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 and 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. 2020; Haki and Legner 2021). 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 and Yellin 2006; Haki et al. 2020; Schmidt and Buxmann 2011).

In the EA literature, the majority of current studies have focused on EA frameworks, principles, and standards (e.g., Boh and Yellin 2006; Haki and Legner 2021; 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 and 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. 2020; Brosius et al. 2018; Dang and Pekkola 2019; Levy and Bui 2019). These studies take an

institutionalization approach, specifically through the lens of institutional theory (DiMaggio and Powell 1983; 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 and Pekkola 2019; Haki et al. 2020).

Although EA has received significant attention in recent years for its role in coordinating and managing the digital transformation process (Haki et al. 2020; Haki and Legner 2021; 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 and 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 2000; King et al. 1994; Mignerat and Rivard 2009; Orlikowski and 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 2000), the legitimization process (e.g., Kaganer et al. 2010), and the role of institutional entrepreneurs (Wang and Swanson 2007). Similarly, in the EA literature, the study of EA institutionalization and assimilation (e.g., Ajer et al. 2021; Beese et al. 2020; Brosius et al. 2018; Dang and Pekkola 2019; Levy and 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. 2020)

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 and Hinings 1996; Mignerat and Rivard 2009; Scott 2001). As such, institutional theory views institutions as active agents capable of responding strategically and innovatively to environmental pressures (Orlikowski and 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 and Rivard 2009; Seo and Creed 2002) is strongly recommended in order to compare institutional effects over a change period (Bala and Venkatesh 2007; Son and 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 2001). Four distinct types of institutional change are recognized: *institutional formation, institutional development, deinstitutionalization, and re-institutionalization* (Jepperson 1991). 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 2001). 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 and 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 and 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 2001; Seo and 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 and Powell 1983; 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 (Sherer and 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 and 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 and 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 and 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 and Powell 1983). 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).

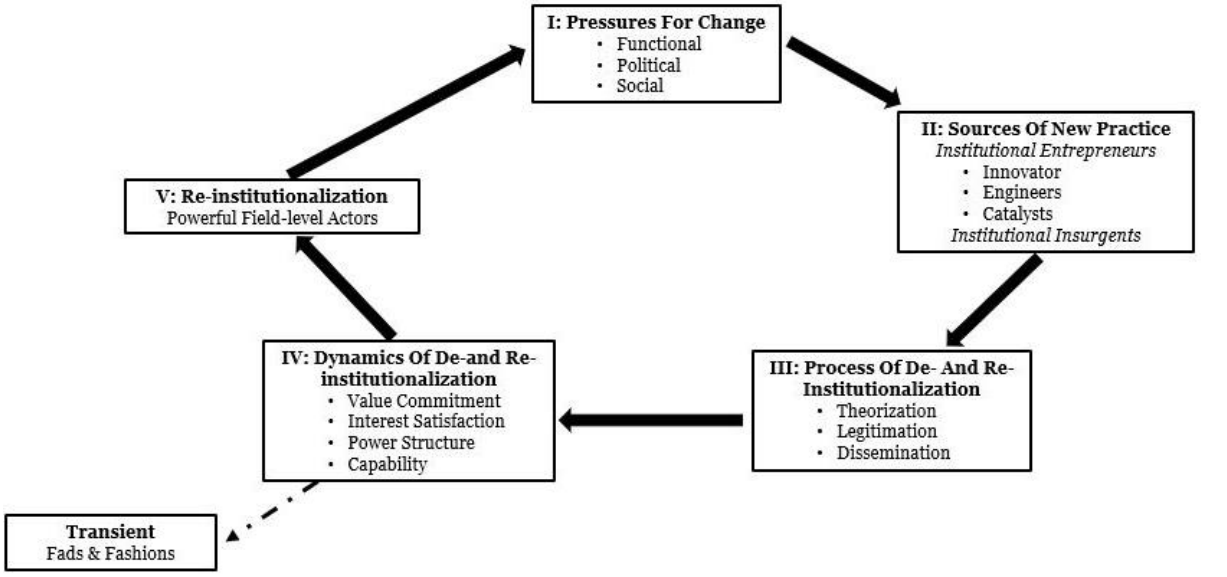

Figure 1. Institutional Change Processes (Hinings et al. 2004)

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 2003). 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 2003). 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 creditability 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	• Internal documents, ranging from 2016 until 2020, over 1,000 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
Semi-Structured Interviews	• 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)
Observations	• Four meetings - four hours • Over 35 pages of single-spaced text and 22,000 words • Participants: Top managers (3) and the working group

Table 1. Overview of Data Collection Techniques

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[1] 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

[1] - 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."

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 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 became 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. 2018; Dang 2021; Dang and Pekkola 2019; Levy and 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 and Barley 2001). Thus, a thorough examination of EA institutionalization requires a longitudinal perspective (Mignerat and 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		Re-Institutionalization
	Sources of New Practice		Dynamics of De-and Re-Institutionalization	

2015-2016	2016-2017	2017-2019	2019-2020	2020-Now
Outsourcing Strategy	Pilot Study	In-House Strategy (Agile Teams)	In-House Strategy (Product Area)	
EA Dominates	EA Dominates	Agile Teams Dominate	Agile Teams Dominate	Dialectic of Agile and EA
• Emerging the new trends emphasizing quick response to customer needs • Digitalization becomes a priority for the Norwegian government • The extensive debate over NAV's failure to respond to users' needs in Media • Changing CEO and CIO	• Pilot study with two small agile teams • Individuals are motivated in agile method • Financial department supports in-house strategy • Labor unions support agile method	• Hiring more than 200 talented individuals for building agile teams • Some in IT department leave the organization or change their role • Architects are unable to contribute to agile teams by traditional way of working • Proposing the idea of "Product Area" by enterprise architects	• Emerging miscoordination and misalignment concerns among the agile teams • Agile teams realize their weakness concerning rules and legal/law compliance • Agile teams are more accepting of the importance of EA practices • Previous CIO leaves the organization	• Emerging Covid-19 leads to high stress to NAV due to high unemployment and many changes • Joining architects to the agile teams • Architects' contribution to the agile teams by bringing holistic view and organizational knowledge • Advisory role of architects • Top managers reexamine EA practices
Color Codes				
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 and 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.

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