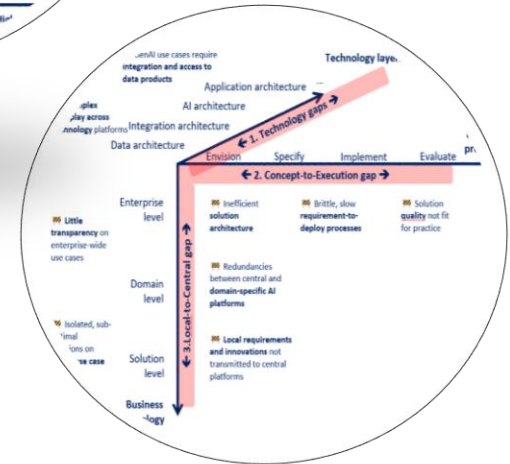
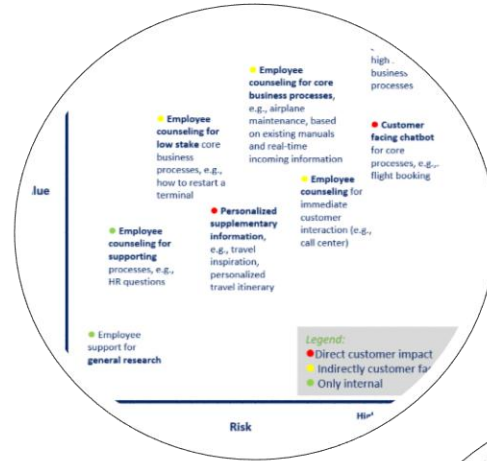


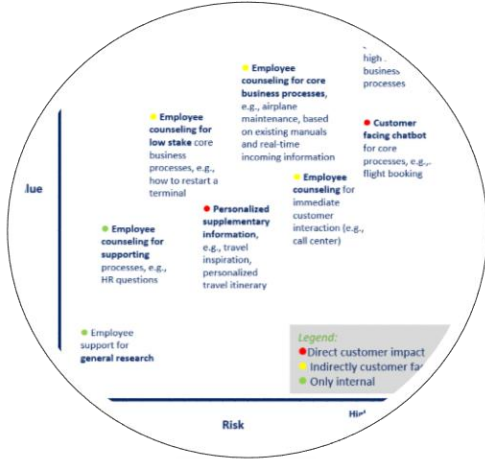
Scalable Development of GenAI and Agentic AI with Enterprise Architecture Management

University St. Gallen, March 2026

Dr. Jörg Ziemann



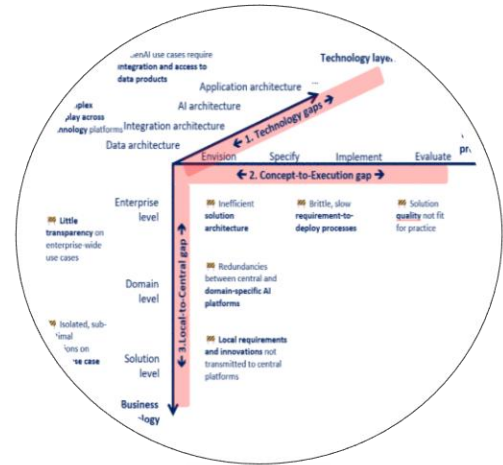
Learning objectives and core points of this presentation



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

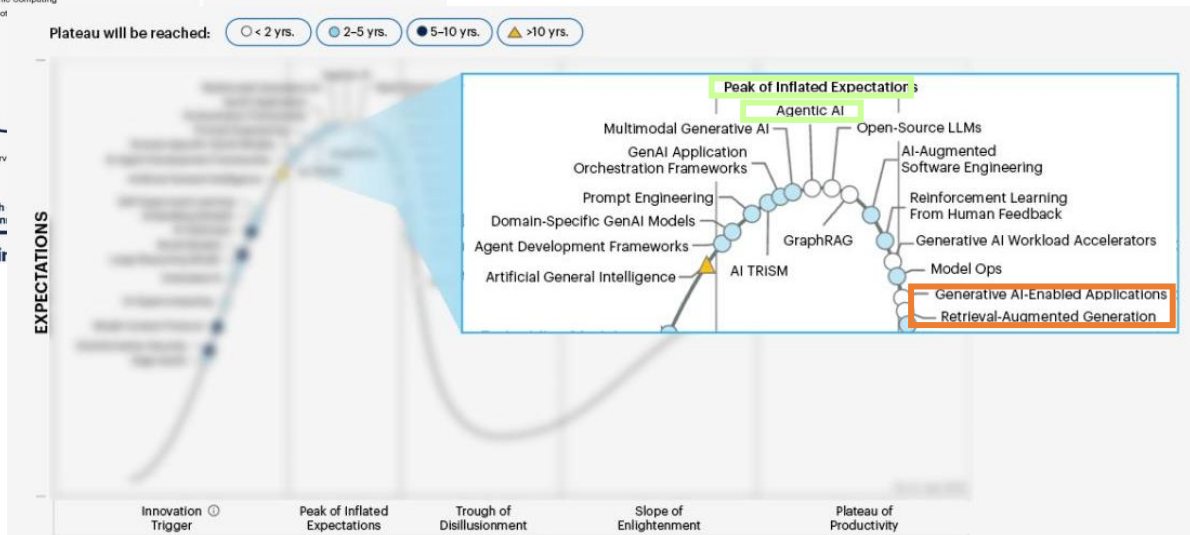
In 2023, **GenAI** was on the peak of inflated expectations.
 In 2025 **Agentic AI** took this position.



Gartner Hype Cycle AI 2023

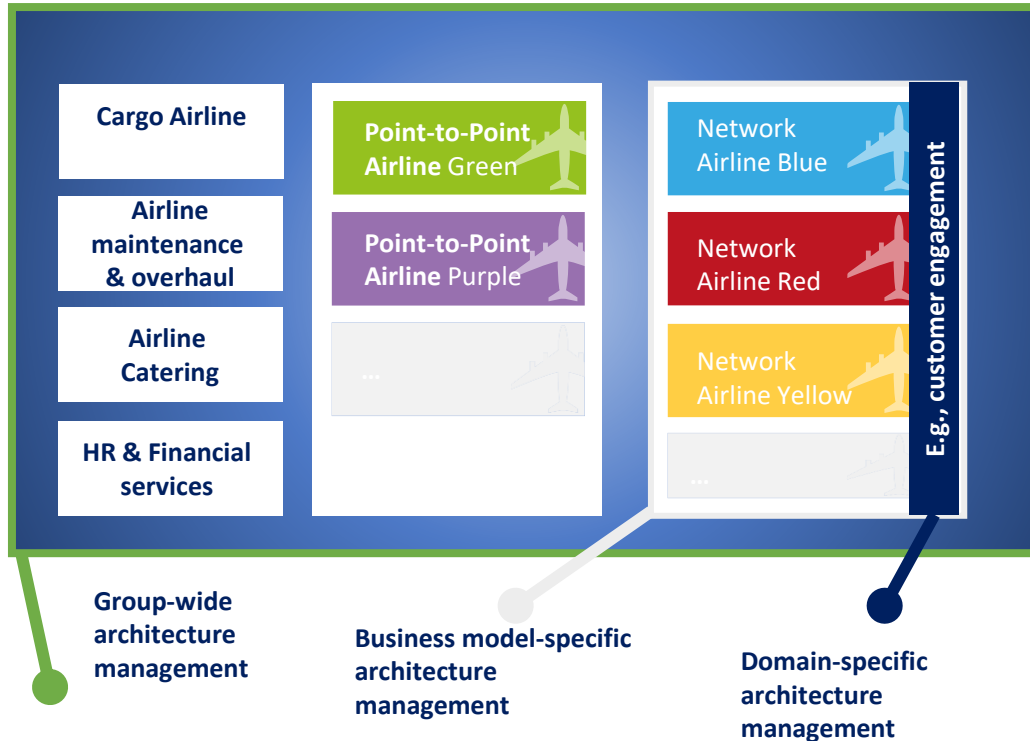


Gartner Hype Cycle AI 2024



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.

AI technique suitability Low (L) Medium (M) High (H)

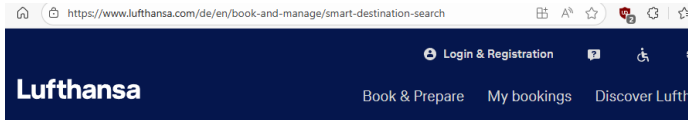
Source: Gartner

Use-case families	Common AI techniques					
	Generative models	Nongenerative machine learning	Optimization	Simulation	Rules/heuristics	Graphs
Prediction/forecasting	L	H	H	M	M	L
Planning	L	L	H	M	M	H
Decision intelligence	L	M	H	H	H	M
Autonomous systems	M	M	H	M	M	L
Segmentation/classification	M	H	L	M	M	H
Recommendation systems	M	H	M	L	M	H
Intelligent automation	M	H	L	L	H	M
Anomaly detection/monitoring	M	H	L	M	M	H
Content generation	H	L	L	H	L	L
Conversational user interfaces	H	H	L	L	M	H
Knowledge discovery	H	M	L	L	M	H
Perception	H	H	L	L	L	L

E.g. Demand forecasting, data-driven revenue management

E.g. OPSD, irreg steering based on Google Grand Solver

GenAI example from Lufthansa: Smart Destination Search



Home > Smart Destination Search

Dream. Explore. Fly.

Tell us what you're looking for, our AI (Beta) tool suggests the perfect spots for you!

Here are some suggestions:

Warm places within 3 hours flight

Romantic getaway in Paris

Weekend escape in Europe with a direct flight

Tell us about your ideal getaway

I want to go scuba diving in a warm pla

Please don't provide any personal information

From

Frankfurt/Main International

Find destinations

AI generated information

You can input in "Smart Destination Search" any travel related questions to find your perfect matching travel destination. Some of the content generated to reply to your questions will be powered by an artificial intelligence (AI). While we strive to ensure the accuracy and relevance of this content, we cannot guarantee its validity. Hence, no warranty is given, or liability assumed as to the accuracy, completeness or currency of the information provided. Use of this "Smart Destination Search" is at user's own discretion and risk.



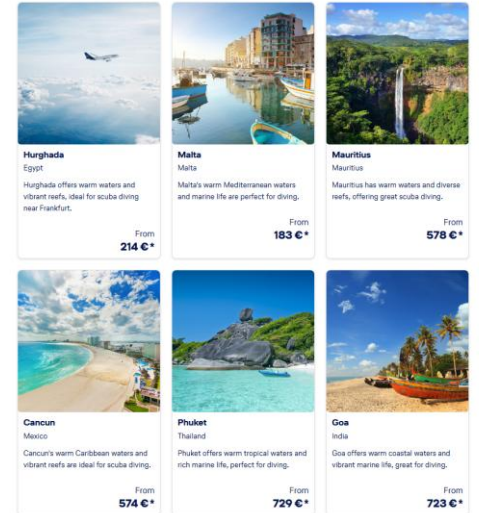
I want to go scuba diving in a warm place not too far from Frankfurt



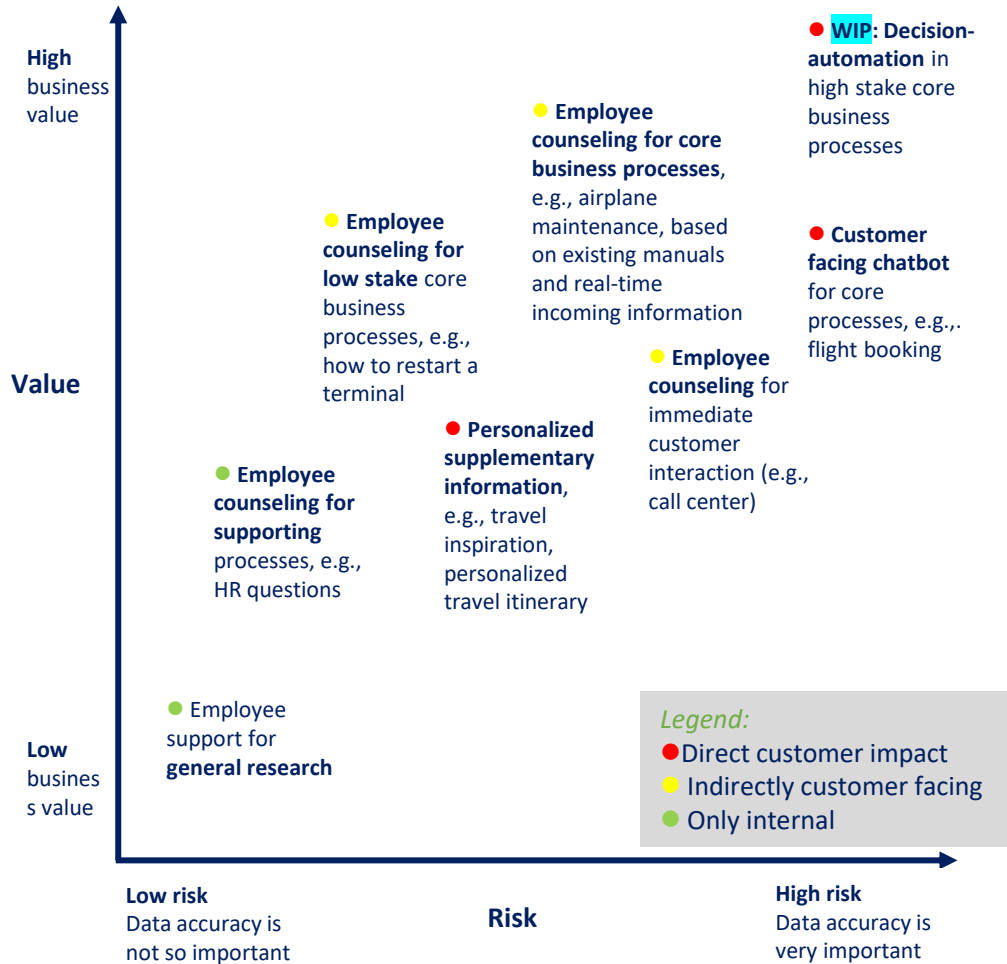
Home > Smart Destination Search

What we think you'll love, from Frankfurt

← Try a new search



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



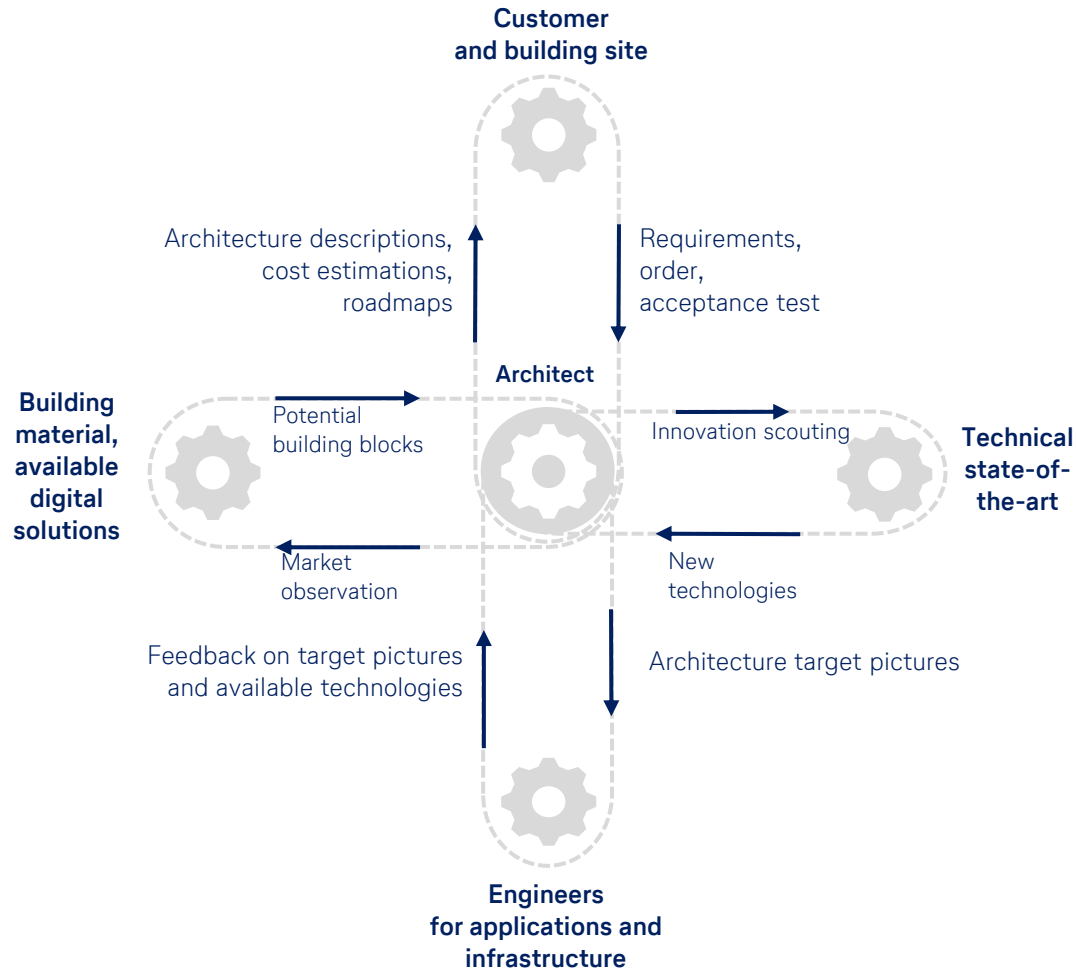
Technological excellence in applied AI



Low production depth based on various vendors

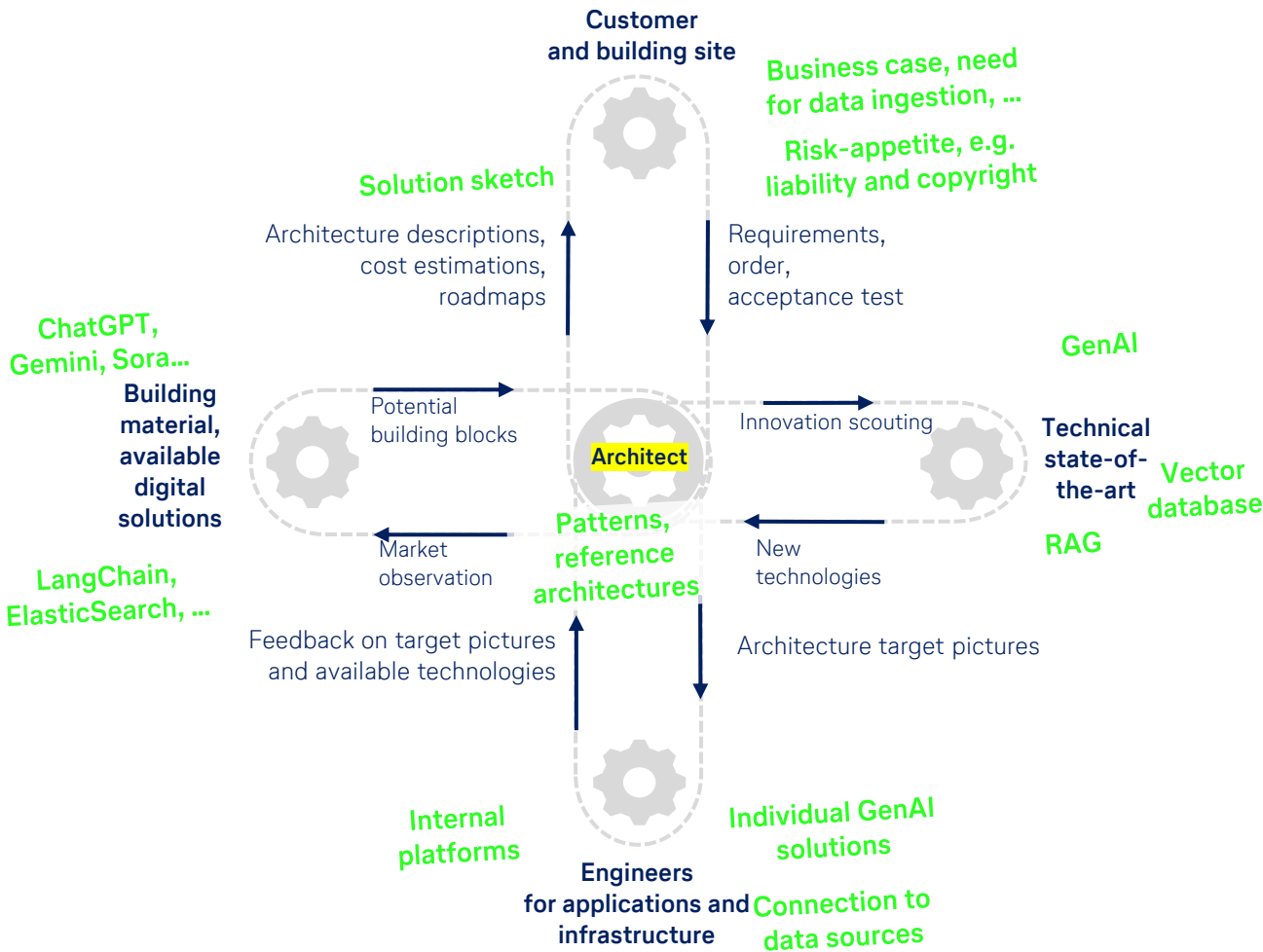


Transparent, responsible, secure and compliant



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



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

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



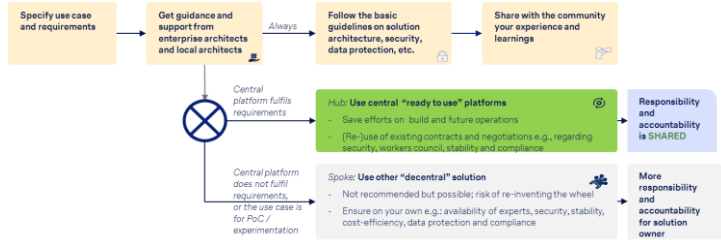
Early developments in 2023: Exchange on the **topic of “GenAI/RAG solution approach”**

- “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”

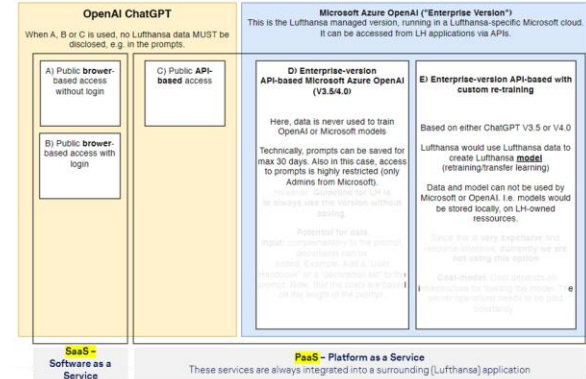
Topic	Speaker	Slides	Start
Welcome + Agenda	@Ziemann, Joerg (LH)		10:00
LCAD	@Daniel Heon (LCAD)		10:15
Zero G	@Rafiki, Paul (ZeroG) @Yu, Genn		11:00
LSBS	@Joller, Christian (LSBS) @Michael Hehn (LHND)		13:30
Hub Airlines	@Sandra Ohmeyer (LHA) @Aldguzzi, Daniel (LHA)		14:15
LX	@Paul, Edward (LX) @Tomáshe Balasterosa, José Ignacio (LX)		15:00

Core enterprise artifacts for steering the GenAI landscape

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

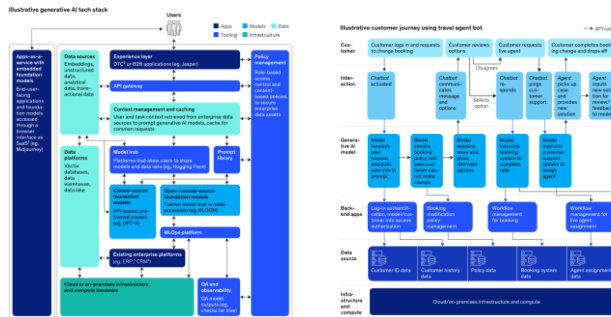


Recommended model portfolio, e.g. of ChatGPT variants

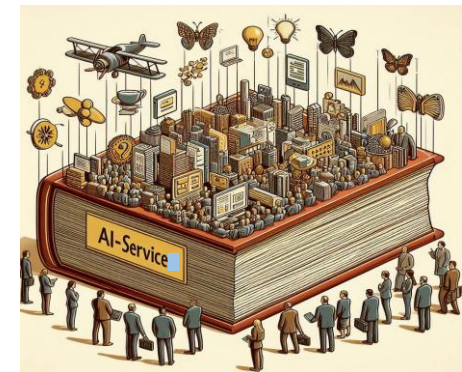


GenAI-specific reference architectures

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



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

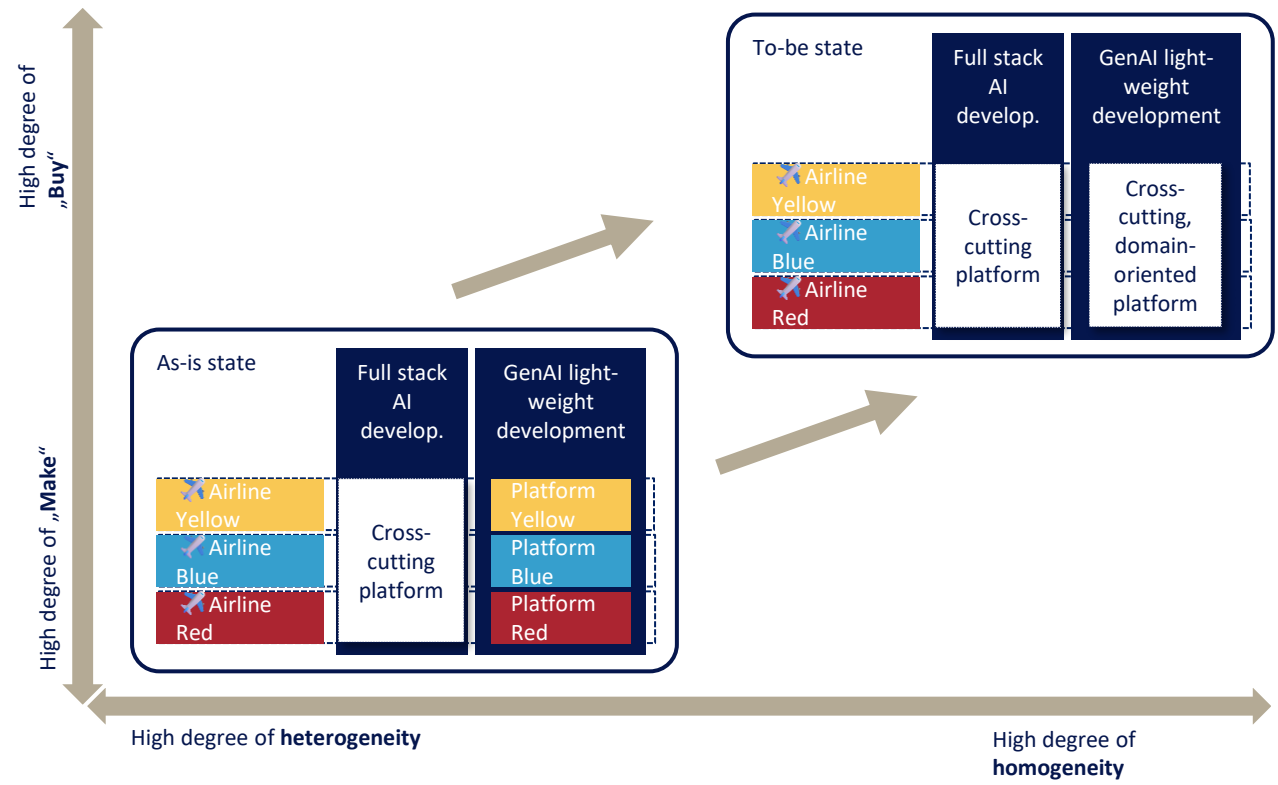


A core question in the group-wide **target picture** for GenAI development:

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

Booking



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

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

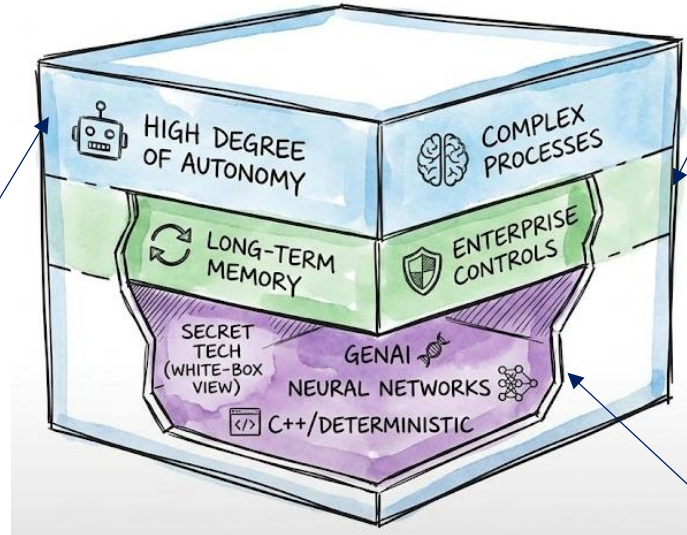
Behavioral, black-box view

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

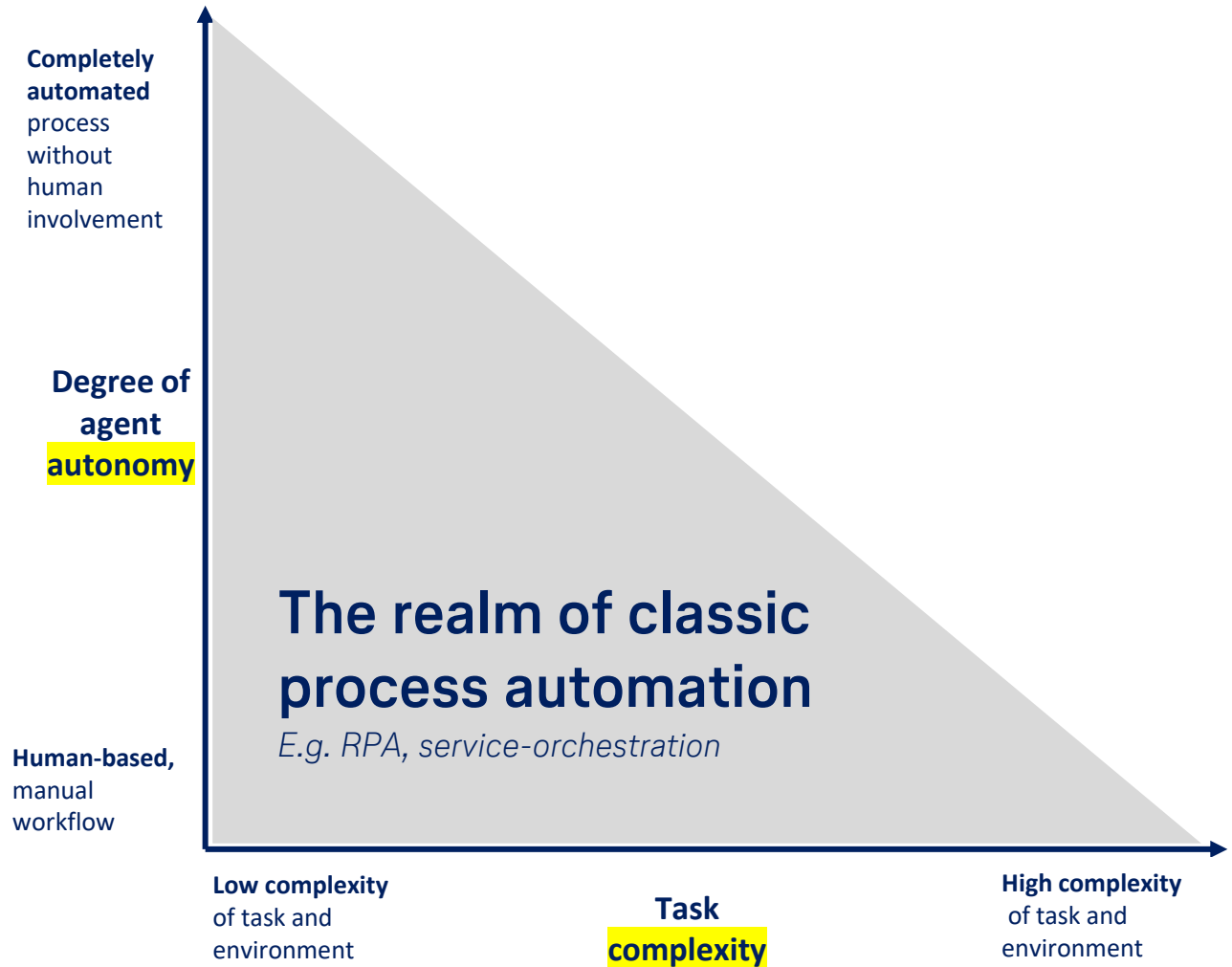
 **Enterprise controls**, e.g., identity, audit, safety & policy enforcement

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?

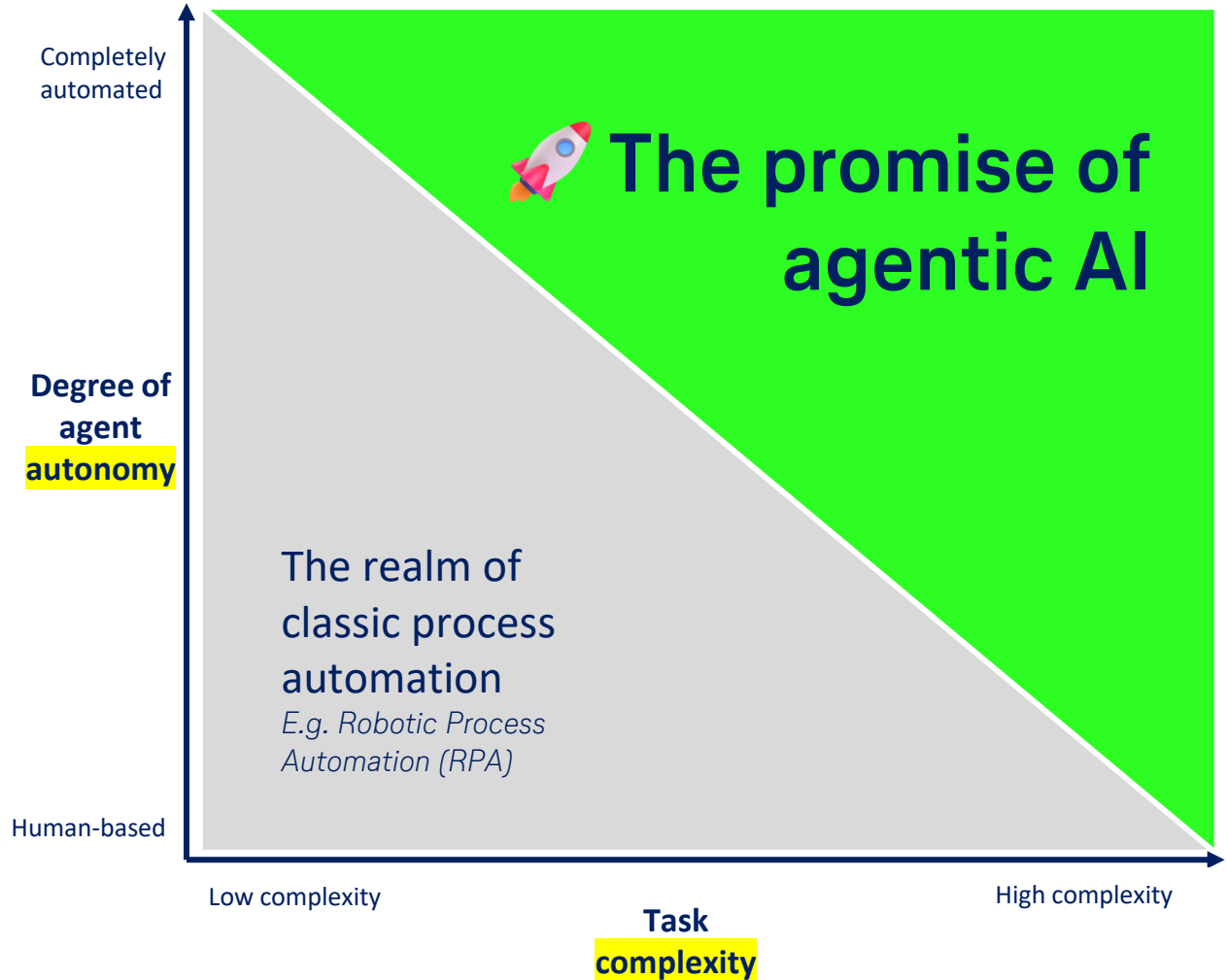
 Does it use specialized Agentic AI software, e.g. LangGraph?

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

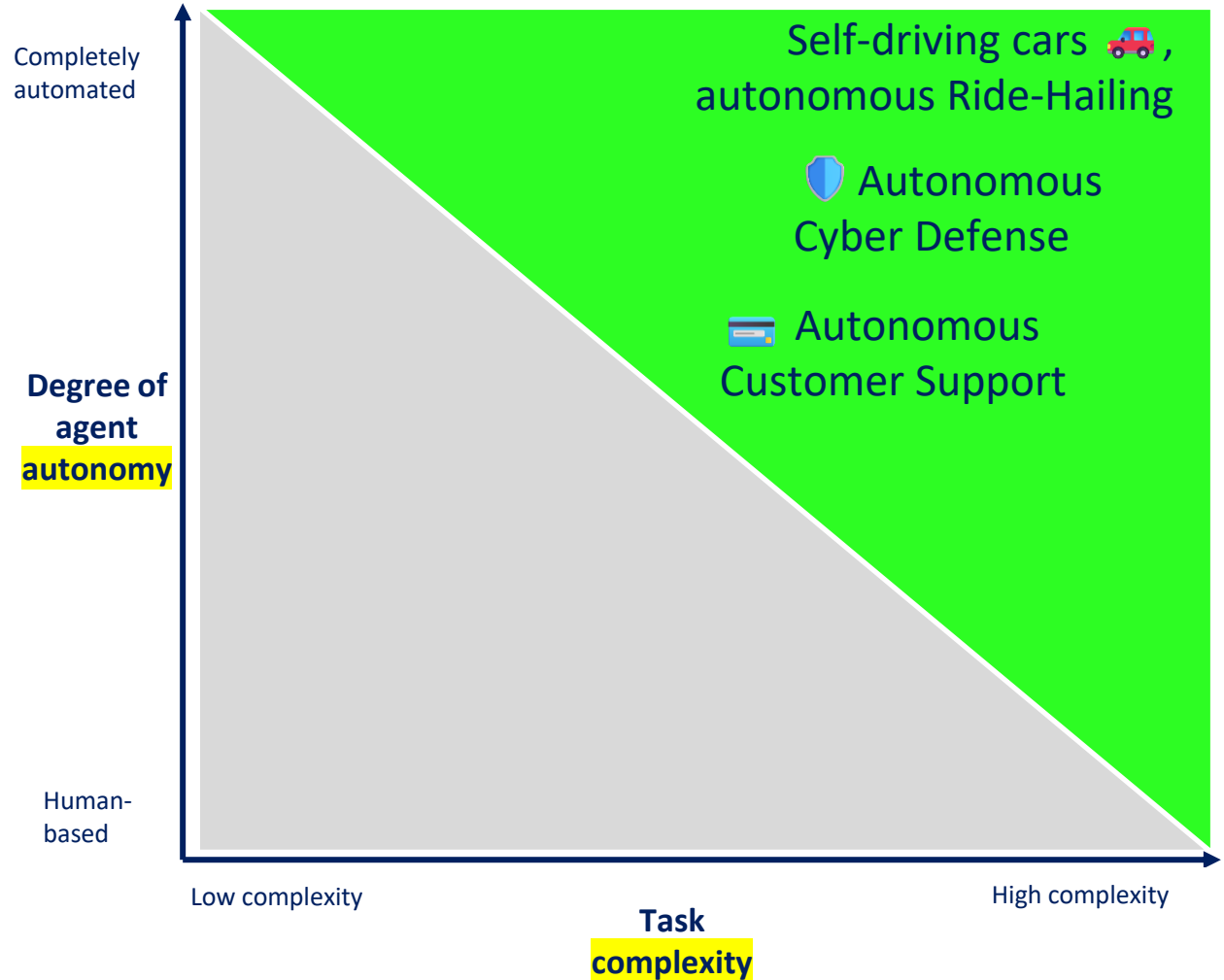


The promise:

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 addresses 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

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

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**

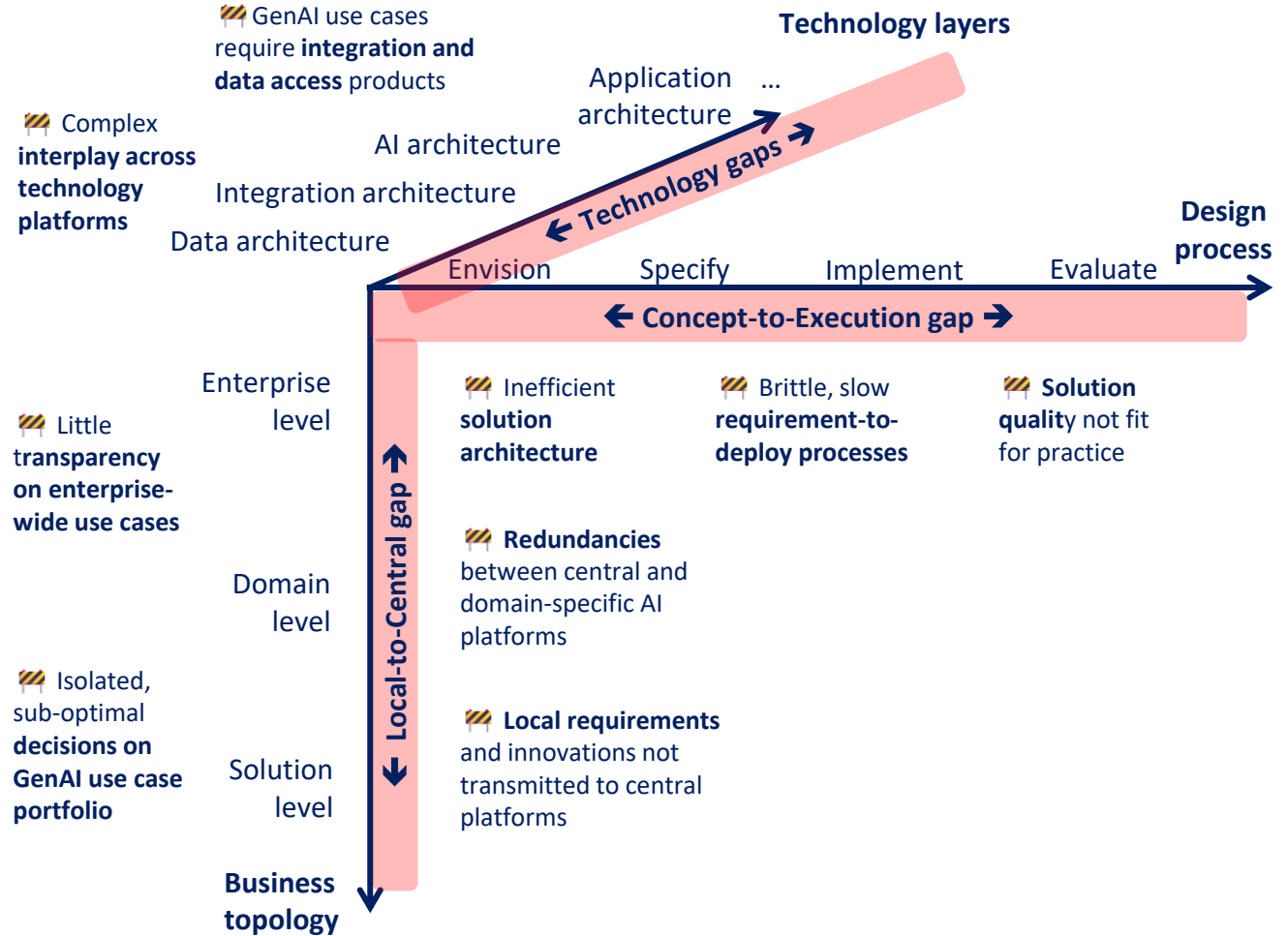
“Select tools that integrate deeply while adapting over time”, “focus on **workflow integration** over flashy demos”

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

EAM provides integrated capabilities to close the gaps

This results in tangible benefits

 **GenAI community and ADRs** enable fast bottom-up alignment on cross-technology integration

 **Target pictures** define “top-down” the interplay between technology platforms


 **Central catalogs** enables enterprise-wide optimization of the emergent GenAI use case landscape

 **Domain target pictures of AI-platforms and solutions** are aligned with enterprise-wide target pictures


Technology alignment

Efficient and effective concept-to-execution flow

Central-local alignment

 **GenAI-specific architecture templates** enable streamlined design

 **GenAI expert council** provides 360° counseling on solutions

 **Effort, risk and value assessment** is part of the solution sketch process



 **GenAI and domain architecture communities** ensure central-local alignment

 **Trainings** for solution and domain architects on best practice for GenAI development streamline the landscape

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


Cross-technology alignment



Efficient concept-to-execution flow



Central-local alignment

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

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

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

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

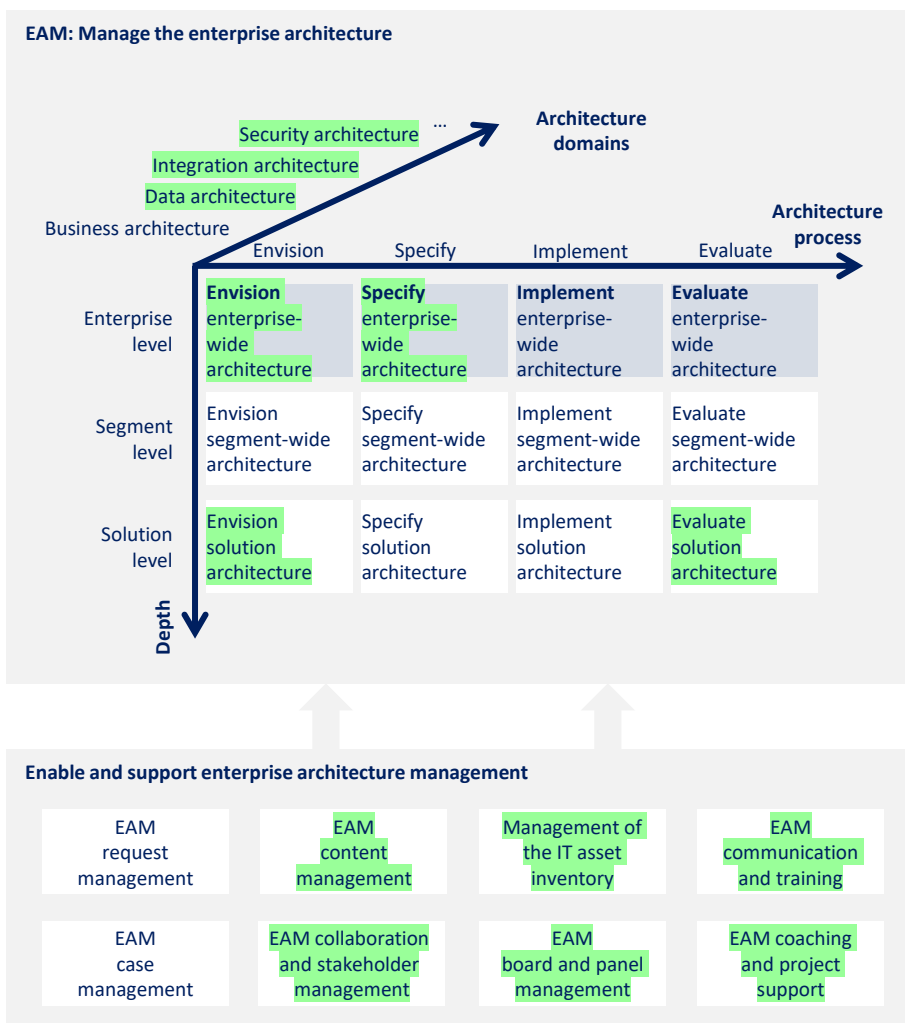
  **Compliance & regulatory speed** (e.g. EU AI Act) improved, decreasing process and re-engineering costs

  **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

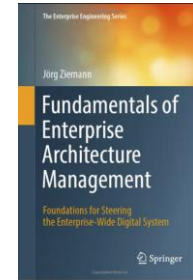
Established processes,
roles and architecture
communities across all
layers, to jointly work
and streamline new
technologies

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](#)