenance scheduling

Station Finder – RAG system for contextualized querying on station information



Digital Twins for production simulation in coal mines

HVS – Fire & smoke detection, PPE Compliance, Forklift safety



Generative AI for manufacturing

Peter Brooke

Principal – Manufacturing Business Development EMEA



Having an industrial data strategy is imperative.

Data-driven organisations are growing an average of **30%** annually.

Statistic provided by [Forrester](#)



The reach of AI/ML is growing

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Increased spending

By 2026, global spending on artificial intelligence will reach \$300 billion growing 4.2 faster than average IT spend

IDC

"IDC Press Release, Worldwide Spending on AI-Centric Systems Will Pass \$300 Billion by 2026, According to IDC, September 2022," <https://www.idc.com/getdoc.jsp?containerId=prUS49670322>



AI across several business units

Gartner survey reveals 80% of executives think automation can be applied to any business decision

Gartner

Gartner, Press Release <https://bit.ly/3is16a2>



AI is critical To success

94% of business leaders surveyed say AI is critical to their success

Deloitte

Deloitte, "State of AI in the Enterprise," <https://bit.ly/3XINOLR>

Generative AI for real-world tasks in manufacturing

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Benefits



Improve efficiency and productivity for employees and plants



Reduce time and cost of production



Grow revenues with product and service differentiation

Capabilities



Assist HR, legal, design, procurement, and contracts with document generation, research and summarisation



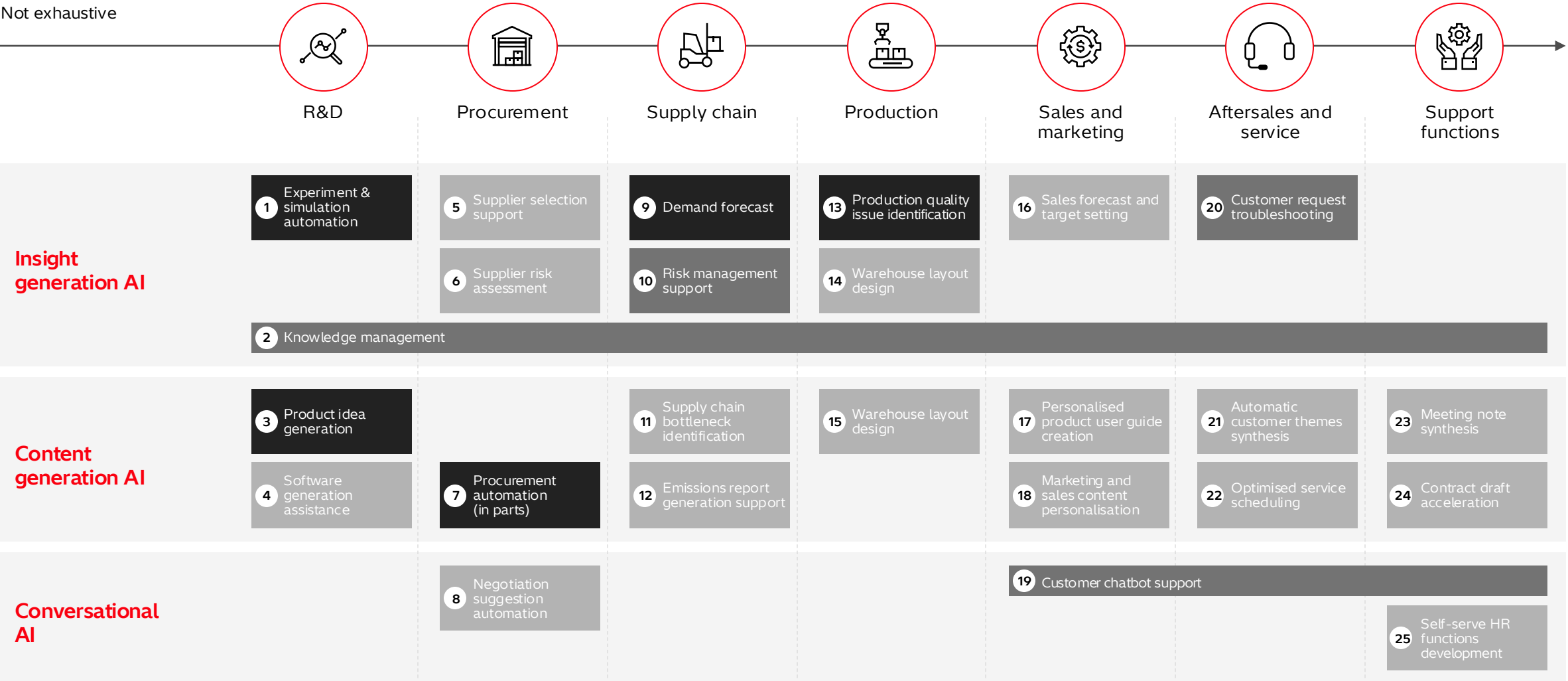
Agents and search for plant maintenance, operations, and research



Generate and enhance new product design. Market and customer research to support market development

Use case overview along manufacturing value chain

Not exhaustive



Impact estimation:  Strong  Medium  Light

Top manufacturing use case for generative AI

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Predictive maintenance

Faster, more intuitive insights

R&D and engineering

Transformation of R&D teams

Logistics

Real-time resource allocation

Developer assistance

Coding companions

Document processing

Extraction, summary

Generative business intelligence

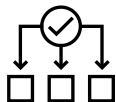
Visualisation, recommendations

Generative AI in automotive and manufacturing

Product engineering – Generative design for physical optimisation



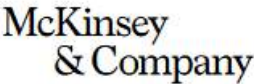
Recently adopted by design engineers, but still mostly used for simple parts like brackets, pistons, frames



Structural optimisation is most common use case, but can also improve design time, material, cost and weight reduction



Future roadmap: more complex design & assembly options, potentially leveraging additive manufacturing and rapid validation by simulation



1. Original Design

2. Gen-AI Design

3. Final Design

Tool Head

Bracket

Piston

Impact			
Weight (savings)	38%	26%	23%
Cost (reduction)	15%	8%	12%

How generative design could reshape the future of product development | McKinsey (2020)

Toyota Brings a Generative Design Seat Frame to the Next Level With AI

For the future of comfortable car interiors, Toyota used generative design to create a seat frame that is safe, lightweight, beautiful, and sustainable.

BY YASUO MATSUNAKA | ARTICLES - MAY 2, 2023



Toyota using AWS Partner Autodesk and generative design to advance seat structures

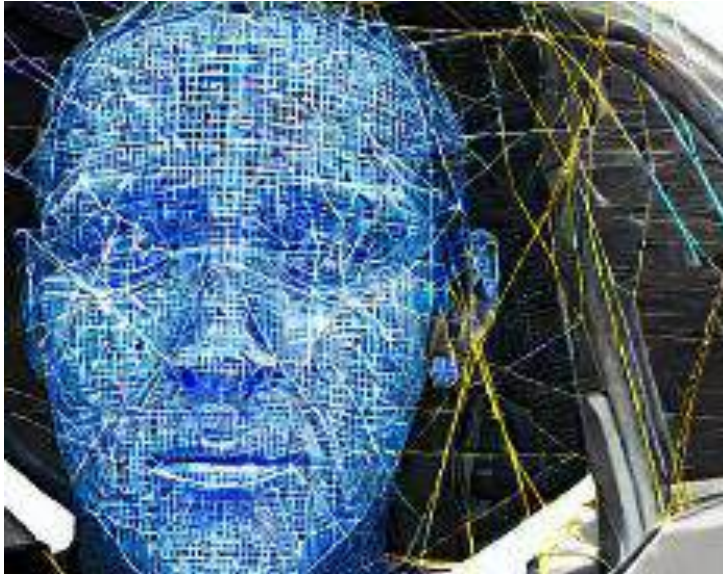
Generative AI in Automotive and Manufacturing

Generative AI for synthetic test data generation – faster, safer, anonymous

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Driver and cabin monitoring systems
(synthetic faces)



Vision-based anomaly detection
(synthetic defects)



AV models for high-risk & edge cases
(synthetic scenarios)

Synthetic training data reduces development time, increases model accuracy and is completely anonymous

[Synthetic Data for In-cabin Monitoring](#)

What's the difference between popular open-sourced tools (Chat GPT) and Industrial-grade GenAI?

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Experimentation vs production

Current open-sourced tools are great for experimenting with Generative AI and learning how this technology could be applied to common problems



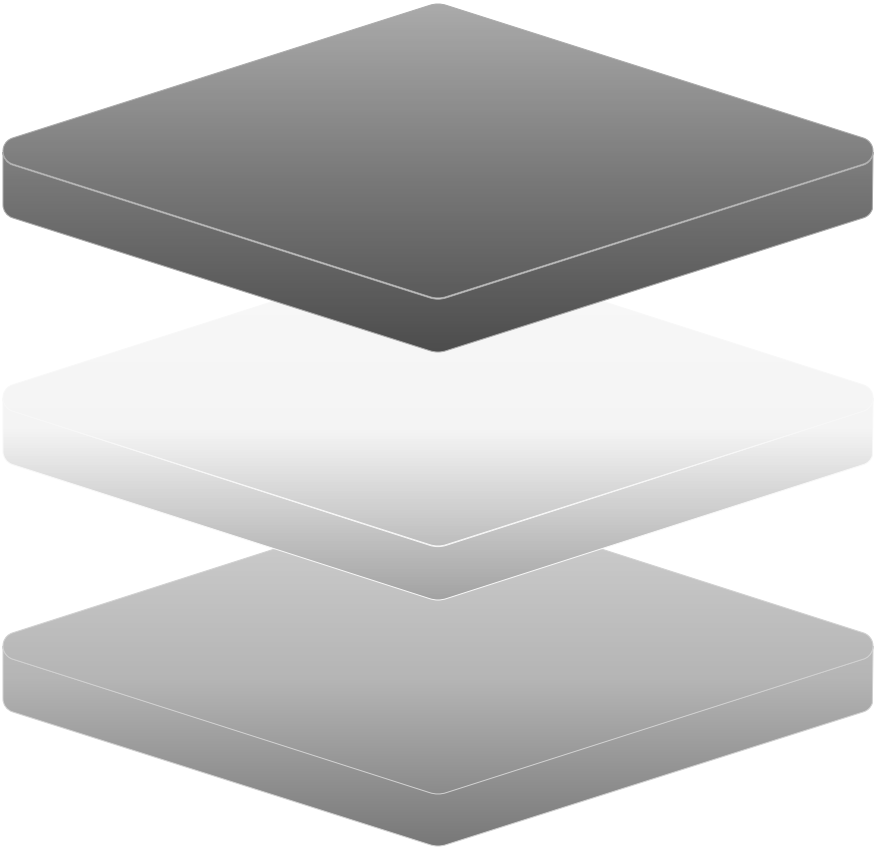
Security and IP

The challenge with current open-source tools is they don't necessarily account for the unique security and legal challenges of using enterprise or proprietary data



Industrial scale and customisation

Automotive and Manufacturing use cases for Generative AI will require more customisation and specific FMs to scale effectively



Applications to boost productivity

 Amazon Q Business
Insights and automation

Amazon Q Developer
Software development lifecycle

Models and tools to build generative AI apps

 Amazon Nova
Foundational model

 Amazon Bedrock
Amazon models | Partner models

Infrastructure to build and train AI models

 Amazon SageMaker AI
Managed Infrastructure

 AWS Trainium
 AWS Inferentia
High performance compute

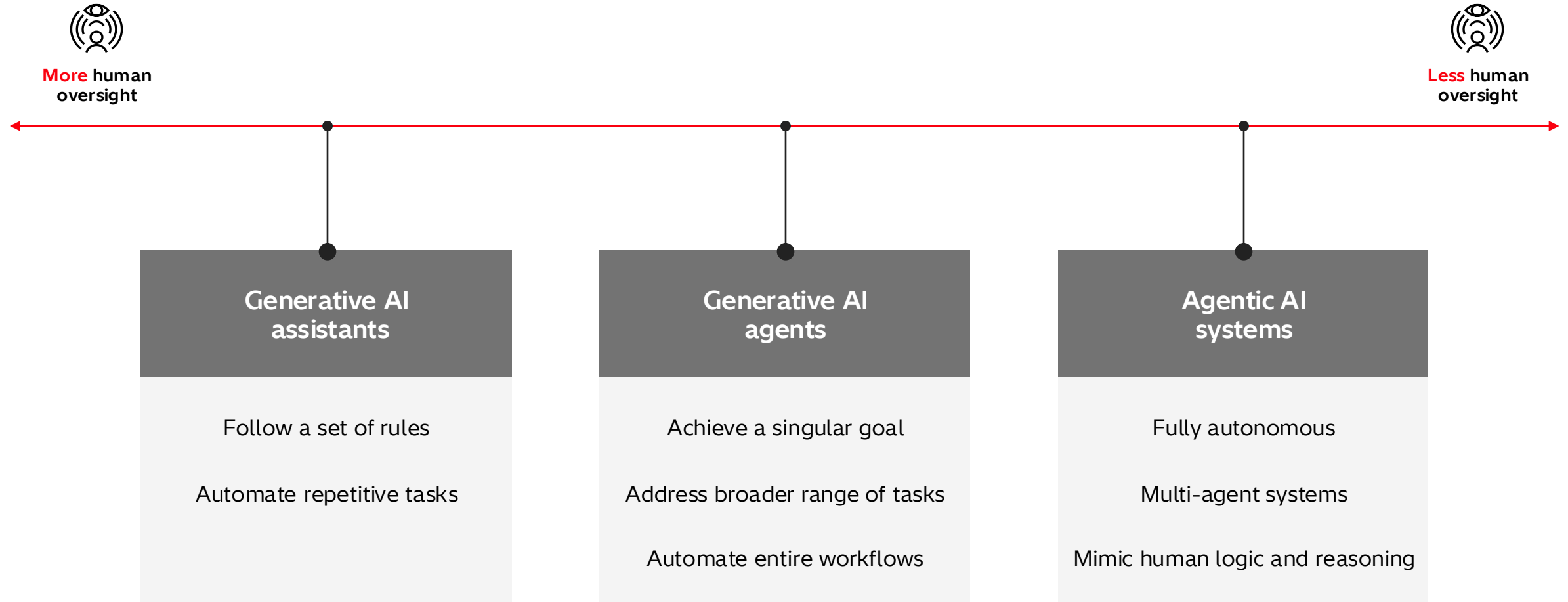
 GPUs

Evolving into Agentic AI

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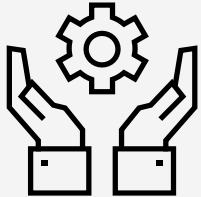


What you need to get business value quickly with generative AI

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Ease of use

Choose a base FM and customize it securely and quickly to build differentiated apps



Cost effectiveness

Manage infrastructure to ensure optimal performance and cost



Faster time to value

Get started with generative AI services for common business tasks

Generative AI

Assisted diagnosis and troubleshooting



“Amazon Bedrock enabled us to quickly innovate on industry use cases with generative AI. AWS’s generative AI capabilities are the platform for our future Technician AI Assistant, which will leverage complex technical documentation and case libraries to speed customer service in the field.”

Amy Chen, CIO, KONE

Customer	Kone
Country	Global
Use case	Assisted diagnosis and troubleshooting
Products	Amazon bedrock

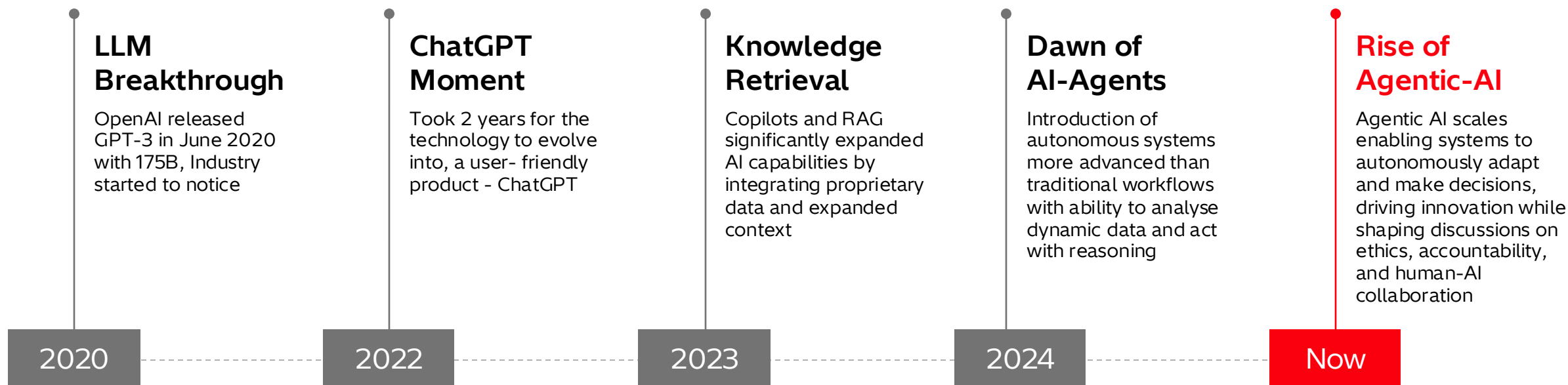
Agentic AI

Vitor Domingos

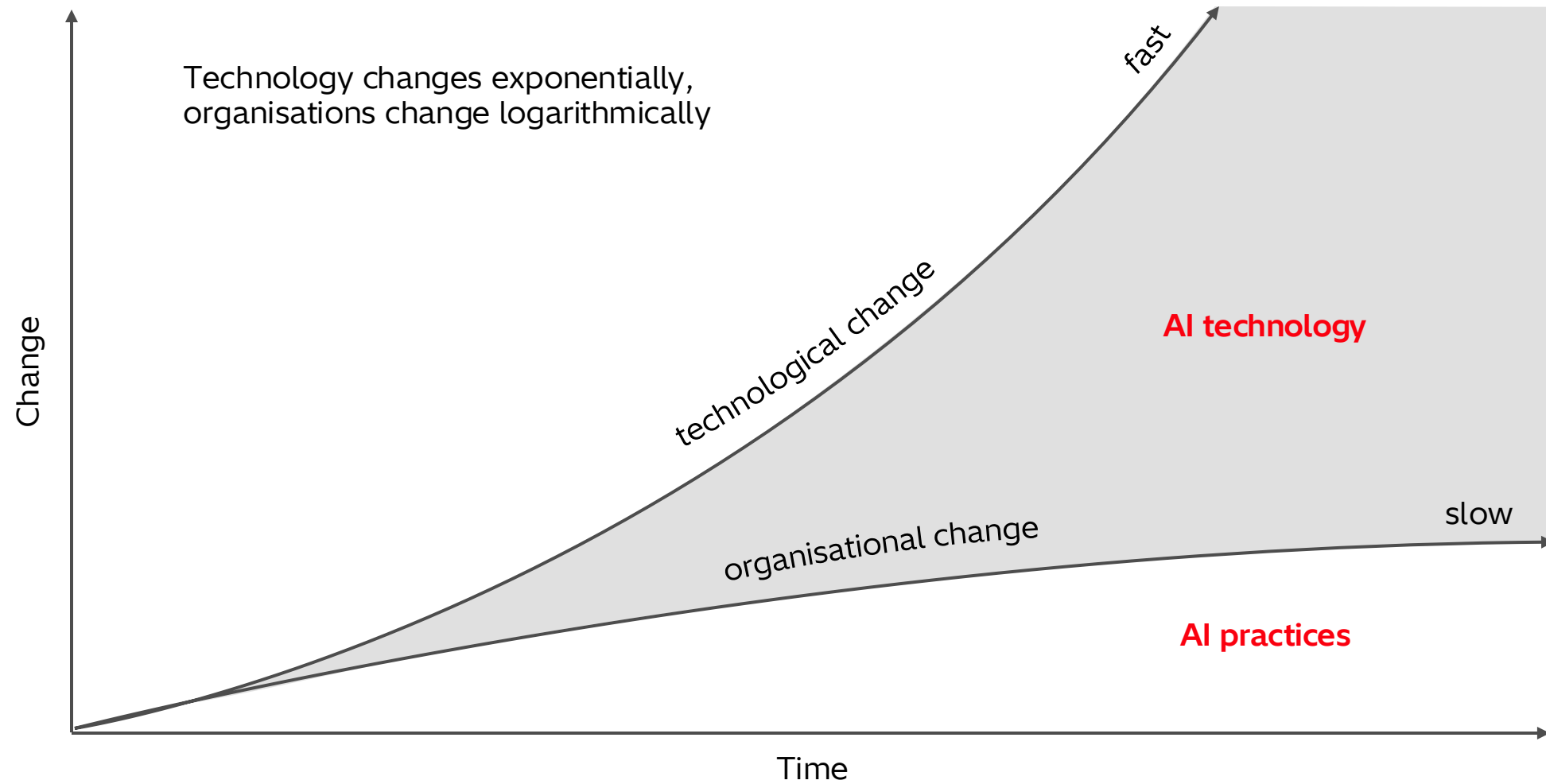
Lead Solution Architect

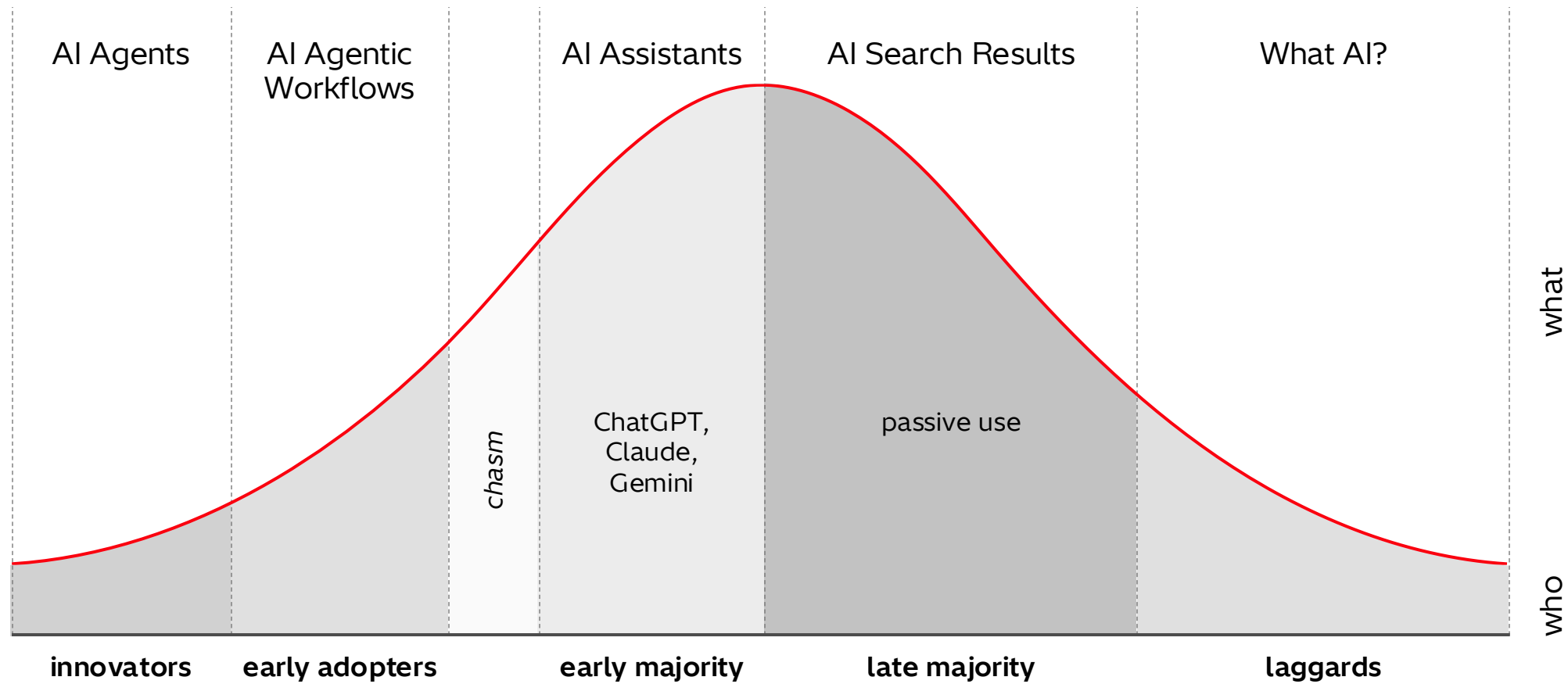






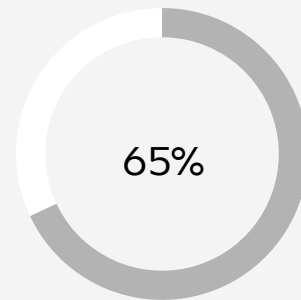
Generative AI has evolved swiftly, starting with breakthroughs in language models and progressing to interactive assistants, intelligent retrieval systems, and autonomous agents. Today, these advancements have culminated in the rise of truly **Agentic AI**, where systems can independently pursue goals and make decisions.





Enterprise world recognises the transformative potential of GenAI and is investing accordingly. The priority now is to **ensure these AI/GenAI deployments are trustworthy, efficient, and scalable** in real business environments.

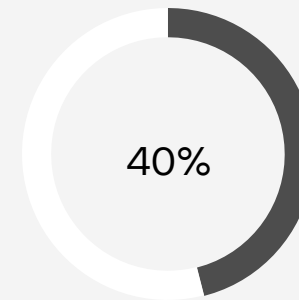
McKinsey's



GenAI

65% of organisations report regularly using GenAI, double the rate from 10 months prior.

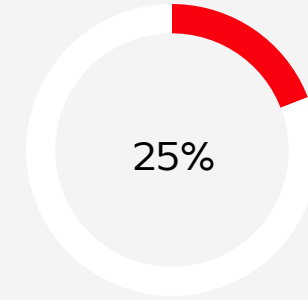
Gartner



Enterprise

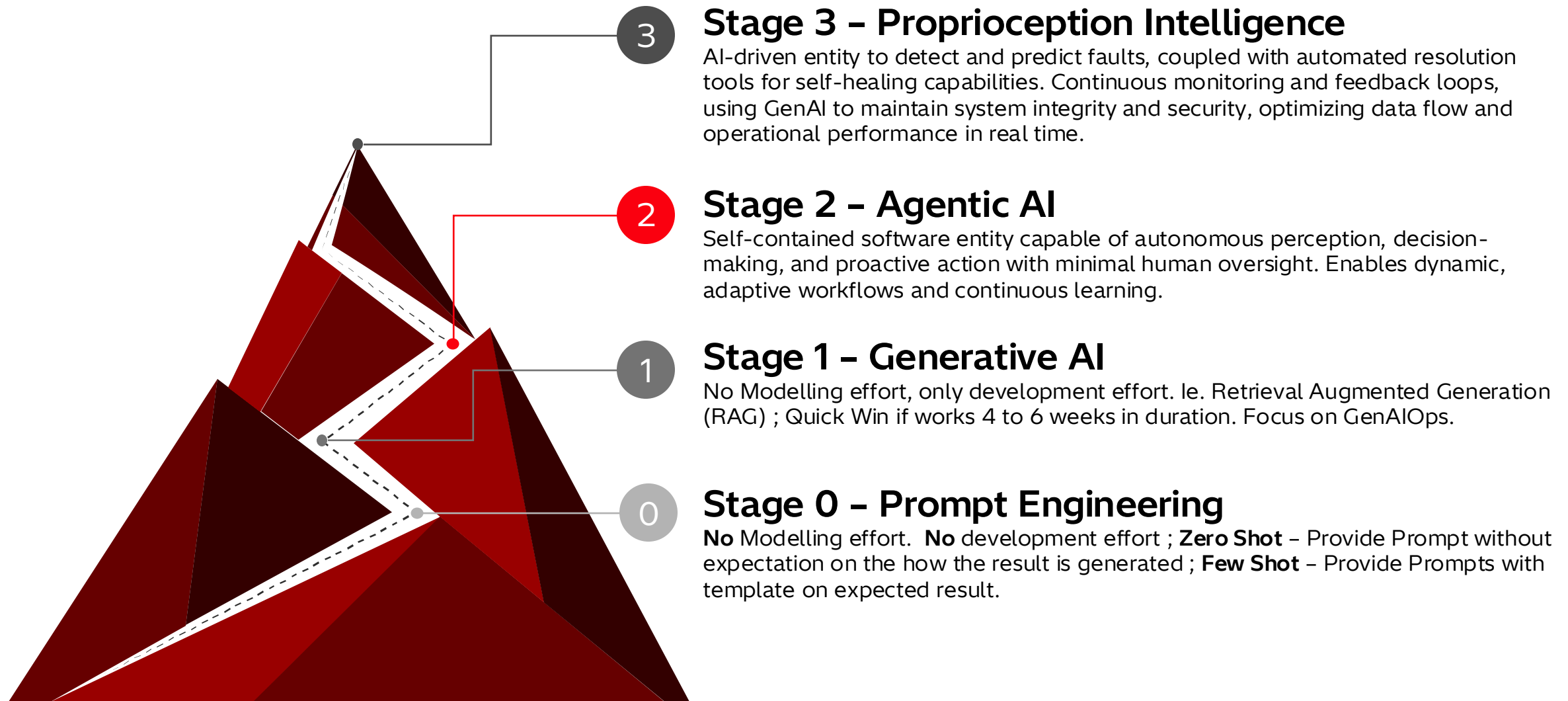
40% of enterprise software apps will embed Agentic AI by 2026, up from < 1 % in 2024; these agents will autonomously make 15 % of day-to-day work decisions.

C-Suite

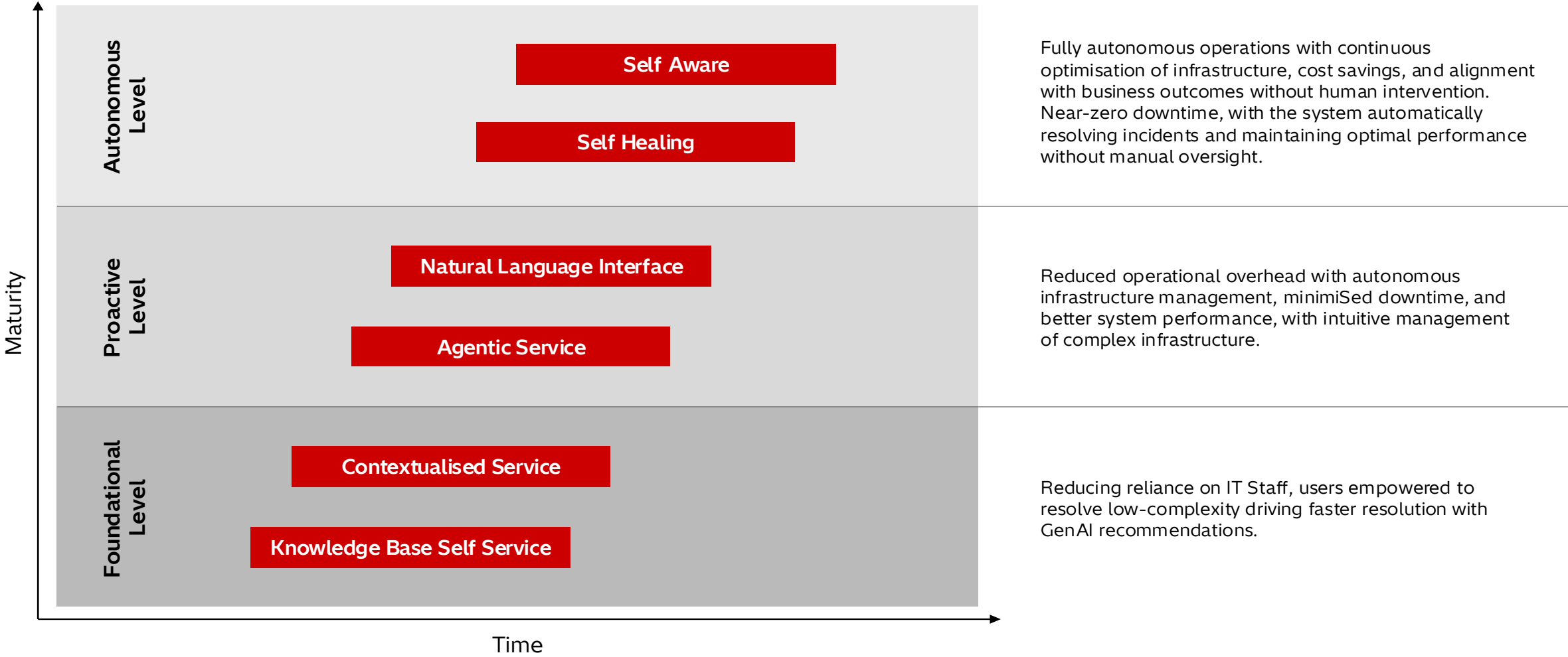


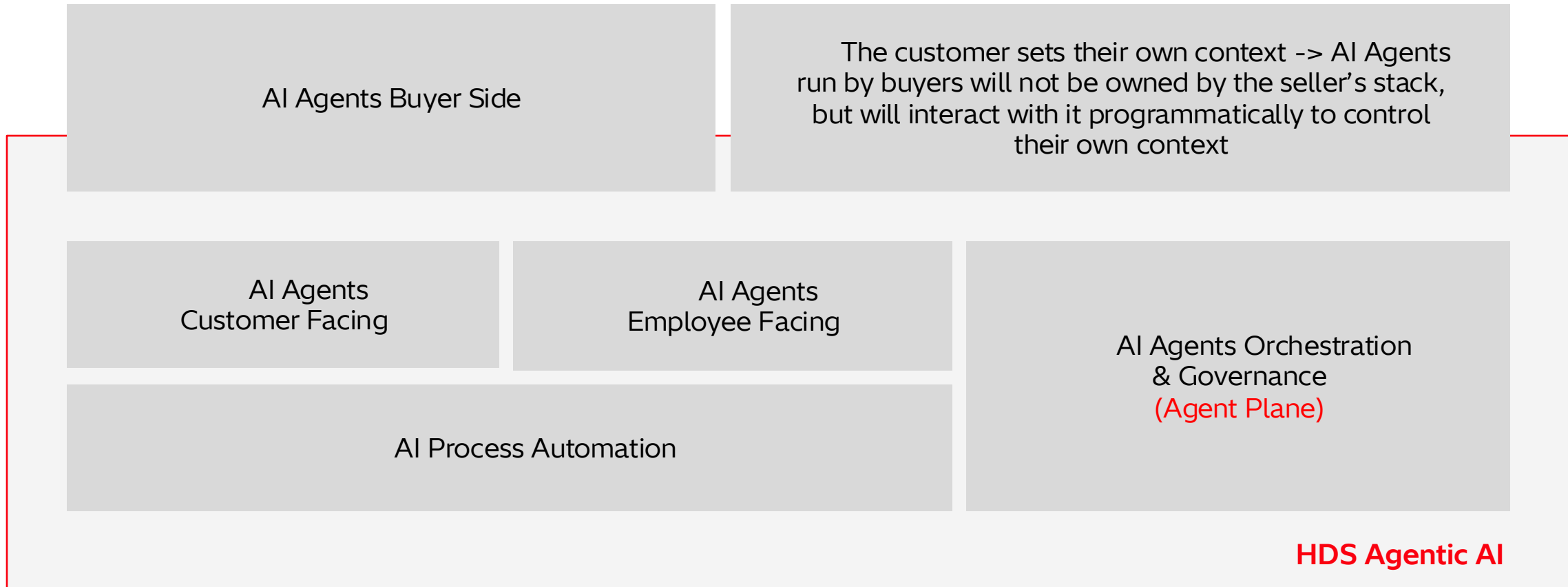
Adoption

25% of the executives are already using GenAI tools for work in 2025. They are increasingly hands-on.

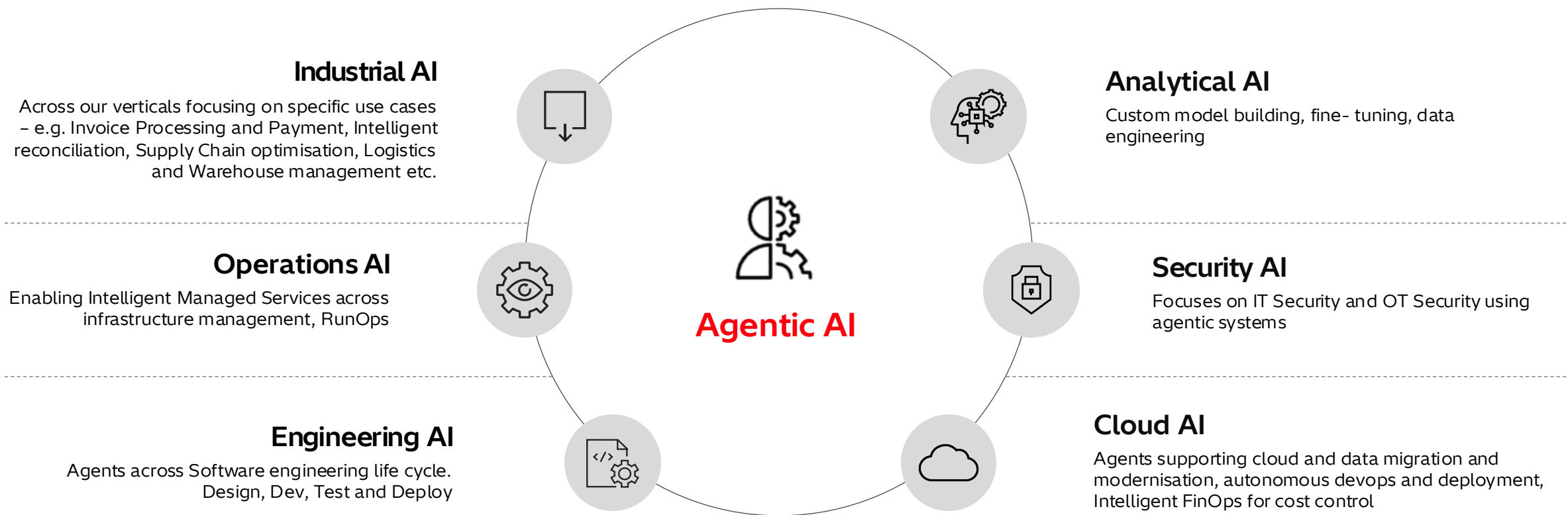


Maturity journey



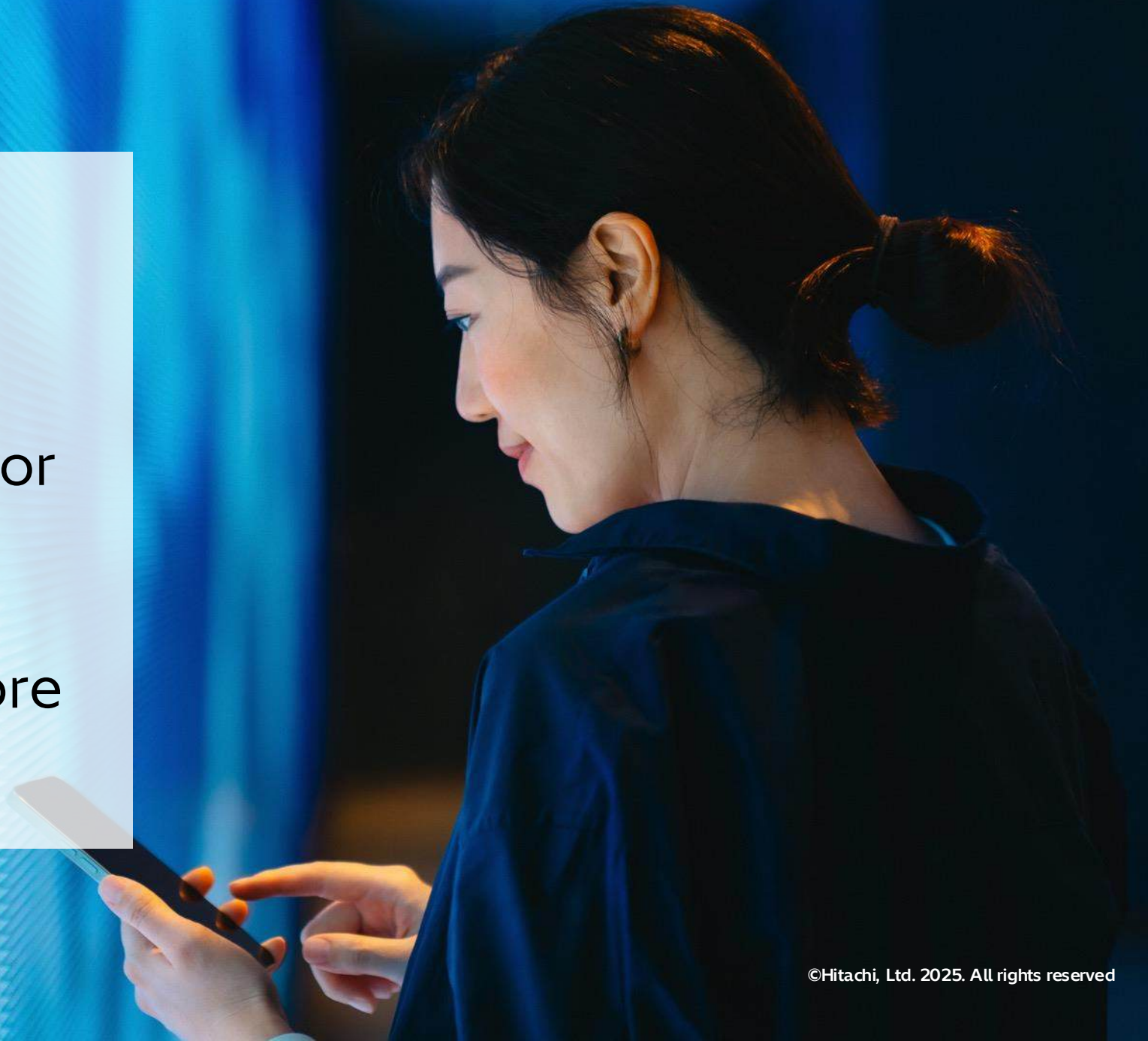


System of agents that seamlessly work together to significantly boost productivity for Hitachi DS teams and jump-start agentic use cases for our customers



Contract management with Agentic AI

Real-time contract oversight through **GenAI-driven agents (Agentic AI)** that monitor execution, detect anomalies, and resolve compliance issues before they escalate.



Agentic AI can transform contract lifecycle into a self-optimising, intelligent system that reduces operational risk, enhances supply chain performance, and drives efficiency



Real-Time Supply Contract Oversight

GenAI-driven agents continuously monitor supplier contracts, detect delays or deviations in material delivery, and resolve quality or compliance anomalies before they affect production timelines.

Procurement Cycle Acceleration

AI modules automate RFQs, supplier scoring, and purchase contract drafting. Agents benchmark vendors on delivery lead times, pricing, and ESG compliance, optimising supplier selection and reducing procurement cycles.

Regulatory & Trade Compliance Monitoring

Agentic AI tracks evolving trade regulations, import/export controls, and ISO/industry standards (e.g., IATF 16949, REACH). It uses historical data to predict compliance risks and ensures proactive remediation before audits.

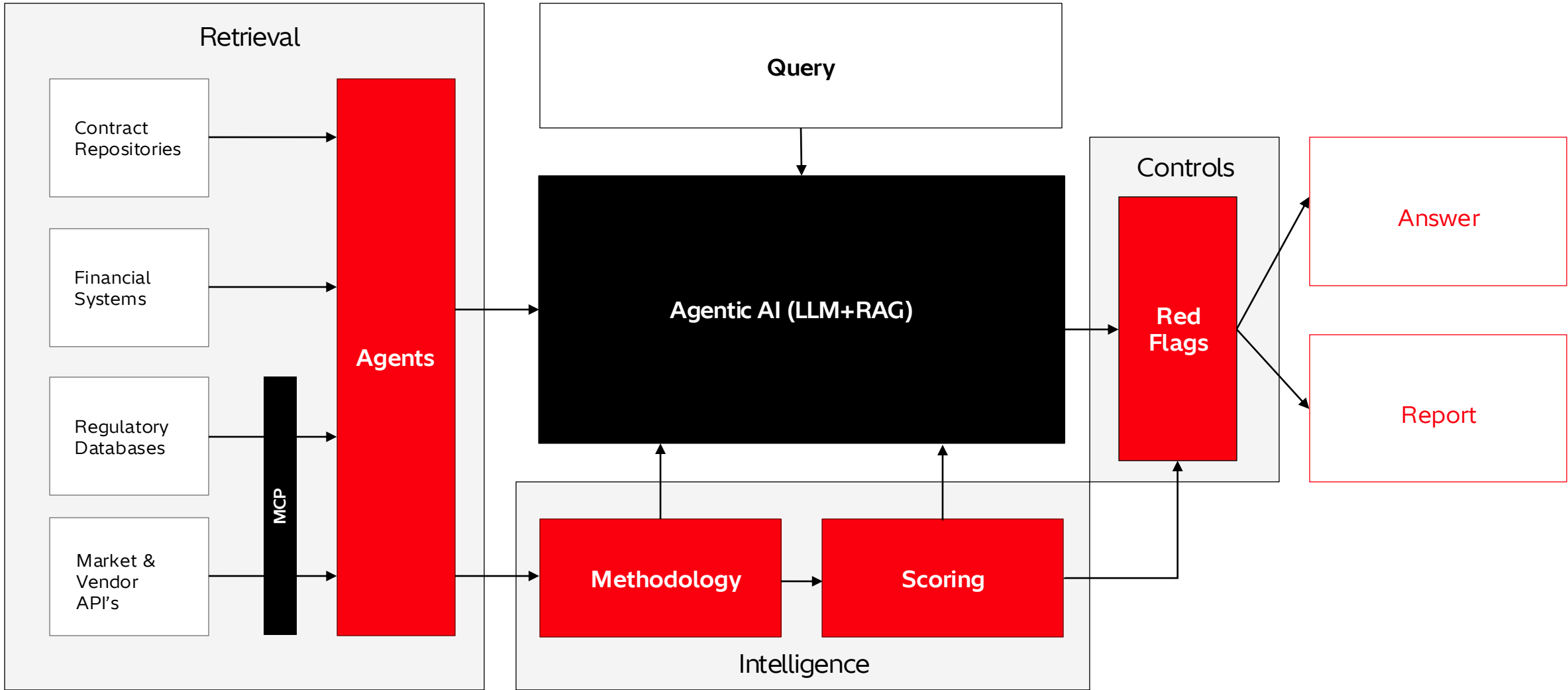
Performance-Linked Contract Intelligence

Tracks manufacturing KPIs tied to contracts (e.g., throughput, defect rates, OTIF delivery) to trigger automated amendments, renegotiations, or supplier escalations — ensuring aligned contractual execution.

Financial Impact Forecasting

Agentic models simulate cost exposure from fluctuating commodity prices, tariffs, and logistics. Tax automation and real-time pricing adjustments ensure every contract is financially sustainable and execution-ready.

Organisations Priority	HDS Contract Management Support
Digital Transformation of Supply Chain & Procurement	GenAI-powered supplier contract intelligence, automated RFQ-to-PO workflows, and risk-based sourcing
Production Continuity & Operational Efficiency	Contract monitoring with anomaly detection tied to delivery SLAs and production inputs
Governance, Risk & Compliance (GRC) Alignment	GenAI-driven compliance intelligence across trade, safety, and industry manufacturing standards
Cost Optimisation & Financial Transparency	Automated financial adjustments & cost tracking
Scalability for Global Operations	Multi-region contract management with financial structure integration



Predictive Maintenance With TimeSeries Foundation Models

Predictive Maintenance with TimeSeries Foundation Models

Use Case: Reducing unplanned downtime and extending equipment life in manufacturing plants by proactively identifying machine failures and maintenance needs through real-time sensor data and intelligent predictive models.

Benefits: Predictive maintenance minimises costly disruptions on the production floor, increases OEE (Overall Equipment Effectiveness), improves safety, and extends asset longevity, directly impacting throughput, cost, and quality KPIs.



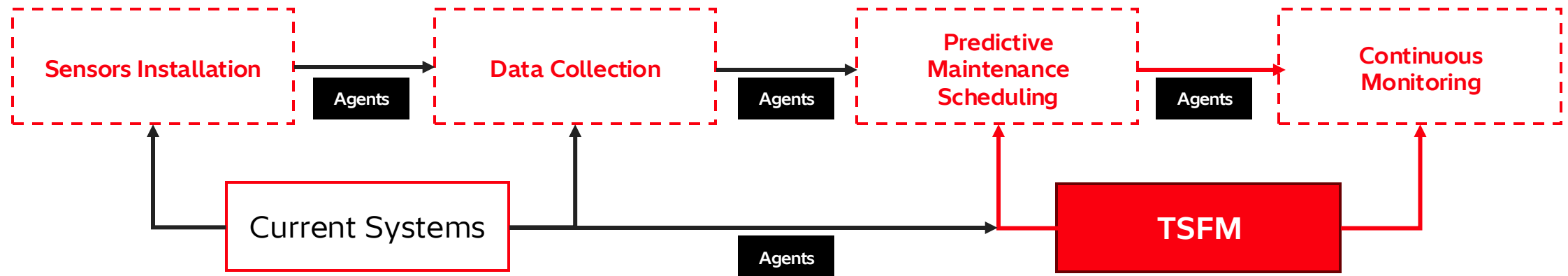
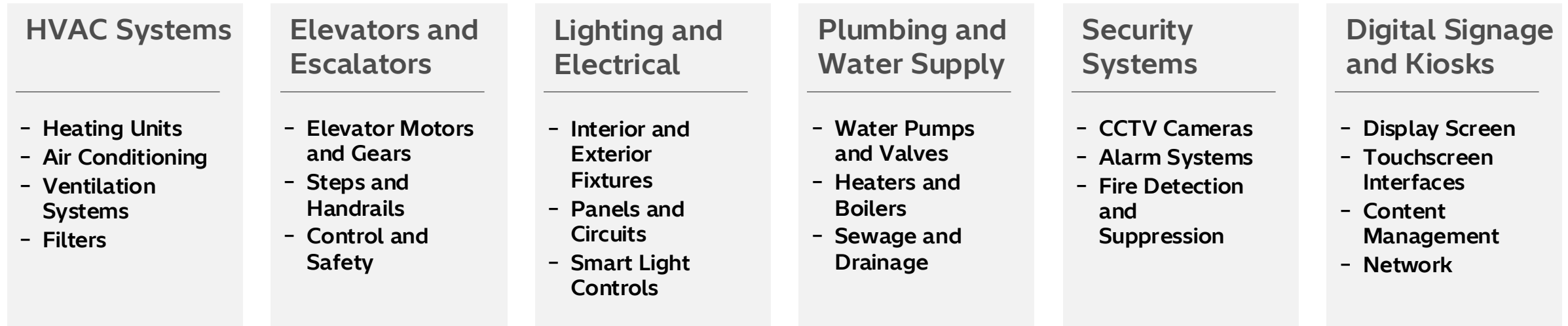
Implementation

IoT Integration: Connecting critical infrastructure (HVAC systems, parking, lighting, etc.) with IoT sensors to monitor performance metrics such as temperature, humidity, availability and energy consumption.

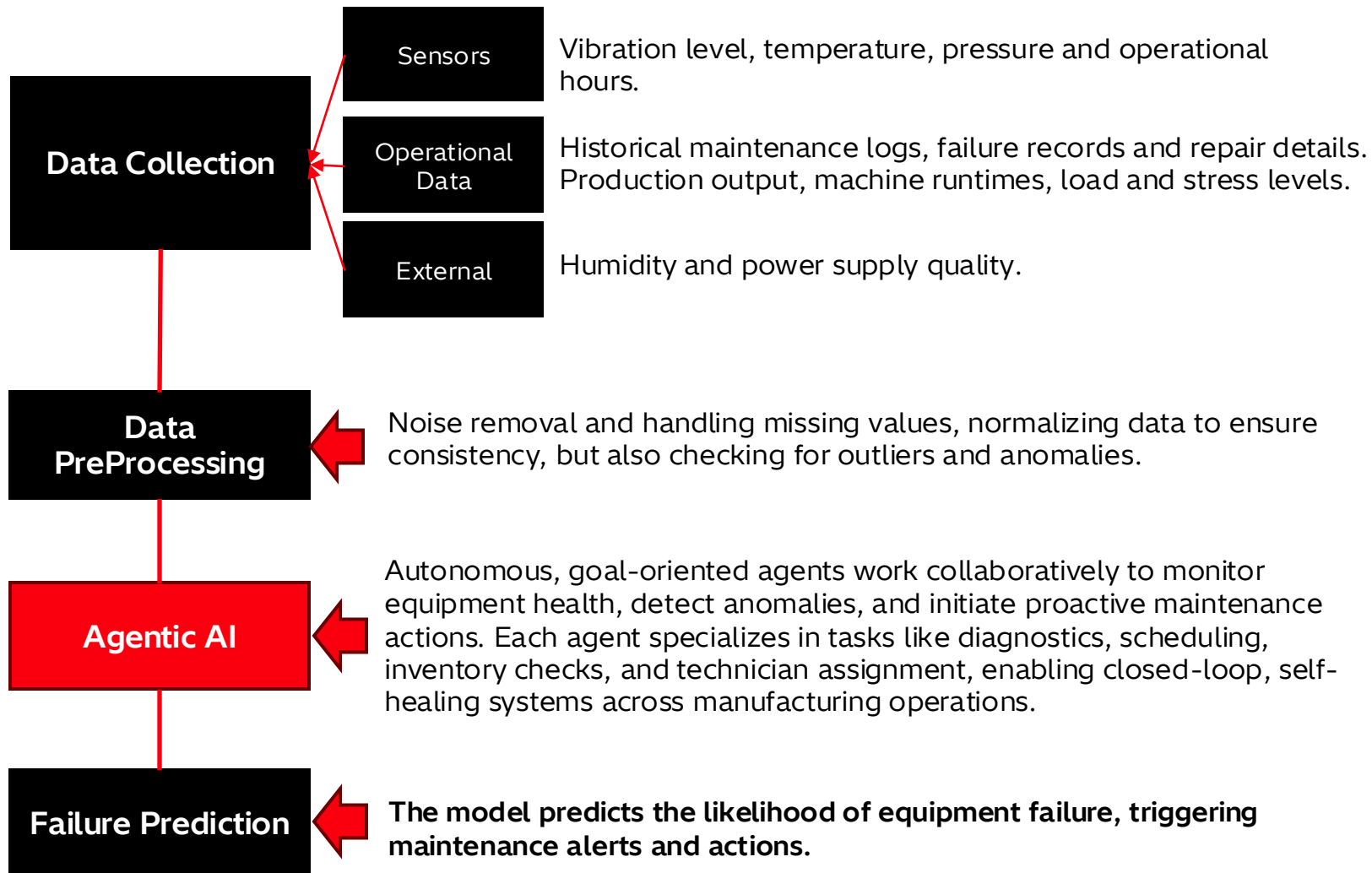
Data Collection & Learning Model: Continuously collecting data from these sensors with Agents to build a comprehensive dataset on the health, performance and availability of each component, aligned to the manufacturer specifications, whilst developing predictive maintenance models using GenAI. Initially, traditional methods like regression or ARIMA can be used, but TSFM can be used to predict failure with same levels of accuracy.

Failure Prediction: Using GenAI to predict potential failures or maintenance needs before they occur (Pattern Detection). For example, an abnormal increase in vibration could indicate an impending failure in an HVAC system and ensure spare parts and maintenance personnel are available when needed, reducing downtime and maintenance costs.

Predictive Maintenance with TimeSeries Foundation Models



Predictive Maintenance with TimeSeries Foundation Models



To Know

- **Autonomous Resilience:** Agents don't just predict failure; they plan, coordinate, and act.
- **Time-to-Value:** Reduces reaction time from hours to seconds by skipping manual approval gates.
- **Scalable Intelligence:** Each factory line can run its own agents trained on local context, while coordinating globally.
- **Closed-Loop Optimisation:** Agents continuously learn from operational feedback and update their models accordingly.

Predictive Maintenance with TimeSeries Foundation Models

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Impact

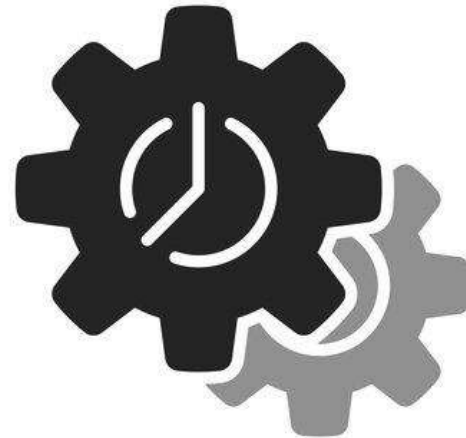
Reduced Downtime: By predicting equipment failures before they occur, the system can schedule maintenance proactively, significantly reducing unexpected downtime.

Cost Savings: Optimizing maintenance schedules and preventing catastrophic failures can lead to substantial cost savings in repairs and operational disruptions.

Improved Efficiency: Real-time monitoring and predictive insights enable more efficient use of resources and better maintenance planning.

Extended Equipment Life: Proactive maintenance can extend the lifespan of machinery, reducing the need for frequent replacements.

Enhanced Safety: Predicting and preventing equipment failures can improve workplace safety by reducing the risk of accidents due to equipment malfunctions.



Predictive Maintenance

Benefits

Reduction in Downtime Events: 50%
(from 4 to 2 events per machine)

Reduction in Safety Incidents and Penalties: 40%

Reduced Downtime Hours per Year:
2,000 hours

Reduction in Unplanned Maintenance Costs: 30%

Increase in Equipment Lifespan: 20%
(from 10 years to 12 years)

Increase in Production Efficiency: 5%

Reduction in Spare Parts Inventory Costs: 25%

Our digital journey

Implementing Gen AI in a large manufacturing organisation

Rajat Mathur

Director Portfolio & Delivery Digital and Data



Who we are

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DS Smith Plc was founded in the 1940's as a box-making business in East London. Since then, we have expanded to provide full solutions including recycling and paper making. We have many acquired businesses in North America and Europe, and have achieved rapid growth.

Today, our business is made up of three core divisions: Packaging, Paper and Recycling.

The bigger we become the more our customers expect of us and the more we expect of ourselves. We have a relentless desire to improve, innovate and reach new goals.



Delivering a wide range of fibre based packaging solutions



Paper Solutions



Brown liners



White liners



Kraft liners



Medium/Fluting grades



Dual-use grades



Coated papers



Plasterboard liners



Solid Board



Coreboard

Packaging Solutions



What's happening in DSS

Implementing Gen AI in a large manufacturing organisation

The case for driving a digital Gen AI change

External Environment



Customers' increasing expectations on price, innovation and service



Increasing demands from society, customers and regulators around ESG/sustainability



Our staff's expectations around their working environment and tools



Disruption starting to appear led by new digital technologies

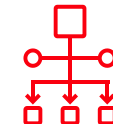
Internal IT Environment



Complex application landscape – over 900 applications over 17 data centres



Complex supplier and vendor landscape – over 200 suppliers



Very manual and often XLS based processes for data analysis and insight



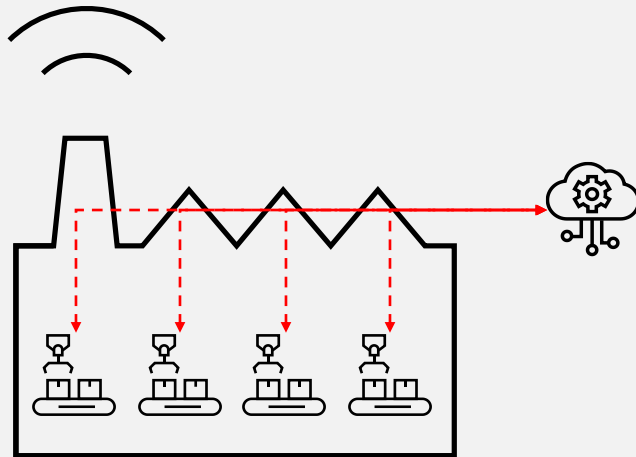
<1% of workloads cloud based meaning data siloed across on prem systems

Connected Factory 2030 – Internally and externally “connected”

Two dimensions to our connected factory strategy – connecting datasets within a factory and between factories

A Connected Factory

Goal: “achieving our perfect day every day”



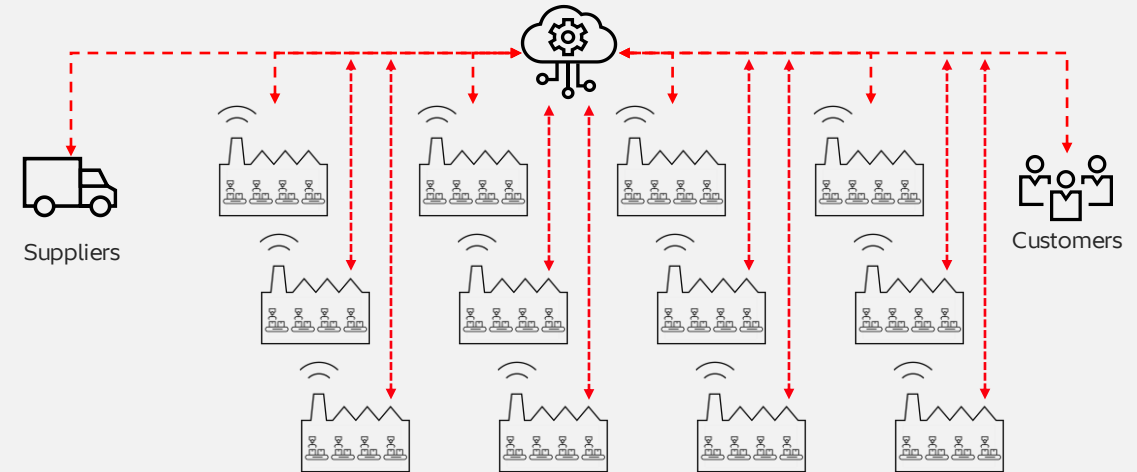
“Internally Connected”

Operational use cases that connect data within a site. Day to day, plant level, typically within a shift, reviewed at DAC.

- A. Product Quality
- B. Energy Monitoring
- C. Connected Worker
- D. Predictive Maintenance
- E. Parts Management
- F. Operational /Productivity Dashboard
- G. Materials Optimisation
- n. Other

Our Connected Factories

Goal: “creating end to end visibility”

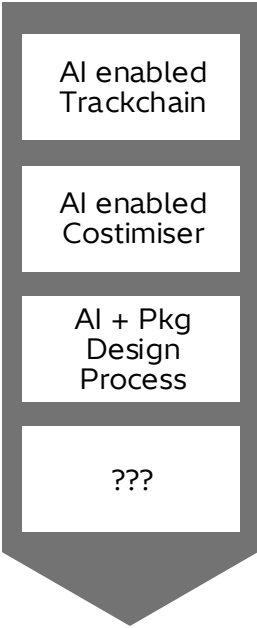


“Enterprise Connected”

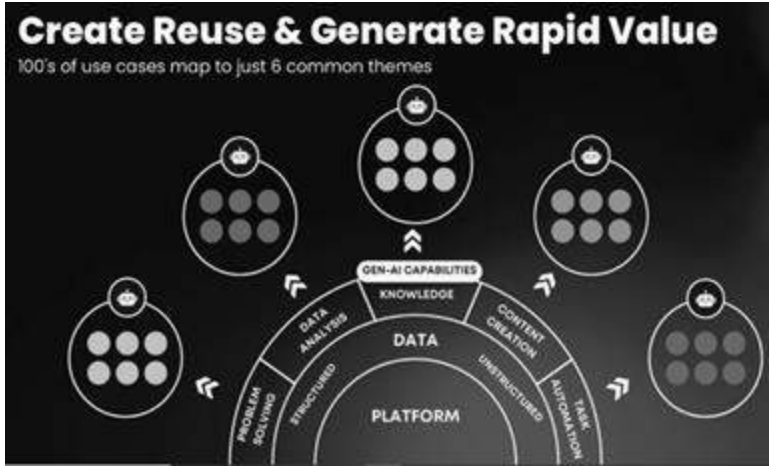
Use cases that span our individual sites, connecting and aggregating data at country, regional and group levels. Longer term, strategic insights. May cover Country, Regional, Enterprise, Customers and Partners

- Track and trace (e.g. EUDR)
- New revenue streams (e.g. Parcelive)
- Supply Chain Control Tower
- Spares & Inventory Management
- Staffing & Skills

Think about AI on two dimensions:
Horizontal (how we work) and Vertical (what we do)



Enabler: it improves what we do today by essentially **automating repetitive task**



Augment: we can create new products and services using AI (and our data probably) by augmenting what we do today

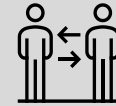
Can put use cases into three broad categories

Whilst Gen AI will have hundreds of use cases across DS Smith, they can mostly be categorised into three types:



The value created to DS Smith increases in each step.

- For **Productivity improvements** the value is reducing costs by increasing staff productivity – same outcome at lower staff costs
- For **Enterprise search** as well as productivity improvements, having easier & better access to more data leads to better insight and hence better outputs – better outcome at lower costs
- For **Service re-design**, potential to completely re-imagine a service leading to radical innovation and change.



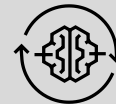
Everyone's personal intern

- First draft of reports
- Translation Tool
- Summarise customer interviews
- First draft of press reports
- Analyse contracts or RFPs.



Enterprise search

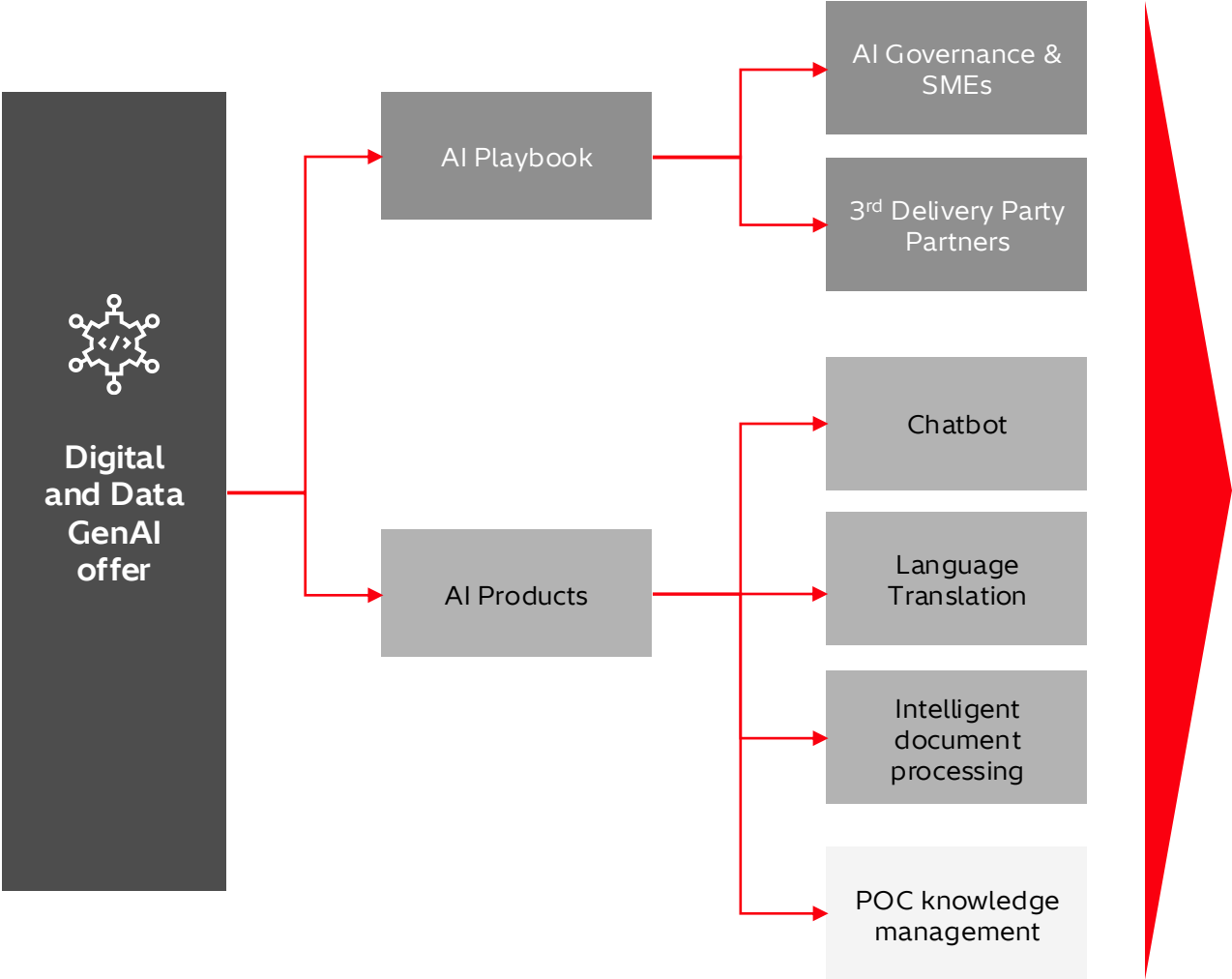
- Search structured and unstructured data across DSS
- Better Demand forecasting
- Pricing optimisation
- Logistics optimisation
- Contract negotiation



Service re-design

- Re-imagine and re-design an activity bottom up using Gen AI eg:
 - Packaging design
 - Customer service interactions
 - Procure to Pay workflow

What we are doing on Gen AI



- Established a special interest group and SME's who guide on all things AI
- Established a process for assessing and onboarding 3rd party/ off the shelf Gen AI tools and solutions so can leverage 3rd party solutions
- Providing Secure and safe access via Bedrock models to variety of models. E.g. Claude Sonnet 3.5/3.7
- Ability to translate PPTs, XLS, PDFs and Docs via simplified UI for the business
- Ingesting scanned documents e.g. invoices or receipts leveraging Cost ~ £0.04 per doc and accuracy > 95%
- POC – ability to upload multi format large documents and interrogate and work with our data & information with the assistance of LLM Models

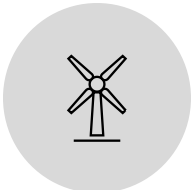
Use Cases in the Exploration Stage



Package Solution Design



Marketing Customer interview analysis



Sustainability Chatbot



Gen AI co-pilot assistant



Document Translation Assistant



Amazon SageMaker



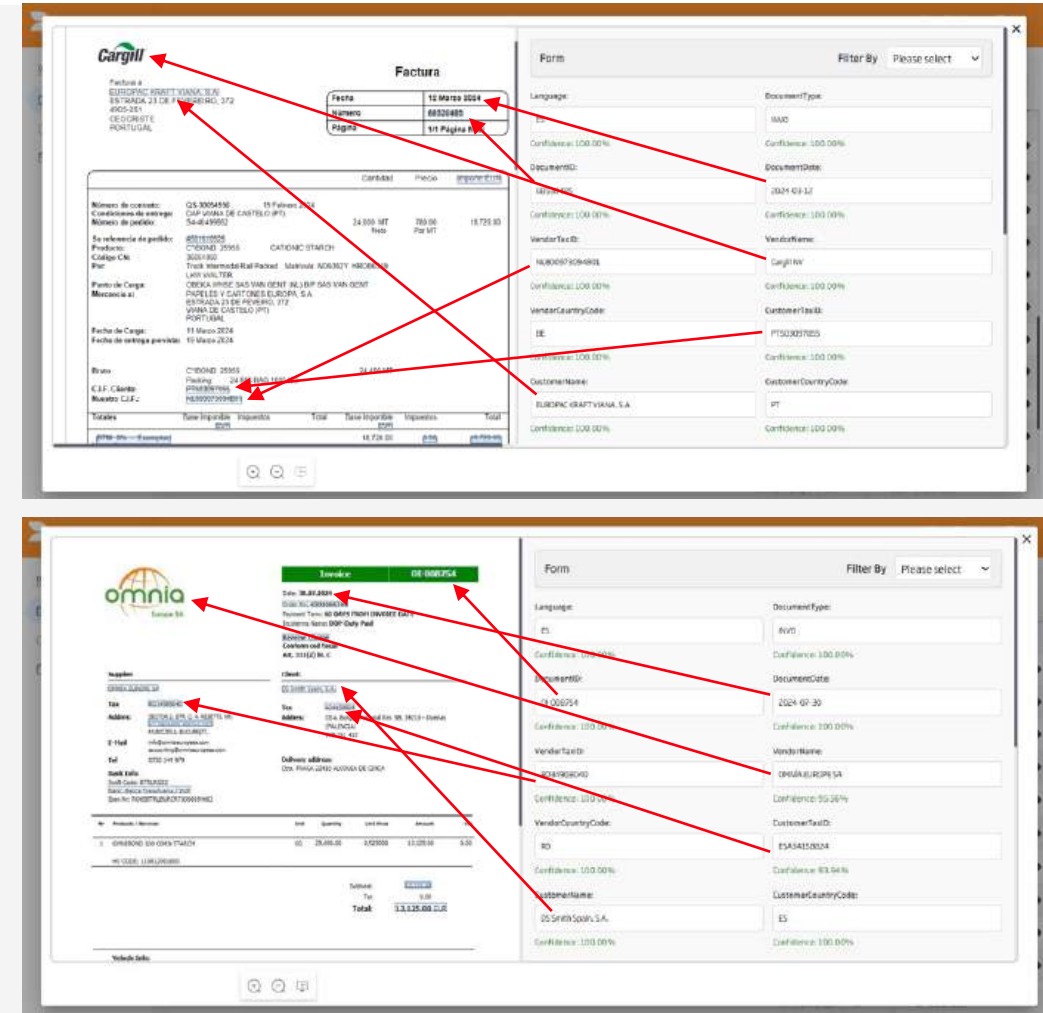
Amazon OpenSearch



Amazon Bedrock

Intelligent document processing – Leveraging Gen AI for doc processing

- Replacing outdated OCR with **fully-based GenAI** document extraction processes to **increase accuracy and reduce costs**.
- Leveraging **economies of scale**, expecting a cost of **£0.02 per document** and **95% / 99% accuracy** for first set of use cases.
- IDP has proven to be a **good fit for any large volume use case** where there is a set of **fields that must be extracted from documents with different structures**.
- First use case going live: **SSC Iberia Accounts Payable** with **annual savings of £269,000**:
 - Phase 1: £86,000 saving from Licensing costs removal
 - Phase 2: £183,000 saving from FTE Repurposing
- Creating a **capability** that could be **easily adapted to other use cases**:
 - Supply Chain Vendor Transport Analysis
 - Customer Remittances
 - Purchasing Orders Processing (Portugal)

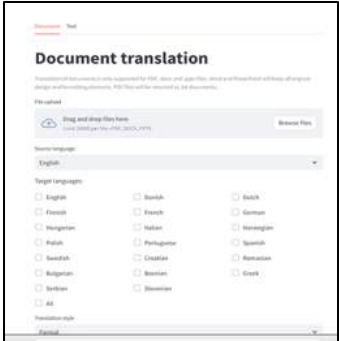


What resources and capabilities do we have today in DSS to support?

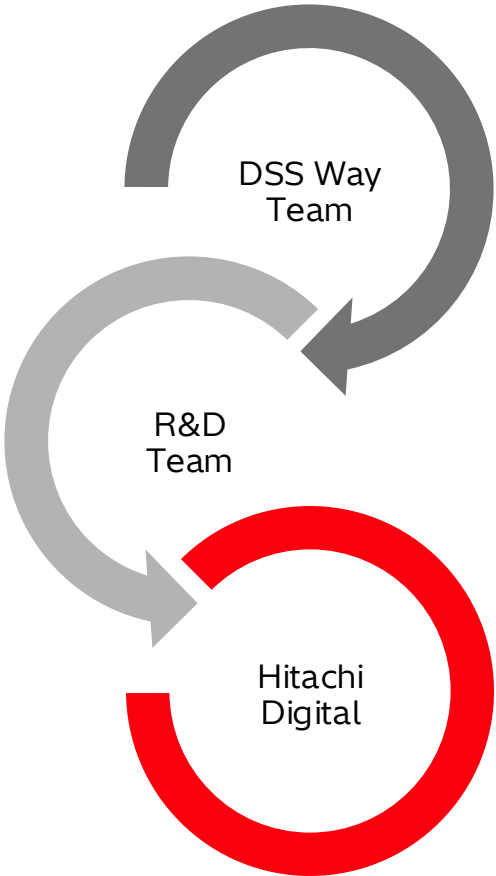
AI chatbot



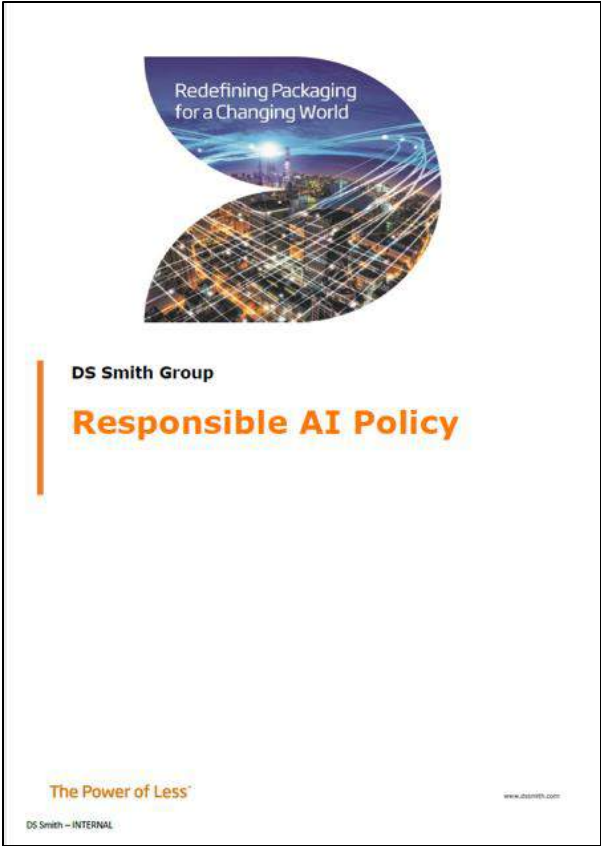
AI Translate



A “Build eco-system”



A framework for on-boarding 3rd party solutions



AWS Gen AI training

HITACHI

aws

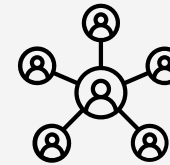


DS Smith employees can create an AWS Skill Builder account which provides them to access a catalogue of free courses in a flexible, digital format



Introduction to generative AI - Art of the Possible

- This course provides an introduction to Gen AI, use cases, risks and benefits. With the help of a content generation example, we illustrate the art of the possible.
- By the end of the course, learners should be able to describe the basics of generative AI, its risks and benefits. They should also be able to articulate how content generation can be used in their business.
 - **Course level: Beginner**
 - **Duration: 1 hour**
 - **Available in 10 languages**



Building a Generative AI-Ready Organisation - AWS Skill Builder

- Building a Generative AI-Ready Organisation is the last course in a three-part series of Generative AI Essentials for Business and Technical Decision Makers. It's recommended you start with the first course in the series, Introduction to Generative AI: Art of the Possible.
- By the end of the course, you should be able to describe the key considerations for building a generative AI-ready organisation. You will be equipped with the tools and the knowledge to upskill employees and to infuse generative AI thinking in your workplace.
 - **Course level: Beginner**
 - **Duration: 1 hour**

Top 3 learnings from our digital journey so far...

HITACHI



01

Think Big but Start Small – show the “Art of the Possible”

02

Always always always **align to business strategy** and show the value

03

Build an ecosystem around you – need to bring in external voices

Q&A

HITACHI



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Industry 4.0, Hitachi Digital
Services



Peter Brooke

Principal Manager – Smart Factory
Business Development, Amazon Web
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