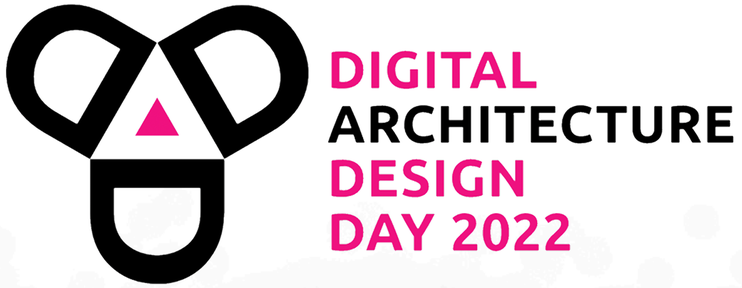
Towards an Antifragile Public Sector

Introducing Antifragility in the Dutch Public Sector with Enterprise Architecture

and the impact on (Enterprise) Architecture



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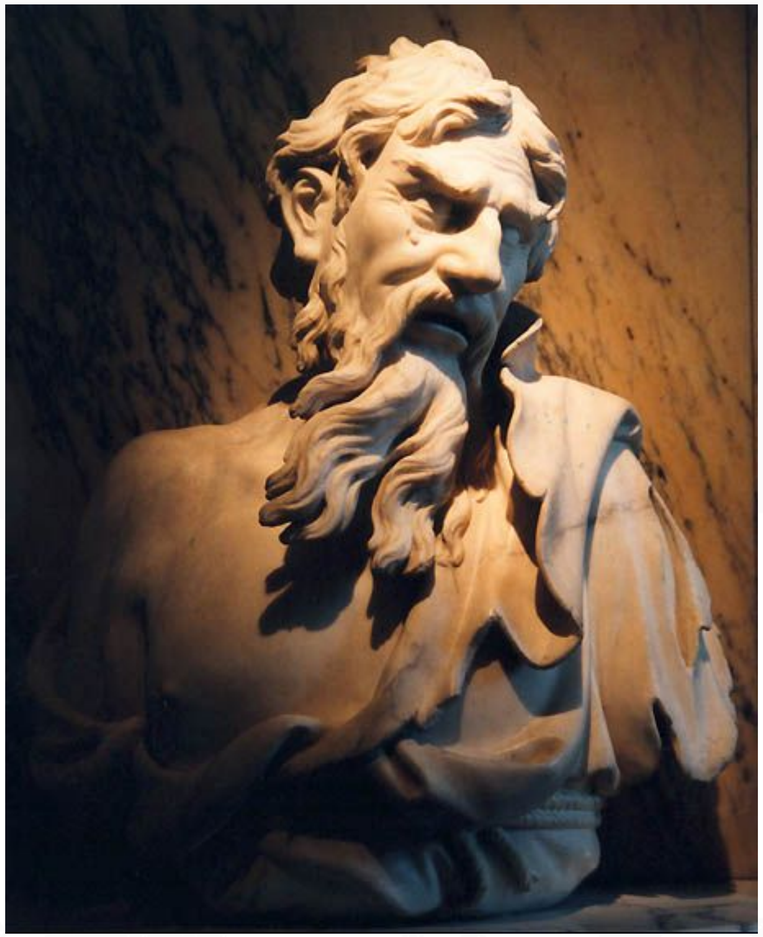
Agenda

- Antifragile in a nutshell
- Research summary
- Key takeaways
- Discussion

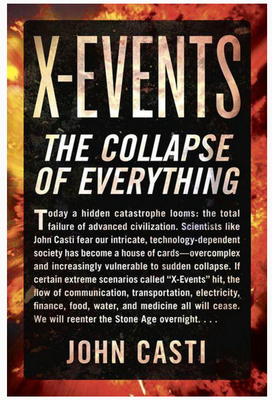
Antifragile in a Nutshell

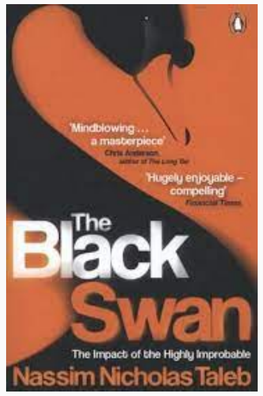


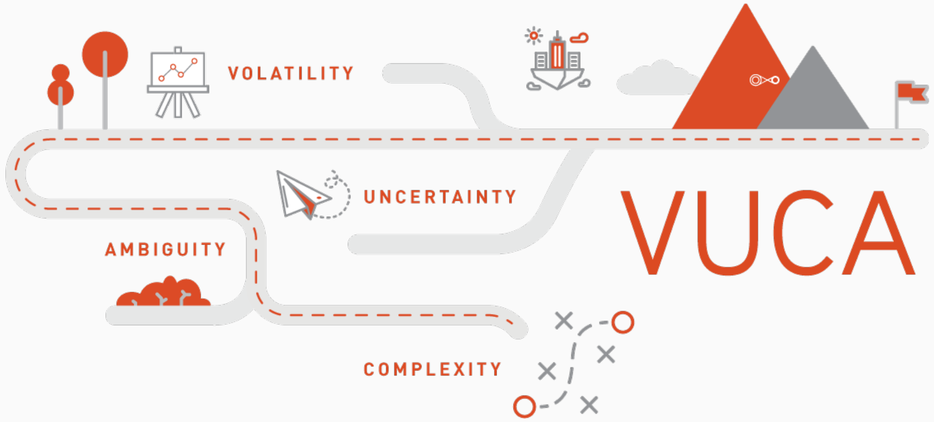
Phanta Rhei

(Everything flows, and nothing stays)

Heraclitus

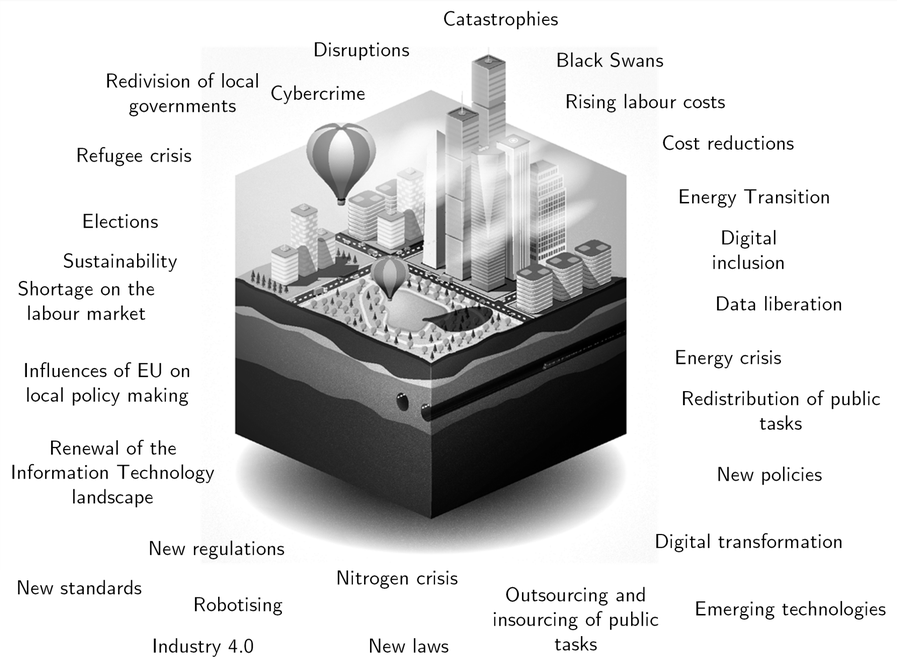






Complexity Science

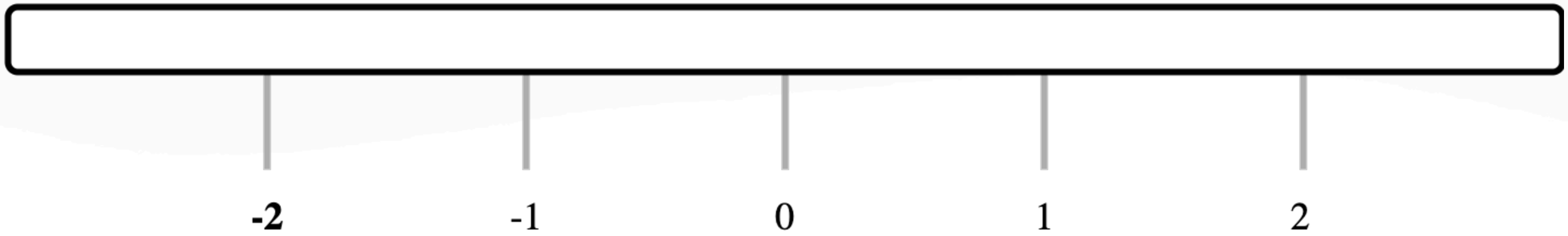
Complexity science is concerned with complex systems and problems that are dynamic, unpredictable and multi-dimensional, consisting of a collection of interconnected relationships and parts. Unlike traditional “cause and effect” or linear thinking, complexity science is characterised by non-linearity.



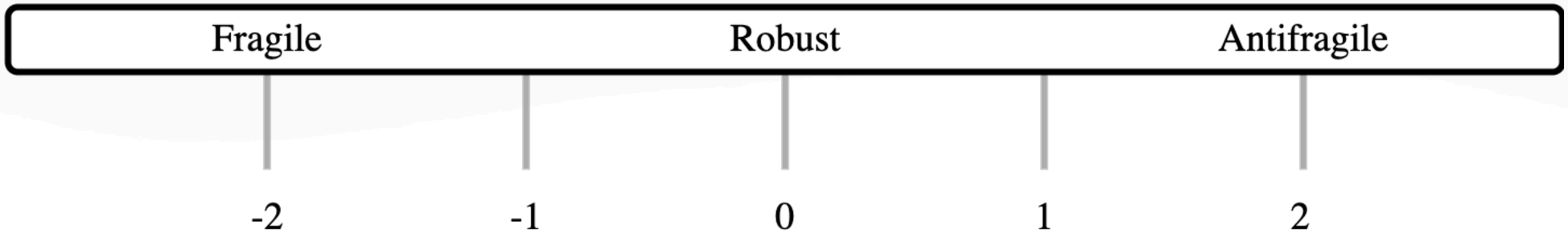
Stressor

When systems are performing effectively, they are in a predetermined condition and conversely when they are not functioning correctly, they are in an unintended state. An unintended condition can be known or unknown. Stressors are forces that threaten to transfer a system from an intended to an unintended condition.

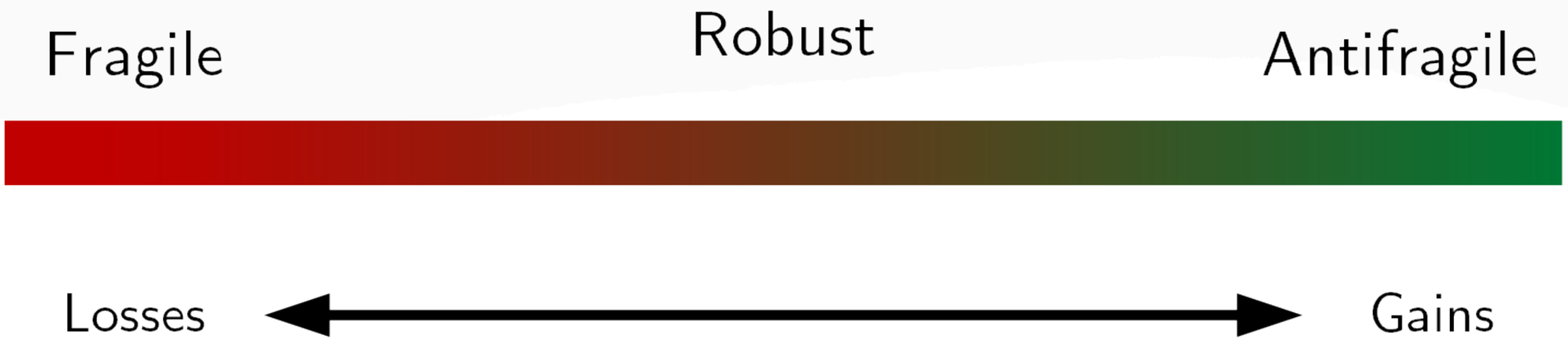
What is the mathematical opposite of -2?

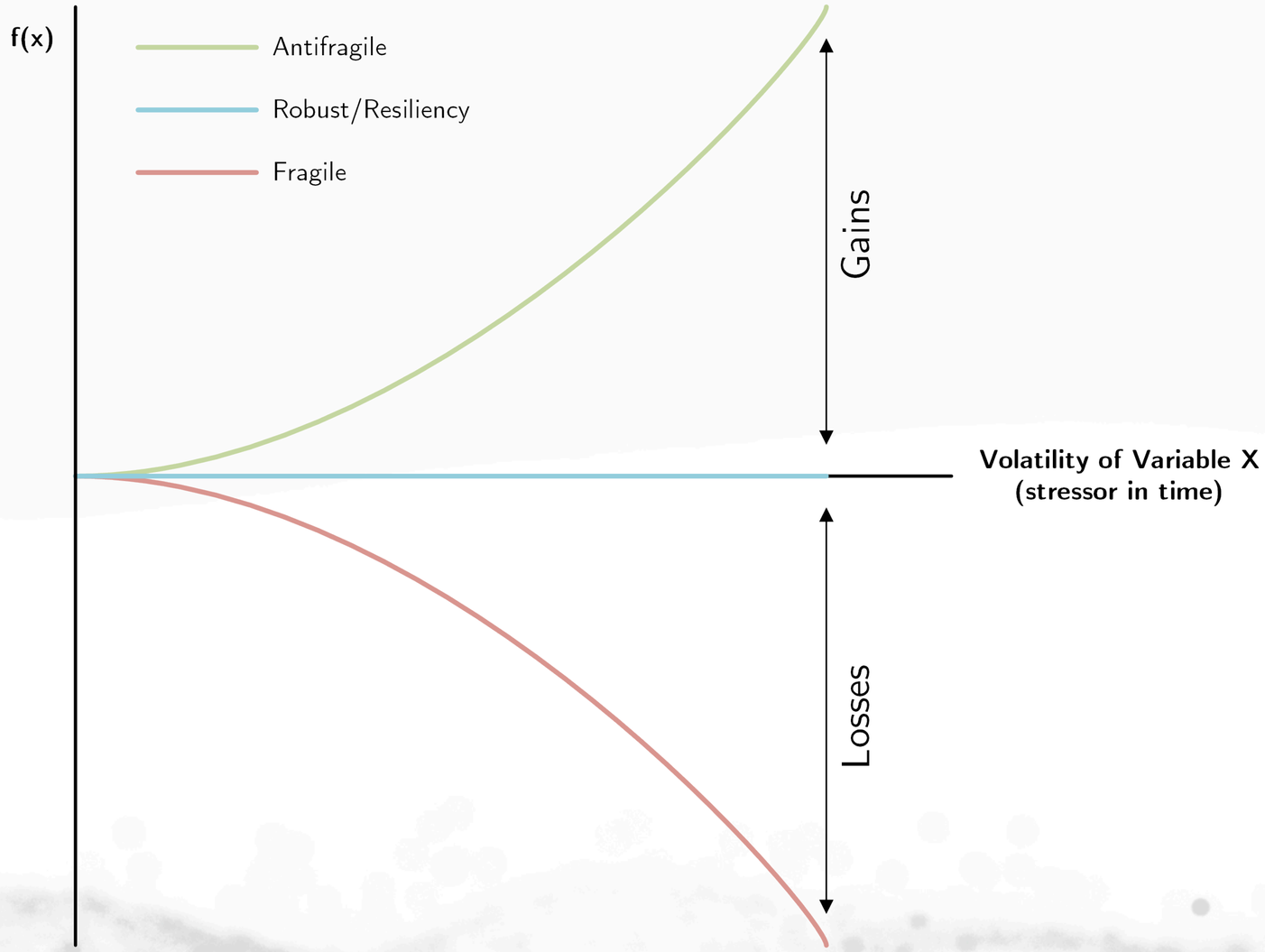


The Triad



The Triad




f(x)
Antifragile
Robust/Resiliency
Fragile
Gains
Losses
Volatility of Variable X
(stressor in time)

Agility ≠ Antifragility

When we architect antifragility, businesses can gain agility. When we build systems that aim to be antifragile for change is better than to control change. The result is the possibility of creating business and technical architectures that enable agility through design (O'Reilly, 2019, p. 884).

Agility is a result of implementation, while antifragility is a property of a system.

Research summary

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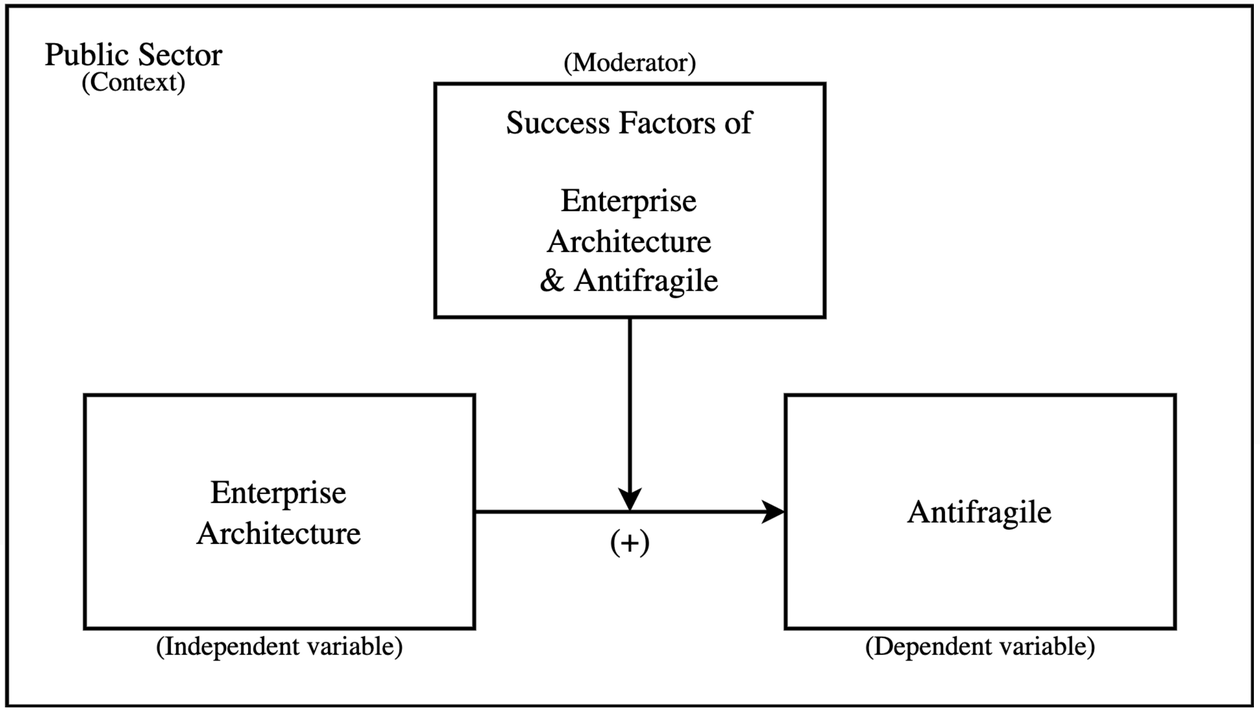
”The processes, while solid, cannot withstand the current pace of change; the dependence on emergency solutions and manual work is increasing” (Wiebes, 2014, p. 2).

”There is a need to invest for an even a better government that can respond adequately and flexibly to unforeseen circumstances.” was plead to Schippers (Huijts, 2017).

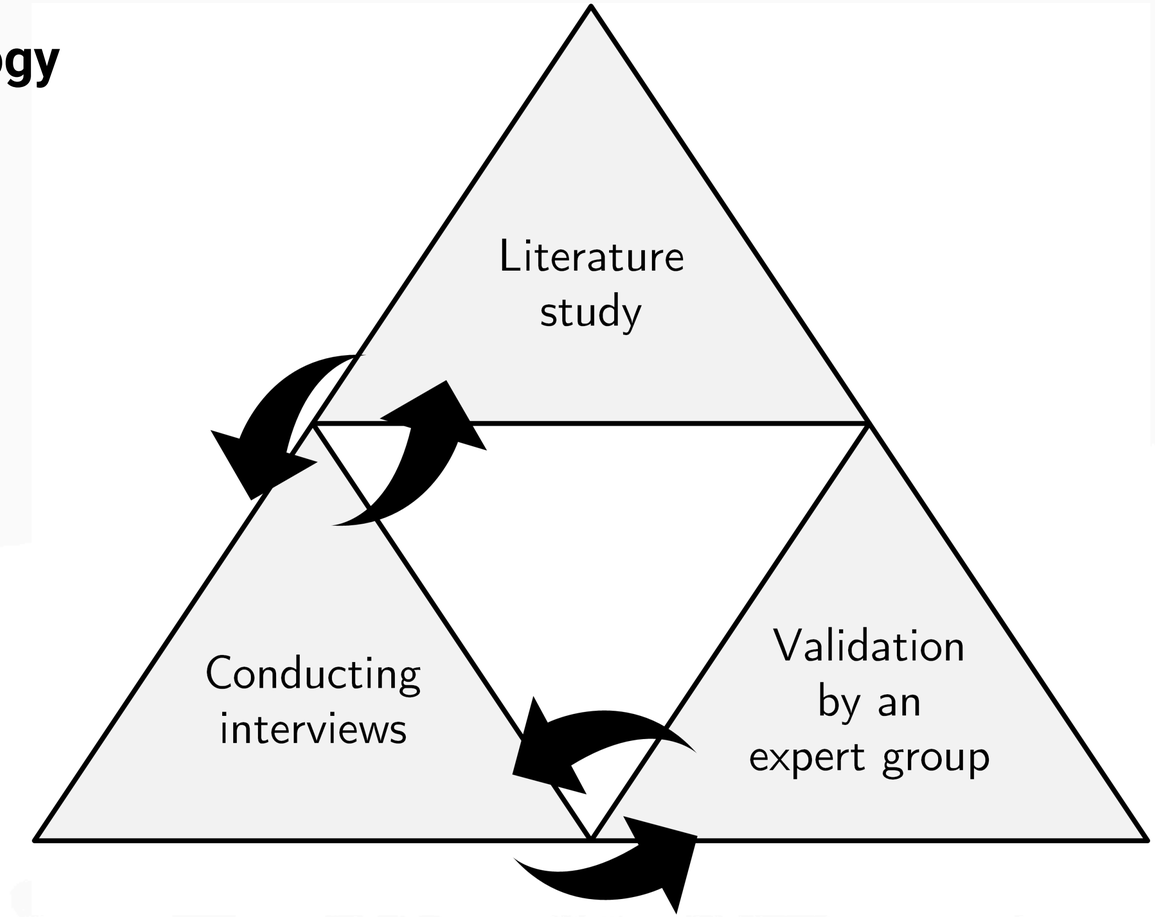
A responsive and adaptive government is needed to deal with this (van der Steen, 2018, pp. 79–81).

We need to create public organisations that can cope with or even seize opportunities in a dynamic difficult, unpredictable environment (Nijssen et al., 2018, pp. 1–2).

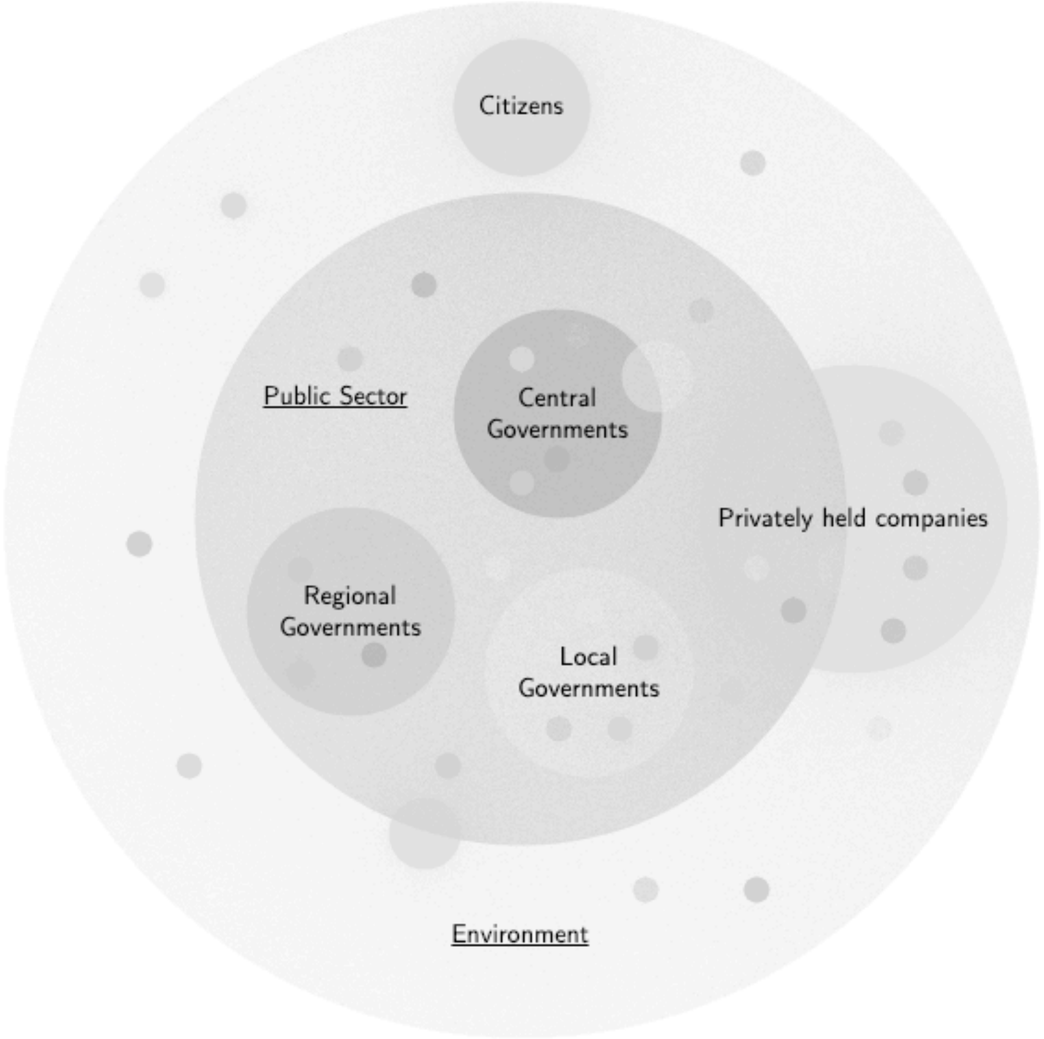


’What are success factors of Enterprise Architecture and antifragile that positively influence the contribution of Enterprise Architecture in achieving antifragility in the Dutch public sector?’

Used Research Methodology



Used lens for system (System-of-Systems)



Antifragile Attributes

Attenuate Variety

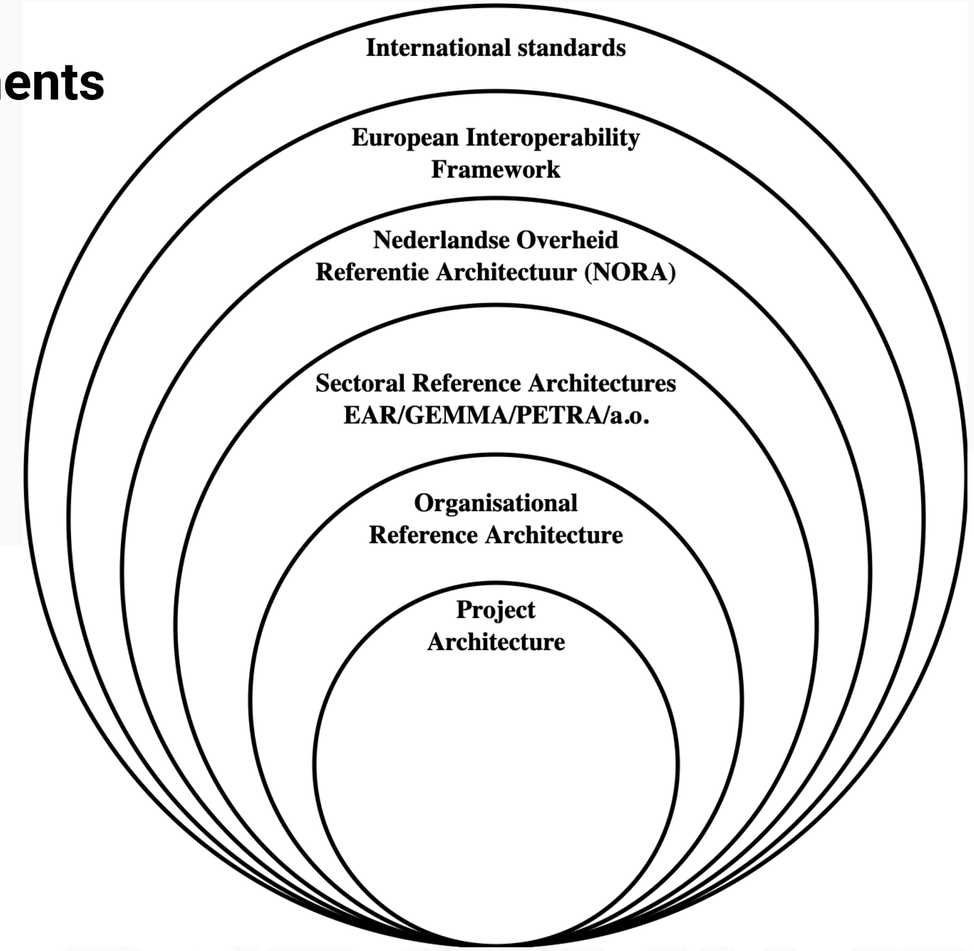
Amplify Variety

Engineering Resilience	Systems Resilience	Complex Adaptive System Resilience	Antifragile
Top-down C&C Micro-management	Redundancy Modularity Loosely coupled	Diversity Non-monotonicity Emergence Self-organization Insert low-level stress Network-connections Fail Fast	Resources to invest Seneca's barbell Insert randomness Reduce naive intervention Skin in the game Optionality*
Learning Organization Personal mastery, Shared mental models, Building shared vision, Team learning, Systems thinking.			

* Reinstated for research of success factors

Based on Botjes et al. (2021)

Reference Architectures Government and Semi-Governments (Dutch)



Based on Greefhorst et al. (2008)

Used (Enterprise) Architecture Definition

Theoretical, architecture is the normative restriction of design freedom.

Practically, architecture is a consistent and coherent set of design principles.

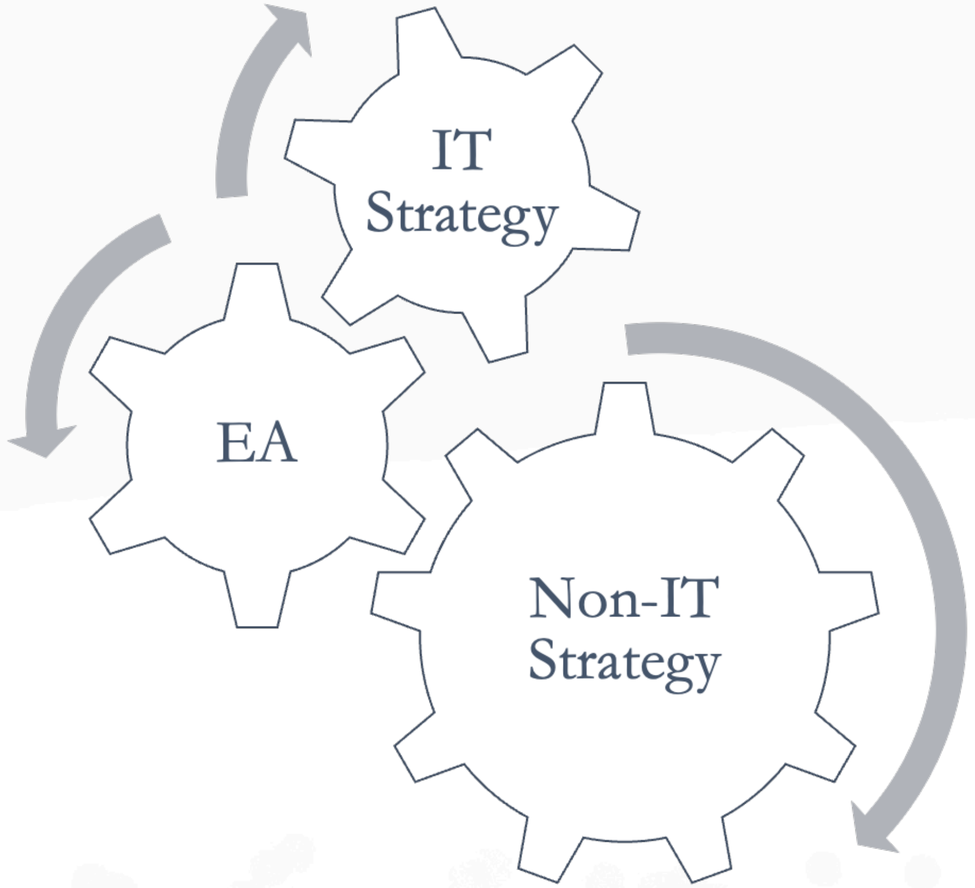
(Dietz, 2008, p. 53)

Most of the existing definitions (like Graves, Gartner and Ross & Weill but also NORA, GEMMA, a.o.) are normative and deterministic. They do not have a good fit with Antifragility that asks for a more guiding approach towards emergent architecture..

School of thought

Enterprise
IT Architecture

(Lapalme, 2012)

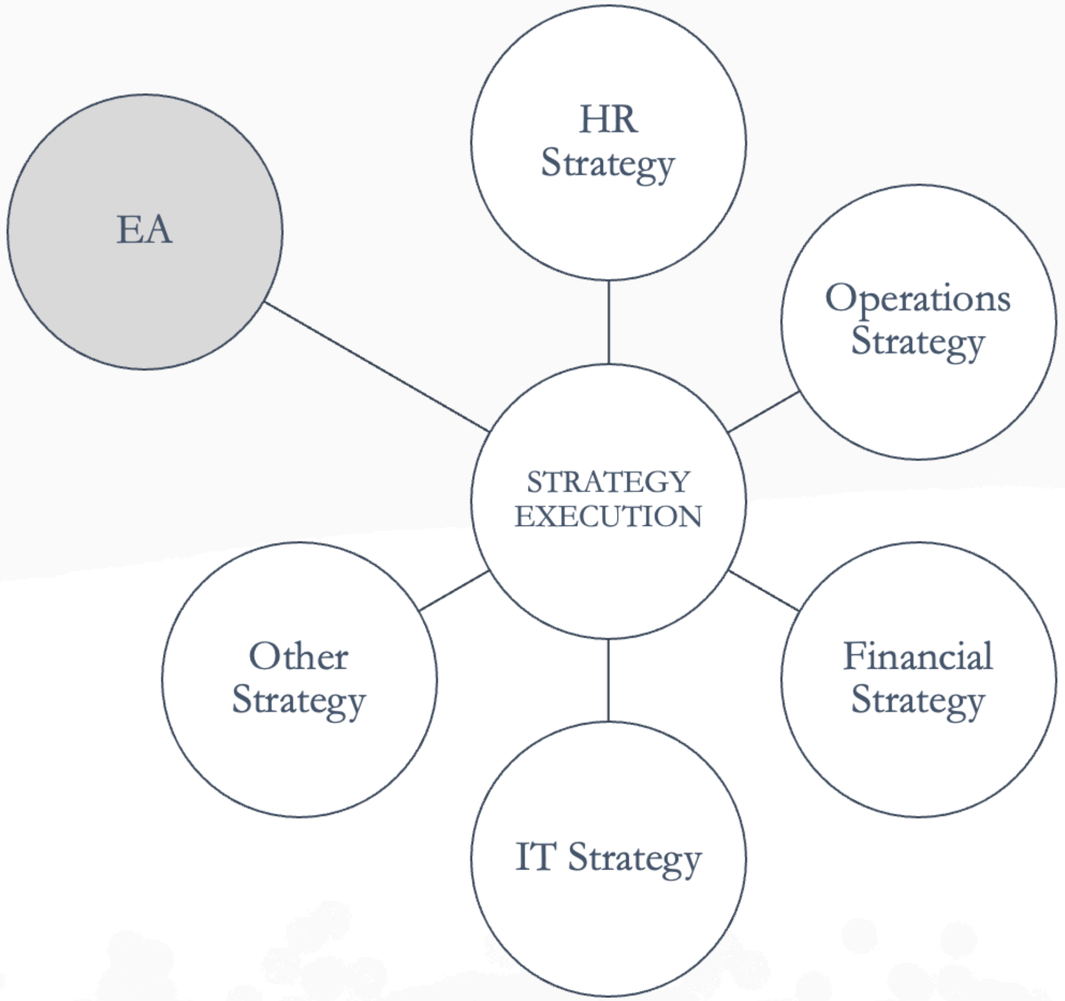


Enterprise Architecture is an enabler for executing the business strategy. This school is about aligning an enterprise's IT assets to execute business strategy effectively and various operations using the proper IT capabilities.

School of thought

Enterprise Integration

(Lapalme, 2012)



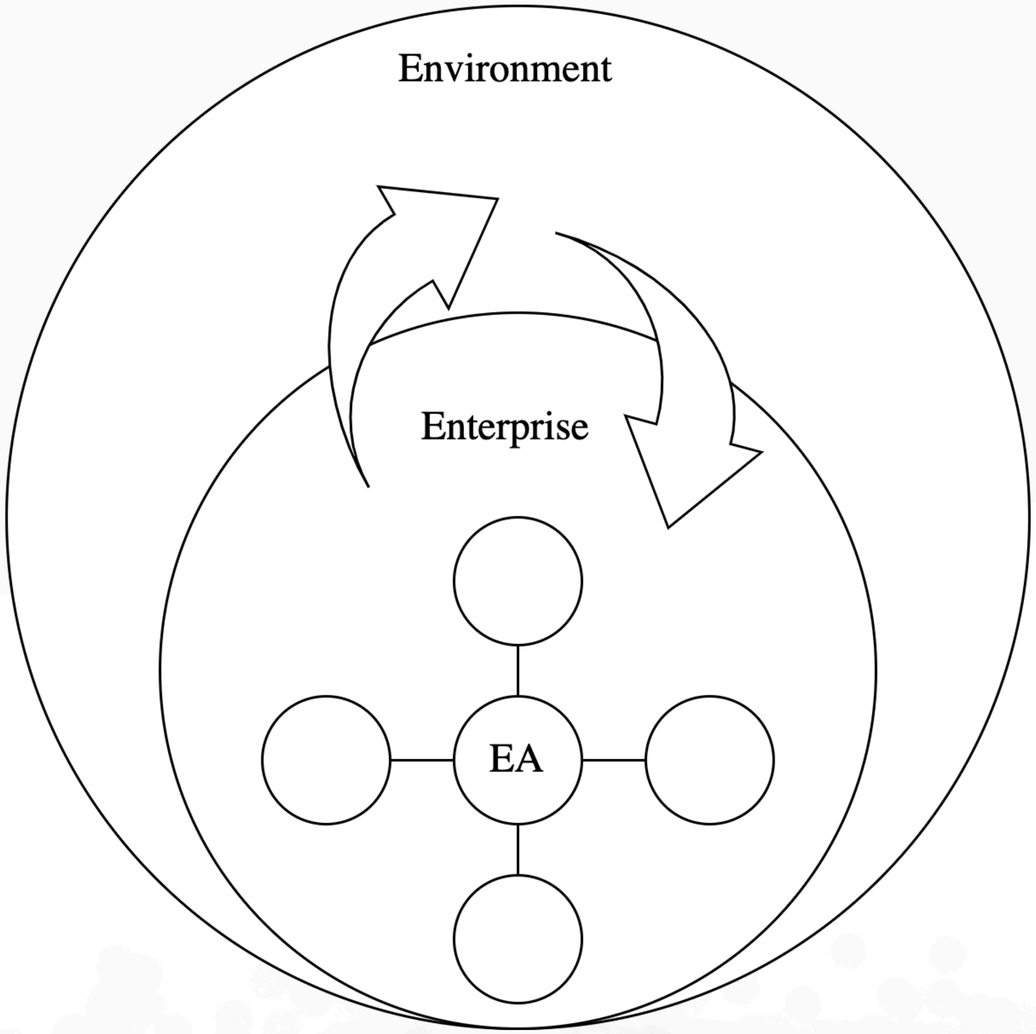
Enterprise Integrating links strategy and execution. It is not only enabling enterprise strategy it also implements it. Designing all the organisational dimensions is fostered with systems thinking.

School of thought

Enterprise
Ecological
Adaptation

(Lapalme, 2012)

Most likely to support Antifragile



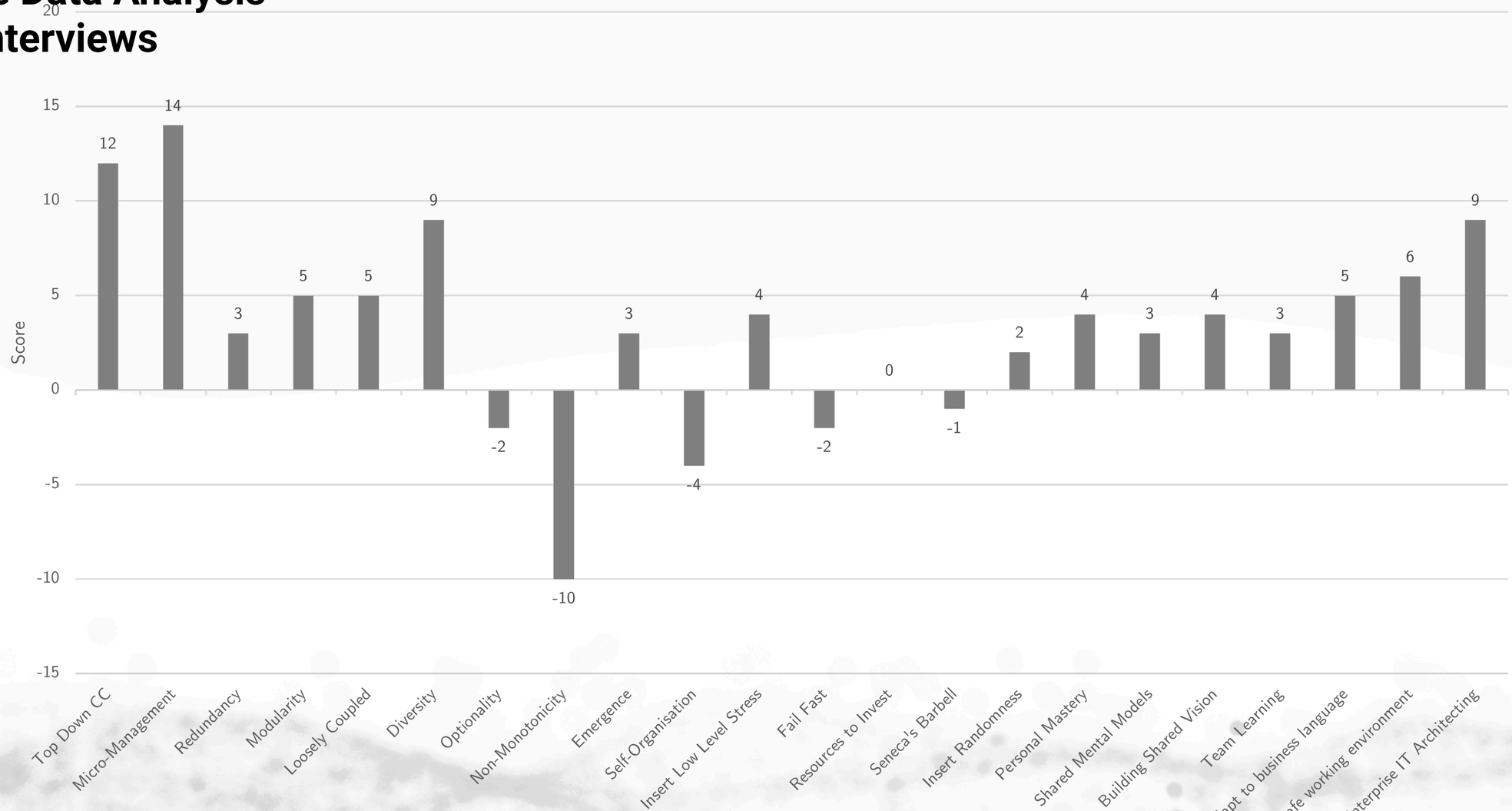
Enterprise Architecture fosters organisational learning by designing all facets of the enterprise. It changes the environment and systematically designs the enterprise, including its relationship to the environment. The enterprise's relationship to its environment is an indisputably connected facet. This school of thought enables innovation and System-in-Environment adaptation. It looks for bidirectional incoherence between the enterprise and its environment. Nevertheless, it is the means for organisational innovation and sustainability. It is about enterprise and environment co-evolution.

Enterprise Architecture Attributes

Attribute	Category
Systems-in-Environment thinking	Enterprise Ecological Adaptation
Holistic (systemic) stance	Enterprise Ecological Adaptation
Intra-organisational coherency	Enterprise Ecological Adaptation
Organisational learning	Enterprise Ecological Adaptation
Environmental learning	Enterprise Ecological Adaptation
System-in-environment coevolution learning	Enterprise Ecological Adaptation

Lapalme (2012)

Qualitative Data Analysis of Interviews



Attribute	Literature	Interviews	Validation group	Score (n out of 3)
Top-Down Command & Control	✓			1
Micro-Management	✓			1
Redundancy	✓			1
Modularity	✓			1
Loosely coupled	✓			1
Diversity	✓			1
Optionality	✓	✓	✓	3
Non-monotonicity	✓	✓		2
Emergence	✓			1
Self-organisation	✓	✓		2
Insert low-level stress	✓			1
Network-connections	✓			1
Fail-fast	✓	✓	✓	3
Resources to invest	✓	✓	✓	3
Seneca's barbell	✓	✓		2
Insert randomness	✓			1
Reduce naive intervention	✓			1
Skin in the game	✓			1
Personal mastery	✓			1
Shared mental model	✓			1
Building shared vision	✓			1
Team learning	✓			1
Systems thinking	✓			1
Safe working environment*		✓	✓	2
Outside-In and Collaboration**				
Data Governance Planes**				
Systems-in-Environment thinking	✓	✓	✓	3

* New attribute of the data set of the interviews.
** New attribute of the data set of the expert group.

Attribute	Literature	Interviews	Validation group	Score (n out of 3)
Holistic (systemic) stance	✓	✓		2
Organisational learning	✓	✓		2
Environmental learning	✓	✓	✓	3
Intra-organisational coherency	✓	✓	✓	3
System-in-environment coevolution learning	✓	✓	✓	3
Adapt to business language*		✓	✓	2
Agile Enterprise**				
Real-Time Trust**				
Foster dialogue**			✓	1
Architecture validation**			✓	1
Always Fitting Enterprise Architecture**				

* New attribute of the data set of the interviews.
** New attribute of the data set of the expert group.

#	Attribute	Category
1	Optionality	Antifragile
2	Fail-fast	Antifragile
3	Resources to invest	Antifragile
4	Systems-in-Environment thinking	Enterprise Architecture
5	Environmental learning	Enterprise Architecture
6	Intra-organisational coherency	Enterprise Architecture
7	System-in-environment coevolution learning	Enterprise Architecture
8	Non-monotonicity	Antifragile
9	Self-organisation	Antifragile
10	Seneca's barbell	Antifragile
11	Safe working environment*	Antifragile
12	Holistic (systemic) stance	Enterprise Architecture
13	Organisational learning	Enterprise Architecture
14	Adapt to business language*	Enterprise Architecture

* Not found in literature

Key takeaways

Takeaway #1

It is not black & white. Antifragile and Robustness can co-exist
(Hint: Seneca’s Barbell)

Takeaway #2

Understand your environment and learn from it

Takeaway #3

Exploit the environment by influencing (changing) it to fit your organisations’ needs

Takeaway #4

Change Strategy/Architecture based on the Environment

Takeaway #5

Talk the **natural** language of your stakeholder(s)

Takeaway #6

Stop prescribing in detail and start guiding

Takeaway #7

Balance Intentional with Emergent Architecture

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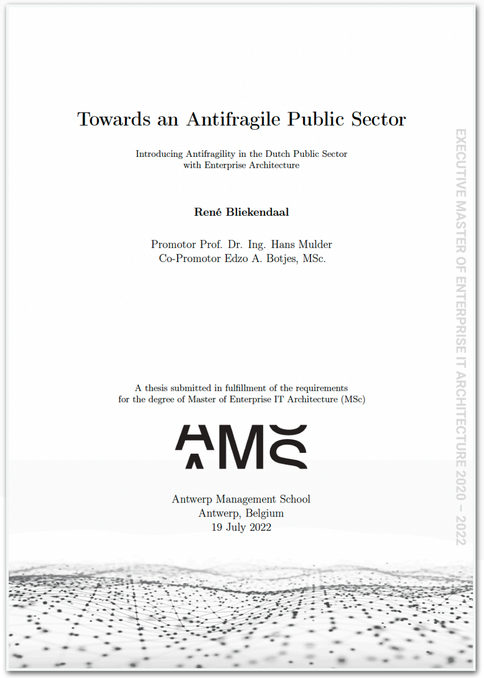

https://doi.org/10.5281/zenodo.6522850

https://doi.org/10.5281/zenodo.7150158

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Definitions

System in Environment Thinking

a system (enterprise) in its environment, including not only the enterprise but also its environment and the bidirectional relationship and transactions between the enterprise and its environment.

Holistic (Systemic) Stance

the enterprise architecture process must not only think of a single domain but about the combination of domains (IT domains and business domains) together. Addressing any IT and business architecture sub-domains separately and trying to adapt the other sub-domains accordingly will probably produce an ineffective and unsustainable outcome.

Intra-Organisational Coherancy

Its possible to make the organisation conducive to ecological learning, environmental influencing, and coherent strategy execution by reinforce wanted intra-dynamics and attenuate unwanted ones

Organisational Learning

to enable innovation and system-in-environment adaptation, Enterprise Architecture is about organisational learning. Designing all facets of the enterprise, including its relationship to the environment, will foster organisational learning.

Environmental Learning

use environmental learning to adapt the enterprise desired goals to be more compatible with the environment.

Adapt to Business Language

speak the **natural** language of your stakeholders such as Directors, Politicians, Public Administrators, and others.