

Doctoral thesis

Doctoral theses at NTNU, 2024:118

Mohammad Ali Kohansal

# Navigating enterprise architecture (EA) institutionalization:

## The Interplay of EA and Agile

**NTNU**  
Norwegian University of Science and Technology  
Thesis for the Degree of  
Philosophiae Doctor  
Faculty of Information Technology and Electrical  
Engineering  
Department of Computer Science



Norwegian University of  
Science and Technology



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Trondheim, April 2024

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ISBN 978-82-326-7830-3 (printed ver.)  
ISBN 978-82-326-7829-7 (electronic ver.)  
ISSN 1503-8181 (printed ver.)  
ISSN 2703-8084 (online ver.)

Doctoral theses at NTNU, 2024:118

Printed by NTNU Grafisk senter

# Abstract

In the rapidly evolving context of digital transformation, the effective adoption, management, and institutionalization of Enterprise Architecture (EA) have emerged as significant efforts for organizations looking for ways to navigate the complex requirements of modern business environments. This Ph.D. thesis embarks on a comprehensive exploration of different aspects of EA, ranging from its adoption challenges to its interaction with agile transformations. This study's main objective is to shed light on different aspects of EA adoption, management, challenges, and integration within large-scale organizations.

The research questions that form the foundation of this thesis are designed to explore the complex nuances of an EA's journey within an organization. The thesis investigates the role of stakeholders in influencing the perception and institutionalization of EA in order to respond to the first research question. It highlights the complex interactions between different stakeholders and their different interests, showing how these interactions can have a big impact on how successful EA initiatives are. The study goes deeper into the organizational factors that contributed to the failure of EA management initiatives, explaining the significance of legitimacy and showing challenges to achieving normative and cultural-cognitive legitimacy.

The third research question focuses on the topic of delegitimization of established EA practices. The thesis shows the ways through which EA practices can lose momentum and relevance within organizations by examining the complex interplay of regulatory, pragmatic, normative, and cultural-cognitive legitimacy. Building on this foundation, the thesis navigates the cycles of EA's institutionalization, de-institutionalization, and re-institutionalization within the organizational context. This dynamic approach highlights the importance of regaining legitimacy and adapting to modern organizational approaches in order to achieve successful re-institutionalization.

In light of the growing popularity of agile approaches, the thesis investigates the challenges posed by such paradigm shifts to established EA practices. The study outlines the modifications that must be made to EA practices by identifying the main functions

that EA must do to support organizational agility. The outcome of this study is a collection of five papers, each of which shows a different part of EA's journey. Together, these contributions enhance the understanding of EA's adoption, management, and integration with agile paradigms, significantly advancing the body of knowledge in this domain.

This Ph.D. thesis gives a comprehensive overview of EA's strategic, operational, and innovative capacity. It shows how stakeholders, organizational dynamics, and an evolving digital environment all work together. This thesis helps organizations looking to use the advantages of EA in their goals of sustainable growth and agility by addressing the research questions and highlighting different aspects of the EA's role.

# Preface

This thesis, titled "Navigating Enterprise Architecture (EA) Institutionalization: The Interplay of EA and Agile," is submitted to the Norwegian University of Science and Technology (NTNU) in partial fulfillment of the requirements for the degree of Philosophiae Doctor. The research journey leading to this work has been conducted at the Department of Computer Science, NTNU, Trondheim, under the insightful guidance of Associate Professor Torstein Elias Løland Hjelle (main supervisor), Professor John Krogstie (co-supervisor), Soudabeh Khodambashi (co-supervisor) and the late Associate Professor Knut-Helge Ronaes Rolland (co-supervisor), who tragically passed away during the course of this research.

This thesis presents an in-depth investigation of EA adoption, management, challenges, institutionalization, and its interplay with agile transformations. It provides insights into the complex domain of EA and how it interacts with contemporary organizational paradigms through a series of empirical studies. The contributions of each paper collectively enhance our understanding and knowledge of this complex domain.

The structure of the thesis includes the following chapters: an introduction that describes the research objectives in the context of the overall research. The literature review chapter explores the current state of knowledge in depth, providing a solid foundation for this research. Following this, a chapter on the research design describes in great detail the study methodology that led to the data collection and analysis for the two case studies. The results of the empirical studies are presented in the chapter titled Results. In the chapter on implications, I investigate the significance of this research's findings and shed light on their potential impact on academic discourse and practical organizational initiatives. The last chapter of the thesis serves as a reflective summary by presenting the research limitations and proposing potential topics for future research.

The following five papers are included in the appendix:

1. Kohansal, Mohammad Ali; Løland Hjelle, Torstein Elias; and Rolland, Knut-Helge Ronæs, "Navigating Enterprise Architecture (EA) Definition: A Story of EA Adoption in a Public Sector Organization" (2021). 12th Scandinavian Conference on Information Systems. 6.

2. Kohansal, M.A., Rolland, K.H.R., Khodambashi, S. (2022). Towards an Explanation for Why Enterprise Architecture Management Fails: A Legitimacy Lens. In: Cuel, R., Ponte, D., Virili, F. (eds) Exploring Digital Resilience. ItAIS 2021. Lecture Notes in Information Systems and Organisation, vol 57. Springer, Cham.
3. Kohansal, M.A. and Haki, K., 2021. How enterprise architecture loses momentum: a case of delegitimization. In Proceedings of the Forty-Second International Conference on Information Systems (ICIS 2021).
4. Kohansal, M.A. and Haki, K., 2021. Enterprise architecture's ups and downs over time: a case of de-and re-institutionalization. In Proceedings of the Forty-Second International Conference on Information Systems (ICIS 2021).
5. Kohansal, M.A., Røstad, H., Krogstie, J. (2023). Enterprise Architecture Evolution Towards an Agile Transformation Advisor [Unpublished]. Submitted to the Journal of Information Technology.



# Acknowledgments

I am deeply grateful to the individuals who have played pivotal roles in my journey towards completing this PhD thesis. Their guidance, support, and encouragement have been instrumental in shaping my research and overall experience.

First and foremost, I extend my deepest appreciation to my main supervisor, Torstein Elias Løland Hjelle. Your guidance and unwavering support have been invaluable throughout this research journey.

I also extend my sincere gratitude to my co-supervisors, John Krogstie and Soudabeh Khodambashi, for their contributions to my research. Your collective expertise and feedback have enriched the quality of this work and expanded my understanding of the subject matter. I must also remember the late Knut H. Rolland, a co-supervisor who tragically passed away during my PhD journey. His dedication to my research and the field of study will forever be remembered, and his absence is deeply felt.

My sincere gratitude goes to my manager, Monica Storvik, whose support and motivation have been instrumental in my progress. Your belief in my abilities pushed me to excel in my research.

I owe a debt of gratitude to Babak Farshchian and Parastoo Mohagheghi for introducing me to NAV. Conducting a part of my research within NAV was an exceptional opportunity that significantly enriched my PhD experience. Thanks to Håkon Røstad, an Enterprise Architecture expert at NAV, who provided unwavering support for my research. Our numerous discussions on various Enterprise Architecture topics greatly contributed to the depth of my work.

I extend my appreciation to Kazem Haki, my co-author for two papers. After the loss of Knut, your significant support was invaluable. Our collaborative efforts resulted in the successful publication of two papers at ICIS 2021.

Majid Rouhani and Mohsen Anvaari, my trusted friends, acted as mentors during moments of uncertainty. Your guidance and encouragement were a source of strength throughout my journey.

I would also like to acknowledge my fellow colleagues, including Hege Annette Olstad, Gunhild Lundberg, and Abdullah Bahmani, whose camaraderie and shared experiences enriched my academic path.

Special thanks go to my wife, Mina Haghshenas, who was not only my life partner but also my trusted colleague. Our discussions on scientific matters were instrumental in my intellectual growth.

To each of you, I am deeply grateful for your unwavering support, encouragement, and inspiration that have helped shape my academic journey and the completion of this thesis. Your contributions will forever be etched in the pages of my academic life.

# Abbreviations

<b>DT</b>	Digital Transformation
<b>EA</b>	Enterprise Architecture
<b>EAM</b>	Enterprise Architecture Management
<b>FEAF</b>	Federal Enterprise Architecture Framework
<b>Gav</b>	Large Scale Municipality in Norway ( <i>one of the studied cases</i> )
<b>IS</b>	Information System
<b>IT</b>	Information Technology
<b>NAV</b>	Norwegian Labor and Welfare Administration
<b>OIP</b>	Organizational Influence Processes
<b>TOGAF</b>	The Open Group Architecture Framework



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# Chapter 1: Introduction

The journey of Digital Transformation (DT) in organizations has resulted in bringing many opportunities and challenges, compelling them to evolve their strategies, practices, and technologies rapidly. In this context, Enterprise Architecture (EA) has emerged as a crucial discipline for ensuring that business objectives and technological capabilities are aligned. Simultaneously, agile methodologies have acquired immense popularity, providing agility and responsiveness to address the dynamic requirements of the digital environment.

This introductory chapter sets the stage for the exploration of this dynamic environment by providing a comprehensive background and motivation for the study. It describes the research aim and questions that motivate our investigation, examines the theoretical approach that guides our inquiry and clarifies the research setting and methodology employed. In addition, this chapter highlights the contributions of the research to the discipline of EA and provides a clear outline of the thesis, guiding the reader through the remaining chapters of this study. In this academic journey, the integration of EA and agile emerges as a promising strategy for navigating the evolving digital environment and achieving transformative success.

## Background and Motivation

The broad influence of digital technology is fast transforming the business environment in the modern digital era. The goal of this process, which is also known as Digital Transformation (DT), is to fully utilize the potential of digital technology by strategically changing business processes, competencies, and models (Chanas et al., 2019).

EA is an essential approach for this transformational journey because it provides the framework on which enterprises may plan and coordinate their digital initiatives (Boh & Yellin, 2006; Haki & Legner, 2021a; Zachman, 1987). EA provides a structured method for coordinating business strategy with information technology. It is conceptualized as a holistic view of an organization's essential components and interdependencies (Ajer et al., 2021; Dang & Pekkola, 2019a; Haki et al., 2020a). EA is essential to incorporating the business and technology views, facilitating smooth knowledge sharing, and enabling thorough negotiations. It encompasses a wide range of actions at different levels of

organizational management (Beese et al., 2020a; Boh & Yellin, 2006; Haki et al., 2020a; Schmidt & Buxmann, 2011).

However, the main research problem emerges from the significant challenges in EA adoption. This study aims to address why EA adoption, while essential, often fails to achieve its full potential within organizations, particularly when integrating with agile methodologies.

Indeed, the evolution of software development approaches, particularly the emergence of agile practices, has begun to challenge traditional EA practices (Gartner, 2021). Agile approaches, which place an emphasis on adaptability, iterative development, and customer satisfaction (Dingsøyr et al., 2018; Jöhnk et al., 2019), fundamentally differ from the top-down, long-term strategic planning approach that underpins traditional EA (Hanschke et al., 2015). This has created a need for an evolution in EA approaches, requiring them to adapt to the dynamic, self-organizing culture of agile work environments (Gartner, 2021).

The institutional theory (DiMaggio & Powell, 1983b; Scott, 2013), an established theoretical framework in the field of information systems (Ajer et al., 2021; Beese et al., 2020a; Brosius et al., 2018a; Dang, 2021; Dang & Pekkola, 2019a; Levy & Bui, 2019), serves as the theoretical foundation for this study. According to Meyer and Rowan (1977), this theory, which places legitimacy at its centre, provides an insightful viewpoint on how institutionalized practices like EA are maintained, challenged, and changed in response to changing institutional norms and pressures. This research is motivated by the need to understand the complexities and practical implications of aligning EA with agile methodologies, specifically focusing on the institutionalization processes and how EA maintains or adapts its legitimacy in agile environments.

The primary aim of this research is to investigate the EA institutionalization process, including its adoption, management, and challenges. This involves a comprehensive exploration of how organizations confront and manage the complexities associated with implementing EA. Specifically, the study delves into the impact of agile methodologies on EA practices, investigating how an agile mindset influences EA's traditional approaches. Additionally, the research evaluates the processes of EA institutionalization, deinstitutionalization, and re-institutionalization, focusing on understanding the adaptive

transformations that EA undergoes to remain effective and relevant in various organizational contexts.

### **Research Aim and Questions**

The primary objective of this Ph.D. thesis is to investigate EA institutionalization process, including its adoption, management, and challenges. More specifically, this study aims at investigation of the evolution of EA practices in the face of digital transformation, particularly in the transition of software development strategy from out-sourcing, with a waterfall approach, to insourcing, with an agile approach. This study attempts to understand the complexity involved in the institutionalization, de-institutionalization, and re-institutionalization of EA practices within two distinct organizational contexts using the lens of institutional theory.

In order to reach this main goal, the study tries to answer the following theoretical and practical questions:

**RQ1:** How do stakeholder influence and power dynamics affect how EA is perceived and ultimately institutionalized?

**RQ2:** What are the underlying organizational factors that lead to the failure of EA management initiatives?

**Q3:** How can established EA practices be delegitimized within an organization?

**Q4:** How does agile approach challenge the accepted norms of institutionalized EA procedures?

**RQ5:** How can EA modify its procedures to successfully support organizational agility in the context of large-scale agile teams?

By addressing these research questions, this study aims at developing a deeper understanding of EA practices in various organizational contexts. Furthermore, it seeks to contribute to the theoretical discussion about EA, institutional theory, and their intersection within the broad scope of digital transformation.

## **Theoretical Approach**

The study of EA dynamics in this thesis is mainly based on institutional theory (DiMaggio & Powell, 1983b; Scott, 2013), with a focus on the concept of legitimacy (Meyer & Rowan, 1977; Scott, 2014). The Institutional Theory provides an insightful viewpoint for understanding how institutions attempt to obtain acceptance and legitimacy within their context (DiMaggio & Powell, 1983b; Jepperson, 1991a; Oliver, 1992; Scott, 2001a, 2013; Suchman, 1995).

According to the institutional theory, organizations work to gain social legitimacy, which guarantees that their acts are legitimate, desired, and consistent with socially formed norms and beliefs (Meyer & Rowan, 1977; Suchman, 1995). Suchman (1995, P. 547) states that legitimacy is a general perception or assumption that the actions of an entity are desirable, proper, or appropriate within a socially constructed system of norms, beliefs, and definitions. In the context of EA, the idea of legitimacy is essential because it has a direct impact on how EA practices are embraced, applied, and upheld inside an organization (Brosius et al., 2018a; Dang, 2021; Dang & Pekkola, 2019a; Levy & Bui, 2019).

In this study, the four stages of accepted, proper, debated, and illegitimate are employed to observe the evolution of EA legitimacy (Deephouse et al., 2017). Through this progress, it is possible to investigate how the legitimacy of EA changes over time and how different factors may affect its course within the organization. In particular, the transitions between these stages and the strategies used for acquiring, maintaining, or regaining legitimacy at each step are examined (Ashforth & Gibbs, 1990; Deephouse et al., 2017; Meyer & Rowan, 1977; Suchman, 1995).

The idea of institutional change (Hinings et al., 2004; Mignerat & Rivard, 2009) is one of the key concepts used to study the subject of this research. According to institutional theory, institutional change can take place in four different ways: institutional formation, development, deinstitutionalization, and re-institutionalization (Avgerou, 2002; Jepperson, 1991a; Scott, 2001a; Suchman, 1995). Each illustrates a potential path for EA within an organization and offers important details about the elements that might influence EA's evolution. Deinstitutionalization, for instance, happens when an institution's defined meanings and activities are deemed to be false, offering an alternative path for the delegitimization of EA (Scott, 2001a).

Additionally, the knowledge gained from research on management fads and trends as well as the idea of sedimentation incorporated into this research (Abrahamson, 1991; Clark & Fincham, 2002). These concepts provide a more nuanced understanding by shedding light on the potential influences of larger trends in management practices on EA practices as well as the potential for them to change over time, integrating both parts of continuity and change.

The institutional theory and the concept of legitimacy, offer a solid and thorough theoretical foundation for this study. By investigating EA through this lens, I hope to increase knowledge of the complex processes underlying its acceptance and evolution and offer helpful insights for managing it effectively inside organizations.

### **Research Setting and Approach**

This study takes place in the context of two large-scale Norwegian public sector organizations: Gov, a large municipality, and the Norwegian Labor and Welfare Administration (NAV). Instead of doing a comparative analysis, the choice of these two contexts intends to provide deep, context-dependent insights into the process of institutionalization, de-institutionalization, and re-institutionalization of EA practices in the public sector.

The goal of the Norwegian government is to have "one digital public sector," and Gov is also committed to this goal. Gov has several different sections, and each one offers different services to citizens. Gov is in the middle of a journey to become more digital. The Digitalization Program, which was set up in 2013 and is in charge of managing all Gov IT projects, is a key part of this digital transformation. Notably, the start of this program led to EA practices being incorporated into the way the organization works. However, a shift occurred around 2016 in which these practices began to concentrate more on IT project duties, resulting in a stop of EA practices.

NAV was established in 2006 through a merger of three main public-sector organizations. NAV plays a crucial role in enhancing labour force capacity and providing financial assistance to those in need. IT development and maintenance for NAV were outsourced before 2015, resulting in a collaboration between the business department, IT department, and external vendors. However, some challenges led NAV to investigate insourcing software development strategies and adopt agile practices. This change prompted the

introduction of a new organizational model known as "Product Area," which combines cross-functional teams accountable for particular user journeys or user groups. The COVID-19 pandemic emphasized the significance of architects in developing new products, resulting in the recognition of their advisory functions within the teams. A working group has been assigned to propose an appropriate approach for EA practices to support the organization's future structure as NAV experiences digital transformation.

This study employs two distinct case studies to provide a broader understanding of EA's legitimacy and institutionalization processes in the real world. Even though both organizations exist within the same national context, the distinct organizational structures, challenges, and responses provide us with a multifaceted perspective on the evolution of EA over time. This approach aims to provide a deep understanding of the complexities surrounding the institutionalization, de-institutionalization, and re-institutionalization of EA practices, taking into account the different aspects and historical paths of each organization.

## **Contributions**

Focusing on the adoption and evolution of EA practices, particularly their intersection with Agile methodology, this study significantly contributes to the field of EA. This study's contributions can be summarized as follows:

### **Practical Contribution: EA Adoption and Evolution**

This study provides valuable insights into the adoption and evolution of EA practices across organizations, taking into account various contextual factors and challenges. It seeks to improve knowledge of and application of EA practices, ultimately resulting in greater organizational performance and successful digital transformations.

This study provides significant practical insights into the problems and implications associated with the adoption of EA practices. This study also explores the various aspects of EA practices and emphasizes the lack of a common understanding among stakeholders. It highlights the importance of aligning interests and building a shared understanding to promote the successful adoption of EA (Ajer & Olsen, 2018b; Banaeianjahromi & Smolander, 2016b; Kurnia et al., 2020; Lucke et al., 2010).

This study also looks at how EA practices have changed over time in response to changes in organizations, especially in the setting of agile methodologies. The study focuses on



the challenges presented by the agile mindset (Boehm & Turner, 2004; Dahlberg & Lagstedt, 2018; Dingsøy et al., 2018; Vinekar et al., 2006) and offers practical recommendations for adapting EA practices to conform with agile principles. It highlights the necessity for a flexible and adaptive approach that maintains a balance between long-term objectives and short-term goals.

This research also examines the institutionalization and eventual delegitimization of EA practices within organizations. It investigates how to develop institutional pillars and the significance of legitimacy in maintaining EA practices all over time. Practical insights are provided on how organizations can navigate the institutional dynamics and maintain the legitimacy of their evolving EA initiatives.

Additionally, this research provides practical suggestions for organizations engaged in digital transformation by incorporating EA practices with agile methodology. This study examines the significance of EA practices in facilitating the process of agile digital transformation. Further, it offers recommendations on the appropriate adoption of EA practices to ensure alignment with organizational objectives and increase effective collaboration with agile teams.

### **Theoretical Contribution: Institutional Theory and Legitimacy**

This research makes theoretical contributions to the understanding of EA practices from an institutional theory perspective (DiMaggio & Powell, 1983b; Scott, 2013), in addition to its practical implications. This study discusses the institutional dynamics, processes, and challenges that are involved in the adoption and delegitimization of EA practices within organizations.

This study also investigates the concepts of legitimacy and institutionalization within the context of EA practices, utilizing insights from institutional theory (DiMaggio & Powell, 1983b; Meyer & Rowan, 1977; Scott, 2013; Suchman, 1995). It investigates how organizations look to institutional pillars to establish and maintain legitimacy for their evolving EA practices. The findings contribute to a better understanding of the institutional processes and mechanisms that affect the adoption and long-term survival of evolving EA practices.

This study also explores the reasons that may cause EA practices to lose their legitimacy within organizations. This study sheds light on the challenges and processes that may

negatively impact the continued acceptance and applicability of the established EA practices by investigating the delegitimization process. It contributes to the concept of institutional change (Hinings et al., 2004; Mignerat & Rivard, 2009) and the factors influencing the institutionalization and deinstitutionalization of organizational practices.

Overall, by utilizing institutional theory and exploring the ideas of legitimacy and institutionalization, this research advances our understanding of how EA practices are evolving on the theoretical side. It offers theoretical insights and frameworks that enhance our understanding of the dynamics and processes underlying the adoption, institutionalization, and potential delegitimization of EA practices within organizations.

By including both practical and theoretical contributions, this study gives a full picture of how EA practices are used and how they change over time. The study offers practical insights for professionals and individuals responsible for making decisions, while also contributing to the theoretical understanding of EA within the wider framework of institutional theory. The implications of the study's findings have value for organizations aiming to effectively utilize EA practices to enhance performance and achieve successful digital transformations.

## **Structure of Thesis**

This thesis looks into the process of EA institutionalization and the complex interaction between EA and agile practices within the context of digital transformation. The following chapters are structured to provide a thorough examination of this dynamic relationship.

### **Chapter 2: Literature Review**

This chapter, through a comprehensive literature review, sheds light on the challenges and opportunities associated with EA institutionalization. This chapter establishes the theoretical foundation and provides valuable insights into how organizations navigate the complexities of EA adoption and evolution in the dynamic environment of digital transformation.

### **Chapter 3: Research Design**

This study's research design and methodology are described in Chapter 3. I justify the use of qualitative methodology, specifically a case study, in order to obtain a comprehensive understanding of the phenomenon at hand. The chapter details the research setting, data collection methods, and data analysis techniques, establishing a robust framework for this study.

### **Chapter 4: Results**

In this key chapter, I present the empirical findings from interviews, observations, and document analysis. I examine the challenges, strategies, and outcomes of organizations attempting to adopt EA and integrate it with agile approaches using real-world examples.

### **Chapter 5: Implications**

Building on the empirical results, Chapter 5 looks into the theoretical and practical implications of this research. The contributions of this study to EA, agile practices, and digital transformation are discussed. The implications are discussed in the context of academia and industry, providing organizations with valuable insights for optimizing their digital transformation initiatives.

### **Chapter 6: Conclusions**

This concluding chapter reviews encountered challenges, strategies to overcome them, and proposes future research opportunities.

In addition, the **Appendix** contains the five research papers in full length and the co-authorship statements.



## Chapter 2: Literature Review

Enterprise Architecture (EA) is a key concept in modern organizational management and technology integration. It has a big impact on both strategic planning and operational execution. EA emerges as a comprehensive discipline that bridges the gap between an organization's strategic goals and its technological infrastructure. In this chapter, I start with a comprehensive literature review of EA, how it is institutionalized, and how it works with agile practices. The literature review, which serves as the foundational pillar for this thesis, examines key concepts, theories, and empirical studies of the subject of this study.

Firstly, I review EA literature, focusing on the relation between digital transformation and EA, the various interpretations of EA and the challenges in its adoption, as well as, the organizational agility. Then, I explore institutional theory, a valuable framework illuminating information system (IS) and EA institutionalization processes. I focus on legitimacy, a central concept in the adoption and institutionalization of EA practices, and dig into its four types: regulatory, pragmatic, normative, and cultural-cognitive.

By establishing a strong theoretical foundation, I aim to understand the complexities of EA institutionalization and its interplay with agile practices during digital transformation. Through diverse perspectives and contexts, I aim to deepen the understanding of EA practices' adoption and evolution in today's dynamic digital environment.

### **Position of Enterprise Architecture in Digital Transformation**

The digital era has led to an increase in innovation and change across all industries that has never been seen before. This has forced organizations to start large-scale digital transformation (DT) projects. DT requires a strategic rethinking of business processes, models, and customer experiences, driven by the integration of cutting-edge technologies (Lacity & Willcocks, 2016). As a result of this shift, EA is increasingly recognized as a pivotal component of successful DT initiatives, particularly in complex domains like healthcare (Rahimi et al., 2023).

In recent years, research has focused on how DT and EA work well together (Haki & Legner, 2021a; Kotusev & Kurnia, 2019; Kurnia et al., 2021). As organizations embark on DTs, they recognize the need to address architecture considerations holistically. Therefore, EA plays a critical role in translating DT objectives into actionable plans,

encompassing technology infrastructure, business processes, data flows, and user experiences (Lapalme et al., 2016; Rahimi et al., 2023).

The alignment of DT strategies with EA principles is an important aspect of this integration. In order to avoid the risks of isolated technological investments, organizations have to align architectural decisions with the broader enterprise context as digital initiatives evolve (Gartner, 2019; Guo & Gao, 2022; Lapalme et al., 2016). EA Management (EAM) is a management approach that provides a holistic understanding of the EA and coordinates EA activities such as planning, developing, and controlling (Buckl et al., 2010; Radeke, 2010) to ensure organizations meet EA principles properly (Guo & Gao, 2022; Hoogervorst, 2004; Rahimi et al., 2017).

Effective EAM assures the seamless integration of digital innovations, thereby promoting interoperability, scalability, and sustainability (Haki et al., 2016; Lapalme et al., 2016). This alignment reduces the risk of fragmented digital efforts and supports a technological environment that can adapt to changing business requirements.

In addition, the dynamic nature of DT emphasizes the need for agile and flexible EA practices. The increased rate of technological progress requires that organizations adopt flexible architectural frameworks that can accommodate emerging digital opportunities (Lacity & Willcocks, 2016) In such circumstances, EA becomes a dynamic navigational tool that assists organizations navigate the complexities of DT (Greefhorst et al., 2011).

Therefore, the integration of DT and EA has become a strategic effort for organizations that want to succeed in the digital age. Effective EAM provides the foundation upon which digital objectives are realized, coordinating technology-driven innovations in a manner that supports business development and agility, as suggested by Boehm and Turner (2004); Hoogervorst (2004). By embracing the synergies between DT and EA, organizations put themselves in a position to take full advantage of digital opportunities while keeping architectural coherence and strategic alignment.

## **Enterprise Architecture**

According to the literature, at its core, EA is more than just a set of words. It has become a strategic approach that brings together all of an organization's different aspects. These consist of the organization's business objectives, processes, data resources, information systems, and technologies (Boh & Yellin, 2006; Ross & Quaadgras, 2012a; Ross et al.,

2006; Schmidt & Buxmann, 2011). EA's strategic role in healthcare, emphasizing its alignment with organizational goals for operational efficiency, is a recent area of focus (Rahimi et al., 2023). Through this integration, EA serves as a means for aligning an organization's operational complexities with its broader strategic vision, thereby facilitating the achievement of long-term objectives (Dang & Pekkola, 2019a; Haki & Legner, 2021a). Additionally, the influence of different institutional logics on the implementation of EA practices highlights the need for diverse stakeholder perspectives in EA adoption (Dang, 2021). In turn, this integration enables organizations to make informed decisions, optimize operations, and navigate the complex environment of DT (Haki & Legner, 2021a). Thus, EA emerges as a strategic blueprint that leads organizations toward increased efficiency, flexibility, and innovation (Beese et al., 2020a; Haki et al., 2020a).

In addition, it is stated that EA is a multifaceted architecture that evolves in accordance with an organization's evolutionary path (Kurnia et al., 2021; Saint-Louis et al., 2019). The evolutionary nature of EA in public sector contexts, especially in managing complexity and driving DT, is also significant (Dang & Pekkola, 2022). EA contains a comprehensive picture of an organization, incorporating different architectural models such as business, information, and technological architectures (Ross et al., 2006; Schmidt & Buxmann, 2011). This repository of models describes the current state of an organization, depicts a vision of its future, and outlines a transitional path between these states (Boh & Yellin, 2006). Moreover, EA's impact on managing the complexity of information systems architecture further emphasizes its role in organizational strategy and decision-making (Beese et al., 2023). This holistic perspective presents EA as a combination of methodology, strategy, and operational guidance, highlighting its inherent diversity.

A key aspect of the EA is the variety of frameworks that provide organized pathways for the development and implementation of EA (Ross et al., 2006; Schmidt & Buxmann, 2011). For instance, the Zachman Framework and The Open Group Architecture Framework (TOGAF) provide systematic methodologies for designing and implementing EA (Denert-Stiftungslehrstuhl, 2015). TOGAF adopts a phased approach that includes business, data, applications, and technology architectures (Ross et al., 2006; Schmidt & Buxmann, 2011). In contrast, the Zachman Framework examines EA into dimensions

such as What, How, Where, Who, When, and Why, providing a structured framework for examining EA from a variety of perspectives (Ross et al., 2006; Schmidt & Buxmann, 2011). These frameworks not only provide guidance for practitioners but also illustrate the evolution of EA from a technical solution to a holistic organizational design methodology (Denert-Stiftungslehrstuhl, 2015).

In this thesis, EA is explored as a multi-dimensional concept that bridges theory and practice. It is recognized both as a knowledge domain, focusing on aligning business and IT, and as a practical methodology equipped with specific processes and tools. This approach acknowledges EA as an extensive view that extends beyond just application architecture, incorporating aspects such as security and information architectures. Therefore, EA is seen in this study as a holistic and evolving approach, seamlessly integrating theoretical insights with practical applications and strategic viewpoints. Recent studies also emphasize the strategic role of EA in healthcare, aligning technology with organizational objectives for operational efficiency (Rahimi et al., 2023), and how EA evolves in response to organizational changes, especially in public sector contexts (Dang & Pekkola, 2022).

The impact of different institutional logics on EA adoption shows the diverse perspectives involved in implementing EA practices (Dang, 2021), and the complexity of managing information systems architecture underscores its strategic role in decision-making (Beese et al., 2023). Academics investigate EA as a subject of highly demanding research, with the goal of establishing standard definitions and foundational theories that support the discipline (Simon et al., 2013). Although progress has been made toward establishing a common understanding, there are still differences in terminology and definitions (Saint-Louis et al., 2019). EA emerges as an enabler of strategic alignment, collaboration, and synergy between business and IT in the practitioner area (Dang & Pekkola, 2017; Haki et al., 2020a). EA practitioners experience challenges such as obtaining management support, leveraging adequate tool support, and maintaining agility in rapidly changing environments (Ahlemann et al., 2012; Olsen & Trelsgård, 2016; Weerakkody et al., 2007). By combining together these different points of view, we can understand EA's value proposition better (Dang & Pekkola, 2019a; Kurnia et al., 2020).

EA has gained attraction in both the public and private sectors (Dang, 2021; Hjort-Madsen, 2006; Olsen & Trelsgård, 2016). Government agencies utilize EA to manage



complexity, optimize processes, and drive DT, just as businesses do (Beese et al., 2020a; Haki et al., 2020a). EA is no longer limited to isolated silos; it has evolved into a strategic tool that facilitates the implementation of integrated solutions across diverse organizational environments (Beese et al., 2023; Ross et al., 2006; Schmidt & Buxmann, 2011).

Organizations in Norway recognize EA as an essential tool for navigating the complexities of DT and optimizing resource utilization. The researchers investigate the complexity of EA adoption, examining its effects on diverse businesses and sectors. Norwegian researchers contribute to the global discourse by shedding light on the intersections between EA, digitalization, and organizational performance (Ajer & Olsen, 2018b; Ajer & Olsen, 2019a; Olsen & Trelsgård, 2016). In addition, Norway's public sector employs EA to improve service delivery, increase interdisciplinary collaboration, and align IT initiatives with broader government strategies (Ajer & Olsen, 2018b; Ajer & Olsen, 2019a; Olsen & Trelsgård, 2016).

### **Enterprise Architecture Adoption and Management**

Adoption and management of EA are essential for organizations pursuing alignment between business and IT strategies, increased organizational agility, and the ability to effectively respond to the challenges of a dynamic business environment. Successful EA adoption requires ongoing commitment, collaboration, and continuous improvement (Ahlemann et al., 2012; Ajer & Olsen, 2018b; Isomäki & Liimatainen, 2008; Kotusev, 2018; Kotusev & Kurnia, 2019) and must consider the context-specific challenges and risks in public sector projects, as highlighted by Rouvari and Pekkola (2022). Incorporating diverse stakeholder perspectives and institutional logics, as mentioned by Dang (2021), further enriches the EA adoption process. It involves involving stakeholders at all organizational levels, promoting a common understanding of EA, and highlighting its value and benefits (Haki & Legner, 2021a; Isomäki & Liimatainen, 2008; Kurnia et al., 2021; Niemi, 2007).

Organizations adopt EA to strengthen IT governance, facilitate decision-making, and align IT initiatives with business objectives (Jonkers et al., 2006; Weerakkody et al., 2007). The adaptability of EA frameworks to organizational needs is crucial in this process (Rahimi et al., 2023). Indeed, EA adoption is not a one-size-fits-all approach; it must be tailored to the context and maturity level of the organization. Organizations have

to create different channels of communication to ensure that stakeholders grasp the rationale behind EA adoption and the benefits it provides (Ahlemann et al., 2012). This involves addressing concerns and miscommunication that may hinder adoption and buy-in from key stakeholders (Kurnia et al., 2021; Weiss et al., 2013).

EAM plays an important role in sustaining the benefits of EA adoption over time. It entails defining and implementing practices, processes, and governance mechanisms to develop, maintain, and use of EA effectively (ea Lankhorst, 2005; Ross et al., 2006). Successful EAM requires the development of an EA framework that defines the principles, standards, and guidelines for designing and governing the enterprise's architecture (Van der Raadt et al., 2010). The EA framework guides the adoption and utilization of EA artifacts and models (ea Lankhorst, 2005; Van der Raadt et al., 2010).

The engagement of stakeholders is a crucial component of EAM. Engaging stakeholders at various organizational levels helps ensure that the EA remains relevant, aligned with business requirements, and supports decision-making (Haki et al., 2016; Van der Raadt et al., 2010). Involving business and IT stakeholders facilitates collaboration, improves communication, and ensures the EA addresses the strategic imperatives of the organization (Kurnia et al., 2021). In addition, EAM needs to be adaptable to changes in the business and technology environment (Gartner, 2019). To remain effective in a changing environment, organizations must continually refine and adapt their EA practices (Weiss et al., 2013).

The Enterprise Architect plays a significant role in EA adoption and management. This role requires both technical and strategic skills, functioning as the link between technological solutions and broader business objectives. The responsibility of the Enterprise Architect is to navigate the EA program toward successful execution, ensuring that IT initiatives align seamlessly with the overall strategic direction (Robertson et al., 2018).

The Enterprise Architect's role goes beyond technical expertise. Research by Kaisler et al. (2005) highlights the significance of a diverse skill set. In addition to technical knowledge, Enterprise Architects must possess project management and change management skills. The intangible "soft skills" that enable architects to navigate complex organizational dynamics, such as emotional intelligence and effective communication,

are much more important (Robertson et al., 2018). Indeed, Enterprise Architects must particularly deal with the gap between technical complexities and business requirements. Chuang and van Loggerenberg (2010) highlight the problem architects experience in expressing technical language to non-technical stakeholders in their study on Enterprise Architects in South Africa.

Networking, stakeholder management, and leadership are the key tools of an architect. Networking skills enable architects to build relationships throughout the organization, thereby gaining support for their initiatives. Achieving effective stakeholder management allows architects to understand user motivations and concerns, which improves project outcomes. Similarly, leadership skills enable architects to lead organizational change and ensure project success (Robertson et al., 2018).

### **Enterprise Architecture Challenges and Critical Success Factors**

EA adoption is a multifaceted endeavour that offers significant benefits but also presents a number of challenges. The context-specific risks and challenges (Rouvari & Pekkola, 2022) add to the complexity of organizational structures, a major barrier to EA adoption (Ahlemann et al., 2012). Enterprises frequently consist of diverse departments, each with its own processes, technologies, objectives, and institutional logics affecting EA adoption (Dang, 2021). This complexity hinders the development of a coherent and unified architecture in accordance with the organization's overall objectives. Overcoming this challenge requires a holistic understanding of the interdependencies between various departments and the ability to harmonize their distinct components (Ahlemann et al., 2012).

Communication gaps and silos within organizations present another significant challenge. Effective communication between business and IT stakeholders is essential for the successful adoption of EA (Weerakkody et al., 2007). However, attaining this alignment can be challenging due to language, priority, and perspective differences. To bridge this gap, effective communication strategies and mechanisms that facilitate meaningful dialogue between various stakeholders are required.

Change resistance is a popular challenge to EA adoption. Löhe and Legner (2014) state that EA may seem disturbing to employees who are used to the way things are done now. This resistance needs to be overcome with a comprehensive change management strategy

that not only communicates the benefits of EA but also engages employees in the transformation process. Without employee buy-in, even the most well-designed EA initiatives can fail.

To successfully navigate these challenges, organizations must prioritize multiple critical success factors. Priority number one is stakeholder engagement. Engaging stakeholders at all organizational levels guarantee that the EA initiative is aligned with business objectives (Isomäki & Liimatainen, 2008). This participation increases the likelihood of successful EA adoption by fostering a sense of ownership and commitment among stakeholders.

Aligning business and IT strategies is also critical (Kotusev & Kurnia, 2019). Organizations must ensure that their EA initiatives are tightly aligned with their strategic objectives, ensuring that the architecture supports the long-term vision of the business. This alignment assists organizations in adapting to changes in the business environment while ensuring that technology investments generate tangible business outcomes.

Moreover, continuous improvement is essential to the successful adoption of EA. EA practices must be adaptable due to the changing nature of technology and business environments (Ajer & Olsen, 2018b). Organizations should establish mechanisms for constantly evaluating and refining their EA practices to accommodate changing business requirements and technological advances.

Therefore, the adoption of EA presents challenges and opportunities. By recognizing the difficulties of complexity, communication issues, and resistance to change, organizations can address these challenges proactively. Utilizing critical success factors such as stakeholder engagement, strategic alignment, and continuous improvement increases the probability of EA adoption success. This holistic approach enables organizations to navigate complexity, generate innovation, and achieve their strategic goals in a business environment that is constantly changing.

### **Organizational Agility and Enterprise Architecture**

The combination of organizational agility and EA has emerged as a key factor in navigating the complexities of DT in the contemporary business environment (Ross et al., 2006). This integrated approach combines an agile mindset and methodologies with

strategic architectural principles, creating a dynamic synergy that powers organizations toward increased adaptability and sustained competitiveness.

In general, an agile mindset emphasizes flexibility, collaboration, and customer-centricity while taking a proactive approach to change (Highsmith, 2002). Agile methodologies, which originated in software development but are now applied to various other domains, provide frameworks for iterative, cross-functional, and incremental work processes (Leffingwell, 2010). This agile philosophy, based on responsiveness and continuous improvement, has prompted a paradigm shift in organizational practices that moves beyond traditional hierarchical models (Leffingwell, 2010; Sambamurthy et al., 2003).

Consequently, organizational agility is the outcome of an agile mindset at the organizational level. It is the ability to quickly sense and react to external triggers, take advantage of new opportunities, and change strategies in environments that change quickly (Hitt et al., 2007; Sambamurthy et al., 2003). Agility is characterized by its capacity to foster innovation, optimize resource allocation, and enable cross-functional teams to make informed decisions autonomously (Fallmyr & Bygstad, 2014).

Additionally, the relationship between EA and organizational agility is essential and collaborative. EA, which was originally limited to technical design, has grown into a strategic enabler for DT (Boh & Yellin, 2006; Schmidt & Buxmann, 2011). It acts as the enabler that integrates an organization's diverse elements - business processes, data resources, IS, and technologies - with its strategic vision (Dang & Pekkola, 2019a; Ross et al., 2006). EA facilitates coherence between short-term actions and long-term objectives by providing a holistic perspective of the organizational environment (Haki et al., 2020a; Haki & Legner, 2021a).

In the context of digital (agile) transformation, the intersection between EA and organizational agility becomes particularly apparent. EA provides a structured approach to designing modular, compatible systems capable of integrating emerging technologies as organizations face the imperative of rapid adaptation. Scaled agile frameworks, such as SAFe and Disciplined Agile, provide a governance structure that aligns agile initiatives across teams with broader organizational objectives (Ambler & Lines, 2012; Leffingwell, 2010).

But it's not always easy to take advantage of this mutually beneficial interaction. The historical association of EA with centralized control and governance may sometimes conflict with the decentralized and autonomous nature of agile methodologies (Ambler & Lines, 2012; Schmidt & Buxmann, 2011). It is crucial to find a balance between providing guiding standards and promoting an innovative culture (Highsmith, 2002; Leffingwell, 2010). In order to bridge this gap, effective collaboration and shared understanding between business and IT stakeholders emerge as crucial success factors.

Indeed, the relationship between organizational agility and EA is a transformative force in the digital era. The convergence of an agile mindset, methodologies, and strategic alignment enabled by EA enables organizations to confidently navigate DTs, fostering adaptability, innovation, and strategic coherence.

## **Institutional Theory**

Institutional theory has emerged as a valuable framework in both IS and EA research, offering insights into the institutionalization processes of IS phenomena and the assimilation of EA practices within organizations (Ajer et al., 2021; Brosius et al., 2018a; Dang, 2021; Dang & Pekkola, 2019a; Haki et al., 2012; Levy & Bui, 2019; Orlikowski & Barley, 2001).

The institutional theory offers a broader perspective on organizations, recognizing the influence of social and cultural contexts on their practices and activities (DiMaggio & Powell, 1983b; Scott, 2013). It views institutions as socially established orders that provide stability and meaning to social life, with norms, values, and rules regulating behaviour within organizations (Scott, 2001a). Institutional theory in the context of EA provides insight into how EA seeks legitimacy and approval within its institutional context (Ajer et al., 2021; Brosius et al., 2018a; Dang, 2021; Dang & Pekkola, 2019a; Haki et al., 2012).

Legitimacy plays a central role in institutional theory, referring to the general perception or assumption that an entity's actions, such as EAs, are desirable, proper, and appropriate within the socially constructed system of norms and beliefs (Brown, 1998; Deephouse et al., 2017; Golant & Sillince, 2007; Suchman, 1995). Legitimacy is essential for the adoption and institutionalization of EA practices within organizations, allowing them to

achieve desired outcomes and objectives (Ajer et al., 2021; Brosius et al., 2018a; Dang, 2021).

The study of institutionalization processes in IS and EA literature has emphasized the importance of legitimacy and institutional change (Hinings et al., 2018; Levy & Bui, 2019; Mignerat & Rivard, 2009; Nicholson & Sahay, 2009; Orlikowski & Barley, 2001). Institutionalization refers to the process by which organizational practices are embedded and taken for granted (Avgerou, 2002; Jepperson, 1991a; Scott, 2001a; Suchman, 1995). This process entails the establishment and maintenance of institutional pillars that provide stability and guide organizational actions. Institutionalization enables EA to gain legitimacy, support, and resources, thereby facilitating successful DTs (Brosius et al., 2018a; Dang, 2021).

This study adopts an institutional theory perspective to investigate how EA practices seek legitimacy, navigate the institutionalization process, and confront the challenges of institutional change within organizations. In particular, this study examines the dynamics of institutionalization and the factors that contribute to the legitimacy or delegitimization of EA practices. Through this study, I hope to gain an in-depth understanding of the complex relationship between institutional processes and the adoption, assimilation, and evolution of EA practices in the context of DT.

### **Institutional Change Processes**

Institutional change involves the transformation of institutions over time, including both incremental and discontinuous changes (Scott, 2001a). Institutional formation, institutional development, deinstitutionalization, and reinstitutionalization have been identified as four distinct categories of institutional change (Jepperson, 1991a).

Institutional formation is the process of establishing new practices and norms within a field, which transforms social disorder into order. It involves the emergence of new concepts and practices that are widely adopted. Institutional development emphasizes the continuation and reinforcement of existing institutional practices. It refers to the maintenance and development of established norms and behaviours ensuring their survival (Scott, 1994c). Deinstitutionalization occurs when an organization's identified meanings and actions are disproved, resulting in a decline and eventual disappearance of formerly legitimate organizational activities or practices (Oliver, 1992; Scott, 2001a). It

is the result of organizational difficulties or the inability to maintain previously acceptable performance. Re-institutionalization means changing from one type of institution to another based on different rules or principles (Suchman, 1995). It involves establishing new standards and procedures to replace the old ones in the environment.

In addition, it is crucial to consider the occurrence of fads and fashions as well as the concept of sedimentation. In line with Abrahamson (1991) and Clark and Fincham (2002), fads and fashions are practices that are temporarily popular but rapidly lose popularity over time. Despite their initial appearance of high legitimacy, they are not institutionalized over time.

Sedimentation offers a dialectical understanding of institutional change, recognizing that previously institutionalized practices may not fade entirely but may become relatively delegitimized (Cooper et al., 1996). At the organizational field level, competing institutional logic can persist (Hinings et al., 2004; Scott, 2001a; Seo & Creed, 2002). This metaphor emphasizes the provisional stability of an organizational field and the presence of latent tensions even in mature fields.

This study employs Hinings et al. (2004) model of institutional change processes, which includes five overlapping stages (Figure 1), to capture these discussions:

### ***Stage I: Pressures for Change***

Political, functional, and social pressures drive institutional change (e.g., DiMaggio & Powell, 1983b; Hoffman, 2001; Holm, 1995; Oliver, 1992; Scott et al., 2000). The loss of political legitimacy generates political pressures, leading to debates and challenges to the status quo. Changes in technology generate functional pressures that necessitate the deinstitutionalization of particular practices. Social pressures increase "social fragmentation" and a decrease in "historical continuity," resulting in initial conflict among actors and the introduction of new values (Oliver, 1992). It is essential to observe, however, that these pressures alone may not result in change, as the response and interpretation of actors also play a significant role (Hinings et al., 2004).



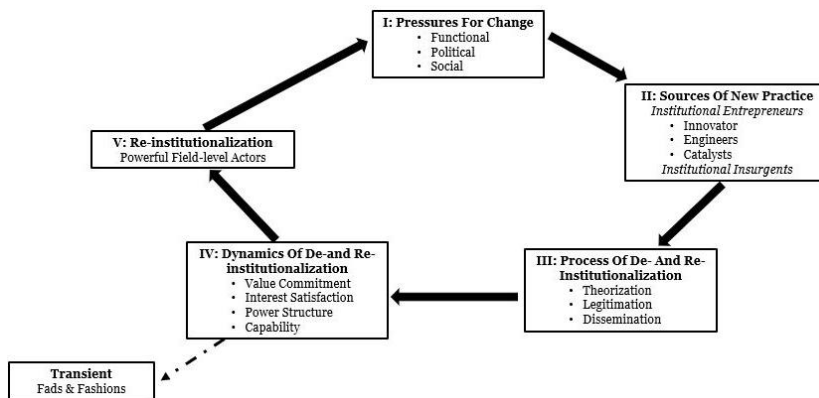


Figure 1 - . Institutional Change Processes (Hinings et al., 2004)

### ***Stage II: Source of New Practices***

Institutional change requires the introduction of new ideas (McAdam, 1996, p. 5). Institutional entrepreneurship, categorized as innovators, engineers, and catalysts, is a significant driver of institutional change (DiMaggio, 1988; Powell & DiMaggio, 2012; Sherer & Lee, 2002). Innovators, who are reputable and powerful existing actors (Sherer & Lee, 2002). Engineers, who influence the control of resources in a field and are strong gatekeepers. They are crucial in establishing the legitimacy of innovations after the innovations have been introduced (Powell & DiMaggio, 2012; Suddaby, 2003). Catalysts, who are the external actors, generating external forces (Hinings et al., 2004).

When political, functional, and social pressures are present, insurgents emerge as influential actors capable of reshaping established ideas and proposing new organizational practices (Hinings et al., 2004).

### ***Stage III: Processes of De- and Re-Institutionalization***

New practices do not affect organizations passively. Institutional entrepreneurs, such as innovators and engineers, actively contribute to the theorization and legitimation of new ideas (Strang & Meyer, 1993, p. 492). Organizations evaluate newly legitimized practices while navigating the tension between new and old values, the participation of active players, the power structure, and the organization's capacity to adopt new practices from technical and social perspectives (Hinings et al., 2004).

#### ***Stage IV: Dynamics of De- and Re-Institutionalization***

The introduction of new practices in a field does not have a passive impact on organizations. Instead, institutional entrepreneurs such as innovators and engineers play a crucial role in advancing and legitimizing these new ideas. First, the institutional entrepreneurs (innovators and engineers) either create and advance the new ideas into the field or contribute to theorization and legitimation processes. Then, organizations attempt to perceive "what do we understand by them?" and evaluate the newly legitimized practices. Therefore, the adoption process is not simple (Hinings et al., 2004). Four interrelated elements influence the rate and the degree of acceptance of a new institutional practice in a field. *Committed to the values*, which concerns the tension between new and old values. *Interest dissatisfaction* means the participation of active players struggling to maintain their advantage in the practices they support (new or old). *Power structure* representing the organizational power of actors committed and interested in new/old practices. In addition, the fourth factor is the *capability* of the organization to adopt a new practice from the perspectives of technical and social aspects (Greenwood & Hinings, 1996).

#### ***Stage V: Re-Institutionalization***

Suchman (1995) explains that re-institutionalization occurs when the adoption of new practices reaches a density that confers cognitive legitimacy, making them the assumed normal and appropriate structures in the field. This strong re-institutionalization transforms discipline and makes it appear mature (DiMaggio & Powell, 1983b). Power is crucial for facilitating, directing, and regulating the introduction of new practices, and visionary leaders are required for large-scale, radical change (Clegg, 1989).

Employing this model of institutional change processes, the purpose of this study is to investigate the dynamics of institutionalization and delegitimization within the field of EA, specifically in relation to agile methodology.

### **Legitimacy**

Institutional theory's central concept of legitimacy provides a lens for understanding how EA practices become legitimized/delegitimized. The institutional theory argues that in order to guarantee their long-term survival, organizations seek legitimacy in their environments (Meyer & Rowan, 1977). Legitimacy is the perception or belief that an

entity's actions are desirable, proper, or appropriate within a socially constructed system of norms, beliefs, and definitions (Suchman, 1995).

There are four distinct genetic stages of legitimacy: accepted, proper, debated, and illegitimate (Deephouse et al., 2017). The accepted state represents a passive evaluation in which the practices are taken for granted, whereas the proper state reflects deliberative judgments. The debated state indicates continuous conflicts within the social system, such as disagreements among stakeholders or challenges to the organization's activities or core values. The condition of being illegitimate occurs when the social system regards an organization as inappropriate, necessitating either a complete reform or the organization's dissolution.

Managing legitimacy is a crucial endeavour that entails multiple activities over time (Deephouse et al., 2017). These endeavours are designed to gain, repair, or maintain legitimacy (Suchman, 1995). Gaining legitimacy, also known as legitimacy building, is a proactive strategy used by managers or those seeking legitimacy to establish legitimacy through various pressures. The maintenance of legitimacy, on the other hand, is viewed as an easy endeavour once the necessary legitimacy has been attained. Legitimacy repair requires reactive responses to unanticipated meaning crises. Often, the decline in cultural support is the leading cause of the inability to maintain legitimacy (Suchman, 1995).

Internal and external stakeholders play a crucial role in evaluating and assessing the legitimacy of subjects, whether consciously or subconsciously, by comparing them to particular criteria or standards (Ruef & Scott, 1998b). The term "legitimacy provider" refers to those who evaluate legitimacy, while "legitimacy seeker" refers to those who attempt to support a phenomenon's legitimacy (Flynn & Du, 2012; Flynn & Puarungroj, 2006a; Hussain et al., 2004). In the context of IS projects, legitimacy seekers can consist of project executives, project team members, or the project leader, whereas legitimacy providers include IS beneficiaries such as business partners, users, and senior management (Flynn & Du, 2012). According to Deephouse et al. (2017), the evaluation of legitimacy consists of four fundamental types of criteria: regulatory, pragmatic, normative/moral, and cultural-cognitive.

**Regulatory legitimacy**

Regulatory legitimacy is gained by connecting new practices with existing legal and quasi-legal rules and regulations in the field (Ruef & Scott, 1998b). Typically, this alignment is accomplished by implementing practices that comply with applicable legal requirements and guidelines (Scott, 2013). IS scholars have highlighted the significance of regulatory legitimacy for innovation success, government compliance, and alignment with non-IT regulations (Haki et al., 2020a; Jang & Luo, 2000b; Teo et al., 2003b).

**Pragmatic legitimacy**

Pragmatic legitimacy is based on the self-interest of an organization's immediate audiences, with assessments ranging from the expected worth of the subject to more complicated goals (Golant & Sillince, 2007; Suchman, 1995). It frequently entails determining a subject's profitability and has received considerable attention in organizational science and the early phases of IT innovation diffusion (e.g., Kaganer et al., 2010b; Ramiller & Swanson, 2003). In the EA context, pragmatic legitimacy is reflected in individuals' engagement in EA practices as they realize EA benefits in their job. Therefore, even without any rewards from the organization, they contribute to EA practices (Ross & Quaadgras, 2012a; Winter, 2014, 2016).

**Normative legitimacy**

Normative legitimacy, also known as moral legitimacy, is the degree to which a new practice complies with and supports the moral standards and values accepted by a particular social audience (Scott, 2001a; Suchman, 1995). It emphasizes evaluating the practice as the correct thing to do, instead of its direct benefits to the evaluator. In the context of EA, normative legitimacy is achieved when individuals view EA's formal procedures and practices as organizational norms, which are frequently enforced by organizational partners who introduce values and norms into social life (e.g., Haki et al., 2020a).

**Cultural-cognitive legitimacy**

Cultural-cognitive legitimacy is thought to be the strongest type of legitimacy because it is based on a deep understanding of practice that is hard to attain and difficult to change (e.g., Aldrich & Fiol, 1994; Suchman, 1995). It entails actions that facilitate decision-making and problem-solving by internalizing a belief system developed by professionals and experts to codify knowledge about a specific practice (Scott, 1994c). Obtaining cultural-cognitive legitimacy enables the practice to be accepted as the basis for daily

routine activities. However, in the early phases of innovation diffusion, this is rarely possible (Kaganer et al., 2010b; Ruef & Scott, 1998b). In the context of EA, cognitive legitimacy is highlighted by how people unconsciously recognize the role of EA. EA deliverables are important parts of the decision-making process, especially when there are uncertainty and people unconsciously imitate the actions of others (Haki et al., 2020a).

By examining these different aspects of legitimacy and their impact on the evaluation and adoption of EA practices, we can obtain a deeper understanding of how legitimacy dynamics influence the delegitimization process within organizations.



## Chapter 3: Research Design

In this chapter, I describe my research design in order to investigate EA institutionalization and its interaction with agile practices. Initially, I employed a qualitative approach that includes interviews, observations, and document analysis. Then, I provide a comprehensive case description that provides context for this study. Next, I elaborate on the data collection methods, which involve interviews and document analysis. I conclude with a review of the data analysis procedures. This comprehensive design aims to shed light on the complexities of EA and agile practices during digital transformation, as well as their adoption and evolution within organizations.

### Research Method

This Ph.D. thesis used a qualitative research approach, based on two compelling case studies, to gain an in-depth understanding of various aspects of EA practices. Understanding EA failures, EA institutionalization, and the delegitimization of EA in real-world organizational settings was the focus.

For Papers 1, 2, and 3, a single-case study approach was adopted (Yin, 2003a), focusing on the same organization. This decision enabled an in-depth investigation of the research questions within the context of the same case. The selected case was deemed critical and relevant to provide deep insights into the phenomena under investigation. The case organization had previously incorporated EA practices into its operations, and I analysed a variety of factors related to EA failures, EAM failures, and the delegitimization of EA practices. The availability of historical data, especially from informed members of the organization, facilitated data analysis and ensured methodological rigor.

Papers 4 and 5 investigated EA institutionalization and the appropriate approach for EA practices supporting agile DT using a different case study. The selected cases were critical and appropriate for gaining a thorough understanding of these distinct phenomena. The fourth paper examined the process of EA institutionalization over a long period, focusing on organizational changes and the re-adoption of EA practices. On the other hand, Paper 5 attempted to identify the appropriate approach for EA practices within the context of agile DT, focusing on the organization's recent change in IT sourcing strategy and the alignment of EA practices with DT efforts.

In addressing the research questions and generating in-depth findings, the qualitative research approach combined with the single-case study design proved to be highly effective. Each case study provided valuable insights into the complexities of EA practices and their implications for the success of an organization. Through in-depth analysis of the selected cases, the research made significant contributions to the field of EA, advancing our understanding of EA failures, institutionalization, and the proper integration of EA practices with agile DT.

## **Case Description**

This section presents two compelling case studies, Gov and NAV, which provide valuable insights into the adoption and implementation of EA practices in the public sector. These cases shed light on the challenges public sector organizations face as they attempt to enhance digital services, increase operational efficiency, and achieve their DT objectives.

The first case study focuses on Gov, a large-scale municipality in Norway. By providing digital services to its citizens, Gov is actively participating in the government's initiative to establish an integrated digital public sector. The Digitalization Program was established in 2013 to coordinate IT initiatives and streamline digitalization efforts. However, the adoption and execution of EA practices within Gov have encountered challenges, resulting in a shift in Enterprise Architects' roles and responsibilities. I acquire valuable insights into the dynamics of EA adoption and its impact on DT in the public sector through an in-depth examination of Gov's journey.

The focus of the second case study is NAV. NAV plays an important role in Norway's welfare system as the organization responsible for increasing the workforce's capacity and providing financial assistance to individuals in need. With a large user base and a substantial budget allocated to benefits, NAV must manage numerous IT applications and services with complexity. NAV's IT development and governance models have experienced significant changes over time, adopting agile methodologies and redefining the role of Enterprise Architects. Examining NAV's journey offers valuable insights into the integration of agile practices and EA principles in a complex public sector context.

Through these case studies, we gain a deeper understanding of the challenges, strategies, and outcomes associated with the adoption and implementation of EA practices in the public sector. The insights learned from Gov and NAV contribute to our understanding



of how organizations in the public sector can leverage EA to drive DT, improve service delivery, and enhance the citizen experience.

### **Gov**

Gov, a large-scale municipality in Norway, was selected as the case study for this research due to its relevance to the topic and the specific criteria set for case selection. The Norwegian government has made a strong commitment to creating "one digital public sector" by giving people digital services, and municipalities, like Gov, are committed to this goal. Gov is divided into six sections, each of which is responsible for a distinct aspect of municipal services. The administration section manages and provides services to all other sections as the central organizational unit.

Gov established Digitalization Program in 2013 in response to a government recommendation to coordinate all IT programs. This program is a temporary structure for coordinating and streamlining digitalization efforts. Each organizational section within Gov has its own IT department responsible for managing the section's particular IT requirements and initiatives. In addition, the administration section has a central IT department that coordinates the smaller IT departments within the various sections and oversees local projects undertaken by Gov.

The central IT department, managed by the IT manager, has a significant impact on the administration section's decisions. The IT manager significantly influences the administration section manager's decisions due to his operational role. The portfolio manager, who is accountable for allocating financial resources to projects, and the leader of the Digitalization Program are two other decision-makers in the administration section.

To meet the IT requirements of each project, temporary IT architects have been employed by project managers. These architects concentrate on addressing specific requirements and expectations of local projects. However, the use of external IT architects presents challenges, especially in terms of organizational knowledge. Over thirty internal and external IT architects assist the Digitalization Program in coordinating project activities. The central IT department and the Digitalization Program must work closely together to ensure efficient project coordination and delivery.

The adoption of EA within Gov to coordinate digitalization processes was initially discussed before the establishment of the Digitalization Program. However, the

establishment of the Digitalization Program prompted Gov to adopt EA practices officially. As a result, EA practices were incorporated into the Digitalization Program's activities. From 2013 to 2019, Gov hired several Enterprise Architects intending to implement the principles of TOGAF (The Open Group Architecture Framework). The purpose of these architects was to provide a central focus on enterprise-wide topics and to facilitate the integration of local IT initiatives.

However, in recent years (starting in 2016), Enterprise Architects' participation in EA practices has decreased. Instead, they have become more involved with IT project duties, resulting in a slowdown in the adoption of EA practices within Gov. Currently, the title of Enterprise Architect has been assigned to an information architect who deals with multiple projects and is unable to allocate sufficient time to EA activities.

Significant changes have occurred within Gov in recent years, which have had an impact on the digitalization processes. For instance, the IT manager has been replaced, resulting in changes in the structure of the central IT department. The central IT department has established a new architecture department that houses both Enterprise Architects and IT architects.

Gov operates with long-term, mid-term, and short-term organizational plans to coordinate its activities effectively. The 12-year long-term plan has a significant impact on Gov's digitalization strategy, and as of 2020, preparations have begun for a new long-term organizational plan.

The case study of Gov offers valuable insight into the difficulties and dynamics of adopting EA in a large municipality. The organizational structure, leadership roles, and allocation of resources all play crucial roles in the successful adoption and management of EA practices. The study highlights the significance of a long-term commitment to EA, alignment with long-term goals, and effective collaboration among the organization's various stakeholders. Picture 2 and 3 illustrates the current structure of Gov and more particularly the administration section.

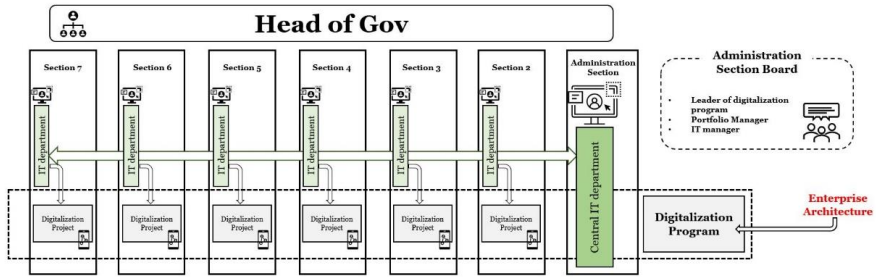


Figure 2 - Organizational Structure of Gov

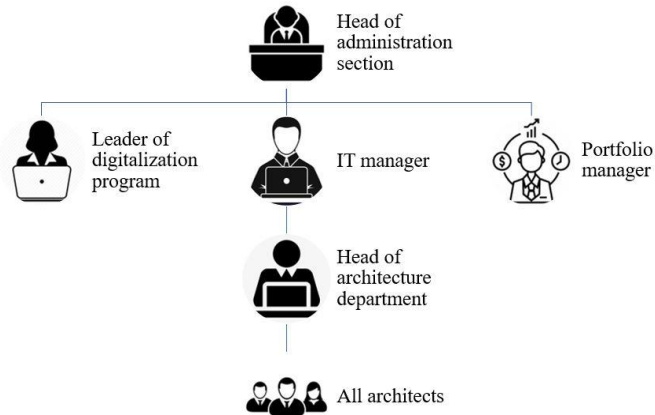


Figure 3 - Structure of administration section in Gov

## NAV

The Norwegian Labour and Welfare Administration (NAV) was chosen as a case study for this investigation in accordance with the case selection criteria. Three significant public-sector organizations merged in 2006 to form NAV. With over 19,000 employees, including more than 1,200 in its IT department, NAV plays a crucial role in increasing the labour force capacity of the population and providing financial assistance to those who cannot support themselves. It provides various benefits, including pensions, unemployment benefits, and childcare services. NAV's budget allocation for benefits comprises approximately one-third of the Norwegian national budget, with approximately 2,8 million active clients. Its IT department serves three primary user categories:

organizations and individuals, NAV staff, and external organizations with value chains linked to NAV.

Before 2015, NAV's IT development and maintenance activities were carried out through collaboration between the business department, the IT department, and external vendors. Outsourcing was the standard procedure for both software development and maintenance and large coordinated releases were typical. The IT department was responsible for many things, such as defining high-level constraints like integration architecture and security requirements, managing contracts, providing operational and technical support to business units, owning the system for integration and release, and making sure the service works as a whole. Architects performed significant roles at various organizational levels. Some believed architects had assumed managerial responsibilities, resulting in a command-and-control approach, and they were frequently viewed as the technology police. However, Enterprise Architects disproved this claim, arguing that while architects may have assumed some managerial responsibilities, they only did so with managers' permission.

A specialist committee criticized NAV in 2015 for failing to develop digital services in response to emerging requirements and for ignoring user experience. This resulted in an intense debate in the Norwegian media. Therefore, NAV began exploring alternative software development methodologies to reduce large release dependencies and associated risks. In 2016, a pilot project was initiated to evaluate the benefits of autonomous agile teams. This pilot project was successful, encouraging NAV to promote cross-functionality within teams and integrate client and vendor resources. NAV has undergone fundamental changes in its sourcing strategy, technical infrastructure, and governance model over the past few years.

The growing number of agile teams necessitated the development of suitable governance structures. The Enterprise Architects played a crucial role in proposing a new organizational model called the "Product Area." This model involves grouping cross-functional teams and assigning them responsibility for specific user journeys, user groups, and related products or features. Each Product Area is accountable for the management, development, delivery, and maintenance of software within its assigned scope. Product Areas manage their budgets with greater autonomy and are typically funded based on the

number of individuals involved. The current Product Areas consist of five to twelve teams with a total of fifty to one hundred individuals.

In 2020, the emergence of the COVID-19 pandemic encountered Norway and NAV with unanticipated challenges. During this critical period, the IT department and Product Areas were actively involved in delivering essential services to users. Architects joined agile development teams to create urgently required new services. Consequently, team members who had previously encountered difficulties with government regulations and laws acknowledged the critical role architects play in the development of successful new products. However, they no longer adhered to the command and control style utilized by architects previously.

Significant changes have been made to NAV's IT sourcing strategy, technical infrastructure, and governance model, primarily due to the need for more flexibility and adaptability. The perception and role of architects in the organization's development process has changed. The majority of people are now aware of the significance of architectural practices in software development and consider architects as valuable team advisors. NAV is actively working to improve its governance model, notably in terms of ensuring autonomous team compliance with rules and regulations.

## **Data Collection**

The data collection process for this study involved a combination of methods to gather comprehensive and diverse datasets from two case organizations: Gov and NAV. Document analysis, semi-structured interviews, and observation of meetings and workshops were the primary methods employed. These techniques allowed for an in-depth study of the digitalization efforts and EA practices of the organizations.

Document analysis played a crucial role in understanding the historical development and strategies of both organizations. Project reports, presentations, meeting minutes, and the internal portal were the main sources of internal documents. Public documents, such as statements, regulations, and policies, provided additional context for national digitalization initiatives. The comprehensive document analysis, approximately 1,600 pages of internal and external documents which spanned from 2009 to 2022, served as the basis for grasping the journey of the organization.

I conducted semi-structured interviews (Eisenhardt, 1989) with key stakeholders from both Gov and NAV. There were 47 interviews conducted, each lasting between 50 and 150 minutes. These interviews included top managers, mid-managers, architects, and IT professionals, allowing for an in-depth investigation of perspectives and experiences. The interviews were recorded and transcribed, giving me a lot of qualitative data to analyse.

In addition to interviews, observations of meetings and workshops (Krueger, 2014) provided invaluable insight into the organizational decision-making processes and collaborative dynamics. Observing four meetings and three workshops provided direct insight into how digitalization and EA practices were discussed and implemented. These observations were documented and transcribed in order to capture important details and interactions. Table 1 provides a summary of the data collection methods used in this study.

<b>Data Collection Technique</b>	<b>Source</b>
<b>Existing Documents</b>	Over 1600 pages Internal documents, including project reports, presentations, historical emails, and the internal portal Public documents ranging from 2009 to 2020, with a particular emphasis on the last three years including statements, regulations, and policies by national authorities relevant to digitalization
<b>Semi-Structured Interviews</b>	47 interviews lasting from 50 to 150 minutes with Digitalization Over 390 pages of single-spaced text Participants: Top managers (6), Mid managers (9), Architects (21), and Developers (4)
<b>Observations</b>	4 meetings - 4 hour 3 workshops, approximately six hours in total Over 35 pages of single-spaced meeting transcripts - Participants: Top managers (3) and the working group Over 20 pages of workshop transcripts - 15 participants (eleven individuals) including portfolio manager, leader of the Digitalization Program, IT architects, architecture department manager, project managers

*Table 1 - Overview of Data Collection Techniques and Sources*

## Gov

The data collection process for this research spanned from September 2019 to October 2020, incorporating both primary and secondary data sources to gain a comprehensive understanding of the case. Through semi-structured interviews and focus group workshops, primary data was acquired, while secondary data was gathered from existing documentation.

To initiate the phase of data collection, a comprehensive review of internal and public documents related to digitalization, architectural practices, and principles was conducted. The internal documents consisted of approximately 600 pages of project reports, presentations, historical emails, and content from the internal portal. These documents provided significant insights into the historical context of EA activities. In addition, public documents such as statements, regulations, and policies issued by national authorities from 2009 to 2020 were reviewed, with a particular emphasis on the last three years.

To supplement the document analysis, semi-structured interviews were conducted in accordance with Eisenhardt (1989) methodology to acquire primary data. There was a total of 14 interviews, each lasting between 80 and 150 minutes. To ensure accuracy and facilitate an in-depth study, these interviews were recorded and then transcribed. Before the interviews, consent forms and an outline of the main topics and questions to be discussed were provided to informants. Beginning with an interview with an enterprise architect, snowball sampling (Paré, 2004b) was used to select the interviewees. Efforts were made to include informants who had been actively involved in the Gov's EA initiative since it started, as their perspectives were essential to grasping the developments and challenges encountered over the past seven years.

In addition to interviews, three focus group workshops based on the methodology proposed by Krueger (2014) were conducted within Gov. The purpose of these workshops was to establish a collaborative environment that contributes to investigating and analysing the topics of interest. The first workshop, attended by five participants including the leader of the Digitalization Program, IT architects, and project managers, focused on sharing our initial understanding of the case based on the document analysis and recent literature on EA. Four participants, including the Digitalization Program leader and project managers, participated in the second workshop, which went deeper into the identified topics of interest. Finally, the third workshop was conducted to present the research findings and ask for feedback from the participants, which includes the portfolio manager, the Digitalization Program leader, IT architects, the architecture department manager, and the project managers. The workshops were invaluable in providing additional insights, clarifying complex topics, and validating the research findings. Table 2 provides an overview of the data collection methods employed in this research.

The combination of interviews and focus group workshops allowed me for a comprehensive exploration of the case, capturing the perspectives of key stakeholders involved in Gov's digitalization and EA initiatives. The primary data collection process ensured a rich and diverse dataset, enabling a detailed analysis of the factors influencing the adoption, implementation, and challenges related to EA practices in Gov. Figure 4. illustrates a summary of significant events affecting EA's journey in this case.

Data Collection Technique	Source
Existing Documents	Internal documents, over 600 pages including project reports, presentations, historical emails, and the internal portal Public documents ranging from 2009 to 2020, with a particular emphasis on the last three years including statements, regulations, and policies by national authorities relevant to digitalization
Semi-Structured Interviews	14 interviews lasting from 80 to 150 minutes with Digitalization Program's leader (1), portfolio manager (1), project managers (3), architecture department manager (1), IT architects (5), and enterprise architects (3) Over 100 pages of interview transcripts
Focus Group Workshops	Three workshops, approximately six hours in total Over 20 pages of workshop transcripts 15 participants (eleven individuals) including portfolio manager, leader of the Digitalization Program, IT architects, architecture department manager, project managers

Table 2 - Overview of Data Collection Techniques in Gov study

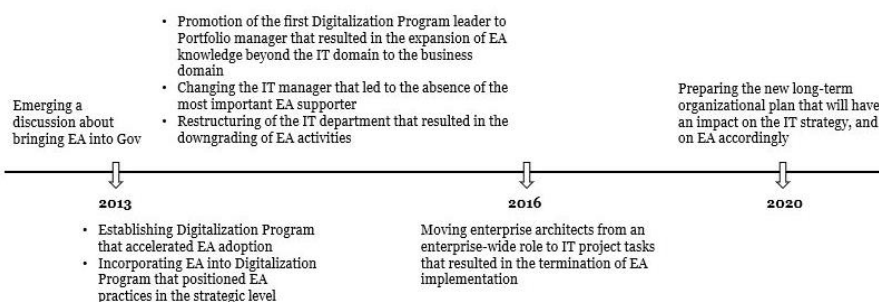


Figure 4 - Summary of Significant Events Affecting EA Journey in Gov

## NAV

The data collection phase of this study began in May 2020 and concluded in March 2022. The phase of data collection included gathering both primary and secondary data through a variety of methods, such as semi-structured interviews, observation, and the analysis of existing documentation.



The data collection process started with the gathering and analysis of internal and public documents related to digitalization and EA practices. The approximately 1,000 pages of internal documents included project reports, presentations, meeting minutes, and content from the internal portal from 2016 to 2020. These internal documents provided valuable insight into the history of digitalization efforts and the organization's adoption of EA practices. In addition, public documents, such as statements, regulations, and policies issued by national authorities, were reviewed to gain a deeper understanding of the external influences on digitalization strategies. This phase of data collection lasted several months, and frequent meetings between the researchers and the primary contact person assisted in gaining an in-depth understanding of the context and identifying key events and decisions.

Additionally, semi-structured interviews were conducted using the Eisenhardt (1989) method for primary data collection. Since the NAV management board approved the research proposal, close communication with the primary contact person was possible during the whole study. The interview questions were carefully designed in accordance with the research objectives and improved iteratively through online meetings and discussions. There was a total of 33 interviews with 31 participants, including top and mid-level managers, architects, and developers. With the participants' permission, these interviews were documented so that the researchers could capture detailed insights, perspectives, and experiences regarding digitalization and EA practices. An external transcription service provider subsequently transcribed the interview recordings, resulting in approximately 290 pages of single-spaced text containing approximately 170,000 words.

In addition to interviews, observation of four meetings was part of the data collection process. Two of these meetings involved working groups tasked with proposing new ways of EA practices for NAV, while the remaining two meetings acted as an opportunity for the working groups to report directly to the management team. These meetings were also recorded and transcribed with permission. Also, there were two additional meetings with the management team that I did not attend. Nonetheless, I had access to the meeting minutes, and the primary point of contact provided explanations for the main topics discussed.

Table 3 provides a summary of the data collection methods employed in this study, showing the variety of sources and techniques used to collect data. The combination of internal and public documents, interviews, and meeting observations resulted in a comprehensive and diverse set of data for analysis. This comprehensive dataset enabled an in-depth investigation of the research objectives, identifying the complexities and nuances of digitalization and EA practices within the NAV organization. The careful transcription of interviews and meetings, totalling hundreds of pages of text, ensures that the collected data can be comprehensively analysed and understood during the subsequent phase of data analysis.

<b>Data Collection Technique</b>	<b>Source</b>
<b>Existing Documents</b>	Internal documents, ranging from 2016 until 2020, over 1000 pages including project reports, presentations, minutes of meetings, and the internal portal Public documents including statements, regulations, and policies by national authorities relevant to digitalization
<b>Semi-Structured Interviews</b>	33 interviews, lasting from 50 to 90 minutes Over 290 pages of single-spaced text and 170,000 words Participants: Top managers (4), Mid managers (9), Architects (14), and Developers (4)
<b>Observations</b>	4 meetings - 4 hour Over 35 pages of single-spaced text and 22,000 words Participants: Top managers (3) and the working group

*Table 3 - Data Collection Techniques and Sources in NAV Study*

## **Data Analysis**

In this part, I give an overview of how the data analysis process was done across the five papers of this Ph.D. thesis. Employing a qualitative approach (Eisenhardt, 1989) for each paper, the data analysis aimed to obtain a deeper understanding of the research questions and investigate the phenomena of interest in a contextually rich manner. The analysis was guided by theoretical frameworks special to each paper while maintaining coherence with the overall research theme of EA practices and its impact on organizations.

Each paper's data analysis process consisted of several important steps that enabled a systematic and rigorous examination of the collected data. Initially, data collection and analysis were performed simultaneously, with initial findings influencing the formulation of subsequent interview questions. This iterative strategy ensured that new or supplementary questions were posed, resulting in a thorough examination of the research topics.

Based on the respective theoretical frameworks, coding schemes were created for each paper to facilitate data analysis. These coding schemes served as guides in identifying themes, patterns, and relationships within the data. The main elements of the coding schemes were carefully defined, allowing for consistent and reliable coding throughout the analysis process.

The data, which included interview and workshop transcripts as well as relevant existing documents, was transferred to NVivo software for data analysis. This software enabled efficient coding and analysis by facilitating the organization and control of the massive qualitative data.

The process of coding involved classifying the data into diverse themes and subcategories, based on the research questions and theoretical perspectives being investigated. In some papers, architectural practices were put into two main groups: project and enterprise levels. This was done based on how they contributed to local IT projects and the strategic decision-making processes at an organizational level.

Throughout the data analysis, I was responsible for conducting the process of coding and reaching an agreement on the meanings of the key components of each coding scheme. To ensure robustness and objectivity, co-authors provided alternative interpretations and responses as devil's advocates. This process of critical evaluation added rigor to the analysis and decreased potential biases.

After a sufficient level of agreement was reached, the data coding was completed, and the results were synthesized to respond to the research questions posed in each paper. The findings were then interpreted in light of the theoretical frameworks, resulting in a deeper understanding of the investigated phenomena.

Each paper's data analysis contributed to an in-depth understanding of the different aspects of EA practices and their implications for organizations. The results shed light on the challenges, failures, institutionalization, and effects of EA practices, as well as how these practices fit with organizations' goals and DT efforts.

In conclusion, the data analysis conducted for this doctoral thesis provided valuable insights into the complexities of EA practices and their applicability in a variety of organizational contexts. The qualitative method enabled a nuanced examination of the

research questions, providing rich and contextually relevant results that contribute to the field of EA research as a whole. The data analysis process was informed by robust theoretical frameworks, ensuring rigor and coherence across the different papers. Overall, the data analysis provides a strong basis for the conclusions and contributions of this thesis, with significant implications for EA theory, practice, and future research.

## Chapter 4: Findings

As we start this chapter, we will begin on a journey to find out how EA (de) institutionalized as well as how EA and agile methodologies work together to create a complex practice in the rapidly changing environment of modern businesses. This research has been driven by a broad objective: to examine different aspects of EA adoption, management, challenges, institutionalization, and the dynamic interplay between EA and agile transformations. In this chapter, we explore the outcomes of this study, providing a comprehensive view of this research effort and its implications.

This chapter is divided into two sections, each of which contributes to a comprehensive understanding of my Ph.D. thesis. The first section addresses the primary research questions that have influenced this thesis. The subsequent section provides a detailed review of each paper, including its titles, authors, significant contributions, publication venues, abstracts, and key findings. In addition, I discuss the inherent relationship between each paper and the overall research questions posed by my Ph.D. thesis. Together, these sections provide a foundation for an in-depth comprehension of the research context I have explored.

### **Paper1: Navigating Enterprise Architecture (EA) Definition: A Story of EA Adoption in a Public Sector Organization**

**Authors:** Mohammad Ali Kohansal, Torstein Elias Løland Hjelle, Knut-Helge Ronæs Rolland

**Contribution:** This paper looks into the challenges related to the adoption of EA within a large public-sector organization. It specifically examines the lack of shared understanding among stakeholders during the EA adoption process and explores how stakeholder influence and power dynamics can significantly impact the success of EA initiatives.

**Published in:** 12th Scandinavian Conference on Information Systems (SCIS2021), Orkanger, Norway.

**Abstract:** Enterprise architecture (EA) is a strategic approach to managing the digital transformation processes in large-scale organizations. Organizations aim at providing a holistic view of business, technology, and information by adopting EA. Although EA is now well established as a practical digital transformation facilitator, some organizations

fail to achieve its benefits. Due to its diverse nature, a lack of shared understanding of EA is one highly cited challenge in its literature. Indeed, during the EA adoption, each actor tries to define EA in a way that fulfills her/his interests. Therefore, there is a risk of failing to achieve the organizational holistic view in this condition. Through a case study in one large-scale public-sector organization in Norway, we illustrate how different EA stakeholders influence EA's understanding. In addition, by adopting the organizational influence process theory, we explain the reason why EA failed in the studied case.

**Main Findings:** The paper indicates that different perspectives and interests among various stakeholders can lead to different understandings of EA's purpose and scope. The study demonstrates the important role of enterprise architects in bridging the gap between business and IT domains, ensuring an effective and successful EA adoption. Additionally, it emphasizes that a lack of shared understanding and misalignment among stakeholders can undermine the holistic view that EA aims to provide, consequently hindering its institutionalization within the organization.

**Relation to Ph.D. Thesis Research Questions:** Paper 1 directly addresses Research Question 1 by investigating the impact of stakeholder influence and power dynamics on the perception and institutionalization of EA.

## **Paper2: Towards an Explanation for Why Enterprise Architecture Management Fails: A Legitimacy Lens**

**Authors:** Mohammad Ali Kohansal, Knut-Helge Ronæs Rolland, Soudabeh Khodambashi

**Contribution:** This paper focuses on exploring the reasons behind the organizational challenges that often lead to the failure of EAM initiatives. By employing a legitimacy lens, the study uncovers the criticality of different types of legitimacy in driving EAM success and identifies barriers hindering achieving a level of normative and cultural-cognitive legitimacy.

**Published in:** Conference of the Italian Chapter of AIS, Trento, 2021.

**Abstract:** Enterprise architecture (EA) is an approach that manages complexities such as organizational structure, technology, and business by providing a holistic view of the organization to coordinate digital transformation efforts. While previous research has highlighted several challenges in taking advantage of EA, few empirical investigations explained how organizations should manage EA attempts to avoid failure. This paper

aimed to explore the root causes of organizational challenges for EA management (EAM) by conducting a case study. Our findings illustrate inadequate legitimacy as a root cause of the organizational challenges, such as lack of shared understanding, stakeholders' engagement, and financial and management support, that needs to be managed over time. Particularly, we demonstrate that although pragmatic legitimacy can positively affect the EAM at its early stages, regulatory legitimacy plays the primary role in EAM's success. In addition, contradictory views and organizational bureaucracy are recognized as significant barriers to achieving normative and cultural-cognitive legitimacy.

**Main Findings:** The research highlights the significance of regulatory and pragmatic legitimacy for successfully managing EAM. It points out that while pragmatic legitimacy can positively influence EAM at its early stages, regulatory legitimacy plays a more significant role in ensuring its long-term success. Furthermore, the study identifies contradictory views and organizational bureaucracy as significant barriers that organizations must overcome to achieve normative and cultural-cognitive legitimacy, essential for sustainable EAM.

**Relation to Ph.D. Thesis Research Questions:** Paper 2 directly addresses Research Question 2 by investigating the underlying organizational factors responsible for the failure of EA management initiatives.

### **Paper3: How Enterprise Architecture Loses Momentum: A Case of Delegitimization**

**Authors:** Mohammad Ali Kohansal, Kazem Haki

**Contribution:** This paper explores the phenomenon of delegitimization affecting established EA practices within an organization. The study investigates the role of regulatory, pragmatic, normative, and cultural-cognitive legitimacy in the institutionalization of EA practices and how the loss of legitimacy can lead to a decline in EA's influence and relevance.

**Published in:** Forty-Second International Conference on Information Systems, Austin 2021.

**Abstract:** Owing to the necessity of effectively establishing enterprise architecture (EA) in an organizational context, there is a growing stream of research to examine the assimilation and institutionalization of EA in organizations. Our study aims to contribute to this stream by giving rise to the legitimacy of EA as the cornerstone of its

institutionalization. To this end, we investigate four criteria of legitimacy, namely regulatory, pragmatic, normative, and cultural-cognitive legitimacy, in a case organization that lost legitimacy for its EA practices. We found the criticality of regulatory and pragmatic legitimacy that need to be obtained effectively and promptly in order to grant sufficient time for normative and cultural-cognitive types of legitimacy to be attained.

**Main Findings:** The research highlights the criticality of regulatory and pragmatic legitimacy in maintaining EA practices within an organization. It demonstrates that the timely acquisition of regulatory and pragmatic legitimacy is essential to allow sufficient time for the establishment of normative and cultural-cognitive legitimacy. Failure to obtain these forms of legitimacy can result in the delegitimization of EA practices, thereby impeding their institutionalization and impact on the organization.

**Relation to Ph.D. Thesis Research Questions:** Paper 3 addresses Research Question 3 by investigating the processes through which established EA practices can be delegitimized within an organization.

#### **Paper4: Enterprise Architecture's Ups and Downs Over Time: A Case of De- and Re-Institutionalization**

**Authors:** Mohammad Ali Kohansal, Kazem Haki

**Contribution:** This paper adopts an institutional change lens to analyse the dynamic processes of EA institutionalization, de-institutionalization, and re-institutionalization within a large public-sector organization. The study introduces a dynamic model that captures the cyclical nature of EA's institutionalization in response to both internal and environmental pressures.

**Published in:** Forty-Second International Conference on Information Systems, Austin 2021.

**Abstract:** This study contributes to the growing body of research on the assimilation and institutionalization of enterprise architecture (EA) within organizations. It adopts an institutional change lens to longitudinally analyse EA's institutionalization, de-, and re-institutionalization processes in one of Norway's large public sector organizations. The study demonstrates a dynamic and cycle model of EA institutionalization in response to both internal and environmental pressures. It specifically emphasizes regaining



legitimacy for EA after getting de-institutionalized by revisiting its classical premise and by adapting to contemporary organizations' agile mode of organizing.

**Main Findings:** The research emphasizes the dynamic nature of EA institutionalization, characterized by periods of de-institutionalization and re-institutionalization in response to changing organizational and environmental contexts. The study highlights the significance of re-establishing legitimacy for EA through revisiting its traditional foundation and adapting to contemporary organizational practices, such as agile approaches, for successful re-institutionalization.

**Relation to Ph.D. Thesis Research Questions:** Paper 4 contributes to Research Questions 4 by examining the factors that lead to the de-institutionalization of EA and exploring the challenges posed by agile approaches to traditional EA procedures.

## **Paper5: Enterprise Architecture Evolution Towards an Agile Transformation Advisor**

**Authors:** Mohammad Ali Kohansal, Håkon Røstad, John Krogstie

**Contribution:** This paper investigates how EA can evolve to support organizational agility in the context of large-scale agile teams. It identifies the key functions that EA should perform to accommodate agile transformations and offers insights into practical modifications required in EA practices.

**Submitted to:** Journal of Enterprise Architecture - Association of Enterprise Architects

**Abstract:** Enterprise Architecture (EA), which has been widely regarded as an effective approach for addressing the complexity associated with an enterprise-wide transformation roadmap, is predicted to lose popularity in the agile transformation due to its mindset distinction from agile software development teams. However, as agile teams grow to large-scale teams, organizational concerns about coordination and alignment arise. Nevertheless, agile teams reject EA's command and control style. To this end, we conducted a single case study in the Norwegian public sector to ascertain how EA can regain its popularity in the era of agile transformation. As a result, we discovered the main functions that EA is expected to perform, which include supportive functions such as strategic and facilitative functions, as well as practical functions such as organizational and standardizing functions. Additionally, we explored how EA practice should be conducted to fulfill these functions.

**Main Findings:** The study identifies crucial functions that EA should fulfill to support organizational agility, encompassing strategic, facilitative, organizational, and standardizing roles. It recommends how EA practices should evolve to effectively service these functions and maintain relevance in the era of agile transformations.

**Relation to Ph.D. Thesis Research Questions:** Paper 5 addresses Research Questions 5 by exploring the challenges presented by agile transformations to traditional EA norms and identifying the necessary modifications in EA procedures to enhance organizational agility in large-scale agile teams.

In this section, I have provided detailed insights into the findings and contributions of each paper. The collective body of research significantly enriches our understanding of EA's adoption, management, institutionalization, and integration with agile approaches in large-scale organizations. By addressing the research questions, these papers contribute to the advancement of knowledge in the field of EA.

### **Addressing Research Questions**

In this section, I delve into the process of EA adoption and its dynamic interplay with the agile paradigm in contemporary digital environments. This exploration is at the heart of my PhD thesis, which aims to investigate the EA institutionalization process, including its adoption, management, and the various challenges encountered.

While this investigation unfolds within the broader context of DT, it is important to note that DT serves as the backdrop against which the nuances of EA institutionalization and adoption are examined. The primary aim is not to dissect DT per se, but to deeply understand how EA practices evolve and adapt within this transformative landscape, particularly as organizations shift from an outsourcing model with a waterfall approach to an insourcing model with agile methodologies.

Through a series of carefully crafted explanatory research questions, this section aims to shed light on the various aspects of EA institutionalization. I will discuss each of these research questions separately, focusing on how they unravel the complexities of EA institutionalization and adoption in organizational contexts. The discussion is intended to contribute to the theoretical understanding of EA, particularly in the context of modern organizational dynamics, while providing practical insights that are essential for the effective management and implementation of EA.

**Research Question 1:** How do stakeholder influence and power dynamics affect how EA is perceived and ultimately institutionalized?

Paper 1 addresses Research Question 1 by exploring how different stakeholders' influences and power dynamics shape the understanding and institutionalization of EA in a large-scale public-sector organization in Norway. The paper utilizes the Organizational Influence Processes (OIP) theory to explain the role of stakeholders in EA adoption, focusing on how their conflicting definitions and interests in EA lead to its adoption failure. The study highlights the significance of enterprise architects in bridging the IT-business gap and suggests their positioning outside of these departments to benefit from EA advantages. This investigation into stakeholder dynamics and their impact on EA provides critical insights into the challenges of achieving a shared understanding and the successful institutionalization of EA.

**Research Question 2:** What are the underlying organizational factors that lead to the failure of EA management initiatives?

Paper 2 addresses Research Question 2 by exploring the root causes of organizational challenges in EAM. This paper conducts a detailed case study to identify and analyze these challenges, with a particular focus on the aspect of legitimacy. It discusses how inadequate legitimacy can lead to organizational issues such as a lack of shared understanding, poor stakeholder engagement, and insufficient financial and management support, all contributing to the failure of EAM initiatives. The paper emphasizes the role of different types of legitimacy (regulatory, pragmatic, normative, and cultural-cognitive) and their impact on the success or failure of EAM within an organizational context. This analysis provides valuable insights into the organizational factors that can impede the effective management and implementation of EA, thus directly responding to the research question concerning the failure of EA management initiatives.

**Research Question 3:** How can established EA practices be delegitimized within an organization?

Paper 3 addresses Research Question 3 by exploring the process through which established EA practices can become delegitimized within an organization. The paper uses a single-case study approach, focusing on a large municipality in Norway. It examines how EA loses its legitimacy over time due to a variety of factors, including conflicting beliefs about the role of EA, changes in management, and the tension between IT and business perspectives. By analyzing the delegitimization process, the paper sheds

light on the importance of maintaining legitimacy across regulatory, pragmatic, normative, and cultural-cognitive criteria, and how the failure to do so leads to the discontinuation of EA practices. This case study contributes to understanding the dynamic and recurring process of legitimacy, delegitimacy, and potential relegitimization of EA in organizational contexts.

**Research Question 4:** How does the agile approach challenge the accepted norms of institutionalized EA procedures?

Paper 4 directly addresses Research Question 4 by examining how the agile approach challenges and transforms the established norms of institutionalized EA procedures. The paper presents a longitudinal case study of Norway's public-sector organization, NAV, focusing on the evolution of EA in response to the shift from a traditional approach to an agile methodology. The study explores the tensions between the agile mindset and the established EA practices, highlighting the de-institutionalization and subsequent re-institutionalization of EA. It shows how EA practices were initially challenged and delegitimized by the agile approach, and how they adapted and regained legitimacy within the new agile context. This paper provides insights into the dynamic relationship between EA and agile methodologies, revealing the complexities and transformations that EA undergoes in such environments.

**Research Question 5:** How can EA modify its procedures to successfully support organizational agility in the context of large-scale agile teams?

Paper 5 addresses Research Question 5 by examining how EA can modify its practices to support organizational agility in large-scale agile team settings. The paper's findings, drawn from a case study in the Norwegian public sector, highlight the transformation of EA roles and practices in response to the evolving needs of agile teams. It emphasizes the shift in EA's function from a traditional 'command and control' approach to a more supportive, advisory, and facilitative role. The study also explores the critical functions that EA must adopt to be effective in an agile context, including strategic advising, decision support, and enhancing coordination and communication. These insights illustrate a comprehensive adaptation of EA practices to align with and effectively support the agility and dynamic requirements of large-scale agile teams.

This section concludes with an overview of insights that not only enhance our understanding of EA's adoption, management, and institutionalization but also show its seamless coordination with agile methodologies within the context of large organizations.

These contributions, which include practical implications, can help organizations figure out how to use EA effectively.



# Chapter 5: Implications

This chapter explores the implications of the findings presented in the five papers on EA and its adoption within organizations. From EA's adoption processes and institutionalization to its function in agile DT, several aspects of EA have been investigated. This chapter seeks to shed light on the theoretical and practical contributions of this research to the field of EA by examining these topics in depth.

## Theoretical Implication

The research's theoretical implications offer valuable insights into the fundamental concepts and dynamics underlying EA. By examining the complexities of EA adoption, institutionalization, and the challenges it encounters, the research advances the theoretical foundation of EA and increases its applicability for contemporary organizations. The following important theoretical implications highlight the research's contributions:

**Understanding EA Adoption Processes:** In this thesis, the adoption processes for EA within organizations are investigated. Using OIP as a lens, this study exposes the critical role of influential actors that affect the success or failure of EA initiatives. The interaction between important actors, e.g., IT managers, Enterprise Architects, and portfolio managers, emerges as a crucial factor requiring special consideration. A shared understanding and collaboration among these stakeholders are essential for leveraging the bridging function of Enterprise Architects effectively. This understanding provides valuable insights into the complexity of EA adoption and suggests strategies for fostering greater collaboration between key actors.

**Achieving Legitimacy for EA Institutionalization:** Through the application of legitimacy theory, this study identifies the factors that contribute to EA's challenges and highlights the significance of obtaining regulatory, pragmatic, normative, and cultural-cognitive forms of legitimacy. The framework highlights how EA can acquire and maintain acceptance within an organization, which is crucial for its long-term sustainability. Practitioners can use these insights to navigate the complexities of institutionalization and develop an EA-accepting and -valued culture.

**Delegitimization and Re-Institutionalization of EA:** A longitudinal perspective on EA's institutional change processes provides essential insights into how EA can become delegitimized and then re-instituted. The study emphasizes the dynamic nature of EA's

role within organizations and the challenges it may confront throughout its lifecycle. Understanding the triggers of delegitimization and the strategies for re-institutionalization equips organizations with the insight and adaptability to sustain EA's value and relevance over time.

**Integrating EA in Agile DT:** The research explores the integration of EA in agile DT processes. The study emphasizes the need for coordination and management of agile teams by examining the efforts of a large public sector organization to strengthen its development governance and align autonomous agile teams with rules and regulations. The implications highlight the significance of adaptable EA artifacts and redefined roles for Enterprise Architects in order to facilitate collaboration and alignment in dynamic transformation contexts.

Together, these theoretical implications advance the understanding of EA as a dynamic and evolving discipline. They provide guidance on navigating complex adoption processes, obtaining institutionalization legitimacy, responding to challenges, and integrating EA into agile DT journeys. The research contributes significantly to the EA literature and provides a solid foundation for future research endeavours with its theoretical insights.

### **Practical Implications**

The practical implications resulting from the research findings offer actionable guidance and recommendations to organizations aiming to realize the full potential of EA in their DT journeys. These implications provide practical insights for overcoming challenges, enhancing collaboration, and optimizing EA practices by relying on real-world case studies and comprehensive analyses. The following main practical implications provide practitioners and decision-makers with valuable guidance:

**Fostering Collaboration Among Stakeholders:** One of the crucial practical implications arising from the research is the need for increased collaboration among stakeholders involved in the EA adoption and implementation processes. IT managers, Enterprise Architects, portfolio managers, and other key actors must establish a shared understanding of the value and purpose of EA. This requires active communication and joint decision-making to align business objectives with EA initiatives. Organizations should facilitate workshops, cross-functional meetings, and knowledge-sharing platforms



to break down silos and promote a collaborative culture that led to successful EA adoption.

**Navigating the Institutionalization Journey:** To ensure the institutionalization of EA, organizations must pay close attention to legitimacy building. The research highlights the significance of gaining regulatory, pragmatic, normative, and cultural-cognitive legitimacy in order to gain acceptance for EA initiatives. Practitioners should invest in communicating the benefits of EA to key stakeholders, highlighting its role in enhancing organizational efficiency, agility, and strategic decision-making. Seeking executive sponsorship and aligning EA with broader organizational objectives can enhance its legitimacy and sustainability.

**Adapting EA Artifacts for Agility:** In the context of agile DTs, static and rigid EA artifacts may hinder progress and collaboration. To accommodate the dynamic nature of agile projects, organizations need to establish flexible and adaptable EA artifacts, according to the practical implications. This may entail the creation of lightweight architectural models, guidelines, and documentation that can adapt to the project's evolving requirements. Agile-friendly EA artifacts can facilitate greater alignment between autonomous agile teams and enterprise-wide objectives, thereby streamlining the DT journey.

**Redefining the Role of Enterprise Architects:** The research sheds light on the evolving role of Enterprise Architects in contemporary organizations. To overcome resistance and foster collaboration, practitioners are advised to redefine the title of "Enterprise Architect" to better reflect their supportive and coaching role. Adopting titles such as "Digital Transformation Coach" for local group architects and "Digital Transformation Officer" for core architectural group architects can reduce conflict and strengthen the architects' role as change and innovation facilitators.

**Establishing a Digital Transformation Office:** The research recommends establishing a Digital Transformation Office to oversee and facilitate EA practices. This core architectural group, which may consist of Enterprise Architects and other relevant stakeholders, serves as a coordination hub between local architectural groups and the larger ecosystem. Digital Transformation Office can facilitate decision-making, align

agile teams with organizational objectives, and offer guidance on the selection and application of EA artifacts.

**Emphasizing Continuous Learning and Improvement:** The research highlights the importance of continuous learning and improvement in EA practices. Organizations should invest in ongoing training and development opportunities for architects and other stakeholders to keep informed of industry trends, best practices, and emerging technologies. Learning from previous EA initiatives and feedback channels can enhance the efficacy of EA practices and inform future decision-making.

**Tailoring EA Practices to Local Contexts:** The research highlights the necessity of adapting EA practices to the specific requirements and constraints of local architectural groups. Organizations should enable local groups to adapt EA artifacts and practices to their particular contexts while maintaining a common identity and overarching alignment. This decentralized strategy can encourage ownership and participation, thereby facilitating the successful implementation of EA initiatives.

In conclusion, the research findings' practical implications provide a road map for organizations seeking to adopt EA as a strategic enabler for DT. Organizations can leverage EA to drive innovation, efficiency, and competitive advantage by fostering collaboration, navigating the institutionalization journey, adapting to agile contexts, and redefining the role of Enterprise Architects. The potential impact of EA initiatives is increased by emphasizing continuous learning and adapting EA practices to local contexts, empowering organizations to succeed in the rapidly evolving digital landscape.

## Chapter 6: Conclusions

The main goal of this Ph.D. thesis has been to study and understand the complex relationship between EA and Digital Transformation, especially in the context of large-scale agile initiatives. Along the way, there have been many unanticipated challenges and excellent learning opportunities. This concluding chapter reviews the challenges that were encountered, and the strategies used to overcome them, highlighting the importance of resilience, collaboration, and adaptability. Moreover, the chapter proposes new options for future research that have emerged from this research.

### **Limitation: Overcoming Challenges**

Starting a Ph.D. program is an exciting endeavour, but it frequently presents unexpected challenges. Finding the ideal case study to support my research posed a significant challenge when I began my Ph.D. In this section, I will describe the ups and downs of my journey, highlighting the unexpected events and eventual accomplishments that shaped my research journey.

Before I began my Ph.D., my main supervisor negotiated for a company to serve as a case study for my research. Unfortunately, nothing went according to plan. The person who was meant to be my primary point of contact at the company quit before I could begin, and the company withdrew its support. It was a disappointing obstacle that left me unsure of how to proceed.

I reached out to my network of colleagues and friends to find an alternative case study. One person, in particular, helped me. Majid Rouhani, who had an extensive network within the industry, introduced me to several companies. Despite my enthusiasm and engaging presentations, none of them were willing to collaborate with me on my research idea at the time.

After nearly a year of investigation and multiple rejections, a glimmer of hope appeared. The local municipality of Trondheim agreed to support my research proposal. It was a turning point that renewed my motivation and sense of purpose.

In May 2019, Trondheim municipality gave my research idea informal approval, and I couldn't wait to get started. Before beginning the data collection phase, I used the summer vacation period to fully engage myself in the review of relevant public and internal

documents. I was able to acquire a deeper understanding of the topic and build a solid foundation for my research during this time.

I eagerly began conducting interviews with key stakeholders. These interviews provided invaluable insights and perspectives, enabling me to refine my research approach and acquire a deeper understanding of the subject. However, just as I was making progress with my data collection, an unanticipated event occurred: the COVID-19 pandemic.

The pandemic blocked my plans and pushed me to stop data collection. It was a difficult period for everyone, and I had to quickly adapt. The original plan was to do a contextual study with various public sectors, like Helsedirektoratet, Skatteetaten, and NAV. Even though all of them agreed with my research idea informally, the pandemic made it impossible to conduct multiple case studies. Instead, I chose to concentrate my efforts on Trondheim municipality and NAV, realizing that flexibility was essential for progress.

Throughout this chaotic journey my co-supervisor, Knut H. Rolland, was always there for me. His guidance and insight were invaluable, and he always had a solution for any problem I encountered. Nonetheless, a tragedy occurred when I lost Knut, who was not only a supervisor but also a dear friend. His tragic passing was a shock, and it made me realize that my Ph.D. journey was about more than just academic goals; it was about the meaningful relationships I built along the way.

The support of my co-author, Kazem Haki, helped me through the hard times. Our paths crossed at ICIS 2019 in Munich, where I presented my research idea and attended the conference. Kazem and I connected immediately, and we continued to work together after the conference.

Despite difficulties, NAV provided me with tremendous assistance throughout the data collection process. Even though the majority of our interactions had to take place through remote meetings and observations, NAV's commitment and assistance were essential to the progress of my research.

In conclusion, my journey to complete my Ph.D. research was full of unforeseen circumstances. Nonetheless, through commitment, the support of supervisors and colleagues, and a willingness to adapt to changing situations, I overcame these obstacles

and continued my research journey. This experience has taught me the significance of persistence, collaboration, and the profound influence of professional networks.

## **Future Research**

The research conducted in the papers presented valuable insights into the dynamics and challenges of EA in the context of DT and agile practices. However, certain limitations and unresolved questions present opportunities for future research. Building on the existing research, future investigations can explore the following areas to advance the understanding and application of EA in the evolving digital environment:

**Multiple-case and Survey Studies for Generalizability:** While the approach of a single-case study provided a comprehensive understanding of the investigated case, future research should attempt to increase the generalizability of the findings. Multiple-case studies or large-scale surveys involving a diverse range of organizations can enhance the validity and applicability of research findings. By evaluating the (de)legitimacy of EA in a broad range of contexts, researchers can identify common patterns and factors that influence EA's acceptability and efficacy in various contexts.

**Carriers of Legitimacy for EA:** The research emphasized the importance of legitimacy for EA adoption and success. However, future research should look deeper into the carriers of legitimacy, especially non-coercive sources like pragmatic, normative, and cognitive legitimacy. Practitioners can increase EA's acceptance and support among stakeholders by identifying and theorizing about the factors that influence various aspects of EA legitimacy. Understanding how these carriers are acquired or manipulated over time can provide researchers and practitioners with valuable guidance.

**Engaging Agile Teams in EA Institutionalization:** While this study explored the perspectives of managers, architects, and a few agile team members, future research should place a greater emphasis on involving agile teams to obtain a more comprehensive understanding of EA initiatives. Understanding how agile teams perceive EA, how they interact with EA practices, and how their feedback can influence the institutionalization process can inform EA integration strategies for agile digital transformation initiatives.

**Evaluating the Impact of Redefined Architect Roles:** As the research proposed redefining the role of Enterprise Architects, future studies should empirically evaluate the impact of such role adjustments. Comparing the outcomes of EA practices with traditional

architect roles to those with the suggested "Digital Transformation Coach" and "Digital Transformation Officer" titles can demonstrate the effectiveness of these redefined roles in fostering collaboration and overcoming resistance.

In conclusion, future research in the domain of EA and its intersection with DT and agile practices holds significant promise. Researchers can contribute to a more complete understanding of EA's role in driving organizational innovation, resilience, and success in the digital era by addressing the identified limitations and investigating new lines of inquiry. In addition, the practical implications of future research can assist organizations in maximizing the potential of EA to navigate the complexities of DT and succeed in a rapidly evolving business environment.

# Reference

- Abrahamson, E. (1991). Managerial fads and fashions: The diffusion and rejection of innovations. *Academy of management review*, 16(3), 586-612.
- Ahlemann, F., Stettiner, E., Messerschmidt, M., & Legner, C. (2012). *Strategic enterprise architecture management: challenges, best practices, and future developments*. Springer Science & Business Media.
- Ajer, A. K., & Olsen, D. H. (2018). Enterprise Architecture Challenges: A Case Study of Three Norwegian Public Sectors. Proceedings of the 26th European Conference on Information Systems, Portsmouth, UK.
- Ajer, A. K. S., Hustad, E., & Vassilakopoulou, P. (2021). Enterprise architecture operationalization and institutional pluralism: The case of the Norwegian Hospital sector. *Information Systems Journal*, 31(4), 610-645.
- Ajer, A. K. S., & Olsen, D. H. (2019). Enterprise architecture implementation is a bumpy ride: a case study in the Norwegian public sector. *Electronic Journal of e-Government*, 17(2), 79-94.
- Aldrich, H. E., & Fiol, C. M. (1994). Fools rush in? The institutional context of industry creation. *Academy of management review*, 19(4), 645-670.
- Ambler, S. W., & Lines, M. (2012). *Disciplined agile delivery: A practitioner's guide to agile software delivery in the enterprise*. IBM press.
- Ashforth, B. E., & Gibbs, B. W. (1990). The double-edge of organizational legitimation. *Organization science*, 1(2), 177-194.
- Avgerou, C. (2002). *Information systems and global diversity*. OUP Oxford.
- Banaeianjahromi, N., & Smolander, K. (2016). Understanding obstacles in enterprise architecture development. Proceedings of the 24th European Conference on Information Systems, İstanbul, Turkey.
- Beese, J., Haki, K., Aier, S., & Winter, R. (2020). Enterprise Architecture as a Public Goods Dilemma: An Experimental Approach. In *Advances in Enterprise Engineering XIII. Cham* (pp. 102-114). Springer.
- Boehm, B., & Turner, R. (2004). Balancing agility and discipline: Evaluating and integrating agile and plan-driven methods. Proceedings. 26th International Conference on Software Engineering,
- Boh, W. F., & Yellin, D. (2006). Using enterprise architecture standards in managing information technology. *Journal of Management Information Systems*, 23(3), 163-207.
- Brosius, M., Aier, S., Haki, K., & Winter, R. (2018). Enterprise architecture assimilation: an institutional perspective. Proceedings of the 39th International Conference on Information Systems, San Francisco.
- Brown, A. D. (1998). Narrative, politics and legitimacy in an IT implementation. *Journal of Management Studies*, 35(1), 35-58.
- Chanias, S., Myers, M. D., & Hess, T. (2019). Digital transformation strategy making in pre-digital organizations: The case of a financial services provider. *The Journal of Strategic Information Systems*, 28(1), 17-33.
- Chuang, C.-H., & van Loggerenberg, J. (2010). Challenges facing enterprise architects: a South African perspective. 2010 43rd Hawaii International Conference on System Sciences,
- Clark, T. A. R., & Fincham, R. (2002). *Critical consulting: New perspectives on the management advice industry*. Blackwell.
- Clegg, S. R. (1989). *Frameworks of power*. Sage.

- Cooper, D. J., Hinings, B., Greenwood, R., Brown, J. L., Cooper, D. J., Hinings, B., Greenwood, R., & Brown, J. L. (1996). Sedimentation and transformation in organizational change: The case of Canadian law firms. *Organization studies*, 17(4), 623-647.
- Dahlberg, T., & Lagstedt, A. (2018). There Is Still No" Fit for All" IS Development Method: Business Development Context and IS Development Characteristics Need to Match. Proceedings of the 51st Hawaii international conference on system sciences,
- Dang, D. (2021). Institutional logics and their influence on enterprise architecture adoption. *Journal of Computer Information Systems*, 61(1), 42-52.
- Dang, D., & Pekkola, S. (2019). Institutional Perspectives on the Process of Enterprise Architecture Adoption. *Information Systems Frontiers*, 22, 1433-1445.
- Dang, D. D., & Pekkola, S. (2017). Systematic Literature Review on Enterprise Architecture in the Public Sector. *Electronic Journal of e-Government*, 15(2).
- Deephouse, D. L., Bundy, J., Tost, L. P., & Suchman, M. C. (2017). Organizational legitimacy: Six key questions. *The Sage handbook of organizational institutionalism*, 4(2), 27-54.
- Denert-Stiftungslehrstuhl, E. (2015). IT Architecture Standardization Survey. *München: Technische Universität München*.
- DiMaggio, P. (1988). Interest and agency in institutional theory. In *Institutional patterns and organizations culture and environment* (pp. 3-21).
- DiMaggio, P. J., & Powell, W. W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. In *American sociological review* (pp. 147-160).
- Dingsøyr, T., Moe, N. B., Fægri, T. E., & Seim, E. A. (2018). Exploring software development at the very large-scale: a revelatory case study and research agenda for agile method adaptation. *Empirical Software Engineering*, 23(1), 490-520.
- ea Lankhorst, M. (2005). Enterprise Architecture at Work: Modelling. *Communication and Analysis*.
- Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of management review*, 14(4), 532-550.
- Fallmyr, T., & Bygstad, B. (2014). Enterprise architecture practice and organizational agility: An exploratory study. 2014 47th Hawaii International Conference on System Sciences,
- Flynn, D., & Du, Y. (2012). A case study of the legitimation process undertaken to gain support for an information system in a Chinese university. *European Journal of Information Systems*, 21(3), 212-228.
- Flynn, D., & Puarungroj, W. (2006). The legitimation-seeking process in information systems development. Proceedings of European Conference on Information Systems, Göteborg, Sweden.
- Gartner. (2019). Enterprise Architecture Must Evolve Into an Internal Management Consultancy. In.
- Gartner. (2021). *Predicts 2021: Enterprise Architecture Designs the Composable Organization*
- Golant, B. D., & Sillince, J. A. (2007). The constitution of organizational legitimacy: A narrative perspective. *Organization studies*, 28(8), 1149-1167.
- Greefhorst, D., Proper, E., Greefhorst, D., & Proper, E. (2011). *The role of enterprise architecture*. Springer.



- Greenwood, R., & Hinings, C. R. (1996). Understanding radical organizational change: Bringing together the old and the new institutionalism. *Academy of management review*, 21(4), 1022-1054.
- Haki, K., Aier, S., & Winter, R. (2016). A Stakeholder Perspective to Study Enterprisewide Is Initiatives.
- Haki, K., Beese, J., Aier, S., & Winter, R. (2020). The Evolution of Information Systems Architecture: An Agent-Based Simulation Model. *MIS quarterly*, 44(1), 155-184.
- Haki, K., & Legner, C. (2021). The Mechanics of Enterprise Architecture Principles. *Journal of the Association for Information Systems*, 22(5).
- Haki, M. K., Legner, C., & Ahlemann, F. (2012). Beyond EA frameworks: Towards an understanding of the adoption of enterprise architecture management. Proceedings of the European Conference on Information Systems, Barcelona, Spain.
- Hanschke, S., Ernsting, J., & Kuchen, H. (2015). Integrating agile software development and enterprise architecture management. Proceedings of the 48th Hawaii International Conference on System Sciences,
- Highsmith, J. A. (2002). *Agile software development ecosystems*. Addison-Wesley Professional.
- Hinings, B., Gegenhuber, T., & Greenwood, R. (2018). Digital innovation and transformation: An institutional perspective. *Information and Organization*, 28(1), 52-61.
- Hinings, C. R., Greenwood, R., Reay, T., & Suddaby, R. (2004). *Dynamics of change in organizational fields*. Oxford University.
- Hitt, M. A., Beamish, P. W., Jackson, S. E., & Mathieu, J. E. (2007). Building theoretical and empirical bridges across levels: Multilevel research in management. *Academy of management journal*, 50(6), 1385-1399.
- Hjort-Madsen, K. (2006). Enterprise architecture implementation and management: A case study on interoperability. Proceedings of the 39th Annual Hawaii International Conference on System Sciences (HICSS'06),
- Hoffman, A. J. (2001). *From heresy to dogma: An institutional history of corporate environmentalism*. Stanford University Press.
- Holm, P. (1995). The dynamics of institutionalization: Transformation processes in Norwegian fisheries. *Administrative science quarterly*, 40(3), 398-422.
- Hoogervorst, J. (2004). Enterprise architecture: Enabling integration, agility and change. *International Journal of Cooperative Information Systems*, 13(03), 213-233.
- Hussain, Z., Taylor, A., & Flynn, D. (2004). A case study of the process of achieving legitimization in information systems development. *Journal of Information Science*, 30(5), 408-417.
- Isomäki, H., & Liimatainen, K. (2008). Challenges of government enterprise architecture work—stakeholders' views. International Conference on Electronic Government,
- Jang, Y. S., & Luo, X. (2000). Nation-state participation in intergovernmental technology organizations. *International journal of comparative sociology*, 41(3), 255-284.
- Jepperson, R. (1991). Institutions, institutional effects, and institutionalism. In *The new institutionalism in organizational analysis* (pp. 143-163).
- Jöhnk, J., Oesterle, S., Winkler, T. J., Nørbjerg, J., & Urbach, N. (2019). Juggling the Paradoxes—Governance Mechanisms in Bimodal IT Organizations. Proceedings of the 27th European Conference on Information Systems, Stockholm & Uppsala, Sweden.

- Jonkers, H., Lankhorst, M. M., ter Doest, H. W., Arbab, F., Bosma, H., & Wieringa, R. J. (2006). Enterprise architecture: Management tool and blueprint for the organisation. *Information Systems Frontiers*, 8(2), 63-66.
- Kaganer, E. A., Pawlowski, S. D., & Wiley-Patton, S. (2010). Building legitimacy for IT innovations: the case of computerized physician order entry systems. *Journal of the Association for Information Systems*, 11(1), 1-33.
- Kaisler, S. H., Armour, F., & Valivullah, M. (2005). Enterprise architecting: Critical problems. Proceedings of the 38th Annual Hawaii International Conference on System Sciences,
- Kotusev, S. (2018). The practice of enterprise architecture: A modern approach to business and IT alignment.
- Kotusev, S., & Kurnia, S. (2019). The Problem of Engagement in Enterprise Architecture Practice: An Exploratory Case Study.
- Krueger, R. A. (2014). *Focus groups: A practical guide for applied research*. Sage publications.
- Kurnia, S., Kotusev, S., Shanks, G., Dilnutt, R., & Milton, S. (2021). Stakeholder engagement in enterprise architecture practice: What inhibitors are there? *information and Software Technology*, 134, 106536.
- Kurnia, S., Kotusev, S., Taylor, P., & Dilnutt, R. (2020). Artifacts, Activities, Benefits and Blockers: Exploring Enterprise Architecture Practice in Depth. Proceedings of the 53rd Hawaii International Conference on System Sciences,
- Lacity, M. C., & Willcocks, L. P. (2016). A new approach to automating services. *MIT Sloan Management Review*.
- Lapalme, J., Gerber, A., Van der Merwe, A., Zachman, J., De Vries, M., & Hinkelmann, K. (2016). Exploring the future of enterprise architecture: A Zachman perspective. *Computers in Industry*, 79, 103-113.
- Leffingwell, D. (2010). *Agile software requirements: lean requirements practices for teams, programs, and the enterprise*. Addison-Wesley Professional.
- Levy, M., & Bui, Q. N. (2019). How field-level institutions become a part of organizations: A study of enterprise architecture as a tool for institutional change. *Information and Organization*, 29(4), 100272.
- Löhe, J., & Legner, C. (2014). Overcoming implementation challenges in enterprise architecture management: a design theory for architecture-driven IT Management (ADRIMA). *Information Systems and e-Business Management*, 12(1), 101-137.
- Lucke, C., Krell, S., & Lechner, U. (2010). Critical issues in enterprise architecting—a literature review.
- McAdam, D. (1996). Conceptual origins, current problems, future directions. In (pp. 23-40).
- Meyer, J. W., & Rowan, B. (1977). Institutionalized organizations: Formal structure as myth and ceremony. *American journal of sociology*, 83(2), 340-363.
- Mignerat, M., & Rivard, S. (2009). Positioning the institutional perspective in information systems research. *Journal of information technology*, 24(4), 369-391.
- Nicholson, B., & Sahay, S. (2009). Deinstitutionalization in the context of software exports policymaking in Costa Rica. *Journal of information technology*, 24(4), 332-342.
- Niemi, E. (2007). Enterprise architecture Stakeholders-a holistic view. *AMCIS 2007 Proceedings*, 41.
- Oliver, C. (1992). The antecedents of deinstitutionalization. *Organization studies*, 13(4), 563-588.

- Olsen, D. H., & Trelsgård, K. (2016). Enterprise Architecture adoption challenges: An exploratory case study of the Norwegian higher education sector. *Procedia Computer Science*, 100, 804-811.
- Orlikowski, W. J., & Barley, S. R. (2001). Technology and institutions: What can research on information technology and research on organizations learn from each other? *MIS quarterly*, 25(2), 145-165.
- Paré, G. (2004). Investigating information systems with positivist case research. *Communications of the Association for Information Systems*, 13(1), 233-264.
- Powell, W. W., & DiMaggio, P. J. (2012). *The new institutionalism in organizational analysis*. University of Chicago press.
- Ramiller, N. C., & Swanson, E. B. (2003). Organizing visions for information technology and the information systems executive response. *Journal of Management Information Systems*, 20(1), 13-50.
- Robertson, E., Peko, G., & Sundaram, D. (2018). Enterprise Architecture Maturity: A Crucial Link in Business and IT Alignment. PACIS,
- Ross, J. W., & Quaadgras, A. (2012). *Enterprise architecture is not just for architects* (CISR Research Briefings, Issue.
- Ross, J. W., Weill, P., & Robertson, D. (2006). *Enterprise architecture as strategy: Creating a foundation for business execution*. Harvard business press.
- Ruef, M., & Scott, W. R. (1998). A multidimensional model of organizational legitimacy: Hospital survival in changing institutional environments. *Administrative science quarterly*, 43(4), 877-904.
- Saint-Louis, P., Morency, M. C., & Lapalme, J. (2019). Examination of explicit definitions of enterprise architecture. *International Journal of Engineering Business Management*, 11, 1847979019866337.
- Sambamurthy, V., Bharadwaj, A., & Grover, V. (2003). Shaping agility through digital options: Reconceptualizing the role of information technology in contemporary firms. *MIS quarterly*, 237-263.
- Schmidt, C., & Buxmann, P. (2011). Outcomes and success factors of enterprise IT architecture management: empirical insight from the international financial services industry. *European Journal of Information Systems*, 20(2), 168-185.
- Scott, W. R. (1994). Institutions and organizations: Toward a theoretical synthesis. In *Institutional environments and organizations: Structural complexity and individualism* (pp. 55-80). Sage.
- Scott, W. R. (2001). Institutions and organizations. In *Sekaran, U.(2003). Research Methods for Business, A Skill Building Process, 4th edn, NY: John Wiley. Seligman, J.(2002). 'No one can serve two masters: Corporate and securities law after Enron', Washington University Law Quarterly* (Vol. 80, pp. 449-518). Sage Publications.
- Scott, W. R. (2013). *Institutions and organizations: Ideas, interests, and identities*. Sage publications.
- Scott, W. R. (2014). W. Richard SCOTT (1995), Institutions and Organizations. Ideas, Interests and Identities. *M@ n@ gement*, 17(2), 136-140.
- Scott, W. R., Ruef, M., Mendel, P. J., & Caronna, C. A. (2000). *Institutional change and healthcare organizations: From professional dominance to managed care*. University of Chicago Press.
- Seo, M.-G., & Creed, W. D. (2002). Institutional contradictions, praxis, and institutional change: A dialectical perspective. *Academy of management review*, 27(2), 222-247.

- Sherer, P. D., & Lee, K. (2002). Institutional change in large law firms: A resource dependency and institutional perspective. *Academy of management journal*, 45(1), 102-119.
- Simon, D., Fischbach, K., & Schoder, D. (2013). An exploration of enterprise architecture research. *Communications of the Association for Information Systems*, 32(1), 1.
- Strang, D., & Meyer, J. W. (1993). Institutional conditions for diffusion. *Theory and society*, 22(4), 487-511.
- Suchman, M. C. (1995). Managing legitimacy: Strategic and institutional approaches. *Academy of management review*, 20(3), 571-610.
- Suddaby, R. R. (2003). *Field-level governance and the emergence of new organizational forms: The case of multidisciplinary practices in law*.
- Teo, H.-H., Wei, K. K., & Benbasat, I. (2003). Predicting intention to adopt interorganizational linkages: An institutional perspective. *MIS quarterly*, 27(1), 19-49.
- Van der Raadt, B., Bonnet, M., Schouten, S., & Van Vliet, H. (2010). The relation between EA effectiveness and stakeholder satisfaction. *Journal of Systems and Software*, 83(10), 1954-1969.
- Vinekar, V., Slinkman, C. W., & Nerur, S. (2006). Can agile and traditional systems development approaches coexist? An ambidextrous view. *Information systems management*, 23(3), 31-42.
- Weerakkody, V., Janssen, M., & Hjort-Madsen, K. (2007). Integration and enterprise architecture challenges in e-government: A European perspective. *International Journal of Cases on Electronic Commerce (IJCEC)*, 3(2), 13-35.
- Weiss, S., Aier, S., & Winter, R. (2013). Institutionalization and the effectiveness of enterprise architecture management.
- Winter, R. (2014). Architectural thinking. *Wirtschaftsinformatik*, 56(6), 395-398.
- Winter, R. (2016). Establishing 'architectural thinking' in organizations. IFIP Working Conference on The Practice of Enterprise Modeling.
- Yin, R. K. (2003). *Case study research design and methods* (Vol. 5). Sage.
- Zachman, J. A. (1987). A framework for information systems architecture. *IBM systems journal*, 26(3), 276-292.

## **Appendix – Papers**



## **Paper 1: Navigating Enterprise Architecture (EA) Definition: A Story of EA Adoption in a Public Sector Organization**

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# Navigating Enterprise Architecture (EA) Definition: A Story of EA Adoption in a Public Sector Organization

Research paper

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## Abstract

*Enterprise architecture (EA) is a strategic approach to manage the digital transformation processes in large-scale organizations. Organizations aim at providing a holistic view of business, technology, and information by adopting EA. Although EA is now well established as a practical digital transformation facilitator, some organizations fail to achieve its benefits. Due to its diverse nature, a lack of shared understanding of EA is one highly cited challenge in its literature. Indeed, during the EA adoption, each actor tries to define EA in a way that fulfills her/his own interests. Therefore, there is a risk of failing to achieve the organizational holistic view in this condition. Through a case study in one large-scale public-sector organization in Norway, we illustrate how different EA stakeholders influence EA's understanding. In addition, by adopting the organizational influence process theory, we explain the reason why EA failed in the studied case.*

*Keywords: Enterprise architecture (EA), Challenges, Organizational influence processes*

## 1. Introduction

Nowadays, one of the most important subjects in the information system (IS) literature is digital transformation and digital innovation in large-scale organizations, particularly in the public sectors (Ajer & Olsen, 2018a; Hjort-Madsen & Pries-Heje, 2009; Ojo et al., 2012). It is now well established that enterprise architecture (EA) is a popular approach to assist organizations in utilizing innovative technologies and new business models (Ajer & Olsen, 2018a). However, organizations have faced several challenges to gain the benefits of EA (Ajer & Olsen, 2018a; Banaeianjahromi & Smolander, 2016a; Isomäki & Liimatainen, 2008; Kotusev & Kurnia, 2019; Ylinen & Pekkola, 2018).

Due to EA practices' diverse nature, different types of organizational stakeholders are involved in EA adoption. Since the stakeholders come from different departments/organizational levels, a lack of shared understanding of EA has been identified as one of the EA challenges (Ajer & Olsen, 2018a; Dang & Pekkola, 2016b; Isomäki & Liimatainen, 2008). Therefore, each stakeholder tends to define EA in a way that meets her/his interests. Consequently, EA understanding is affected by stakeholders' influence and might result in EA adoption failure.

In their literature review, Saint-Louis et al. (2019) analyze explicit definitions of EA. They argue that "the literature presents various ways to approach EA, but they are not always complementary or nuanced and are sometimes in opposition." They believe that this situation may result in various challenges in terms of creating confusion and conflict about the goals of EA, the expectations of organizations from EA, and the way to practice it. However, although the explicit definition of

EA is missing in the literature, there is an agreement about the significant role of EA in making alignment between information technology (IT), information, and business strategy in organizations (Jonkers et al., 2006; Kaisler et al., 2005). Acknowledging that the lack of shared understanding has been cited as one of the EA challenges (Isomäki & Liimatainen, 2008), explaining how this challenge results in EA failure to provide a holistic view, can shed light on the importance of shared understanding to gain EA benefits. Hence, this paper aims at explaining how different stakeholders influence the EA adoption processes by applying their own understanding of EA. We perform this through a case study of one of the largest Norwegian municipalities (Gov). EA adoption was started in Gov more than seven years ago, but due to a lack of shared understanding of EA, the organization has not succeeded in achieving EA advantages. Therefore, this work attempts to respond to how lack of shared understanding negatively affects EA success.

In doing so, this paper adopts the organizational influence processes (OIP) theory (Ansari & Kapoor, 1987; Brass, 1984; Porter et al., 2003) to explain how individuals or groups try to influence other individuals or groups to obtain a specific goal. Therefore, this study contributes to research on EA challenges by demonstrating EA stakeholders' role in EA failure when they disagree on the EA definition and actively try to introduce it to the organization in a manner that meets their interests. Particularly, we suggest that since the enterprise architects have a significant role in EA adoption through bridging the gap between IT and business, if organizations aim to benefit from the EA advantages, the enterprise architects need to be released from both business and IT departments, and they need to have a trans-departmental position. Moreover, through this study, practitioners also gain deep insights into the role of stakeholders' power in succeeding in the EA adoption.

This paper is structured as follows. Section 2, a brief overview of the recent history of EA and its challenges. Section 3 describes the organizational influence processes (OIP) theory. Section 4 describes our research method, an overview of the case, data collection and analysis procedures. Section 5 describes the findings. Finally, Section 6 discusses our findings and concludes the paper.

## **2. Literature Review**

In this section, we first describe how EA practice is introduced in the literature. Then, we illustrate different identified steps of EA adoption and its stakeholders. Thereafter, we continue presenting some of the significant identified EA challenges and, more particularly, focusing on EA definition. Finally, we summarize the motivation behind the research question posed in this study.

EA is described as the collection of an organization's IT (and business) components and their interdependence, as well as efforts to align local and short-term investments with enterprise-wide and long-term strategic imperatives (Boh & Yellin, 2006; Haki et al., 2020b; Schmidt & Buxmann, 2011). Several terms are used to describe organizational benefits and problems of EA practice. The most common of which are "EA management" (Löhe & Legner, 2014; Schmidt & Buxmann, 2011), "EA programs" and "EA projects" (Alaeddini & Salekfard, 2013; Levy, 2014) or only "enterprise architecture" (Bradley et al., 2011; Dang & Pekkola, 2016b). In their case study of challenges of government EA work, Isomäki and Liimatainen (2008) also expressed that organizations can use EA as an umbrella for illustrating the relationships between the projects and managing change rather than of only thinking to implement ICT. Hence, EA has become a popular in IS literature in which it needs to be defined correctly among organizational stakeholders.

Through the EA adoption process, EA becomes a normal organizational process (Iyamu, 2009; Weiss et al., 2013). Numerous studies have attempted to explain the EA adoption process in organizations (for example, Armour & Kaisler, 2001; Banaeianjahromi, 2018; Banaeianjahromi & Smolander, 2019; Dang & Pekkola, 2019b). In their study, Armour and Kaisler (2001) classified it in five stages: initiating the process, characterizing the baseline architecture, developing the target architecture, planning the architecture transition, and planning the

architecture implementation, while Banaeianjahromi and Smolander (2019) recognized three stages: pre-development, development, and post-development. More recently, Dang and Pekkola (2019b) suggested two main stages for EA adoption, EA initiation, and EA implementation.

Due to the broad nature of EA activities, considering the role of stakeholders in investigating EA adoption is essential. Niemi and Pekkola (2017) defined EA stakeholders as people who interact with EA. This involves both individuals and groups. Niemi (2007) classified EA stakeholders as those producing EA artifacts (e.g. architects and projects), those using them (e.g. architects, projects, IT organization and management) and those facilitating EA artifact production and usage (i.e. management). Fonstad and Robertson (2006) also categorized all EA stakeholders based on two dimensions. First, EA stakeholders belong to the business or IT stakeholders. Second, EA stakeholders can be part of the enterprise, business unit, or project level. Thereby, they suggest six main groups of EA stakeholders with different objectives.

Despite its promising goals, EA adoptions have suffered various challenges. In a study to discover critical issues in enterprise architecting, Lucke et al. (2010) observe that lack of management commitment, poorly experienced architects, the difficulty of requirements understanding in the EA teams, insufficient tool support, and rapidly changing environmental conditions are the important challenges. In another case study, Ajer and Olsen (2018a) state that the organizational units' autonomy, lack of financial support for national objectives, lack of understanding of EA and holistic thinking are the main challenges in the Norwegian public sector. Kurnia et al. (2020) also in their study note the EA initiatives blockers as follows: lack of experienced architects, the inadequate resources to develop complete EA documentation, communication challenges, and organizational politics. Similarly, Banaeianjahromi and Smolander (2016a) classify 20 identified obstacles to benefit from EA into five groups: political issues of the government, EA consultant related issues, outdated organizational statutes, constant change of management, and inefficient human resource department.

Moreover, the definition of EA is another subject of debate in the literature. For example, it is stated that EA can broadly be defined as an approach for managing organizational complexity (Weiss et al., 2013), developing business (Tamm et al., 2011), or driving digital transformation (Ajer & Olsen, 2018a) in the organization, by consciously managing organizational resources towards a strategically desirable future. Also, Gartner (2009) describes EA as "the process of translating business vision and strategy into effective enterprise transformation by creating, communicating, and improving the key principles and models that describe the enterprise's future state and enable its evolution". More particularly, Saint-Louis et al. (2019) have illustrated how EA is defined and understood in their recent literature review. Exploring 102 journal articles and extracting 160 definitions, they demonstrate different definitions and understandings of EA. In the same vein, Lapalme et al. (2016) also states that the definitions of EA "in terms of scope and purpose" are not clear in the literature. Despite all EA definition challenges, it seems there is a common agreement on the role of EA in the alignment of organizations' business capabilities, information and information technology (IT) to a common goal (Niemi & Pekkola, 2017; Tamm et al., 2011).

In a study conducted by Janssen (2012), it is explained that EA can be understood by stakeholders in different forms to meet their own goals and interests. Over time architecture is developed by a broad range of stakeholders, all exercising some influence. He explains that EA stakeholders influence the EA adoption informally or formally by applying decision-making procedures and routines. He describes that each stakeholder aims to seek specific goals from their point of view. However, EA should meet organizational goals, which might require balancing the different interests in an integral form. Hence, since there are many various stakeholders involved in EA activities and all have their own objectives, the alignment and integration need to go beyond the definition of models at various levels in order to reach an understanding of each other's needs and requirements. Jusuf and Kurnia (2017) also mention that having a shared and adequate understanding of EA by all stakeholders is essential. In this vein, Isomäki and Liimatainen (2008)

also express that without a shared understanding, organizations can not holistically improve their business.

Although EA adoption challenges have been studied extensively in the literature, it seems there are few efforts to discover how each mentioned challenge reveals during the adoption process. Therefore, because the lack of a shared understanding of EA among stakeholders might significantly result in EA failure, more investigations on how each stakeholder can influence EA understanding throughout the adoption processes are needed.

### **3. Theory**

In the theory of organizational influence processes (OIP), the networks of social actions are studied. This theory has been used in IS literature to study the role of organizational actors in IT projects (Nordheim & Nielsen, 2008; Setterstrom, 2016). Based on Porter et al. (2003), an individual or group tries to influence other individuals or groups to obtain a specific goal. They argue that because organizational actors depend on each other for their achievements, all organizational activities are affected by organizational influence processes. There is a different definition between power and influence in the theory of organizational influence processes. Power is assumed as a resource of force, while influence is the actual application of that.

The factors, such as the position of actors in the organizational hierarchy and on resources and organizational conditions, enable organizational actors or groups to influence another (Ansari & Kapoor, 1987; Brass, 1984). In this vein, Hickson et al. (1971) also emphasize that the power is gathered to departments with control over critical events in an organization's operations.

Based on Porter et al. (2003) suggestion, power is divided into two subsets: position power and personal power. As discussed in their study, reward power, coercive power, and legitimate power are three main types of position power, and personal power includes referent and expertise power.

Blau (2017), in his book titled exchange and power in social life, argues that reward and evaluation structures play an important role in organizations due to their impact on individuals' motivation and behaviors. Indeed, an actor or group who are able to offer higher rewards in exchange will have a higher power. In contrast with reward power, in the coercive power, the punishment is a tool to influence actors' behavior (French et al., 1959). Coercive power is a risky practice due to its potential for retaliation (Ireland & Webb, 2007). Porter et al. (2003) also describe legitimate power as a type of power based on the target's belief that the influence originator has the right to issue directives, usually related to the position.

As mentioned above, personal power consists of referent and expertise power. In the literature, referent power refers to a condition that the power results from social popularity and prestige and is strongly related to the social networking concept of tie density. Based on this type of power, actors influence each other based on the identification others have with them (French et al., 1959). In this regard, it is said that when a person is popular among others, s/he plays a central position in the context, therefore s/he is considered to be important for accessing and sharing knowledge within a network (Hickson et al., 1971). Also, expertise is another type of personal power that points to business expertise and technical expertise, depending on the context (Swan et al., 1999). In the IS literature, Harris and Mennecke (2011) describe business expertise as knowledge of business processes connected with the IS system use and technical expertise as knowledge of how the IS processes function.

In their framework, Porter et al. (2003), proposed three general direct influence processes. Based on this framework, while downward influence indicates that the influencer is at a higher organizational level than the potential target, lateral influence indicates that there is no clear hierarchical difference between the two parties involved. Moreover, upward influence demonstrates that the influencer is at a lower organizational level than the potential target (Nordheim & Nielsen, 2008).

## 4. Method

Based on the research objective, we chose a single-case study to understand how a phenomenon (EA failure) happens in a real-world setting (Yin, 2003b). Thus, we found the criticality and relevance of the case organization in order to obtain illuminating insights (Yin, 2003b). To address our research question, we needed to select a case in which (1) EA practices had previously been incorporated into organizational practices, (2) EA practices had already lost their credibility and were no longer performing as organizational practices, and (3) appropriate historical information was available, especially through knowledgeable members of the organization.

### Case description

We chose Gov, a large municipality in Norway, based on the case selection criteria. Since the Norwegian government is committed to achieving the goals of a "one digital public sector," municipalities have also committed to offering digital services to their residents. Gov is divided into six sections, each of which is in charge of a different aspect of municipal services. The administration section is the central organizational unit that manages and provides services to all other sections. The Digitalization Program is a temporary program launched in 2013 in response to a government recommendation to coordinate all Gov's IT projects.

Each organizational section, according to the Gov structure, has its own IT department in charge of managing its IT needs and projects. Additionally, the administration section houses a central IT department. The central IT department coordinates all small IT departments within the various sections and handles the Gov's local projects. Due to the organizational position of the central IT department, and thus the IT manager, the administration section manager's decisions are influenced by the IT manager. Two additional persons who contribute to decision-making in the administration section are the portfolio manager, who is responsible for allocating financial resources to the projects, and the leader of the Digitalization Program. The central IT department lacks sufficient internal IT architects to support all IT projects across various sections. As a result, each project manager hired a temporary IT architect to focus on the requirements of the corresponding local project. A serious problem concerning external IT architects is a lack of organizational knowledge. Over 30 IT architects (internal/external) work with the Digitalization Program to coordinate project activities. To do this, the central IT department collaborates with the Digitalization Program.

Adopting EA to coordinate digitalization processes was discussed prior to the establishment of the Digitalization Program; however, the Digitalization Program's establishment prompted Gov to adopt EA. As a result, EA practices were integrated into the work of the Digitalization Program. Between 2013 and 2019, Gov hired several enterprise architects to implement TOGAF principles. However, Gov no longer performs EA practices. Enterprise architects were intended to be a central focus for enterprise-wide topics and to integrate local IT projects. Nonetheless, they have been more involved in IT project tasks in recent years (as of 2016). As a result, no EA practices have been carried out since this date.

Numerous changes have occurred over the past few years that have had an impact on the digitalization processes. For example, the initial leader of the Digitalization Program, who was one of the first to work on the implementation of TOGAF principles in Gov, was promoted to portfolio manager. Additionally, the IT manager and thereafter the structure of the central IT department were changed. In 2013, there were no subsections within the IT department, and the IT manager supervised all architects directly. Following the change in IT management, the central IT department established a new subsection called the architecture department, which housed both enterprise and IT architects.

Besides this, three distinct types of organizational plans are used to organize organizational activities: long-, mid-, and short-term plans. The 12-year long-term plan has a major effect on the

Gov's digitalization strategy. As of 2020, Gov is preparing a new long-term organizational plan. Figure 1 shows the organizational hierarchy in Gov related to EA activities.

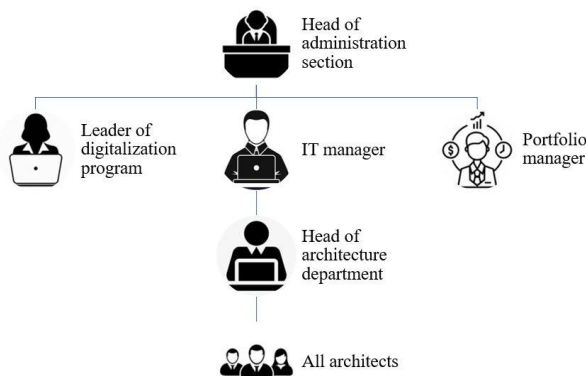


Figure 1. Organizational hierarchy in Gov related to EA activities

has resulted in establishing a new organization. Due to Gov's responsibility to support this new organization, one enterprise architect from Gov has been sent there to help them in realizing the needs of Gov in the project (new organization). This enterprise architect has a responsibility to ensure that the Gov's principles and standards are followed. It is interesting to mention that Gov has had only one enterprise architect at that time. Currently, the title of the enterprise architect has been given to an information architect. S/He works on different projects, therefore, cannot spend enough time on EA activities. Figure 2 shows an abstract overview of organizational structure and the Digitalization Program position and EA in Gov.

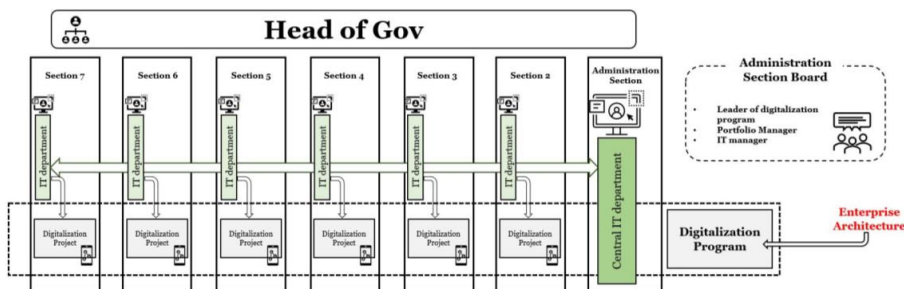


Figure 2. An overview of the organizational structure of Gov

### Data collection

The data collection period began in September 2019 and finished in October 2020. We collected primary and secondary data through semi-structured interviews and focus group workshops (primary data collection), as well as through existing documentation (secondary data collection).

The data collection process started with the gathering and processing of internal and public documents on digitalization, architectural practices, and principles. Internal documents numbered in the range of 600 pages and included project reports, presentations, historical emails, and the internal portal. Public documents included statements, regulations, and policies by national authorities relevant to digitalization, from 2009 till 2020, with a particular emphasis on the last three years. This step provided us with historical background for EA practices, especially at Gov and in the Norwegian public sector.

Furthermore, we collected data through semi-structured interviews (Eisenhardt, 1989). To begin, an informal interview with the leader of the Digitalization Program provided us with background for the case. In total, 14 semi-structured interviews ranging in length from 80 to 150 minutes each were conducted. Each interview was recorded and transcribed. Before the interviews, informants were provided with a consent form and an overview of the interview questions' main topics. We started the interviews with one enterprise architect and then used snowball sampling to select the remaining informants (Paré, 2004a). Since information about the previous seven years (since EA was introduced in Gov) was required, we explicitly contacted informants who were involved in the implementation of the EA practices in Gov. Finally, the informants included the Digitalization Program's leader (1), portfolio manager (1), project managers (3), architecture department manager (1), IT architects (5), and enterprise architects (3).

Additionally, we held three focus group workshops in Gov. These workshops aimed to complement our understanding of the case by stimulating discussion among several informants on the topics of interest. The first two workshops focused on sharing our understanding of the case situation based on Gov's document analysis and recent discourses in the EA literature. We organized a third session later in the study, during which we presented our results to participants and requested their feedback. We held workshops for approximately 6 hours with 15 participants (11 individuals), including the portfolio manager, the leader of the Digitalization Program, IT architects, the architecture department manager, and project managers. Moreover, these workshops were recorded and transcribed with permission. Table 1 summarizes the data collection methods used.

Data Collection Technique	Source
Existing Documents	<ul style="list-style-type: none"> <li>• Internal documents, over 600 pages including project reports, presentations, historical emails, and the internal portal</li> <li>• Public documents ranging from 2009 till 2020, with a particular emphasis on the last three years including statements, regulations, and policies by national authorities relevant to digitalization</li> </ul>
Semi-Structured Interviews	<ul style="list-style-type: none"> <li>• 14 interviews lasting from 80 to 150 minutes with Digitalization Program's leader (1), portfolio manager (1), project managers (3), architecture department manager (1), IT architects (5), and enterprise architects (3)</li> <li>• Over 100 pages of interview transcripts</li> </ul>
Focus Group Workshops	<ul style="list-style-type: none"> <li>• 3 workshops, approximately 6 hours in total</li> <li>• Over 20 pages of workshop transcripts</li> <li>• 15 participants (11 individuals) including portfolio manager, leader of the Digitalization Program, IT architects, architecture department manager, project managers</li> </ul>

Table 1. Overview of Data Collection Techniques

## Data Analysis

According to our qualitative approach, we conducted data collection and data analysis steps in parallel (Eisenhardt, 1989). That is, the early analysis of the first stage interviews prompted the subsequent series of interviews to include new or complementary questions. Nonetheless, since our approach was influenced by organizational influence processes (OIP) theory, our data analysis was guided throughout by a coding scheme derived from the concept of EA stakeholders and OIP, including position power (reward, coercive, and legitimate power), personal power (referent and expert power), and influence direction (downward, lateral, and upward). In fact, in this study, three different understandings of EA were recognized that each one supported by a group of stakeholders. These groups of stakeholders included the IT department, enterprise architects, and the portfolio manager. Additionally, we developed a coding guideline (based on the coding scheme) that provides definitions and examples for each of the constituent items of the coding scheme.

We transferred all interview and workshop transcripts, as well as relevant existing documents, to NVivo 12 pro in order to perform data coding. The data is coded in accordance with the coding scheme. Along with the constituent items of the coding scheme, we classified architectural practices data into two categories: project and enterprise. At the project level, architectural practices contribute to the fulfillment of requirements for local IT projects. At the enterprise level, architectural practices have recommendations and decision-making materials for IT strategy and portfolio management processes. Thus, we monitored EA failures via discontinued enterprise-wide practices. The main author coded the scheme after reaching an agreement on the meanings of each of the coding scheme's constituent items. The co-authors then took on the position of the devil's advocate, proposing alternate interpretations and counterarguments. After establishing a proper degree of agreement, the data were coded.

## 5. Empirical Findings

### Different understandings of EA

The subject of what EA's function is and where and how it can contribute to digitalization in Gov, even after seven years, still was a debate and challenge. The evidence of a lack of shared understanding of EA could be clearly seen in informants' responses during the interviews. There were two extremely different opinions, and one idea in between. While the portfolio manager commented that EA comes from the business side, the IT department believed EA is part of IT activities. Indeed, the portfolio manager argued that EA should capture and find business opportunities, and then IT capabilities should support the business goals. By contrast, the IT department believed that EA is originally a type of IT activity to assist the business goals based on its abilities. Additionally, enterprise architects supported a third view, somewhere in between the two-pointed extremes, about the meaning of EA. It's worth noting that, despite being employed by the IT department, enterprise architects' views varied from those of the majority of IT department employees. Thus, when we refer to the IT department's opinion, we refer to the majority view held by influential members of this department, while enterprise architects held their own.

Although three different opinions were discovered through interviews potentially, one of them worked in Gov, practically. The existing idea was a definition close to the IT department's view. To find out how the IT department's opinion has gotten more accepted in Gov, we asked informants how they understand EA, what they have done to convince others about their idea, and the extent to which they have succeeded.

*"When we are talking about TOGAF and EA here, people are thinking about IT more. I think an enterprise architect is a person closer to the management level. It means it should not be seen as an IT person; it should be more a strategic person. (...) Now*



*architects are in the third or fourth (organizational) level, in the IT department, and it is very complicated to bring it up to the strategic level"* (Portfolio Manager)

However, the people who worked in the IT department considered EA practices as a type of IT activity. Therefore, they perceived a proper position and situation for EA practices in Gov.

*"I think EA's progress has been good enough for these seven years. (...) We have an architectural group. In this group, we (internal architects) gather together and discuss our challenges to find a solution. (...) However, we do not have any authority to stop the project. (...) We try to find a solution. If we inform the top managers, and then because of the political issue, they do not consider our comments, that is okay for us because they have accepted the consequence of this decision. (...) Because both the IT manager and portfolio manager have an IT background, I think just giving feedback and informing without any power to stop the projects can be enough"* (Architecture Department's Manager)

Although enterprise architects also worked in the architecture department placed in the IT department, the enterprise architects' opinion concerning EA practice did not support the main idea in the IT department. They had different opinions concerning EA practices. They assumed both roles, operational and strategic, for EA practices. They argued that Gov needs a virtual position for EA practices in the organizational structure close to the top/strategic level. The enterprise architects should directly relate and communicate with all IT projects. They also have to provide signature-ready advice for strategic decisions. By inspiring "*The Architect Elevator*" (Hohpe, 2015), they had prepared a proposal and explained how this idea could contribute to digitalization in Gov.

### **Realizing actors' interest concerning EA**

The portfolio manager believed that the framework, words, and concepts of EA are complicated and hard to understand for managers. Therefore, s/he could not convince others, especially the head of the section, to apply her/his idea concerning EA in Gov. S/he said that "*although several times, in different ways, I have tried, no positive results have been achieved.*" However, because s/he played a significant role in the administration section by assigning the resources to the projects, s/he deemed solving this challenge by pushing his/her idea in the new organizational plan.

*"I believe without solving the challenge between the IT view and Business view; we can place EA in the right position. We should solve it officially. We had this challenge with IT information security, and it was solved by changing the position"* (Portfolio Manager)

The majority of participants noted that the IT department worked more in IS maintenance rather than IS development. Yet, due to this significant role, the IT department had received a considerable position in Gov. Hence, the head of the administration section considered the IT manager's advice perfectly. Furthermore, the IT department staff also believed their manager (IT manager) supported their jobs properly. More particularly, the IT architects believed the architectural concerns are supported by the IT manager. Although most of the IT department staff felt the IT manager supported their jobs, the enterprise architects did not feel the same. It is worth mentioning that at the time of data collection, no enterprise architect worked there. One of them had left Gov, and the other had been sent to the joint project. The third one also was not an enterprise architect. S/he was an information architect who had gotten the title of the enterprise architect.

The enterprise architects said that no one understands and supports the importance of EA practices. They approved that architectural concerns are followed at the project level, but at the

enterprise-level had been forgotten. Although they worked in the IT department, the IT manager did not support or supervise their work. They also complained about the lack of financial resources for hiring IT architects. They said because the portfolio manager does not assign enough money to hire new IT architects, we have to work more at the project level rather than at the enterprise level. They argued that enterprise architects need a sort of authority, as they are responsible for providing a holistic view of the organization. However, they observed that since the only matter of importance for project managers is budget and planning, they cannot convince people involved in the project about their advice. In addition, assigning the external architects to the project had caused some challenges. The majority of the time of enterprise architects was spent educating these external architects. Yet, due to the importance of budget and planning for project managers, the enterprise architects' advice was not considered by the external architects.

*"The challenges of enterprise architecture's role are not just related to where s/he should work; rather there is a question that do we (Gov) really need? ... as the enterprise architect, I was not given specific tasks. I created a website myself. It was only my idea, and I believe the IT manager has not seen that even once. S/He always mentioned that I heard you created a good website, which I should take time to have a look at"* (Enterprise Architect)

*"When we contribute to making a better alignment between IT and Business, we do it because we want it, not because it is measured! This is very difficult in Gov because the colleagues are measured with the product. Many people are measured by, you are very successful by leading the project to live. (...) but how are your successes in EA measured? It is not easy!"* (Enterprise Architect)

Surprisingly, despite both enterprise architects and the portfolio manager presumed a similar role for EA, and both believed EA practices need to be close to the strategic level; they had never spoken together about this topic. The enterprise architects said they invited the portfolio manager to their architectural meeting, but s/he did not attend. In addition, although the portfolio manager believed the EA deliveries were essential input for her/his job, s/he did not involve her/himself in the architectural works due to the strong conflict with the IT manager regarding the EA positioning. S/he also assumed that all architects who worked there were IT architects and emphasized that they needed enterprise architects who considered business goals.

Enterprise architects also by proposing the idea of "The Architect Elevator," aimed to establish their opinion concerning EA practices in Gov. In this proposal, they had explained how the architect elevator could facilitate the digitalization and innovation process. However, after sending the proposal to the IT manager, they received only one sentence as a response that *it is a good idea, but it is not the right time*. The portfolio manager had not been informed about this proposal. Table 2 presents different actions that have been applied to define EA by influential actors in Gov.

## 6. Discussion and Conclusion

The broad nature of EA activities (Banaeianjahromi & Smolander, 2016a; Dang & Pekkola, 2016b; Kotusev & Kurnia, 2019; Olsen & Trelsgård, 2016) has made it a difficult concept to understand, particularly for top-level managers. As a result, there is a strong potential to introduce or define EA to the organizations in a way that may cause it to not achieve its advantages in providing a holistic view. This section discusses how EA definition navigated in this study and shows how this navigation affected EA adoption processes.

Although three different views were identified in order to EA definition, only one of them succeeded in selling its opinion about EA definition to the organization. The portfolio manager, IT department, and enterprise architects were three active actors, among others, involved in EA adoption who influenced the processes of EA adoption. Based on OIP, factors such as the position

of actors in the organizational hierarchy and on resources and organizational conditions enable organizational actors or groups to influence another (Ansari & Kapoor, 1987; Brass, 1984). Hence, the portfolio manager who was in charge of assigning money to the projects, controlled the financial resource. The IT department, because of its organizational responsibilities and position, had a significant influence on the administration section's decisions. Also, the enterprise architects worked in the IT department, first supervised by the IT manager and then by the architecture department's head. Although enterprise architects worked in the IT department, they had a different opinion about EA than other IT department staff. The interactions of these three actors influenced EA adoption processes.

The contradiction between the IT manager as the head of the IT department and the portfolio manager was evident among the interviews. Because both of them worked at a similar organizational level, we can say the direction of influence of them on each other was the lateral (Porter et al., 2003). Besides, the direction of the organizational influence between the IT manager and enterprise architects was downward (Porter et al., 2003) because enterprise architects were supervised by the head of the architecture department, where it was part of the IT department. The IT manager was very expert in her/his job concerning IT support. The majority of employees who worked with/in the IT department mentioned her/his expertise, and they were happy to work with the IT manager. Hence, the IT manager had the expertise (Swan et al., 1999) and referent (French et al., 1959) power due to her/his technical knowledge and position among the employees. Moreover, due to her/his role in assigning resources to the projects, the portfolio manager had a legitimate power as well (Porter et al., 2003). S/he influenced the digitalization process through her/his right to assign money to projects. But, due to their organizational hierarchy, the enterprise architects did not have any organizational authority in the EA adoption process.

Influential actors in EA adoption in Gov	EA definition	Actions to apply the idea
Portfolio Manager	EA is a business and strategic activity that IT capabilities should support	Several times had tried to place EA at the top level but could not convince the head of the administration section. Aimed to place EA at the top level through the new organizational plan.
IT Department	EA is a type of IT activities to support business goals based on its abilities	IT manager had a significant influence on the organizational decision. IT manager had not sent the enterprise architect's proposal to the portfolio manager or head of the administration section. Located enterprise architects in the architecture department placed in the IT department.
Enterprise Architects	EA is a strategic activity with a direct relation and communication, with all IT projects	They had no organizational power. The only active enterprise architect had been sent to other organizations

Table 2. Actions of influential actors to define EA in Gov

In this study, although the enterprise architects and portfolio manager's opinion were similar in terms of EA organizational positioning, the IT department's idea was succeeded to be accepted by the administration section's manager. In fact, the following barriers and events influenced the navigation of EA definition, which also resulted in EA failure in the end.

The enterprise architects felt that the portfolio manager did not assign money for hiring more architects, to work on the projects, on purpose. Therefore, enterprise architects never thought that they might have a similar perspective with the portfolio manager regarding EA positioning in the organizational hierarchy. Besides, although one of the enterprise architects had proposed a strategic position for EA through a virtual department, the IT manager had not sent it to the section's manager or let the portfolio manager know. Consequently, the portfolio manager also deemed that all architects there are IT architects. Therefore, the portfolio manager argued that they need enterprise architects who have business considerations. The IT department also had a significant role in the organization, and the IT manager also was a knowledgeable person. S/he had a considerable impact on organizational decisions. Moreover, the concepts and terms in TOGAF were difficult to understand. Therefore, altogether the above reasons caused the portfolio manager to not assign resources for hiring new architects. As a result, the last enterprise architect was forced to be sent outside the organization for contributing to the joint project with another organization, and EA adoption was stopped.

The three identified actors had different interests and responsibilities concerning EA adoption. While the IT department and the portfolio manager sought to fulfill their organizational needs, in terms of IT and business requirements, the enterprise architects were responsible for bridge the gap between IT and business (Dang & Pekkola, 2017) by facilitating communication among all stakeholders (Niemi & Pekkola, 2017). To this end, all of them had a common agreement on the important role of EA in aligning between IT, information and business strategy, which is in line with EA literature as well. However, their various ways of thinking about EA definition resulted in serious competition in convincing the section's manager and others about their own idea. This disagreement was the main reason for lacking the cooperation between them (Saint-Louis et al., 2019). In fact, although enterprise architects' opinion was an idea between two other ideas and might be able to build cooperation among all stakeholders, they could not make it due to the lack of organizational power.

Accordingly, we argue that influential organizational actors as the IT project stakeholders can navigate the IT projects' direction due to their organizational power and influence, which might cause its failure as well. In this study, in line with the literature, we shed brilliant light on the importance of a common and shared understanding of EA among all stakeholders to obtain successful results. We showed how stakeholders' organizational power affects EA processes. Hence, this study contributes to the literature by showing the importance of enterprise architects' positioning in the organizational hierarchy. Remarkably, we suggest that since the enterprise architects have a significant role in EA adoption through bridging the gap between IT and business, if organizations aim to benefit from the EA advantages, the enterprise architects need to be released from both business and IT departments. Although IT has become significantly important for organizations, the collaboration of IT and business is crucial. Therefore, since EA is assumed to play the role of "communication facilitator" to contribute to digital transformation in organizations, it needs to have a trans-departmental position. In fact, positioning enterprise architects on each side of the organization may cause a failure in fulfilling the interests of another side, which might enhance the risk of failure.

This study's main limitation was that while the contradiction between the IT manager's and the portfolio manager's opinion was one of the most important EA failure factors, we could not talk to the IT manager. Hence, we had to interpret others' opinions about the IT manager's actions. Also, since due to the diverse nature of EA processes, various stakeholders need to cooperate together, more study on the role of enterprise architects to make cooperation in order to build a shared understanding is suggested, particularly when enterprise architects have some organizational power as well.

## 7. Acknowledgment

We are deeply grateful to all the professionals who agreed to participate in the study. This research was supported by the Norwegian Research Council (pr. nr. 811475008).

## 8. References

- AJER, A. K. & OLSEN, D. H. 2018. Enterprise Architecture Challenges: A Case Study of Three Norwegian Public Sectors.
- ALAEDDINI, M. & SALEKFARD, S. 2013. Investigating the role of an enterprise architecture project in the business-IT alignment in Iran. *Information Systems Frontiers*, 15, 67-88.
- ANSARI, M. A. & KAPOOR, A. 1987. Organizational context and upward influence tactics. *Organizational behavior and human decision processes*, 40, 39-49.
- ARMOUR, F. J. & KAISLER, S. H. 2001. Enterprise architecture: Agile transition and implementation. *IT professional*, 3, 30-37.
- BANAEIANJAHROMI, N. Where enterprise architecture development fails a multiple case study of governmental organizations. 2018 12th International Conference on Research Challenges in Information Science (RCIS), 2018. IEEE, 1-9.
- BANAEIANJAHROMI, N. & SMOLANDER, K. 2016. Understanding obstacles in enterprise architecture development.
- BANAEIANJAHROMI, N. & SMOLANDER, K. 2019. Lack of communication and collaboration in enterprise architecture development. *Information Systems Frontiers*, 21, 877-908.
- BLAU, P. 2017. *Exchange and power in social life*, Routledge.
- BOH, W. F. & YELLIN, D. 2006. Using enterprise architecture standards in managing information technology. *Journal of Management Information Systems*, 23, 163-207.
- BRADLEY, R. V., PRATT, R. M., BYRD, T. A. & SIMMONS, L. L. 2011. THE ROLE OF ENTERPRISE ARCHITECTURE IN THE QUESTFORIT VALUE. *MIS Quarterly Executive*, 10.
- BRASS, D. J. 1984. Being in the right place: A structural analysis of individual influence in an organization. *Administrative science quarterly*, 518-539.
- DANG, D. & PEKKOLA, S. 2019. Institutional Perspectives on the Process of Enterprise Architecture Adoption. *Information Systems Frontiers*, 1-13.
- DANG, D. D. & PEKKOLA, S. 2016. Root Causes of Enterprise Architecture Problems in the Public Sector. *PACIS*, 287.
- DANG, D. D. & PEKKOLA, S. 2017. Systematic Literature Review on Enterprise Architecture in the Public Sector. *Electronic Journal of e-Government*, 15.
- EISENHARDT, K. M. 1989. Building theories from case study research. *Academy of management review*, 14, 532-550.
- FONSTAD, N. O. & ROBERTSON, D. 2006. Transforming a company, project by project: The IT engagement model. *MIS Quarterly Executive*, 5.
- FRENCH, J. R., RAVEN, B. & CARTWRIGHT, D. 1959. The bases of social power. *Classics of organization theory*, 7, 311-320.
- GARTNER 2009. Gartner Identifies Ten Enterprise Architecture Pitfalls. Egham, UK.
- HAKI, K., BEESE, J., AIER, S. & WINTER, R. 2020. The Evolution of Information Systems Architecture: An Agent-Based Simulation Model. *MIS Quarterly*, 44.
- HARRIS, A. & MENNECKE, B. 2011. Power Interactions in Enterprise System Assimilation. *Power*, 8, 7-2011.
- HICKSON, D. J., HININGS, C. R., LEE, C. A., SCHNECK, R. E. & PENNING, J. M. 1971. A strategic contingencies' theory of intraorganizational power. *Administrative science quarterly*, 216-229.
- HJORT-MADSEN, K. & PRIES-HEJE, J. Enterprise architecture in government: Fad or future? 2009 42nd Hawaii International Conference on System Sciences, 2009. IEEE, 1-10.
- HOHPE, G. 2015. *The Architect Elevator* [Online]. Available: [https://www.enterpriseintegrationpatterns.com/ramblings/79\\_elevator.html](https://www.enterpriseintegrationpatterns.com/ramblings/79_elevator.html) [Accessed].

- IRELAND, R. D. & WEBB, J. W. 2007. A multi-theoretic perspective on trust and power in strategic supply chains. *Journal of Operations management*, 25, 482-497.
- ISOMÄKI, H. & LIIMATAINEN, K. Challenges of government enterprise architecture work-stakeholders' views. International Conference on Electronic Government, 2008. Springer, 364-374.
- IYAMU, T. The factors affecting institutionalisation of enterprise architecture in the organisation. 2009 IEEE Conference on Commerce and Enterprise Computing, 2009. IEEE, 221-225.
- JANSSEN, M. 2012. Sociopolitical aspects of interoperability and enterprise architecture in e-government. *Social Science Computer Review*, 30, 24-36.
- JONKERS, H., LANKHORST, M. M., TER DOEST, H. W., ARBAB, F., BOSMA, H. & WIERINGA, R. J. 2006. Enterprise architecture: Management tool and blueprint for the organisation. *Information systems frontiers*, 8, 63-66.
- JUSUF, M. B. & KURNIA, S. Understanding the Benefits and Success Factors of Enterprise Architecture. Proceedings of the 50th Hawaii International Conference on System Sciences, 2017.
- KAISLER, S. H., ARMOUR, F. & VALIVULLAH, M. Enterprise architecting: Critical problems. Proceedings of the 38th Annual Hawaii International Conference on System Sciences, 2005. IEEE, 224b-224b.
- KOTUSEV, S. & KURNIA, S. 2019. The Problem of Engagement in Enterprise Architecture Practice: An Exploratory Case Study.
- KURNIA, S., KOTUSEV, S., TAYLOR, P. & DILNUTT, R. Artifacts, Activities, Benefits and Blockers: Exploring Enterprise Architecture Practice in Depth. Proceedings of the 53rd Hawaii International Conference on System Sciences, 2020.
- LAPALME, J., GERBER, A., VAN DER MERWE, A., ZACHMAN, J., DE VRIES, M. & HINKELMANN, K. 2016. Exploring the future of enterprise architecture: A Zachman perspective. *Computers in Industry*, 79, 103-113.
- LEVY, M. 2014. 'Shelfware' or Strategic Alignment? An Enquiry into the Design of Enterprise Architecture Programs.
- LÖHE, J. & LEGNER, C. 2014. Overcoming implementation challenges in enterprise architecture management: a design theory for architecture-driven IT Management (ADRIMA). *Information Systems and e-Business Management*, 12, 101-137.
- LUCKE, C., KRELL, S. & LECHNER, U. 2010. Critical issues in enterprise architecting—a literature review.
- NIEMI, E. 2007. Enterprise architecture Stakeholders—a holistic view. *AMCIS 2007 Proceedings*, 41.
- NIEMI, E. & PEKKOLA, S. 2017. Using enterprise architecture artefacts in an organisation. *Enterprise Information Systems*, 11, 313-338.
- NORDHEIM, S. & NIELSEN, P. A. 2008. Enterprise system implementations: Organizational influence processes for corporate user representatives.
- OJO, A., JANOWSKI, T. & ESTEVEZ, E. Improving Government Enterprise Architecture Practice--Maturity Factor Analysis. 2012 45th Hawaii International Conference on System Sciences, 2012. IEEE, 4260-4269.
- OLSEN, D. H. & TRELSGÅRD, K. 2016. Enterprise Architecture adoption challenges: An exploratory case study of the Norwegian higher education sector. *Procedia Computer Science*, 100, 804-811.
- PARÉ, G. 2004. Investigating information systems with positivist case research. *Communications of the association for information systems*, 13, 18.
- PORTER, L. W., ANGLE, H. L. & ALLEN, R. W. 2003. *Organizational influence processes*, ME Sharpe.
- SAINT-LOUIS, P., MORENCY, M. C. & LAPALME, J. 2019. Examination of explicit definitions of enterprise architecture. *International Journal of Engineering Business Management*, 11, 1847979019866337.
- SCHMIDT, C. & BUXMANN, P. 2011. Outcomes and success factors of enterprise IT architecture management: empirical insight from the international financial services industry. *European journal of information systems*, 20, 168-185.

- SETTERSTROM, A. J. 2016. IT Project Manager Decision-Making Authority: An Empirical Examination of Antecedents and Consequences.
- SWAN, J., NEWELL, S., SCARBROUGH, H. & HISLOP, D. 1999. Knowledge management and innovation: networks and networking. *Journal of Knowledge management*.
- TAMM, T., SEDDON, P. B., SHANKS, G. & REYNOLDS, P. 2011. How does enterprise architecture add value to organisations? *Communications of the association for information systems*, 28, 10.
- WEISS, S., AIER, S. & WINTER, R. Institutionalization and the effectiveness of enterprise architecture management. 2013. Association for Information Systems.
- YIN, R. K. 2003. Design and methods. *Case study research*, 3.
- YLINEN, M. & PEKKOLA, S. 2018. Enterprise Architecture as a Scapegoat for Difficulties in Public Sector Organizational Transformation.





## **Paper 2: Towards an Explanation for Why Enterprise Architecture Management Fails: A Legitimacy Lens**

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# *Towards an Explanation for Why Enterprise Architecture Management Fails: A Legitimacy Lens*

## *Completed Research Paper*

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**Abstract.** Enterprise architecture (EA) is an approach that manages complexities such as organizational structure, technology, and business by providing a holistic view of the organization to coordinate digital transformation efforts. While previous research has highlighted several challenges in taking advantage of EA, few empirical investigations explained how organizations should manage EA attempts to avoid failure. This paper aimed to explore the root causes of organizational challenges for EA management (EAM) by conducting a case study. Our findings illustrate inadequate legitimacy as a root cause of the organizational challenges, such as lack of shared understanding, stakeholders' engagement, and financial and management support, that needs to be managed over time. Particularly, we demonstrate that although pragmatic legitimacy can positively affect the EAM at early stages, regulatory legitimacy plays the primary role in EAM success. In addition, contradictory views and organizational bureaucracy are recognized as significant barriers to achieving normative and cultural-cognitive legitimacy.

**Keywords:** Enterprise Architecture (EA), Enterprise Architecture Management (EAM), Organizational challenges, Legitimacy theory

## **1 Introduction**

As organizations continue to invest in digitalization and transformation, IT managers and IS scholars alike seek structured strategies and approaches for managing the increasing complexity of their digitalization initiatives and addressing the uncertainty associated with an enterprise-wide transformation roadmap (Haki et al., 2020b; Haki & Legner, 2020). Enterprise Architecture (EA) is an approach that has gained great interest in both research and practice. EA is described as the collection of an organization's IT (and business) components and their interdependence, as well as efforts to align local and short-term investments with enterprise-wide and long-term strategic imperatives (Boh & Yellin, 2006; Haki et al., 2020b; Schmidt & Buxmann, 2011). Moreover, the holistic process of managing activities such as planning, and development of EA is called enterprise architecture management (EAM) (Buckl et al., 2010; Hoogervorst, 2004; Labusch & Winter, 2013; Rahimi et al., 2017).

Despite EA's benefits, only a few studies have focused on the enterprise architecting process (Rolland et al., 2015). Other than that, a large number of studies on EA demonstrate that it is more difficult and challenging (Ajer & Olsen, 2018a; Banaeianjahromi, 2018; Banaeianjahromi & Smolander, 2016a; Hjort-Madsen, 2006; Isomäki & Liimatainen, 2008; Kotusev & Kurnia, 2019; Olsen & Trelsgård, 2016; Seppänen et al., 2018; Ylinen & Pekkola, 2018). Unsurprisingly, the majority of EA-related issues identified in this literature are organizational and social in nature

rather than technical (e.g., Ajer & Olsen, 2018a; Banaeianjahromi & Smolander, 2016a). Additionally, considering the numerous difficulties associated with EA, the primary question is how can organizations better manage such processes to avoid failure? Moreover, to what extent can EA at all be managed in contexts of emergent use and continuous development of new digital solutions? Hence, this paper aims at exploring *why EAM fails*. We accomplish this through a case study of one of the largest Norwegian municipalities (Gov) wherein EA was introduced to the organization in 2012, and EAM activities are currently stopped.

Theoretically, we use the legitimacy concept (Suchman, 1995) from institutional theory to shed light on how EA processes and management need legitimacy at various organizational levels among stakeholders in order to succeed. Indeed, the process of obtaining organizational support for IS projects is referred to as legitimization (Flynn & Du, 2012). As a consequence, achieving an appropriate level of legitimacy reduces stakeholder resistance to IT initiatives, which is a critical factor in achieving IS success (Mäki-Lohiluoma et al., 2016a).

Investigating the EA organizational challenges that led EAM to fail in our case study, we contribute to this growing research area by exploring the root cause of these challenges and illustrating how it led EAM to fail. We also argue that recognizing the root cause of EA organizational challenges is not only essential, but also need to be managed over time to reduce the chance of failure in EAM. The paper's remaining parts include a brief overview of EA's recent history and its challenges, the theory and method sections, empirical findings, and discussion section.

## 2 Research Background

The existing understanding of EA in the literature is diverse (Saint-Louis et al., 2019). Moreover, the recognized definitions of EA are not necessarily complementary but sometimes in conflict. It is now well-established from various studies that EA integrates with other organizational practices, while EA itself consists of a variety of diverse activities (Ahlemann et al., 2012; Kotusev, 2018; Ross et al., 2006). EA's organizational practices consist of different levels, such as top management level, middle management level, portfolio level, and project implementation level (Kurnia et al., 2020).

There are several descriptions for EA practices in organizations, including EA development, which refers to the process of developing initiatives, EA implementation, which refers to the process of implementing models and frameworks, and EA adoption, which refers to the way EA practices are incorporated in organizations (Dang & Pekkola, 2017). Additionally, enterprise architecture management (EAM) (Aier & Weiss, 2012; Hylving & Bygstad, 2019; Rahimi et al., 2017; Weiss et al., 2013) is a term that has been used in the literature to refer to the management activities associated with the installation, maintenance, and development of an organization's EA (Olsen & Trelsgård, 2016). Indeed, EAM is a management approach that provides a holistic understanding of the EA and coordinates EA activities such as planning, developing, and controlling (Buckl et al., 2010; Radeke, 2010) to ensure organizations meet EA principles properly (Hoogervorst, 2004; Rahimi et al., 2017).

EAM is not only a technological issue; it is also a social and political one to a large extent (Weiss et al., 2013). Due to the broad scope of EAM, a large number and diversity of stakeholders are involved in EAM processes (Dijkman et al., 2004; Kurpjuweit & Winter), which has impact on EAM's institutionalization in organizations. As a result, organizations find various challenges in achieving the benefits of EAM. Thus, actually paying attention to the quality of the EAM product, EAM infrastructure, EAM service delivery, and EAM organizational anchoring are identified as critical factors need to be considered for the success of EAM (Lange et al., 2016).

Researchers have been interested in EA challenges, and several have been identified, including a lack of management commitment, insufficiently experienced architects, difficulty of understanding requirements in EA teams, insufficient tool support, rapidly changing environmental conditions, EA consultant-related issues, outdated organizational statutes, and communication challenges (Ajer & Olsen, 2018a; Banaeianjahromi & Smolander, 2016a; Kurnia et al., 2020; Lucke et al., 2010). In addition, the root causes of the EA challenges in the public sector are also discovered as problems related to organizational structure, problems from the political influence, legislation and policies problem, and users' readiness problem to adapt EA products (Dang & Pekkola, 2016b).

Although extensive research has been carried out on EA challenges, little attention has been paid to discovering how EA organizational challenges accumulate and sometimes lead to EAM failure. Indeed, this knowledge can provide us a fundamental insight into the most effective ways of EAM, as adopting IS innovations are always surrounded by different challenges that need to be managed.

Following studies on other IS phenomena (e.g., Avgerou, 2000a; King et al., 1994; Mignerat & Rivard, 2009; Orlikowski & Barley, 2001), institutional theory has gained considerable attention in EA research to explore assimilating and institutionalizing EA practices in order to achieve the promised outcomes of EA (e.g., Brosius et al., 2018b; Dang, 2019; Dang & Pekkola, 2019b; Levy, 2019). Along with previous studies, we also examine the concept of legitimacy (Suchman, 1995), which is central to institutional theory (Meyer & Rowan, 1977). Legitimacy is widely recognized as a vital concept for accepting IS phenomena/practices in their context (e.g., Kaganer et al., 2010a; Teo et al., 2003a). Organizations must establish an appropriate level of legitimacy for their IS initiatives to secure the acceptance of initiatives in their context. To demonstrate how EAM fails in an organizational, we use four types of legitimacy criteria to develop our theoretical framework.

## **2.1 Theoretical Framework**

Legitimacy can be classified into four genetic stages: accepted, proper, debated, and illegitimate (Greenwood et al., 2017). The accepted state denotes a more passive evaluation state that reflects taken-for-grantedness, while the proper state denotes conclusions made by a more deliberate process. This distinction demonstrates that accepted organizations, in comparison to proper organizations, are those that are not evaluated actively or recently. The term "debated" refers to a state in which there is an ongoing disagreement within the social system. Disagreements often occur in this state between conflicting stakeholders or between dissident stakeholders and organizations. Debated also includes stakeholder questions or challenges regarding the organization's activities or underlying values. Finally, an organization is deemed illegitimate when the social system deems it inappropriate. In this case, the organization should be fully reformed or terminated.

Internal and external stakeholders determine and assess the legitimacy of the subject, whether consciously or unconsciously, by contrasting them to specific criteria or standards (Ruef & Scott, 1998a). The term "legitimacy provider" refers to stakeholders that assess legitimacy (Flynn & Du, 2012; Flynn & Puarunroj, 2006c), while the term "legitimacy seeker" refers to those who attempt to legitimize a particular phenomenon (Hussain et al., 2004). In IT projects, legitimacy seekers include project executives, project team members, and the project leader, while legitimacy providers include the IT project's beneficiaries, which include business partners, users, and top management (Flynn & Du, 2012). To evaluate legitimacy, four basic types of criteria are used including regulatory, pragmatic, normative/moral, and cultural-cognitive. Different types of legitimacy (e.g., moral legitimacy) gain when specific criteria (moral value) are commonly accepted upon within the social system (Greenwood et al., 2017).

**Regulatory legitimacy:** Considering that legitimacy is established by associating a social object with a specific feature of the institutional field, regulatory legitimacy is established by associating a new activity with symbolic systems (Ruef & Scott, 1998a). This alignment is typically accomplished by establishing new practices that conform to the domain's existing legal and quasi-legal rules and regulations (Scott, 2014). IS scholars have used regulative legitimacy in a variety of ways in their research, for example, by emphasizing that innovation succeeds when it is consistent with government and/or international IT policies and directives (Jang & Luo, 2000a), or by emphasizing that it aids in gaining agreement with relevant non-IT regulations and alleviates pressures placed on the adopter organization by resource-dominant organizations (Teo et al., 2003a).

**Pragmatic legitimacy:** Pragmatic legitimacy is built on the self-interest of an organization's most immediate stakeholders (Golant & Sillince, 2007). These estimations can range from a straightforward evaluation of the subject's anticipated benefit to stakeholders to more nuanced objectives (Suchman, 1995). Sometimes, pragmatic legitimacy is followed by an evaluation of the subject's usefulness (Golant & Sillince, 2007). Organizational science has shown a great deal of interest in pragmatic legitimacy (e.g., Ramiller & Swanson, 2003). It has been demonstrated that pragmatic legitimacy can influence the early stages of IT innovation diffusion considerably (e.g., Kaganer et al., 2010a).

**Normative legitimacy:** Normative (or moral) legitimacy refers to a collection of criteria used to determine whether a new practice adheres to and/or respects moral standards and values endorsed by a specific social audience (Scot, 2001; Suchman, 1995). In effect, the term "normative legitimacy" does not refer to whether a given procedure benefits the evaluator; rather, it refers to the practice being assessed as the correct course of action (Suchman, 1995).

**Cultural-cognitive:** Cultural-cognitive legitimacy has been deemed the most robust type of legitimacy. Due to the fact that cultural-cognitive legitimacy is based on our in-depth knowledge of practice, it is the most powerful form of legitimacy, but it is also the most difficult to obtain and exploit (e.g., Aldrich & Fiol, 1994; Suchman, 1995). Cultural-cognitive legitimacy is concerned with acts that facilitate or help in decision-making, resulting in problem-solving. In other words, cultural-cognitive legitimacy is achieved by the internalization of a belief system established by practitioners and scientists to define and codify knowledge about a particular practice (Scott, 1994a). Through gaining cultural-cognitive legitimacy, the practice can be taken for granted as a foundation for daily routine activities (e.g., Ruef & Scott, 1998a). As such, it is extremely difficult to achieve during the early stages of innovation diffusion (Kaganer et al., 2010a).

### 3 Research Method

According to the aim of our research to understand why EAM fails, we opted for a single-case study to have an in-depth understanding of how a phenomenon occurs in a real-life setting (Yin, 2003b). Thus, we considered the criticality and relevance of the case organization in order to extract illuminating insights (Yin, 2003b). To address our research question, we needed to select a case in which (1) EA practices had previously been incorporated into organizational practices, (2) EA practices were no longer being conducted, and (3) adequate historical information was available, especially through knowledgeable members of the organization.

#### 3.1 Case Description

We chose Gov, a large municipality in Norway, based on the case selection criteria. Since the Norwegian government is committed to achieving the goal of a "one digital public sector," municipalities have committed to providing digital services to their residents as well. Gov is divided into six sections, each of which is in charge of a different aspect of municipal services.

The administration section is the central organizational unit that manages and provides services to all other sections. The Digitalization Program is a temporary program established in 2013 in response to a government recommendation to coordinate all Gov's IT projects.

Each organizational section, according to the Gov structure, has its own IT department in charge of managing its IT needs and projects. Additionally, the administration section houses a central IT department. The central IT department coordinates all small IT departments within the various sections and handles the Gov's local projects. The central IT department, and thus the IT manager, has a considerable influence on the administration section manager's decisions due to the operational role. Two other actors who contribute to decision-making in the administration section are the portfolio manager, who is responsible for allocating financial resources to projects, and the leader of the Digitalization Program. The central IT department lacks sufficient internal IT architects to handle all IT projects across various departments. As a result, each project manager has employed a temporary IT architect to work on the requirements of the corresponding local project. A big challenge concerning external IT architects is a lack of organizational knowledge. Over 30 (internal/external) IT architects work with the Digitalization Program to coordinate project activities. To do this, the central IT department collaborates with the Digitalization Program.

Adopting EA to coordinate digitalization processes had been proposed before the establishment of the Digitalization Program; however, the establishment of the Digitalization Program prompted Gov to adopt EA. As a result, EA practices were incorporated into the Digitalization Program's work. Gov employed several enterprise architects between 2013 and 2019 to implement TOGAF principles. However, Gov no longer continues in conducting EA practices. Enterprise architects were hired to take central focus on enterprise-wide topics and to incorporate local IT projects. Nonetheless, they have been more involved in recent years in IT project tasks (as of 2016). As a result, there have been no considerable EA practices conducted since this date.

Numerous changes have occurred in recent years that have affected digitalization processes. For instance, the initial leader of the Digitalization Program was promoted to portfolio manager. He was one of the first to work on implementing TOGAF principles in Gov. Additionally, the IT manager was replaced, and the central IT department's structure was changed. In 2013, there were no subsections within the IT department, and the IT manager supervised all architects directly. Following the change in IT management, the central IT department created a new subsection called the architecture department to house both enterprise and IT architects.

Apart from this, three distinct types of organizational plans are used to coordinate organizational activities: long-term, mid-term, and short-term. The 12-year long-term plan has a major effect on the Gov's digitalization strategy. As of 2020, Gov is preparing a new long-term organizational plan.

Gov collaborates with another public sector organization on a large-scale collaborative initiative that resulted in creating a new organization. Due to Gov's responsibility to support this new organization, one enterprise architect has been assigned to implement Gov's requirements for the project (new organization). This enterprise architect is responsible for adhering to the Gov's principles and standards. It's worth noting that Gov only had one enterprise architect at the time. Currently, an information architect holds the title of the enterprise architect. S/He is handling several tasks and therefore cannot allocate sufficient time to EA practices.

### **3.2 Data collection**

The data collection period began in September 2019 and finished in October 2020. We gathered data through semi-structured interviews and focus group workshops (primary data collection), as well as existing documentation (secondary data collection).

The collection and processing of internal and public documents on digitalization, architectural practices, and principles was the first step in the data collection process. Internal documents totaled 600 pages and contained project reports, presentations, historical emails, and the internal portal. Public documents contained statements, regulations, and policies by national authorities relating to digitalization from 2009 to 2020, focusing on the last three years. This step gave us the historical background for EA practices, especially at Gov and the Norwegian public sector.

In addition, we collected data through semi-structured interviews (Eisenhardt, 1989). To begin, an informal interview with the Digitalization Program's leader provided us with background for the case. 14 semi-structured interviews ranging in duration from 80 to 150 minutes were performed in total. Every interview was recorded and transcribed. Before the interviews, informants were given a consent form as well as an outline of the key topics of the interview questions. We began the interviews with one enterprise architect and then selected the remaining informants using snowball sampling (Paré, 2004a). We explicitly contacted informants involved in implementing EA practices in Gov because information about the previous seven years (since EA was implemented in Gov) was needed. Finally, among the informants were the Digitalization Program's leader (1), portfolio manager (1), project managers (3), architecture department manager (1), IT architects (5), and enterprise architects (3).

We have organized three focus group workshops in Gov. These workshops aimed to supplement our understanding of the case by fostering discussion among a variety of informants on relevant topics. The first two workshops focused on sharing our interpretation of the case situation based on the study of Gov's documents and recent discourses in the EA literature. Later in the study, we held a third session in which we presented our findings to participants and requested their input. We conducted 6 hours of workshops with 15 participants (11 individuals), including the portfolio manager, the Digitalization Program leader, IT architects, the architecture department manager, and project managers. Furthermore, with permission, these workshops were recorded and transcribed.

### **3.3 Data Analysis**

We collected and analyzed data in parallel using our qualitative approach (Eisenhardt, 1989). That is, the early analysis of the first step interviews prompted the posing of new or additional questions in the following round of interviews. Nonetheless, because of our theory-informed approach based on the notion of legitimacy in institutional theory, data analysis was guided throughout by a coding scheme built from our theoretical framework. We also developed a coding guideline (based on the coding scheme) that includes definitions and examples for each of the coding scheme's constituent items.

To code the data, we imported all of the interview and workshop transcripts, as well as any relevant existing documentation, into NVivo 12 pro. The coding scheme was used to guide the data coding. In addition to the constituent items of the coding scheme, we categorized architectural practice data into two categories: project and enterprise. At the project level, architectural practices assist in fulfilling the requirements of local IT projects. At the enterprise level, architectural practices give suggestions and decision-making materials for IT strategy and portfolio management processes that are ready for signature. As a result, we were able to follow the reasons that caused architectural practices at the enterprise level (EAM) to fail. After reaching an agreement on the definitions of each of the coding scheme's constituent items, the coding was carried out by the main author. The co-authors then played the role of the devil's advocate, proposing alternative interpretations and counterarguments. The data coding was completed once a sufficient level of agreement was reached.



## 4 Empirical Findings

Lack of common understanding of the EA practices was the first serious challenge observed in this study's earliest stages. When asked about EA, the participants were not unanimous in the view that what the responsibility or application of EA for Gov was. In particular, we identified several diverging views. On the one hand, the portfolio manager commented that EA must come from the business side, and then IT capabilities should support the business goals. On the other hand, the IT department believed EA is part of the IT strategy, and it comes from the IT side to help organizational goals. Moreover, enterprise architects' opinion was something in between those ideas. Although in this study, enterprise architects worked in the IT department, they had different views from most colleagues in the IT department. Therefore, when we mention IT department opinion, we mean the general idea supported by influential people in this department, while enterprise architects had their own idea.

*“When we are talking about TOGAF and EA, people are thinking about IT more. An enterprise architect is a person closer to the management level. It should not be seen as an IT person; it should be more a strategic person. Now architects are in the third or fourth (organizational) level, in the IT department, and it is very complicated to bring it up to the strategic level”*  
(Portfolio Manager)

*“Enterprise architects needs more power; I see some issues in the projects, and I am sure it can make a problem in the future; But, I cannot stop the project (...) only budget and schedule are important for the project managers”* (Enterprise Architect)

This ambiguity in the EA understanding had different consequences. For example, some architects felt that the IT manager supported the EA activities and other managers also understood the architectural concerns very well. Thus, they were satisfied with the architects' position, while enterprise architects, who perceived EA practices beyond IT tasks, deemed EA must be placed in the decision-making process. As such, they felt no one pays enough attention to the consequence of the lack of EA consideration in Gov. Therefore, enterprise architects' role was also unclear in organizational processes.

*“The challenges of enterprise architect's role are not just related to where it should work; rather there is a question that we (Gov) really need?”* (Enterprise Architect)

Also, in this study, no clear response was achieved when asked about how or who confirmed the enterprise architects' tasks. The Digitalization Program's leader believed the enterprise architects could approve their work, and in case they need approval from the upper level, the IT manager or portfolio manager should do it. However, when we asked Digitalization Program's leader why they did not supervise enterprise architects' work, we received this response: *“Although the IT department manages all architects; I think because the IT department lends the architects to the projects, IT manager does not feel that S/he should supervise their task”*

Moreover, the portfolio manager, who was not the architects' direct manager, did not supervise enterprise architects' tasks due to the organizational bureaucracy. Despite believing that EA deliveries were major input for his work, he did not engage in the architectural work due to the disagreement with the IT manager on EA positioning.

In addition, in response to the question 'why have the EA practices been stopped?', different answers were given. Digitalization Program's leader felt that the financial limitation was the reason, while the portfolio manager considered that the main issue was related to how we look at EA. One enterprise architect also commented that EA was not a priority for the individuals in Gov.

The evidence from this study suggests that although the majority of individuals theoretically knew the difference between IT architecture and EA, they practically did not differentiate between the architectural activities at the project and enterprise level. We received that due to the IT management's support, the architectural activities at the project level were appropriately accepted. Each project manager assigned sufficient resources to fulfil the architectural needs. In addition, the architectural group also had a great collaboration with the project managers. Yet, the importance of architectural activities at the enterprise level was in a debate which resulted in their being stopped. In this way, the EA practices were neglected, and no one, except enterprise architects, was willing to assign time or resources on them.

Having discussed how EA was understood and individuals reacted towards it, the next part, based on different legitimacy criteria introduced in the theoretical framework section, addresses how it was driven to the current state over time.

#### **4.1 Regulatory legitimacy**

Regulatory legitimacy refers to the situation where the object under the study has obtained its legitimacy from, for example, legal rules. In this circumstance, following the rule is coercive for the organization. From this point of view, the main idea for creating Digitalization Program comes originally from a governmental statement, where it was recommended to follow architectural principles in digitalization projects. Therefore, they argued EA also should be at the core of the Digitalization Program. Yet, based on the historical document analysis, we found that both Digitalization Program and considering IT architectural principles were governmental recommendations. However, nowhere pointed directly to EA.

Despite the fact that EA practices had stopped, everyone noted that continuing EA is essential for Gov. For example, Digitalization Program's leader, who thought the financial limitation was the main barrier for EA, expected by emphasizing the importance of EA's role for Gov's IT strategy, in the new organizational plan, they could provide more resources for EA. However, the portfolio manager, who did not assume the financial limitation as a barrier, asserted the only solution to making EA a Gov routine, is bringing it up close to the management level. The portfolio manager also referred to the latest governmental statement and said now it is the time of "a big change." Since he witnessed a similar organizational structure change for IT information security in the past, he hoped the possibility of a new change became more likely through this statement, which recommended Norwegian municipalities to consider EA principles.

*“Without solving the challenge between IT and Business view, we can place EA in the right position. We should solve it officially. We had this challenge with IT information security, it was solved by changing the position”* (Portfolio Manager)

#### **4.2 Pragmatic legitimacy**

From the pragmatic legitimacy perspective, which considers the individuals' self-interested calculations in the organization, we received evidence that the prior IT manager introduced EA to Gov and supported it.

*“At that time (2011 or 2012), the IT manager defined an IT evaluation project in Gov. (...) They (consultants) suggested recruiting two enterprise architects and creating an Enterprise Architecture Section and...”* (Enterprise Architect)

The prior IT manager accepted this suggestion, but the point is that his organizational role changed after a while. The new IT manager also supported the IT department well. However, compared with the prior IT manager, the new IT manager supposed the EA practices as a part of IT activities.

At the time of this study, the enterprise architects were the main individuals who actively tried to highlight EA concerns in Gov. Yet, they were more engaged with the projects. Indeed, although they preferred to spend more time on EA, rather than project activities, they could not change the condition because they were not part of the decision-making board. More correctly, we can say that Gov did not have any enterprise architects at the time of data collection.

*“When we contribute to making a better alignment between IT and Business, we do it because we want it, not because it is measured! (...) Many people are measured by, you are very successful by leading the project to live. (...) but how are your successes in EA measured? It is not easy!”* (Enterprise Architect)

One participant commented, architects themselves also have a significant role in understanding the importance of paying attention to architectural principles. As he said, one of the architects who worked there several years ago did not deliver any task. That person only attended meetings and gave some feedback to others. After a while, others felt the architectural work is not very important. But, after he left Gov and a new architect was hired, this new person, by doing a great job, determined how architects could help others in the projects' activities.

### **4.3 Normative legitimacy**

The portfolio manager was the first leader of the Digitalization Program and had an IT background. He started to implement EA in Gov. However, after being assigned to the portfolio manager role, he had spent no more time on the EA. He believed EA practices should particularly include business concerns. Thus, enterprise architects needed to be placed at the management level, and they should actively contribute to the decision-making process. Although the portfolio manager aimed to bring EA up close to the management level, he did not achieve it. The portfolio manager assumed two reasons for not succeeding in convincing the section's manager to make an organizational change to bring EA up close to the management level. First, EA concepts were hard to understand. Second, the term “architect” was used to refer to IT specialists in Gov.

Surprisingly, although both enterprise architects and the portfolio manager presumed a similar role for EA, they had never spoken together about this topic. On the one hand, the architects said they invited the portfolio manager to their architectural meeting, but he did not attend. On the other hand, the portfolio manager mentioned all architects, who worked there, were IT architects. The portfolio manager emphasized that they needed enterprise architects who considered business goals. It was interesting because they both (portfolio manager and enterprise architects) mentioned a similar matter. For example, one enterprise architect offered a virtual structure or a change in the organizational structure. In this suggestion, he proposed the idea of “*The Architect Elevator*” (Hohpe, 2015), and explained how it could facilitate the digitalization and innovation process in Gov. He told us, after sending the proposal to the IT manager, he received only one sentence as a response that “*it is a good idea, but it is not the right time.*” The portfolio manager did not know about this proposal. We understood that the conflict between the IT manager and portfolio manager and how the portfolio manager perceived all architects' tasks and abilities, were significant barriers to developing some organizational rules and standards regarding EA practices.

### **4.4 Cultural-cognitive legitimacy**

A recurrent theme in the interviews was a sense amongst interviewees that their outcomes measured their job. Since the consequences of the lack of EA consideration were unclear to the managers, the enterprise architect's job evaluation was challenging.

*“We should show to others that we (Gov) need EA. The challenge is that even without EA, the digitalization processes have progressed. Therefore, this is very difficult to explain to others that, yet in this situation, we need EA. (...) we should show that by bringing EA here, after for*

*instance three years, through standardization, we will obtain more efficiency” (Enterprise Architect)*

Totally, the architectural activities were under discussion at all levels. The architects believed they should fix problems that others had not seen yet. They had to hold different workshops, attend meetings, and participate in the projects to introduce the importance of architectural principles for digitalization processes. However, the overall organizational culture did not support them properly.

*“People are too busy with tasks they are hired for. This is a big pressure. (They) do not use effort to look at the work outside their work. This is a reason people don't feel willing to do a job that is not part of their job description” (IT architect)*

Together, these findings provided important insights such as understanding how EA came into Gov, the extent to which it was accepted, and why architectural activities stopped at the enterprise level. In the next section, we discuss how EA organizational challenges accrued and led EAM to be failed.

## **5 Discussion and Conclusion**

There is a growing body of research in the EA literature on EA challenges associated with organizational adoption. Several challenges have been identified, including a lack of management commitment, insufficiently experienced architects, the difficulty of understanding requirements in EA teams, insufficient tool support, rapidly changing environmental conditions, EA consultant-related issues, outdated organizational statutes, and communication challenges (Ajer & Olsen, 2018a; Banaeianjahromi & Smolander, 2016a; Kurnia et al., 2020; Lucke et al., 2010). However, in order to reduce as many challenges as possible, it is critical to understand the underlying reasons for EA challenges. Consequently, the problems related to organizational structure, problems from the political influence, legislation and policies problem, and users' readiness problem to adapt EA products are all recognized as root causes of EA challenges in the public sector (Dang & Pekkola, 2016b). In complementing the studies about the roots of EA challenges, we examine the root of EA's challenges through a legitimacy lens. Legitimacy is a key element and foundation of institutional theory (Suchman, 1995), as it explains how a particular phenomenon obtains or loses acceptance in its institutional context (Scott, 2005a).

To do this, we developed a theoretical framework based on four distinct criteria of legitimacy: regulatory, pragmatic, normative, and cultural-cognitive. We evaluated a failed EAM case to determine why EA was unable to maintain its acceptance within the studied organization, based on these distinct but complementary criteria of legitimacy. The findings reveal that a lack of adequate legitimacy was the primary reason for the emergence of several challenges, including lack of shared understanding (Ajer & Olsen, 2018a; Lucke et al., 2010), stakeholders' engagement (Kotusev & Kurnia, 2019), and financial (Ajer & Olsen, 2018a; Dang & Pekkola, 2016b; Kotusev & Kurnia, 2019; Kurnia et al., 2020; Olsen & Trelsgård, 2016) and management support (Ajer & Olsen, 2018a; Banaeianjahromi, 2018; Banaeianjahromi & Smolander, 2016a; Lucke et al., 2010; Olsen & Trelsgård, 2016), all of which drove to EAM's failure. However, as IT architectural activities gained adequate legitimacy, they were not challenged with the abovementioned problems.

### **5.1 Theoretical Implications**

Appropriate legitimacy has been identified in the organizational literature as a factor in organizational survival (Meyer & Rowan, 1977) and can be a key element in resource competition (Mignerat & Rivard, 2015). We observed EAM efforts at the time of this study were at a debated legitimacy state, where the disagreement about EA existed among different stakeholders and led

to its stoppage. Thus, one can also consider a lack of adequate legitimacy as the root cause of the organizational challenges encountered by EAs in this study. However, the question is how the state of architectural activities, which were previously legitimized at both levels (project and enterprise), has changed over time to the point where they have lost their enterprise legitimacy.

This study's findings confirm that pragmatic legitimacy is important in bringing EA into an organization at an early stage (e.g., Kaganer et al., 2010a). Moreover, whereas normative and cultural-cognitive legitimacy are essential for IS adoption (Mignerat & Rivard, 2015), they were never obtained for EAM in this study. Furthermore, this study found that regulatory legitimacy was a major factor in achieving adequate legitimacy. It is observed that regulatory legitimacy significantly reduces organizational actors' pressures when it comes to gaining IT-related innovation (Teo et al., 2003a). While regulatory legitimacy was never achieved at the enterprise level, this study showed that IT architectural practices gained appropriate legitimacy as a result of the government recommendation.

Although both levels of architectural activities were introduced concurrently to the organization, the lack of regulatory legitimacy hindered the emergence of other types of legitimacy criteria for EA. Likewise, the evidence demonstrates that pragmatic legitimacy is inadequate to sustain enough legitimacy. However, as a result of the impact of regulatory legitimacy on the organizational context, we observed that IT architectural activities could obtain additional types of legitimacy that ensure their survival.

## 5.2 Practical Implications

The legitimacy lens has significant implications for practice. According to institutional theory, if all regulatory, pragmatic, normative, and cultural-cognitive criteria are met, EA can obtain legitimacy in its institutional setting. This indicates that institutionalization of EA is a function of not only EA governance, principles, and standards, but also of consensus among key stakeholders regarding the expected value of EA and the spreading of architectural thinking to include EA procedures into the organization's norms and routines. This may be evidence of numerous EA failures. In many situations, despite significant effort invested in establishing governance procedures, EA failed to achieve the desired objectives due to the existence of competing belief systems within the organization or because EA remained in its ivory tower, ignorant to the everyday routines of stakeholders.

## 6 References

1. Haki, K., et al., *The Evolution of Information Systems Architecture: An Agent-Based Simulation Model*. MIS Quarterly, 2020. **44**(1).
2. Haki, K. and C. Legner, *The Mechanics of Enterprise Architecture Principles*. Journal of the Association for Information Systems, 2020.
3. Boh, W.F. and D. Yellin, *Using enterprise architecture standards in managing information technology*. Journal of Management Information Systems, 2006. **23**(3): p. 163-207.
4. Schmidt, C. and P. Buxmann, *Outcomes and success factors of enterprise IT architecture management: empirical insight from the international financial services industry*. European journal of information systems, 2011. **20**(2): p. 168-185.
5. Buckl, S., C.M. Schweda, and F. Matthes. *A design theory nexus for situational enterprise architecture management*. in *2010 14th IEEE International Enterprise Distributed Object Computing Conference Workshops*. 2010. IEEE.
6. Hoogervorst, J., *Enterprise architecture: Enabling integration, agility and change*. International Journal of Cooperative Information Systems, 2004. **13**(03): p. 213-233.
7. Labusch, N. and R. Winter. *Towards a conceptualization of architectural support for enterprise transformation*. 2013. Association for Information Systems.

8. Rahimi, F., J. Götze, and C. Møller, *Enterprise architecture management: Toward a taxonomy of applications*. Communications of the Association for Information Systems, 2017. **40**(1): p. 7.
9. Rolland, K.H., G. Ghinea, and T.-M. Gronli, *Ambidextrous Enterprise Architecting: Betting on the Future and Hacking Path-dependencies*. 2015.
10. Ajer, A.K. and D.H. Olsen, *Enterprise Architecture Challenges: A Case Study of Three Norwegian Public Sectors*. 2018.
11. Banaeianjahromi, N. *Where enterprise architecture development fails a multiple case study of governmental organizations*. in *2018 12th International Conference on Research Challenges in Information Science (RCIS)*. 2018. IEEE.
12. Banaeianjahromi, N. and K. Smolander, *Understanding obstacles in enterprise architecture development*. 2016.
13. Hjort-Madsen, K. *Enterprise architecture implementation and management: A case study on interoperability*. in *Proceedings of the 39th Annual Hawaii International Conference on System Sciences (HICSS'06)*. 2006. IEEE.
14. Isomäki, H. and K. Liimatainen. *Challenges of government enterprise architecture work—stakeholders' views*. in *International Conference on Electronic Government*. 2008. Springer.
15. Kotusev, S. and S. Kurnia, *The Problem of Engagement in Enterprise Architecture Practice: An Exploratory Case Study*. 2019.
16. Olsen, D.H. and K. Trelsgård, *Enterprise Architecture adoption challenges: An exploratory case study of the Norwegian higher education sector*. *Procedia Computer Science*, 2016. **100**: p. 804-811.
17. Ylinen, M. and S. Pekkola, *Enterprise Architecture as a Scapegoat for Difficulties in Public Sector Organizational Transformation*. 2018.
18. Seppänen, V., K. Penttinen, and M. Pulkkinen, *Key issues in enterprise architecture adoption in the public sector*. *Electronic journal of e-government*, 2018. **16**(1).
19. Suchman, M.C., *Managing legitimacy: Strategic and institutional approaches*. *Academy of management review*, 1995. **20**(3): p. 571-610.
20. Flynn, D. and Y. Du, *A case study of the legitimation process undertaken to gain support for an information system in a Chinese university*. *European Journal of Information Systems*, 2012. **21**(3): p. 212-228.
21. Mäki-Lohiluoma, P., P. Hellsten, and S. Pekkola, *Why do we Need this? Roles in the Information System Acquisition legitimation Process*. 2016.
22. Saint-Louis, P., M.C. Morency, and J. Lapalme, *Examination of explicit definitions of enterprise architecture*. *International Journal of Engineering Business Management*, 2019. **11**: p. 1847979019866337.
23. Ahlemann, F., et al., *Strategic enterprise architecture management: challenges, best practices, and future developments*. 2012: Springer Science & Business Media.
24. Kotusev, S., *The practice of enterprise architecture: A modern approach to business and IT alignment*. 2018.
25. Ross, J.W., P. Weill, and D. Robertson, *Enterprise architecture as strategy: Creating a foundation for business execution*. 2006: Harvard business press.
26. Kurnia, S., et al. *Artifacts, Activities, Benefits and Blockers: Exploring Enterprise Architecture Practice in Depth*. in *Proceedings of the 53rd Hawaii International Conference on System Sciences*. 2020.
27. Dang, D.D. and S. Pekkola, *Systematic Literature Review on Enterprise Architecture in the Public Sector*. *Electronic Journal of e-Government*, 2017. **15**(2).
28. Weiss, S., S. Aier, and R. Winter. *Institutionalization and the effectiveness of enterprise architecture management*. 2013. Association for Information Systems.
29. Aier, S. and S. Weiss, *Facilitating Enterprise Transformation Through Legitimacy-An Institutional Perspective*, in *Multikonferenz der Wirtschaftsinformatik (MKWI)*. 2012: Braunschweig. p. 1073-1084.

30. Hylving, L. and B. Bygstad, *Nuanced responses to Enterprise architecture management: Loyalty, voice, and exit*. Journal of Management Information Systems, 2019. **36**(1): p. 14-36.
31. Radeke, F. *Awaiting Explanation in the Field of Enterprise Architecture Management*. in AMCIS. 2010.
32. Dijkman, R.M., et al. *A rigorous approach to relate enterprise and computational viewpoints*. in *Proceedings. Eighth IEEE International Enterprise Distributed Object Computing Conference, 2004. EDOC 2004*. 2004. IEEE.
33. Kurpjuweit, S. and R. Winter. *based Meta Model Engineering*. in *Proceedings of the 2nd Int'l Workshop EMISA 2007, Bonn, 2007, Gesellschaft fur Informatik, Köllen*. Citeseer.
34. Lange, M., J. Mendling, and J. Recker, *An empirical analysis of the factors and measures of Enterprise Architecture Management success*. European Journal of Information Systems, 2016. **25**(5): p. 411-431.
35. Lucke, C., S. Krell, and U. Lechner, *Critical issues in enterprise architecting—a literature review*. 2010.
36. Dang, D.D. and S. Pekkola, *Root Causes of Enterprise Architecture Problems in the Public Sector*. PACIS, 2016. **287**.
37. Avgerou, C., *IT and organizational change: an institutionalist perspective*. Information Technology & People, 2000.
38. King, J.L., et al., *Institutional factors in information technology innovation*. Information systems research, 1994. **5**(2): p. 139-169.
39. Mignerat, M. and S. Rivard, *Positioning the institutional perspective in information systems research*. Journal of information technology, 2009. **24**(4): p. 369-391.
40. Orlikowski, W.J. and S.R. Barley, *Technology and institutions: What can research on information technology and research on organizations learn from each other?* MIS quarterly, 2001. **25**(2): p. 145-165.
41. Brosius, M., et al. *Enterprise architecture assimilation: an institutional perspective*. in *Thirty Ninth International Conference on Information Systems (ICIS 2018)*. 2018. San Francisco: Association for Information Systems.
42. Dang, D., *Institutional logics and their influence on enterprise architecture adoption*. Journal of Computer Information Systems, 2019: p. 1-11.
43. Dang, D. and S. Pekkola, *Institutional Perspectives on the Process of Enterprise Architecture Adoption*. Information Systems Frontiers, 2019: p. 1-13.
44. Levy, M., *How field-level institutions become a part of organizations: A study of enterprise architecture as a tool for institutional change*. Information and Organization, 2019. **29**(4): p. 100272.
45. Meyer, J.W. and B. Rowan, *Institutionalized organizations: Formal structure as myth and ceremony*. American journal of sociology, 1977. **83**(2): p. 340-363.
46. Kaganer, E.A., S.D. Pawlowski, and S. Wiley-Patton, *Building legitimacy for IT innovations: the case of computerized physician order entry systems*. Journal of the Association for Information Systems, 2010. **11**(1): p. 2.
47. Teo, H.-H., K.K. Wei, and I. Benbasat, *Predicting intention to adopt interorganizational linkages: An institutional perspective*. MIS quarterly, 2003: p. 19-49.
48. Greenwood, R., et al., *The Sage handbook of organizational institutionalism*. 2017: Sage.
49. Ruef, M. and W.R. Scott, *A multidimensional model of organizational legitimacy: Hospital survival in changing institutional environments*. Administrative science quarterly, 1998: p. 877-904.
50. Flynn, D. and W. Puarunroj, *The legitimation-seeking process in information systems development*, in *ECIS 2006 Proceedings*. 2006.
51. Hussain, Z., A. Taylor, and D. Flynn, *A case study of the process of achieving legitimation in information systems development*. Journal of Information Science, 2004. **30**(5): p. 408-417.
52. Scott, W.R., *W. Richard SCOTT (1995), Institutions and Organizations. Ideas, Interests and Identities*. M@ n@ gement, 2014. **17**(2): p. 136-140.

53. Jang, Y.S. and X. Luo, *Nation-state participation in intergovernmental technology organizations*. International journal of comparative sociology, 2000. **41**(3): p. 255.
54. Golant, B.D. and J.A. Sillince, *The constitution of organizational legitimacy: A narrative perspective*. Organization studies, 2007. **28**(8): p. 1149-1167.
55. Ramiller, N.C. and E.B. Swanson, *Organizing visions for information technology and the information systems executive response*. Journal of Management Information Systems, 2003. **20**(1): p. 13-50.
56. Scot, t.W.R., *Institutions and organizations*. Thousand Oaks, CA: Sage Publications. Sekaran, U.(2003). *Research Methods for Business, A Skill Building Process*, 4th edn, NY: John Wiley. Seligman, J.(2002). 'No one can serve two masters: Corporate and securities law after Enron', Washington University Law Quarterly, 2001. **80**(2): p. 449-518.
57. Aldrich, H.E. and C.M. Fiol, *Fools rush in? The institutional context of industry creation*. Academy of management review, 1994. **19**(4): p. 645-670.
58. Scott, W.R., *Institutions and organizations: Toward a theoretical synthesis*. Institutional environments and organizations: Structural complexity and individualism, 1994: p. 55-80.
59. Yin, R.K., *Design and methods*. Case study research, 2003. **3**.
60. Eisenhardt, K.M., *Building theories from case study research*. Academy of management review, 1989. **14**(4): p. 532-550.
61. Paré, G., *Investigating information systems with positivist case research*. Communications of the association for information systems, 2004. **13**(1): p. 18.
62. Hohpe, G. *The Architect Elevator*. 2015; Available from: [https://www.enterpriseintegrationpatterns.com/ramblings/79\\_elevator.html](https://www.enterpriseintegrationpatterns.com/ramblings/79_elevator.html).
63. Scott, W.R., *Institutional theory*. Encyclopedia of Social Theory 2005: p. 408–414.
64. Mignerat, M. and S. Rivard, *Positioning the institutional perspective in information systems research*, in *Formulating Research Methods for Information Systems*. 2015, Springer. p. 79-126.



### **Paper 3: How Enterprise Architecture Loses Momentum: A Case of Delegitimization**

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# How Enterprise Architecture Loses Momentum: A Case of Delegitimization

Completed Research Paper

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## Abstract

*Owing to the necessity of effectively establishing enterprise architecture (EA) in an organizational context, there is a growing stream of research to examine the assimilation and institutionalization of EA in organizations. Our study aims to contribute to this stream by giving rise to the legitimacy of EA as the cornerstone of its institutionalization. To this end, we investigate four criteria of legitimacy, namely regulatory, pragmatic, normative, and cultural-cognitive legitimacy, in a case organization that lost legitimacy for its EA practices. We found criticality of regulatory and pragmatic legitimacy that need to be obtained effectively and promptly in order to grant sufficient time for normative and cultural-cognitive types of legitimacy to be attained.*

**Keywords:** Enterprise Architecture (EA), institutional theory, legitimacy, single-case study

## Introduction

As organizations continue their digitalization and transformation activities, IT managers and IS scholars alike look for systematic methods and approaches to harness the increasing complexity of their digitalization initiatives, and to address the uncertainty associated with an enterprise-wide roadmap for transformation (Haki et al., 2020b; Haki & Legner, 2021b). Enterprise Architecture (EA) is one approach that has received considerable attention in both research and practice. EA is defined as the set of an organization's IT (and business) components and their interdependencies as well as efforts to keep local and short-term investments in line with enterprise-wide and long-term strategic imperatives (Boh & Yellin, 2006; Haki et al., 2020b; Schmidt & Buxmann, 2011).

Due to a visible interest in both research and practice, an extensive research has been carried out on EA. The majority of exiting studies focus on EA frameworks, principles, and standards (Boh & Yellin, 2006; Haki & Legner, 2021b; Zachman, 1987), challenges and benefits of EA (e.g., Ajer & Olsen, 2018b; Banaeianjahromi & Smolander, 2016b; Dang & Pekkola, 2016a; Lange et al., 2016; Tamm et al., 2011), as well as EA management

and adoption (e.g., Aier, 2014; Ajer & Olsen, 2019b; Haki et al., 2012; Schmidt & Buxmann, 2011; Seppänen et al., 2018). While the latter studies lay emphasis on how to structure and bring EA to an organizational context, other studies examine institutionalization of EA to shed light on how EA can be assimilated as an inherent part of organizations (e.g., Ajer et al., 2021; Beese et al., 2020b; Brosius et al., 2018a; Dang & Pekkola, 2019a; Levy & Bui, 2019). Following an institutionalization approach, specifically from the lens of institutional theory (DiMaggio & Powell, 1983a; Scott, 2013), these studies consider an organization as an institution in which EA needs to establish the required institutional pillars and to obtain institutional legitimacy to eventually become an inherent part of organizations (e.g., Dang, 2021; Dang & Pekkola, 2019a; Haki et al., 2020b). Thus, EA endeavors need to gain legitimacy in their institutional context, and even more importantly to repair and maintain their legitimacy, in order to be accepted and thereby ensure their long-term survival (Meyer & Rowan, 1977; Suchman, 1995). As such, even after institutionalizing EA and gaining legitimacy for its operationalization, it may lose its momentum due to new circumstances that *delegitimize* its continuation in the organization (e.g., Maguire & Hardy, 2009). Given that a delegitimized practice is viewed as an unnecessary practice, it is critical to understand the process of EA's delegitimization. Indeed, investigating the delegitimization process can assist us in advancing our knowledge on the legitimacy process of EA. That is, examining the delegitimization process helps us understand what causes existed previously, the absence of which resulted in the EA's delegitimization. Thus, in order to preserve EA's legitimacy under the new circumstances, the previously legitimized practice must discover new sources of legitimacy.

While recent studies have examined the institutionalization of EA, there is a lack of evidence on *how EA becomes delegitimized* within an organization, resulting in it being viewed as an unnecessary practice. To this end, guided by the legitimacy concept (Suchman, 1995) from institutional theory, we opted for an explanatory case study on one of Norway's largest municipalities (Gov). Gov began implementing EA in 2013 and dedicated considerable resources for establishing EA. However, Gov currently has no EA practice and lost an enterprise-wide view on its local projects. By examining a case of delegitimization, we incorporate the discourse of EA (de)legitimacy into the EA institutionalization stream, and scrutinize the effect of different types of legitimacy, namely regulatory, pragmatic, normative, and cultural-cognitive on the process of introducing and (de)legitimizing EA in the organization.

The remainder of this paper is structured as follows. As a background to the study, the following section synthesizes EA literature and provides an introduction to the concept of legitimacy. Following an explanation of the employed research method, the empirical findings section presents the resulting insights. Finally, we discuss the derived insights with regard to their theoretical and practical implications.

## Research Background

Current studies in the EA literature provide insights into *EA conceptualization*, with focus on EA frameworks, principles, and standards (Boh & Yellin, 2006; Haki & Legner, 2021b; Zachman, 1987); *introducing EA into the organization*, with focus on EA management and adoption (e.g., Aier, 2014; Haki et al., 2012; Schmidt & Buxmann, 2011); and *incorporating EA into the organization*, with focus on institutionalization and assimilation of EA (e.g., Ajer et al., 2021; Beese et al., 2020b; Brosius et al., 2018a; Dang & Pekkola, 2019a; Levy & Bui, 2019). Following studies on the other IS phenomena (e.g., Avgerou, 2000b; Bernardi et al., 2019; King et al., 1994; Mignerat & Rivard, 2009; Nicholson & Sahay, 2009; Orlikowski & Barley, 2001), institutional theory has received a significant attention in EA literature. The latter is due to the necessity of assimilating EA in the organization and institutionalizing EA practices into the organization to obtain

EA's promised outcomes (e.g., Brosius et al., 2018a; Dang, 2021; Dang & Pekkola, 2019a; Levy & Bui, 2019). In complementing existing studies, we spotlight the notion of legitimacy that resides at the heart of institutional theory (Meyer & Rowan, 1977). Legitimacy is recognized as a fundamental concept in accepting IS practices in their institutional context (e.g., Kaganer et al., 2010a; Teo et al., 2003b). However, to explain how EA fails to get institutionalized and assimilated in an organizational context, we specifically focus on the importance of maintaining and repairing legitimacy (Meyer & Rowan, 1977; Suchman, 1995), which has not been sufficiently examined in the IS literature. We do so by examining how EA becomes delegitimized in an organization while previously being considered as a legitimate and important practice in the given organization.

In this study, EA is assumed as a kind of organizational practice (Bradley et al., 2012; Venkatesh et al., 2007), requiring to gain legitimacy to eventually get institutionalized in its institutional context. Institutions are defined as socially established orders; taken for granted facts, actions, and shared understandings shaping future practices and activities (Greenwood & Hinings, 1996; Mignerat & Rivard, 2009; Scott, 2001b). They include norms, values, and rules that "provide stability and meaning to social life" (Scott, 2001b, p. 48). In this sense, to better understand the advantages of appropriate legitimacy in the organization and its effects, it is argued that most of the stakeholders would only tend to engage with legitimate practices (Deephouse et al., 2017). Therefore, legitimacy is a tool for obtaining organizational goals and a factor for competition to achieve the required resources (Pfeffer & Salancik, 2003). An appropriate legitimacy enhances organizational survival (Meyer & Rowan, 1977) and avoids questions or challenges from society (Hirsch & Andrews, 1984; Meyer & Rowan, 1977). In contrast, "organizations whose legitimacy is debated have less freedom and are closely monitored" (Brown, 1998, p. 35).

In the IS literature, legitimacy is connotated to the process of obtaining organizational support for IS initiatives (Flynn & Du, 2012), which results in reducing the stakeholders' resistance to the given IS initiatives. Therefore, legitimacy can be perceived as a significant factor for IS success (Mäki-Lohiluoma et al., 2016b). Legitimate practices are not only seen as more worthwhile, but also as more meaningful, predictable, and trustworthy, resulting in a credible collective justification for the organization's actions and motivations (Jepperson, 1991b). Hence, the way people perceive a phenomenon, such as EA, is strongly affected by its legitimacy (Aier & Weiss, 2012). However, it is always possible for previously legitimated practices to lose legitimacy, and thereby to get dissipated, rejected, or replaced because of inability to reproduce previously legitimated or assumed organizational performance (Oliver, 1992).

## ***Theoretical Background***

In this study, we employ the concept of legitimacy from institutional theory as a lens to shed light on how EA becomes delegitimized. The fundamental underlying assumption of institutional theory is that organizations seek to gain legitimacy in their environments in order to be accepted and, thus, ensure their long-term survival (Meyer & Rowan, 1977). Indeed, the question 'why do we need this?' reflects the significant importance of legitimacy (Mäki-Lohiluoma et al., 2016b). According to Suchman (1995, p. 547), legitimacy is "a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, beliefs, and definitions."

The concept of legitimacy can be tracked in four genetic stages, namely accepted, proper, debated, and illegitimate (Deephouse et al., 2017). The accepted state refers to a more passive assessment state indicating taken-for-grantedness, while proper refers to judgments reached by a more deliberative process. This distinction shows that accepted

organizations, in contrast to proper organizations, are those that are not actively assessed, or have not been evaluated recently. Debated is a condition that indicates an ongoing conflict within the social system. In this state, disagreements often occur between different stakeholders or between dissident stakeholders and organizations. Debated also includes stakeholder questions or challenges regarding the organization's activities or underlying values. Finally, the state of being illegitimate is when the social system judges the organization as inappropriate. In this situation, the organization should either be fully reformed or disappeared.

Legitimacy management is a necessary endeavor that requires various activities at different points in time (Deephouse et al., 2017). These activities result in gaining, repairing, or maintaining legitimacy (Suchman, 1995). Gaining legitimacy, also known as legitimacy building, is a proactive strategy. Managers or legitimacy seekers in this situation possess advanced information about the subject of the change requiring legitimacy and attempt to establish legitimacy through a variety of pressures. Maintaining legitimacy is seen as a simpler task than gaining or repairing legitimacy (Suchman, 1995). Thus, if a practice gains appropriate legitimacy, maintaining it is often assumed, as legitimacy assessments are more likely to occur in an unstable state (Ashforth & Gibbs, 1990). Legitimacy repairing is similar to legitimacy building from different perspectives. A legitimacy-repair practice is a "reactive response to an unforeseen crisis of meaning" (Suchman, 1995, p. 597). One of the primary reasons for a failure to maintain legitimacy is a decline in cultural support (Suchman, 1995). In our quest to examine the delegitimization process of EA, we develop a theoretical framework based on four legitimacy criteria, namely regulatory, pragmatic, normative, cultural-cognitive in order to understand how EA becomes delegitimized within an organization.

## **Theoretical Framework**

Internal and external stakeholders evaluate and assess the legitimacy subjects, whether consciously or unconsciously, by comparing them to special criteria or norms (Ruef & Scott, 1998b). The term "legitimacy provider" refers to stakeholders who evaluate legitimacy (Flynn & Du, 2012; Flynn & Puarungroj, 2006b), while "legitimacy seeker" refers to those who attempt to support the given phenomenon subject to legitimacy (Hussain et al., 2004). In IS projects, legitimacy seekers are for example project executives, project team members, or the project leader, while legitimacy providers are the IS beneficiaries, such as business partners, users, and top management (Flynn & Du, 2012). To evaluate legitimacy, four basic types of criteria are used including *regulatory*, *pragmatic*, *normative/moral*, and *cultural-cognitive*. Different types of legitimacy (e.g., moral legitimacy) appear when specific criteria (e.g., moral value) are generally agreed upon within the social system (Deephouse et al., 2017).

**Regulatory legitimacy:** Assuming that legitimation gets obtained through linking a social object to a particular element of the institutional field, regulative legitimacy is provided by aligning a new practice with symbolic systems (Ruef & Scott, 1998b). Such alignment is usually achieved by setting up new practices following the related legal and quasi-legal rules and regulations existing within the domain (Scott, 2013). IS scholars have used regulative legitimacy in a variety of ways in their research, by for instance emphasizing that innovation succeeds when it is consistent with government and/or international IT policies and directives (Jang & Luo, 2000a), or highlighting that it aids gaining agreement with relevant non-IT regulations and alleviate pressures placed on the adopter organization by resource-dominant actors (Teo et al., 2003b). By the same token, regulatory legitimacy of EA initiatives is gained when they are directly derived from internal and external regulatory mandates enforced by, for instance, the government (or a regulatory body) or by executive managers (e.g., Haki et al., 2020b).

**Pragmatic legitimacy:** Pragmatic legitimacy is based on the self-interest of an organization's most immediate audiences (Golant & Sillince, 2007). These estimates can range from a direct assessment of the subject's expected value to stakeholders to more complex goals (Suchman, 1995). Pragmatic legitimacy is often accompanied by an assessment of the subject's profit (Golant & Sillince, 2007). Pragmatic legitimacy has received considerable interest in organizational science (e.g., Ramiller & Swanson, 2003). Similarly, it has been demonstrated that pragmatic legitimacy can play a significant role in shaping the early stages of IT innovation diffusion (e.g., Kaganer et al., 2010a). In the EA context, pragmatic legitimacy is reflected in individuals' engagement in EA practices as they realize EA benefits in their job. Therefore, even without any rewards from the organization, they contribute to EA practices (Ross & Quaadgras, 2012b; Winter, 2014, 2016).

**Normative legitimacy:** Normative (or moral) legitimacy refers to a set of factors in determining whether a new practice complies with and/or supports moral standards and values approved by a particular social audience (Scott, 2001b; Suchman, 1995). In effect, the concept of normative legitimacy does not refer to whether a given practice benefits the evaluator; rather, it refers to the practice being evaluated as the right thing to do (Suchman, 1995). Normative legitimacy of EA is gained when individuals take EA's formal procedures and practices as granted and consider them as part of organizational norms. Therefore, EA procedures are somewhat forced by organizational counterparts that introduce an obligatory dimension into social life via values and norms (e.g., Haki et al., 2020b).

**Cultural-cognitive legitimacy:** Cultural-cognitive legitimacy has been described as the most robust type of legitimacy. Since cultural-cognitive legitimacy refers to our in-depth knowledge of practice, it is the most effective type of legitimacy, which is difficult to acquire and manipulate (e.g., Aldrich & Fiol, 1994; Suchman, 1995). Cultural-cognitive legitimacy is concerned with actions that simplify or aid in understanding decision-making and thereby leads to problem-solving. In other words, cultural-cognitive legitimacy results from internalizing a belief system created by professionals and scientists to specify and codify knowledge about a certain practice (Scott, 1994b). Through gaining cultural-cognitive legitimacy, the practice can be taken for granted as a foundation for daily routine activities (e.g., Ruef & Scott, 1998b). As such, it is rarely achievable in the early stages of innovation diffusion (Kaganer et al., 2010a). In the EA context, cognitive legitimacy is reflected in individuals' unconscious recognition of EA role. As such, EA deliverables are significant input to decision making, specifically when individuals or organizational actors encounter uncertain causes and solutions in which they unconsciously model themselves on other actors (e.g., Haki et al., 2020b).

## **Research Method**

Owing to the objective of our research to understand the delegitimization of EA, we opted for a single-case study to have an in-depth understanding of how a phenomenon (delegitimization of EA) occurs in a real-life setting (Yin, 2003c). Thus, we considered the criticality and appropriateness of the case organization to obtain illuminating insights (Yin, 2003c). In order to answer our research question, we needed to choose a case in which (1) EA practices were previously integrated into organizational practices, (2) EA practices have already lost their legitimacy and are no longer performing as organizational practices, and (3) adequate historical information was accessible, particularly through access to knowledgeable members of the organization.

## **Case Description**

In line with case selection criteria, we opted for Gov, a large municipality in Norway. Since the Norwegian government is committed to achieving the objective of a "one digital public sector," municipalities have also committed to offering digital services to their residents. Gov is divided into six sections, each of which is responsible for a different aspect of municipal services. The administration section is the central organizational unit under which all other sections are managed, and services are provided. The Digitalization Program is a temporary program established in 2013 in response to a government recommendation to coordinate all Gov IT projects.

According to the Gov structure, each organizational section has its own IT department in charge of managing its IT needs and projects. Additionally, there is a central IT department within the administration section. The central IT department coordinates all small IT departments within the different sections and manages the Gov's local projects. The central IT department, and thus the IT manager, has a considerable influence on the administration section manager's decisions due to the operational role. Two other individuals who contribute to decision-making in the administration section are the portfolio manager, who is in charge of assigning financial resources to projects, and the leader of the Digitalization Program. The central IT department does not have enough internal IT architects to support all IT projects across different sections. As a result, each project manager has hired a temporary IT architect, with focus on the corresponding local project's requirements. A crucial problem for external IT architects is a lack of organizational knowledge. There are over 30 IT architects (internal/external) who should collaborate with the Digitalization Program in order to coordinate projects activities. To this end, the central IT department works cooperatively with the Digitalization Program.

Adopting EA to coordinate digitalization processes was a discussion that began prior to the establishment of the Digitalization Program. However, the establishment of the Digitalization Program prompted Gov to adopt EA. Thus, EA practices were incorporated into the Digitalization Program's work. While several enterprise architects (with an enterprise-wide focus) were hired to implement TOGAF principles in Gov between 2013 and 2019, Gov is no longer conducting EA practices. Enterprise architecture was meant to focus on enterprise-wide aspects and coordinate local IT projects. Nevertheless, they have recently (as of 2016) been more involved in IT project tasks. As a result, no EA practices have been performed since this point in time. Currently, the enterprise architect title has been assigned to an IT architect who is overloaded with IT project tasks.

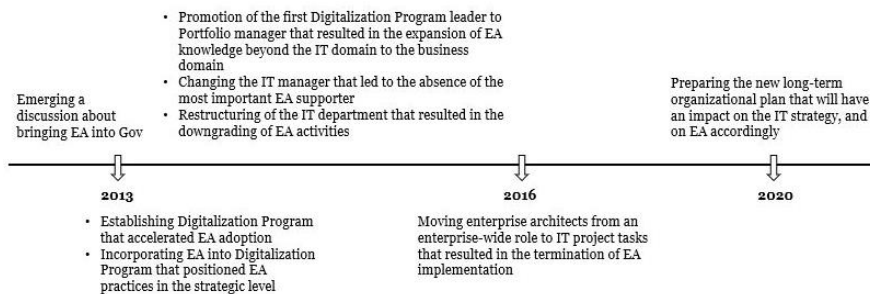
Several changes have occurred in the last couple of years that have impacted the digitalization processes. For instance, the Digitalization Program's initial leader, who was one of the first individuals to work on the implementation of TOGAF principles in Gov, became the portfolio manager. Additionally, the IT manager and thereby the structure of the central IT department were changed. In 2013, the IT department did not have any subsections, and the IT manager directly supervised all architects. However, following the change of the IT manager, the central IT department created a new subsection called the architecture department, which housed both enterprise architects and IT architects. Besides that, three types of organizational plans are used to coordinate organizational activities: long-, mid-, and short-term plans. The long-term plan, which spans 12 years, has a major impact on the Gov's digitalization strategy. As of 2020, Gov is preparing a new long-term organizational plan. Figure 1 summarizes significant events affecting EA journey in the studied case.



## Data Collection

Data collection started in September 2019 and lasted till October 2020. We collected both primary and secondary data by means of semi-structured interviews and focus group workshops (primary data collection) as well as existing documentations (secondary data collection).

Data collection process began with the collection and reflection on internal and public documents pertaining to digitalization, architectural practices, and principles. Internal documents totaled approximately 600 pages and contained project reports, presentations, historical emails, and the internal portal. Public documents included statements, regulations, and policies by national authorities relevant to digitalization, from 2009 till 2020, with a particular emphasis on the last three years. This step provided us with a historical perspective on EA activities, especially at Gov and in the Norwegian public sector in general.



**Figure 1. Summary of Significant Events Affecting EA Journey in the Studied Case**

We further collected data using semi-structured interviews (Eisenhardt, 1989). To begin, an informal interview with the Digitalization Program's leader provided us with an overview of the case circumstances. In total, 14 semi-structured interviews were conducted, lasting between 80 to 150 minutes per interview. Each interview was recorded and subsequently transcribed. Prior to interviews, informants were given a consent form and the main themes of the interview questions. We began the interviews by interviewing one enterprise architect and then selecting the other informants using snowball sampling (Paré, 2004a). Since information about the previous seven years (since EA came into Gov) was needed, we specifically approached informants who were engaged as of the outset of the EA initiative in Gov. In total, the informants included Digitalization Program's leader (1), portfolio manager (1), project managers (3), architecture department manager (1), IT architects (5), and enterprise architects (3).

In addition, we held three focus group workshops (Krueger, 2014) in Gov. These workshops aimed to complement our understanding of the case by stimulating discussion among several informants on the topics of interest. The first workshop, attended by five participants, including the Digitalization Program's leader and IT architects and project managers, focused on sharing our understanding of the case situation gained through Gov's document analysis and recent discourses in the EA literature. Following that, the second workshop with similar topics was held with four participants, including the Digitalization Program's leader and project managers. We conducted the third session later in the study, during which we presented our findings to participants and requested their feedback. The latest session included ten participants, including the portfolio manager, the Digitalization Program leader, IT architects, the architecture department manager, and project managers. These workshops were also

recorded and transcribed with permission. Table 1 summarizes the employed means for data collection.

### Data Analysis

Owing to our qualitative approach, we conducted data collection and data analysis steps in parallel (Eisenhardt, 1989). That is, the early analysis of the first step interviews stimulated posing new or complementary questions in the subsequent set of interviews. Nonetheless, due to our theory-informed approach by the notion of legitimacy in institutional theory, data analysis was informed throughout by a coding scheme that we derived from our theoretical framework. Additionally, we created a coding guideline (based on the coding scheme) that includes meanings and examples for each of the coding scheme's constituent items.

Data Collection Technique	Source
Existing Documents	<ul style="list-style-type: none"> <li>• Internal documents, over 600 pages including project reports, presentations, historical emails, and the internal portal</li> <li>• Public documents ranging from 2009 till 2020, with a particular emphasis on the last three years including statements, regulations, and policies by national authorities relevant to digitalization</li> </ul>
Semi-Structured Interviews	<ul style="list-style-type: none"> <li>• 14 interviews lasting from 80 to 150 minutes with Digitalization Program's leader (1), portfolio manager (1), project managers (3), architecture department manager (1), IT architects (5), and enterprise architects (3)</li> <li>• Over 100 pages of interview transcripts</li> </ul>
Focus Group Workshops	<ul style="list-style-type: none"> <li>• Three workshops, approximately six hours in total</li> <li>• Over 20 pages of workshop transcripts</li> <li>• 15 participants (eleven individuals) including portfolio manager, leader of the Digitalization Program, IT architects, architecture department manager, project managers</li> </ul>
<b>Table 1. Overview of Data Collection Techniques</b>	

To conduct coding of the data, we transferred all the interview and workshop transcripts as well as relevant existing documentations to NVivo 12 pro. The coding of the data was closely guided by the coding scheme. Next to the coding scheme's constituent items, we coded data of architectural practices into two categories: project and enterprise. At the project level, architectural practices assist in fulfilling the requirements of local IT projects. At the enterprise level, architectural practices provide recommendations and decision-making materials that are ready for signature for IT strategy and portfolio management processes. Thus, we tracked delegitimization of EA through enterprise-wide level practices that had been stopped. The coding was conducted by the main author, after achieving the agreement about the meanings of each of the coding scheme's constituent items. The co-author then acted as devil's advocate, suggesting alternate interpretations and counterarguments. After achieving a sufficient degree of agreement, the coding of the data was completed.

## Empirical Findings

The analysis of the data revealed distinct, strongly competing beliefs about EA role in GOV. While one idea stated that EA should originate on the business side and that IT capabilities should then support business goals (as advocated by the portfolio manager), another idea stated that EA is a function of IT strategy and originates on the IT side (supported by the IT department). When collecting data, we clearly observed serious debate between these two ideas. Interview and workshop participants (in)directly referred to this debate and its consequences for the EA's position. There was additionally one more opinion, somewhere in between the two-pointed extremes, about EA role that enterprise architects supported. It is noteworthy that although enterprise architects were employed by the IT department, their perspectives differed from those of the majority of IT department employees. Thus, when we refer to the IT department's opinion, we mean the common understanding held by influential members of this department, while enterprise architects had their own.

*“When we are talking about TOGAF and EA, people are thinking about IT more. An enterprise architect is a person closer to the management level. It should not be seen as an IT person; it should be more a strategic person. Now architects are in the third or fourth (organizational) level, in the IT department, and it is very complicated to bring it up to the strategic level” (Portfolio Manager)*

*“EA program needs more power; otherwise, it cannot be effective. I see some issues in the projects, and I am sure it can make a problem in the future; But I cannot stop the project (...) only budget and schedule are important for the project managers”  
(Enterprise Architect)*

This divergence and uncertainty in understanding EA position and role had a variety of implications. For example, when we asked about EA, the IT department's members argued that the IT manager supports EA practices and that other managers also understand architectural concerns very well. As a result, they were pleased with the position of the architects. In contrast, enterprise architects, who saw EA practices as distinct from IT function, believed that EA should be integrated into the decision-making process. As such, they believed that no one pays sufficient attention to the consequences of the lack of EA consideration in Gov. Thus, the enterprise architect's position in organizational processes was also unclear. Indeed, only enterprise architects and the portfolio manager assumed a position for EA practices consistent with our study's premise that EA practices relate to enterprise-wide activities.

*“The challenges of enterprise architect's role are not just related to where it should work; rather, there is a question that do we (Gov) really need them?” (Enterprise Architect)*

*“... as the enterprise architect, I was not given specific tasks. I created a website myself. It was only my idea, and I believe the IT manager has not seen that even once. S/he always mentioned that I heard you created a good website, which I should take time to have a look at” (Enterprise Architect)*

Moreover, no one supervised enterprise architects' activities, even during the period EA practices were conducted. While either the IT manager or the portfolio manager was required to supervise and approve the enterprise architecture tasks, the conflict between the IT manager and the portfolio manager acted as the main obstacle to the portfolio manager's contribution. Despite the portfolio manager's belief that EA deliverables were critical to her/his job since she/he was not the direct manager of enterprise architects, the portfolio manager was never involved in EA practices. As a result of this,

organizational bureaucracy led to the portfolio manager's unwillingness to collaborate with enterprise architects.

*“Although the IT department manages all architects; I think because the IT department lends the architects to the projects, IT manager does not feel that S/he should supervise their (architects’) task”* (Digitalization Program’s leader)

When discovering the primary reasons for stopping EA implementation, next to disagreements over EA's position and role in GOV, other issues popped up such as budget pressures (stated by Digitalization Program's leader) or individual concerns and priorities (stated by enterprise architects). Indeed, there were similarities between the EA situation in Gov and public concern about climate change. As one enterprise architect put it, *“Even though people discuss climate change because its effects cannot be quantified or seen, they still disregard it when making a decision.”*

Further, although the majority of individuals theoretically understood the distinction between IT architecture and EA, they actually did not distinguish between architectural activities at the project and enterprise levels. Architectural activities at the project level were properly accepted due to the IT manager's support. Each project manager was concerned with allocating adequate resources to meet architectural requirements. Additionally, the architecture department worked well with project managers. Nonetheless, the enterprise-level role of architectural practices was a point of conflict, such that the conducted EA practices to account for enterprise-wide objectives were completely discontinued.

After discussing how EA was perceived, the following section explains how EA became involved in such a heated debate, with regard to all legitimacy aspects, which resulted in its delegitimization.

## ***Regulatory Legitimacy***

Regulative legitimacy is gained by associating with symbolic processes. Following the law is oppressive for the organization in this situation. From this point of view, the Digitalization Program was established in response to a government recommendation that digitalization projects should adhere to architectural principles. Although establishing a Digitalization Program and implementing IT architectural principles (at the project level) were recommended, some argued that EA should be central to the Digitalization Program. Therefore, EA is an implicit recommendation by the government. However, this argumentation was perceived as poor and fragile in the organization. Indeed, some individuals were aware that the recommendation was limited to IT architecture. Others who showed doubts about the details of the government recommendations justified their approach by arguing that working at the project level is also a necessary part of implementing EA. Such a vague association to the government's recommendation, as the underlying symbolic system, brought about the stagnation and eventually discontinuation of EA in general, and TOGAF in particular.

Notwithstanding discontinuation of TOGAF implementation, participants stressed the serious importance of continuing EA practices for Gov and stated their opinions on how to reintroduce EA into Gov in a variety of ways. Some suggested that emphasizing EA's role in the Gov's IT strategy in the new organizational plan would result in increased financial support for EA practices. Others claimed that incorporating the EA position at the management level is the only way to reintroduce it in Gov. Indeed, there is a completely new recommendation from the government that Norwegian municipalities use EA benefits for coordinating their digitalization processes. Therefore, there is a hope

that this recommendation would increase the possibility of this movement, as Gov had previously experienced a similar movement for IT information security.

*“Without solving the challenge between IT and Business view, we can place EA in the right position. We should solve it officially. We had this challenge with IT information security, it was solved by changing the position”* (Portfolio Manager referencing the new governmental recommendation)

The initial vague interpretation from the government’s recommendation provided an initial regulatory legitimacy to EA. Nevertheless, such a legitimacy did not sustain due to the room for diverging interpretations. Considering the status-quo of EA in Gov and given the fact that there are still positive opinions about EA’s role to Gov, repairing and regaining legitimacy seems to be the next step to reintroduce EA into Gov.

### ***Pragmatic Legitimacy***

Pragmatic legitimacy perspective is based on the stakeholders' self-interest in the subject's benefit. The primary source of pragmatic legitimacy for EA practices at Gov was the previous IT manager’s interest. The prior IT manager hired a consultancy group to evaluate the IT department’s efficiency. The IT manager desired feedback in order to facilitate and improve the process of Gov digitalization. One of the consulting group's most significant recommendations was to hire two enterprise architects and to create an enterprise architecture section, that the prior IT manager highly welcomed. Nevertheless, the new IT manager made no significant distinction between architectural practices at the project and enterprise levels.

At the time of this study, enterprise architects were the primary individuals actively attempting to raise awareness of EA concerns in Gov. Nonetheless, they were more involved with the projects' tasks at the time. Indeed, even though they tended to spend more time on EA than on project tasks, they were unable to change the situation due to their exclusion from the decision-making board.

*“When we contribute to making a better alignment between IT and Business, we do it because we want it, not because it is measured! (...) Many people are measured by, you are very successful by leading the project to live. (...) but how are your successes in EA measured? It is not easy!”* (Enterprise Architect)

The other cause that led to questioning pragmatic legitimacy of architectural practices was both IT and enterprise architects themselves. Gov had worked with an IT architect who failed to complete any assignments during her/his service. This IT architect was only present at meetings and provided others with unrealistic advice. As a result, some argued that IT architects do not play a significant role in IT projects. However, after s/he left Gov and a new one was hired, the new IT architect demonstrated how IT architects would assist others with project activities.

As such, the primary reason for bringing EA into Gov was due to the previous IT manager's interest, which was later strengthened by enterprise architects' contributions. However, changing the IT manager resulted in a shift in the way influential actors in Gov viewed EA. Thus, although enterprise architects kept advocating for continuation of EA practices, they were overwhelmed by project-level tasks that avoided them of contributing to enterprise-level considerations.

## **Normative Legitimacy**

The portfolio manager was the first leader of the Digitalization Program and had an IT background. When s/he managed the Digitalization Program, s/he contributed to implementing TOGAF principles. However, once assigned to the portfolio manager position, s/he stopped engaging in EA practices. The portfolio manager, who assumed EA practices originate from business concerns, argued that enterprise architects needed to be moved to the management level and participate actively in decision-making. Although the portfolio manager intended to transfer EA to the management level, s/he was unsuccessful. Two possible explanations for the inability to convince the section's manager to enact an organizational change that would elevate EA include: EA concepts were difficult to understand; the word "architect" was used in Gov to refer to IT experts.

Surprisingly, despite the fact that both enterprise architects and portfolio manager considered a similar position for EA, they had never discussed the subject together. On the one hand, enterprise architects invited the portfolio manager to their architectural meeting, but s/he declined. On the other hand, the portfolio manager believed that all architects are just IT architects, so they do not take business objectives into account. It was interesting because they both (portfolio manager and enterprise architects) discussed a similar issue. For example, one enterprise architect offered a virtual structure or a change in the organizational structure inspired by the concept of "The Architect Elevator" (Hohpe, 2015). This proposal demonstrated how this change could accelerate the process of digitalization and innovation in Gov. However, by submitting the proposal to the IT manager, the enterprise architect received just one sentence in response: *"it is a good idea, but the time is not right."* The portfolio manager was unaware of the proposal.

Therefore, the tension between the IT manager and portfolio manager, as well as the portfolio manager's perception of all architects' tasks and abilities, were significant barriers to establish certain organizational norms for EA practices. Moreover, it was unknown if there were previously any norms or defined procedures for conducting EA practices. We only understood that at one point in time (particularly when the first enterprise architect worked in Gov), EA practices were carried out remarkably well and contributed significantly to projects and strategic decisions. However, recently enterprise architects worked mostly at the project level, performing tasks similar to those of IT architects.

## **Cultural-Cognitive Legitimacy**

A recurrent theme in the interviews was a sense amongst interviewees that their outcomes measured their job. Since the consequences of the lack of EA considerations were unclear to managers, the enterprise architects' job evaluation was challenging.

*"We should show to others that we (Gov) need EA. The challenge is that even without EA, the digitalization has progressed. Therefore, this is very difficult to explain to others that, yet, we need EA. (...) we should show that by bringing EA here, after for instance three years, we will obtain more efficiency"* (Enterprise Architect)

Throughout, architectural practices were questioned at all levels. Enterprise architects believed they should resolve issues that others had not yet identified. They were required to conduct various workshops, attend meetings, and engage in projects in order to raise awareness about the critical role of architectural principles in digitalization processes. However, the organizational culture as a whole did not adequately help them. Thus, from a cultural-cognitive criteria perspective, it was obvious that the majority of people working in Gov, especially those outside the IT department who did not have an IT

background, did not understand the importance of architectural principles at both levels. As a result, EA practices have never been gained this type of legitimacy.

*“People are too busy with tasks they are hired for. This is a big pressure. (They) do not use effort to look at the work outside their work. This is a reason people don't feel willing to do a job that is not part of their job description” (IT architect)*

In Table 2, two situations are compared based on our theoretical framework. First, the conditions which resulted in bringing EA into Gov and making it part of organizational practices. Following that, the conditions resulting in the delegitimization of EA.

Legitimacy Criteria	Source of Legitimization	Reason for Delegitimization
Regulatory Legitimacy	It had been initially interpreted that implementing EA is a recommendation from the government (based on the government's old statement). A very recently released government statement recommended EA implementation, which is perceived as a trigger to reintroduce and re-legitimate EA.	Individuals became aware that the government (on the old statement) only had recommended implementing IT architecture principles and there was no recommendation on EA in particular.
Pragmatic Legitimacy	Prior IT manager was convinced, and actually established, that the organization needs EA and enterprise architect roles. Enterprise architects tried to raise awareness about the significant role of EA in the organization's digitalization initiatives.	The current IT manager made no distinction between architectural practices at the project and enterprise levels, thereby no attention to EA as a distinct practice. Only enterprise architects showed an interest in implementing EA practices. However, they were allocated to projects and considerably busy with their assigned, project-level tasks.
Normative Legitimacy	EA practices did not make it to obtain normative legitimacy from the outset due to conflicting and highly competing beliefs about EA role among managers, and owing to inconstant views on EA in the organization.	
Cultural-Cognitive Legitimacy	EA practices did not make it to obtain cognitive legitimacy from the outset due to a general unawareness, among non-IT employees, of the importance of architectural principles and practices.	
<b>Table 2. Factors Influencing (De)Legitimization of EA</b>		

## Discussion

There is a growing stream of research in EA literature on incorporating EA into an organization, with specific focus on EA institutionalization inspired by institutional theory (e.g., Brosius et al., 2018a; Dang, 2021; Dang & Pekkola, 2019a; Levy & Bui, 2019). In theorizing on institutionalization of EA and elaborating on how EA can become part

of the organization, existing studies provide important insights by investigating institutional pressures, pillars, and logic (e.g., Dang, 2021; Haki et al., 2020b). While existing studies implicitly account for legitimacy in their investigation of EA, our study complements them by examining EA's institutionalization through a legitimacy lens. As an integral part and the cornerstone of institutional theory (Suchman, 1995), legitimacy is considered as a prerequisite for institutionalization (Scott, 2005b) and makes sense of how a particular phenomenon gains or loses its momentum in its institutional context. Specifically, our study lays emphasis on the process through which EA becomes delegitimized while previously being considered as a legitimate and important practice in the organization. The latter shifts the focus from merely obtaining legitimacy for EA to the process of dynamically maintaining and repairing legitimacy after exposure to new circumstances and value systems. Therefore, we address the lack of attention to delegitimization in EA literature and call for investigating EA as a dynamic and recurring process of legitimacy, delegitimacy, and relegitimacy (eg., Lawrence et al., 2001).

To answer our research question on how EA becomes delegitimized within an organization, we relied on four criteria of legitimacy, namely regulatory, pragmatic, normative, and cultural-cognitive. We investigated how and to which extent the studied organization obtained and lost legitimacy in each of the abovementioned criteria. Building on these distinct but complementary aspects of legitimacy, we examined a case of delegitimized EA to discover why EA was unable to maintain its momentum within the studied organization. The findings indicate that normative and cultural-cognitive legitimacy were never obtained in the studied organization, whereas EA encountered multiple challenges for retaining regulatory and pragmatic legitimacy after being partially attained. Thus, EA became delegitimized, and the organization discontinued expected EA practices. However, since the organization had previously invested considerable effort in EA and gained partial legitimacy in some of its aspects, the organization has now been considering to reintroduce EA, thereby entering a phase of relegitimization for EA.

## ***Theoretical Implications***

Our empirical data provides evidence on antecedents of EA's delegitimization such as the tension between important stakeholder groups, individual interests and priorities of stakeholder groups, the lack of communication between stakeholder groups with similar attitude toward EA, the lack of consensus on interpretation of regulatory obligations, and convergence in interest to EA with regard to its project or enterprise-wide level scope and impacts. While these causes can be mapped to Oliver's (1992) political, functional, and social antecedents of delegitimization, our study discusses them with regard to the main criteria of legitimacy to more closely investigate how and to which extent legitimacy criteria are attained and lost over time. Nevertheless, our study goes beyond merely demonstrating each of the legitimacy aspects in the context of EA. Instead, our empirical data unfolds the *dynamics between different aspects of legitimacy*.

That is, our findings advocate the cruciality of regulatory legitimacy and its role in delineating and reinforcing the other legitimacy aspects. Since regulatory legitimacy was not fully achieved in the studied case, other legitimacy criteria were either not met or encountered difficulties. For example, after the IT manager (the main legitimacy provider in the pragmatic category) was changed, EA simultaneously struggled with its regulatory legitimacy due to the lack of consensus on interpretation of the government's obligations. Therefore, the new appointed IT manager did not feel coerced to proceed and therefore discontinued EA practice. Thus, the already obtained pragmatic legitimacy gained by the previous IT manager's interest and supported by the interest of existing enterprise architects did not help to bring EA back to the organization's interest.



Pragmatic legitimacy should also be gained promptly and effectively during the EA institutionalization process for which legitimacy providers play a critical role. In the initial stages of EA institutionalization, since EA was the personal interest of the previous IT manager, the organization experienced a relatively successful practice on EA although regulatory legitimacy of EA was not totally clear to stakeholders. Therefore, a strong pragmatic legitimacy can, to some extent, compensate the fragility of regulatory legitimacy. Nevertheless, the legitimacy providers are responsible for ensuring that EA is introduced correctly in the organization. As was the case in the studied organization, individuals had distinct views on EA; some saw it as an important practice, while others ignored its strategic role. As a consequence of this uncertainty, a major divergence in the organization's belief about the role of EA occurred. Indeed, friction between managers appears to be the primary reason for the loss of pragmatic legitimacy.

The criticality of regulatory and pragmatic legitimacy for institutionalization process also leans on the fact that normative and cultural-cognitive legitimacy need time to be established. Therefore, the achievement of regulatory and pragmatic legitimacy would cater the required time and the basis for normative and cultural-cognitive legitimacy to be attained. This is specifically decisive for regulatory legitimacy that, owing to its coercive nature, it has access to more immediate mechanisms (e.g., rules, regulations, standards) to be obtained and established.

### ***Practical Implications***

The lens of legitimacy caters important implications for practice. According to institutional theory, EA can gain legitimacy in its institutional context if all regulatory, pragmatic, normative, and cultural-cognitive criteria are put in place. This means that, EA institutionalization is the function of not only EA governance, principles, and standards, but also consensus among major stakeholders on the expected role from EA as well as propagation of architectural thinking to make EA procedures part of the organization's norms and routines. This may point to many EA failure cases. In such cases, even though a considerable effort was invested to establish governance procedures, EA did not make the expected outcomes due to the existence of competing belief systems in the organization or because EA remained in its ivory tower without affecting the daily routines of stakeholders. Therefore, next to establishment of regulatory mechanisms (e.g., procedures, standards, principles) that are already emphasized in research and practice, an important recommendation to practitioners is to design and establish carriers (Scott, 2003, 2013) for normative and cultural-cognitive legitimacy. Examples for normative carriers are organizing architecture-related events and architecture training sessions, and issuing architecture awards (Haki et al., 2020b). For cognitive legitimacy, exemplary carriers are highlighting architecture success stories and architecture role models in the organization (Haki et al., 2020b). While normative and cognitive legitimacy are less under the direct control of managers, the establishment of related carriers can facilitate the processes of attaining or retaining these aspects of legitimacy.

### ***Limitations and Future Research***

Due to our single-case study approach, we assume boundary conditions to our findings when it comes to their generalizability. The choice of a single case gave us the opportunity of having an in-depth understanding of the studied case and to thoroughly explain why EA lost its momentum. To make the results generalizable, we encourage future research to, building on our findings, examine EA (de)legitimacy in a multiple-case or survey setting to collect data from a wide range of cases.

In addition, the investigated case in this study did not allow us to provide insights into the relegitimization phase after delegitimization. While our initial empirical data shows that the organization has now been considering to reintroduce EA, we encourage the study of other cases in which the repairing of legitimacy has already happened to provide a full picture of EA as a dynamic and recurring process of legitimacy, delegitimacy, and relegitimacy.

We further encourage future research to study the underlying carriers to gain or manipulate different aspects of legitimacy. Carriers for regulatory legitimacy such as EA principles and standards (Boh & Yellin, 2006; Haki & Legner, 2021b) are coercive in nature and under the control of managers. We thus specifically encourage future research to examine carriers for pragmatic, normative, and cognitive legitimacy as they seem to be beyond the direct control of managers and may take time to put in place. Therefore, deriving and theorizing on carriers for non-coercive sources of legitimacy is of high value for both research and practice.

## Acknowledgments

We are deeply grateful to all the professionals who agreed to participate in the study. This research was supported by the Norwegian Research Council (pr. nr. 811475008).

## References

- Aier, S. 2014. "The Role of Organizational Culture for Grounding, Management, Guidance and Effectiveness of Enterprise Architecture Principles," *Information Systems and e-Business Management* (12:1), pp. 43-70.
- Aier, S., and Weiss, S. 2012. "Facilitating Enterprise Transformation through Legitimacy-an Institutional Perspective," in: *Multikonferenz der Wirtschaftsinformatik (MKWI)*. Braunschweig: pp. 1073-1084.
- Ajer, A. K., and Olsen, D. H. 2018. "Enterprise Architecture Challenges: A Case Study of Three Norwegian Public Sectors," *Proceedings of the 26th European Conference on Information Systems*, Portsmouth, UK: Association for Information Systems.
- Ajer, A. K. S., Hustad, E., and Vassilakopoulou, P. 2021. "Enterprise Architecture Operationalization and Institutional Pluralism: The Case of the Norwegian Hospital Sector," *Information Systems Journal* (31:4), pp. 610-645.
- Ajer, A. K. S., and Olsen, D. H. 2019. "Enterprise Architecture Implementation Is a Bumpy Ride: A Case Study in the Norwegian Public Sector," *Electronic Journal of e-Government* (17:2), pp. pp79-94-pp79-94.
- Aldrich, H. E., and Fiol, C. M. 1994. "Fools Rush In? The Institutional Context of Industry Creation," *Academy of management review* (19:4), pp. 645-670.
- Ashforth, B. E., and Gibbs, B. W. 1990. "The Double-Edge of Organizational Legitimation," *Organization science* (1:2), pp. 177-194.
- Avgerou, C. 2000. "It and Organizational Change: An Institutional Perspective," *Information Technology & People* (13:4), pp. 234-262.
- Banaeianjahromi, N., and Smolander, K. 2016. "Understanding Obstacles in Enterprise Architecture Development," *Proceedings of the 24th European Conference on Information Systems*, Istanbul, Turkey.
- Beese, J., Haki, K., Aier, S., and Winter, R. 2020. *Enterprise Architecture as a Public Goods Dilemma: An Experimental Approach*. Springer.
- Bernardi, R., Sarker, S., and Sahay, S. 2019. "The Role of Affordances in the Deinstitutionalization of a Dysfunctional Health Management Information System in Kenya: An Identity Work Perspective," *MIS Quarterly* (43:4), pp. 1177-1200.

- Boh, W. F., and Yellin, D. 2006. "Using Enterprise Architecture Standards in Managing Information Technology," *Journal of Management Information Systems* (23:3), pp. 163-207.
- Bradley, R. V., Pratt, R. M., Byrd, T. A., Outlay, C. N., and Wynn, J., Donald E. 2012. "Enterprise Architecture, Its Effectiveness and the Mediating Role of IT Alignment in US Hospitals," *Information Systems Journal* (22:2), pp. 97-127.
- Brosius, M., Aier, S., Haki, K., and Winter, R. 2018. "Enterprise Architecture Assimilation: An Institutional Perspective," *Proceedings of the 39th International Conference on Information Systems*, San Francisco: Association for Information Systems.
- Brown, A. D. 1998. "Narrative, Politics and Legitimacy in an IT Implementation," *Journal of Management Studies* (35:1), pp. 35-58.
- Dang, D. 2021. "Institutional Logics and Their Influence on Enterprise Architecture Adoption," *Journal of Computer Information Systems* (61:1), pp. 42-52.
- Dang, D., and Pekkola, S. 2019. "Institutional Perspectives on the Process of Enterprise Architecture Adoption," *Information Systems Frontiers* (22), pp. 1433-1445.
- Dang, D. D., and Pekkola, S. 2016. "Root Causes of Enterprise Architecture Problems in the Public Sector," *Proceeding of the 20th Pacific Asia Conference on Information Systems*: Association for Information Systems.
- Deephouse, D. L., Bundy, J., Tost, L. P., and Suchman, M. C. 2017. "Organizational Legitimacy: Six Key Questions," *The SAGE handbook of organizational institutionalism* (4:2), pp. 27-54.
- DiMaggio, P. J., and Powell, W. W. 1983. "The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields," *American sociological review*, pp. 147-160.
- Eisenhardt, K. M. 1989. "Building Theories from Case Study Research," *Academy of management review* (14:4), pp. 532-550.
- Flynn, D., and Du, Y. 2012. "A Case Study of the Legitimation Process Undertaken to Gain Support for an Information System in a Chinese University," *European Journal of Information Systems* (21:3), pp. 212-228.
- Flynn, D., and Puarungroj, W. 2006. "The Legitimation-Seeking Process in Information Systems Development," *Proceedings of European Conference on Information Systems*: Association for Information Systems.
- Golant, B. D., and Sillince, J. A. 2007. "The Constitution of Organizational Legitimacy: A Narrative Perspective," *Organization studies* (28:8), pp. 1149-1167.
- Greenwood, R., and Hinings, C. R. 1996. "Understanding Radical Organizational Change: Bringing Together the Old and the New Institutionalism," *Academy of Management Review* (21:4), pp. 1022-1054.
- Haki, K., Beese, J., Aier, S., and Winter, R. 2020. "The Evolution of Information Systems Architecture: An Agent-Based Simulation Model," *MIS Quarterly* (44:1).
- Haki, K., and Legner, C. 2021. "The Mechanics of Enterprise Architecture Principles" *Journal of the Association for Information Systems* (22:5).
- Haki, M. K., Legner, C., and Ahlemann, F. 2012. "Beyond EA Frameworks: Towards an Understanding of the Adoption of Enterprise Architecture Management," *Proceedings of the European Conference on Information Systems*: Association for Information Systems.
- Hirsch, P. M., and Andrews, J. 1984. "Administrators' Response to Performance and Value Challenges--or, Stance, Symbols and Behavior in a World of Changing Frames," in *Leadership and Organizational Culture: New Perspectives on Administrative Theory and Practice*. pp. 170-185.
- Hohpe, G. 2015. "The Architect Elevator." from [https://www.enterpriseintegrationpatterns.com/ramblings/79\\_elevator.html](https://www.enterpriseintegrationpatterns.com/ramblings/79_elevator.html)
- Hussain, Z., Taylor, A., and Flynn, D. 2004. "A Case Study of the Process of Achieving Legitimation in Information Systems Development," *Journal of Information Science* (30:5), pp. 408-417.

- Jang, Y. S., and Luo, X. 2000. "Nation-State Participation in Intergovernmental Technology Organizations," *International Journal of Comparative Sociology* (41:3), p. 255.
- Jepperson, R. 1991. "Institutions, Institutional Effects, and Institutionalism," *The New Institutionalism in Organizational Analysis*, pp. 143-163.
- Kaganer, E. A., Pawlowski, S. D., and Wiley-Patton, S. 2010. "Building Legitimacy for IT Innovations: The Case of Computerized Physician Order Entry Systems," *Journal of the Association for Information Systems* (11:1), p. 2.
- King, J. L., Gurbaxani, V., Kraemer, K. L., McFarlan, F. W., Raman, K., and Yap, C.-S. 1994. "Institutional Factors in Information Technology Innovation," *Information systems research* (5:2), pp. 139-169.
- Krueger, R. A. 2014. *Focus Groups: A Practical Guide for Applied Research*. Sage publications.
- Lange, M., Mendling, J., and Recker, J. 2016. "An Empirical Analysis of the Factors and Measures of Enterprise Architecture Management Success," *European Journal of Information Systems* (25:5), pp. 411-431.
- Lawrence, T. B., Winn, M. I., and Jennings, P. D. 2001. "The Temporal Dynamics of Institutionalization," *Academy of Management Review* (26:4), pp. 624-644.
- Levy, M., and Bui, Q. N. 2019. "How Field-Level Institutions Become a Part of Organizations: A Study of Enterprise Architecture as a Tool for Institutional Change," *Information and Organization* (29:4), p. 100272.
- Maguire, S., and Hardy, C. 2009. "Discourse and Deinstitutionalization: The Decline of Ddt," *Academy of Management Journal* (52:1), pp. 148-178.
- Mäki-Lohiluoma, P., Hellsten, P., and Pekkola, S. 2016. "Why Do We Need This? Roles in the Information System Acquisition Legitimation Process," *Proceedings of the 24th European Conference on Information Systems*, Istanbul, Turkey: Association for Information Systems.
- Meyer, J. W., and Rowan, B. 1977. "Institutionalized Organizations: Formal Structure as Myth and Ceremony," *American Journal of Sociology* (83:2), pp. 340-363.
- Mignerat, M., and Rivard, S. 2009. "Positioning the Institutional Perspective in Information Systems Research," *Journal of Information Technology* (24:4), pp. 369-391.
- Nicholson, B., and Sahay, S. 2009. "Deinstitutionalization in the Context of Software Exports Policymaking in Costa Rica," *Journal of Information Technology* (24:4), pp. 332-342.
- Oliver, C. 1992. "The Antecedents of Deinstitutionalization," *Organization studies* (13:4), pp. 563-588.
- Orlikowski, W. J., and Barley, S. R. 2001. "Technology and Institutions: What Can Research on Information Technology and Research on Organizations Learn from Each Other?," *MIS quarterly* (25:2), pp. 145-165.
- Paré, G. 2004. "Investigating Information Systems with Positivist Case Research," *Communications of the Association for Information Systems* (13:1), p. 18.
- Pfeffer, J., and Salancik, G. R. 2003. *The External Control of Organizations: A Resource Dependence Perspective*. Stanford University Press.
- Ramiller, N. C., and Swanson, E. B. 2003. "Organizing Visions for Information Technology and the Information Systems Executive Response," *Journal of Management Information Systems* (20:1), pp. 13-50.
- Ross, J. W., and Quaadgras, A. 2012. "Enterprise Architecture Is Not Just for Architects," *CISR Research Briefings* (7:9).
- Ruef, M., and Scott, W. R. 1998. "A Multidimensional Model of Organizational Legitimacy: Hospital Survival in Changing Institutional Environments," *Administrative Science Quarterly* (43:4), pp. 877-904.
- Schmidt, C., and Buxmann, P. 2011. "Outcomes and Success Factors of Enterprise IT Architecture Management: Empirical Insight from the International Financial

- Services Industry," *European Journal of Information Systems* (20:2), pp. 168-185.
- Scott, W. R. 1994. *Institutions and Organizations: Toward a Theoretical Synthesis*. Institutional Environments and Organizations: Structural Complexity and Individualism: Sage.
- Scott, W. R. 2001. "Institutions and Organizations," *Thousand Oaks, CA: Sage Publications*. Sekaran, U.(2003). *Research Methods for Business, A Skill Building Process, 4th edn*, NY: John Wiley. Seligman, J.(2002). 'No one can serve two masters: Corporate and securities law after Enron', *Washington University Law Quarterly* (80:2), pp. 449-518.
- Scott, W. R. 2003. "Institutional Carriers: Reviewing Modes of Transporting Ideas over Time and Space and Considering Their Consequences," *Industrial and Corporate Change* (12:4), pp. 879-894.
- Scott, W. R. 2005. *Institutional Theory*. Encyclopedia of Social Theory Sage.
- Scott, W. R. 2013. *Institutions and Organizations: Ideas, Interests, and Identities*. Sage publications.
- Seppänen, V., Penttinen, K., and Pulkkinen, M. 2018. "Key Issues in Enterprise Architecture Adoption in the Public Sector," *Electronic Journal of e-Government* (16:1).
- Suchman, M. C. 1995. "Managing Legitimacy: Strategic and Institutional Approaches," *Academy of Management Review* (20:3), pp. 571-610.
- Tamm, T., Seddon, P. B., Shanks, G., and Reynolds, P. 2011. "How Does Enterprise Architecture Add Value to Organisations?," *Communications of the Association for Information Systems* (28:1), p. 10.
- Teo, H.-H., Wei, K. K., and Benbasat, I. 2003. "Predicting Intention to Adopt Interorganizational Linkages: An Institutional Perspective," *MIS Quarterly* (27:1), pp. 19-49.
- Venkatesh, V., Bala, H., Venkatraman, S., and Bates, J. 2007. "Enterprise Architecture Maturity: The Story of the Veterans Health Administration," *MIS Quarterly Executive* (6:2).
- Winter, R. 2014. "Architectural Thinking," *Wirtschaftsinformatik* (56:6), pp. 395-398.
- Winter, R. 2016. "Establishing 'Architectural Thinking' in Organizations," *IFIP Working Conference on The Practice of Enterprise Modeling*: Springer, pp. 3-8.
- Yin, R. K. 2003. *Design and Methods*. Case study research: Sage.
- Zachman, J. A. 1987. "A Framework for Information Systems Architecture," *IBM Systems Journal* (26:3), pp. 276-292.



**Paper 4: Enterprise Architecture's Ups and Downs Over Time: A Case of De- and Re-Institutionalization**

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# **Enterprise Architecture's Ups and Downs Over Time: A Case of De- and Re-Institutionalization**

*Completed Research Paper*

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## **Abstract**

*This study contributes to the growing body of research on the assimilation and institutionalization of enterprise architecture (EA) within organizations. It adopts an institutional change lens to longitudinally analyze EA's institutionalization, de-, and re-institutionalization processes in one of Norway's large public sector organizations. The study demonstrates a dynamic and cycle model of EA institutionalization in response to both internal and environmental pressures. It specifically emphasizes on regaining legitimacy for EA after getting de-institutionalized by revisiting its classical premise and by adapting to contemporary organizations' agile mode of organizing.*

**Keywords:** Institutional theory, institutional change, enterprise architecture (EA)

## **Introduction**

It is generally understood that the success of an organization is influenced by a variety of factors, one of which is the information systems (IS) used to support complex business operations (Williams & Karahanna, 2013). The larger the organization and the more diverse business activities, the more likely it is that budgets and ownership of IS development projects would be assigned to local business units. On the one hand, local ownership enables alignment of IS development efforts with local business needs. On the other hand, it often results in an inability of IS to cope with cross-unit efficiencies and integration requirements (Peterson, 2004). Thus, organizations pursue strategies for managing the increasing complexity and uncertainty associated with enterprise-wide infrastructures and architectures in this situation (Haki et al., 2020b; Haki & Legner, 2021a). To this, enterprise architecture (EA) is one approach that has received considerable interest in both research and practice. EA is described as the collection of an organization's IT (and business) components and their interdependence, as well as efforts to align local and short-term IT investments with enterprise-wide and long-term strategic imperatives (Boh & Yellin, 2006; Haki et al., 2020b; Schmidt & Buxmann, 2011).

In the EA literature, the majority of current studies have focused on EA frameworks, principles, and standards (e.g., Boh & Yellin, 2006; Haki & Legner, 2021a; Zachman, 1987), and also on the challenges and benefits of EA (e.g., Lange et al., 2016; Tamm et al., 2011), as well as on EA management and adoption (e.g., Aier, 2014; Haki et al., 2012; Schmidt & Buxmann, 2011). While the latter studies focused on how to structure and integrate EA into an organizational context, others examined the institutionalization of EA to shed light on how EA can be integrated as an essential part of organizations (e.g., Ajer et al., 2021; Beese et al., 2020b; Brosius et al., 2018a; Dang & Pekkola, 2019a; Levy & Bui, 2019). These studies take an institutionalization approach, specifically through the lens of institutional theory (DiMaggio & Powell, 1983a; Scott, 2013). They view an organization as an institution wherein EA must establish the necessary institutional pillars and gain institutional legitimacy to eventually become an inherent part of organizations (e.g., Dang, 2021; Dang & Pekkola, 2019a; Haki et al., 2020b).

Although EA has received significant attention in recent years for its role in coordinating and managing the digital transformation process (Haki et al., 2020b; Haki & Legner, 2021a; Kurnia et al., 2021), it has considerably been challenged by an increasingly agile mindset and approach in organizations (Gartner, 2021). EA traditionally follows a classical top-down approach, which emphasizes long-term goals and strategies (Hanschke et al., 2015). This decision model contrasts with agile short-term ambitions (Dingsøyr et al., 2018), which rely primarily on self-autonomy (Jöhnk et al., 2019). Thus, it is argued that the "command and control" style of EA will fail in the digital age, and advised that organizations reframe the EA practice to promote agility (Gartner, 2021). As such, the classical EA's legitimacy is getting challenged in organizations resulting in de-institutionalization of EA, after a long effort to have it institutionalized, and requiring further efforts for its re-institutionalization.

Our study complements existing studies on EA institutionalization by capturing all the three major phases of institutionalization processes, including institutionalization, de-institutionalization, and re-institutionalization. Current research has focused on the institutionalization of EA from a single snapshot perspective. Instead, we opted for a longitudinal perspective to study institutionalization (Mignerat & Rivard, 2009) and adopt a process model approach (Hinings et al., 2004) to comprehend *how EA institutionalization occurs* in a long journey. This approach helps us capture novel insights into EA's ups and downs and on its reform to catch up with new institutional circumstances and to regain its legitimacy.

To this end, guided by institutional change processes model (Hinings et al., 2004) from institutional theory, we opted for an explanatory case study on one of Norway's largest public-sector (NAV) organizations. NAV has a long history of conducting EA practices and has experienced various organizational changes over the recent years. The latter primarily includes changing its software development strategy from outsourcing to insourcing through agile teams, which have had a considerable impact on EA. The long journey of EA's institutionalization process in NAV, including institutionalization, de-institutionalization, and re-institutionalization, resulted in the transformation of EA to a new form to ensure its survival in the current state of NAV.

The remainder of this paper is organized as follows. The next section provides background for the study by providing insights into the literature on EA and institutional theory. After a presentation of the theoretical foundations, the section on research method describes our data collection and analysis procedures. Following the analysis of the findings, we finally discuss the research results.

## Research Background

Institutionalization has received significant interest in the IS literature, and institutional theory is widely regarded as a valid lens for examining institutionalization processes of IS phenomena (e.g., Avgerou, 2000b; King et al., 1994; Mignerat & Rivard, 2009; Orlikowski & Barley, 2001). The study of IS institutionalization processes covers a number of topics, including IS standards, IS development processes, and IT innovation, in which scholars have concentrated on various aspects of institutional theory, such as the institutionalization process (e.g., Avgerou, 2000b), the legitimization process (e.g., Kaganer et al., 2010a), and the role of institutional entrepreneurs (Wang & Swanson, 2007). Similarly, in the EA literature, the study of EA institutionalization and assimilation (e.g., Ajer et al., 2021; Beese et al., 2020b; Brosius et al., 2018a; Dang & Pekkola, 2019a; Levy & Bui, 2019) has gained a considerable momentum. These studies provide important insights by investigating institutional pressures, pillars, and logic for EA (e.g., Dang, 2021; Haki et al., 2020b)

One of the institutional theory's central characteristics is its view of the world as an open environment (Scott, 2014), which has a significant effect on studying organizations. While organizations were historically regarded as processes that converted inputs into outputs, institutional theory takes a broader perspective and acknowledges the role of the social and cultural context in influencing organizations (Greenwood & Hinings, 1996; Mignerat & Rivard, 2009; Scott, 2001b). As such, institutional theory views institutions as active agents capable of responding strategically and innovatively to environmental pressures (Orlikowski & Barley, 2001), rather than as a passive entity controlled by the demands of their environment.

A significant challenge for institutional studies is, however, to demonstrate how and why embedded actors into an environment can be inspired to envision and adopt novel practices (Greenwood et al., 2002). As a result, a process model is needed to explain how and why institutions change (Hinings et al., 2004). To this, the employment of a longitudinal approach for conceptualizing and describing institutionalization processes (Mignerat & Rivard, 2009; Seo & Creed, 2002) is strongly recommended in order to compare institutional effects over a change period (Bala & Venkatesh, 2007; Son & Benbasat, 2007; Standing et al., 2009). This approach helps scholars identify the main triggers of the change and its implications. Owing to the scarcity of such an approach in the IS literature, and in the EA literature alike, in this study we adopt the institutional change processes model from institutional theory (Hinings et al., 2004) in a longitudinal research to examine the process of EA institutionalization and to ascertain how EA interacts with its environment.

## Theoretical Foundations

Although institutions are generally considered to be stable, they are subject to both incremental and discontinuous changes (Scott, 2001b). Four distinct types of institutional change are recognized: *institutional formation*, *institutional development*, *deinstitutionalization*, and *re-institutionalization* (Jepperson, 1991a). The institutional formation is the process by which social disorder is transformed into order. The term institutional development refers to an institution's continuation rather than its death. Deinstitutionalization occurs when an organization's identified meanings and actions are discredited, either by contradictory meanings and actions or by failing to contribute to the institution's continued existence (Avgerou, 2002). Deinstitutionalization is thus described as the process by which institutions weaken and eventually disappear (Scott, 2001b). In this state, the legitimacy of a previously legitimated organizational activity or practice disappears as a result of organizational challenges or due to inability to reproduce previously legitimated organizational performance (Oliver, 1992). The final

type of institutional change is re-institutionalization, which entails transitioning from one institutional form to another based on different principles or rules (Suchman, 1995).

Two additional points, however, are worth considering: the occurrence of fads and fashions, and the concept of sedimentation. There is an extensive body of research on management fads and fashions (Abrahamson, 1991; Clark & Fincham, 2002) demonstrating that institutionalization often does not occur despite the emergence of incipient institutionalization. "How long does it take for a new practice to become institutionalized?" is the question raised. For instance, although a practice such as Total Quality Management may gain widespread acceptance and appear to have a high degree of legitimacy, its adoption rapidly declines after a few years. Thus, widespread adoption practices are sometimes classified as a fad or fashion or as a proto-institution (Abrahamson, 1996; Lawrence et al., 2002).

The other argument is about re-institutionalization, which examines whether fundamentally radical structural change occurs during the transformation from one practice to another—or whether, more often, a mixture of continuity and change occurs (Child & Smith, 1987; Pettigrew, 1985). The latter is discussed through the concept of sedimentation. Sedimentation is a geological metaphor that enables a dialectical rather than linear understanding of change. The main argument is that, although institutional change can occur, it does not imply that previously institutionalized practices have disappeared; rather, it means that they have become relatively delegitimized and thus no longer justify the required support from powerful actors in the field (Cooper et al., 1996). Therefore, conflicting institutional logics can persist at the organizational field level (Scott, 2001b; Seo & Creed, 2002). The metaphor of sedimentation thereby highlights that an organizational field's stability is often provisional and that latent tensions often stay hidden under even in the most mature fields (Hinings et al., 2004).

To account for the above-outlined discussions, we opted for Hinings et al.'s (2004) model of institutional change processes (see Figure 1). This model is useful for integrating a large body of institutional change literature, especially when institutions are viewed as dynamic rather than static environments. This model comprises five overlapping stages of institutional change as described below.

### ***Stage I: Pressures for Change***

There are three pressures, or antecedents, of institutionalization named political, functional, and social, which have been investigated in various studies (e.g., DiMaggio & Powell, 1983a; Hoffman, 2001; Holm, 1995; Oliver, 1992; Scott et al., 2000). *Political* pressures lead to losing the practice's political legitimation, resulting in a debate regarding the given practice. *Functional* pressures are the results of technological changes, creating pressures to deinstitutionalize specific practices. In addition, increasing "social fragmentation" and decreasing "historical continuity" are the consequences of social pressures. As a result, *social* pressures bring initial argumentation among the field's actors, expand values from outside the field, and finally change actors' beliefs about their existing value (Oliver, 1992). However, Hinings et al. (2004) argue that there are two aspects concerning these pressures. First, these pressures are from the outside of the institution, which may not produce a change themselves. Second, the actors' response or interpretation may cause change or competition in the institution.

### ***Stage II: Source of New Practices***

It is expressed that "the critical catalytic effect of new ideas" is required for a change (McAdam, 1996, p. 5). As such, the "institutional entrepreneurship" is recognized as an influential trigger in institutional change dynamics (DiMaggio, 1988). Institutional

entrepreneurship classifies into three groups. *Innovators*, who are reputable and powerful existing actors (Scherer & Lee, 2002). *Engineers*, who influence the control of resources in a field and are strong gatekeepers. They are crucial in establishing the legitimacy of innovations after the innovations have been introduced (Powell & DiMaggio, 2012; Suddaby, 2003). *Catalysts*, who are the external actors, generating external forces (Hinings et al., 2004).

In the dynamics of institutional change framework, "insurgents" is also proposed as another source of new practice (Hinings et al., 2004). Accordingly, when political, functional, and social pressures are imposed, institutional entrepreneurs, both internal and external, emerge as significant actors, with the role of initiating change. Indeed, institutional entrepreneurs and insurgents are critical in raising a change process. They reshape established ideas and processes (thereby precipitating deinstitutionalization) and propose new organizational practices (institutionalization) (Hinings et al., 2004).

### ***Stage III: Processes of De- and Re-Institutionalization***

In this step, the processes of de- and re-institutionalization can be viewed from three aspects: theorization, legitimation, and dissemination. *Theorizing* is the process of "development and specification of abstract categories and the elaboration of chains of cause and effect; that is, it involves both building a model of how new practices and organizational forms work, and, providing a justification for them in the current and future contexts" (Strang & Meyer, 1993, p. 492). Moreover, new organizational forms need to be *legitimized* by connecting to the values and beliefs of actors involved in the societal context. Furthermore, *dissemination* refers to disseminating a new practice by using coercive, normative, and mimetic isomorphism processes (Hinings et al., 2004).

### ***Stage IV: Dynamics of De- and Re-Institutionalization***

The new practices that change the field do not affect organizations in a passive way. First, the institutional entrepreneurs (innovators and engineers) either create and advance the new ideas into the field or contribute to theorization and legitimation processes. Then, organizations attempt to perceive "what do we understand by them?" and evaluate the newly legitimized practices. Therefore, the adoption process is not simple (Hinings et al., 2004). Four interrelated elements influence the rate and the degree of acceptance of a new institutional practice in a field. *Committed to the values*, which concerns the tension between new and old values. *Interest dissatisfaction* means the participation of active players struggling to maintain their advantage in the practices they support (new or old). *Power structure* representing the organizational power of actors committed and interested in new/old practices. In addition, the fourth factor is the *capability* of the organization to adopt a new practice from the perspectives of technical and social aspects (Greenwood & Hinings, 1996).

### ***Stage V: Re-Institutionalization***

Re-institutionalization takes place when the density of adoption provides concepts with cognitive legitimacy to the point that they are assumed to be the normal and acceptable structures for all organizational fields (Suchman, 1995). This is referred to as strong re-institutionalization, and it results in a transformed field that resembles the mature field (DiMaggio & Powell, 1983a). Stage IV made it clear how power serves to facilitate, guide, and control the introduction of new practices. While the literature holds that large-scale, radical change occurs as a result of broad commitments, reality demonstrates that it is

only made possible by "transformational" or "visionary" leaders. Therefore, the role of power in both de- and re-institutionalization is very important (Clegg, 1989).

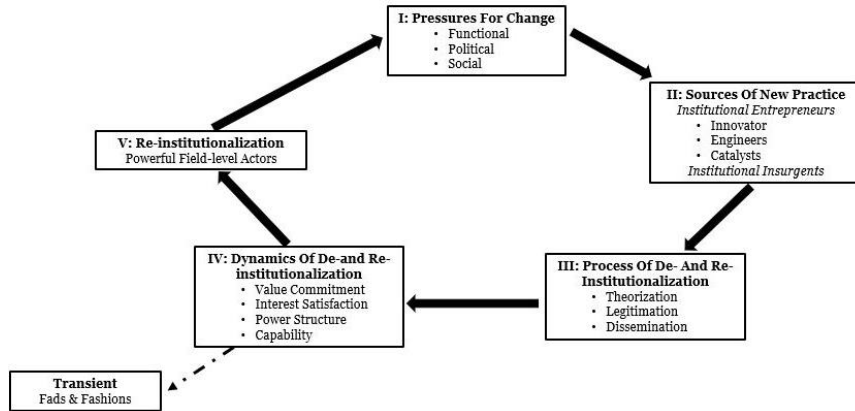


Figure 1. Institutional Change Processes (Hinings et al., 2004)

## Research Method

In line with the research's objective of examining EA institutionalization longitudinally, we chose a single-case study to develop a full understanding of how a phenomenon (institutionalization of EA) occurs in a real-world environment (Yin, 2003c). Concentrating on a single case highlights a desire to conduct a study of EA and the institutionalization process and produce a detailed case description (Darke et al., 1998). In accordance with our study's objectives, we chose the case organization based on its criticality and appropriateness in order to obtain illuminating insights (Yin, 2003c). To address our research question, we needed to select a case in which (1) conducting EA practices has a long history of organizational practices, (2) the organization has made a significant change that has impacted the credibility of EA practices, (3) EA practices have responded to this change and have been adopted again, and (4) adequate historical information was accessible, particularly through access to knowledgeable members of the organization.

## Case Description

In line with the case selection criteria, we opted for Norwegian Labor and Welfare Administration (NAV). NAV was established in 2006 by merging three large public-sector organizations. It employs over 14,000 people and a further 5,000 are employed in the municipality partnership. There are over 1,200 employees in its IT department. NAV is in charge of increasing the labor force capability of the population as well as providing financial aid to those who are unable to support themselves, through a variety of benefit packages such as pension, unemployment, and childcare. NAV has approximately 2.8 million active users and distributes one-third of Norway's national budget in the form of benefits. NAV offers IT services to three distinct groups of people across more than 300 applications: organizations and individuals, NAV employees, and external organizations with linked value chains.

From NAV's establishment until 2015, IT development and maintenance were handled collaboratively by three parties: the business organization, the IT department, and external vendors. Both software development and maintenance were outsourced and conducted as large coordinated releases. During that period, the IT department was responsible for a number of tasks, including the creation of high-level constraints such as integration architecture and security specifications, contract management, operational and technical assistance to business units, owning the system for integration and release, providing first-customer support, and ensuring the service's full functionality. The IT projects were primarily governed by function, costs, and deadlines, necessitating close monitoring of these factors. In this governance model, architects, at all levels, had strong roles. Some believed that architects had taken the manager's role. Thus, the command and control were their approaches, and their role was assumed as the technology police, which the vendor companies only tried to get their approval. However, enterprise architects rejected this claim and stated that architects might have taken the manager's role, but most likely with authority delegated by the manager.

In 2015, a specialist committee criticized NAV for failing to develop planned digital services, and for paying insufficient attention to user experiences, prompting a vigorous argument in the Norwegian media. As a result, NAV examined other software development approaches to reduce the dependencies and threats that large releases bring. NAV decided to conduct an agile pilot project in January 2016 to investigate the advantages of autonomous agile teams and how to solve future challenges. This experience was positive, and the company was encouraged to take action to improve cross-functionality in teams and to have client and vendor resources work side by side. The CIO was influential in the adoption of the in-house software development strategy and agile method. Moreover, the enterprise architects collaborated with the CIO and brought this idea, and thereafter, the CFO supported them.

In the new structure, there was less need for an individual to handle functional and technical requirements i.e., the architect's responsibilities in the previous model. Teams needed programmers, UX designers, data scientists, agile coaches, and other skills. In 2017, NAV began hiring talented employees at a rate of approximately 100 per year and building required competencies. Some employees left the organization, while others changed positions. Many architects became either product owners, programmers, or tech leads, and some project leaders and software process experts changed their role to team leaders and coaches. By increasing the number of autonomous teams, individuals became more motivated by the modern methodology, which promotes bottom-up and short-term planning approach. As a result, a serious opposition arose against architects who previously took a top-down, long-term approach with a command and control style. The teams challenged the architect's position and architectural practice in general. People in the teams argued strongly that NAV does not require architects and that architectural practice is unnecessary.

The increased number of agile teams led to a need to establish appropriate governance of the teams. As a result of the enterprise architects' contributions, a new organizational model, known as "Product Area", was introduced to NAV. The Product Area groups a number of cross-functional teams, and is in charge of one or more "user journeys" or "user groups," as well as related products or features. A Product Area encompasses all of the skills required to manage, develop, deliver, and maintain software within its responsibility scope. As a result of their autonomy, Product Areas manage their own budgets and are usually funded depending on the number of people involved. The current Product Areas are made up of 5-12 teams with 50 to over 100 people.

In 2020, by the emergence of Covid-19 globally, Norway, like other countries, and thus NAV, found itself in unexpected situations requiring a rapid and efficient response. The IT department and product areas were involved in delivering the demanded services to

users. Many remaining architects joined the agile teams to build new necessary services. Thus, members of the agile teams, who previously struggled with issues relating to government regulations and law, recognized architects' critical role in effectively developing new products. They did not, however, comply with the command and control style previously used by architects. Currently, NAV has fundamentally changed its sourcing strategy, technical infrastructure, and governance model for development and maintenance of IT systems. Moreover, the situation is different than it was two or three years ago. The majority of people agree on the importance of architectural practices in the software development process and emphasize the architect's role as a team advisor. The organization is working to improve the governance model, including how to better ensure compliance with rules and regulations by the autonomous teams.

## **Data Collection**

This study began in May 2020 and is currently ongoing. We collected both primary and secondary data by means of semi-structured interviews and observation (primary data collection) as well as existing documentations (secondary data collection).

First, the data collection process began with collecting and reflecting on internal and public documents about digitalization and architectural practices. Internal documents totaled approximately 1,000 pages and, ranging the years 2016 to 2020, contained project reports, presentations, minutes of meetings, and the internal portal. Public documents included statements, regulations, and policies by national authorities relevant to digitalization. This step lasted approximately five months, during which the first author and the main contact person met several times. These meetings aided us in understanding and recognizing various events and decisions that occurred between 2016 and 2020 in NAV. The document analysis, however, was not limited to this point. Following this point and after the interviews, the main contact person provided us with more documentation to help in gaining additional context detail.

Second, we collected data using semi-structured interviews (Eisenhardt, 1989). It's worth noting that our research proposal was accepted by the NAV's management board. As such, the contact person collaborated closely with us during the study's various phases. As a result, the first author and the main contact person worked to develop interview questions that met the research objectives. The primary interview questions were finalized following several back-and-forth communications through online meetings. However, various new questions to extract more details emerged during the interviews. Due to the need for historical information, we approached informants who were involved in the processes of the NAV's organizational change and EA practices. In total, we conducted 33 interviews with 31 participants, each lasting between 50 and 90 minutes. Participants included Top managers (4), Mid managers (9), Architects (14), and Developers (4). The meetings we had with the contact person to discuss the various research steps were not included in the statistics provided. Additionally, due to time constraints, two additional architects responded to our questions via email. We recorded all interviews with the permission of the interviewees. Following that, interviews were transcribed word by word using an external transcription service provider. The transcripts of the interviews totaled approximately 290 pages of single-spaced text and approximately 170,000 words.

Third, we observed four meetings. Two of them were working groups tasked with proposing new EA practices for NAV, while the other two were meetings at which the working group reported directly to top management. These meetings were also recorded and transcribed with permission. Additionally, there have been two additional meetings at the top management level with the same topic. Although we were unable to attend, we



read the minutes of the meetings, and the contact person explained the major topics covered. The summary statistics for the data collection methods are shown in Table 1.

Data Collection Technique	Source
Existing Documents	<ul style="list-style-type: none"> <li>• Internal documents, ranging from 2016 until 2020, over 1,000 pages including: project reports, presentations, minutes of meetings, and the internal portal</li> <li>• Public documents including statements, regulations, and policies by national authorities relevant to digitalization</li> </ul>
Semi-Structured Interviews	<ul style="list-style-type: none"> <li>• 33 interviews, lasting from 50 to 90 minutes</li> <li>• Over 290 pages of single-spaced text and 170,000 words</li> <li>• Participants: Top managers (4), Mid managers (9), Architects (14), and Developers (4)</li> </ul>
Observations	<ul style="list-style-type: none"> <li>• Four meetings - four hours</li> <li>• Over 35 pages of single-spaced text and 22,000 words</li> <li>• Participants: Top managers (3) and the working group</li> </ul>
<b>Table 1. Overview of Data Collection Techniques</b>	

## Data Analysis

We conducted data collection and analysis in parallel due to our qualitative approach (Eisenhardt, 1989). That is, the initial analysis of the first step interviews prompted the subsequent collection of interviews to include new or complementary questions. Nonetheless, since our approach was theoretically informed by the concept of the institutional change process as defined in institutional theory, our data analysis was guided throughout by a coding scheme derived from our theoretical framework. Additionally, we created a coding guideline (based on the coding scheme) that provides definitions and examples for each of the constituent elements of the coding scheme.

We transferred all interview and observation transcripts, as well as relevant existing documents, to NVivo 20 for data coding. The data is coded in accordance with the coding scheme. The main author coded after reaching agreement on the meanings of each of the coding scheme's constituent items. The co-author then took on the position of the devil's advocate, proposing alternative theories and counterarguments. After establishing a proper degree of agreement, the data were coded.

## Empirical Findings

To ease in understanding, this section presents the findings according to the various stages of the institutional change process. However, since NAV is a large-scale organization of over 19,000 employees, transitioning between stages takes time and sometimes overlaps. As a result, it wasn't easy to distinguish between stages 2 and 3 of the theoretical framework. Additionally, although the interviews were performed in 2020 and 2021, the following quotes sometimes do not represent the organization's current state. This is because we asked interviewees to discuss the history of the organizational changes. Also, in some circumstances, people continued to support an idea opposing the organization's overall idea due to the gradual nature of institutional change. However, the quotes support the institutional change's stage, which presents them.

## **Pressures for Change**

In 2015, with the advent of new trends emphasizing quick response to customer needs and a focus on user experience, NAV recognized that its outsourcing strategy for developing new digitalized services would fail of society's expectations. Users' needs were evolving rapidly, and due to the significant distance between users and developers, NAV responded slowly and insufficiently to the new users' needs. Additionally, digitalization had become a priority for the Norwegian government. The government encouraged and suggested that both public and private sectors take advantage of the benefits of digitalization. Thus, NAV's top leaders were required to attend a variety of workshops and courses to become more acquainted with the benefits of digitalization and the emerging developments and opportunities associated with digital transformation. Besides, as a result of the extensive debate over NAV's failure to respond to users' needs through digital tools, NAV's CEO and CIO<sup>1</sup> were changed. While everyone in NAV agreed on the importance of changing their digitalization strategy, there was considerable fear of failure about a change due to the NAV's duty to provide assistance and money to people and the massive discussion about NAV's failure in Norwegian media.

## **Sources of New Practice and Process of De- and Re-Institutionalization**

NAV employed a CIO (previous CIO), who was a visionary leader (in 2015). He came from a well-known international IT company along with in-depth knowledge of digitalization and digital transformation. He believed that IT should be at the heart of companies like NAV, which offer a variety of services to their customers. As a result, he argued outsourcing is not an effective method for handling NAV's digitalization. Changing people's mindsets proved difficult. However, he did not stop there; he made a concerted effort to persuade the top management to shift the software development strategy to the in-house. Although he felt lonely on several occasions, he never gave up. He thought it was critical to creating a sense of urgency and motivation for change in the leadership team. He believed that if the leadership team does not recognize the need for change, NAV will fail. Therefore, NAV must begin with the leadership, create motivation, and at the same time, remind people that we are not embarking on a revolution; this is a journey, and the way to get there is not by turning every stone here now; we must create a parallel reality in order to develop the future. Finally, as a pilot study, he tried his idea by bringing two small agile teams. The successful outcomes of these teams became apparent quite quickly and resulted in support from a variety of groups, including the financial department (from within NAV) and labor unions (from outside the NAV).

*"He had a great way of talking about visions and very good at storytelling, so while we were doing things, he was always already 4-5 years in front of us. He created this illustration where they had these roles with different tops or hills. When you are getting to the top of the hill, you feel that yes, we managed it, and we are looking for him [previous CIO]; but he is not there. We are wondering where he is, and then you see the next hill is already there, and that is the next goal. [...] He is best at not moving something 5 degrees, but 180, totally changing something, so he is more like a transformation leader, and he also has a technology background." (Developer talking about the previous CIO)*

The agile teams were awarded a digitalization prize in Norway, which had a major impact on the new idea's credibility, especially following NAV's 2015 criticism. The new employees hired for the agile pilot teams served as role models in NAV. Additionally, as

<sup>1</sup> - We will not make reference in this study to the CEO or CIO of NAV prior to 2015. Indeed, when we refer to the "previous CIO," which will be mentioned later, we are referring to the CIO who joined NAV in 2015 and left in December 2018. Furthermore, the CIO who referred to in the case description is the "previous CIO."

a result of these successful outcomes and the interest of individuals in trying out new ideas, IT department employees became more interested in in-house and agile method. The majority of architects, especially enterprise architects, along with the previous CIO and development department manager, were strong supporters of agile teams. Nevertheless, empowering the new idea created a challenge for architectural practices and architects' roles in IT departments, as these two had key roles in the outsourcing strategy. Indeed, developers viewed enterprise architects as people who earn a lot of money and attend a lot of meetings to make decisions. They also receive budgets, which means they get a lot of resources. In the eyes of developers, enterprise architects produce something that is not in line with teams' expectations. Developers indicated strongly that enterprise architects must shift into teams and away from committees.

*"I think for us, it is quite difficult to combine the modern way of thinking with the EA framework and the thoughts they have, so I don't think the EA is quite modern." (Mid manager)*

### ***Dynamics of De-and Re-Institutionalization***

Over the course of two years, NAV's previous CIO hired more than 200 talented individuals to develop agile teams. Bringing in new employees resulted in a rapid change in the organizational mindset. KPIs were no longer used to determine success. Individuals just discussed providing real value to the consumer. As a result, NAV was faced with a considerable challenge. People were divided into two groups. The first group was a passionate supporter of the modern way of working and was vehement in its criticism of the old way of working. Although the second group recognized the benefits of the new way of working, they claimed the previous way of working had many advantages as well. The second group highlighted planning and budgeting as the major advantages of the old way of working. Indeed, since planning and budgeting are necessary factors of public sector organization management, the financial department faced significant challenges as a result of the modern way of working, which promotes autonomy in various areas, including budget. However, the first group argued that while planning is necessary, it is not particularly valuable.

*"I am not really sure that people supported the old way of working. [...] I think the big problem was that we had many people hired at NAV in roles that matched the old way of working, but we do not need those roles anymore in the new way of working. I think that is where you find the people that either consciously or unconsciously are holding back. [...] A new strategic way of thinking about what competency do we need in the IT department was going ahead. [...] To a lot of these people were told either you have to be developer or designer. Then we will help you along the way or maybe if you do not want to do that maybe you should look for other work so. A lot of those people are now in other places and those people who embrace the change become other things, and they work in this new way." (Architect)*

In NAV, a competency-building project was initiated. Everybody attempted to acquire the new skills that were needed. They acquired necessary knowledge in a variety of ways, including taking classes, attending lectures, reading books, and conversing with one another. Additionally, the change's main leaders attempted to incorporate the fruitful experiences of other organizations into NAV in various ways such as visiting many organizations both in and outside of Norway to become acquainted with the methods appropriate for large-scale organizations change and speaking with consulting companies. However, after conducting an extensive investigation, they concluded that, while NAV's circumstances are similar to some of the successful visited organizations, NAV has its own unique circumstances that distinguish it from the others. As a result,

they made a concerted effort to integrate all necessary capabilities and skills into the organization and to develop an effective way of working.

*"In NAV, the consequence can be that you [the user of NAV's services] do not receive your money or receive the total wrong money, or do not get money because we made the wrong solution. So, I wanted to find an organization that has this high risk. I found one, they made a similar journey, but it was a totally different area." (Mid manager)*

Throughout all of these activities, enterprise architects continued as strong supporters of empowering agile teams and incorporating awareness and lessons learned into NAV. Individuals within the teams, on the other hand, were unaware of enterprise architects' contributions to their jobs. In addition, autonomy became important for teams. Thus, those who remembered the command and control style of architectural work, in the old way of working, took a strong stance against architects. This group declared that neither architecture nor architects were necessary. They believed that architectural responsibilities should be included in the developer's job description. They also stated that, while there was a significant need for enterprise architects to focus on strategy several years ago, agile teams can now make decisions in this domain. These discussions resulted in some architects leaving the company or moving to other organizational departments. Some architects recognized that, in many cases, the primary obstacle is not the architect's role or architectural practice. Instead, they argued that the terms "architect" and "architecture" pose difficulties as a result of their historical use in NAV.

## ***Re-Institutionalization***

In December 2018, NAV's previous CIO left the organization. Until that point, agile teams became powerful as a result of his constant support. Indeed, by recruiting over 200 new employees, he created a new organization that values in-house development and an agile mindset. As a result, there was no question about the importance of in-house software development to meet user needs. However, as the number of teams increased, many issues arose, including coordination and alignment concerns, as well as issues with team members understanding governmental rules and laws.

*"We need someone or a function or something overall that keeps it [different aspects of NAV] altogether so that we are able to see how the business affects the [software] development and how the [software] development affects the business. So, I think that some areas require more models and connections than other areas, which is okay. That could be the responsibility of the Product Area or service, but I think that understanding what that service or product is in the large context of NAV is important in the future." (Mid manager)*

This way, members of the teams began to understand the value of architecture. They argued, however, that while architecture is important, it is a practice for which teams should take responsibility. They claimed that the previous central architecture department was unable to fulfill the current requirements of NAV. As a result, 40 designers were hired to complement the necessary team's skills, and decentralized architectural work was introduced. Enterprise architects also proposed a new organizational structure called Product Area at this time. It was an effective way of establishing agile teams that was well-received by individuals. In addition, while agile teams agreed on the need to bring a holistic perspective to the team, they continued to oppose architects, claiming that developers could perform architectural practices to increase team visibility and understanding.

*"I am a developer. At the moment, I am working with enterprise architecture problems because we have to solve them, but I am solving them by actually writing*

*code and talking with the people I am going to integrate with and talking with the user. I am just doing the project development job. I am not sitting in an office disconnected from the reality of technologies, right? So, I have my both hands in that field and try to understand what the best will be. Maybe architects do the same. I do not know..."* (Developer)

In early 2020, with the emergence of the Covid-19, all became involved in initiatives that addressed the emerging user needs. Architects also assisted the teams. As a result, a new experience of collaboration between architects and teams was shaped by the collaboration of architects within the agile teams. Thus, agile teams recognized that the architect's experiences and skills could be a required resource. However, the architects chose not to use the title "architect" in their collaboration. They anticipated that this title would create some difficulties. Through this collaboration, several architects confirm that they previously lacked sufficient flexibility in their jobs. They also agreed that in order to create value in this new way of working, they must reform their working style.

Being concerned about the future of NAV's organizational structure, currently, the CFO jointly with the current CIO and Product Area Director, has defined a project for a working group with the goal of providing an appropriate approach to EA that supports agile teams. Indeed, since agile teams' work is not transparent to the rest of the organization other than the IT department, questions about performance and coordination, as well as budgeting and planning challenges, exist in NAV, especially in the financial department.

*"We have to know how we work in NAV, what do we mean, what is the NAV-way of working. One thing is to know where we stand with respect to the number of Product Areas and teams and help create a picture of where we are going forward. What purpose do the Product Areas have, and what lessons do we gain from them with respect to size, complexity, number of domains [... and] what experience do we get from this? This experience should be gathered to continuously create a base of experience of what we know well and what is related to how we do business development."* (CFO talking to the working group)

The following table summarizes the study's findings by illustrating the points at which the institutionalization stages of EA overlapped as well as demonstrating the processes of change in sourcing strategy, their effect on EA institutionalization, and their triggering events.

## Discussion

There is a growing body of research in EA literature on how to integrate EA into an organization, with a particular emphasis on EA institutionalization guided by institutional theory (e.g., Brosius et al., 2018a; Dang, 2021; Dang & Pekkola, 2019a; Levy & Bui, 2019). In theorizing on the institutionalization of EA and elaborating on how EA can become integrated into an organization, the majority of these studies take a single snapshot perspective, paying insufficient attention to *how* (de)institutionalization occurs. However, institutional phenomena are proactive in dynamically responding to their environmental pressures (Orlikowski & Barley, 2001). Thus, a thorough examination of EA institutionalization requires a longitudinal perspective (Mignerat & Rivard, 2009), with an emphasis on the sources of (de)institutionalization to make sense of how EA becomes institutionalized and when it loses its established legitimacy resulting in its de-institutionalization. It is also required to discover under what circumstances EA regains its legitimacy, if at all, and becomes re-institutionalized.

To this end, we adopted the institutional change processes model (Hinings et al., 2004) from institutional theory as a lens to understand *how* EA institutionalization occurs over time. We conducted a longitudinal explanatory case study on one of Norway's largest public-sector (NAV) organizations. The study provides empirical accounts to different stages of institutional change resulting in the de- and re-institutionalization of NAV's institutionalized EA.

Pressures for Change		Process of De- and Re-Institutionalization		Dynamics of De-and Re-Institutionalization	
Sources of New Practice				Institutionalization	
<b>2015-2016</b>		<b>2016-2017</b>		<b>2017-2019</b>	
Outsourcing Strategy	Pilot Study	In-House Strategy (Agile Teams)	In-House Strategy (Product Area)	<b>2019-2020</b>	
<b>EA Dominates</b>	<b>EA Dominates</b>	<b>Agile Teams Dominate</b>	<b>Agile Teams Dominate</b>	<b>2020-Now</b>	
<ul style="list-style-type: none"> <li>Emerging trends emphasizing quick response to customer needs</li> <li>Digitalization becomes a priority for the Norwegian government</li> <li>The extensive debate over NAV's failure to respond to users' needs in Media</li> <li>Changing CEO and CIO</li> </ul>	<ul style="list-style-type: none"> <li>Pilot study with two small agile teams</li> <li>Individuals are motivated in agile method</li> <li>Financial department supports in-house strategy</li> <li>Labor unions support agile method</li> </ul>	<ul style="list-style-type: none"> <li>Hiring more than 200 talented individuals for building agile teams</li> <li>Some in IT department leave the organization or change their role</li> <li>Architects are unable to contribute to agile teams by traditional way of working</li> <li>Proposing the idea of "Product Area" by enterprise architects</li> </ul>	<ul style="list-style-type: none"> <li>Emerging miscoordination and misalignment concerns among the agile teams</li> <li>Agile teams realize their weakness concerning rules and legal/law compliance</li> <li>Agile teams are more accepting of the importance of EA practices</li> <li>Previous CIO leaves the organization</li> </ul>	<ul style="list-style-type: none"> <li>Emerging Covid-19 leads to high stress to NAV due to high unemployment and many changes</li> <li>Joining architects to the agile teams</li> <li>Architects' contribution to the agile teams by bringing holistic view and organizational knowledge</li> <li>Advisory role of architects</li> <li>Top managers reexamine EA practices</li> </ul>	
<b>Color Codes</b>					
EA has a strong position	Emerging an agile mindset and beginning of the EA challenges	Agile teams have a strong position	Emerging challenges for agile teams and beginning of the EA's contribution	Collaboration of agile teams and EA	

Table 2. The Process of EA's De- and Re-Institutionalization at NAV

## Theoretical Implications

Our study contributes to IS literature, specifically to the existing body of knowledge on EA, by illustrating the dynamic and cycle model of EA institutionalization. The five-stage institutional change model enables us to capture both internal and environmental triggers for transitioning in between phases, i.e., from institutionalized to de- and then re-institutionalized states. The dialectical interplays between the two competing logics (i.e., agile and EA) specify the main internal change trigger resulting in the de- and re-institutionalization of EA. However, we found that without environmental pressures, the turning points of institutionalization process would not have occurred. The latter demonstrates the impact of environmental triggers in stimulating the transition and in strategically and innovatively responding to environmental pressures (Orlikowski & Barley, 2001). Specifically, in the studied case, EA began to de-institutionalize in response to massive functional and social pressures, and then started to re-institutionalize in response to the emergence of new circumstances (e.g., new requirements due to Covid-19) that can be assumed as a social pressure. Thus, it is evident that, while internal pressures influence the EA's institutionalization status in certain ways, the major changes occurred only when environmental pressures appear.

Moreover, our findings show that, while a well-established practice within an organization may lose its legitimacy due to a combination of internal and environmental pressures, the de-institutionalization process unfolds gradually. That is, a previously institutionalized practice is rarely completely excluded from the context, which is consistent with the notion of sedimentation (Cooper et al., 1996). However, to re-institutionalize a delegitimized practice, the prior premise must be reformulated according to the new, emerged context. Therefore, we assert that re-institutionalization occurs when the delegitimized practice demonstrates a willingness to embrace some change to be compatible with the organization's new circumstances. In the case of NAV, while EA had lost its legitimacy due to the massive debate raised by agile teams against EA practices, EA could eventually retain its legitimacy (i.e., re-institutionalized) by reforming its fundamental assumptions and by building trust among stakeholders.

Further, taking a longitudinal approach allowed us to reveal that the change of pressure types (stage I) and sources of new practice (stage II) might result in the convergence of two logics and in terminating their fights. In the case of NAV, while the EA (individuals who supported the EA) accepted and promoted the importance of agile, the agile (individuals who supported agile) fought the EA to get it excluded from organizational practices. However, the emergence of Covid-19 and concerns about miscoordination (changing in the factors of stage I), as well as the absence of the previous CIO and the encouragement of current top managers for proposing new ways to execute EA (changing in the factors of stage II), resulted in re-empowering EA and in accelerating the re-institutionalization processes.

## ***Practical Implications***

From a practical perspective, our findings address one of the major challenges and debates on the role of EA in organizational practices when large-scale agile teams are used to develop software. This study posits that organizations continue to need EA so as to organize and align their activities even under a deeply adopted agile approach. Nonetheless, the traditional command and control approach of architects might no longer be acceptable in contemporary organizations. Hence, EA practitioners may see their roles changed to act as an advisor to assist software development teams and need to bring an agile basis into their practices.

Moreover, it is critical that organizations create an opportunity for agile teams and architects to collaborate. This would contribute to providing a holistic view and promoting an effective digital transformation process. However, as previously stated,



changing the old mindset of architecting work is crucial, and it might be recommended that the titles “architect” and “architecture” be changed to avoid any potential bias. As a result, organizations may be able to accelerate the re-institutionalization of EA by educating their architects to transition from a command and control to an advisory role, reorganizing the architectural practice’s structure, and creating conditions under which agile teams and architects can closely collaborate.

## **Limitations**

Since our study focuses on a single public sector organization, the resulted insights have certain limitations in terms of generalizability. The majority of participants in our data collection were either managers with organizational responsibilities or architects. We interviewed several agile team members and gained an understanding of their perspectives through observations and by reading relevant documents. Nonetheless, a more focus on agile teams might result in further insights. Thus, prospective research on EA institutionalization is encouraged to equally engage architects and agile teams to reach a more balanced grasp on the studied EA endeavors.

## **Acknowledgments**

This study was funded by the Norwegian Research Council (pr. nr. 811475008). Additionally, we conducted our study under the terms of a research collaboration between NTNU's department of computer science (IDI) and NAV. This research collaboration was formed by Babak Frashchian and Parastoo Mohagheghi. We owe them a great deal of gratitude for their cooperation with this research. Moreover, we would like to extend our sincere appreciation to Håkon Røstad, the industrial contact person for our study. He spent much time facilitating data collection and clarifying on several aspects of the research context. Finally, we would like to extend our thanks to all of the professionals who agreed to participate in the research.

## **References**

- Abrahamson, E. (1991). Managerial fads and fashions: The diffusion and rejection of innovations. *Academy of management review*, 16(3), 586-612.
- Abrahamson, E. (1996). Technical and aesthetic fashion. In *Translating organizational change* (pp. 117-138). De Gruyter.
- Ahlemann, F., Stettiner, E., Messerschmidt, M., & Legner, C. (2012). *Strategic enterprise architecture management: challenges, best practices, and future developments*. Springer Science & Business Media.
- Aier, S. (2014). The role of organizational culture for grounding, management, guidance and effectiveness of enterprise architecture principles. *Information Systems and e-Business Management*, 12(1), 43-70.
- Aier, S., & Weiss, S. (2012). *Facilitating Enterprise Transformation Through Legitimacy-An Institutional Perspective* Multikonferenz der Wirtschaftsinformatik (MKWI), Braunschweig.
- Ajer, A. K., & Olsen, D. H. (2018a). Enterprise Architecture Challenges: A Case Study of Three Norwegian Public Sectors.
- Ajer, A. K., & Olsen, D. H. (2018b). Enterprise Architecture Challenges: A Case Study of Three Norwegian Public Sectors. Proceedings of the 26th European Conference on Information Systems, Portsmouth, UK.
- Ajer, A. K. S., Hustad, E., & Vassilakopoulou, P. (2021). Enterprise architecture operationalization and institutional pluralism: The case of the Norwegian Hospital sector. *Information Systems Journal*, 31(4), 610-645.

- Ajer, A. K. S., & Olsen, D. H. (2019a). Enterprise architecture implementation is a bumpy ride: a case study in the Norwegian public sector. *Electronic Journal of e-Government*, 17(2), 79-94.
- Ajer, A. K. S., & Olsen, D. H. (2019b). Enterprise architecture implementation is a bumpy ride: a case study in the Norwegian public sector. *Electronic Journal of e-Government*, 17(2), pp79-94-pp79-94.
- Alaeddini, M., & Salekfard, S. (2013). Investigating the role of an enterprise architecture project in the business-IT alignment in Iran. *Information Systems Frontiers*, 15(1), 67-88.
- Aldrich, H. E., & Fiol, C. M. (1994). Fools rush in? The institutional context of industry creation. *Academy of management review*, 19(4), 645-670.
- Ambler, S. W., & Lines, M. (2012). *Disciplined agile delivery: A practitioner's guide to agile software delivery in the enterprise*. IBM press.
- Ansari, M. A., & Kapoor, A. (1987). Organizational context and upward influence tactics. *Organizational behavior and human decision processes*, 40(1), 39-49.
- Armour, F. J., & Kaisler, S. H. (2001). Enterprise architecture: Agile transition and implementation. *IT professional*, 3(6), 30-37.
- Ashforth, B. E., & Gibbs, B. W. (1990). The double-edge of organizational legitimation. *Organization science*, 1(2), 177-194.
- Avgerou, C. (2000a). IT and organizational change: an institutionalist perspective. *Information Technology & People*.
- Avgerou, C. (2000b). IT and organizational change: an institutionalist perspective. *Information Technology & People*, 13(4), 234-262.
- Avgerou, C. (2002). *Information systems and global diversity*. OUP Oxford.
- Bala, H., & Venkatesh, V. (2007). Assimilation of interorganizational business process standards. *Information systems research*, 18(3), 340-362.
- Banaeianjahromi, N. (2018). Where enterprise architecture development fails a multiple case study of governmental organizations. 2018 12th International Conference on Research Challenges in Information Science (RCIS),
- Banaeianjahromi, N., & Smolander, K. (2016a). Understanding obstacles in enterprise architecture development.
- Banaeianjahromi, N., & Smolander, K. (2016b). Understanding obstacles in enterprise architecture development. Proceedings of the 24th European Conference on Information Systems, Istanbul, Turkey.
- Banaeianjahromi, N., & Smolander, K. (2019). Lack of communication and collaboration in enterprise architecture development. *Information Systems Frontiers*, 21(4), 877-908.
- Beese, J., Aier, S., Haki, K., & Winter, R. (2023). The impact of enterprise architecture management on information systems architecture complexity. *European Journal of Information Systems*, 32(6), 1070-1090.
- Beese, J., Haki, K., Aier, S., & Winter, R. (2020a). Enterprise Architecture as a Public Goods Dilemma: An Experimental Approach. In *Advances in Enterprise Engineering XIII. Cham* (pp. 102-114). Springer.
- Beese, J., Haki, K., Aier, S., & Winter, R. (2020b). *Enterprise Architecture as a Public Goods Dilemma: An Experimental Approach*. Springer.
- Bernardi, R., Sarker, S., & Sahay, S. (2019). The role of affordances in the deinstitutionalization of a dysfunctional health management information system in Kenya: An identity work perspective. *MIS quarterly*, 43(4), 1177-1200.
- Blau, P. (2017). *Exchange and power in social life*. Routledge.
- Boehm, B., & Turner, R. (2004). Balancing agility and discipline: Evaluating and integrating agile and plan-driven methods. Proceedings. 26th International Conference on Software Engineering,
- Boh, W. F., & Yellin, D. (2006). Using enterprise architecture standards in managing information technology. *Journal of Management Information Systems*, 23(3), 163-207.
- Bradley, R. V., Pratt, R. M., Byrd, T. A., Outlay, C. N., & Wynn, J., Donald E. (2012). Enterprise architecture, IT effectiveness and the mediating role of IT alignment in US hospitals. *Information Systems Journal*, 22(2), 97-127.

- Bradley, R. V., Pratt, R. M., Byrd, T. A., & Simmons, L. L. (2011). THE ROLE OF ENTERPRISE ARCHITECTURE IN THE QUEST FOR IT VALUE. *MIS Quarterly Executive*, 10(2).
- Brass, D. J. (1984). Being in the right place: A structural analysis of individual influence in an organization. *Administrative science quarterly*, 518-539.
- Brosius, M., Aier, S., Haki, K., & Winter, R. (2018a). Enterprise architecture assimilation: an institutional perspective. Proceedings of the 39th International Conference on Information Systems, San Francisco.
- Brosius, M., Aier, S., Haki, K., & Winter, R. (2018b). Enterprise architecture assimilation: an institutional perspective. Thirty Ninth International Conference on Information Systems (ICIS 2018), San Francisco.
- Brown, A. D. (1998). Narrative, politics and legitimacy in an IT implementation. *Journal of Management Studies*, 35(1), 35-58.
- Buckl, S., Schweda, C. M., & Matthes, F. (2010). A design theory nexus for situational enterprise architecture management. 2010 14th IEEE International Enterprise Distributed Object Computing Conference Workshops,
- Chanias, S., Myers, M. D., & Hess, T. (2019). Digital transformation strategy making in pre-digital organizations: The case of a financial services provider. *The Journal of Strategic Information Systems*, 28(1), 17-33.
- Child, J., & Smith, C. (1987). The Context and Process of Organizational transformation-Cadbury limited in its Sector. *Journal of Management Studies*, 24(6), 565-593.
- Chuang, C.-H., & van Loggerenberg, J. (2010). Challenges facing enterprise architects: a South African perspective. 2010 43rd Hawaii International Conference on System Sciences,
- Clark, T. A. R., & Fincham, R. (2002). *Critical consulting: New perspectives on the management advice industry*. Blackwell.
- Clegg, S. R. (1989). *Frameworks of power*. Sage.
- Cooper, D. J., Hinings, B., Greenwood, R., Brown, J. L., Cooper, D. J., Hinings, B., Greenwood, R., & Brown, J. L. (1996). Sedimentation and transformation in organizational change: The case of Canadian law firms. *Organization studies*, 17(4), 623-647.
- Dahlberg, T., & Lagstedt, A. (2018). There Is Still No "Fit for All" IS Development Method: Business Development Context and IS Development Characteristics Need to Match. Proceedings of the 51st Hawaii international conference on system sciences,
- Dang, D. (2019). Institutional logics and their influence on enterprise architecture adoption. *Journal of Computer Information Systems*, 1-11.
- Dang, D. (2021). Institutional Logics and Their Influence on Enterprise Architecture Adoption. *Journal of Computer Information Systems*, 61(1), 42-52. <https://doi.org/10.1080/08874417.2018.1564632>
- Dang, D., & Pekkola, S. (2019a). Institutional Perspectives on the Process of Enterprise Architecture Adoption. *Information Systems Frontiers*, 22, 1433-1445.
- Dang, D., & Pekkola, S. (2019b). Institutional Perspectives on the Process of Enterprise Architecture Adoption. *Information Systems Frontiers*, 1-13.
- Dang, D., & Pekkola, S. (2022). Organizational Change and Enterprise Architecture Adoption: A Case Study in the Public Sector. In *Information Systems Research in Vietnam: A Shared Vision and New Frontiers* (pp. 49-64). Springer.
- Dang, D. D., & Pekkola, S. (2016a). Root Causes of Enterprise Architecture Problems in the Public Sector. Proceeding of the 20th Pacific Asia Conference on Information Systems,
- Dang, D. D., & Pekkola, S. (2016b). Root Causes of Enterprise Architecture Problems in the Public Sector. *PACIS*, 287.
- Dang, D. D., & Pekkola, S. (2017). Systematic Literature Review on Enterprise Architecture in the Public Sector. *Electronic Journal of e-Government*, 15(2).
- Darke, P., Shanks, G., & Broadbent, M. (1998). Successfully completing case study research: combining rigour, relevance and pragmatism. *Information Systems Journal*, 8(4), 273-289.
- Deephouse, D. L., Bundy, J., Tost, L. P., & Suchman, M. C. (2017). Organizational legitimacy: Six key questions. *The Sage handbook of organizational institutionalism*, 4(2), 27-54.

- Denert-Stiftungslehrstuhl, E. (2015). IT Architecture Standardization Survey. *München: Technische Universität München*.
- Dijkman, R. M., Quartel, D. A., Pires, L. F., & van Sinderen, M. J. (2004). A rigorous approach to relate enterprise and computational viewpoints. Proceedings. Eighth IEEE International Enterprise Distributed Object Computing Conference, 2004. EDOC 2004.,
- DiMaggio, P. (1988). Interest and agency in institutional theory. In *Institutional patterns and organizations culture and environment* (pp. 3-21).
- DiMaggio, P. J., & Powell, W. W. (1983a). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American sociological review*, 147-160.
- DiMaggio, P. J., & Powell, W. W. (1983b). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. In *American sociological review* (pp. 147-160).
- Dingsøyr, T., Moe, N. B., Fægri, T. E., & Seim, E. A. (2018). Exploring software development at the very large-scale: a revelatory case study and research agenda for agile method adaptation. *Empirical Software Engineering*, 23(1), 490-520.
- ea Lankhorst, M. (2005). Enterprise Architecture at Work: Modelling. *Communication and Analysis*.
- Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of management review*, 14(4), 532-550.
- Fallmyr, T., & Bygstad, B. (2014). Enterprise architecture practice and organizational agility: An exploratory study. 2014 47th Hawaii International Conference on System Sciences,
- Flynn, D., & Du, Y. (2012). A case study of the legitimation process undertaken to gain support for an information system in a Chinese university. *European Journal of Information Systems*, 21(3), 212-228.
- Flynn, D., & Puarunroj, W. (2006a). The legitimation-seeking process in information systems development. Proceedings of European Conference on Information Systems, Göteborg, Sweden.
- Flynn, D., & Puarunroj, W. (2006b). The legitimation-seeking process in information systems development. Proceedings of European Conference on Information Systems,
- Flynn, D., & Puarunroj, W. (2006c). *The legitimation-seeking process in information systems development* ECIS 2006 Proceedings,
- Fonstad, N. O., & Robertson, D. (2006). Transforming a company, project by project: The IT engagement model. *MIS Quarterly Executive*, 5(1).
- French, J. R., Raven, B., & Cartwright, D. (1959). The bases of social power. *Classics of organization theory*, 7, 311-320.
- Gartner. (2009). *Gartner Identifies Ten Enterprise Architecture Pitfalls*. Egham, UK.
- Gartner. (2019). Enterprise Architecture Must Evolve Into an Internal Management Consultancy. In.
- Gartner. (2021). *Predicts 2021: Enterprise Architecture Designs the Composable Organization*
- Golant, B. D., & Sillince, J. A. (2007). The constitution of organizational legitimacy: A narrative perspective. *Organization studies*, 28(8), 1149-1167.
- Greefhorst, D., Proper, E., Greefhorst, D., & Proper, E. (2011). *The role of enterprise architecture*. Springer.
- Greenwood, R., & Hinings, C. R. (1996). Understanding radical organizational change: Bringing together the old and the new institutionalism. *Academy of management review*, 21(4), 1022-1054.
- Greenwood, R., Oliver, C., Lawrence, T. B., & Meyer, R. E. (2017). *The Sage handbook of organizational institutionalism*. Sage.
- Greenwood, R., Suddaby, R., & Hinings, C. R. (2002). Theorizing change: The role of professional associations in the transformation of institutionalized fields. *Academy of management journal*, 45(1), 58-80.
- Guo, H., & Gao, S. (2022). Achieving Alignment by Means of EA Artifacts. International Conference on Enterprise Design, Operations, and Computing,
- Haki, K., Aier, S., & Winter, R. (2016). A Stakeholder Perspective to Study Enterprisewide Is Initiatives.

- Haki, K., Beese, J., Aier, S., & Winter, R. (2020a). The Evolution of Information Systems Architecture: An Agent-Based Simulation Model. *MIS quarterly*, 44(1), 155-184.
- Haki, K., Beese, J., Aier, S., & Winter, R. (2020b). The Evolution of Information Systems Architecture: An Agent-Based Simulation Model. *MIS quarterly*, 44(1).
- Haki, K., & Legner, C. (2020). The Mechanics of Enterprise Architecture Principles. *Journal of the Association for Information Systems*.
- Haki, K., & Legner, C. (2021a). The Mechanics of Enterprise Architecture Principles. *Journal of the Association for Information Systems*, 22(5).
- Haki, K., & Legner, C. (2021b). The Mechanics of Enterprise Architecture Principles *Journal of the Association for Information Systems* 22(5).
- Haki, M. K., Legner, C., & Ahlemann, F. (2012). Beyond EA frameworks: Towards an understanding of the adoption of enterprise architecture management. Proceedings of the European Conference on Information Systems,
- Hanschke, S., Ernsting, J., & Kuchen, H. (2015). Integrating agile software development and enterprise architecture management. Proceedings of the 48th Hawaii International Conference on System Sciences,
- Harris, A., & Mennecke, B. (2011). Power Interactions in Enterprise System Assimilation. *Power*, 8, 7-2011.
- Hickson, D. J., Hinings, C. R., Lee, C. A., Schneck, R. E., & Pennings, J. M. (1971). A strategic contingencies' theory of intraorganizational power. *Administrative science quarterly*, 216-229.
- Highsmith, J. A. (2002). *Agile software development ecosystems*. Addison-Wesley Professional.
- Hinings, B., Gegenhuber, T., & Greenwood, R. (2018). Digital innovation and transformation: An institutional perspective. *Information and Organization*, 28(1), 52-61.
- Hinings, C. R., Greenwood, R., Reay, T., & Suddaby, R. (2004). *Dynamics of change in organizational fields*. Oxford University.
- Hirsch, P. M., & Andrews, J. (1984). Administrators' Response to Performance and Value Challenges--Or, Stance, Symbols and Behavior in a World of Changing Frames. In *Leadership and organizational culture: New perspectives on administrative theory and practice* (pp. 170-185).
- Hitt, M. A., Beamish, P. W., Jackson, S. E., & Mathieu, J. E. (2007). Building theoretical and empirical bridges across levels: Multilevel research in management. *Academy of management journal*, 50(6), 1385-1399.
- Hjort-Madsen, K. (2006). Enterprise architecture implementation and management: A case study on interoperability. Proceedings of the 39th Annual Hawaii International Conference on System Sciences (HICSS'06),
- Hjort-Madsen, K., & Pries-Heje, J. (2009). Enterprise architecture in government: Fad or future? 2009 42nd Hawaii International Conference on System Sciences,
- Hoffman, A. J. (2001). *From heresy to dogma: An institutional history of corporate environmentalism*. Stanford University Press.
- Hohpe, G. (2015). *The Architect Elevator*. [https://www.enterpriseintegrationpatterns.com/ramblings/79\\_elevator.html](https://www.enterpriseintegrationpatterns.com/ramblings/79_elevator.html)
- Holm, P. (1995). The dynamics of institutionalization: Transformation processes in Norwegian fisheries. *Administrative science quarterly*, 40(3), 398-422.
- Hoogervorst, J. (2004). Enterprise architecture: Enabling integration, agility and change. *International Journal of Cooperative Information Systems*, 13(03), 213-233.
- Hussain, Z., Taylor, A., & Flynn, D. (2004). A case study of the process of achieving legitimation in information systems development. *Journal of Information Science*, 30(5), 408-417.
- Hylving, L., & Bygstad, B. (2019). Nuanced responses to Enterprise architecture management: Loyalty, voice, and exit. *Journal of Management Information Systems*, 36(1), 14-36.
- Ireland, R. D., & Webb, J. W. (2007). A multi-theoretic perspective on trust and power in strategic supply chains. *Journal of Operations management*, 25(2), 482-497.
- Isomäki, H., & Liimatainen, K. (2008). Challenges of government enterprise architecture work--stakeholders' views. International Conference on Electronic Government,

- Iyamu, T. (2009). The factors affecting institutionalisation of enterprise architecture in the organisation. 2009 IEEE Conference on Commerce and Enterprise Computing,
- Jang, Y. S., & Luo, X. (2000a). Nation-state participation in intergovernmental technology organizations. *International journal of comparative sociology*, 41(3), 255.
- Jang, Y. S., & Luo, X. (2000b). Nation-state participation in intergovernmental technology organizations. *International journal of comparative sociology*, 41(3), 255-284.
- Janssen, M. (2012). Sociopolitical aspects of interoperability and enterprise architecture in e-government. *Social Science Computer Review*, 30(1), 24-36.
- Jepperson, R. (1991a). Institutions, institutional effects, and institutionalism. In *The new institutionalism in organizational analysis* (pp. 143-163).
- Jepperson, R. (1991b). Institutions, institutional effects, and institutionalism. *The new institutionalism in organizational analysis*, 143-163.
- Jöhnk, J., Oesterle, S., Winkler, T. J., Nørbjerg, J., & Urbach, N. (2019). Juggling the Paradoxes—Governance Mechanisms in Bimodal IT Organizations. Proceedings of the 27th European Conference on Information Systems, Stockholm & Uppsala, Sweden.
- Jonkers, H., Lankhorst, M. M., ter Doest, H. W., Arbab, F., Bosma, H., & Wieringa, R. J. (2006). Enterprise architecture: Management tool and blueprint for the organisation. *Information Systems Frontiers*, 8(2), 63-66.
- Jusuf, M. B., & Kurnia, S. (2017). Understanding the Benefits and Success Factors of Enterprise Architecture. Proceedings of the 50th Hawaii International Conference on System Sciences,
- Kaganer, E. A., Pawlowski, S. D., & Wiley-Patton, S. (2010a). Building legitimacy for IT innovations: the case of computerized physician order entry systems. *Journal of the Association for Information Systems*, 11(1), 2.
- Kaganer, E. A., Pawlowski, S. D., & Wiley-Patton, S. (2010b). Building legitimacy for IT innovations: the case of computerized physician order entry systems. *Journal of the Association for Information Systems*, 11(1), 1-33.
- Kaisler, S. H., Armour, F., & Valivullah, M. (2005). Enterprise architecting: Critical problems. Proceedings of the 38th Annual Hawaii International Conference on System Sciences,
- King, J. L., Gurbaxani, V., Kraemer, K. L., McFarlan, F. W., Raman, K., & Yap, C.-S. (1994). Institutional factors in information technology innovation. *Information systems research*, 5(2), 139-169.
- Kotusev, S. (2018). The practice of enterprise architecture: A modern approach to business and IT alignment.
- Kotusev, S., & Kurnia, S. (2019). The Problem of Engagement in Enterprise Architecture Practice: An Exploratory Case Study.
- Krueger, R. A. (2014). *Focus groups: A practical guide for applied research*. Sage publications.
- Kurnia, S., Kotusev, S., Shanks, G., Dilnutt, R., & Milton, S. (2021). Stakeholder engagement in enterprise architecture practice: What inhibitors are there? *information and Software Technology*, 134, 106536.
- Kurnia, S., Kotusev, S., Taylor, P., & Dilnutt, R. (2020). Artifacts, Activities, Benefits and Blockers: Exploring Enterprise Architecture Practice in Depth. Proceedings of the 53rd Hawaii International Conference on System Sciences,
- Kurpjuweit, S., & Winter, R. based Meta Model Engineering. Proceedings of the 2nd Int'l Workshop EMISA 2007, Bonn, 2007, Gesellschaft für Informatik, Köllen,
- Labusch, N., & Winter, R. (2013). Towards a conceptualization of architectural support for enterprise transformation.
- Lacity, M. C., & Willcocks, L. P. (2016). A new approach to automating services. *MIT Sloan Management Review*.
- Lange, M., Mendling, J., & Recker, J. (2016). An empirical analysis of the factors and measures of Enterprise Architecture Management success. *European Journal of Information Systems*, 25(5), 411-431.
- Lapalme, J., Gerber, A., Van der Merwe, A., Zachman, J., De Vries, M., & Hinkelmann, K. (2016). Exploring the future of enterprise architecture: A Zachman perspective. *Computers in Industry*, 79, 103-113.

- Lawrence, T. B., Hardy, C., & Phillips, N. (2002). Institutional effects of interorganizational collaboration: The emergence of proto-institutions. *Academy of management journal*, 45(1), 281-290.
- Lawrence, T. B., Winn, M. I., & Jennings, P. D. (2001). The temporal dynamics of institutionalization. *Academy of management review*, 26(4), 624-644.
- Leffingwell, D. (2010). *Agile software requirements: lean requirements practices for teams, programs, and the enterprise*. Addison-Wesley Professional.
- Levy, M. (2014). 'Shelfware' or Strategic Alignment? An Enquiry into the Design of Enterprise Architecture Programs.
- Levy, M. (2019). How field-level institutions become a part of organizations: A study of enterprise architecture as a tool for institutional change. *Information and Organization*, 29(4), 100272.
- Levy, M., & Bui, Q. N. (2019). How field-level institutions become a part of organizations: A study of enterprise architecture as a tool for institutional change. *Information and Organization*, 29(4), 100272.
- Löhe, J., & Legner, C. (2014). Overcoming implementation challenges in enterprise architecture management: a design theory for architecture-driven IT Management (ADRIMA). *Information Systems and e-Business Management*, 12(1), 101-137.
- Lucke, C., Krell, S., & Lechner, U. (2010). Critical issues in enterprise architecting—a literature review.
- Maguire, S., & Hardy, C. (2009). Discourse and deinstitutionalization: The decline of DDT. *Academy of management journal*, 52(1), 148-178.
- Mäki-Lohiluoma, P., Hellsten, P., & Pekkola, S. (2016a). *Why do we Need this? Roles in the Information System Acquisition legitimation Process*
- Mäki-Lohiluoma, P., Hellsten, P., & Pekkola, S. (2016b). Why do we Need this? Roles in the Information System Acquisition legitimation Process. Proceedings of the 24th European Conference on Information Systems, Istanbul, Turkey.
- McAdam, D. (1996). Conceptual origins, current problems, future directions. In (pp. 23-40).
- Meyer, J. W., & Rowan, B. (1977). Institutionalized organizations: Formal structure as myth and ceremony. *American journal of sociology*, 83(2), 340-363.
- Mignerat, M., & Rivard, S. (2009). Positioning the institutional perspective in information systems research. *Journal of information technology*, 24(4), 369-391.
- Mignerat, M., & Rivard, S. (2015). Positioning the institutional perspective in information systems research. In *Formulating Research Methods for Information Systems* (pp. 79-126). Springer.
- Nicholson, B., & Sahay, S. (2009). Deinstitutionalization in the context of software exports policymaking in Costa Rica. *Journal of information technology*, 24(4), 332-342.
- Niemi, E. (2007). Enterprise architecture Stakeholders-a holistic view. *AMCIS 2007 Proceedings*, 41.
- Niemi, E., & Pekkola, S. (2017). Using enterprise architecture artefacts in an organisation. *Enterprise Information Systems*, 11(3), 313-338.
- Nordheim, S., & Nielsen, P. A. (2008). Enterprise system implementations: Organizational influence processes for corporate user representatives.
- Ojo, A., Janowski, T., & Estevez, E. (2012). Improving Government Enterprise Architecture Practice--Maturity Factor Analysis. 2012 45th Hawaii International Conference on System Sciences,
- Oliver, C. (1992). The antecedents of deinstitutionalization. *Organization studies*, 13(4), 563-588.
- Olsen, D. H., & Trelsgård, K. (2016). Enterprise Architecture adoption challenges: An exploratory case study of the Norwegian higher education sector. *Procedia Computer Science*, 100, 804-811.
- Orlikowski, W. J., & Barley, S. R. (2001). Technology and institutions: What can research on information technology and research on organizations learn from each other? *MIS quarterly*, 25(2), 145-165.

- Paré, G. (2004a). Investigating information systems with positivist case research. *Communications of the Association for Information Systems*, 13(1), 18.
- Paré, G. (2004b). Investigating information systems with positivist case research. *Communications of the Association for Information Systems*, 13(1), 233-264.
- Peterson, R. (2004). Crafting information technology governance. *Information systems management*, 21(4), 7-22.
- Pettigrew, A. (1985). *The awakening giant*. Oxford: Blackwell.
- Pfeffer, J., & Salancik, G. R. (2003). *The external control of organizations: A resource dependence perspective*. Stanford University Press.
- Porter, L. W., Angle, H. L., & Allen, R. W. (2003). *Organizational influence processes*. ME Sharpe.
- Powell, W. W., & DiMaggio, P. J. (2012). *The new institutionalism in organizational analysis*. University of Chicago press.
- Radeke, F. (2010). Awaiting Explanation in the Field of Enterprise Architecture Management. *AMCIS*,
- Rahimi, F., Gøtze, J., & Møller, C. (2017). Enterprise architecture management: Toward a taxonomy of applications. *Communications of the Association for Information Systems*, 40(1), 7.
- Rahimi, N. I. M., Yatya, S. M., & Bakar, N. A. A. (2023). Enterprise Architecture: Enabling Digital Transformation for Healthcare Organization. *Open International Journal of Informatics*, 11(1), 67-73.
- Ramiller, N. C., & Swanson, E. B. (2003). Organizing visions for information technology and the information systems executive response. *Journal of Management Information Systems*, 20(1), 13-50.
- Robertson, E., Peko, G., & Sundaram, D. (2018). Enterprise Architecture Maturity: A Crucial Link in Business and IT Alignment. *PACIS*,
- Rolland, K. H., Ghinea, G., & Gronli, T.-M. (2015). Ambidextrous Enterprise Architecting: Betting on the Future and Hacking Path-dependencies.
- Ross, J. W., & Quaadgras, A. (2012a). *Enterprise architecture is not just for architects* (CISR Research Briefings, Issue).
- Ross, J. W., & Quaadgras, A. (2012b). Enterprise architecture is not just for architects. *CISR Research Briefings*, 7(9).
- Ross, J. W., Weill, P., & Robertson, D. (2006). *Enterprise architecture as strategy: Creating a foundation for business execution*. Harvard business press.
- Rouvari, A., & Pekkola, S. (2022). Contextuality and Temporality of Enterprise Architecture Problems: A Comparative Case Study. International Conference on Enterprise Design, Operations, and Computing,
- Ruef, M., & Scott, W. R. (1998a). A multidimensional model of organizational legitimacy: Hospital survival in changing institutional environments. *Administrative science quarterly*, 877-904.
- Ruef, M., & Scott, W. R. (1998b). A multidimensional model of organizational legitimacy: Hospital survival in changing institutional environments. *Administrative science quarterly*, 43(4), 877-904.
- Saint-Louis, P., Morency, M. C., & Lapalme, J. (2019). Examination of explicit definitions of enterprise architecture. *International Journal of Engineering Business Management*, 11, 1847979019866337.
- Sambamurthy, V., Bharadwaj, A., & Grover, V. (2003). Shaping agility through digital options: Reconceptualizing the role of information technology in contemporary firms. *MIS quarterly*, 237-263.
- Schmidt, C., & Buxmann, P. (2011). Outcomes and success factors of enterprise IT architecture management: empirical insight from the international financial services industry. *European Journal of Information Systems*, 20(2), 168-185.
- Scot, t. W. R. (2001). Institutions and organizations. *Thousand Oaks, CA: Sage Publications*.  
 Sekaran, U.(2003). *Research Methods for Business, A Skill Building Process, 4th edn*,



- NY: John Wiley. Seligman, J.(2002). 'No one can serve two masters: Corporate and securities law after Enron', *Washington University Law Quarterly*, 80(2), 449-518.
- Scott, W. R. (1994a). Institutions and organizations: Toward a theoretical synthesis. *Institutional environments and organizations: Structural complexity and individualism*, 55-80.
- Scott, W. R. (1994b). *Institutions and organizations: Toward a theoretical synthesis*. Sage.
- Scott, W. R. (1994c). Institutions and organizations: Toward a theoretical synthesis. In *Institutional environments and organizations: Structural complexity and individualism* (pp. 55-80). Sage.
- Scott, W. R. (2001a). Institutions and organizations. In Sekaran, U.(2003). *Research Methods for Business, A Skill Building Process, 4th edn*, NY: John Wiley. Seligman, J.(2002). 'No one can serve two masters: Corporate and securities law after Enron', *Washington University Law Quarterly* (Vol. 80, pp. 449-518). Sage Publications.
- Scott, W. R. (2001b). Institutions and organizations. *Thousand Oaks, CA: Sage Publications*. Sekaran, U.(2003). *Research Methods for Business, A Skill Building Process, 4th edn*, NY: John Wiley. Seligman, J.(2002). 'No one can serve two masters: Corporate and securities law after Enron', *Washington University Law Quarterly*, 80(2), 449-518.
- Scott, W. R. (2003). Institutional carriers: reviewing modes of transporting ideas over time and space and considering their consequences. *Industrial and corporate change*, 12(4), 879-894.
- Scott, W. R. (2005a). Institutional theory. *Encyclopedia of Social Theory* 408–414.
- Scott, W. R. (2005b). *Institutional theory*. Sage.
- Scott, W. R. (2013). *Institutions and organizations: Ideas, interests, and identities*. Sage publications.
- Scott, W. R. (2014). W. Richard SCOTT (1995), Institutions and Organizations. Ideas, Interests and Identities. *M@ n@ gement*, 17(2), 136-140.
- Scott, W. R., Ruef, M., Mendel, P. J., & Caronna, C. A. (2000). *Institutional change and healthcare organizations: From professional dominance to managed care*. University of Chicago Press.
- Seo, M.-G., & Creed, W. D. (2002). Institutional contradictions, praxis, and institutional change: A dialectical perspective. *Academy of management review*, 27(2), 222-247.
- Seppänen, V., Penttinen, K., & Pulkkinen, M. (2018). Key issues in enterprise architecture adoption in the public sector. *Electronic Journal of e-Government*, 16(1).
- Setterstrom, A. J. (2016). IT Project Manager Decision-Making Authority: An Empirical Examination of Antecedents and Consequences.
- Sherer, P. D., & Lee, K. (2002). Institutional change in large law firms: A resource dependency and institutional perspective. *Academy of management journal*, 45(1), 102-119.
- Simon, D., Fischbach, K., & Schoder, D. (2013). An exploration of enterprise architecture research. *Communications of the Association for Information Systems*, 32(1), 1.
- Son, J.-Y., & Benbasat, I. (2007). Organizational buyers' adoption and use of B2B electronic marketplaces: efficiency-and legitimacy-oriented perspectives. *Journal of Management Information Systems*, 24(1), 55-99.
- Standing, C., Sims, I., & Love, P. (2009). IT non-conformity in institutional environments: E-marketplace adoption in the government sector. *Information & Management*, 46(2), 138-149.
- Strang, D., & Meyer, J. W. (1993). Institutional conditions for diffusion. *Theory and society*, 22(4), 487-511.
- Suchman, M. C. (1995). Managing legitimacy: Strategic and institutional approaches. *Academy of management review*, 20(3), 571-610.
- Suddaby, R. R. (2003). *Field-level governance and the emergence of new organizational forms: The case of multidisciplinary practices in law*.
- Swan, J., Newell, S., Scarbrough, H., & Hislop, D. (1999). Knowledge management and innovation: networks and networking. *Journal of Knowledge management*.
- Tamm, T., Seddon, P. B., Shanks, G., & Reynolds, P. (2011). How does enterprise architecture add value to organisations? *Communications of the Association for Information Systems*, 28(1), 10.

- Teo, H.-H., Wei, K. K., & Benbasat, I. (2003a). Predicting intention to adopt interorganizational linkages: An institutional perspective. *MIS quarterly*, 19-49.
- Teo, H.-H., Wei, K. K., & Benbasat, I. (2003b). Predicting intention to adopt interorganizational linkages: An institutional perspective. *MIS quarterly*, 27(1), 19-49.
- Van der Raadt, B., Bonnet, M., Schouten, S., & Van Vliet, H. (2010). The relation between EA effectiveness and stakeholder satisfaction. *Journal of Systems and Software*, 83(10), 1954-1969.
- Venkatesh, V., Bala, H., Venkatraman, S., & Bates, J. (2007). Enterprise architecture maturity: The story of the veterans health administration. *MIS Quarterly Executive*, 6(2).
- Vinekar, V., Slinkman, C. W., & Nerur, S. (2006). Can agile and traditional systems development approaches coexist? An ambidextrous view. *Information systems management*, 23(3), 31-42.
- Wang, P., & Swanson, E. B. (2007). Launching professional services automation: Institutional entrepreneurship for information technology innovations. *Information and Organization*, 17(2), 59-88.
- Weerakkody, V., Janssen, M., & Hjort-Madsen, K. (2007). Integration and enterprise architecture challenges in e-government: A European perspective. *International Journal of Cases on Electronic Commerce (IJCEC)*, 3(2), 13-35.
- Weiss, S., Aier, S., & Winter, R. (2013). Institutionalization and the effectiveness of enterprise architecture management.
- Williams, C. K., & Karahanna, E. (2013). Causal explanation in the coordinating process: A critical realist case study of federated IT governance structures. *MIS quarterly*, 37(3), 933-964.
- Winter, R. (2014). Architectural thinking. *Wirtschaftsinformatik*, 56(6), 395-398.
- Winter, R. (2016). Establishing 'architectural thinking' in organizations. IFIP Working Conference on The Practice of Enterprise Modeling,
- Yin, R. K. (2003a). *Case study research design and methods* (Vol. 5). Sage.
- Yin, R. K. (2003b). Design and methods. *Case study research*, 3.
- Yin, R. K. (2003c). *Design and methods* (Vol. 3). Sage.
- Ylinen, M., & Pekkola, S. (2018). Enterprise Architecture as a Scapegoat for Difficulties in Public Sector Organizational Transformation.
- Zachman, J. A. (1987). A framework for information systems architecture. *IBM systems journal*, 26(3), 276-292.

**Paper 5: Enterprise Architecture Evolution Towards an Agile Transformation Advisor**

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*In the process of submission to the Journal of Enterprise Architecture - Association of Enterprise Architects*

This paper is not yet published and is therefore not included.



ISBN 978-82-326-7830-3 (printed ver.)  
ISBN 978-82-326-7829-7 (electronic ver.)  
ISSN 1503-8181 (printed ver.)  
ISSN 2703-8084 (online ver.)



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Science and Technology