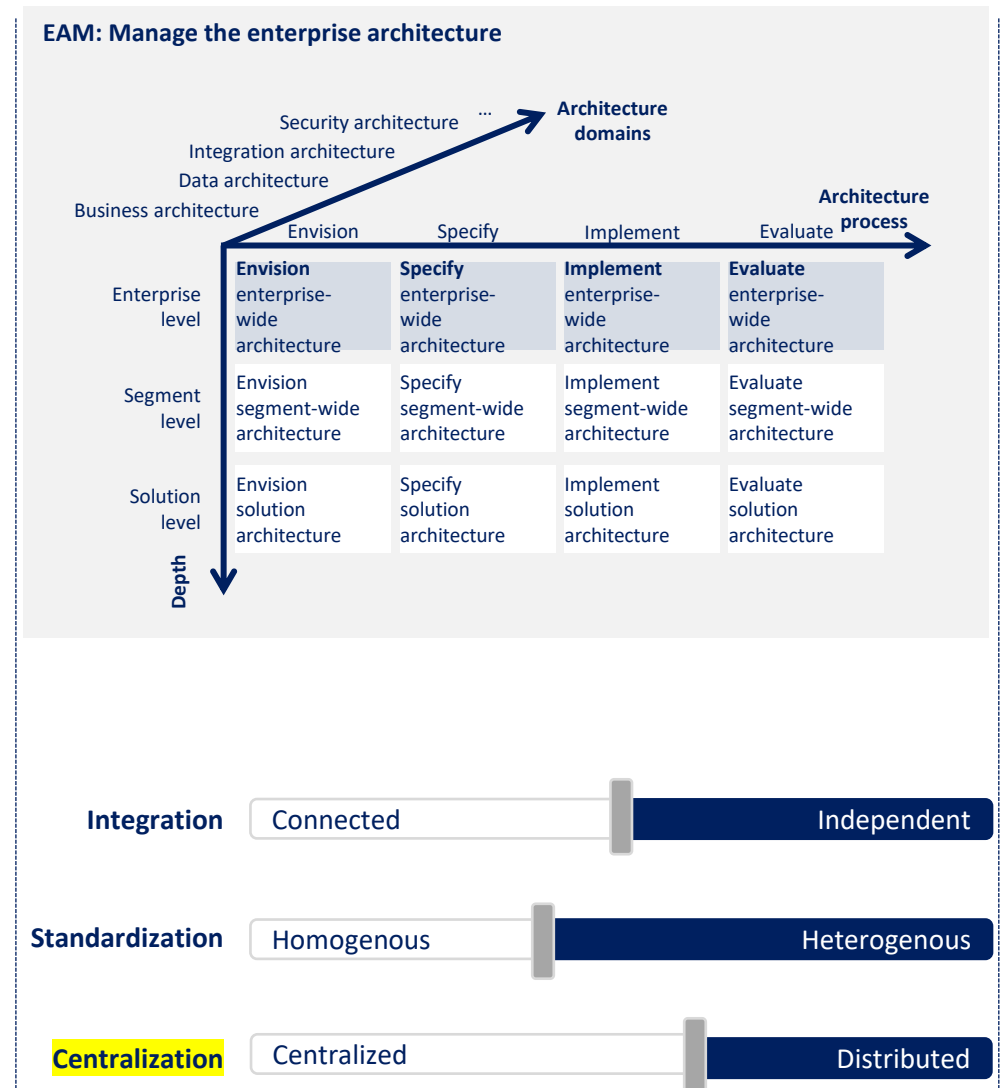


Central and Decentral Allocation of Enterprise Architecture Management Capabilities

University St. Gallen, March 2026

Dr. Jörg Ziemann



Background Jörg Ziemann: Enterprise Digitalization and Data Architecture for 20 years

Please find me on [EAMfundamentals.com](https://www.eamfundamentals.com) and [LinkedIn](#)

- Internships and **software engineering**, e.g. at Volkswagen de Mexico; study of **business information systems**, e.g., University of California (UCI)



- **Project lead and architect** @ DFKI – German Research Center for Artificial Intelligence 2004-2010



- **Senior Enterprise Architect** and **project lead** @ Talanx

tal anx.

- **Author, reviewer, and speaker** on enterprise digitalization 2004-today



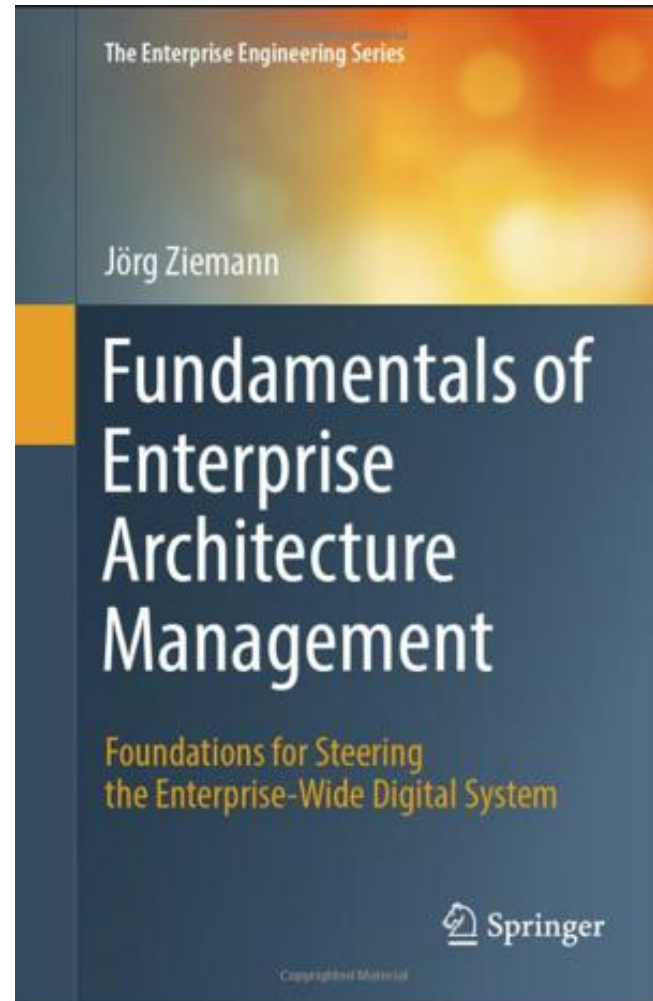
- **Lecturer** on Enterprise Architecture and Enterprise Digitalization at University of Hannover 2016-today



- **Global Lead Architect Data Analytics** Lufthansa, Senior Enterprise Architect 2018-today



Latest book from 2022:

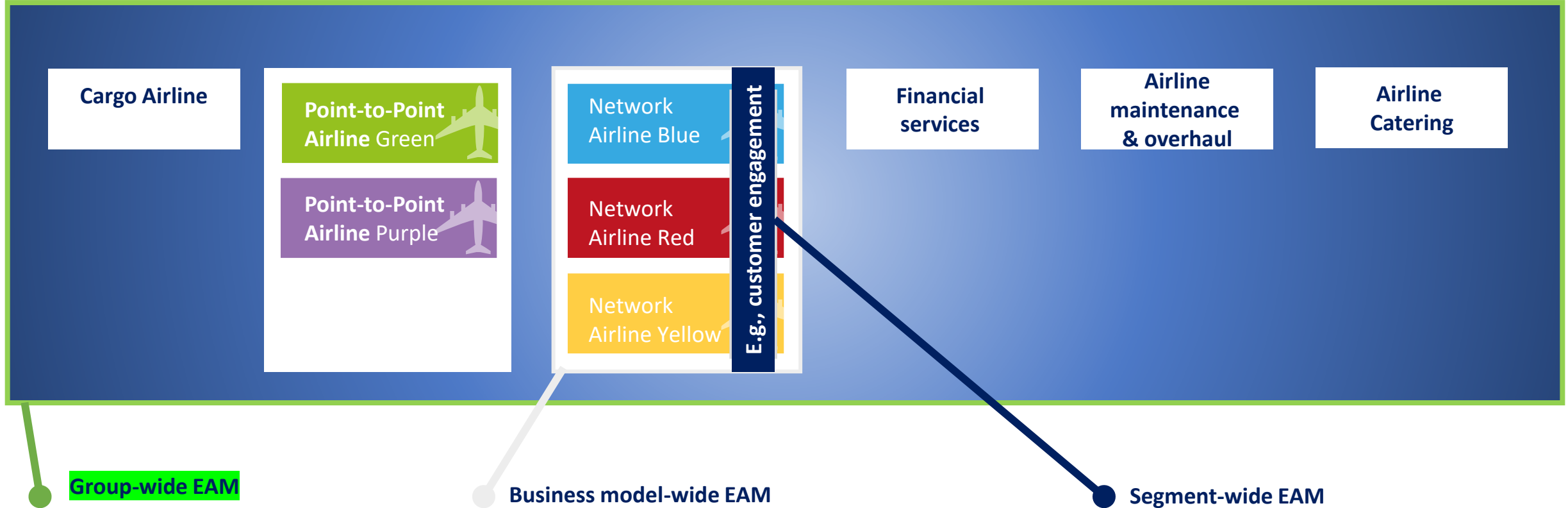


“Finally, a compact book that presents EAM consistently from a management perspective, ...” Robert Winter, Director of the Institute of Information Management, University of St. Gallen

“A truly fundamental textbook [...]. It is equally useful for practitioners who need a concise state-of-the art overview of Enterprise Architecture Management.” Jan Mendling, Einstein-Professor of Process Science, Humboldt-Universität zu Berlin

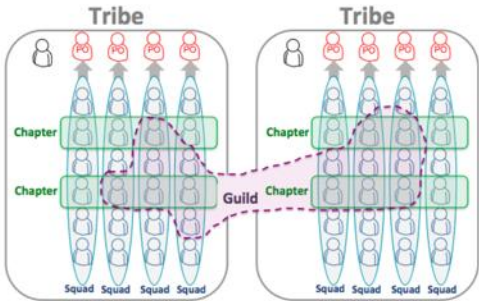
“An extremely well rounded and comprehensive display of the current state of Enterprise Architecture Management. A definitive must-read for anybody studying or working in this area.” André Christ, CEO and Co-Founder at LeanIX

I am working in the group-wide enterprise architecture management capability



(De)centralization of digitalization architecture remains a hot topic

Spotify model

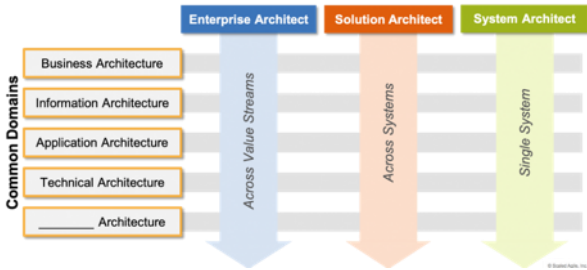


“The best architectures, requirements, and designs emerge from **self-organizing teams**”

“Generally, I am a fan of decentralization. However – though I went through a lot of literature – **there are no simple answers for the right degree of centralization**”

“**Don’t worry; the only thing organizational strategy consultants can do to us is allocating us more centrally or more decentrally**”

SAFe

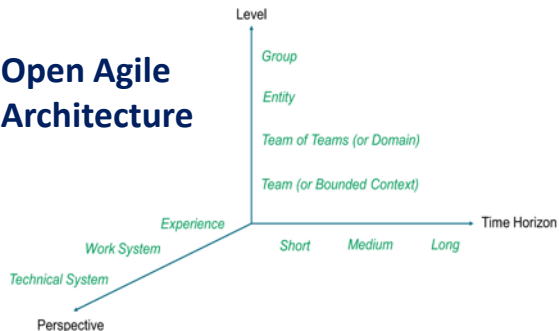


Agile Manifesto: 12 Principles behind the Agile Manifesto, 2001

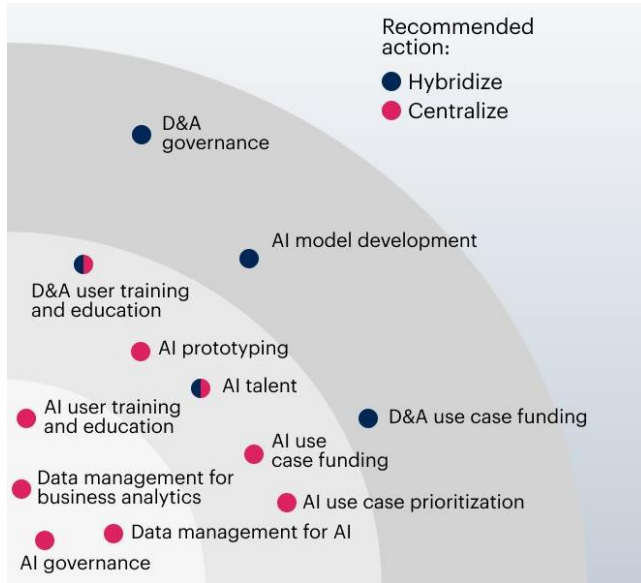
CIO of large Aviation Group, 2022

Chief Architect of Large Insurance Group, 2016

Open Agile Architecture

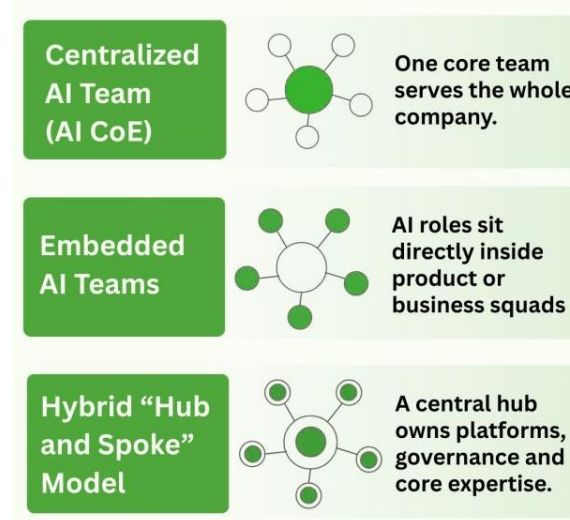


Recent example: AI capabilities inside an enterprise ... should be centralized?



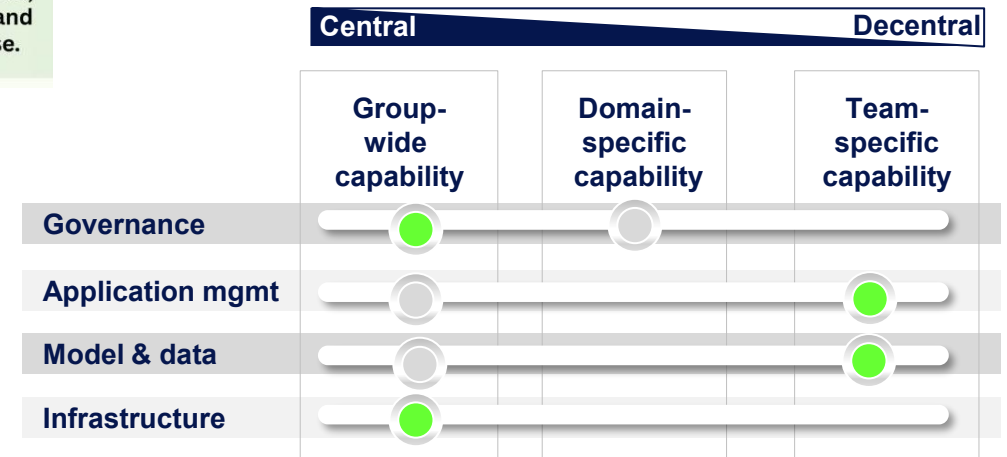
Reference from Gartner

**“A question currently asked in every enterprise:
 How to distribute AI development capabilities”**
Google customer engineer AI, 2026

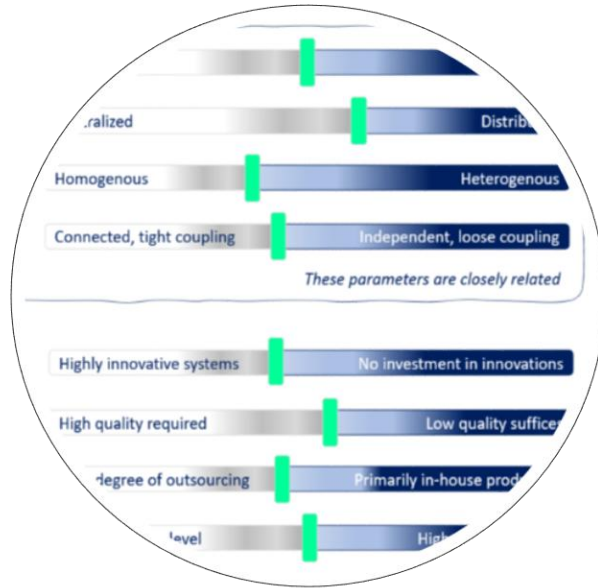


Reference from [LinkedIn](#)

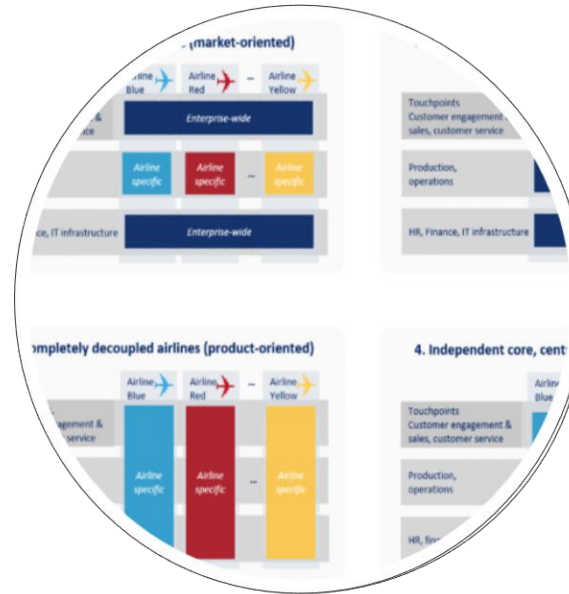
How to distribute the capabilities for **full-stack ML-applications** in a large aviation group?



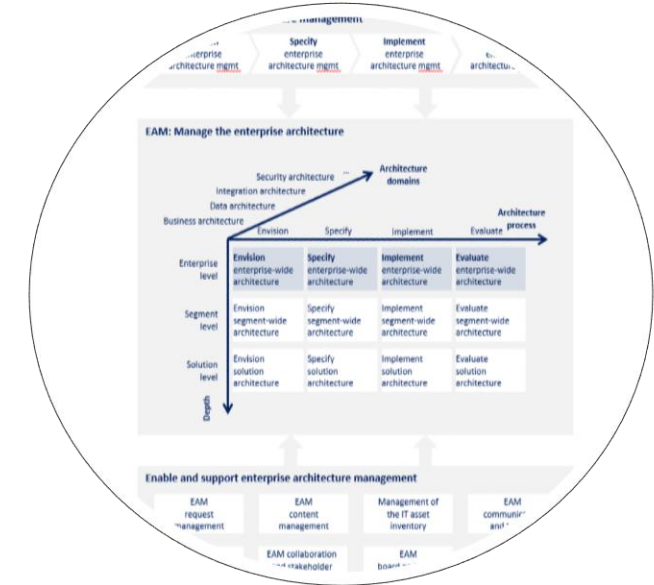
Learning objectives and core points of this presentation



(De-)centralization as core design parameter of socio-technical systems



(De-)centralization in business and operating models



(De-)centralization of enterprise architecture management

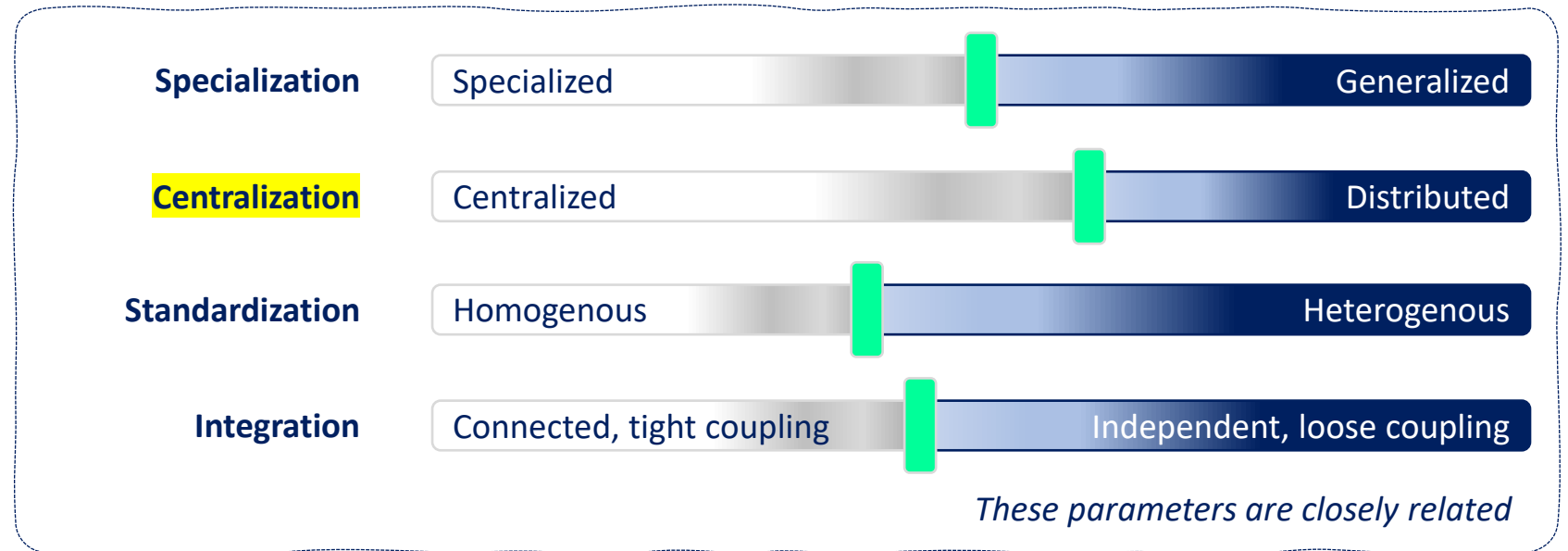
- ➔ Understand the strategic role of (de-)centralization on the different layers of socio-technical systems
- ➔ Understand how to derive the EAM topology from the business topology for a specific enterprise

Introduction and general motivation

(De)centralization remains a hot topic –
Both in large political systems and in
technical systems

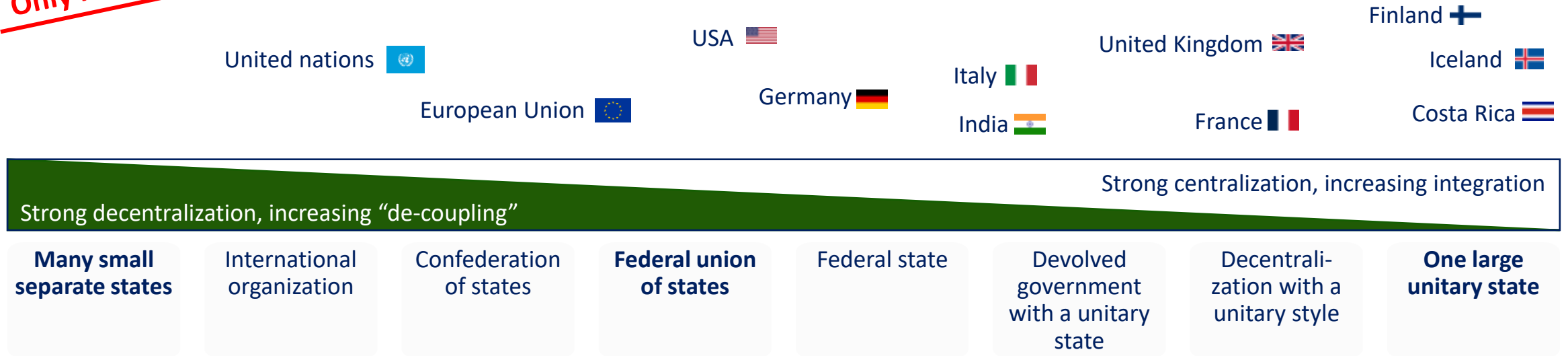
Central-
ization and
related
core
parameters
shaping
socio-
technical
systems

Many of these
parameters are
highly inter-
dependent



All socio-technical systems are characterized by their degree of centralization and integration – for example: large political systems

Only illustrative






- “In **federations**, the provincial/regional governments share powers with the central government as equal actors through a written **constitution**, to which the consent of both is required to make amendments”

- “A **unitary state** is a sovereign state governed as a single entity in which the central government is the supreme authority. The central government may create (or abolish) **administrative divisions** (sub-national units). Such units exercise **only the powers that the central government chooses to delegate**”

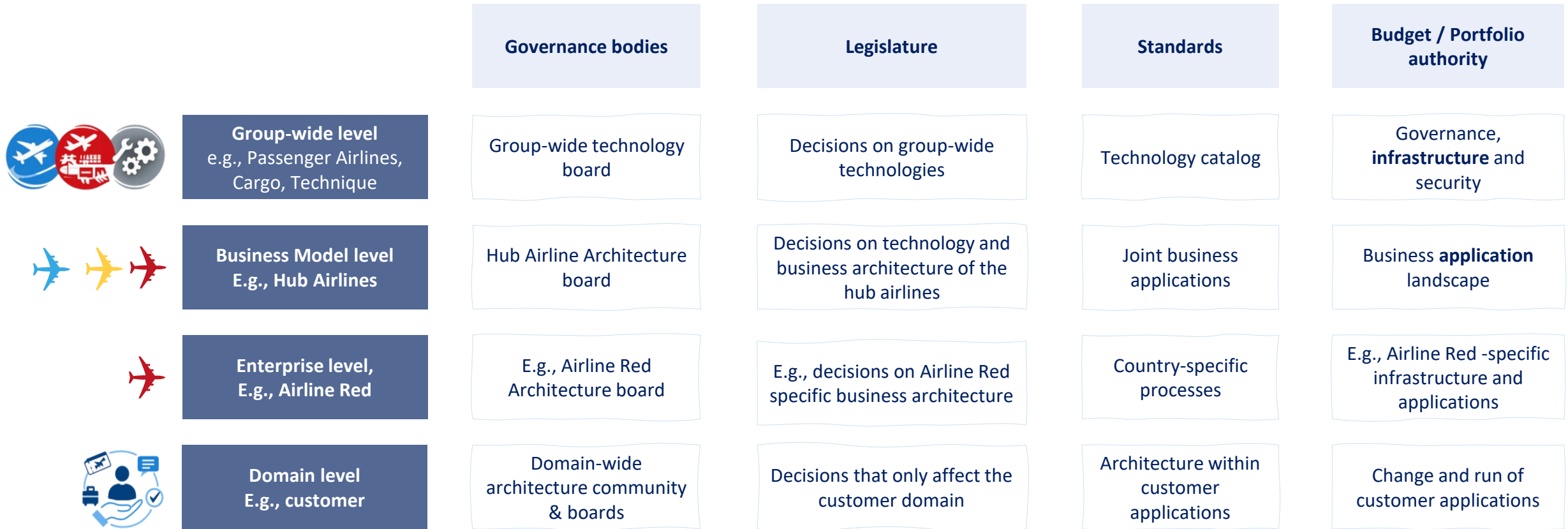
Interactions across the various central and decentral layers of large political systems are complex, e.g., inside the EU

Only illustrative

	Legislative bodies	Legislature	Standards	Taxes	Investments
 <p>European Union</p>	European Parliament & Commission	Trade treaties, emissions targets	Currency, GDPR, EU AI Act	Customs duties, Plastic levy (no direct income tax)	Structural funds, e.g., funding a rural bridge
 <p>Nation e.g., Germany</p>	<p>Bundestag passes laws for entire country.</p> <p>The Bundesrat represents the Länder and can participate in legislative procedures</p> <p>Also, laws are passed by parliaments (Landtag) of each federal state</p>	Nation enacts laws as empowered by constitution; e.g. Criminal law, Immigration code	Language, DIN Norms, Medical licenses	Income, corporation, sales tax	The Autobahn, Military, National railways
 <p>Federal state e.g., Rhineland-Palatinate</p>	<p>Also, laws are passed by parliaments (Landtag) of each federal state</p>	Police laws, School systems	Education, e.g. high school diplomas (Abitur rules)	Real estate transfer tax Inheritance tax	Universities, State police, Regional hospitals
 <p>Municipality, City e.g., Mainz</p>	City Council (Stadttrat)	Zoning laws, Parking zones	Local building codes, Waste disposal rules	Property tax, Trade tax (Gewerbsteuer)	School buildings, Public parks, Local trams

The interaction across the various central and decentral layers of large socio-technical systems is complex - e.g., inside a large aviation group

Only illustrative

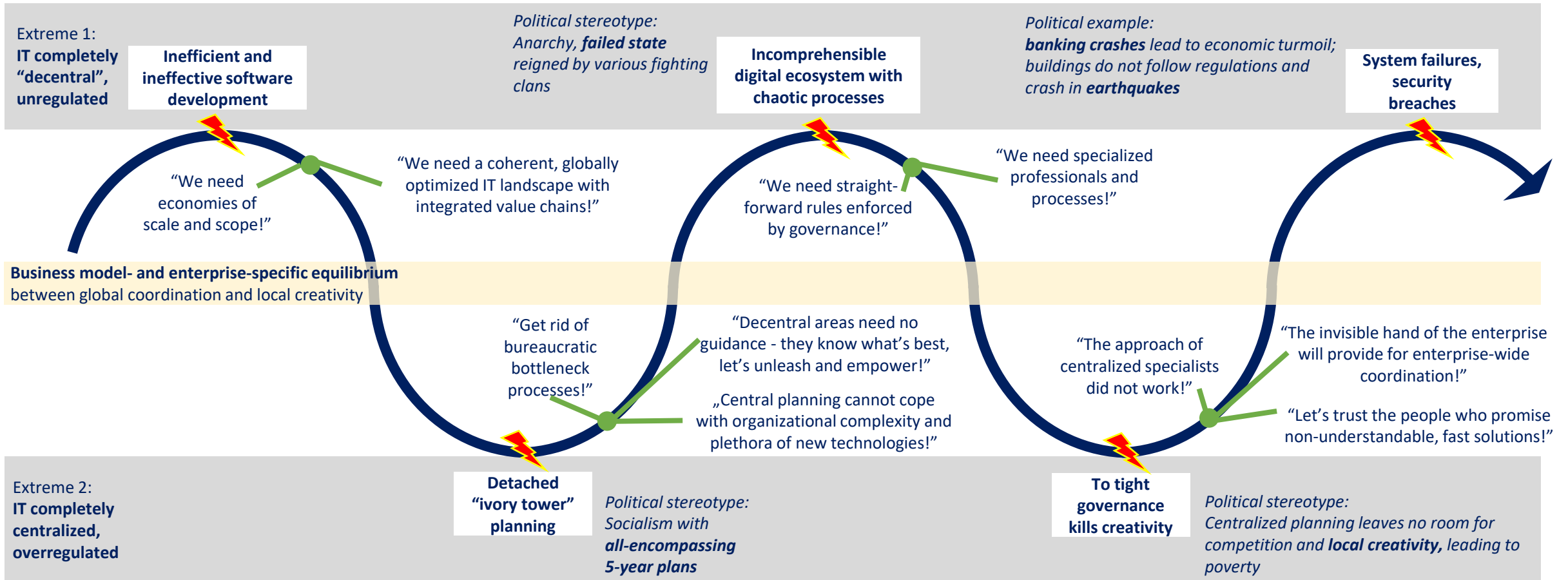


→ „Constitution“: E.g., 10 high-level principles for shaping the digital ecosystem

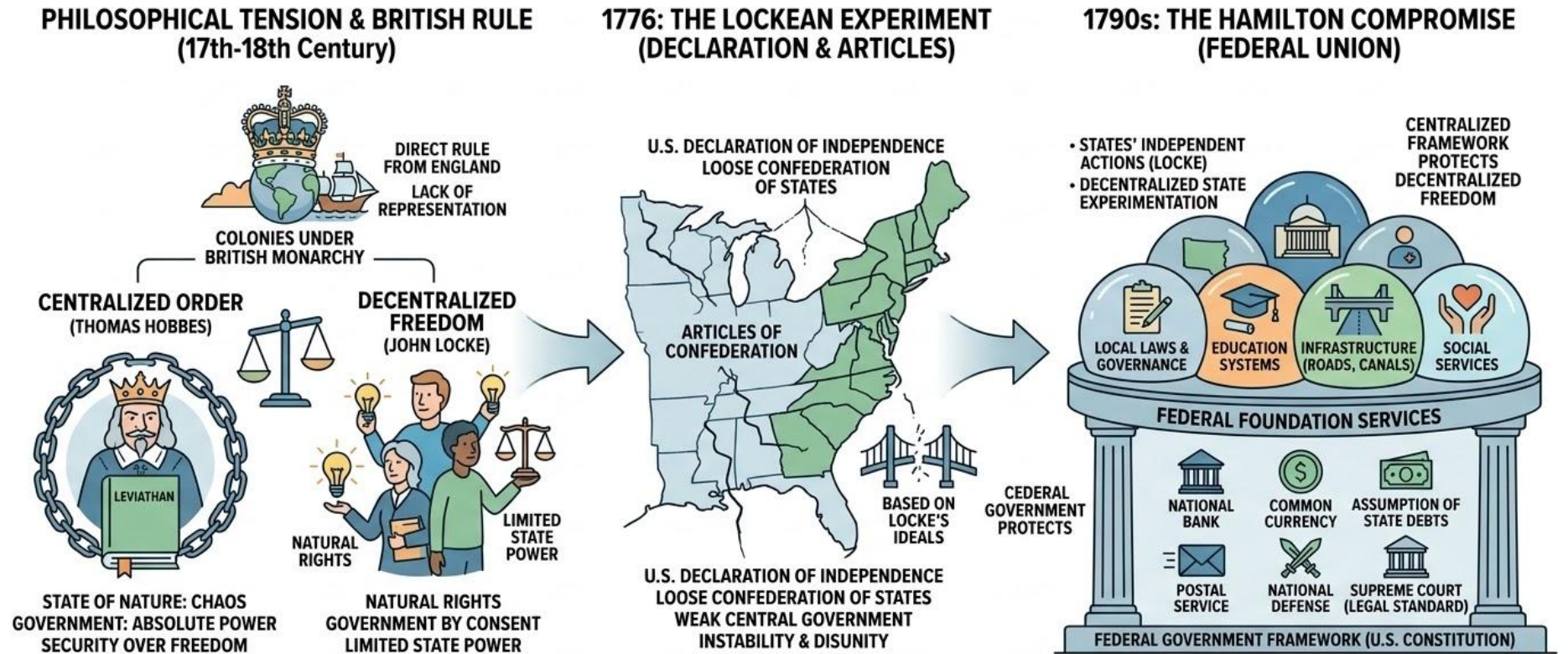
→ „Laws“: E.g., processes and guidelines for software development

The “pig cycle of digitalization governance”:

Within boundaries, in most large socio-technical systems, governance meanders



Centralization in the US history: From *Hobbes* and monarchy, to *Lockes'* loose confederation, and *Hamiltons* „United States“



Thomas Hobbes (Centralized Order): Strong, central "Leviathan" to prevent chaos and ensure collective security. Authority and standardization over individual autonomy, top-down control as a necessary safeguard against instability.

John Locke (Decentralized Freedom): "Natural Rights" (Life, Liberty, Property), the individual as the primary source of political legitimacy. A decentralized model where government power is limited and derived solely from the consent of the governed.

Montesquieu & Hamilton (The Federal Platform): Synthesize freedom and order by creating a robust central framework that protects decentralized autonomy. Montesquieu contributes the "Separation of Powers" to prevent tyranny, while Hamilton implements the financial and legal infrastructure of the Union. "Platform" approach ensures national stability while allowing the individual parts to remain independent and innovative.

Centralization in the US history: From *Hobbes* and monarchy, to *Lockes'* loose confederation, and *Hamiltons* „United States“

Extreme 1:
**Complete
freedom**

John Locke (Decentralized Freedom): "Natural Rights" (Life, Liberty, Property), the individual as the primary source of political legitimacy. A decentralized model where government power is limited and derived solely from the consent of the governed.

Equilibrium between global coordination and local creativity

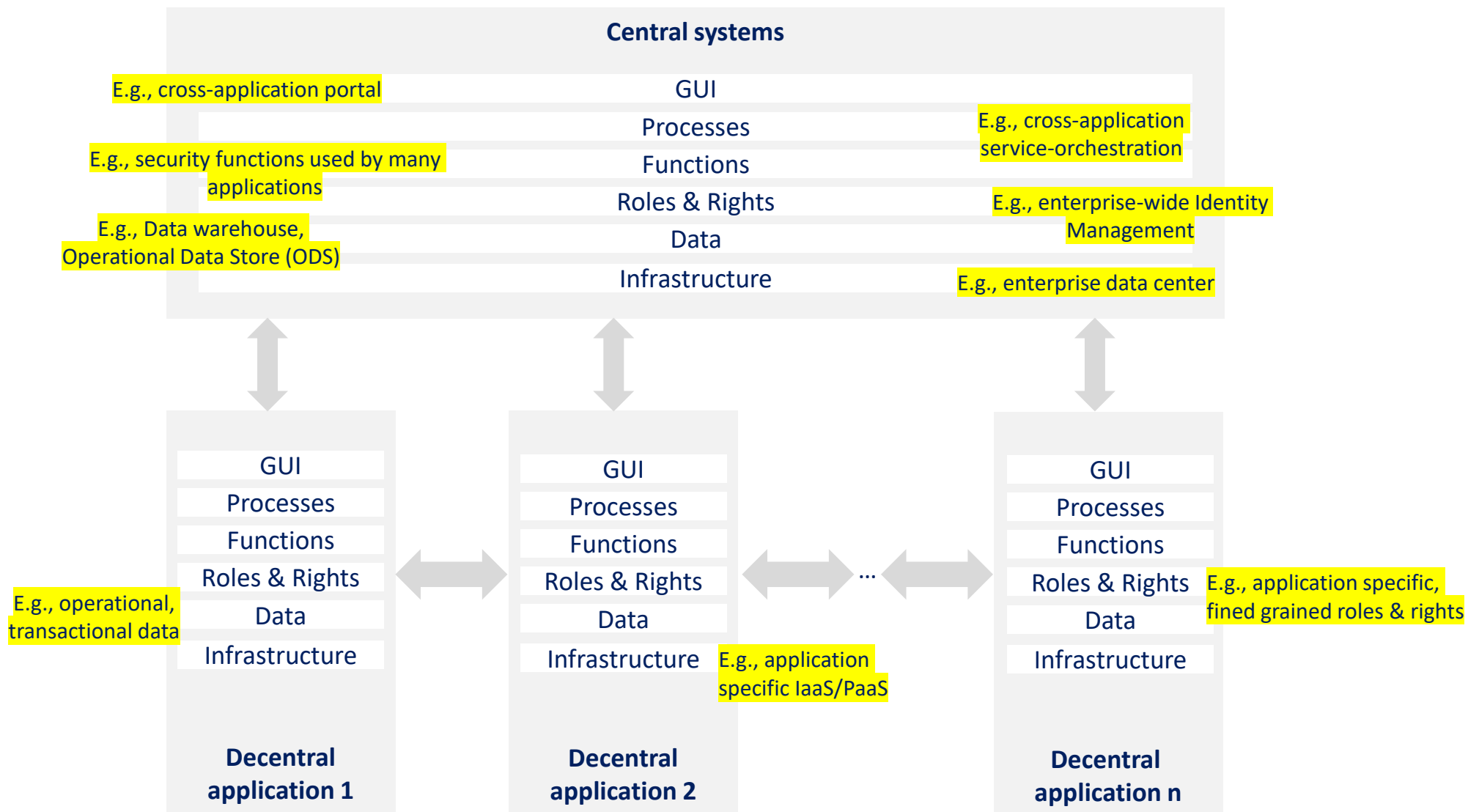
Montesquieu & Hamilton (The Federal Platform)

Synthesize freedom and order by creating a robust central framework that protects decentralized autonomy.

Extreme 2:
**Complete
central
control**

Thomas Hobbes (Centralized Order): Strong, central "Leviathan" to prevent chaos and ensure collective security. Authority and standardization over individual autonomy, top-down control as a necessary safeguard against instability.

A large socio-technical system like the enterprise-wide digital ecosystem always consists of central and decentral elements



Parameters of the data mesh: Centralization, integration, and specialization

		1. Data warehouse in theory	2. Data warehouses in practice of large enterprises	3. Data Mesh on one central platform	4. Data Mesh on various platforms
Governance	Data quality standards	Enterprise-wide quality standards, semantics and syntax	Enterprise-wide standards (high-level) Domain-wide standards (detailed)	Enterprise-wide quality standards, semantics and syntax	Enterprise-wide standards (high-level) Domain-wide standards (detailed)
	Semantic harmonization e.g., IDM, glossary				
	Syntactic harmonization e.g., contracts				
Product development	Consumer-specific products ("consumer-aligned")	Enterprise-wide i.e., by central development team	Domain-wide i.e., a data warehouse for each (large) business domain	Sub-domain (team-wide) ≈ independent data analytic "areas" for each team	Sub-domain (team-wide) ≈ independent data analytic "areas" for each team
	Integrated data base ("Aggregate data")				
	Data ingestion / ETL				
Platform	(Physical) analytics platform	Enterprise-wide platform	Domain-wide	Enterprise-wide platform	Domain-wide
	Technology standard harmonization		Enterprise-wide		Enterprise-wide
		<ul style="list-style-type: none"> + High integration, data quality and cohesion - Bottle neck, too slow for today's requirements 	<ul style="list-style-type: none"> + At least domain-wide integration, data quality and cohesion - Bottle neck, still too slow, data swamp 	<ul style="list-style-type: none"> + Fast and innovative local developments - <i>Challenging</i>: Platform scalability, data quality, integration, coherence 	<ul style="list-style-type: none"> + Fast and innovative local developments - <i>Challenging</i>: data quality, integration, coherence
		<p><i>Read-optimized</i> Centralization, integration, specialization and coherence</p>		<p>Decentralization, decoupling, generalization, and flexibility <i>Write-optimized</i></p>	

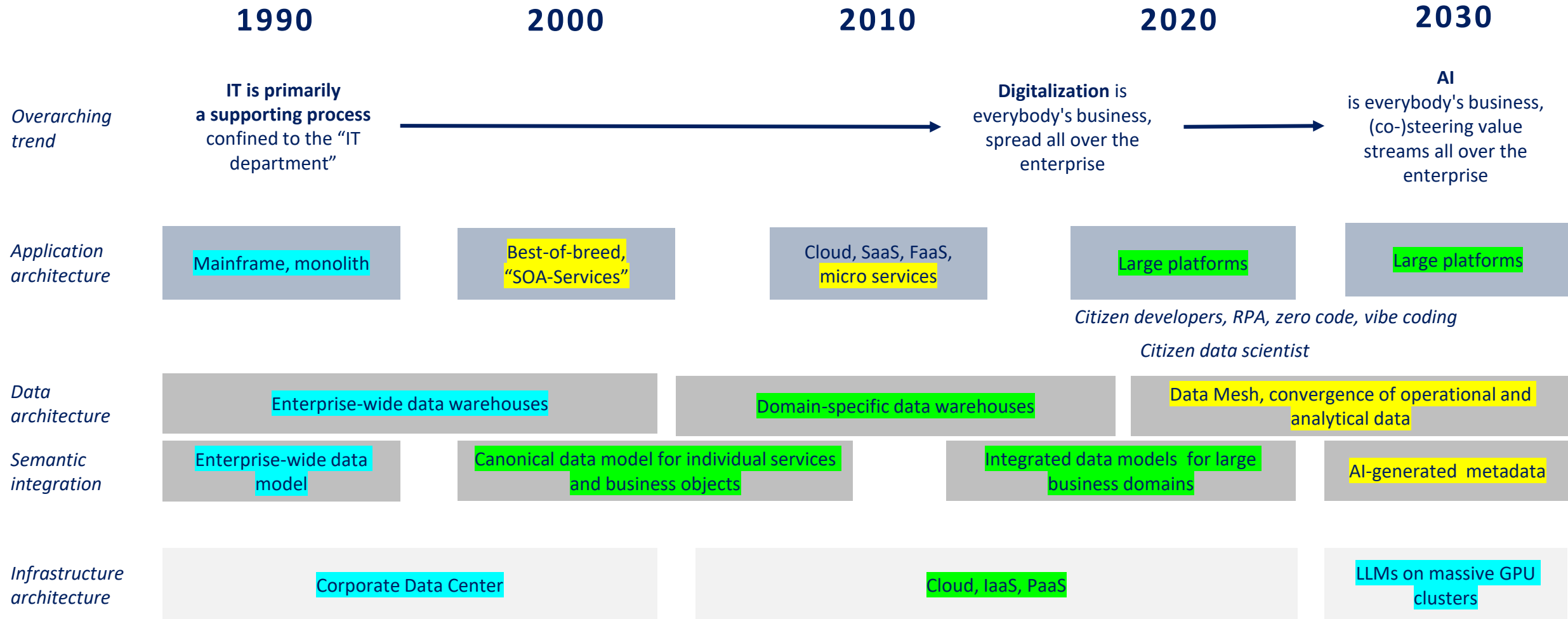
Through the history of enterprise digitalization, the pendulum of (de)centralization swings back and forth

Legend:

Centralized

Federated (middle ground)

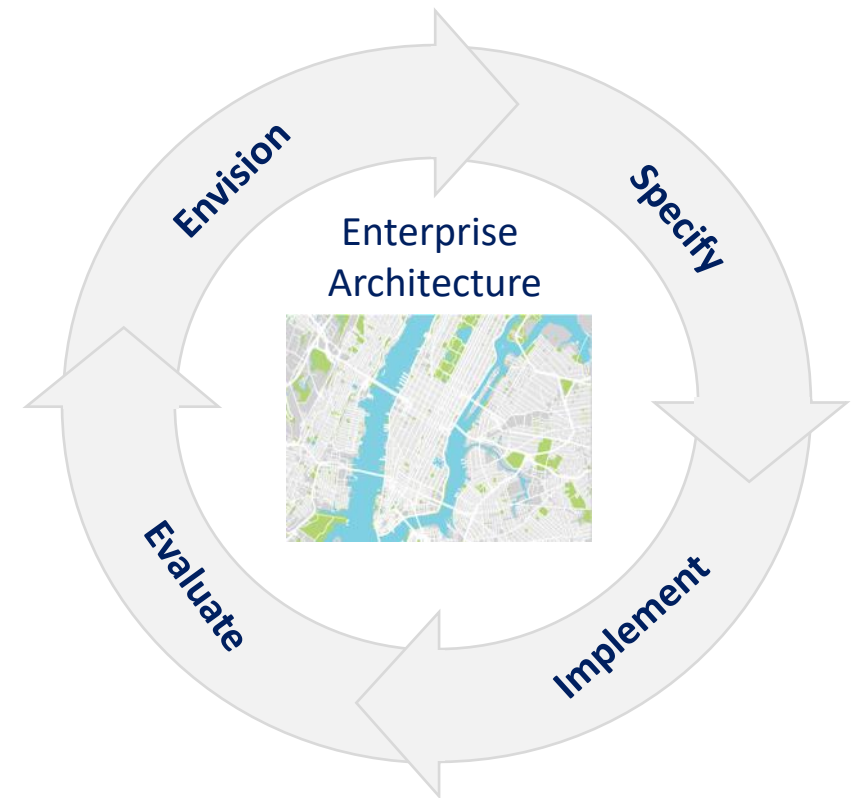
Decentralized



Short Recap:

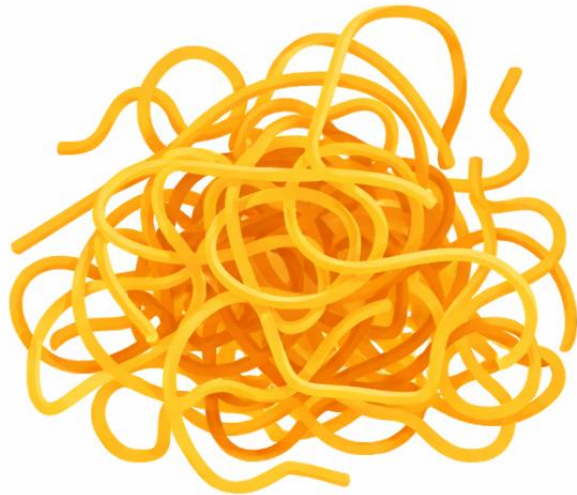
Enterprise Architecture Management in
the context of (de-centralization)

The core idea of EAM at least sounds “central”:
the steering and optimization of the **enterprise-wide** digital ecosystem



Without enterprise-wide coordination the enterprise-wide ecosystem “emerges” ... into a big ball of spaghetti

Spaghetti Architecture

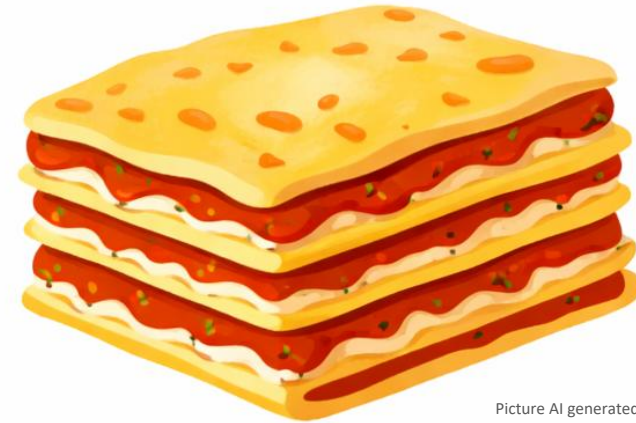


Picture AI generated

A tangled bowl where everything sticks to everything.

- Noodles intertwined in many directions
- Hard to separate or change a single strand
- The more you add, the messier it becomes

Lasagna architecture



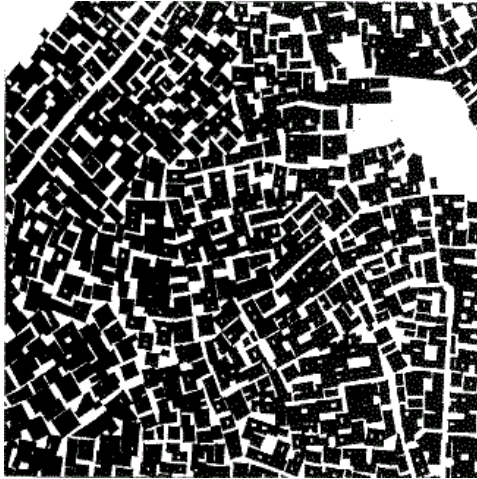
Picture AI generated

Large, standardized, layered building blocks

- Fewer elements and dependencies; coherent, well-integrated overall system
- Lower system complexity

A core argument of EAM: Without enterprise-wide coordination the enterprise-wide ecosystem “emerges” into a big ball of mud

“Emergent”, organically grown city

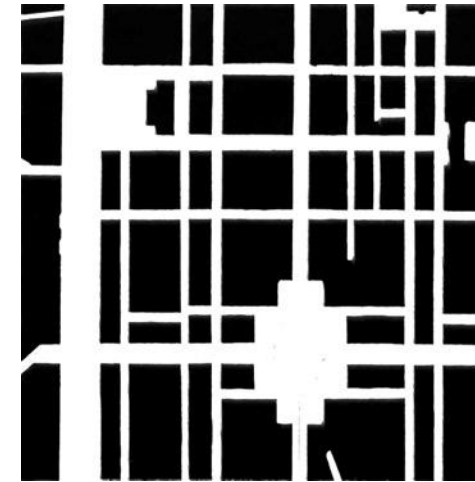


Gerhard Curdes ©Public Domain/CC BY-SA 3.0

Many small, heterogeneous building blocks

- Many elements, many dependencies
- High complexity, low transparency, low overall agility
- Redundancies, high costs, weak security

Designed city



Gerhard Curdes ©Public Domain/CC BY-SA 3.0

Large, standardized, layered building blocks

- Fewer elements and dependencies; coherent, well-integrated overall system
- Lower system complexity, higher agility
- Economies of scale and scope

Brick-and-mortar as well as digital systems must be architected on all levels



City



Building complex



Complex building



Simple building

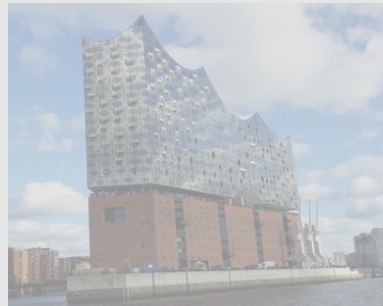
Brick-and-mortar as well as digital systems must be architected on all levels



City



Building complex



Complex building



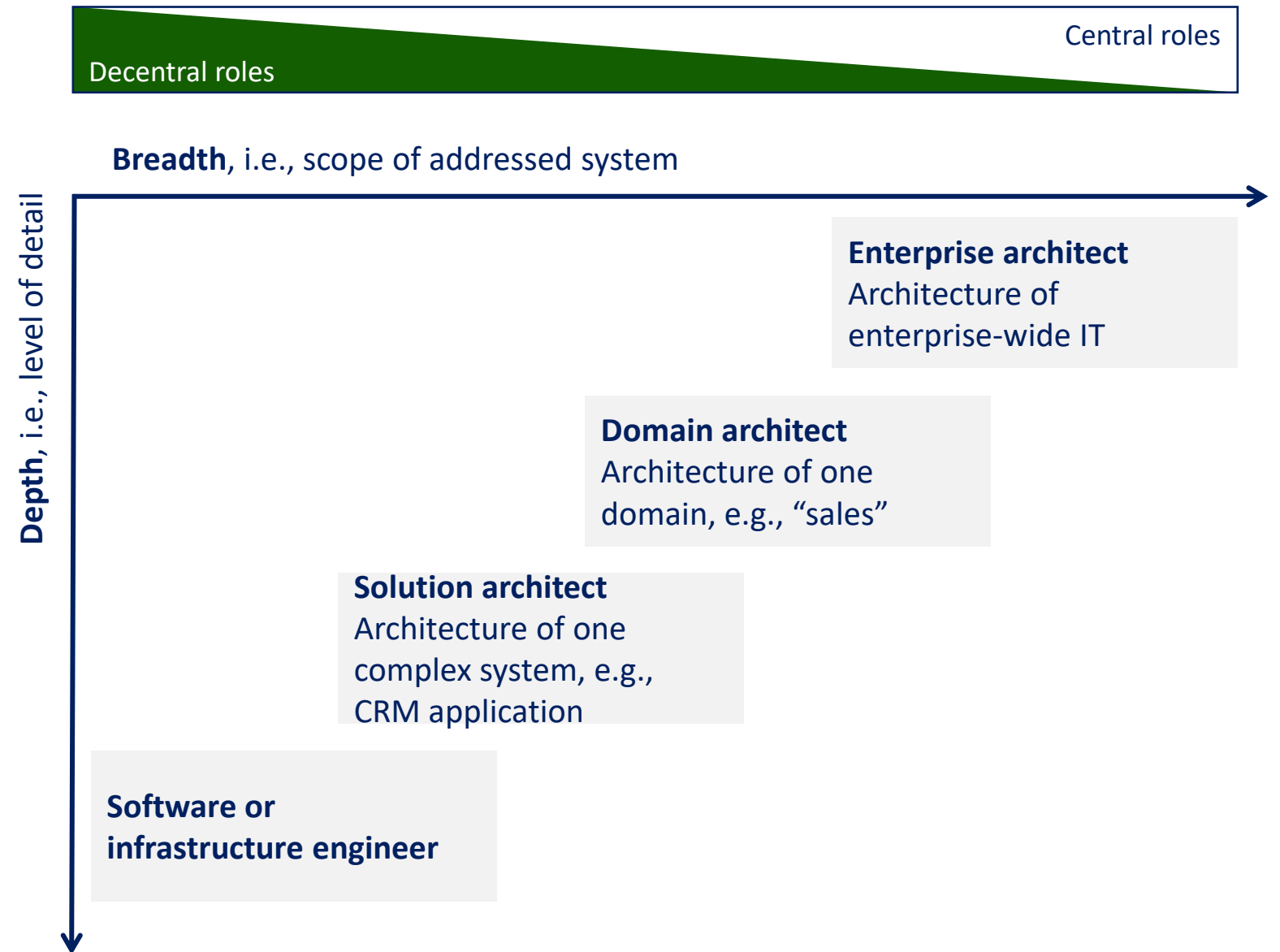
Simple building

10.000 “simple buildings” are easier to architect than one large airport.



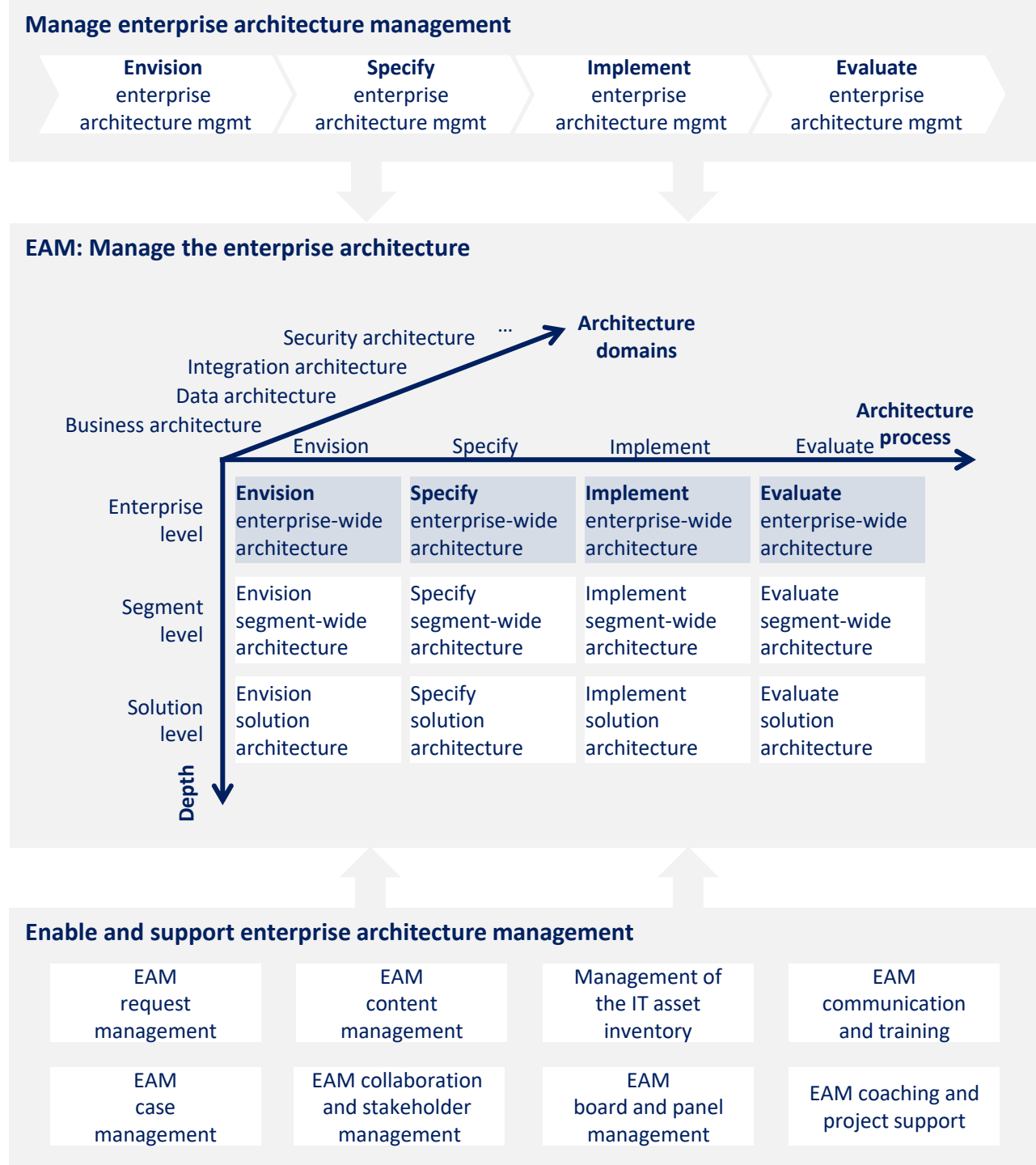
However, our world does not consist only out of decoupled “simple buildings”

The interplay of central and decentral roles is part of the classic EAM role model canon



As expressed by this EAM capability model, EAM consist of many well-established functions.

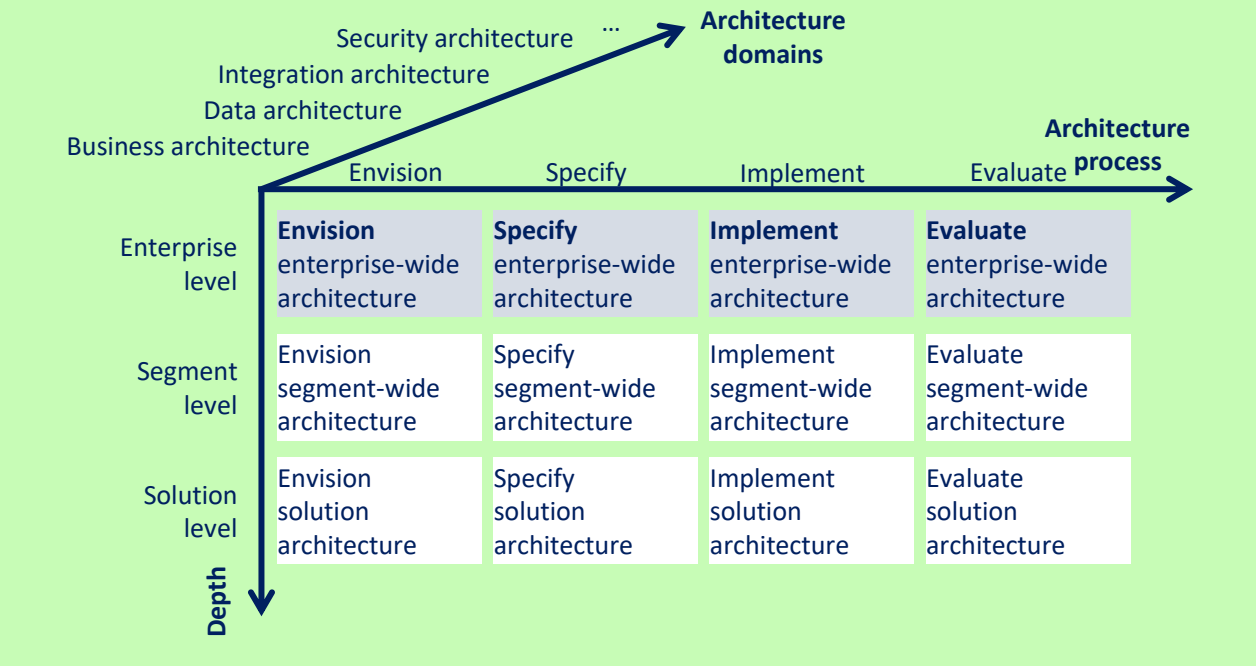
These are needed for the holistic development of the enterprise-wide digital landscape.



Manage enterprise architecture management



EAM: Manage the enterprise architecture



This area comprises the **core EAM processes**, i.e., activities for managing architectures on all levels, for all architecture domains

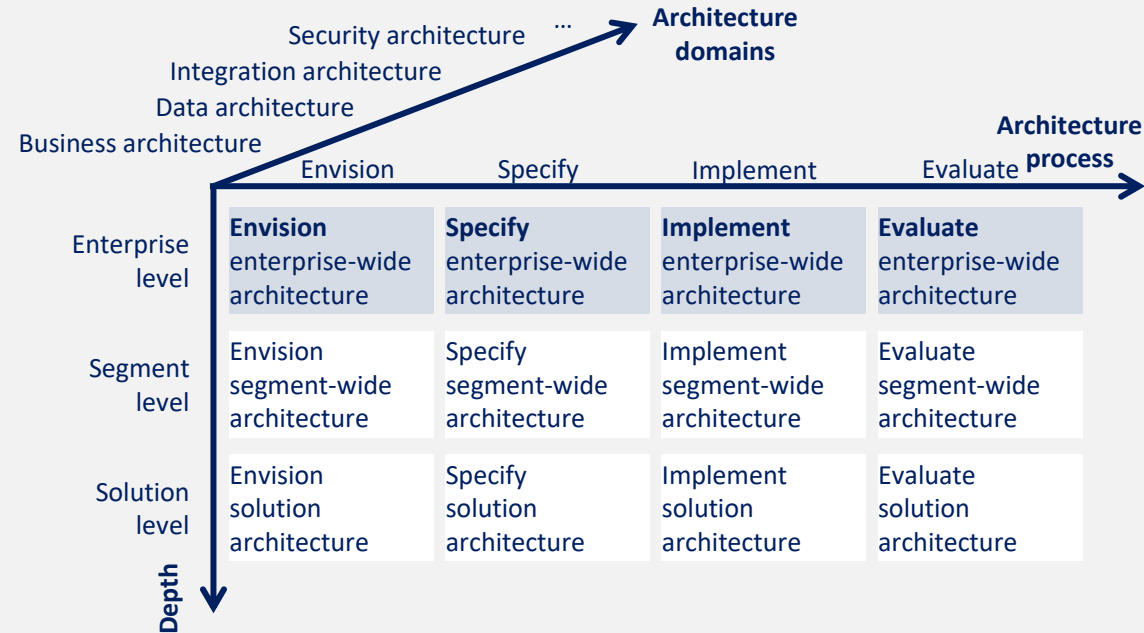
Enable and support enterprise architecture management



Manage enterprise architecture management



EAM: Manage the enterprise architecture



Enable and support enterprise architecture management



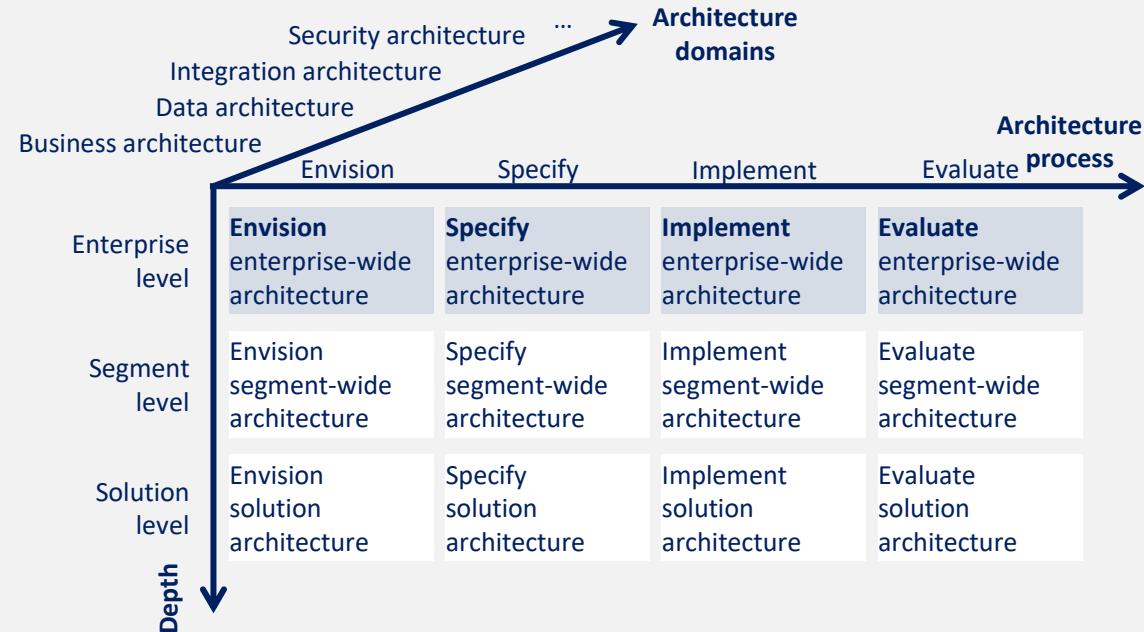
This area comprises **supporting processes** that **enable** the core EAM processes

Manage enterprise architecture management



← This area manages the EAM function in an enterprise, e.g., the continuous, strategic adaptation of the EAM capability

EAM: Manage the enterprise architecture



Enable and support enterprise architecture management



Most large enterprises frequently calibrate their EAM capability. This must be based on the surrounding socio-technical ecosystem.

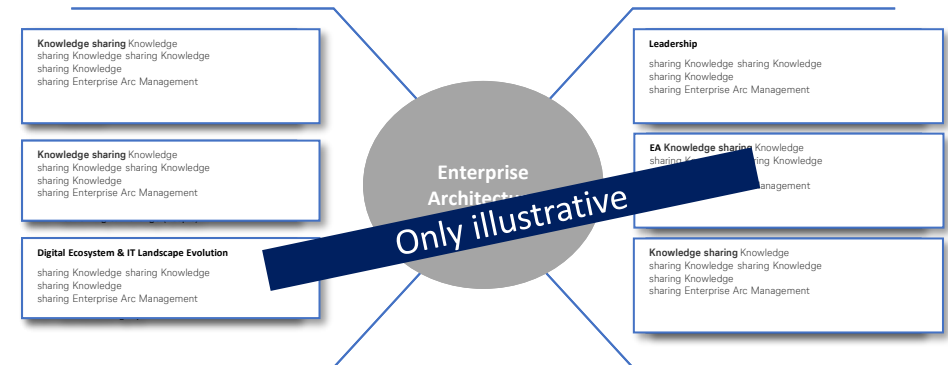
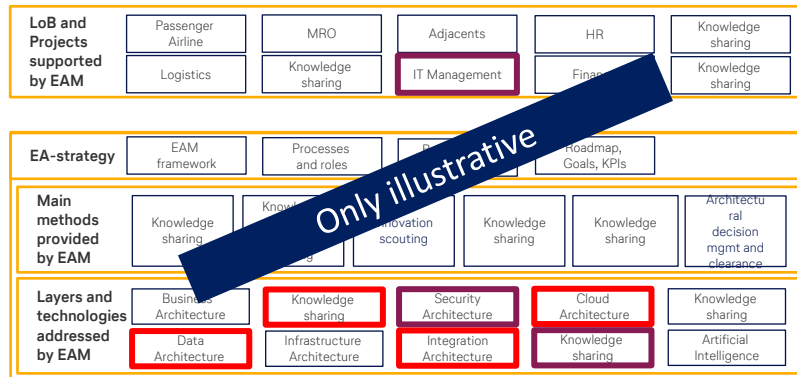
Example: inside a large aviation group, the group-wide EAM capability is calibrated every 1-2 years



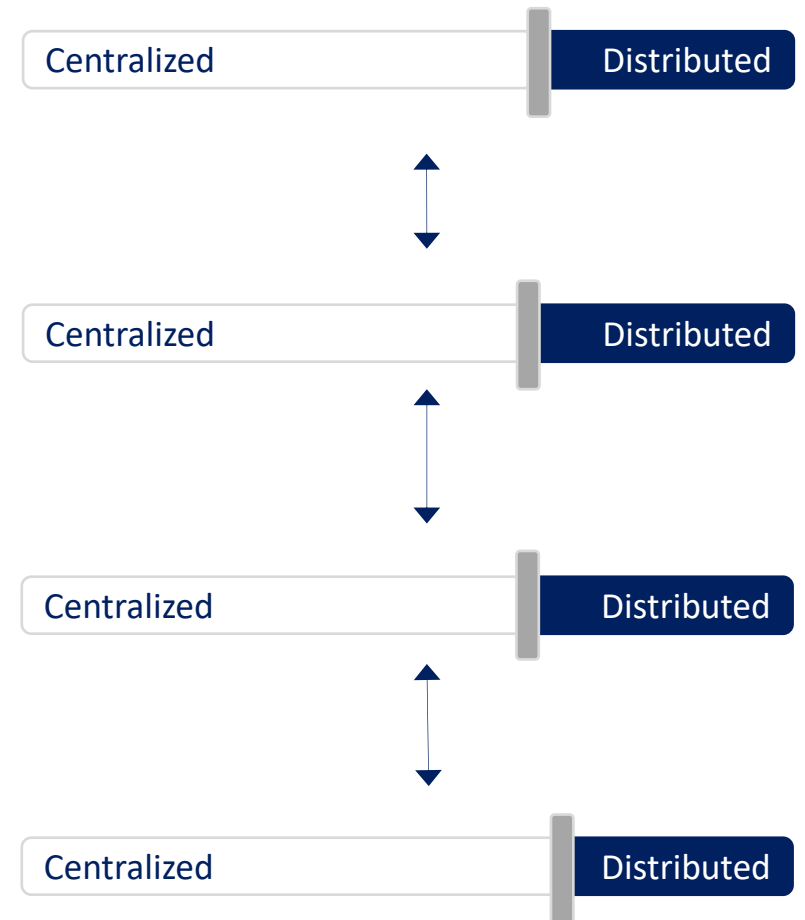
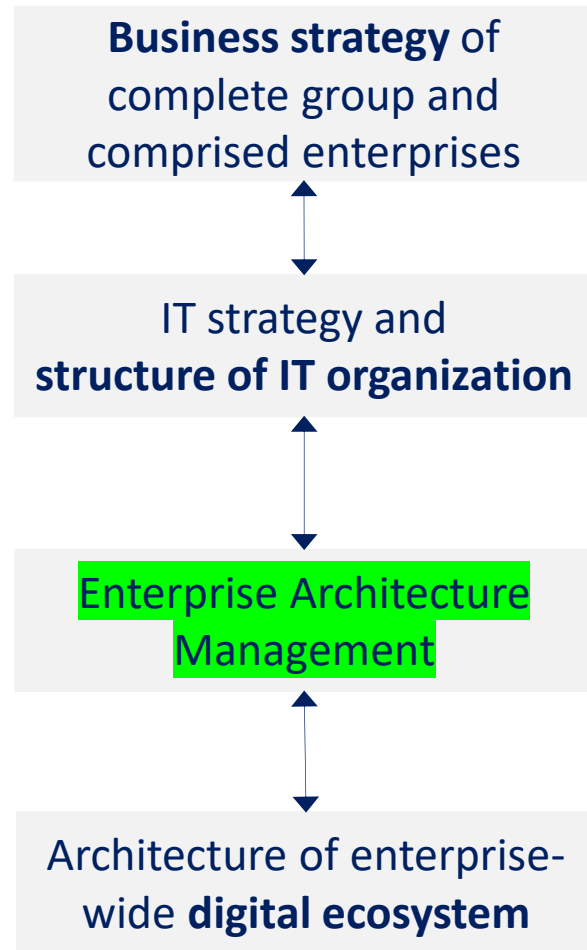
2018

2020

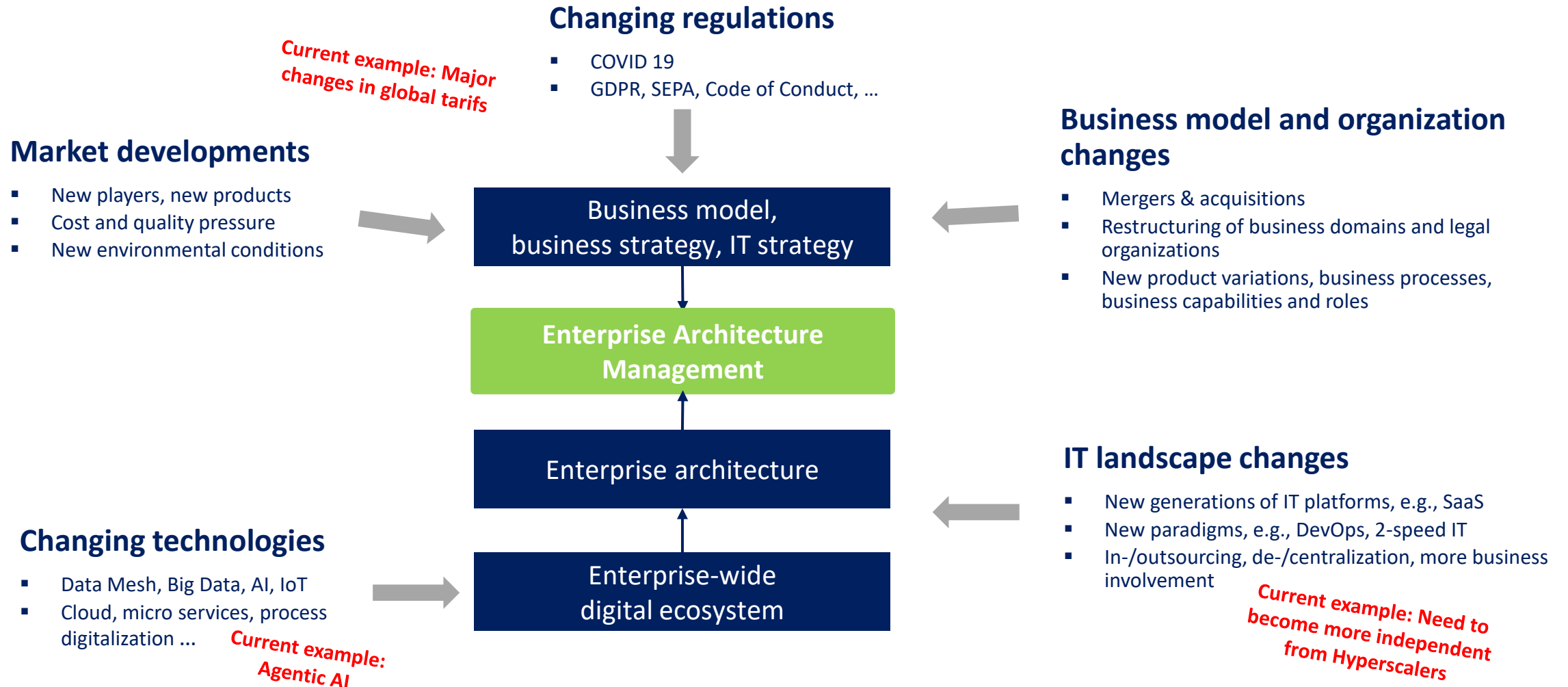
2022



The EAM structure follows the structure of the business – and the structure of the digital ecosystem



The EAM capability changes constantly, because its environment changes constantly



Lufthansa Group launches new brand identity

News from December 2025, [Lufthansa Group launches new brand identity](#), [LinkedIn post](#)



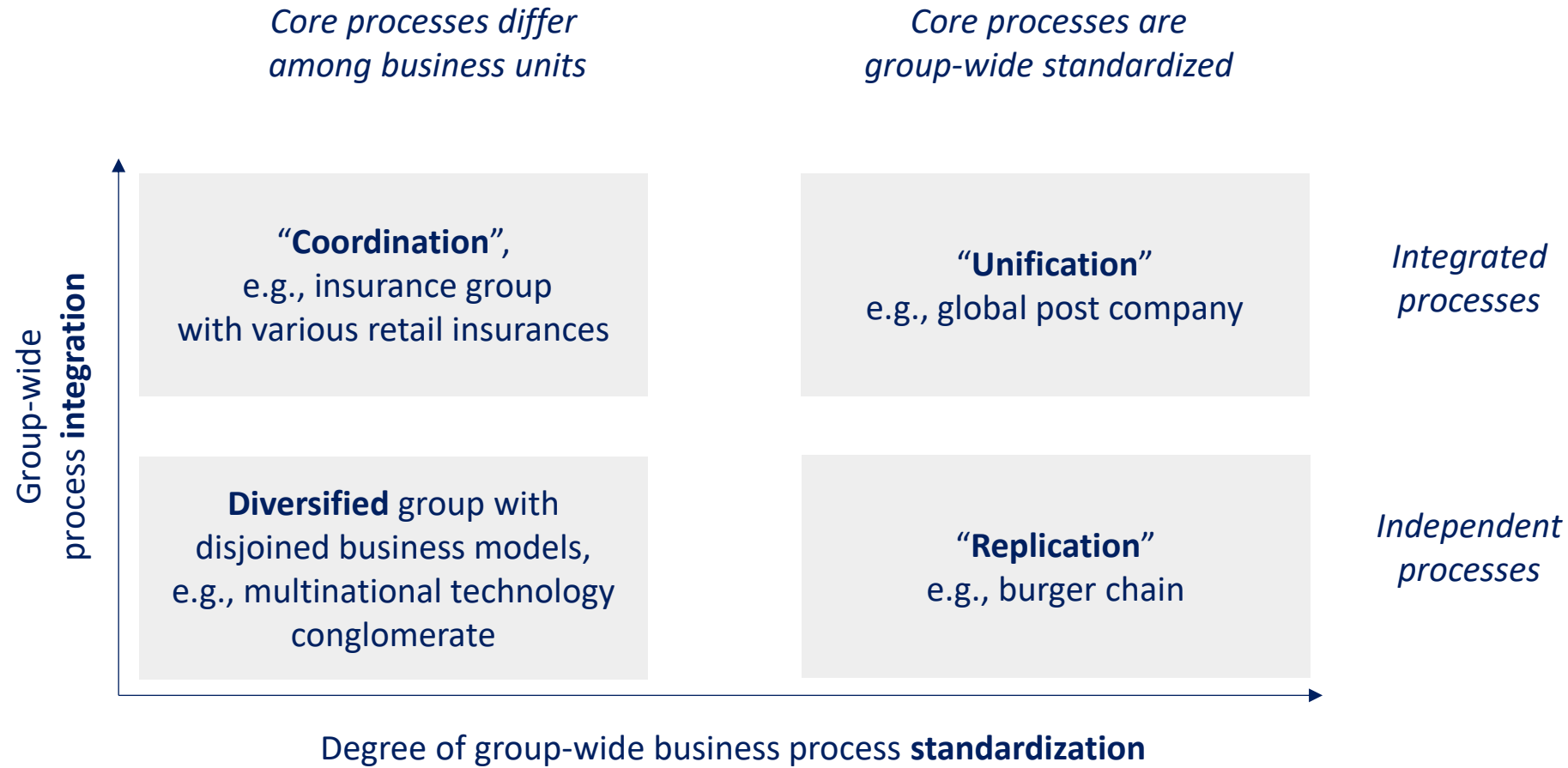
We are evolving from a group of airlines into an integrated airline group. The new brand identity provides orientation and strengthens identification with the Lufthansa Group.

In addition, we will keep the **strength of our individual brands, while customers benefit from the connectivity and cohesion of our multi-brand ecosystem.** It gives space for Lufthansa, Swiss International Air Lines, Austrian Airlines, Brussels Airlines, ITA Airways and all parts of our Group to show their character and specific brand values while being unmistakably connected.

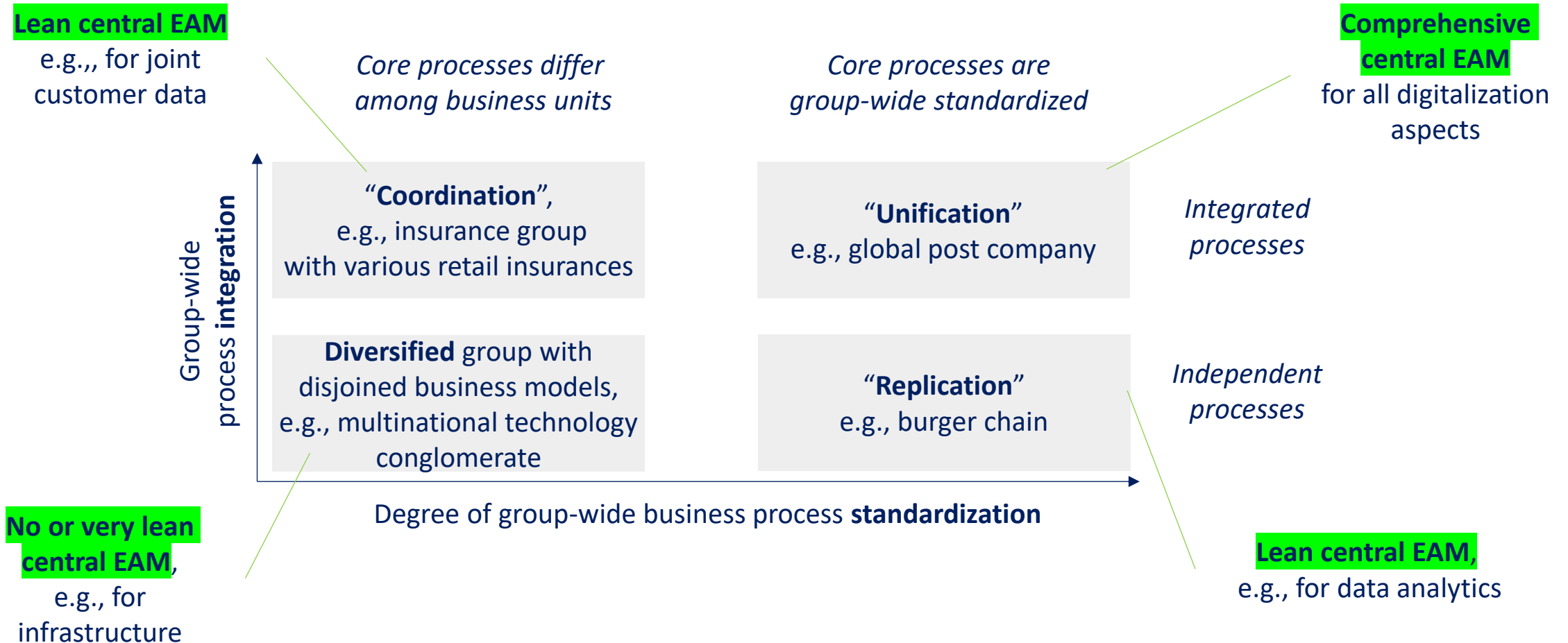
The basis for calibrating the enterprise architecture as well as the EAM capability:

The business model and the operating model of an enterprise

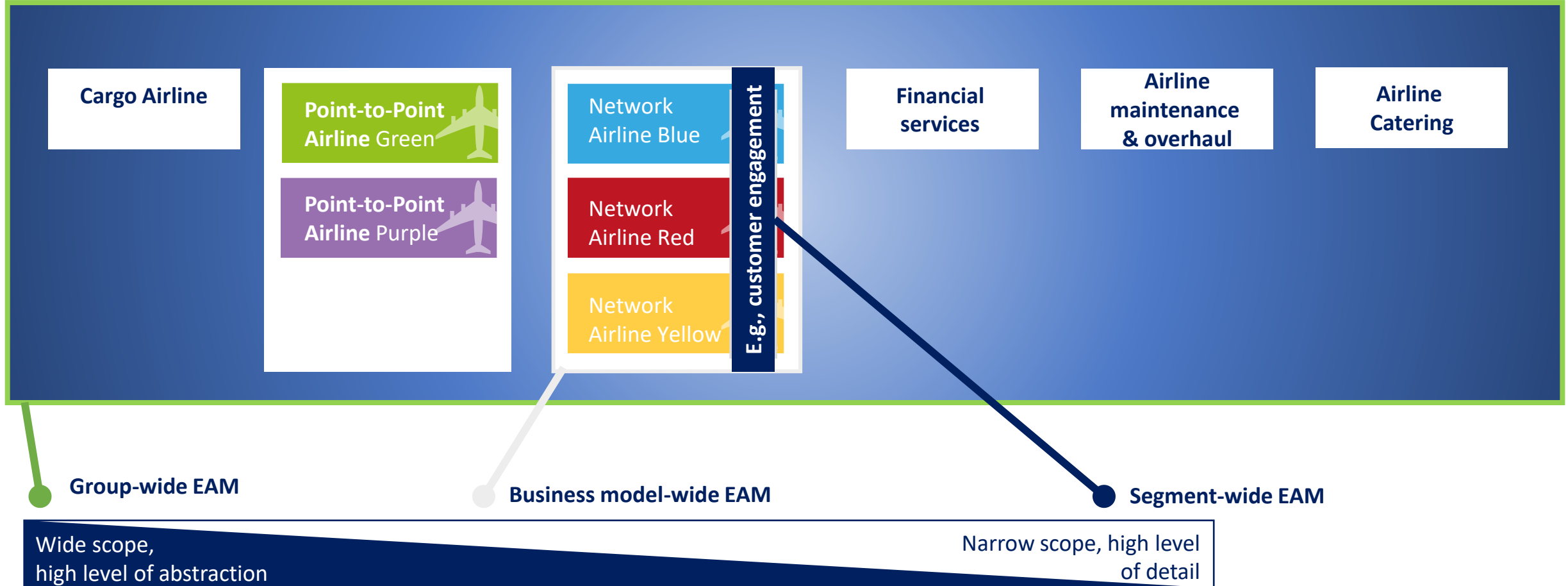
Ross et. al. (2004) define four types of “operating models”



The enterprise operating model determines the **degree of standardization and integration** – for the business and the digital ecosystem. This has a direct impact on the mandate of the EAM capability.

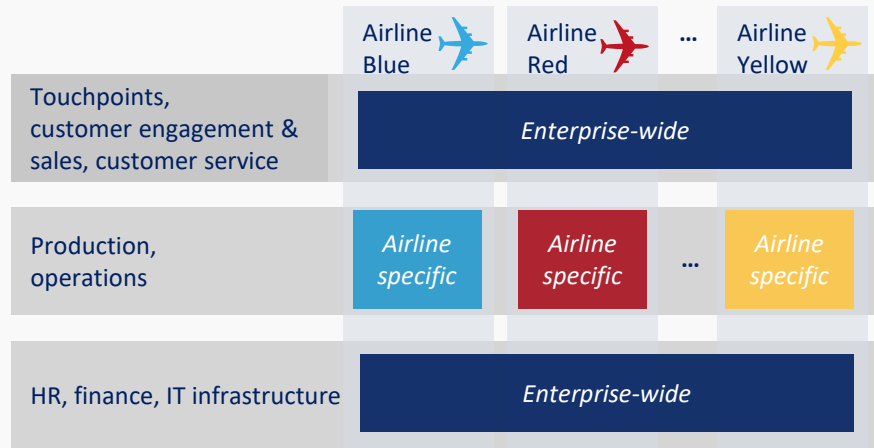


Example for a “coordination” model: various loosely coupled business models and corresponding architectural spheres inside a large aviation group

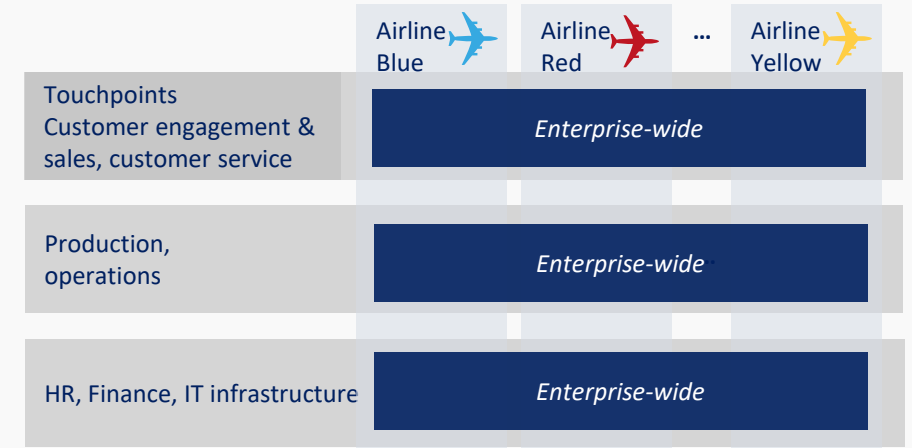


Inside one business model, only so many patterns of business segmentation are possible

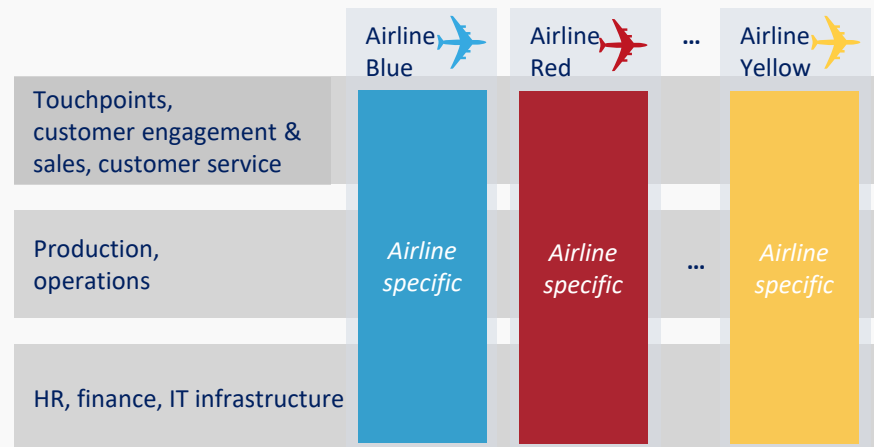
1. Decentralized operations (market-oriented)



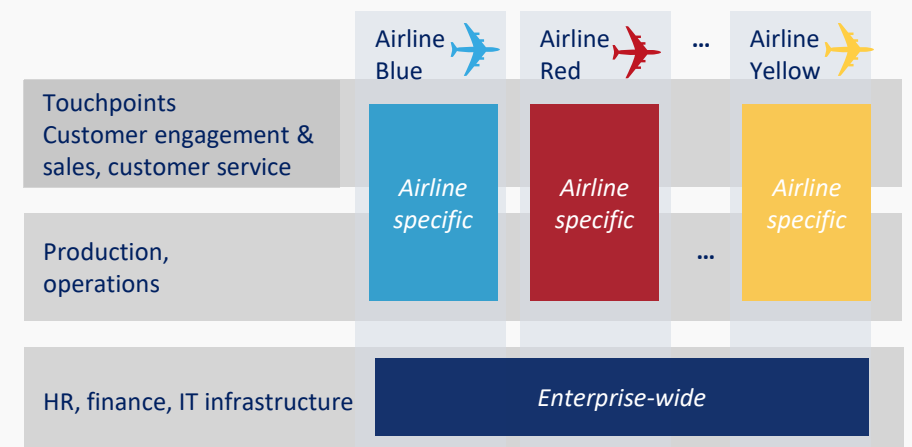
2. Completely integrated airlines (function-oriented)



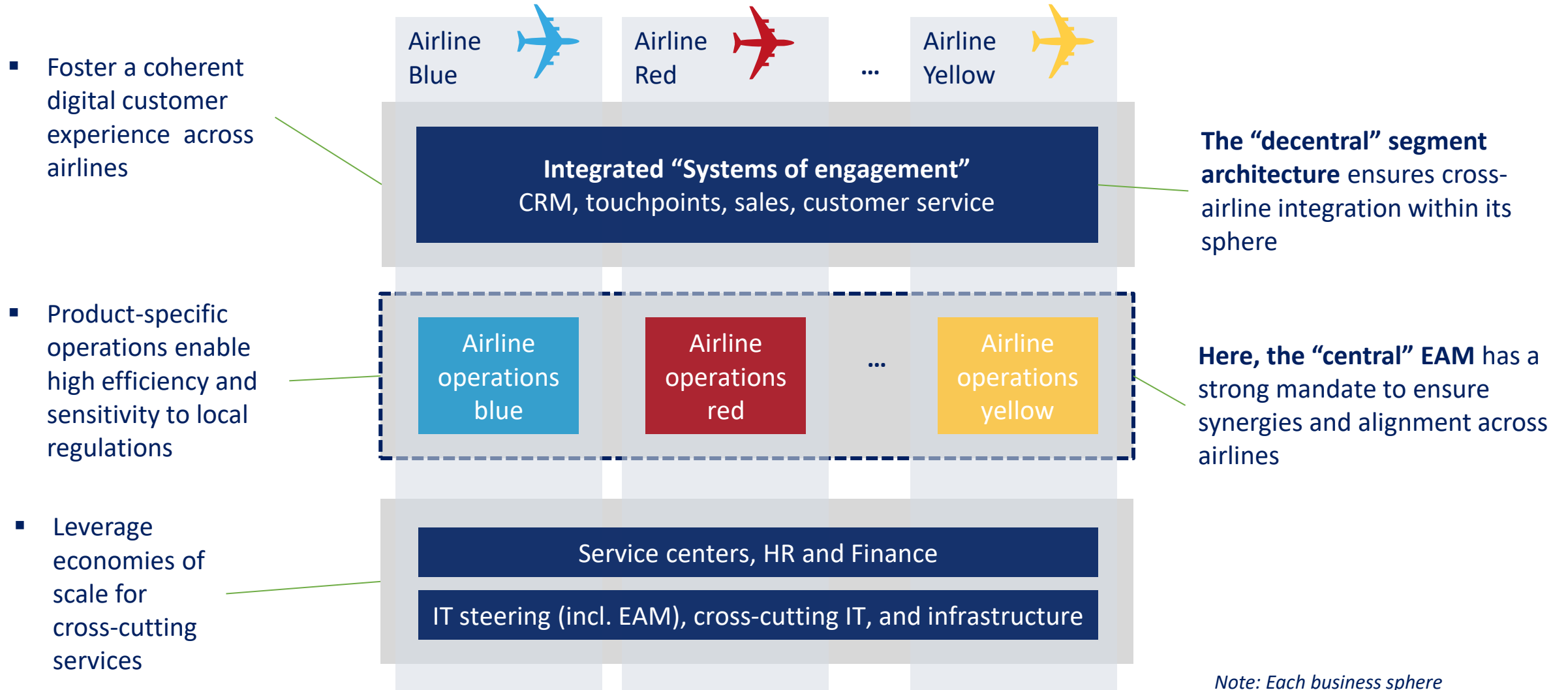
3. Completely decoupled airlines (product-oriented)



4. Independent core, centralized supporting services

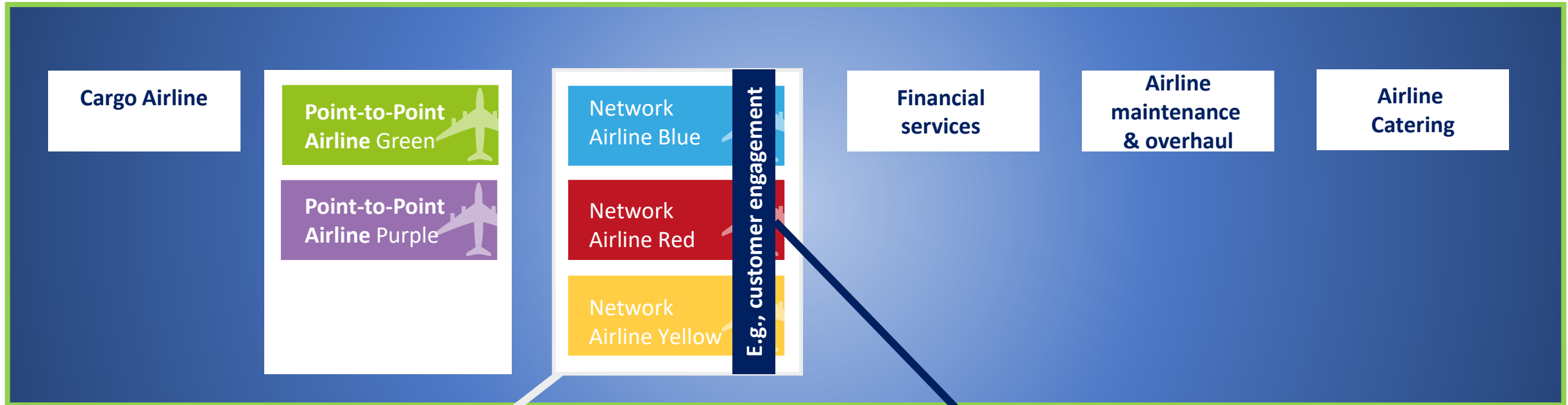


The business segments determine the architecture spheres – as well as the mandate for architectural work inside the spheres



Note: Each business sphere has its own IT

Example for a “coordination” model: various loosely coupled business models and corresponding architectural spheres inside a large aviation group



Group-wide EAM, e.g.,

- Technology standards and application catalog
- Reference EAM processes and metrics
- Informal architecture rounds
- References for architecture layers, processes and metrics

Business model-wide EAM, e.g.,

- Business Capability maps and target picture process
- Evaluations and cost savings
- Binding architecture boards
- Business-model wide business architecture, integration architecture, data architecture, ...

Segment-wide EAM, e.g., for customer engagement

- Coherent architecture for one segment
- Platform architecture
- Architecture processes and panels on segment level
- Artifacts on segment level, e.g., *domain arc decisions, debts, roadmaps*

Conclusion

There is consensus on this:

The enterprise-wide digital ecosystem requires **specialists** for the individual areas. However, **business and IT** are closely intertwined.



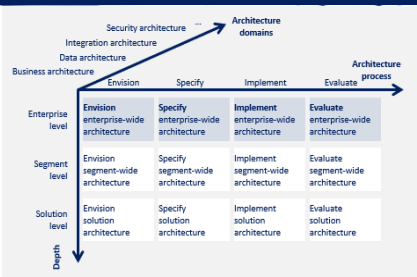
→ In large enterprises, architecture is always federated and cross-disciplinary

You need to consciously architect a socio-technical system. **Coherent systems do not „emerge“ by themselves.**



→ No invisible or “magic hand”

The **optimal quantity of tasks for architecting all relevant areas** does not change...



... no matter where you allocate them.

Only thing left to do: based on the business and the operating model, two questions must be answered:

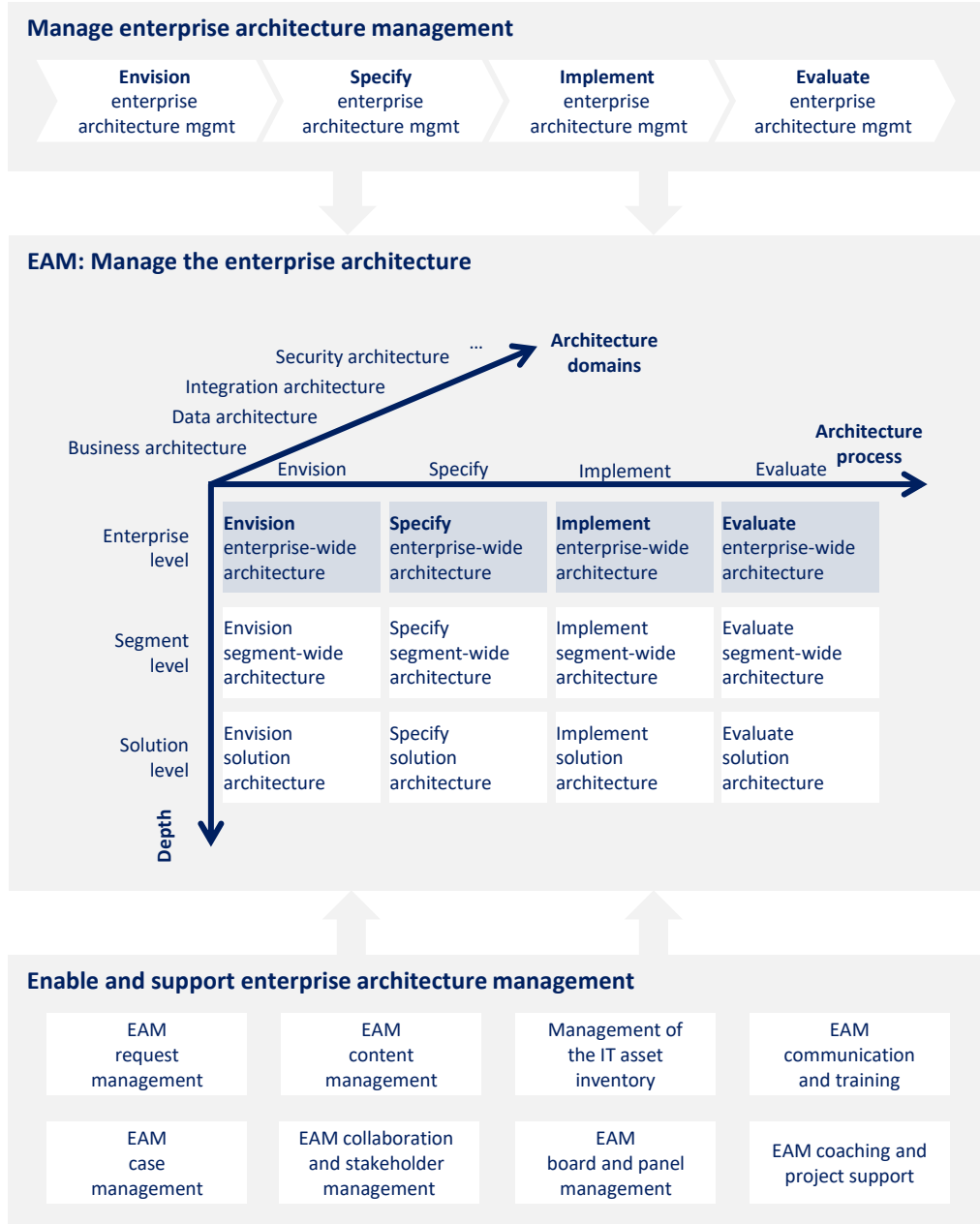
1. Which architectural spheres are optimal for a specific enterprise?

2. How exactly are the architectural capabilities in these spheres instantiated?

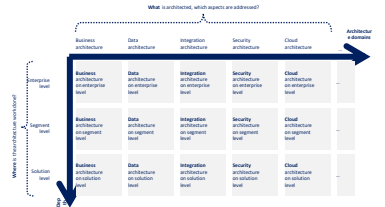
Digitalization architecture is always a federated team sport, incorporating central and decentral capabilities.

Next steps:

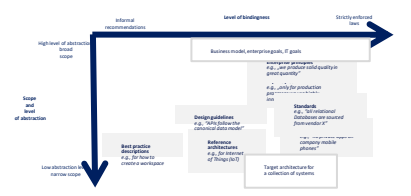
Distribute architecture activities among the "spheres" on all vertical levels



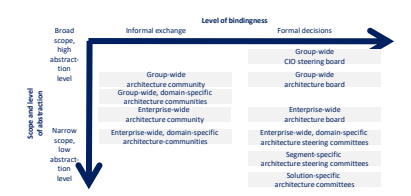
Architecture communities



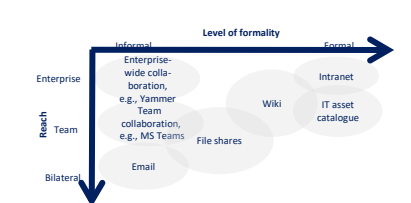
Architectural guidance



Arc. boards and panels



Arc. content & collaboration



Summary

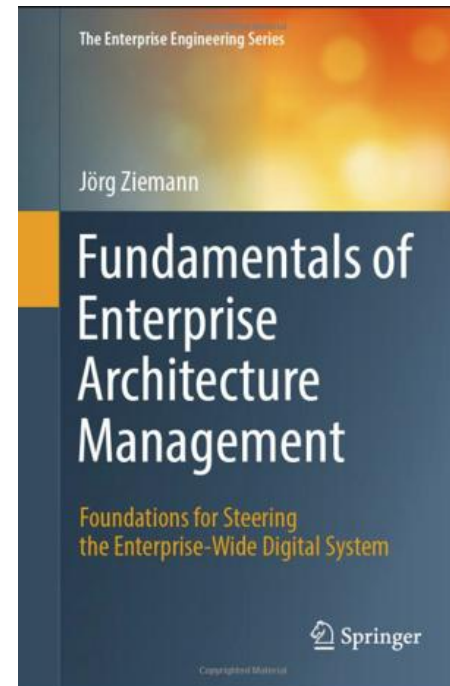
In large enterprise we always need both **central and decentral** architecture capabilities, i.e., a cross-level federation

There is a **rational process** for allocating architecture capabilities on the different levels:

1. Identify **architectural spheres** based on the business model, and 2. use an **EAM capability model** to distribute the tasks

Thank you for your attention

Further reading:



- <https://eamfundamentals.com/>
- **The Pig Cycle of Digitalization Governance: Navigating the Extremes of Decentralization and Overregulation.** Medium.com, June 2023. [Link](#).