Scalable Development of GenAI and Agentic AI with Enterprise Architecture Management

University St. Gallen, March 2026

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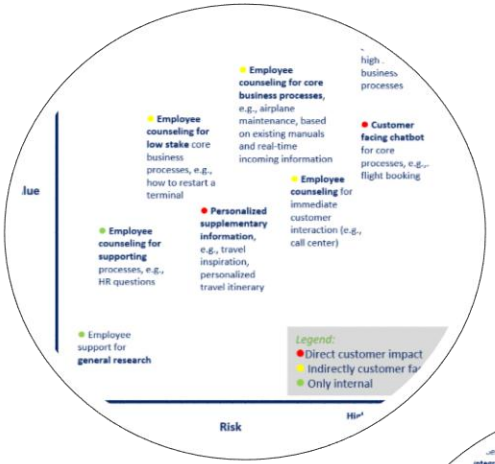
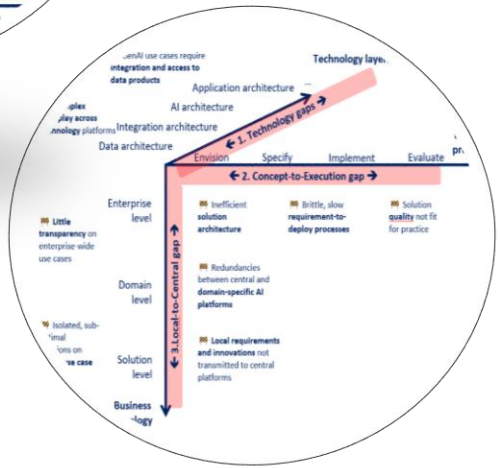
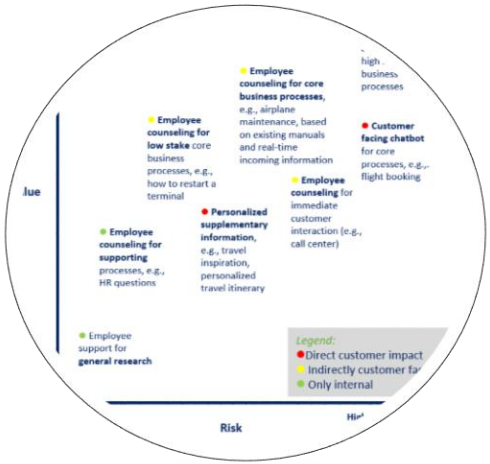


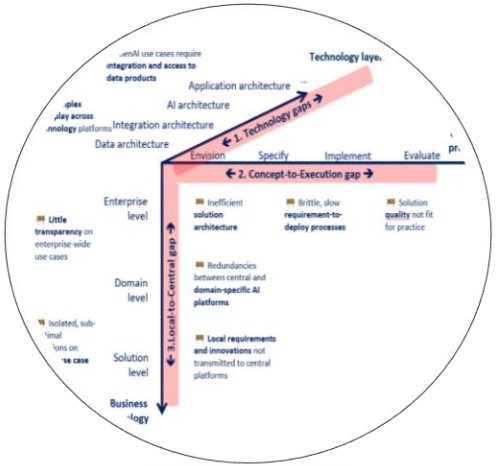


Learning objectives and core points of this presentation



EAM tools for steering the GenAI landscape

EAM tools for steering the Agentic AI landscape

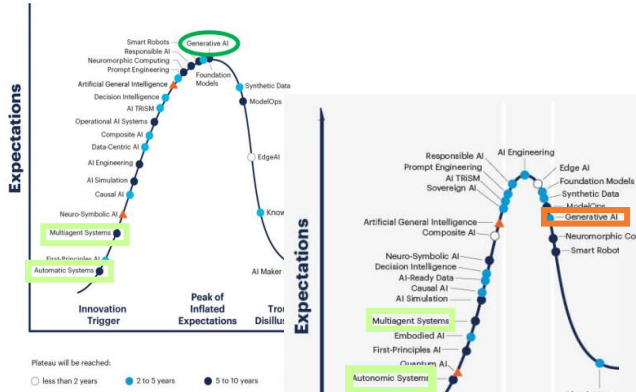


The general role of EAM for introducing technologies like GenAI and Agentic AI

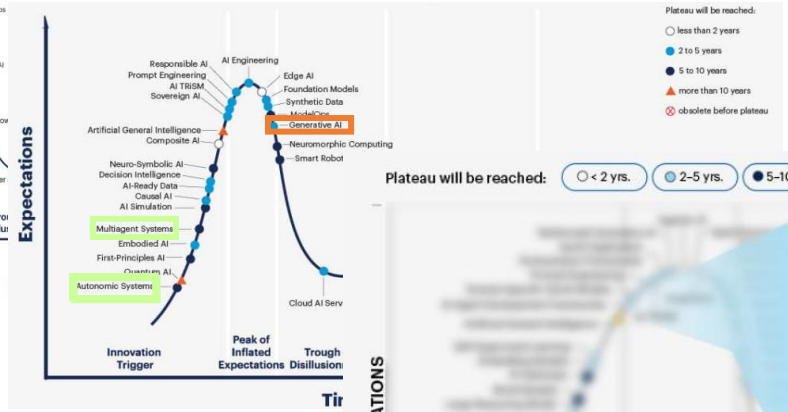
➔ Understand the strategic role of EAM in introducing highly innovative, strategic technologies like GenAI and Agentic AI
➔ Understand the EAM specific tools use here

How EAM supports the **development of GenAI** in a large aviation group.
A brief recap

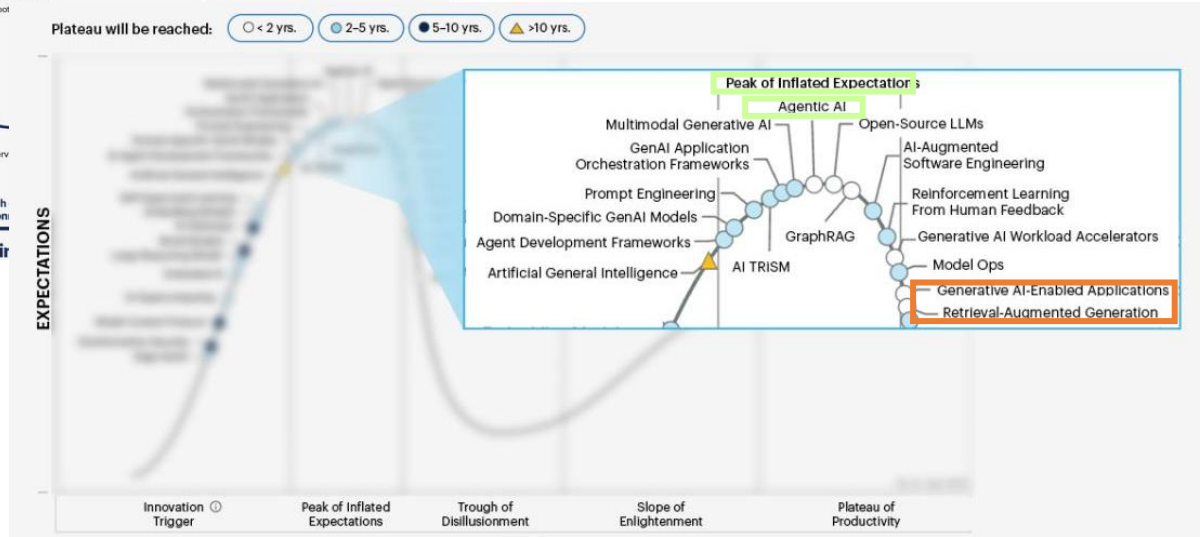
In 2023, GenAI was on the peak of inflated expectations.
In 2025 Agentic AI took this position.



Gartner Hype Cycle AI 2023

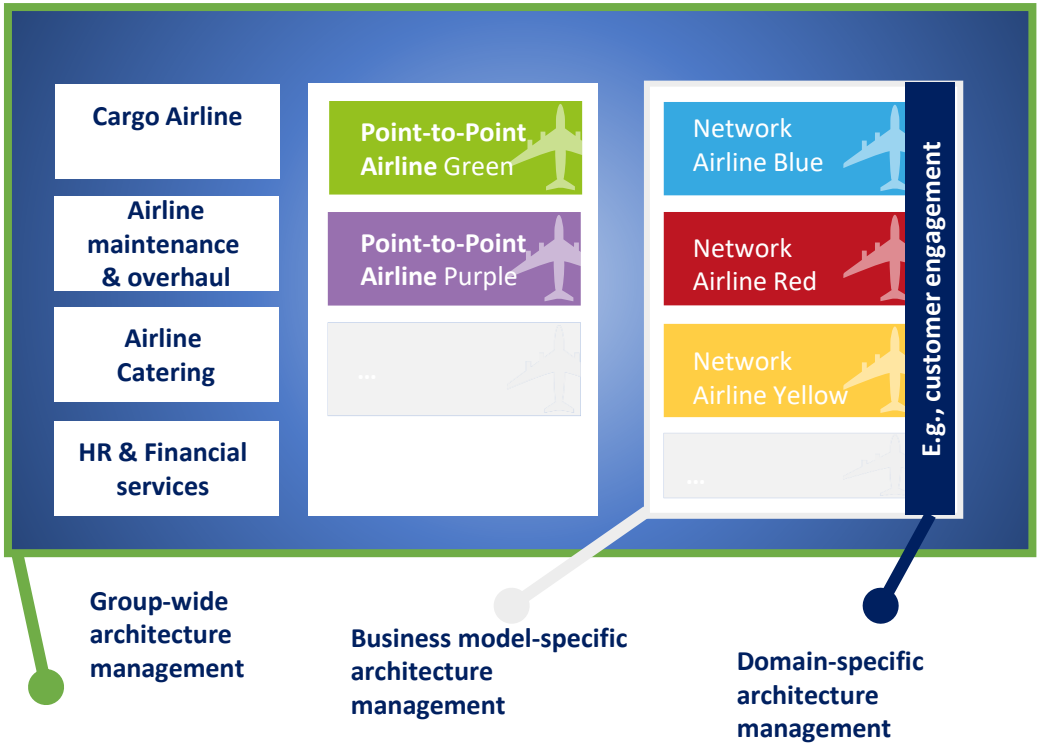


Gartner Hype Cycle AI 2024



Gartner Hype Cycle AI 2025

Ca. 100.000 people work in the large aviation group; it is a federation of large business units, including both B2C and B2B business models



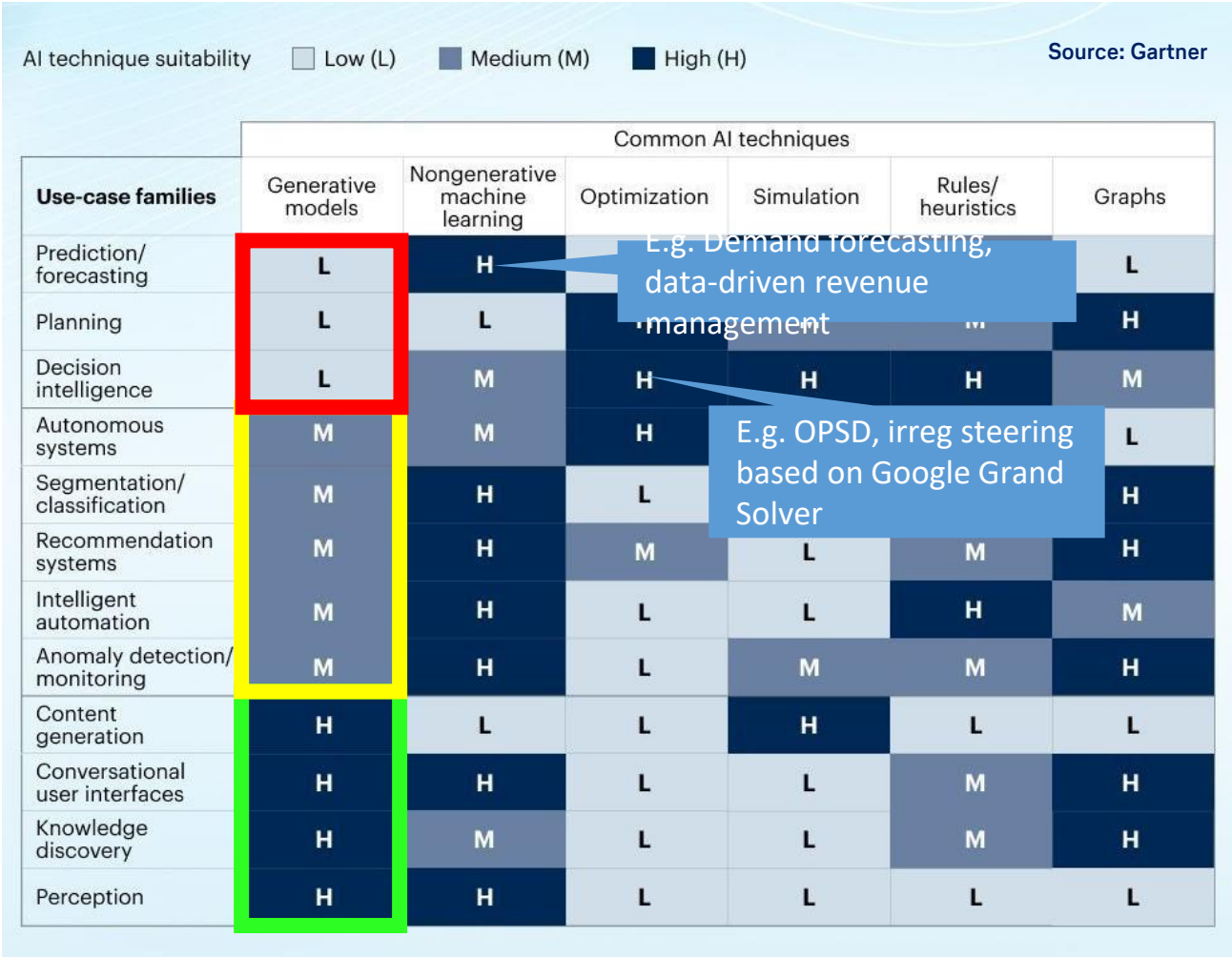
- **Bottom-up:** Since the beginning of 2023 basically every business unit and domain produced **GenAI-based solutions**
- **Fast, explorative innovation:** Many highly engaged GenAI-speedboats with steep learning curves. For some use cases: difficult to assess feasibility upfront, and/or technical debt.
- **Governance/Steering:** to optimize the overall GenAI landscape without slowing down the momentum, enterprise architecture must focus on *collaboration*; fine-grained target pictures are not adequate

AI has many flavors

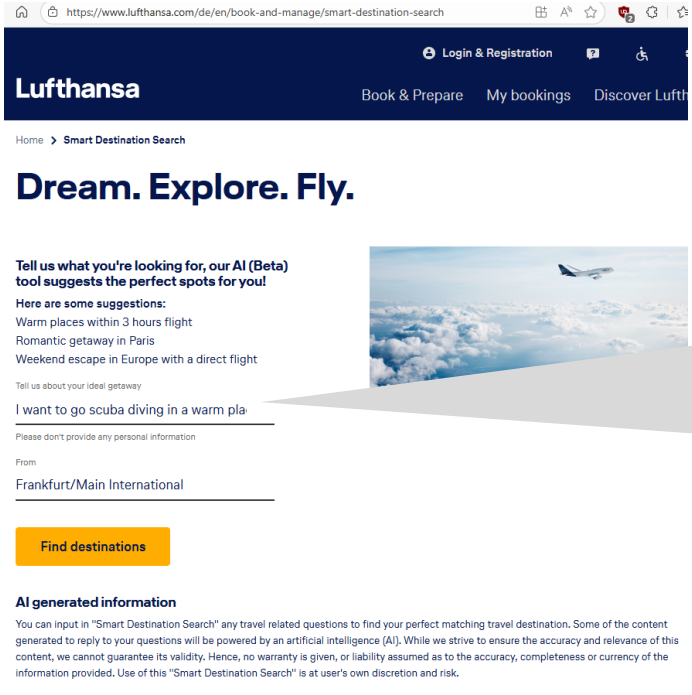
AI is an umbrella term for various technologies, which all have different strengths and weaknesses.

Yes, GenAI is nice hammer. But not everything is a nail.

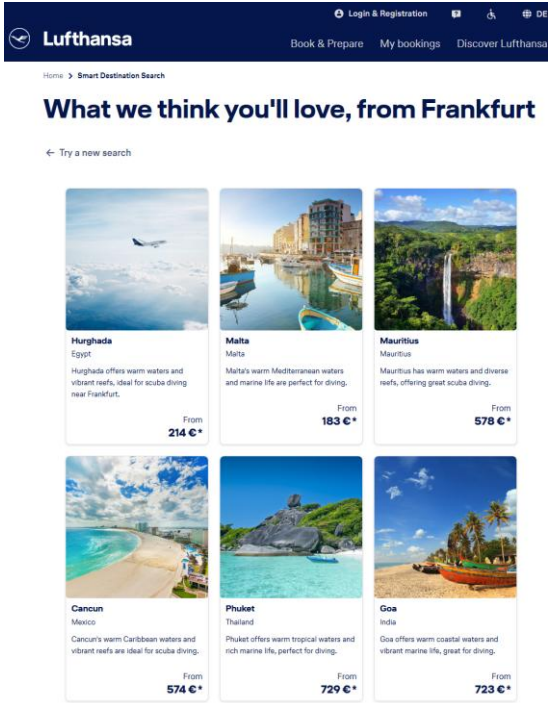
Are you confused yet? That is why we have specialized roles to help you **architect** your solution.



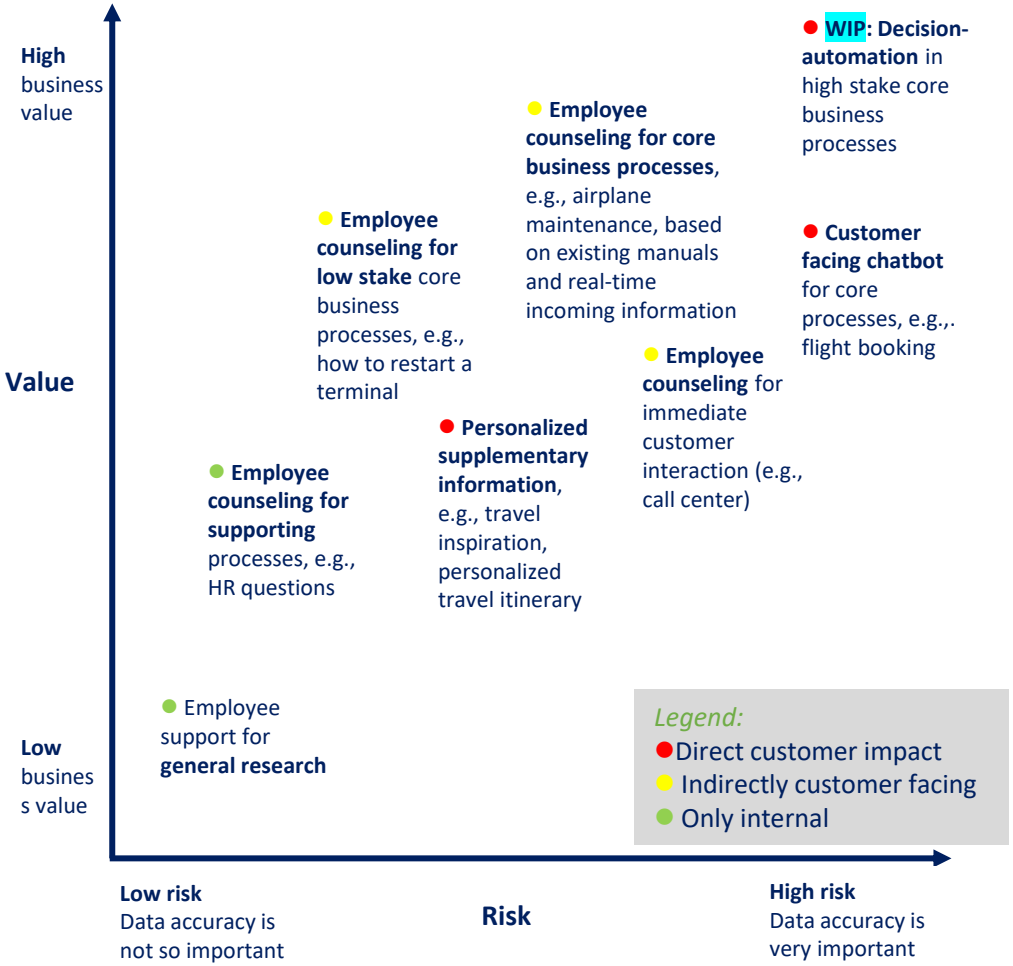
GenAI example from Lufthansa: Smart Destination Search



I want to go scuba diving in a warm place not too far from Frankfurt



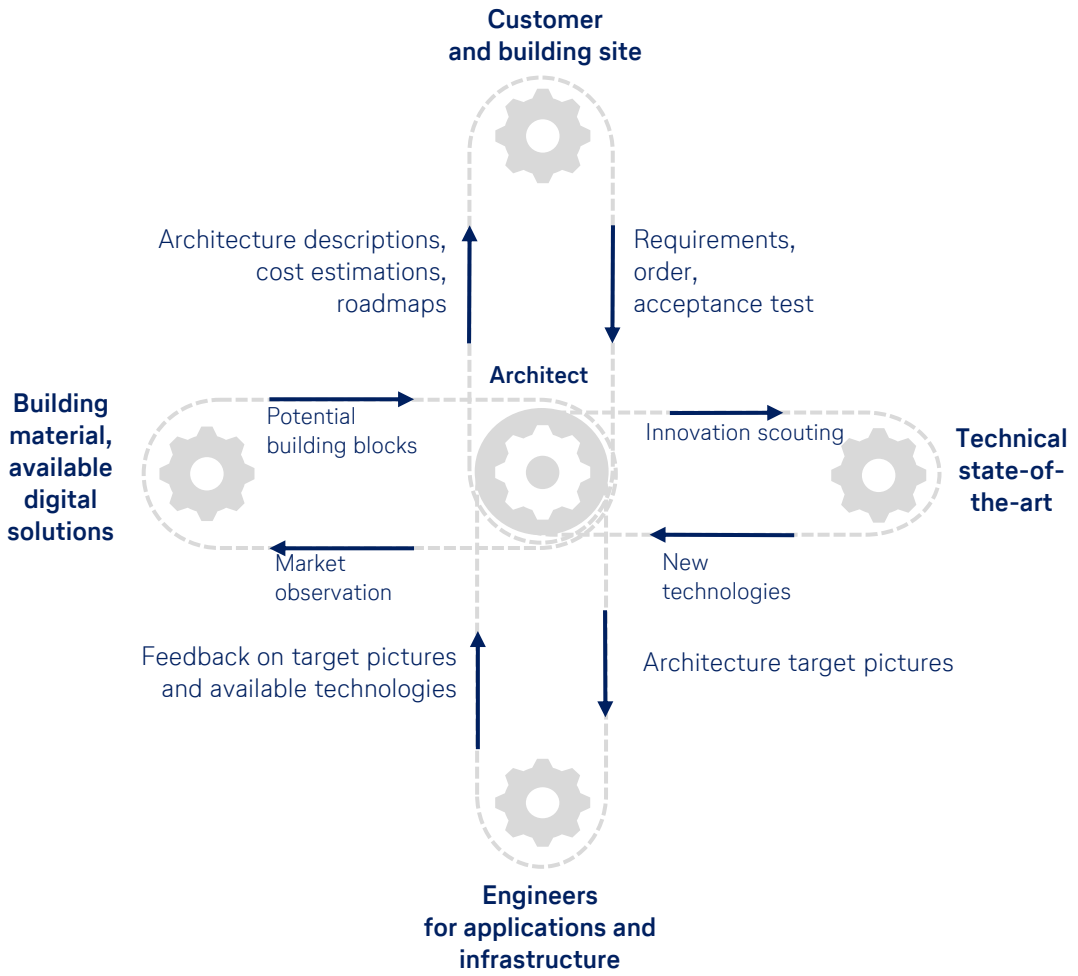
Exemplary GenAI solution types in a large aviation group



- More than **40 GenAI use cases** are already in production, their number has outgrown those based on traditional Machine Learning
- Use cases are spread **across all business domains**; directly customer facing use cases include travel inspiration and planning
- Due to the non-deterministic nature of GenAI, **most use cases are internal** employee-focused, with a "human-in-the loop"
- *WIP/exploratory phase*: GenAI and Agentic AI in **high-risk, core business processes**

Typical GenAI **strategy principles** of a large federated group

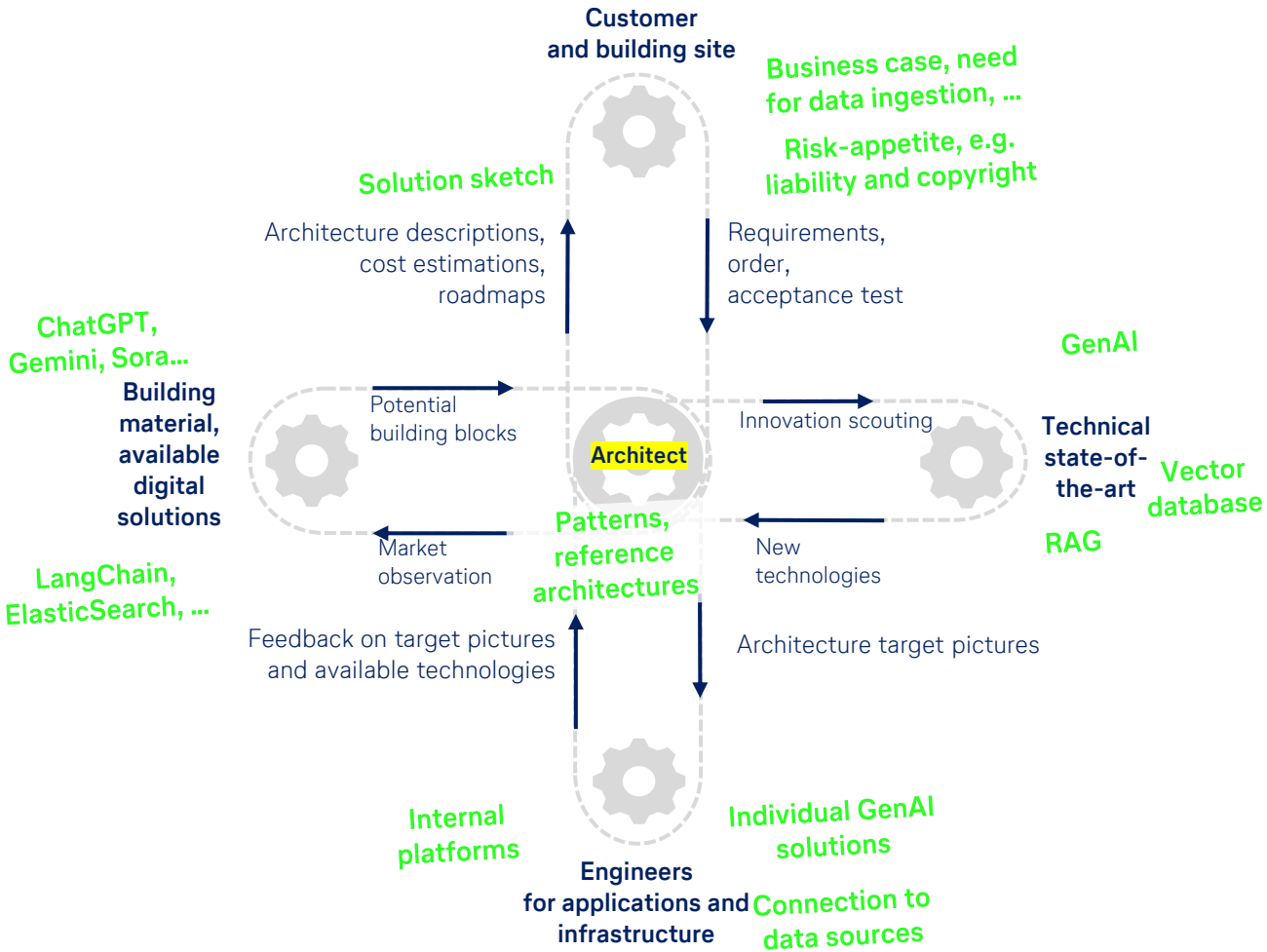
🚀	Ambitious and business driven
🌍	Federated development in each business unit
🌐	Technical and logical harmonization across the group
🤝	Group-wide collaboration and knowledge sharing
🗼	Lighthouses, platforms, and specializations
🔬	Technological excellence in applied AI
🏗️	Low production depth based on various vendors
🔍	Transparent, responsible, secure and compliant



Roles:

Domain and solution architects are a central piece of the puzzle

- Problem:
  Central roles alone, e.g. the enterprise architect for AI, or a central AI department, will not scale
- Solution:
  Decentralize by using the architects within each business domain to design GenAI-enabled solutions



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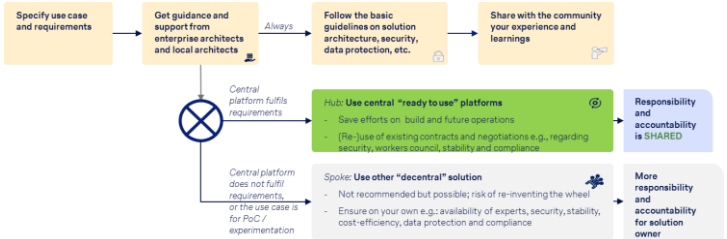
Lufthansa AI community: The group-wide GenAI architecture community frequently gathers for a group-wide exchange of best practices

Early developments in 2023: Exchange on the **topic of "GenAI/RAG solution approach"**

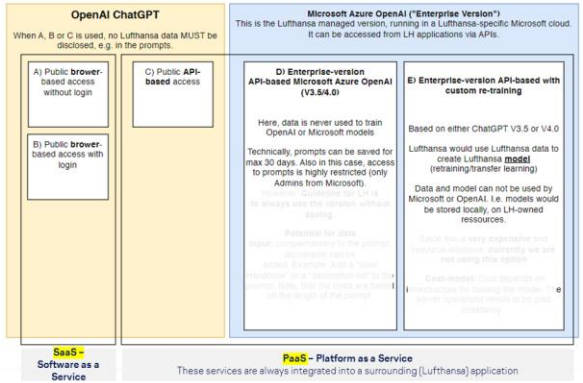
- "Illustrate your (BU-specific) solution approach with a current use case
- The focus is on discussing the re-usable parts, i.e. parts of the solution that can in future be used to build further, similar use cases"

Core enterprise artifacts for steering the GenAI landscape

GenAI-specific architecture processes,
e.g. for choosing the right platform

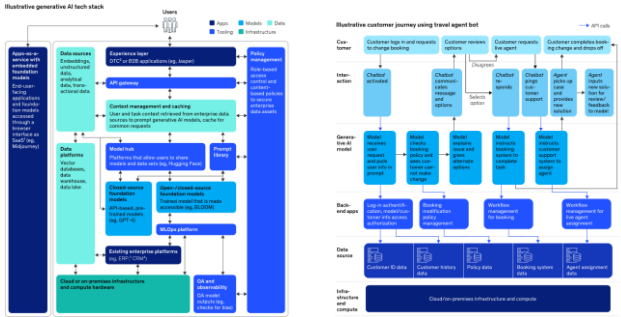


Recom-mended model portfolio,
e.g. of ChatGPT variants

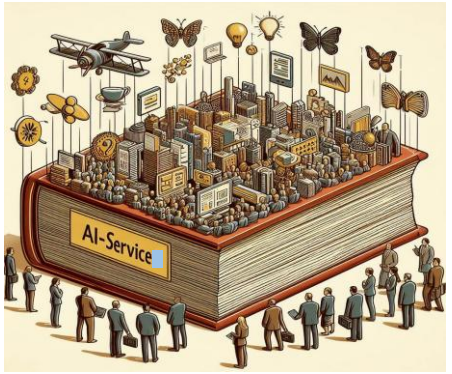


GenAI-specific reference architectures

E.g. for data connectivity of for chatBots, *here only exemplary*



Enterprise-wide catalog
of AI-services,
AI-based applications,
and AI platforms

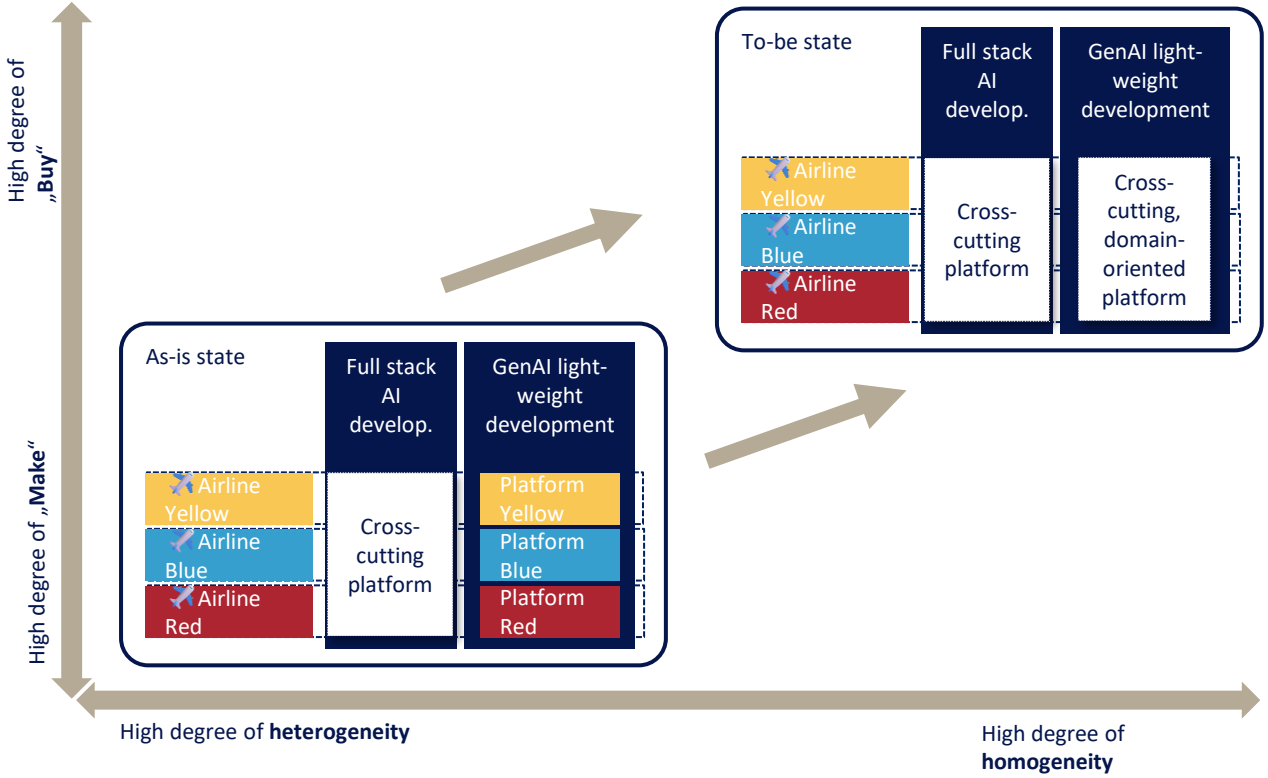


A core question in the group-wide **target picture** for GenAI development:

Degree of buy (vs. make) and Degree of centralization and standardization

In the early GenAI rush, several AOC-specific GenAI platforms enabled fast development.

Based on more mature products from the market, today a stronger harmonization is sought for.



How EAM supports the enterprise-wide development of **Agentic AI**

Currently, every large enterprise investigates how to optimally apply Agentic AI.
E.g.: Where in the Customer Journey can Agentic AI be useful?

Finds best flight options tailored to customer preferences, provides instant comparisons and personalized suggestions

Search

Automates ticket purchase and payment steps, applies upgrades, bundles, and promotions dynamically

Detects delays/cancellations and rebooks automatically. Manages compensation, hotels, and alternative travel options

Disruption

Inspiration & Planning	Compare & Select	**Booking** Book Travel	Plan & Prepare	Get to the airport & await flight	Take flight	Connect	Arrive at destination	Get to and stay at destination	Stay involved Claims & Retroactive Credit of Miles

Sends reminders for check-in, visa, baggage rules; proactively solves document or travel preparation issues

Pre-Trip

Airport

Guides passengers through airport navigation and gate changes.
Coordinates with lounge, security, and boarding systems

Tracks rewards and miles automatically. Suggests best ways to redeem points for value

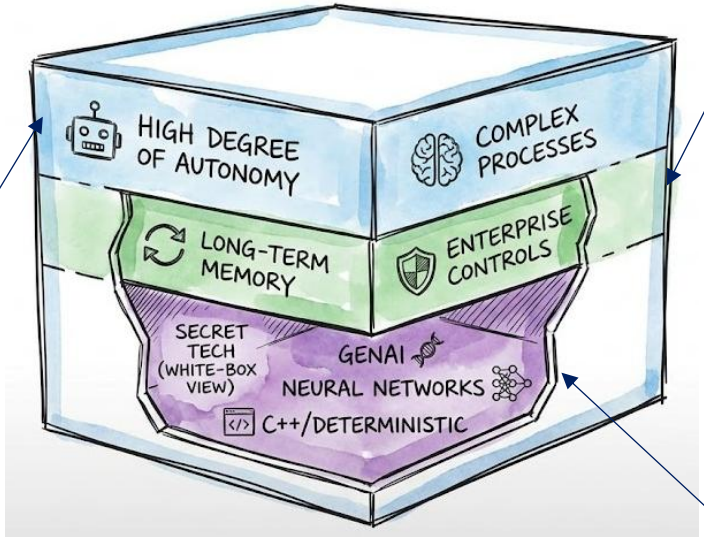
Loyalty

Picture AI generated

“Agentic AI” is defined from a black-box and white-box perspective

Behavioral, black-box view
Which requirements does the solution fulfill?

- **High degree of autonomy,** proactive, multi-step planning, goal orientation, automatically respond to conditions
- **Complex processes**, human-like creative steps
- **Tool** orchestration, e.g., function calling



Picture AI generated

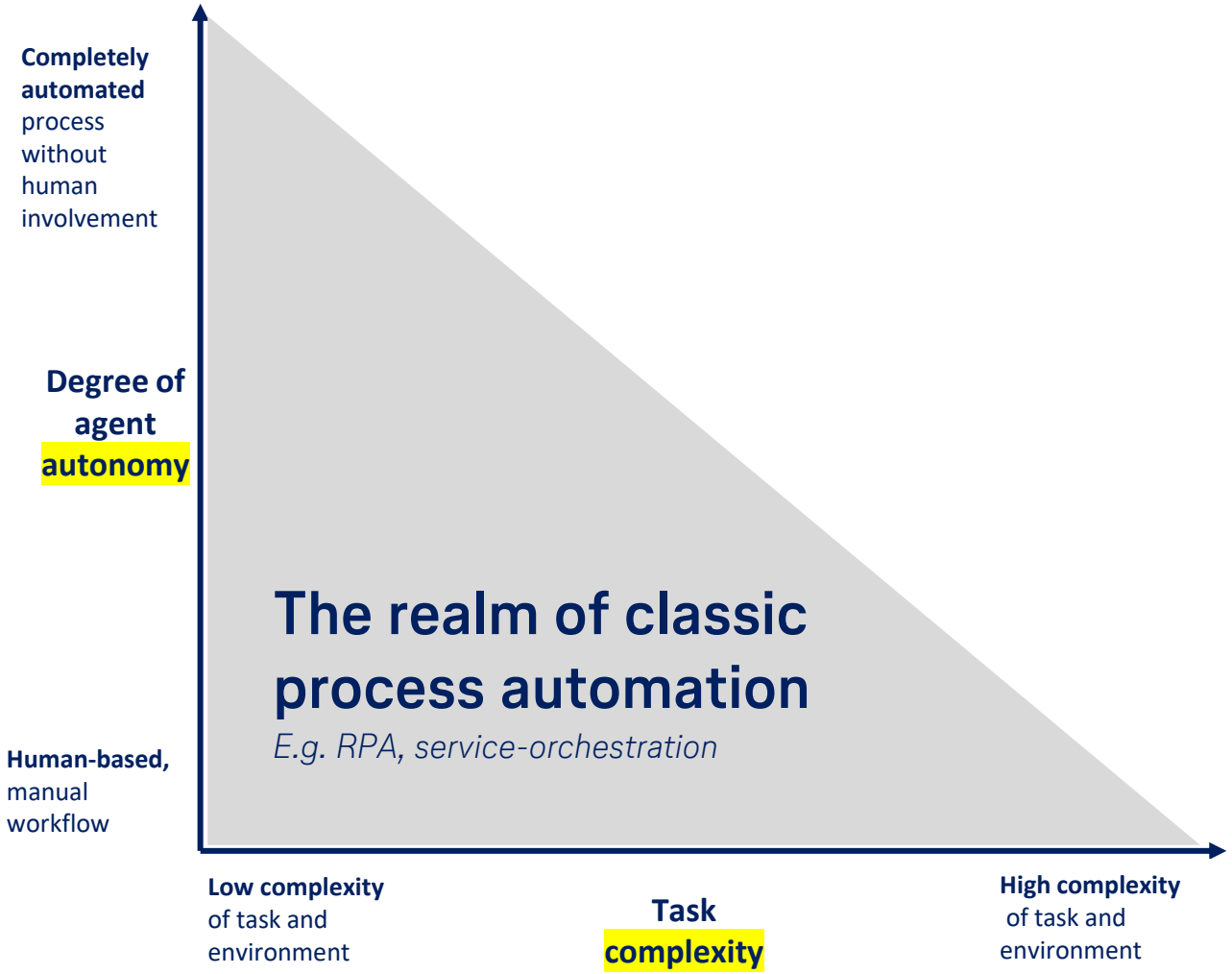
Grey-box view, *methods directly under the surface we cannot see directly, but infer from the solutions' behavior*

- Long- and short-term **memory**, continuous **learning** or adaptation
- **Enterprise controls,** e.g., identity, audit, safety & policy enforcement

Technical, white-box view, *of stuff deep inside the box: Which technologies does the solution use?*

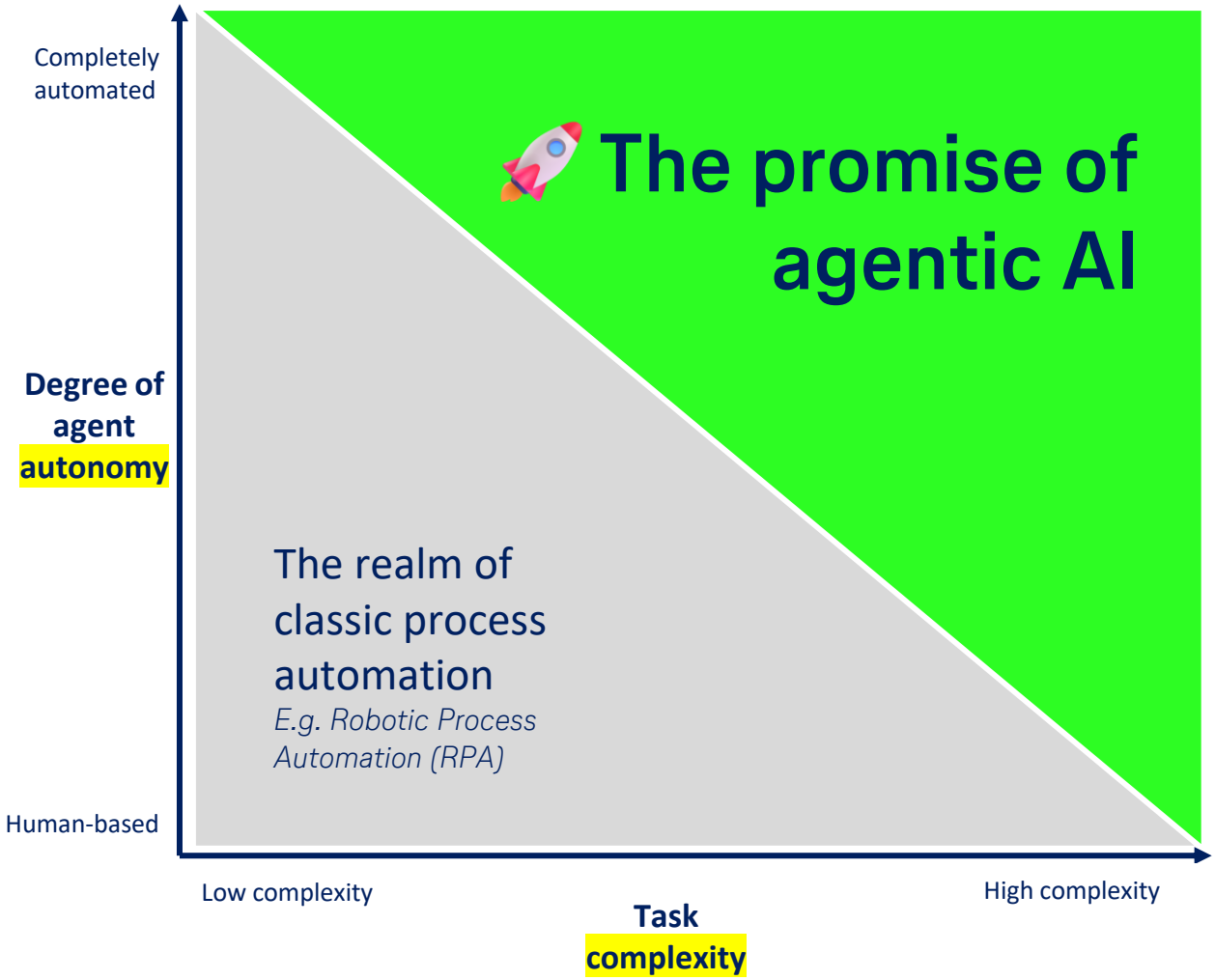
- Is the solution probabilistic (e.g. based on neural networks, GenAI), deterministic, or a mixture?
- Does it use specialized Agentic AI software, e.g. LangGraph?

In classic process automation – i.e., solutions not based on machine learning – the degree of process **automation and complexity are negatively correlated**



The promise of agentic AI:

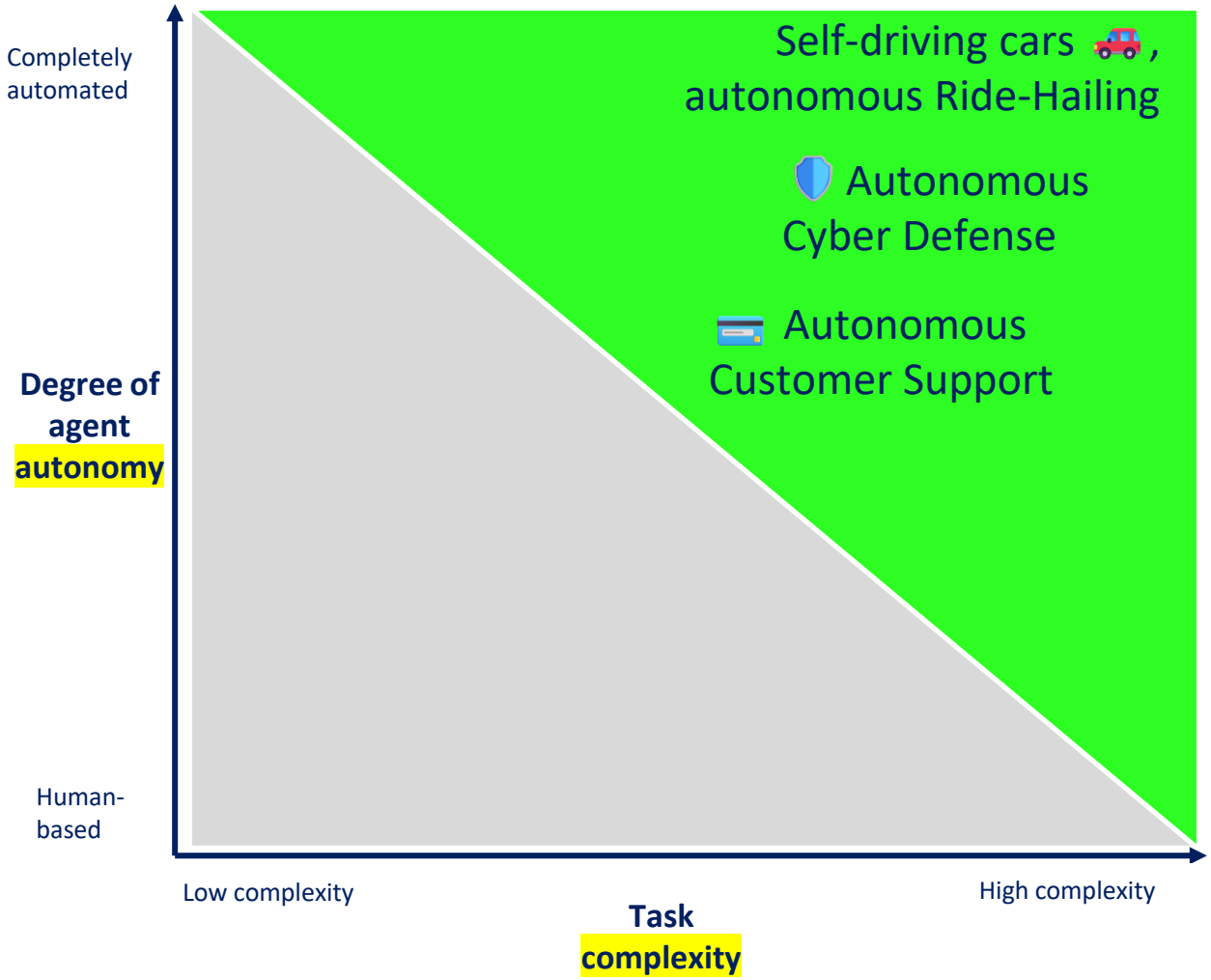
AI-based process orchestration and task fulfillment are so intelligent, that also highly **complex processes can be automated – with little effort**



The promise:
You can automate a highly complex process with little effort

The reality:

- Can you name **three real-life solutions** that score high on both dimensions?
- There are few; but the effort for developing those is enormous



„Ach, diese Lücke, diese entsetzliche Lücke “

How EAM adresses the GenAI Gap.

The findings of MIT's [The GenAI Divide: State of AI in Business 2025] confirm the need to holistically address…

1. **Decentral development and budget,** while maintaining a coherent big picture
2. **Professional assessment of individual use cases,** incl. value-effort estimation, following classic architecture principles ("buy before build")
3. **Comprehensive technical integration**

Enterprise paradox:
Big firms lead in pilot volume but lag in scale-up

Limited disruption:
Only 2 of 8 major sectors show meaningful structural change

Investment bias:
Budgets favor visible, top-line functions over high-ROI back office

"Empower line managers rather than **central labs**", "Success depends less on resources and more on **decentralizing** authority with clear ownership"

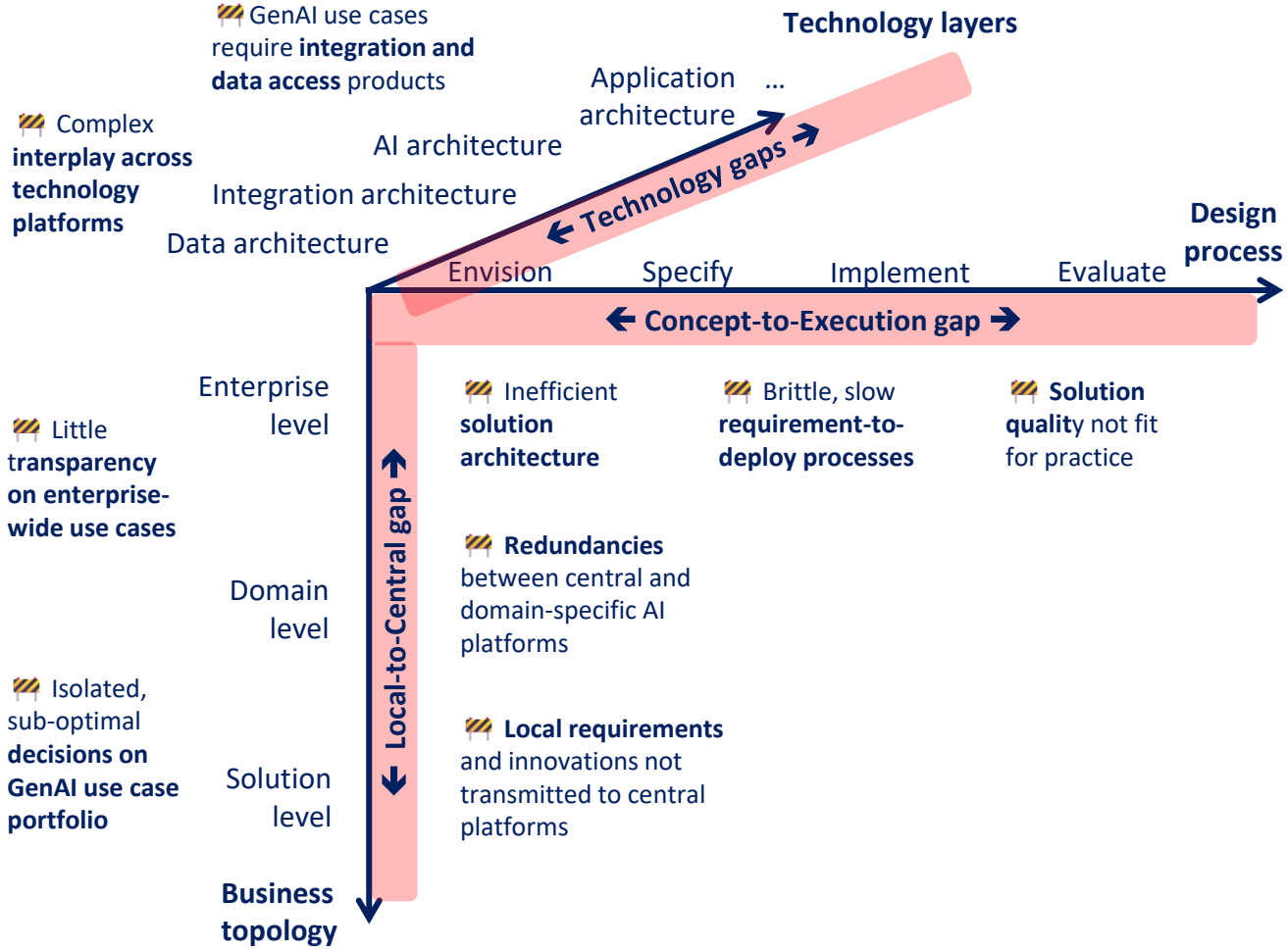
"Select tools that integrate deeply while adapting over time", "focus on **workflow integration** over flashy demos"

External partnerships see twice the success rate of internal builds. "**Buy rather than build**", "start partnering with vendors who offer custom systems"

Gaps for scaling GenAI exist in multiple dimensions

EAM provides **integrated capabilities** to close the gaps

This results in tangible benefits



Gaps for scaling GenAI occur in multiple dimensions

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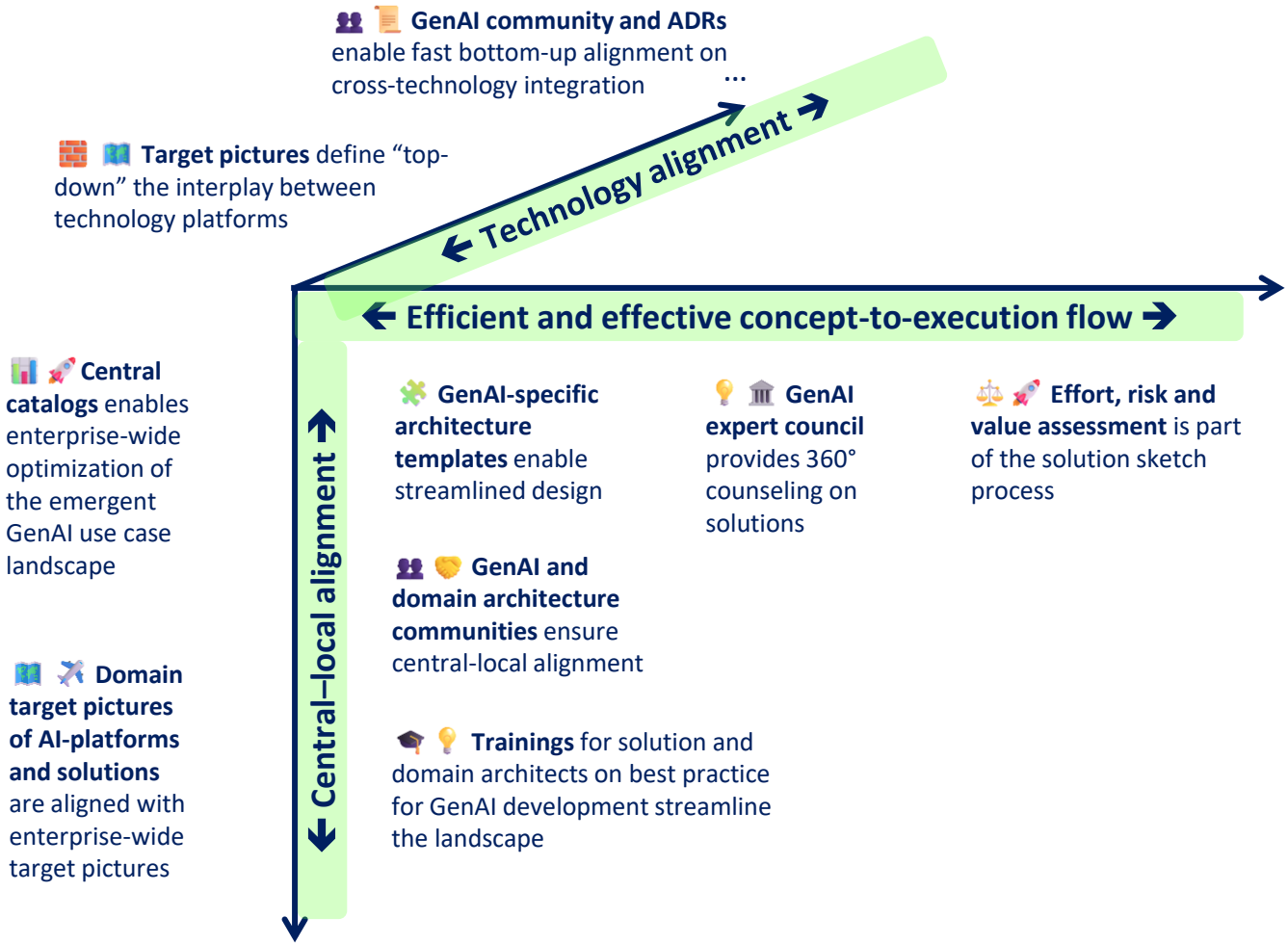


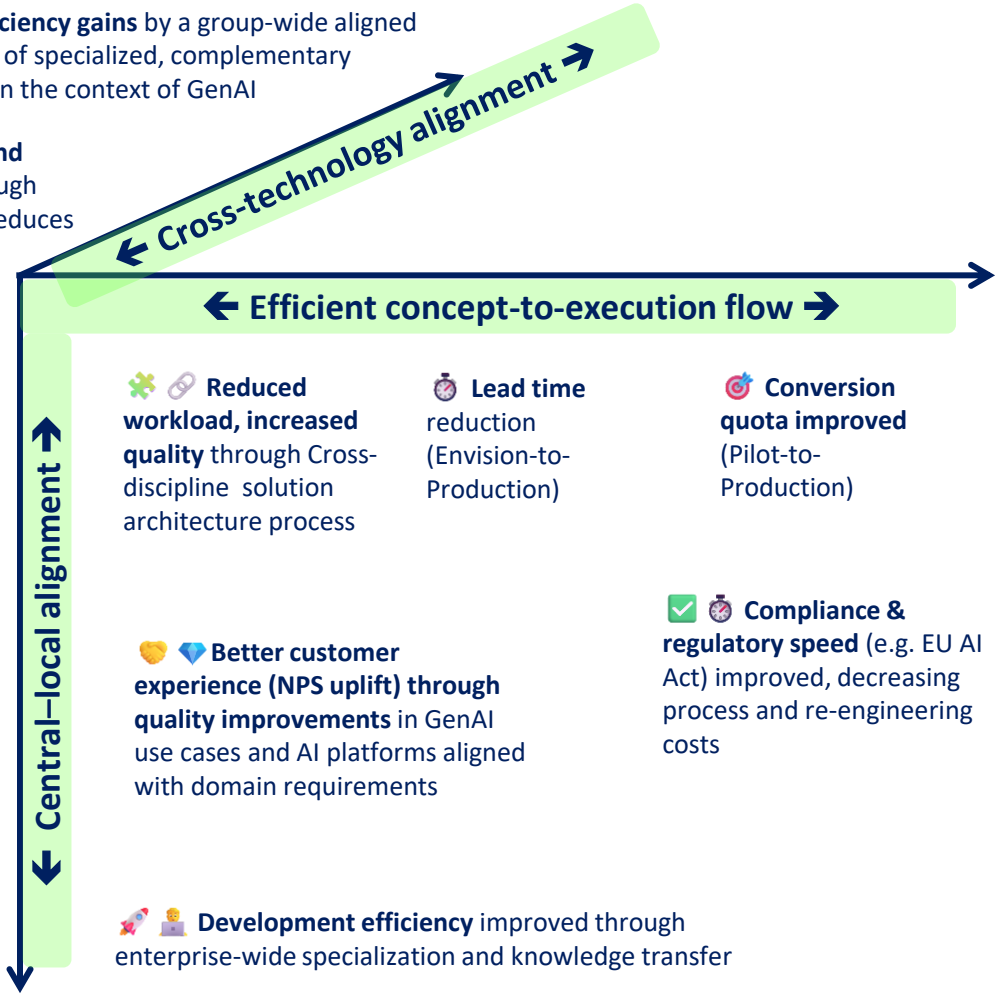
Gaps for scaling GenAI occur in multiple dimensions

EAM provides **integrated capabilities** to close the gaps

This results in tangible benefits

🌐 💎 **Efficiency gains** by a group-wide aligned ecosystem of specialized, complementary platforms in the context of GenAI

🔗 💰 ⏱️ **integration costs and time-to market** reduced through cross-technology alignment reduces



🎯 **Portfolio impact shift** by balancing core transformation and supporting GenAI use cases

🌐 💰 **Cost avoidance via de-duplication** by transforming airline-specific into group-wide (domain-specific) GenAI use cases and GenAI platforms

🧩 🔗 **Reduced workload, increased quality** through Cross-discipline solution architecture process

⏱️ **Lead time** reduction (Envision-to-Production)

🎯 **Conversion quota improved** (Pilot-to-Production)

✅ ⏱️ **Compliance & regulatory speed** (e.g. EU AI Act) improved, decreasing process and re-engineering costs

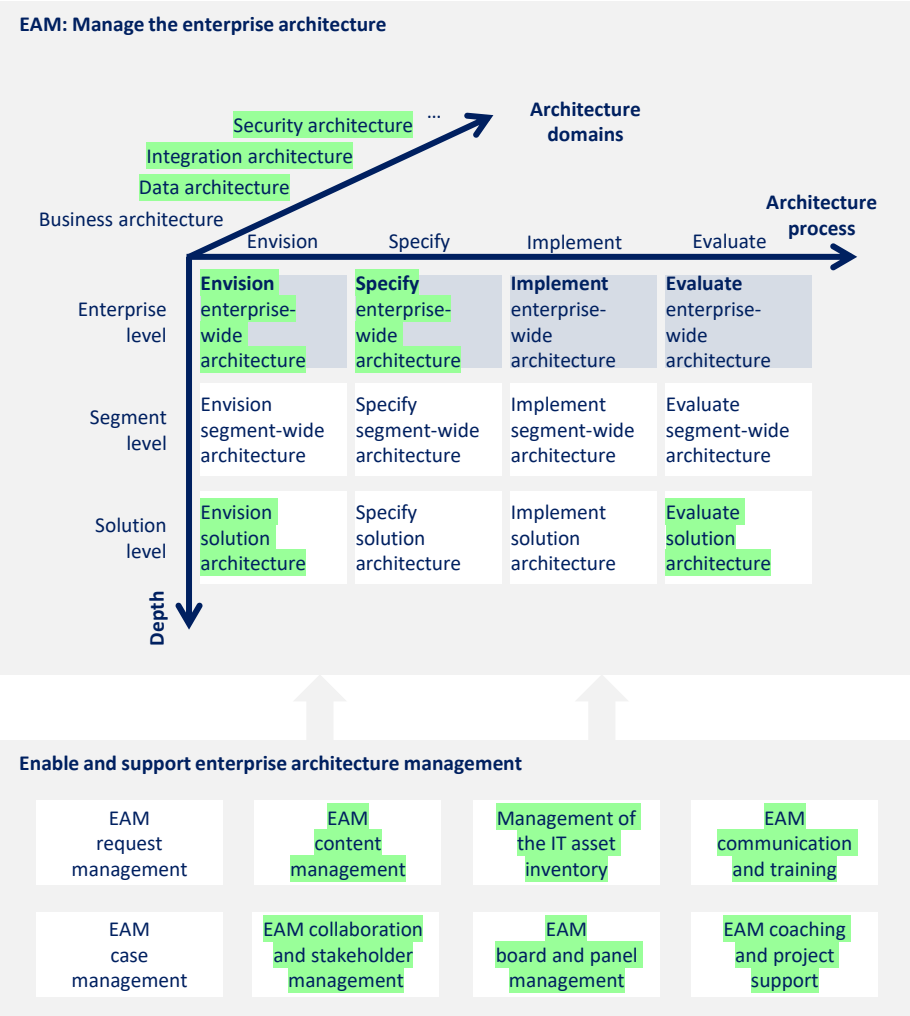
🤝 💎 **Better customer experience (NPS uplift) through quality improvements** in GenAI use cases and AI platforms aligned with domain requirements

🚀 👷 **Development efficiency** improved through enterprise-wide specialization and knowledge transfer

Summary:

Supporting the airline group-wide development of the GenAI landscape, the **classic EAM tools** have been used.

However, due to the strong **bottom-up character of GenAI, the focus is on enabling, connecting tools.**



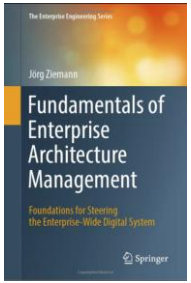
- The **enterprise-/group-wide architecture** for GenAI emerges very fast mostly „bottom-up“. Top-down, the EAM capability focus on lean guidelines, standards, and reference architectures
- The EAM capability supports **solution architecture development** via solution sketching and cross-domain expert councils
- To steer the enterprise-wide development of GenAI in one direction, the emphasis is on the enabling and connecting activities, joined learning, and creating transparency (e.g. on the portfolio)

Conclusion

GenAI is immature but everywhere	GenAI capabilities are of strategic importance	GenAI use cases and platforms are created with high-speed everywhere in the group	GenAI technology is immature, and continuously developing in high-speed
Need for coherency	A way for continuously evolving the GenAI landscape into a coherent system while constantly adapting	An enterprise-wide target picture for GenAI-based business solutions	An enterprise-wide target picture for GenAI infrastructure, e.g., central platforms, access layers and CoEs
EAM provides solutions	Established processes, roles and architecture communities across all layers, to jointly work and streamline new technologies	Domain-specific (business) architecture, transparency of portfolio via application catalog	Target picture process, guidelines and standards

Thank you for your attention

Further reading:



- https://eamfundamentals.com/
- **Isolated Data and AI Strategies Without Enterprise Architecture? Still a Common Mistake– How to Build Scalable Data & AI Strategies with Enterprise Architecture.** Medium.com, June 2025, Link.
- **The Essential Role of Enterprise Architecture Management for Data and AI Strategy & Governance**. EAMInsights Conference, Bonn, May 2025. Link (full slide set).
- **Do Large Enterprises Need a Dedicated "AI Governance" Department?** LinkedIn, June 2024. Link.
- **Gen AI in a large aviation group – How EAM helps introducing a disruptive technology**. Guest lecture, University of Lausanne, May 2024. Link