Accelerating in a world of chaos

by using Enterprise Architecture with the concept Antifragility

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”It is quite perplexing that those from whom we have benefited the most aren’t those who have tried to help us (say with ”advice”) but rather those who have actively tried - but eventually failed - to harm us.”
- *Nassim Nicholas Taleb*

”A consistency proof for [any] system can be carried out only by means of modes of inference that are not formalized in the system itself.”
- *Kurt Gödel*

”Reality is created by the mind.
We can change our reality by changing our mind.”
- *Plato*

”But he who neither thinks for himself nor learns from others, is a failure as a man.”
- *Hesiod*

”The only constant is change.”
- *Heraclitus*

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Keywords

antifragility, antifragile, enterprise architecture, architecture principles, enterprise engineering

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Accelerating in a world of chaos

by using Enterprise Architecture with the concept Antifragility

J.R. Bliekendaal

Abstract

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Glossary of Terms

agile The ability to adjust before failure happens. 3

antifragile The ability to strive for and evolve under stress. 1, 3

antifragility The state of being antifragile. 2

fragile The quality of being easily broken or destroyed. 3

resilient The ability to recover from failure. 3

robust The ability to resist failure. 3

Abbreviations

EA Enterprise Architecture. 1, 2

ISV Independent Software Vendor. 1, 2

VUCA Volatility, Uncertainty, Complexity and Ambiguity. 1

1. Introduction

Speed of change
Only constant is change

Volatility, Uncertainty, Complexity and Ambiguity (VUCA)
The challenge

In this thesis, the researcher defines how and with which Enterprise Architecture (EA) concepts EA can be used to steer an Independent Software Vendor (ISV) towards being antifragile in the Public Sector Market.

1.1. Context

The researcher is working as a Chief Architect for an ISV specialised in delivering software and services to the local governments in The Netherlands, such as the municipalities, the provinces, and the regional water authorities. The local governments embraced the digital transformation, and because of this the pace of change is increasing rapidly **(NEEDS REF)**.

1.2. Structure of the thesis

In chapter 1 the context of the research is set, the core concepts of EA and antifragility are introduced together with the contextual concepts of ISV and the Public Sector Market. In chapter 2 the theoretical background is given on the research. Chapter 3 explains the used methodology for the research.

1.3. Introduction of the Public Sector Market

1.4. Introduction of Indepenent Software Vendor

1.5. Introduction of the concept Enteprise Architecture

1.6. Introduction of the concept of Antifragility

1.7. Problem statement

1.8. Research questions

1.8.1. Main research question

What are, for an Independent Software Vendor, the success factors of Enterprise Architecture for antifragility in the public sector market?

1.8.2. Sub-questions

1. Sub-question 1
2. Sub-question 2

2. Theoretical background

2.1. What is a system?

2.2. Organisation

2.2.1. Independent Software Vendor

2.3. Antifragile

- Randomness
- Variability
- Hormesis / Mithridatisation (by taleb) / Antidotum Mithridatium

2.3.1. Relation between antifragile, fragile, robust, resilient, and agile

antifragile with fragile, robust, resilient, and agile.

2.4. VUCA

2.5. Enterprise Architecture

2.5.1. Steering mechanisms

2.6. Public Sector market

2.6.1. Differences with the Private Sector Market

2.7. What is a stressor?

3. Research Methodology

3.1. Research Model

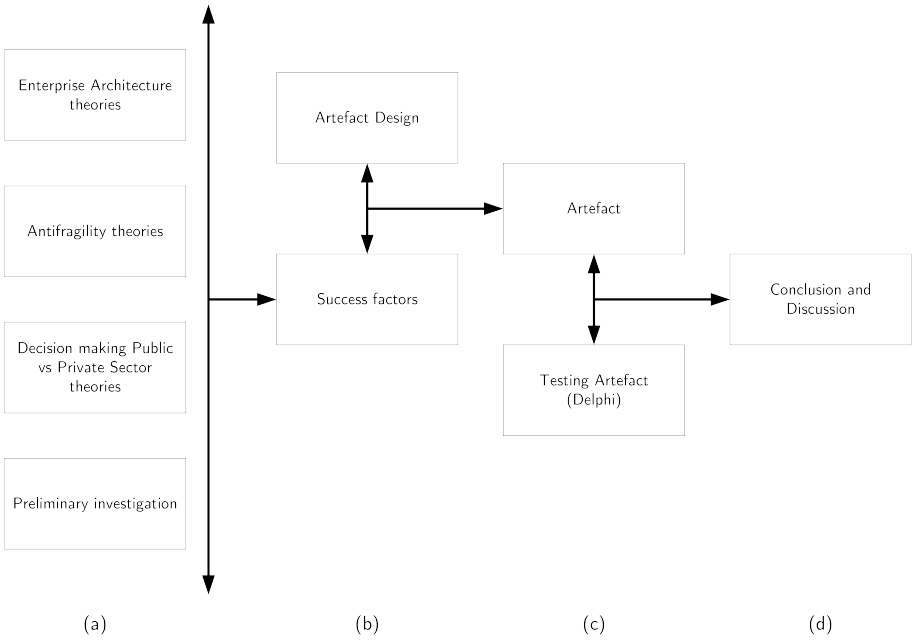

Figure 3.1.: Research Model

3.2. Delphi Group

For the Delphi Group participants see appendix B

What about the sample size? Normally Delphi is about 100+. What about this research. How large should the sample size be for a qualitative result?

3.3. Quality of the Research (old example text)

The research was qualitative. The information is based on qualitative information gathered by the researcher from employees of the organisation. However, with the research approach and transparency, the research can be validated, can be repeated, so it is reliable and reducible. With the use of managerial models and methods like Lean, Value Stream Mapping with supporting tools like NEN-ISO/IEC 25011 and ServQual got a nonbiased result.

- **The validity** of the research is dependent on the right use of the right models and the right methods. The researcher conducted research on which models, frameworks and tools to use. The results and the rationales around the choice of theories, models, frameworks and tools are stated in chapter 4. The sources used for determining the theories, models, frameworks and tools are from scientific and expert sources.

- **The reliability** is about the influence of possible errors. For the research, the researcher used methods like triangulation, and sources from scientific reports and expert literature. The number of interviews was too small for the right statistical outcome. To enlarge the reliability of the interviews, the researcher used the same framework of themes for his semi-structured interviews. The transcriptions are placed in the appendixes for transparency. The information gathered with the interviewees is compared with the other interviewees.

- **The repeatability** is about getting the same results when the research is conducted again. The researcher uses his research design and research approach, as stated. All the steps taken are put into the research design. If this research design is followed, the same results should follow.

- **The reducibility** is about the outcome of the research can be deducted step by step. By using the research model, and the structure of the thesis, every step is reducible.

- Think about Replication

- Recker types

- OpenScience

- Howto falsify?

- Rigourness

3.4. Used infrastructure and tooling

This transparency increases the replication factor of the research.

3.4.1. Thesis creation

The student used his corporate laptop (Dell Latitude 7200 2-in-1[1]) with Windows 10 Professional installed for creating the thesis. The thesis is created with the markup language LaTeX[2]. The used typesetting environment is TexLive[3] with the document type of "Report" from KOMA-Script[4]. TexStudio[5] is the used LaTeX Editor. It supports syntax-highlighting, has an integrated viewer, reference checking and numerous wizards. For the creation and administration of references BibLaTeX[6] is used with the reference manager JabRef[7] with the citation style of APA 7th Edition[8] and with web browser integration. The files are stored on a personal Dropbox[9] that is used by GitHub Desktop[10] to synchronise with a public GitHub repository[11]. GitHub[12] is used for source control but also for reviewing and discussing the topics with the (Co-)Promotor and the planning of the master thesis project. The thesis source files are copied to an Amazon S3 Blob[13] for backup. The backup rotation is seven versions. Cloudberry Explorer Freeware for Amazon S3[14] is used for backup. Grammarly[15], with the paid subscription service, checks the thesis for spelling, grammar, style, and plagiarism. The used goals for Grammarly are audience=knowledgeable, formality=formal, and domain=academic. Microsoft Visio Professional[16] is used to create figures. The GitHub repository contains all the sources.

[1] https://www.dell.com/en-us/work/shop/dell-laptops-and-notebooks/latitude-7200-2-in-1-laptop/spd/latitude-12-7200-2-in-1-laptop
[2] https://www.latex-project.org/
[3] https://www.tug.org/texlive/
[4] https://ctan.org/pkg/koma-script
[5] https://www.texstudio.org/
[6] https://ctan.org/pkg/biblatex/
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[8] https://apastyle.apa.org/
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[11] https://github.com/JRBliekendaal/master-thesis
[12] https://github.com/
[13] https://aws.amazon.com/s3/
[14] https://www.msp360.com/explorer/windows/amazon-s3.aspx
[15] https://www.grammarly.com
[16] https://www.microsoft.com/en-ww/microsoft-365/visio/

3.4.2. Research administration

The research administration, which includes documentation containing privacy-sensitive information, like the name and contact information of the Delphi Group participants, is stored on a non-public GitHub Repository[17]. The private GitHub Repository is also for staging thesis parts that still need to be anonymised. For taking notes Leuchtturm1917[18] Notebooks are used with mechanical pencils of Faber-Castell[19] and pens from Sakura[20] with long-lasting ink.

3.4.3. Research execution

For the execution of the research, Microsoft Excel[21] is used for the administration of the literature research. For the administration of the literature research, the following headers are used: ID (for a unique ID per item), search terms used, scope, title, subtitle, author(s), year, type, BibLaTeX citation key, title relevance, abstract relevance, content relevance, found at, doi/isbn, url, date found, duplicate, date used, use for, and notes. Researchgate[22], Web of Science[23], and Google Scholar[24] are the main sources for searching for literature. PaperPanda[25] is used for hard to find literature. The literature administration is, together with the publicly available literature, stored in the repository of the master thesis. For non-public available literature, the administration contains the location where the literature is retrievable. For working as paperless as possible all the literature, where possible, is in PDF or in eBook format. An Amazon Kindle Oasis[26] is used for reading eBooks.

Meetingwizard[27]

[17] https://github.com/JRBliekendaal/master-thesis-administration
[18] https://www.leuchtturm1917.us/notebook-classic.html
[19] https://www.fabercastell.com/products/tk-fine-vario-l-mechanical-pencil-10mm-135900
[20] https://www.sakuraofamerica.com/product/pigma-micron/
[21] https://www.microsoft.com/en-us/microsoft-365/excel
[22] https://www.researchgate.net/
[23] https://app.webofknowledge.com/
[24] https://scholar.google.com/
[25] https://paperpanda.app/
[26] https://www.amazon.com/dp/B07L5GJD99
[27] https://www.meetingwizard.nl/

4. Conclusion

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5. Discussion

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5.1. Discussion on research

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5.2. Discussion on research quality

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6. Blocks of text that can be used

6.1. Validation through an artefact

Because there is not much known on the applicability of antifragile on Enterprise Architecture, the success factors need to be validated to be true. To validate, the researcher will create an artefact. The Delphi Research Method is used to validate the artefact. By validating the artefact, the researcher can ensure that the success factors are valid with some degree of certainty.

Appendices

A. Interview Participants

Who	Role	From
Christiaan Konstapel	Lead Enterprise Architect	Mileway
Y	2	tbd
Y	2	tbd

Table A.1.: Interview Participants

B. Delphi Group Participants

Who	**Role**	**From**
Jan Ploeg	Enterprise Architect	Centric Netherlands B.V. (ISV)
Y	2	Other ISV
Y	2	Municipality
Y	2	VNG-Realisatie
Y	2	Logius
Z	0	Academic

Table B.1.: Delphi Group Participants

C. Literature Selection

D. Research Log

Date	What
24/11/20	Initial research subject proposal to AMS
25/11/20	Initial research subject proposal sent to Hans Mulder & Yuri Bobbert
30/11/20	First meeting with Hans Mulder to explore the subject
12/02/21	AMS Master Project Coaching
10/03/21	Second meeting with Hans Mulder. Definitive Area of Research selected. The success factors of EA for Business Agility/Resilience/antifragility
11/03/21	Elaborated with COO on antifragility
14/03/21	Started research on the concept of antifragility
03/04/21	One Pager on the concepts Enterprise Architecture, Public Sector, Independant Software Vendor, and Antifragility
04/04/21	Deskresearch on concepts
10/04/21	Reading Taleb
25/05/21	Third meeting with Hans Mulder
20/06/21	Creating 5 pager
20/06/21	Sent 5 pager presentation for review to Hans Mulder
20/06/21	Sent 5 pager presentation for review to Dieneke Schouten (COO) and Maarten Hillenaar (CEO)
20/06/21	Promotor suggestion Roland Ettema, Martin Op 't Land, Bas van Gils or Hans Mulder
20/06/21	Sugestion of Hans Mulder as promotor with Edzo Botjes as co-promotor
21/06/21	Requested Maarten Hillenaar as Sponsor, Dieneke Schouten as Second Reader, Jan Ploeg as participant in Delphi, Christiaan Konstapel as interviewee
24/06/21	Presentation of Five Pager at Master Project Coaching AMS
29/06/21	Created thesis LaTeX skeleton
06/07/21	Meeting with Edzo Botjes to get acquainted
06/07/21	Edzo Botjes accepted co-promotorship
date	what
date	what
date	what
enddate	final version