TOWARDS A FRAMEWORK FOR MANAGING BUSINESS CAPABILITY STABILITY USING ENTERPRISE ARCHITECTURE

by

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I declare that the above thesis is the outcome of my own work, research, and investigation. All sources that have contributed to this research or that I have utilised and quoted have been clearly indicated and acknowledged by using complete references. I also declare that I have not previously submitted this work, or part of it, for examination at UNISA for another qualification or at any other higher education institution.



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2026/07/09

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ABSTRACT

This study is situated in the information systems discipline, within the domain of enterprise architecture, where business capabilities are used to align an organisation's strategy with the people, processes, and technology that deliver it. Within this domain, the thesis aims at understanding and formalising the concept of capability stability in contexts of rapid technology disruption. The study begins by establishing why stability is a critical dimension of business capabilities for enterprise architecture research and practice, particularly when enterprises must continuously adapt without undermining their foundational strengths. The study then proceeds to construct a framework that defines capability stability concepts, relationships, and governance mechanisms in the enterprise architecture domain. The research is motivated by the need to provide organisations with a structured method for preserving essential capabilities while embracing innovation, ensuring that architecture practice can operate effectively in an environment characterised by accelerated change, complex ecosystems, and heightened stakeholder expectations.

This research responds to a call for more integrative approaches to enterprise architecture that account for shifting technological, organisational, and regulatory conditions. The study is framed by the pragmatic and interpretive paradigms: its ontological position accepts that multiple realities coexist because individuals perceive reality through different lenses, and its epistemological position holds that knowledge is socially constructed and validated through practical application. Design science research (DSR) — pragmatic by nature in its focus on building artefacts whose worth is judged by their utility in solving real-world problems — provides the methodological foundation. Drawing on sociotechnical systems theory and the principles of DSR, the work investigates issues such as what constitutes stability in business capabilities; how stability can be measured, monitored, and maintained over time; and whether a formalised stability framework can support enterprise architecture practice in managing both resilience and transformation.

Within a design science research approach, the study employs a literature review, thematic analysis, and framework synthesis to develop the stability management artefact. The framework was validated through engagement with industry practitioners across financial services, technology, and public sector organisations, who assessed its applicability, clarity, and value in guiding architectural decision-making. Participants confirmed that the framework captures the key dimensions of stability that are relevant to enterprise architecture, and that its concepts are transferable across different organisational and ecosystem contexts.

The study delivers three main outcomes. First, it formally defines capability stability as the capacity of a capability to remain in, or return to, a state of equilibrium when disruption occurs — its strength to endure disruption and to tolerate changes to the defined factors of its ecosystem without loss of its core function. Second, it develops the capability stability ecosystem conceptual model, which

organises these factors into three interconnected layers: capability enablement (people, process, and technology), capability measurement (performance, measure, capacity, and engagement), and influencers and environmental context (governance and cost, within the external environmental context). Third, it constructs the Capability Stability Management Framework (CSMF), which embeds the ecosystem in a relational matrix that enables practitioners to diagnose potential instabilities and trace the cascading effects of change before disruption manifests. The findings confirm that stability is an emergent property of the ecosystem as a whole, and that it is measurable, manageable, and essential for maintaining enterprise coherence during continuous transformation.

In addition to addressing the scarcity of literature on capability stability in enterprise architecture, this research promotes stability-conscious architecture practices that balance agility with continuity. Both theoretical and practical applications of enterprise architecture stand to benefit from the proposed framework which supports a shared understanding of stability as a strategic architectural concern. By enabling enterprises and their stakeholders to align on stability objectives, the framework may assist in safeguarding value delivery while navigating continuous disruption.

Keywords: business capability; capability stability; design science research (DSR); enterprise architecture (EA); framework; capability ecosystem; stakeholder; thematic analysis

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LIST OF ACRONYMS

Abbreviation	Full term
CSMF	Capability Stability Management Framework
DSR	Design Science Research
EA	Enterprise Architecture
EAM	Enterprise Architecture Management
EAPs	Enterprise Architecture Practitioners
IS	Information Systems
IT	Information Technology
SaaS	Software as a Service
TOGAF	The Open Group Architecture Framework
FEDS	Framework for Evaluation in Design Science

1 CHAPTER 1: INTRODUCTION

1.1 BACKGROUND TO THE STUDY

This thesis develops a Capability Stability Management Framework (CSMF) for managing capability stability using enterprise architecture (EA). The primary aim of this framework is to empower EA practitioners (EAPs) to use academic best practices — that is, theory-informed design guidelines and evidence-based processes derived from the peer-reviewed literature — functionally and practically. The framework is the outcome of a Design Science Research (DSR) process.

Three core concepts underpin this study. A business capability is the combination of people, processes, and technology that enables an organisation to perform its business services (The Open Group 2010; Rosemann & Vom Brocke 2015; Zhu, Vanden Broucke, Zhu, Vanthienen & Baesens 2016). Capability stability denotes the capacity of a capability to remain in equilibrium — to endure disruption and to tolerate change to the factors that form part of its ecosystem — a notion grounded in the systems-theoretical concept of homeostasis (Danielewicz-Betz 2016). The capability ecosystem denotes the structured set of dimensions within which a capability operates, namely capability enablement, capability measurement, and capability influencers and environmental context. These concepts are expanded in Section 1.3.5, deepened in Chapter 2, and formally defined and integrated in Chapter 3, where they culminate in the capability stability ecosystem conceptual model.

The three concepts operate at different levels of analysis and are nested within one another. The business capability is the unit of analysis — the entity, composed of people, processes, and technology, that delivers a business service. Capability stability is a property of that individual capability, describing at the capability level how well it maintains or returns to equilibrium when its constituent factors change. The capability ecosystem operates at the surrounding systemic level: the structured set of dimensions and factors — capability enablement, capability measurement, and capability influencers and environmental context — within which the capability exists and through which change propagates. A capability is therefore stable to the extent that it withstands disturbances arising within its ecosystem, and the two are integrated in the capability stability ecosystem conceptual model developed in Chapter 3. For consistency, this thesis uses business capability stability (shortened to capability stability) for this capability-level property, and business capability ecosystem (shortened to capability ecosystem) for the systemic context.

As the Fourth Industrial Revolution unfolds and digitally enabled business becomes essential for survival, traditional EA processes are struggling to keep pace with the rapidly evolving technology landscape (Ngomana 2023; Shava 2022). The challenge for EAPs is to identify the areas that require attention and maintain agility in design and function while upholding the best practices, frameworks, and design thinking principles that define EA (De Castilho Junior, Rocha Loures, Portela Santos & Deschamps 2023; Kohansal 2024). This framework to manage capability stability is a compass that guides EAPs through the design complexities and touchpoints of a swiftly changing digital world.

The framework equips EAPs with the tools to maintain a capability's design aspects, enabling a capability to adapt to the influences of its external and internal environment which can significantly impact its operations. The framework provides EAPs with a toolbox to effectively manage the dynamic environments in which business capabilities must function.

Although widely adopted industry definitions of EA exist in practice — most notably that of The Open Group's TOGAF standard — the academic literature has yet to converge on a single view or definition of EA or its purpose in an organisation. There are three schools of thought regarding EA (Lapalme 2011; Saint-Louis, Morency & Lapalme 2017). These different schools divide EA into three interconnected architectures: technical, socio-technical, and ecosystemic (Lapalme 2011; Saint-Louis et al. 2017). The three types of architecture are aligned with distinct ontological and epistemological beliefs (Lapalme 2011; Saint-Louis et al. 2017), uniquely require specific methods and tools, and are self-regulating (Lapalme 2011; Saint-Louis et al. 2017).

Whatever way EA is viewed, the understanding remains the same: EA refers to the alignment of an enterprise's information, technology, standards, processes, policy, and framework with its goals and strategies to achieve the required level of standardisation, integration, consistency, and compliance (Salem Edhah & Zafar 2016). EAPs also attribute systematic and structured processes and procedures when using EA to provide direction to the information technology (IT) landscape and a holistic view of the organisation (Saint-Louis et al. 2017).

Considering that EA has an inherent design component, any EA design should achieve a specific goal or outcome (Winter & Aier 2011). Any influence on any of the components within the design will then have an impact on how the design functions, whether negative or positive. The problem can be described as how the impact is determined and, if negative, how the design is managed to reduce the impact.

The significance of this problem grows with the pace of digital change. As organisations increasingly depend on rapidly evolving, externally hosted technology, a change to one component of a capability — its people, processes, or technology — can destabilise the capability as a whole, yet EAPs have no systematic means of anticipating or managing that instability. This matters because a destabilised capability can no longer reliably deliver the value for which it was designed, directly undermining strategy execution. While the literature describes in depth how capabilities are designed and governed, it remains largely silent on their stability once operational (Danielewicz-Betz 2016; Gong & Janssen 2019). What is therefore not known is how capability stability should be defined and managed from an EA perspective: the EA discipline lacks both a conceptual model that describes the capability ecosystem and capability stability, and an evidence-based framework to manage that stability.

This study addresses that gap. It asks what EA-based framework can be designed to guide the management of business capability stability in enterprises, and its objective is to develop — through a Design Science Research process — a Capability Stability Management Framework that enables EAPs

to manage capability stability while preserving the value for which a capability was designed. The study thereby offers a theoretical contribution, namely a conceptual model of the capability ecosystem and a formal definition of capability stability, and a practical contribution, namely a framework that EAPs can apply in any organisation to manage capability stability effectively.

This chapter is structured as follows: Section 1.2 details the rationale of this study on developing a framework to manage capability stability. Section 1.3 presents the theoretical grounding that underpins the study. Section 1.4 presents the research problem. Section 1.5 outlines the research questions and objectives, and Section 1.6 presents the research design. Section 1.7 discusses the practical and theoretical contributions. Section 1.8 depicts the layout of the thesis, and Section 1.9 concludes the chapter.

1.2 RATIONALE

Some scientific discoveries are based on observation. Most observations can be illustrated by an anecdote. Anecdotal evidence of this study's research problem can be found in almost every household worldwide where someone struggles with a new feature that was updated without prior consent, training, or knowledge. Cries of resounding frustration and pieces of paper, with "how to" instructions lying next to smart TVs and smartphones, which enable people to perform basic functions, are common occurrences; at least, this is observed in the household of this researcher.

The same frustration, though on a different scale, is happening with the advent of the Fourth Industrial Revolution. In 2025, technology disruption is the industry buzzword, and the focus on providing IT solutions has shifted to enabling rapid technological changes that align with the business strategy of being the first to deliver products to the market (Kohansal 2024; Shava 2022). "De-risking your IT environment" has become the de facto sales pitch for moving systems from traditional on-premise solutions, which were maintained with features enabled and turned on and off by in-house application support specialists, to Software as a Service (SaaS), where, for a fee, a product with specified features and functions is accessible to the user (Das, Ghia, Joyce & Zhang 2019). The standardisation that is inherent in SaaS solutions, namely that everybody gets the same features in the product, reduces development and hosting costs (Dippenaar 2008). Where, previously, multiple companies required application support specialists and hardware technicians to support the operation of on-premise systems, the onus now is on the provider to have the required IT staff, resulting in a cost reduction for user companies from a staff and infrastructure perspective, while the companies receive a maintained, up-to-date system without worrying about IT governance and the related costs (Walther, Plank, Eymann, Singh & Phadke 2012).

This innovation is seen as a business benefit, as system features are updated to the latest industry best practices without long scoping sessions and product customisation (Floerecke 2018). This allows business capabilities to realise benefits quickly (Hyysalo 2019). A business capability is found in many

disciplines and is broadly defined as the ability to do something. (Jacobides & Winter 2012). It is described as an ability that an organisation, person, or system possesses (Michell 2011). It is usually described in high-level terms and comprises a combination of organisation, people, processes, and technology (Chen, Wang, Nevo, Jin, Wang & Chow 2014).

Using this combination of people, processes and technology with a pre-defined process allows a business to execute a business strategy (Jung, Choi & Song 2007). Every business's main aim is to execute its strategy to achieve its goals, making the business financially sustainable while achieving its mission and vision (Ross, Weill & Robertson 2006). A business achieves its business strategy by using a process of strategic planning and development. Developing a business strategy is a broad area, and the idea of business capabilities is only one of the many topics of strategic content. A business strategy is closely aligned with the business's domain and is thus influenced by changes in that domain (Ross et al. 2006).

The main viewpoints used in EA descriptions are people, processes, and technology perspectives (Silva, Mira da Silva & Sousa 2017). These viewpoints allow for a business capability to be seen through a lens that highlights the combined concerns of people, processes, and technology (Hafner & Mira da Silva 2024).

EA focuses on documenting the change in business capabilities over time, starting with a current and future business landscape, while highlighting the necessary changes the business must achieve to reach its strategic goals (Shanks, Gloet, Asadi Someh, Frampton & Tamm 2018). However, EAPs realised that detailing the current and future landscapes was insufficient (Gampfer, Jürgens, Müller & Buchkremer 2018). A phased approach to changing the business landscape was required, ensuring strategic alignment and implementation assurance (Buckl, Ernst, Matthes & Schweda 2009).

To assist the business with the changing landscape, EAPs have been concentrating on establishing and evolving business capabilities as the organisation's strategy, mission, and vision change (Bente, Bombosch & Langade 2012). A primarily business-orientated view defines these capabilities, although the IT space mostly drives the function (Schoonjans 2016).

The concept of EA has long been a subject of debate, particularly because it is often driven by the IT domain (Hoogervorst 2004; Ross et al. 2006). Proponents of EA realise and confirm that business input is key to its success (Foorthuis, Van Steenbergen, Brinkkemper & Bruls 2016). From an IT perspective, the value of EA lies in aligningtechnology aspect to support business capability (Tamm, Seddon, Shanks & Reynolds 2011). This alignment between the technology, people, and process components enables strategy execution (Gregor, Hart & Martin 2007).

Consider, for example, if the technology component of a business is moved to a cloud environment, what impact do changes on cloud platforms have on people and processes? EAPs, being tasked with the design of a business capability, including the three design elements of people, process, and technology, must be aware of possible impacts that can influence the design of the capability (Van de

Wetering, Hendrickx, Brinkkemper & Kurnia 2021). If the technology changes due to being hosted on a cloud platform, people's technological processes will have to change, as not all process-related activities happen on a system.

Table 1 is included to make explicit which layers of a capability's technology component pass from the enterprise to the provider at each service tier, from full on-premises control to complete SaaS outsourcing (Singh & Sharma 2021). Under the SaaS model in particular, governance of the technology component shifts to the provider: because the environment is multi-tenant (Sabahi 2011) and the provider may alter the underlying technology unilaterally, the enterprise loses control over technology changes that directly affect the stability of the capability (Zhu 2004). SaaS providers promise businesses major benefits if they move software to the cloud, as depicted by the shared responsibility model shown in Table 1 below:

TABLE 1 THE SHARED RESPONSIBILITY MODEL (SINGH & SHARMA 2021)

On-Premises	Infrastructure as a Service	Platform as a Service	Software as a Service
Application			x
Middleware		x	x
Database		x	x
Operating system		x	x
Virtualisation	x	x	x
Servers	x	x	x
Storage	x	x	x
Network	x	x	x

The shared responsibility model is an industry-standard that shows the benefits of outsourcing all IT-related activities to a provider (Sabahi 2011). According to this model, the ultimate goal is for businesses to have “all the blocks in a green state”, hence outsourcing all the inherent risks of managing these IT capabilities to a provider (Hulshof 2021; Singh & Sharma 2021).

This would place the responsibility for the upgrade, maintenance, security, and upkeep of these IT capabilities with the provider, which would include additional benefits such as not having to be concerned about system downtime or system upgrades and patches.

However, the problem with this is that the provider has control of all the technical elements of the business capability. This gives the provider the power to change the technology component of the business capability without considering the other components of the business capabilities (Zhu 2004).

People and processes are left behind as the innovative technology component rushes to keep up with upcoming IT trends (Tidd & Bessant 2020). While this innovation is desirable from a digitalisation perspective, how it impacts the business's capability to function is unknown, as the business capability was designed to produce specific outputs that align with the business strategy.

The concept of EA has long been contested, primarily because it is frequently perceived as an IT-driven discipline. This narrow view undermines the broader intent of EA, which is to enable sustainable organisational capability through the integrated design of people, processes, and technology. The adoption of technology remains a critical factor in shaping a sustainable future (Al-Emran & Griffy-Brown 2023). Technological adoption shapes not only an organisation’s capacity to sustain day-to-day operations but also its ability to realise strategic objectives by automating and regulating routine business activities and enabling more agile business processes (Chen et al., 2014; Warner & Wäger, 2019; Zhu, 2004). However, technological adoption in isolation seldom results in success. When individuals within the organisation do not understand or appreciate the value that technology and redesigned processes contribute, adoption becomes superficial and may hinder long-term sustainability. Recent research shows that modernisation pressures continue to dominate organisational agendas, with legacy system digitisation emerging as a critical challenge that directly affects strategic execution. Studies highlight that organisations struggle to balance the need for technological renewal with the realities of organisational readiness, structural constraints, and evolving capability demands (Das et al., 2019; Gampfer et al., 2018; Shanks et al., 2018).

Organisations that adopt technology innovatively tend to achieve a competitive advantage (Warner & Wäger 2019), as both clients and employees increasingly value efficiency, accessibility, and digital interaction. A business that provides services through digital channels, for instance, is likely to outperform one that relies on traditional, location-based engagement. Internally, staff expectations mirror this trend, seeking technology that simplifies tasks and enhances productivity. Consequently, the success of digital transformation initiatives depends not only on the technology itself but also on how effectively people and processes are aligned to support it. Resistance to change remains a critical barrier (Tidd & Bessant 2020); therefore, sustainable transformation requires deliberate efforts to embed human and procedural adaptation into technological design.

For this reason, EAPs must deliberately integrate the triad of people, process, and technology as interdependent design elements for the establishment and enablement of business capabilities. Incremental advancements across these dimensions can produce substantial organisational outcomes. The increasing focus on enabling business capabilities through technology reinforces the imperative for a holistic EA approach—one that extends beyond IT implementation to serve as a strategic mechanism for achieving capability-driven sustainability.

1.3 BACKGROUND TO THE RESEARCH PROBLEM

The fast pace of digital change continues to influence how organisations operate and compete in modern economies. In this environment, EA has become an important approach for aligning business strategy with the technologies that support it. Yet, despite its strategic value, EA is often seen mainly as an IT function focused on systems, applications, and infrastructure. This narrow view reduces its potential to guide broader organisational transformation and long-term capability development.

When EA is treated as a technology exercise, the human and process dimensions that make transformation successful are often overlooked. Technology can enable progress, but its benefits depend on how well people understand and use it, and on how effectively organisational processes are adapted to support it. Many organisations still struggle to achieve this balance. While they continue to invest in new technologies, organisations often face resistance to change and difficulties in embedding new ways of working.

This research is positioned within this context. It examines the gap between EA's purpose as a holistic discipline that integrates people, processes, and technology, and its current practice as an IT-led activity. The study seeks to explore how EA can be applied to build stable business capabilities by connecting social and technical aspects, contributing to a more balanced and sustainable approach to digital transformation.

1.3.1 THE CONCEPT OF COMPLEXITY IN EA

Complexity considerations of EA have become an emerging topic in EA research (Schneider, Zec & Matthes 2014). EAPs have differing views about the definition of this complexity (Lankhorst 2009). Complexity science has become of interest to researchers, and irrespective of general complexity, researchers have developed their subfields by applying general findings to a specific context (Scharnhorst, Börner & Van den Besselaar 2012). The missing conceptual framework for complexity and the various ways of interpreting and defining complexity make it even more difficult to define the concept (Gorry & Scott Morton 1971). This is also true for EA. Systems theory, cybernetics, and complexity are pervasive in the literature, but they remain separate streams of research that are not aligned with EA (Schneider et al. 2014). Cybernetics is broadly understood as the study of regulation, communication, and control within complex systems, focusing on how feedback loops enable systems to sense, adapt, and maintain stability across changing conditions. It examines the mechanisms through which information circulates between system components and how these interactions support self-regulation, learning, and purposeful behaviour in both biological and engineered environments (Wiener, 1948). Since various EA researchers apply different definitions of complexity, the tangibility of this concept becomes an ideal instead of a reality.

Complexity in EA has no formalised definition; however, there are four categories of complexity (Flood & Carson 2013; Kreitler, Zigler & Kreitler 2009; Lichtenstein & McKelvey 2011; Suh 2005). The first is organised complexity versus disorganised complexity (Collier & Hooker 1999). It makes a difference if

two or three variables describe the system under consideration or if there are more than one hundred. Disorganised complexity refers to a large number of variables with individually inconsistent variables or several unknown variables (Maguire, McKelvey, Mirabeau & Öztas 2006). Despite the unpredictable behaviour of certain variables, a system can still possess ordered, intentionally designed, and analytically tractable properties (Merali, 2006). Organised complexity arises when a moderate number of interdependent variables form an integrated whole through strong relational patterns (Collier & Hooker, 1999). Even where numerous variables are present, they remain open to examination because their influence manifests at the level of the system as a coherent entity (Gregor, 2006).

The second type of complexity is qualitative complexity versus quantitative complexity. Qualitative complexity refers to evaluating a certain attribute or variable in a system (Kaplan & Duchon 1988). This type of complexity is independent of the number of variables. Still, it relates more to complex system phenomena, using the notion of complexity with other notions such as self-organisation, emergence or dynamical systems (Merali 2006). Kolmogorov (1998) proposed a measure for quantitative complexity. The Kolmogorov complexity is the length of the shortest computer program capable of generating a given string (Kolmogorov 1998). Another notion for quantitative complexity is entropy, which relates to a measure of uncertainty in a message (Gell-Mann & Lloyd 1996). Other approaches to measuring quantitative complexity are based on the number and variety of components and their interactions with a system (Ma, He & Du 2005). Quantitative measures infer that a quantity or a particular property directly influences complexity.

The third type of complexity is subjective complexity versus objective complexity. This complexity is based on the viewpoint of the observer of the complexity. Objective complexity refers to complexity which is independent of the observer (Sinha 2014). Complexity is considered a property of a system under observation. Such objective views are relevant in qualitative complexity, where system properties like emergence are investigated (Gregor 2006). Complexity can also be considered a property of the relationship between a system and its observer (Gregor 2006). The observer can see a system as complex if their mental model of the system cannot explain their observations. Contrasting with objective complexity, subjective complexity is bound to the existence of an individual observing the system (Merali 2006).

The fourth and last type of complexity used in EA research is structural versus dynamic complexity. Structural complexity is also known as combinational or detail complexity (Traub 2003). It is concerned with the patterned configuration of system components, including the number of variables involved and the causal relationships that link them into a coherent structure (Collier & Hooker, 1999; Merali, 2006). A structural perspective is applied in research where networks of variables are prevalent, especially where extended connectivity plays an important role (Cenfetelli & Bassellier 2009). Dynamic complexity refers to variables with multifaceted interdependencies and changes in the interaction of the variables of a system (Beese, Aier, Haki & Winter 2023). Dynamic complexity describes the interactions among the variables over time (Benbya & McKelvey 2006). In a complex system, the

impact of actions often cannot be reversed (Gregor 2006). Therefore, the "state" of the variable at a certain point in time must be recorded for comparison purposes (Gregor 2006). With several different interacting feedbacks on a variable, determining an exclusive state of the variable is extremely difficult (Gregor 2006). Consequently, interpreting system behaviour is usually complicated. The existence of cause-and-effect delays should be taken into account because they can produce system instability and affect complex system dynamics. Dynamic complexity emerges from the strong interactions between systems as well as actions that shape upcoming decision possibilities.

The study of complexity in EA therefore requires a nuanced understanding of how multiple types of complexity interact within organisational systems. While each type reflects distinct characteristics, together they reveal the interdependence between structural, behavioural, and technological elements that define enterprise functioning. This interconnectedness has led researchers to adopt theories and models from systems thinking and complexity science to better explain how EA operates within dynamic environments. As a result, EA is increasingly viewed not merely as a framework for managing technology but as a discipline for understanding and navigating the adaptive behaviour of enterprises as complex systems. Within this perspective, systems-oriented models demonstrate how organisations sustain viability by balancing reactive responses, anticipatory capability, and governance functions as part of a coherent whole. Systems thinking highlights that organisational viability depends on maintaining this dynamic equilibrium amid increasing structural and environmental complexity (Gharajedaghi, 2011; Merali, 2006; Collier & Hooker, 1999).

1.3.2 GOVERNANCE AND COMPLEXITY

In 2014, Esmaeil Zadeh (2014) demonstrated how The Open Group Architecture Framework (TOGAF) architecture principles correspond to cybernetic concepts through the application of the viable system model. Research demonstrates that TOGAF business architecture principles match with viability, recursion, cohesion, coordination, and homeostasis, which confirms the need for EA governance to support an enterprise's self-regulation abilities and adaptability. The theoretical mapping illustrates that structural elements within EA derive from cybernetic principles but it clarifies that these principles prioritise system structure instead of system dynamics.

Chaos theory explains how complex systems exhibit nonlinear behaviour in which small variations in initial conditions can produce disproportionately large and often unpredictable outcomes. It emphasises sensitivity to starting states, feedback-driven dynamics, and the tendency of systems to move through patterns of instability and self-organisation rather than linear progression (Kreitler, Zigler & Kreitler, 2009; Lichtenstein & McKelvey, 2011).

In their 2009 study, Saat, Aier, and Gleichauf integrated these principles into EA planning and argued that recognising sensitivity to initial architectural conditions is essential for effective design development. Their qualitative exploration of enterprise complexity revealed that structural invariance and an organisation’s preference for specific operating models significantly influence the design and

planning stages of EA. This perspective reinforces the view that enterprise systems behave unpredictably and dynamically, positioning chaos theory as a valuable lens for understanding and managing the inherent uncertainty embedded within EA functions (Collier & Hooker, 1999; Merali, 2006).

Kandjani, Bernus, and Wen (2012) and Chen et al. (2014) offer quantitative approaches to EA complexity. Kandjani et al. (2012) used cybernetics to measure complexity in global software development projects through three indicators that provide a systematic approach to assess the complexity inherent in these large-scale projects. In contrast, Chen et al. (2014) presented one of the first empirical evaluations of complexity measures within application architecture, focusing on interdependencies, technology diversity, and redundancy. These empirical methods illustrate how EA complexity can be quantified, thus enabling a more rigorous evaluation of complexity in practical EA implementations.

Multiple EA complexity methods, including cybernetic frameworks and chaos theory, confirm the understanding of enterprises as systems with complex adaptive characteristics. The multiple approaches provide distinctive perspectives on managing or categorising complexity in the EA discipline and enhance our understanding of enterprise evolution and adaptation in dynamic contexts.

Research shows that systems possess inherent complexity which results from both their component relationships and the emergent non-linear behaviours that arise from such interactions. Complexity functions as a result of multiple interacting components such as interdependencies along with emergent behaviours and control mechanisms (Bernus et al. 2016; Chen et al. 2014; Kandjani et al. 2012). This understanding aligns with Beer's viable system model (Buckl et al. 2011). Buckl et al. (2011) demonstrated that enterprise complexity requires evaluation beyond structural components because an organisation must adapt and self-regulate using both reactive and proactive methods. Enterprise systems display non-linear dynamics through their feedback loops and adaptive behaviours which manifest in the dual nature of reactive and proactive governance that shapes their complexity.

Esmaeil Zadeh (2014) expanded the concepts of complexity in EA by mapping TOGAF's architecture principles onto cybernetic concepts such as viability, recursion, and homeostasis. The analysis shows how an enterprise's systems exhibit complex adaptive behaviours, requiring continuous adjustment and coordination to maintain stability. The application of the concept of homeostasis then reveals the system's capacity for self-regulation, where non-linear feedback mechanisms enable the organisation to maintain balance—or homeostasis—amidst external and internal disruptions. This idea of homeostasis is important to understanding complexity, as it showcases how seemingly small changes in one part of the system can have disproportionate and unexpected results which affect the whole ecosystem.

Moreover, Saat et al. (2009) applied chaos theory to explore further the non-linear aspects of enterprise complexity. Their analysis of EA planning underscored the system's sensitivity to initial

conditions—a core principle of chaos theory—suggesting that enterprises, much like chaotic systems, can experience vastly different outcomes from minor variations in initial states. This sensitivity highlights the unpredictability of enterprise behaviour, where the interdependencies between different system components can give rise to surprising events or incidents that are difficult to control or predict. The researcher also reflected on how certain complex operating models can amplify overall enterprise complexity, a phenomenon that often only becomes visible when organisations attempt to implement these models by relying on industry "standard" operating practices. Therefore, individual context is required to understand these complexities.

The research conducted by Kandjani et al. (2012) together with Chen et al. (2014) investigated empirical methods for measuring complexity through measurable indicators such as interdependencies and redundancy alongside technology diversity. These studies give priority to structural complexity elements yet they recognise behavioural dimensions, especially when applied to worldwide software development projects and application structures. The Kandjani et al. (2012) study metrics for complexity measurement demonstrate the unpredictable challenges created by interaction among multiple global actors through indicators like team coordination and control levels. Similarly, Chen et al. (2014) showed how technological diversity and system interdependencies affect system behaviour and how non-standard technologies can cause unpredictable and potentially destabilising results. Research outcomes demonstrate that complex systems become harder to predict and control when they exhibit non-linear relationships.

The literature indicates that system complexity extends beyond structural relations to include non-linear behaviours and emergent properties and control problems. The studies by Buckl et al. (2009), Esmaeil Zadeh (2014), Saat et al. (2009), Kandjani et al. (2012), and Chen et al. (2014) show that system complexity operates quantitatively and qualitatively and therefore demands a comprehensive approach which integrates both measurable factors and unforeseeable system behaviours. The crucial role systems complexity plays in EA necessitates a deeper and more detailed examination of these non-linear and behavioural complexities to better understand the challenges EAPs face when managing complex adaptive enterprises. Implementing this examination would enable deeper insight into the nuances of EA and help create better strategies for facing the unpredictable nature of complex systems.

The growing body of research on system complexity underscores that understanding and managing complexity within EA requires more than technical modelling—it necessitates an appreciation of the dynamic and adaptive behaviours embedded in enterprise systems. These studies collectively illustrate that EA must operate at the intersection of structured system design and emergent organisational behaviour. As such, EAPs are challenged not only to address measurable aspects of complexity, such as interdependencies and system components, but also to interpret and manage the unpredictable, qualitative dimensions that arise from human, procedural, and environmental interactions. This broader interpretation of complexity directly influences how EA is implemented across organisations.

While EA is widely acknowledged as a framework for aligning business and IT, its practical application varies considerably across contexts due to differences in organisational maturity, strategic focus, and governance structures. Consequently, understanding how enterprises interpret and enact EA becomes essential to explaining why some achieve transformation and adaptability while others struggle to operationalise these outcomes effectively (Boh & Yellin 2006; Haki, Legner & Ahlemann 2012; Kotusev & Kurnia 2021).

1.3.3 EA AND DIGITAL TRANSFORMATION

The assertion that EA helps enterprises with transformation in response to evolving environments needs additional detail to cover the wide variety and intricate nature of implementing an EA function. EA functions as a recognised standard for business and IT alignment yet organisations implement it in highly variable ways. Each enterprise faces different organisational structures and contexts along with distinct requirements which lead to this variation, according to Boh and Yellin (2006), Haki et al. (2012), and Kotusev and Kurnia (2021).

Although EA has been extensively studied and promoted by researchers, standardisation bodies, and solution providers, there is no universally accepted or standardised way to implement EA across all organisations (Beese et al. 2023; Boh & Yellin 2006; Kotusev & Kurnia 2021). This is partly because organisations differ in their size, industry, culture, and strategic goals, which directly influences the scope and focus of the EA function. Certain organisations place their primary focus on IT governance alongside operational efficiency whereas other organisations emphasise innovation and digital transformation or scalability goals (Beese et al. 2023; Boh & Yellin 2006; Kotusev & Kurnia 2021). Each enterprise requires a unique EA framework to meet its specific business objectives and challenges, which leads to the absence of a universal EA standard.

The variability in organisational contexts means that EA functions must be flexible and adaptable to meet the distinct needs of each enterprise. This adaptability is necessary to ensure alignment between business and IT strategies and to enable organisations to respond effectively to external changes such as market dynamics, regulatory shifts, or technological disruptions (Beese et al. 2023; Bente et al. 2012). As Bente et al. (2012) suggest, EA is crucial in transforming enterprises. However, the success of such transformations depends heavily on the extent to which the EA function is customised to the organisation's specific environment and operational complexities.

Haki et al. (2012) point out that even though EA's significance is broadly acknowledged, organisations face standardisation challenges because EA implementation requires specific contextual adaptation. Organisations face obstacles when setting up an efficient EA function because they need to manage the absence of uniform standards and depend on adaptable frameworks to fit their specific needs. The conceptual scope of EA is widely acknowledged in the literature, with scholars emphasising its diverse interpretations and theoretical grounding (Kotusev & Kurnia, 2021; Simon, Fischbach & Schoder, 2013).

Because organisations must tailor EA practices to their unique structures, strategies, and contextual constraints, establishing a single universal EA standard remains inherently challenging.

In a rapidly changing economic, technical, and regulatory environment, the flexibility to adapt to changes and the ability to implement new business capabilities quickly are vitally important for companies, regardless of their type and size (Buckl et al. 2009). Over the last decade, technological advances have led to the development of large-scale interconnected information systems (IS) architectures, upon which organisations rely to conduct their daily business operations (Benbya, Nan, Tanriverdi & Yoo 2020). Recent implications of IS, such as sophisticated digital service and product offerings, have further fuelled this growth through significant IS investments (Walther et al. 2012; Dippenaar 2008).

Modern approaches, including service-oriented architectures, domain-specific languages and model-driven development, demonstrate potential as solutions for better business–IT alignment. Organisations encounter multiple obstacles when they try to implement these emerging paradigms in practice. Adopting service-oriented architectures offers benefits but demands a major overhaul of an organisation's IT infrastructure. Extensive information gathering about applications as well as related business processes and business objects is required in this process (Buckl et al. 2009).

At the outset of a service-oriented architectures transformation, it is common for much of this necessary information to be incomplete or unavailable. Collecting and synthesising this information is an ongoing process that must be embedded into the transformation effort. Even when the required data is available, the organisation is likely undergoing continuous changes. These dynamic shifts require service-oriented architectural transformation efforts to be continually realigned with parallel change initiatives and maintenance activities, ensuring coherence across evolving organisational and technological conditions (Gampfer et al., 2018; Korhonen et al., 2016). This realignment underscores the complexity of such transformations, as the organisation does not remain static during implementation.

Successful service-oriented architectures transformations and similar paradigms require essential alignment between business operations and IT development. This alignment moves past IT's conventional function of only serving business needs as a service provider. IT must adopt an enabling role that actively supports organisational flexibility and adaptability to enhance overall agility, a view reinforced by research showing that IT capabilities contribute to process agility and strategic responsiveness (Chen et al., 2014; Ross, Weill & Robertson, 2006; Warner & Wäger, 2019). The proactive role of IT in developing organisational agility demonstrates how business and IT need to achieve mutual alignment instead of maintaining a one-way relationship.

1.3.4 EA AND CROSS-FUNCTIONAL ALIGNMENT

This dual role of IT—functioning both as an operational backbone and as a strategic enabler—highlights the essence of business–IT alignment, a relationship that can be understood from both

business-driven and technology-driven perspectives (Groenewald et al., 2024). Achieving mutual alignment requires efforts from both sides, not just from one management function. Business and IT management need to collaborate in a way that transcends traditional siloed approaches, addressing cross-cutting issues such as organisational strategies and projects (Saat et al. 2009).

This cross-functional approach is crucial because the evolution of the organisation is inextricably linked to its strategies for growth and adaptation. A management function that integrates business and IT concepts while also considering strategic and project-based dimensions is necessary to guide an organisation through complex transformation efforts (Gregor 2006).

EA provides this holistic view, as it encompasses the fundamental design of the enterprise and its environment. Enterprise architecture is understood as a fundamental conception of the organisation, expressed through its core elements, the relationships among them, and the principles that guide its design and evolution (Korhonen & Poutanen, 2013; Lankhorst, 2009; Saint-Louis, Morency & Lapalme, 2017). EA's comprehensive nature enables it to account for both the strategic and operational elements of an organisation, making it an essential framework for managing the ongoing transformation and evolution of an enterprise.

The management of EA forms a management discipline that seeks to address the topic of mutual alignment by embracing the overall EA (Korhonen, Lapalme, McDavid & Gill 2016). On the one hand, the increasing prevalence of IS has been theorised as a competitive advantage and large-scale interconnected IS architectures are commonly associated with productivity increases (Beese et al. 2023). On the other hand, the inherent complexity of rapidly growing and constantly changing IS architectures also causes their development and maintenance issues (Hoogervorst 2004). For example, IS components generally do not act in isolation but are interdependent with other IS components (Lankhorst 2009). Therefore, any changes (e.g. in reaction to extended customer interactions or new business requirements) to a single IS component may have unintended effects on multiple related IS components. Since IS development is usually carried out simultaneously in several different IS projects, this leads to potentially inconsistent or redundant applications, software systems, and IT infrastructure components(Lankhorst 2009). In effect, increasing complexity causes the overall IS architecture to be difficult to maintain, and organisations struggle to respond flexibly to required or desired changes (Beese et al. 2023).

In response to these challenges, practitioners have investigated how to restrain and control IS development more effectively (Boh & Yellin 2006; Lankhorst 2009). Large organisations commonly employ EA management (EAM), which refers to enterprise-wide IS standardisation and harmonisation efforts to avoid unnecessary redundancies and inconsistencies (Ziemann 2022). EAM activities thereby allow the alignment of local short-term, project-related IS investments with long-term, organisation-wide objectives(Beese et al. 2023; Tamm et al. 2011).

IS architecture complexity is a multifaceted construct, reflected in several research streams from theoretical and empirical perspectives (Beese et al. 2023; Saint-Louis & Lapalme 2018). Stated concisely, the theoretical research stream acknowledges complexity as an inherent property of many modern IS (Beese et al. 2023; Simon et al. 2013). It discusses how theoretical perspectives, such as complex adaptive systems, can be applied to understand this complexity better (Beese et al. 2023; Janssen & Kuk 2006; Schilling, Beese, Haki, Aier & Winter 2017). Furthermore, the ever-increasing need to address practical issues arising from increasingly complex IS architecture in large organisations has led to another stream of empirical research that investigates specific challenges (Simon et al. 2013; Tamm et al. 2011). Empirical studies include research on application portfolio complexity, EA complexity, IS program complexity, and dynamic effects of IS architecture complexity (Gampfer et al. 2018; Simon et al. 2013). IS architectures are recognised as complex socio-technical systems in which organisational components interact with technological components to process information (Beese et al. 2023; Korhonen & Poutanen 2013; Buckl, Matthes & Schweda 2011).

In response to increasing IS architecture complexity, many organisations develop and maintain architectural plans which reflect the organisation's business and IT landscape in its current and targeted future states (Beese et al. 2023; Tamm et al. 2011). EAM, referring to associated management activities, aims to address associated challenges of IS architecture complexity by providing a holistic view of an organisation's IS architecture and purposefully guiding its development towards enterprise-wide objectives (Beese et al. 2023; Korhonen et al. 2016; Lankhorst 2009). In practice, EAM is commonly implemented through the architecture plans, architecture principles, and related organisational roles and responsibilities for monitoring and enforcing these plans and principles through compliance (Bente et al. 2012; Haki et al. 2012; Lankhorst 2009). More recently, there have also been increasing efforts to establish a more agile approach to EAM, aiming at a more direct interaction with all stakeholders while continuously revising and communicating the central architectural artefacts (Bente et al. 2012).

Although research highlights adoption issues in EAM initiatives, an organisation's higher level of EAM maturity is generally expected to lead to improved architectural outcomes (Beese et al. 2023; Haki et al. 2012; Shanks et al. 2018).

Several empirical studies discuss the effects of IS architecture complexity and highlight negative consequences, such as increased coordination efforts, higher failure rates of large implementation projects, and diminished flexibility (Beese et al. 2023; Schmidt & Buxmann 2011; Simon et al. 2013). EAM aims to prevent or mitigate these negative consequences by working towards desirable architectural outcomes that result from a systematically governed IS development in line with long-term, enterprise-wide objectives (Beese et al. 2023; Rahimi, Gøtze & Møller 2017).

Common architectural outcomes include efficiency, flexibility, transparency, and predictability. Efficiency refers to the ability of the organisation to use minimal resources while ensuring that all

necessary IS capabilities are of sufficient quality (Van de Wetering et al. 2021; Foorthuis et al. 2016; Ross et al. 2006). Flexibility captures how quickly an organisation can adapt its IS architecture in reaction to novel or changing objectives and conditions (Beese et al. 2023; Lankhorst 2009; Ross et al. 2006). Transparency relates to the ability to track and understand the detailed operation of the organisation's IS architecture (Foorthuis et al. 2016; Lankhorst 2009; Ross et al. 2006; Simon et al. 2013). Finally, predictability refers to the organisation's ability to predict the overall impact of changes and changes to the IS architecture (Foorthuis et al. 2016; Lankhorst 2009; Ross et al. 2006; Schmidt & Buxmann 2011; Simon et al. 2013).

In general, evidence points towards a negative relation between the technological complexity of IS architecture and architectural outcomes, i.e. for a group of otherwise similar organisations, those with a technologically more complex IS architecture are expected to score worse in terms of architectural outcomes (Beese et al. 2023; Dang 2019; Tamm et al. 2011).

High levels of IS architecture complexity prevent people from recognising optimal ways to adapt IS to cope with new requirements, thereby decreasing transparency (Beese et al. 2023; Lankhorst 2009; Ross et al. 2006). This also reduces the capacity of the IT function to adequately adapt to changing demands and opportunities, leading to low levels of flexibility (Beese et al. 2023; Bente et al. 2012; Ross et al. 2006). Similarly, dynamic complexity has been linked to increasing difficulties in predicting IS (Lankhorst 2009; Ross et al. 2006).

In their Delphi study on the complexity of IS programs, Piccinini, Gregory and Muntermann (2014) conclude that an interesting result of their study is that a new meta-category emerged–coordination and control deficiencies–which appears with one component in the final ranking, namely 'unclear or ill-defined program methodology'. This means that complexity, as perceived by IS program practitioners, increases if a sound methodology is not in place in an IS program. Practitioners may use this insight to justify investment decisions in EAM (Beese et al. 2023; Schmidt & Buxmann 2011; Zhou 2017).

Some scholars argue that EA can serve as a means to reduce complexity within organisations (Foorthuis et al. 2016; Gong & Janssen, 2019; Korhonen et al. 2016; Shanks et al. 2018; Tamm et al. 2011). However, this view has been contested. Rather than directly reducing complexity, EA is more accurately understood as a tool for managing and navigating complexity. Programs might be implemented alongside EA to help address and mitigate complexity, but EA itself is not a simplification mechanism (Bente et al. 2012; Foorthuis et al. 2016; Haki et al. 2012).

EA initiatives can sometimes inadvertently introduce additional complexity. As organisations undergo the transformation and new capabilities are introduced, the very process of implementing EA can increase the complexity it is intended to manage (Beese et al. 2023; Bente et al. 2012; Saat et al. 2009; Tamm et al. 2011). This contradiction has prompted a more nuanced stance, in which EA is seen as a

framework for managing complexity rather than reducing it outright (Beese et al. 2023; Gong & Janssen 2019).

The core paradox is that while EA is intended to manage and reduce organisational complexity, it frequently generates new forms of complexity in the process. This arises as organisations introduce new capabilities, processes, and governance structures during EA implementation, which can reshape existing dependencies and architectural dynamics (Gong & Janssen, 2019; Beese et al., 2023; Van de Wetering et al., 2021). These additional complexities require diligent architecture governance, ongoing development and maintenance of models, and effective communication of EA's role and alignment with the broader organisational structure (Lankhorst 2009; Simon et al. 2013; Tamm et al. 2011). In this sense, EA does not eliminate complexity but provides the means to manage and integrate it within the organisation.

Complexity management has become an essential undertaking for EA (Bente et al. 2012; Tamm et al. 2011). Complexity management is directed at achieving an optimal level of complexity to efficiently and effectively use the EA for its intended purposes (Bente et al. 2012; Foorthuis et al. 2016; Korhonen et al. 2016). The basis for complexity management is measurement, yet no standardised or proven method for EA complexity measurement exists, nor is there consensus about the attributes contributing to complexity (Bente et al. 2012; Tamm et al. 2011). Additionally, the many stakeholders involved in EA all have a different perception of complexity, leading to subjective complexity (Iacob, Monteban, Van Sinderen, Hegeman & Bitaraf 2018; Korhonen et al. 2016).

1.3.5 EA AND THE USE OF BUSINESS CAPABILITIES

A further development in EA's approach to managing the complexities introduced by the continuously changing business landscape was the definition of business capabilities in TOGAF version 9.2 (The Open Group 2010). TOGAF specifically concentrated on establishing business capabilities and managing its evolution in step with business strategy change. Due to the close link between a business strategy and its operational domain, the strategy is directly impacted by changes in the operational domain (Gregor et al. 2007; Simon et al. 2013; Tamm et al. 2011). This relationship leads to a primarily business-orientated view in creating business capabilities.

Even though the combination of people, process, and technology is seen as a capability from an EA perspective, it can also be described as a business function from the business perspective, linking a business capability meaningfully to a business function (The Open Group 2010). Business capabilities and functions are committed to providing a service to other business functions and being responsible for regulatory compliance (Kurniawan & Suhardi 2013).

People, processes, and technology can be understood as the core building blocks required to enable a capability to perform business services (Rosemann & Vom Brocke 2015; Zhu, Vanden Broucke, Zhu, Vanthienen & Baesens 2016), as depicted in Figure 1 below.

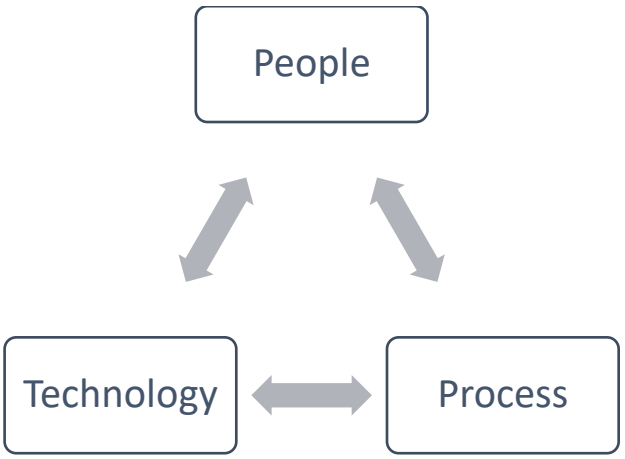


FIGURE 1 A BUSINESS CAPABILITY (ZHU ET AL. 2016; ROSEMANN & VOM BROCKE 2015; THE OPEN GROUP 2010)

Systems theory introduced homeostasis as a fundamental concept for comprehending business capabilities which function as adaptive interconnected systems. Homeostasis defines the capacity of systems to keep their internal environment stable even when facing external changes or disruptions (Danielewicz-Betz 2016). A capability that employs people, processes, and technology maintains stability within a changing business setting through this concept. The cooperation between these elements, governed by a specific capability design, allows the capability to function as a system that can withstand external pressures while continuing to operate effectively.

Business capabilities operate as interconnected systems in which interdependent components function collectively toward shared goals, reflecting core principles of systems theory and systemic organisation (Whitchurch & Constantine, 1993; Laszlo & Krippner, 1998; Gharajedaghi, 2011). Business capabilities achieve continuity and efficiency through internal regulatory processes which mirror the feedback mechanisms and adaptive responses found in biological systems that maintain equilibrium. Homeostasis plays a key role in explaining how capabilities maintain their core functions while adapting to external changes through self-regulation. Self-regulation requires ongoing adaptations to internal mechanisms and resource distribution which enables capabilities to lessen the effects of environmental changes.

The capability ecosystem consists of three interconnected dimensions: capability influencers and environmental context; capability measurement; and capability enablement. The dimensions demonstrate the capability's interactions with internal and external factors while also measuring its performance and revealing its dependence on essential elements that include people, processes, and technology. A capability maintains homeostasis through effective balancing of its dimensions, which guarantees both stability and adaptability when environmental conditions change.

The first dimension, capability influencers and environmental context, encompasses external factors such as market shifts alongside technological developments and regulatory changes which affect capability performance. A capability must preserve its core functions while it responds to external

factors to maintain homeostasis. An adaptive design enables the system to maintain functionality by effectively absorbing external disruptions without major interruptions.

The second dimension, capability measurement, sustains homeostasis through ongoing feedback regarding the capability's performance. Through careful observation of key performance indicators and various metrics, the system identifies performance deviations from the ideal state and launches appropriate corrective measures. Through this process, the capability continues to match organisational goals regardless of changes in external conditions. Continuous measurement enables prompt modifications which maintain and enhance the capability's stability and performance.

The third dimension, capability enablement, includes people, processes, and technology which serve as foundational elements of the capability. The components function together harmoniously to maintain homeostasis while each one contributes to the system's total stability. Resilient capabilities depend on effective teamwork among people while using optimised processes and adaptable technologies to meet new demands and challenges. Homeostasis operates through ongoing adaptation and realignment to address both internal and external changes instead of being a fixed state.

Analysing business capability via homeostasis demonstrates how systems maintain stability by self-regulating and adapting to environmental changes. Achieving stability and effectiveness in a system demands maintaining balance between capability components and their external interactions to withstand disruptions. Homeostatic principles applied to business capabilities deliver a complete method for handling complexity because they blend core capability design with both adaptability and stability. A capability ecosystem embodies a holistic view through its interdependent dimensions of influence, measurement, and enablement which together facilitate continual capability development and performance.

1.4 THE RESEARCH PROBLEM

This study concerns business capabilities in general — any capability composed of people, processes, and technology that delivers a business service — and not capabilities in the abstract. Within this scope, the research field of capabilities has been advanced by the introduction of a business capability ecosystem designed to ensure the operational stability of business capabilities. Organisations have long defined capabilities as distinct functional sectors which deliver designated results through their personnel, procedures and technological assets (Chen et al. 2014; Michell 2011). Understanding capabilities as part of a "capability ecosystem" transforms our perspective by representing them as connected system elements that maintain stability by continuously interacting with both internal components and external environments. An ecosystemic approach improves the understanding of capabilities by recognising their need to adapt and survive within constantly shifting operational environments. The new perspective highlights the critical need for analysing capabilities both independently and within the broader interconnected system of the organisation. Through an

ecosystem conceptualisation approach, researchers and practitioners can more effectively analyse the impact of individual capability stability on and its response to the entire organisational environment. Operational stability requires both efficient internal processes and effective interaction with other capabilities along with proper responses to external pressures.

The concept of capability ecosystems represents a new focal point within systems theory and EA domains. The capability ecosystem approach fits into the current trend of understanding organisations as complex adaptive systems because each element plays a fundamental role in maintaining organisational stability and adaptability (Groenewald et al. 2024; Kotusev & Kurnia 2021). Ecosystem thinking applied to capabilities reflects parallel developments in organisational research areas like supply chain ecosystems and digital ecosystems which both highlight interconnectedness and interdependence as essential elements for sustainable operational stability (Groenewald et al. 2024; Kotusev & Kurnia 2021).

The capability ecosystem model is the structured representation of the capability ecosystem: it organises the ecosystem's three dimensions — capability enablement, capability measurement, and capability influencers and environmental context — into a single, layered view of the factors that shape and sustain a capability. In this form, the capability ecosystem model provides a framework that ensures operational stability and enhances an organisation's ability to innovate and adapt to changing business environments. Integrating internal and external factors within the ecosystem framework allows for a more holistic understanding of capability dynamics, particularly in how internal governance and external market forces enable, measure, and influence capabilities. This concept encourages organisations to adopt a more proactive approach to capability management, focusing on continuous feedback, governance, and adaptability, which are critical for maintaining stability in complex environments (Haki, Legner & Ahlemann 2012).

The field will likely explore maintenance of stability across interconnected capabilities as research on capability ecosystems develops. Maintaining operational stability in capability ecosystems requires continuous realignment of people, processes, and technology, which defies traditional linear development models by demonstrating that stability is a dynamic rather than static state. The ecosystemic approach represents a pivotal change in capability research while delivering practical implications for business operations and EA, including IT alignment (Rahimi et al. 2017; Ross et al. 2006).

The complexity and effort involved in creating a fully documented model of a system's fundamental organisation, as defined by The Open Group (2010), lead to a partial or incomplete understanding of the capability's operational aspect (Kotusev & Kurnia 2021; Lange, Mendling & Recker 2016; Simon et al. 2013). This contributes to a potential lack of clarity by EAPs while they define, design, and manage capabilities within a local or greater business ecosystem (Rahimi et al. 2017; Ross et al. 2006).

The academic literature discusses the relationships that guide and govern the capability's design but is silent on the stability of a capability. This silence may create a sense of incoherence when considering the context in which a capability operates, as the emphasis is on the design but not necessarily the ongoing operational existence of capabilities (Danielewicz-Betz 2016; Gong & Janssen 2019). EAPs aim to define the operational dimensions of capabilities but might miss or deem some dimensions unimportant. While such a dimension might not be relevant when initially designing the capability, not designing the capability for future instances where such a dimension may be a problem, or a new requirement, may reveal costly design flaws once the capability becomes operational.

Regardless of whether a new capability is introduced to the organisation or an existing capability is changed, EA must be applied to manage the change and the resulting complexity (Korhonen et al. 2016). This suggests a strong interest in achieving and managing business capability stability from practice. This interest, along with no known framework for the definition and management of capability stability, points to a gap in the current body of knowledge and supports the need to define the concept of capability stability and work towards a framework to manage the stability of business capabilities. This led to the realisation that, to define capability stability, a meta-model which describes the capability ecosystem and all its dimensions and factors must be defined before the definition and the framework can be developed. For clarity, this thesis uses business capability stability (shortened to capability stability) for the property of a capability to remain in equilibrium under change, and business capability ecosystem (shortened to capability ecosystem) for the structured set of dimensions and factors within which a capability operates; the two concepts are integrated in the capability stability ecosystem conceptual model developed in Chapter 3.

Consequently, the first research problem is that the EA discipline lacks a conceptual model that describes the capability ecosystem and capability stability.

The second research problem is that once the conceptual model of the ecosystem, with the concept of capability stability, has been defined, a framework is required to manage the stability for which the capability was designed. The framework should cover all aspects of a change that impacts a capability, but only to the degree necessary for managing stability while maintaining the design principles that drive value and retain agility, flexibility, transparency, and predictability.

Therefore, the main research problem can be described as the lack of a framework to manage the stability of business capabilities which allows EAPs to maintain the value delivered through design.

The problem statement is therefore: There is currently no evidence-based framework that can be used to manage capability stability from an EA perspective.

These research problems give rise to, and justify, the study's research questions, so that each question is traceable to a specific problem. The main research question — what EA-based framework can be designed to guide the management of business capability stability — responds directly to the problem statement and the main research problem. The first research problem, namely the absence of a

conceptual model describing the capability ecosystem and capability stability, is addressed by the three sub-research questions: SRQ 1 defines capability stability, SRQ 2 identifies the dimensions and factors required to describe a business capability, and SRQ 3 addresses the governance mechanisms within that model. The second research problem, namely the need for a framework to manage the stability for which a capability was designed, is addressed by the refined Research Question 1.

The study rests on several assumptions. It assumes that a business capability can be meaningfully described as a combination of people, processes, and technology that delivers a business service; that capability stability is a real property that can be defined, described, and managed; that the dimensions and factors drawn from the peer-reviewed literature adequately represent those that influence capability stability; and that enterprise architecture practitioners are the intended users of the artefacts and are competent to apply them.

The study is demarcated as follows. It addresses business capabilities in general rather than a specific industry, organisation, or capability type; it manages capability stability from an enterprise architecture perspective rather than from a purely technical, financial, or behavioural one; it delivers a conceptual model and a management framework (the CSMF) rather than a software tool or automated system; and it evaluates the artefacts through design science research cycles and practitioner engagement rather than large-scale quantitative or longitudinal validation. The study is therefore bounded by the scope of the reviewed literature and the practitioners engaged during evaluation.

1.5 RESEARCH QUESTION AND OBJECTIVES

The following main research question guides the current research:

What EA-based framework can be designed to guide the management of business capability stability in enterprises?

In answering the question of what methodology can be used to develop a robust and practically relevant framework, this study identified DSR as an ideal approach. DSR is particularly suited for framework development because it is centred on creating and refining artefacts—such as models, methods, or frameworks—designed to solve real-world problems while integrating scientific rigour (Hevner, March, Park & Ram 2004). This methodology effectively bridges the gap between theory and practice by combining design processes with evaluative cycles, ensuring that the artefacts produced are both theoretically sound and practically applicable.

The DSR process operates through multiple iterative cycles that consist of problem identification followed by design stages, evaluation phases, and refinement processes (Peffers, Tuunanen, Rothenberger & Chatterjee 2007). The cyclical approach enables framework development that responds to theoretical questions while remaining flexible enough to handle organisational complexities and evolving requirements. The systematic evaluation of artefacts in their functional environments through DSR enables researchers to enhance framework efficiency and adaptability which meets user requirements (Vaishnavi & Kuechler 2004).

DSR highlights the practical application and usefulness of the artefact as an essential element in creating frameworks that organisations can implement in real-world settings. The DSR methodology achieves particular effectiveness in EA and IS because its evaluation processes are rigorous and it concentrates on how artefacts solve real-world problems along with their adaptability to complex environments (Gregor & Hevner 2013).

DSR combines theoretical knowledge with practical problem-solving to create a robust framework development methodology which delivers innovative and applicable solutions that address complex organisational questions.

DSR's first step or trigger is an awareness of a problem. This awareness of something that is inherently wrong or that can be done better naturally flows into the next step of defining the research problem. Having a clearly defined research problem allows a researcher to deliberate on what is required to solve this problem. These possible solutions can only be considered a solution once they answer the question—does this solve the problem? While deliberating on possible solutions to the problem, researchers may become aware of more than one problem or a question that requires an answer before solving the bigger problem. This is often the case when using DSR to solve a problem.

The awareness of subsequent problems that require an answer appeared in this study. The initial problem of how to manage capability stability raised the questions:

- SRQ 1 – Sub-Research Question 1: What is capability stability?
- SRQ 2 – Sub-Research Question 2: What dimensions and factors are required to describe a business capability?
- SRQ 3 – Sub-Research Question 3: What governance mechanisms are required to support the management of business capability stability?

The following goals have been identified for this study:

- SRG 1 – Sub-Research Goal 1: Develop a definition for capability stability.
- SRG 2 – Sub-Research Goal 2: Define a capability stability ecosystem conceptual model.

The goals create a common vocabulary and a shared understanding of the underlying aspects of addressing the greater problem. Once this has been achieved, the main research question can be refined into a more focused, operational research question:

- RQ 1 – Research Question 1: What can be used to manage capability stability to maintain the value or purpose for which the capability was designed?

To answer this refined research question, the following goals were identified:

- RG 1 – Research Goal 1: Develop a mechanism to manage capability stability.

Sub-Research Goals 1 and 2 are retained as the conceptual foundation of the study; building on them, this goal is further broken down into the following sub-goals, which continue the sub-research-goal sequence and assist with achieving the main goal:

- SRG 3 – Sub-Research Goal 3: Decide on the best mechanism to manage capability stability; as discussed in Chapter 5.
- SRG 4 – Sub-Research Goal 4: Design the mechanism to be practically used to manage capability stability, as discussed in Chapter 6.
- SRG 5 – Sub-Research Goal 5: Identify the level of influence of all the factors in the capability ecosystem to ensure the management of change, limit bureaucracy, and maintain agility, minimising the amount of work to maintain the capability's stability. Chapter 4 introduces literature to inform the factors, and Chapters 5 and 6 expand on this literature.
- SRG 6 – Sub-Research Goal 6: Package the mechanism in a manner that is easy to use and consume, as discussed in Chapter 6.
- SRG 7 – Sub-Research Goal 7: Test the mechanism with other EAPs for input and validity. Chapter 7 explores the results.
- The study is further guided by research-strategy goals — the methodological and ethical goals (covering ethical clearance, documentation of the DSR process, and the thematic-analysis tooling) that ensure academic rigour. As these support the conduct of the study rather than answering the research question, they are presented with the methodology in Chapter 2.

To avoid ambiguity, the following distinctions apply throughout this study. The research goal is the overarching aim of the study — to develop a mechanism to manage business capability stability. The research objectives are the specific outcomes that must be achieved to meet this goal; in this study the objectives are expressed directly through the research goal and its sub-research goals, so that each goal statement also constitutes an objective. The sub-research goals are the actionable steps through which the research goal, and the supporting sub-research questions, are answered. The research-strategy goals are distinct from these: they are methodological and ethical goals that ensure the study is conducted with academic rigour, rather than goals that directly answer the research question. The table below consolidates these elements and shows how each relates to the research questions.

Element	**Label**	**Statement**	**Answers / serves**
Main research question	Main RQ	What EA-based framework can be designed to guide the management of business capability stability in enterprises?	The overarching question the study answers

Element	Label	Statement	Answers / serves
Sub-research question	SRQ 1	What is capability stability?	Clarifies the problem
Sub-research question	SRQ 2	What dimensions and factors are required to describe a business capability?	Clarifies the problem
Sub-research question	SRQ 3	What governance mechanisms are required to support the management of business capability stability?	Clarifies the problem
Refined research question	RQ 1	What can be used to manage capability stability to maintain the value or purpose for which the capability was designed?	Operational refinement of the main RQ
Research goal (objective)	RG 1	Develop a mechanism to manage capability stability.	Answers RQ 1; the study's principal objective
Sub-research goal (objective)	SRG 1	Develop a definition for capability stability.	Answers SRQ 1
Sub-research goal (objective)	SRG 2	Define a capability stability ecosystem conceptual model.	Answers SRQ 2
Sub-research goal (objective)	SRG 3	Decide on the best mechanism to manage capability stability.	Achieves RG 1
Sub-research goal (objective)	SRG 4	Design the mechanism to be practically used to manage capability stability.	Achieves RG 1
Sub-research goal (objective)	SRG 5	Identify the level of influence of the factors	Achieves RG 1

Element	Label	Statement	Answers / serves
		in the capability ecosystem.	
Sub-research goal (objective)	SRG 6	Package the mechanism so that it is easy to use and consume.	Achieves RG 1
Sub-research goal (objective)	SRG 7	Test the mechanism with other EA practitioners for input and validity.	Achieves RG 1

All the research-related activities are described in detail in Chapter 2.

The data sources used to achieve Sub-Research Goals 1 and 2 are based on literature that include conference papers, journals, and books. The research method for these goals is a literature review that uses thematic analysis, as described by Clarke and Braun (2013), using techniques such as template analysis and interpretive analysis.

To achieve Sub-Research Goals 3 to 7, this study used DSR based on the approach by Kuechler and Vaishnavi (2012).

1.6 RESEARCH DESIGN

This section presents an outline of the approach taken in the literature review, the thematic analysis and DSR, the philosophical paradigm underpinning the study, and the theoretical lens through which the different study phases were viewed as they were conducted.

1.6.1 LITERATURE REVIEW APPROACH

A literature review is an essential part of the research process (Saint-Louis et al. 2017; Simon et al. 2013). It helps in understanding existing information that addresses the research problem and the concepts used within the study. The literature review gathers information from many sources to provide the theoretical foundations and context of the research question (Schoonjans 2016; Tamm et al. 2011). Literature reviews provide an impartial, thorough overview, synthesis, and analytic assessment of previous research (Randolph 2019), and, as such, make a vital contribution to the rigour and relevance of the research (Vom Brocke et al. 2015; Vom Brocke, Schmid, Simons & Safrudin 2021).

This study derives rigour by effectively using existing theoretical foundations and research methodologies, while improving relevance by not re-investigating that which is already known (Oates, Griffiths & McLean 2022; Vom Brocke et al. 2021).

This study identified and established themes through the literature review, and analysed data from online journal publications using thematic analysis. This process can be seen as a secondary literature

review to determine the prevalence of the themes throughout a broader set of publications. This process is described in Chapter 2 (Section 2.4-2.6). The following section outlines the philosophical paradigms that underpin this thesis.

1.6.2 PHILOSOPHICAL PARADIGMS

A research paradigm is a belief system with assumptions about knowledge development (Korhonen & Poutanen 2013; Saunders & Lewis 2017; Simon et al. 2013). Philosophical paradigms influence research practice and inform the choice of research methods (Levy 2013). During every stage of the research process, all researchers make assumptions (Kotusev & Kurnia 2021; Pearlson, Saunders & Galletta 2019; Simon et al. 2013), typically involving the realities uncovered (ontology), assumptions about human knowledge (epistemology), and assumptions about the degree to which the researcher's values influence the research process (axiology). The researcher's assumptions and interpretation of the results influence how the research questions are understood, which data collection methods will be used, and how the problem is answered (Saunders & Lewis 2017). Simon et al. (2013) state that research in EA requires the researcher to locate their research in a particular paradigm. The interpretive and pragmatic paradigms framed this study's data collection and analysis and are described in more detail in Chapter 3.

1.6.3 DESIGN SCIENCE RESEARCH METHODOLOGY

The research design aligns with this study's interpretivist and pragmatist approach. Design, in an organisational context, is an open-ended process (Korhonen et al. 2016). Any design should focus on analysing the needs and designing specific functionalities to meet those needs (Gregor & Hevner 2013; Peffers et al. 2007). The main form of theory in EA research should be the theory of design and action, with DSR as one way of responding to the calls for academics to engage in work that has a greater impact on the practitioners in the field of EA (Meyer 2015; Strohmann, Siemon, Elshan & Wittholz 2024).

Hevner and Chatterjee (2010) state that DSR addresses the relevance gap in academia. De Sordi (2021) and Herselman and Botha (2015) agree that if the research is done with the intent inherent in DSR while adhering to the highest standards of rigour and a high level of relevance, the produced artefact will foster a stronger relationship between practitioners and academia. The use of DSR in developing a framework to manage capability stability combines theory and practice, thus ensuring a high level of rigour in developing the artefacts to assist EAPs in their day-to-day operations (Hevner & Chatterjee 2010).

The evaluation of an artefact motivated the use of DSR in this study. The outcome of DSR is an artefact, and thus, the focus is on delivering the artefact, while there is little to no focus on practitioners' input in the evaluation of the artefact (Doyle, Luczak-Roesch & Mittal 2019; Sonnenberg & Vom Brocke 2012). EAPs' evaluation of the artefact is critical to ensuring its applicability and obtaining input in developing a framework.

Vaishnavi and Kuechler (2004) introduced a five-step process for DSR that explains the logical progression through which knowledge is generated, refined, and embedded into an artefact, as depicted in Figure 2 below. The title, *"Reasoning in the Design Science Research Cycle"*, highlights that the DSR process is not merely procedural but is driven by distinct modes of reasoning that support the development and validation of design knowledge:

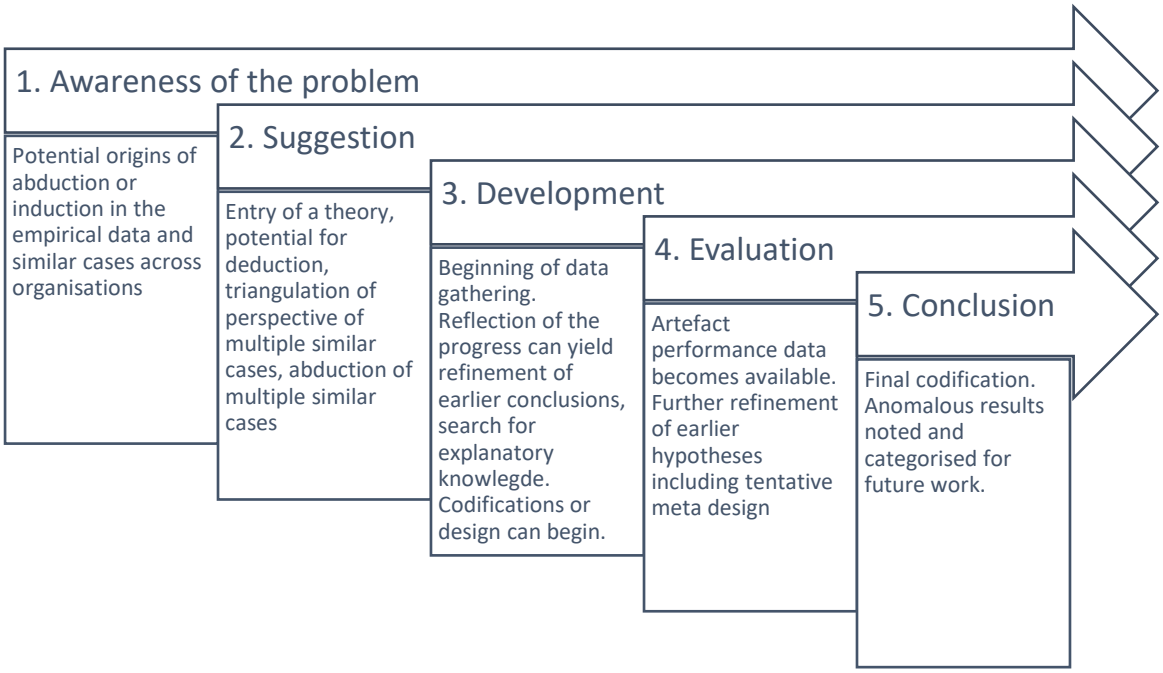


FIGURE 2 REASONING IN THE DESIGN SCIENCE RESEARCH CYCLE (VAISHNAVI & KUECHLER 2004)

Steps 1 and 2 fall within the mode of reasoning by analogy, in which existing theoretical constructs are transferred into the design domain to guide the initial formulation of the artefact (Kuechler & Vaishnavi, 2012). Steps 3 to 5 introduce a reflective mode of reasoning, allowing the researcher to evaluate, question, and iteratively refine the artefact. This reflective stage also enables inductive reasoning, where insights emerging across multiple design trials can inform broader conclusions (Kuechler & Vaishnavi, 2012). As data accumulates, it may prompt a return to earlier stages in the cycle to revise assumptions or generate new knowledge, reinforcing the iterative and knowledge-building nature of DSR (Kuechler & Vaishnavi, 2012). The DSR process followed in this study is described in detail in Chapter 2. The following section outlines the qualitative and quantitative methods used for data collection and analysis.

1.6.4 DATA COLLECTION AND DATA ANALYSIS METHODS

This study's primary data sources comprise the work of authors published by well-known and regarded publishers in IS and EA research. The main criteria for selecting the publications are their relevance and contribution to the body of knowledge, which is derived from the number of citations of their work. Another key factor is the accessibility of their research in the academic community. The

secondary data source for the study is also published work, but thematic analysis is used to quantify the number of instances in which a theme appears. The same criteria are used to select the primary and secondary data sources. The study's third data source is the interviews conducted during the evaluation phase of the DSR process (Chapter 2), which is described and analysed fully in Chapter 7.

1.7 CONTRIBUTIONS

The findings of this study contribute to both EA and IS research in a theoretical and practical manner.

1.7.1 THEORETICAL CONTRIBUTIONS

This study adds to the field of EA and IS success by first creating a conceptual model of a capability ecosystem that defines the dimensions and factors included in the ecosystem and their relationship to one another. This study also defines the concept of capability stability derived from the research that supported the development of the conceptual model. This study also started the development of a framework to manage capability stability, which academia can use as a reference point for ontologies to manage capabilities more effectively.

1.7.2 PRACTICAL CONTRIBUTIONS

As described in Section 1.6.3, this study also aims to contribute to EA practitioners' efforts to assist in pragmatically resolving real-world problems. The framework can be used practically in any organisation with EAPs to ensure an effective management of capability stability.

The research contributions are detailed in Chapter 8.

1.8 OUTLINE OF CHAPTERS

The structure of the study is described below and summarised in Figure 3:

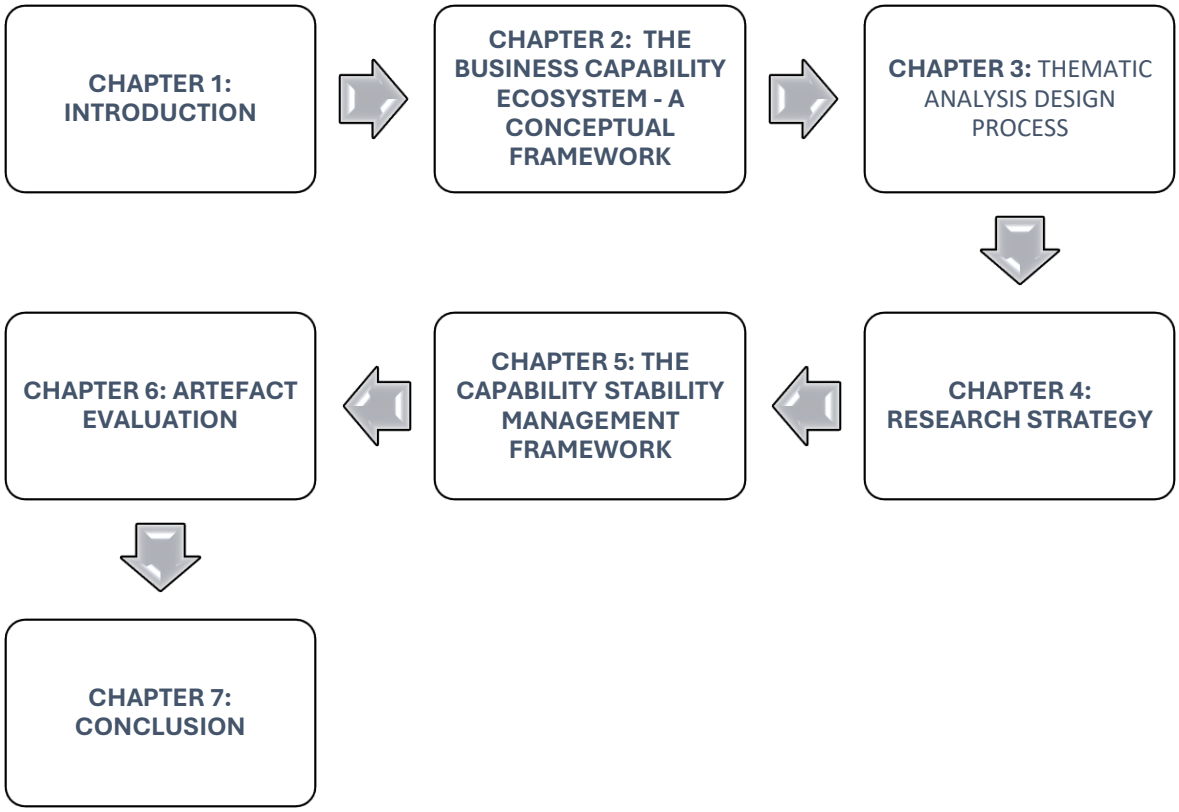


FIGURE 3 OUTLINE OF CHAPTERS

Chapter 1 introduces the study, presenting the background, rationale, research problem, research questions and goals, research design, and contributions. Chapter 2 sets out the research strategy — the research methodology, research design, the design science research approach, systems thinking, the research plan, goals, data sources, and ethical clearance. Chapter 3 documents the thematic analysis of the literature, through which the factors that shape capability stability are surfaced. Chapter 4 develops the theoretical context, defining enterprise architecture and business capabilities and organising these factors into the dimensions of the business capability ecosystem. Chapter 5 defines capability stability, constructs the capability stability ecosystem model, and positions the proposed solution using design science research and systems thinking. Chapter 6 presents the CSMF, including its design criteria, building blocks, and use. Chapter 7 evaluates the CSMF using a structured four-stage evaluation lens and practitioner interviews across successive design science research cycles. Chapter 8 concludes the study, summarising the research, its contributions and key findings, and setting out the limitations and directions for future work. Figure 3 outlines the structure of the study:

1.9 SUMMARY AND DISCUSSION

This chapter introduced the background and rationale for the study, considering how the Fourth Industrial Revolution and a rapidly changing technology landscape affect the ability of business capabilities to continue operating as originally designed while remaining stable in the delivery of their services. It set out the research problem and questions; the research design, including the philosophical paradigms, theoretical framing, and data-collection methods, together with the study's delimitations, constraints, and assumptions; and the study's significance and contributions. The central argument established here is that capability stability is a distinct and under-addressed concern for enterprise architecture: the discipline is well developed in designing and governing capabilities, yet offers little for keeping them stable once operational. This gap motivates the conceptual and methodological work that follows. Chapter 2 develops the theoretical context, positions the study within the enterprise-architecture literature, and begins to construct the capability stability ecosystem conceptual model.

2 CHAPTER 2: RESEARCH STRATEGY

2.1 INTRODUCTION

Chapter 1 introduced the research problem, the research questions, and the objectives of the study, and situated the work within enterprise architecture and the management of business capability stability. This chapter builds on that foundation by setting out the research strategy through which the research questions are answered.

This chapter is positioned within the relevance cycle of the design science research (DSR) process, whose reasoning cycle and relevance, design, and rigour components are set out later in this chapter. It explains how the research interacts with the practical problem environment and how practitioner insights inform the design and evaluation of the artefact.

The objective of this chapter is to present a detailed description of the research process. It outlines the research methodology and the justification for the chosen methodological approach, describes the data sources and data collection methods, and concludes with a discussion of the ethical clearance obtained for this study.

2.1.1 RESEARCH METHODOLOGY

A research methodology must be built upon a well-defined framework that delineates the construction, understanding, and validation of knowledge. The research process requires several layers of inquiry, beginning with epistemological grounding and extending through the theoretical perspective, methodological choices, and the specific techniques used for data collection and analysis. This multilayered progression aligns with established guidance in information systems research, where methodological coherence depends on linking philosophical positioning with methodological execution (Oates et al. 2022; Myers & Venable 2014; Peffers et al. 2007). All components of the research process work together to maintain consistency across the research question, data collection methods, and analytical procedures.

The theory of knowledge that research relies on is known as epistemology which examines the methods through which we acquire knowledge. It establishes how the researcher connects with the subject matter under investigation. Within positivist epistemology, researchers operate on the assumption that an objective reality exists which they can measure and understand without their own influence affecting it. Interpretivist epistemology assumes that knowledge is socially constructed and that reality is understood through the subjective meanings individuals assign to their experiences. This perspective emphasises the importance of capturing personal viewpoints and context-dependent interpretations when investigating organisational or IS phenomena, a position reflected in qualitative IS scholarship that foregrounds meaning-making and participant perspectives (Kaplan & Duchon 1988; Bryant 2012; De Villiers 2005; Brooks et al. 2015).

The philosophical stance called the theoretical perspective determines which methodology researchers select. The theoretical perspective establishes the worldview assumptions that shape how

the researcher interprets the problem and selects approaches for addressing it. In applied research domains such as DSR, this perspective commonly aligns with pragmatic thought, which emphasises the practical usefulness of knowledge and the pursuit of solutions that demonstrate real-world value. This orientation is reflected in DSR's focus on creating artefacts that are both functional and contextually relevant, aligning inquiry with problem-solving and utility-driven outcomes (Hevner et al. 2004; Vaishnavi & Kuechler 2004; Hevner & Chatterjee 2010; Myers & Venable 2014). Pragmatism considers knowledge to be validated through practical applications, which makes it appropriate as a theoretical framework for developing and assessing research models and artefacts.

The methodology serves as a framework for investigating the research problem by establishing a structured plan for research execution. DSR methodology requires repetitive design and evaluation stages to produce artefacts that effectively tackle particular real-world problems. EAPs benefit from constant testing and refinement of frameworks to maintain practical applicability, according to Hevner et al. (2004).

Methods refer to the distinct techniques and procedures researchers use to collect and examine data. Within DSR, methods such as prototyping, interviews, and case studies are employed to assess how developed artefacts perform in real-world settings. The selected methods for data collection and analysis align with the study's epistemological and theoretical orientation, ensuring methodological coherence and enabling the study to address its research questions appropriately (Peffers et al. 2007; Oates et al. 2022; Saunders & Lewis 2017).

Every research method operates on basic philosophical beliefs that define valid knowledge and proper development procedures. Within DSR, these philosophical foundations play a critical role because they influence the design and evaluation process while determining the application of artefacts like frameworks and models in practical settings. In DSR, two philosophical frameworks stand out as particularly relevant, namely pragmatism and interpretivism because they provide different approaches to generating knowledge and its application.

Within DSR, pragmatism highlights the importance of practical problem-solving skills and creating functional artefacts to meet real-world requirements. Pragmatists hold the view that knowledge should be judged by how well it works in practice rather than its theoretical correctness (Goldkuhl 2012; Hevner et al. 2004). The emphasis here matches DSR's purpose because it aims to create artefacts that maintain theoretical validity while demonstrating practical effectiveness. Researchers who develop EA frameworks through pragmatism prioritise utility which ensures their artefacts meet real organisational requirements and maintain adaptability to changing business circumstances (Gregor & Hevner 2013; Peffers et al. 2007). The iterative processes of design and evaluation require a pragmatic approach because the utility of the framework depends on its capability to address real-world problems while delivering practical solutions.

Interpretivism seeks to understand how artefacts gain meaning within social contexts as well as the experiences of their developers and users. DSR employs interpretivism in its evaluation phase where researchers use interviews and case studies to study EAPs' perceptions and interactions with the new artefact (Klein & Myers 1999; Walsham 1995). Through interpretivist research in DSR, researchers can identify the personal experiences and contextual elements that affect organisational acceptance and implementation of a framework. This perspective remains crucial during EA framework development because it reveals stakeholder interpretations of the framework and how it fits into or affects their existing practices and beliefs (Klein & Myers 1999).

An effective research approach for developing an EA framework from a conceptual model and evaluating it through practitioner interviews combines elements of both pragmatism and interpretivism. The application of pragmatism in the design and development stages allows the framework to achieve practical utility and real-world applicability within organisational settings (Peffers et al. 2007). Interpretivism strengthens the evaluation phase by giving detailed understanding of practitioner perceptions of the framework together with the cultural and social contexts that determine its successful implementation (Klein & Myers 1999; Walsham 2006).

Research that combines pragmatism and interpretivism results in an EA framework that remains functionally strong while also being context-sensitive to organisational requirements and incorporating human and social elements which affect its use.

Kivunja and Kuyini (2017) describe multiple research characteristics within the pragmatic paradigm that align with the objectives of this thesis. Researchers in pragmatism select research relationships according to their suitability for solving specific problems and focus on tangible results rather than abstract theory. The ontological belief within pragmatism states that individuals perceive reality through different lenses, which enables multiple realities to exist together. The study benefits from this approach when it needs to comprehend subjective experiences that occur within different contexts. Pragmatism uses mixed methods methodologically by combining qualitative and quantitative research techniques to collect a wide range of detailed information. The axiological foundation of pragmatic research operates with value-based principles that acknowledge research aims to deliver direct advantages to people and the broader community.

The interpretivism framework described by Alharahsheh and Pius (2020) directly supports the goals of this study. The research problem in interpretivism develops through the researcher’s personal interests which enable the inquiry to focus deeply on context-specific details. This approach requires researchers to focus on analysing participants' personal experiences within their specific contexts by extensively applying qualitative research methods. Interpretivist research outcomes rely heavily on participant input and meaning which show the interpretive nature of reality through the eyes of those participating in the study.

Pragmatism and interpretivism originate from shared foundational philosophical principles. Both research paradigms use an axiological standpoint because the researcher's perspective and interpretation play a fundamental role in the investigation process. Researchers need to practice strong reflexivity, which means they must examine their assumptions and understand how these assumptions could affect the study results. Saunders and Lewis (2017) explain that the research question functions as the central driver of methodological choice, shaping the epistemological, ontological, and axiological positions adopted within a study. Researchers can adjust their methodological and theoretical approaches to match research needs instead of being confined to a single paradigm, according to Saunders and Lewis (2017).

2.1.2 RESEARCH DESIGN

The research literature recognises design-oriented inquiry as a broad field encompassing multiple design-focused disciplines. Within this landscape, design science research is positioned as a specialised IS research approach distinguished by its structured investigative methodology and its emphasis on creating and evaluating artefacts (Hevner et al. 2004; Vaishnavi & Kuechler 2004; Baskerville et al. 2011; Prat et al. 2015). Design research concentrates on studying design itself through theoretical exploration and analysis of the design process. DSR functions through integrating design activities directly into its research methodology. Design functions as the main research method in DSR which allows researchers to develop and evaluate artefacts that provide solutions to particular real-world challenges. DSR defines its research process with design integration, which makes it a unique method for generating and analysing innovative solutions (Goldkuhl 2012).

2.1.3 DESIGN SCIENCE RESEARCH

DSR projects are typically driven by the conditions within the external environment where the resulting artefacts are intended to be applied. The purpose of DSR extends beyond the mere creation and evaluation of artefacts; it aims to produce artefacts that can deliver substantial benefits to stakeholders, thereby addressing broader impacts (Drechsler & Weißschädel 2018; Hevner & Gregor 2022; Myers & Venable 2014). By iteratively crafting new solutions tailored to specific contexts, DSR projects engage with complex, real-world challenges. Enhancing the effectiveness of practical solutions to these challenges is a central goal of DSR (Drechsler & Weißschädel 2018; Hevner & Gregor 2022)

In the field of IS, DSR involves creating a wide range of artefacts, including decision support systems, constructs, models, frameworks, and methods for IS evaluation. It also encompasses the development of design principles, methods, and theories (Gregor & Hevner 2013; Kuechler & Vaishnavi 2012). DSR emphasises the artefact itself and its applicability and impact within its intended domain (Hevner & Chatterjee 2010).

Despite the many articles highlighting the advantages of DSR, several critiques have raised important concerns. Hevner et al. (2004) and Gregor and Hevner (2013) state that DSR often addresses problems so specific to a given domain that the resulting solutions lack generalisability. De Villiers (2005) echoes

this critique, arguing that claims in DSR tend to be heavily influenced by the researcher's interaction with the context. This influence limits the applicability of findings to other contexts where the researcher's role is less direct. Therefore, while DSR aims to solve practical problems, focusing on context-specific solutions often diminishes the generalisability of both the results and the insights gained.

Gregor and Hevner (2013) further argue that this issue stems partly from a predominant emphasis within DSR on artefact creation, with relatively little attention to contributing to broader, generalised knowledge. To address the challenge of generalisability in this study, participants were engaged at every stage of the research process to reduce the impact of researcher bias on the findings and enhance their relevance across different contexts.

Identifying and understanding a problem as a basis for taking action is a central tenet in DSR (Gregor & Hevner 2023). DSR research activities encompass two primary processes focused on performance enhancement: build and evaluate. "Build" refers to the creation or construction of an artefact, while "evaluate" involves developing and applying criteria to assess the artefact's effectiveness and impact (Baskerville et al. 2018; Vom Brocke, Winter, Hevner & Maedche 2020). This dual process is critical for iterative refinement, as the artefact's utility and relevance are systematically tested against real-world criteria and performance benchmarks.

Relevance and innovation remain critical attributes of DSR artefacts (Gregor & Hevner, 2023). Consequently, an artefact must first offer solutions to significant and impactful problems. DSR should then either approach an unresolved issue with a unique and original perspective or improve upon an existing solution more effectively, distinguishing DSR from routine design work (Prat, Comyn-Wattiau & Akoka 2015; Baskerville, Pries-Heje & Venable 2011). Across DSR studies, common elements include the necessity of clearly defining the problem before artefact development (De Sordi 2021; Vom Brocke et al. 2020), identifying specific artefact features and requirements before the design and development phases (Gregor & Hevner 2023; Venable et al. 2016), and implementing an evaluation process to ensure rigour and to validate the artefact's relevance and effectiveness in addressing the identified problem (De Sordi 2021; Lowry, Petter & Leimeister 2020).

2.2 BRIDGING THE GAP BETWEEN THEORY AND PRACTICE USING DSR

Developing the framework through DSR links theoretical knowledge with practical requirements: the artefact combines rigorous academic standards with alignment to the realities faced by EAPs, serving as a practical tool for daily operations while preserving academic rigour (Hevner & Chatterjee 2010). This two-way orientation benefits both communities — practitioners gain a usable tool, and the academic field gains insight from practice — provided findings are framed and presented consistently across contexts.

The proposed methodology fulfils the objectives of Sub-Research Goal 3 (SRG 3) which seeks to identify the optimal mechanism for capability stability management. The examination of this goal is

comprehensively discussed in Chapter 2. The research uses DSR as its methodological base to create a framework that satisfies academic requirements while delivering practical approaches for maintaining capability stability in real-world applications.

The following section describes how this study progressed from recognising the problem outlined in section 2.1 to developing potential solutions.

2.2.1 APPLICABILITY OF DSR TO EA FRAMEWORK DEVELOPMENT

DSR is particularly relevant to developing EA frameworks because its structured focus on problem-solving and artefact creation aligns with EA's dual aim of structuring complex systems and solving practical organisational challenges. Its iterative balance of relevance and rigour, and its cyclical process of creation and evaluation, allow an artefact to be refined through stakeholder feedback and empirical assessment, strengthening both practical utility and theoretical contribution (Gregor & Hevner 2013; Peffers et al. 2007; Hevner et al. 2004; Lowry et al. 2020).

This matters for EA, where frameworks must serve long-term strategic alignment and short-term operational flexibility at once while evolving with shifting business environments and emerging technologies. DSR's structured evaluation identifies and mitigates weaknesses before deployment, producing frameworks that are theoretically grounded yet accessible to practitioners and responsive to specific organisational needs (Prat et al. 2015; Gregor & Hevner 2023; Vom Brocke et al. 2020; Baskerville et al. 2011; Hevner & Gregor 2022).

In this study, the literature study did not indicate an existing framework to manage capability stability. This finding points to a gap regarding a framework that can manage a capability's stability from an EA perspective. Using current information, this study attempted to solve the problem innovatively by developing a metamodel to contextualise the conversation around capability stability.

2.3 SYSTEMS THINKING AS A FOUNDATIONAL APPROACH TO MANAGING COMPLEX ENTERPRISE ARCHITECTURES

Systems thinking is introduced here, as part of the research strategy, because it is the foundational lens that shapes how the framework is designed and how the effects of change are reasoned about throughout the study, rather than a discrete data-collection or analysis method. Managing EA requires systems thinking as an essential practice particularly within complex IS environments (Beese et al. 2023; Korhonen & Halén 2017). While traditional linear thinking focuses on examining individual components separately, systems thinking investigates how various elements within a system connect and depend on each other (Korhonen & Halén 2017; Op't Land et al. 2008;). Through this approach, EAPs achieve a holistic view of the architecture which shows how various components affect and

interact with each other. Through this approach, the system's functionality alongside its performance and adaptability becomes clearer which proves essential given the rapid evolution of EA, according to Lankhorst (2009) and Tamm et al. (2011).

Systems thinking stands out because it reveals how changes in one system area produce effects throughout other system components. The ability to recognise and manage ripple effects in EAM becomes essential since changes in technology, processes, or personnel can create extensive impacts across various business domains (Foorthuis et al. 2016; Ross et al. 2006). EAPs who integrate interdependency considerations into their design process, develop systems that remain flexible and robust enough to manage modern business complexities and uncertainties (Korhonen & Halén 2017). A systems thinking methodology enables organisations to anticipate future obstacles while creating architectural designs that maintain their integrity through change and support sustainable development.

Systems thinking aids in maintaining alignment between EA and organisational goals and strategies (Gregor & Hevner 2013; Hoogervorst 2004). The approach urges EAPs to expand their perspective beyond technical architecture elements to understand how architecture integrates with organisational ecosystems through business processes and stakeholder requirements and external environmental factors. A holistic view enables EA initiatives to fulfil technical requirements while advancing the organisation’s strategic goals and long-term vision (Gregor & Hevner 2013; Morganwalp & Sage 2004). Systems thinking merges business and technical viewpoints which creates a unified and intentional EA approach so that the architecture development stays aligned with organisational objectives.

Systems thinking creates improved communication channels and cooperative dynamics among all EA process stakeholders (Bente et al. 2012; Korhonen & Halén 2017). A shared framework that allows everyone to understand the entire system helps to connect technical experts with non-technical stakeholders. With shared knowledge, stakeholders can make better decisions while decreasing the possibility of EA misalignment with business requirements. The success of EA projects depends on establishing a shared language which allows collaboration among diverse stakeholders who must address modern enterprise system complexities.

Systems thinking brings numerous advantages but also faces valid criticisms and limitations. Its abstract, holistic nature can be difficult for stakeholders to grasp and can invite analysis paralysis, as too much time is spent examining inter-component relationships rather than executing practical resolutions (Hoogervorst 2004; Op’t Land et al. 2008). In highly complex environments the interconnections may be too numerous to map accurately, risking oversimplification and incomplete or inaccurate evaluations of system dynamics (Foorthuis et al. 2016). It can also be difficult to embed in organisations that favour linear, reductionist decision-making, requiring a cultural transformation and substantial training before it takes hold (Bente et al. 2012). Systems thinking brings numerous advantages but also faces valid criticisms and limitations. The complexity and abstract nature of

systems thinking presents a significant challenge because stakeholders who do not understand its foundational principles often perceive it as too intricate. The requirement to understand system-wide interdependencies and broader contexts appears too complex to apply effectively within business settings that demand rapid decision-making. Systems thinking's holistic method may become a hindrance since it can cause analysis paralysis as too much time is dedicated to examining inter-component relationships rather than executing practical resolutions (Hoogervorst 2004; Op't Land et al. 2008).

The application of systems thinking to complex environments may result in oversimplification. Systems thinking promotes a broad perspective but enterprises find it challenging to capture the detailed aspects of extensive systems because they involve numerous stakeholders with diverse goals. The complexity of component interconnections in certain cases reaches a level where accurate mapping becomes almost impossible, which results in incomplete or inaccurate evaluations of system dynamics (Foorthuis et al. 2016).

A major concern is the difficulty of bringing systems thinking principles into conventional management structures. Numerous organisations prefer linear reductionist decision-making methods that target single components instead of understanding the entire system. The effectiveness of systems thinking relies on organisations undergoing a cultural transformation in which leaders and teams embrace a comprehensive interconnected approach (Bente et al. 2012). The transition presents challenges because it demands substantial alterations to organisational mindsets and processes together with extensive training.

The advantages of systems thinking surpass its challenges when proper application is ensured. Mitigating potential downsides requires maintaining an equilibrium between systems thinking approaches and their practical implementation. As they examine system interdependencies, EAPs must also concentrate on producing actionable insights which lead to real-world results. The combination of consistent iterative processes with stakeholder engagement and alignment of systems thinking principles to business needs helps avoid analysis paralysis while supporting practical application, according to Korhonen and Halén (2017).

The choice of systems thinking as the foundational approach for EA in this situation derives from its effectiveness in handling modern enterprises' complex and interconnected nature. Organisations must adopt a method to manage the complex relationships between their technology, processes and people, which require understanding their interdependencies. The framework provided by systems thinking enables organisations to anticipate shifts and plan accordingly while sustaining alignment with their established objectives. The approach maintains stakeholder engagement and alignment throughout the EA process through its focus on collaboration and communication (Korhonen & Halén 2017).

2.4 THE RESEARCH PLAN

The research process follows the DSR framework developed by Vaishnavi and Kuechler (2004), which provides a structured, iterative approach for creating and evaluating artefacts within IS research. Through the DSR model, "knowing by making" becomes a central principle while methods maintain logical coherence that reinforces the research's theoretical and epistemological structure. The alignment provides a systematic approach to developing EA artefacts which is rooted in philosophical foundations.

Figure 18 provides the description of the DSR steps. Five primary steps make up the DSR model and guide the design cycle's execution by proceeding through each step sequentially. As the design develops through each step, the research process produces outputs while using resources. During the essential development and evaluation phases, the research process generates knowledge through a method called circumscription. The formal logical system of circumscription recognises knowledge fragments as valid only in particular contexts and generates insights through observed outcomes that differ from theoretical expectations. The methodology promotes iterative learning within DSR because the research process expands understanding by revealing discrepancies through identifying theoretical limitations. Whereas these five steps structure a single pass of the design cycle, the study as a whole was executed over five successive cycles — each a complete build-and-evaluate pass, with the term iteration reserved for refinement within a cycle. These five cycles are reported in full in Chapter 7.

FIGURE 4 DSR METHODOLOGY

DSR researchers find circumscription especially beneficial because it highlights how practical challenges during artefact construction drive learning experiences. The mismatch between artefact performance and theoretical expectations prompts researchers to update their understanding and modify design approaches. The iterative knowledge development method known as "learning by making" helps DSR achieve its goal of knowledge generation through artefact production while staying

true to design science principles and advancing theoretical understanding alongside practical application. Figure 18 shows the modified DSR steps below.

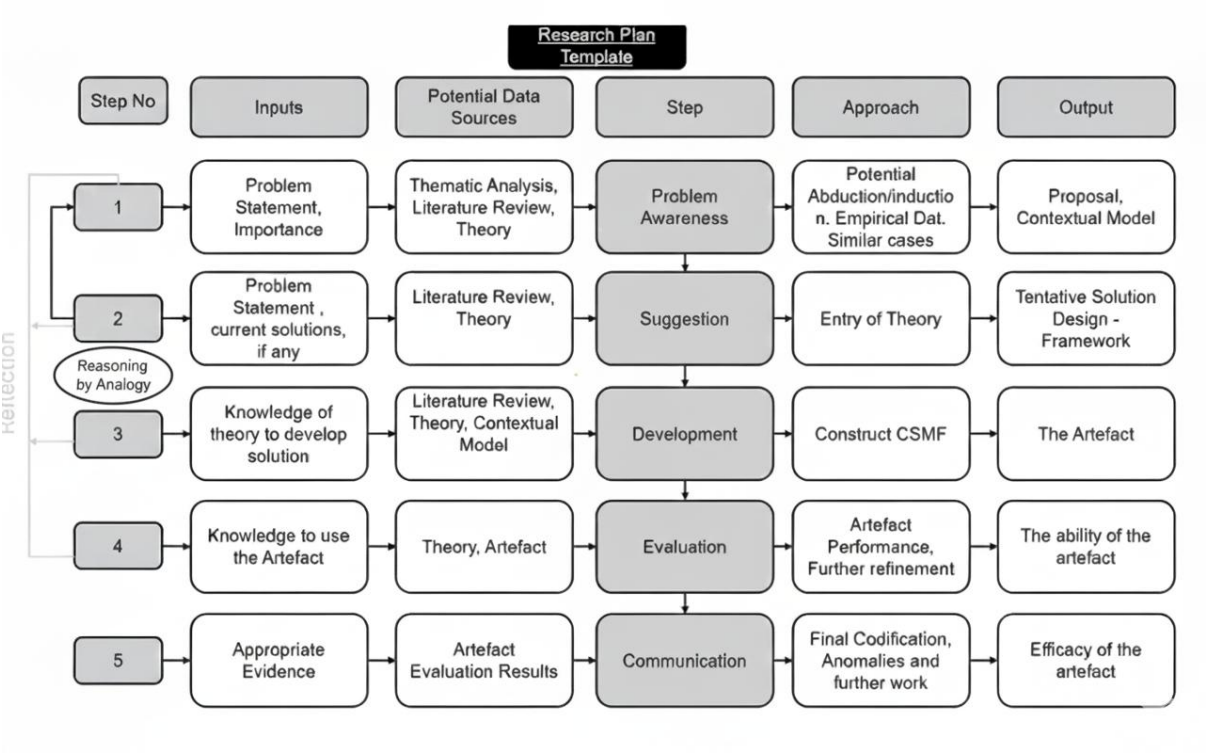


FIGURE 5 DSR ALIGNED TO THE STUDY

Figure 18 shows a structured research plan template for the DSR process, organised into five sequential steps: Problem Awareness, Suggestion, Development, Evaluation, and Communication. Every step requires specific inputs and potential data sources along with theory construction methods to produce defined outputs. The initial step, Problem Awareness, uses a problem statement to highlight its significance while drawing data from literature reviews and theoretical understandings and previous artefact assessments to create a proposal. The Suggestion stage improves problem analysis by reviewing existing solutions and referencing theories and analogous situations to generate a preliminary solution framework. The Development phase uses existing theoretical knowledge to build the artefact while ongoing reflection and codification processes steer its formation. During the Evaluation stage, experts figure out artefact performance through theoretical and practical analyses that could result in additional improvements. During the Communication stage, the research findings along with codified evidence and identified anomalies are presented to establish the artefact's effectiveness. The research process incorporates reflective loops at every stage to enable continuous feedback and iterative enhancements while remaining adaptable and based on empirical and theoretical foundations.

Although Figure 18 depicts the five DSR steps in sequence for clarity, the process was applied iteratively rather than as a single linear pass. Consistent with the design-science cycle of Vaishnavi and Kuechler (2004), each development–evaluation loop generated circumscription knowledge — anomalies and

lessons that fed back into renewed problem awareness and suggestion, refining the artefact before the next iteration. In this study, these iterations were enacted as the five evaluation cycles reported in Chapter 7 (Section 7.8): the earlier cycles refined the framework's factors, dimensions, and layering in response to expert feedback, while the later cycles confirmed its completeness and applicability. Each cycle therefore repeated the build-and-evaluate sequence shown in Figure 18, so that the final artefact reflects the cumulative outcome of successive iterations rather than a single design pass.

The five iterations executed in this study are summarised below and illustrated in full in Figure 21 (Section 7.8).

TABLE 2 FIVE ITERATIONS IN THIS STUDY

Iteration	DSR focus	Outcome
Cycle 1	Problem awareness	Identified the gap — little structured research addresses capability stability — and established the need for a conceptual framework.
Cycle 2	Suggestion and development	Built the preliminary layered "ecosystem" model from the literature and thematic analysis (people, process, technology, cost, governance); flagged the need for testing and refinement.
Cycle 3	Feasibility exploration	Tested the model's conceptual plausibility against a targeted body of literature and EA practice; confirmed its viability and motivated a systematic thematic analysis.
Cycle 4	Validation through thematic analysis	Applied the coded template to an expanded set of articles and used co-occurrence scores to confirm the nine key factors and their relationships.
Cycle 5	Evaluation	Completed the CSMF (relationship matrix and evaluation criteria) and evaluated it through expert interviews, affirming its clarity, completeness, and practical utility.

2.5 RESEARCH GOALS AND OBJECTIVES

The research question, sub-research questions, and research-question goals are presented in full in Chapter 1 and are not repeated here. This section sets out the research-strategy goals that ensure the study's academic rigour, together with the data sources and methods used to achieve the research goals.

In addition to the research question, objectives, and the goals required to answer the research question fully, additional goals must be added to ensure academic rigour. These goals relate to the understanding of developing an academic contribution based on sound research practices and ethics. These goals include:

- RSG 1- Research Strategy Goal 1: Obtain the necessary certifications for ethical clearance.
- RSG 2- Research Strategy Goal 2: Obtain ethical clearance for the study.
- RSG 3 - Research Strategy Goal 3: Understand and document the DSR process for this study.
- RSG 4- Research Strategy Goal 4: Understand Atlas.ti and the use of Thematic Analysis

The data sources used to achieve Sub-Research Goals 1 and 2 will be literature-based, including conference papers, journals, and books. The research method for these goals will be a literature review using Thematic Analysis, as described by (Clarke & Braun 2013a) using techniques such as template analysis and interpretive analysis.

To achieve Sub-Research Goals 3 to 7, a DSR based on (Kuechler & Vaishnavi 2012) approach is used.

2.6 EXECUTION OF THIS RESEARCH PLAN

The research problem constitutes the research context for designing the conceptual model and the CSMF. The CSMF artefact addresses the main research question of what can be used to manage capability stability. The conceptual model is used to answer Sub-Research Question 2 – What dimensions and factors are required to describe a business capability? The conceptual model results are thus a prerequisite for the CSMF's design and implementation. The execution of the research plan is an application of a DSR model, as shown in Figure 19 below.

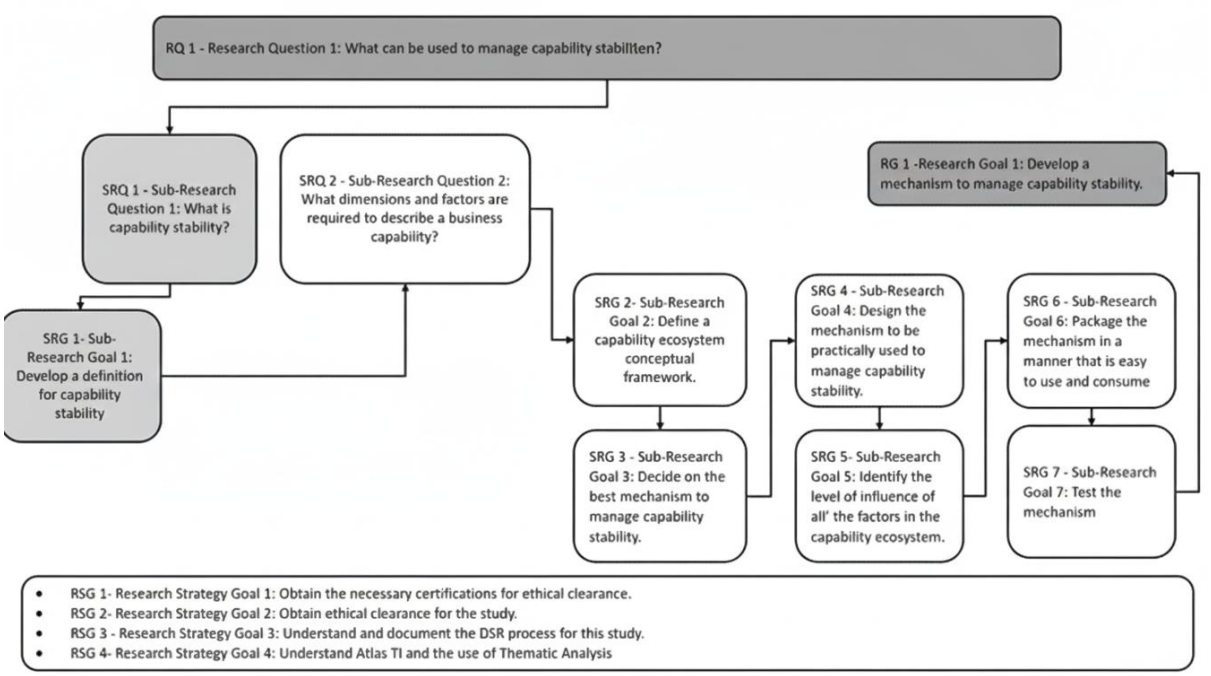


FIGURE 6 EXECUTION OF THE RESEARCH PLAN

Figure 19 presents a structured research framework to address the central research question: Which methods and tools can ensure capability stability to preserve the capability's intended value and purpose? The primary research objective involves creating a mechanism to manage capability stability while relying on multiple supporting sub-research questions and goals. The foundational element of the framework is Sub-Research Question 1 (SRQ 1) which asks "What is capability stability?" Sub-Research Goal 1 (SRG 1) focuses on developing a precise definition of the concept. The research then addresses Sub-Research Question 2 (SRQ 2) by examining "Which dimensions and factors are necessary to describe a business capability?" The insights gained through Sub-Research Question 2 (SRQ 2) establish the basis for Sub-Research Goal 2 (SRG 2) which aims to create a capability stability ecosystem conceptual model. Sub-Research Goal 3 (SRG 3) focuses on determining an ideal method to handle capability stability before leading to Sub-Research Goal 4 (SRG 4) which involves developing this method for real-world implementation. Sub-Research Goal 5 (SRG 5) evaluates the performance of this mechanism by exploring how different factors affect the capability ecosystem. Researchers package the mechanism for user application during Sub-Research Goal 6 (SRG 6) and perform its evaluation in Sub-Research Goal 7 (SRG 7). The framework receives support through research strategy objectives which require obtaining necessary certifications and ethical clearance while using DSR and thematic analysis methodologies that uphold the study's validity and rigour.

2.7 DATA SOURCES AND COLLECTION

To achieve rigour and relevance in IS research, this study adopts a structured data collection approach based on DSR principles. The research project starts with a thorough literature review to build foundational knowledge of the domain and identify essential theoretical constructs. The literature review findings enable thematic analysis to create critical themes and patterns that support the study's

goals. Theoretical contextualisation situates research themes within a suitable conceptual framework which provides a structured perspective to interpret the findings. The study uses semi-structured interviews with EAPs who bring practical expertise to verify and enhance the study results by examining their applicability and completeness. The multi-method strategy guarantees that data collection supports DSR's iterative and artefact-focused principles while maintaining academic excellence and practical applicability.

Researchers commonly employ semi-structured interviews as a qualitative data collection technique during exploratory and iterative investigations like DSR. The research method combines structured components with open-ended questioning to preserve consistency across respondents while still allowing the researcher to explore new or unanticipated themes as they emerge. This balanced approach supports both comparability and depth in the data collection process, aligning with qualitative research guidance that emphasises flexibility, responsiveness, and iterative engagement with participants (Clarke & Braun 2013; Brooks et al. 2015). A predetermined interview guide with open-ended questions ensures that all key topics are consistently addressed across participants, while still allowing individuals to elaborate on their experiences in their own terms. This approach aligns with established qualitative research practices, which emphasise structured guidance combined with flexibility to facilitate deeper insight and richer data generation (Clarke & Braun 2013; Brooks et al. 2015). This approach excels in extracting information from EAPs because it gives researchers the ability to dig deeper for understanding, remove uncertainties, and modify questions in line with the participant's specific expertise.

To achieve successful outcomes, researchers need to execute semi-structured interviews with meticulous planning and execution. The development of a structured interview guide requires researchers to ground their questions in established theoretical perspectives and in the insights generated through the literature review and thematic analysis. Qualitative research guidance emphasises that interview structures should be informed by prior conceptual work while remaining flexible enough to capture nuanced participant perspectives (Clarke & Braun 2013; Brooks et al. 2015). Before the main interviews, the interview guide was pilot tested to improve question clarity and resolve sequencing issues, and the questions were refined accordingly. Researchers conducting qualitative interviews should apply active listening and probing techniques to elicit rich, detailed responses. Guidance on qualitative interviewing emphasises the importance of responsive interaction, where researchers encourage elaboration and clarification to ensure that participants' perspectives are fully articulated (Clarke & Braun 2013; Brooks et al. 2015). Researchers conducting interviews must uphold a neutral and unbiased position to avoid influencing participant responses, while still creating an environment where participants feel comfortable expressing their views openly. Qualitative interviewing guidance highlights the need for balanced researcher engagement that supports openness without leading or shaping responses (Clarke & Braun 2013; Oates, Griffiths & McLean 2022).

The interview sessions were audio-recorded and then transcribed to ensure the accurate capture of participant responses. According to Clarke and Braun (2013), researchers can ensure their study results match their objectives by performing systematic data analysis through thematic evaluation and other qualitative methods.

Sampling for qualitative research seeks individuals who can provide complete and contextually relevant data when studying specialised roles such as the roles of EAPs. The sampling process of this study faces unique challenges in South Africa due to the limited availability of operational EAPs in the region. South African organisations have not fully institutionalised EA as a discipline, which results in a limited number of knowledgeable and skilled practitioners. A researcher employs purposive sampling when it is necessary to select participants who are best positioned to provide rich, relevant insights that align with the study's objectives. Methodological literature emphasises that sampling strategies in qualitative and design-oriented research must support depth, relevance, and alignment with the research purpose, ensuring that participants possess the knowledge required to inform the development and evaluation of the artefact (Oates, Griffiths & McLean 2022; Peffers et al. 2007).

Due to the limited EAP population in South Africa, the study uses a criterion-based sampling strategy to select EAPs with extensive experience in EA from finance, telecommunications and public service sectors where EA practices are established (Patton 2014).

The criterion-based selection applied four inclusion criteria, each chosen so that participants could authoritatively evaluate the artefact. Participants were required to have (i) at least ten years' experience in information technology; (ii) current or recent practice as an enterprise architect; (iii) familiarity with established EA frameworks such as TOGAF; and (iv) direct involvement in capability design in terms of people, process, and technology. These criteria follow directly from the research question: because the study asks what enterprise-architecture-based framework can guide the management of business-capability stability, the most appropriate informants are experienced EAPs who design and manage business capabilities through enterprise architecture. Such practitioners are best positioned to judge whether the framework's factors, dimensions, and layering are complete, correctly grouped, and applicable in practice, which confirms that the target population is appropriate to the research question.

The limited availability of EAPs in South Africa creates both challenges and possibilities for this research study. The small sample size limits how widely the results can be generalised, yet it fits perfectly within qualitative research which values deep exploration over wide-ranging coverage. South African practitioners provide specialised perspectives that reveal the specific challenges and necessary adaptations for maintaining capability stability in developing economies. The study benefits from high-quality data and direct relevance to research goals through the use of participants who possess specialised knowledge. The research mitigates bias and strengthens credibility through triangulation across three evidence sources — the literature review, the thematic analysis of the sampled articles,

and the expert interviews — so that the literature-derived factors are corroborated against practitioner experience and the conclusions reflect both international and local perspectives.

2.7.1 ETHICAL CLEARANCE

The University of South Africa (UNISA) provided ethical clearance for this study after its strict ethical research practice guidelines were followed. The research demanded careful examination of participant rights and confidentiality while evaluating study-related risks during interviews. The Ethics Review Committee of UNISA thoroughly evaluated the research proposal according to their ethics framework to ensure compliance with ethical standards such as participant respect, beneficence, and justice.

The ethical process operated under UNISA's standards with informed consent functioning as a foundational element. Each participant was given a detailed information sheet that outlined the study's objectives and explained both the role of interviews in data collection and participant rights. Participants received assurances about their voluntary participation rights as well as their ability to withdraw from the study at any point without consequences. They also received guarantees of the confidentiality of their information. All interview participants provided written informed consent which confirmed their full understanding of the study's scope and purpose.

The study ensured EAP anonymity by removing personal and organisational identifiers from interview data before reporting findings. Access to the interview recordings and transcripts was restricted to the research team, and they were stored safely in files protected by passwords. Participants received information that their responses would only serve academic purposes, and the study followed data protection regulations, including the Protection of Personal Information Act of South Africa.

Possible power imbalances were identified when interviewing professionals holding specialised positions. Measures were taken to create a neutral and respectful environment that enabled participants to freely express their thoughts. Ethical standards were maintained throughout the investigation by creating a pressure-free environment for participants while honouring their professional expertise.

The adherence to UNISA's ethical clearance process enabled this study to achieve the highest ethical standards for human participants resulting in enhanced credibility and trustworthiness of the research.

2.7.2 TRUSTWORTHINESS AND RIGOUR

Ethical clearance addresses the ethical conduct of the research but does not, by itself, establish the trustworthiness of its findings. Because this study is situated within the pragmatic and interpretive paradigms and follows a design science research (DSR) strategy, its quality is assessed through the trustworthiness criteria appropriate to qualitative and design-oriented research (Lincoln & Guba 1985; Guba & Lincoln 1994), together with the rigour and relevance expectations of DSR (Hevner et al. 2004; Peffers et al. 2007). The strategy of inquiry, research design, and methods were selected to serve the research objectives: the literature review and thematic analysis build and ground the conceptual

artefact, addressing the conceptual objectives, while the semi-structured expert interviews evaluate its applicability and completeness, addressing the evaluation objective.

Credibility, the qualitative counterpart of internal validity, was pursued by grounding the a priori codes and the resulting factors in the peer-reviewed literature (Table 2), by applying template analysis systematically across the set of articles, and by triangulating three evidence sources: the literature review, the thematic analysis of the sampled articles, and the practitioner interviews. Coding against explicit factor definitions rather than surface word matches, together with the expert validation of the artefact, provides a form of member checking that strengthens the correspondence between the findings and the phenomena studied.

Transferability, the counterpart of external validity, is supported by thick description of the research context, the sampled sectors (finance, telecommunications, and public service), and the participant-selection criteria, allowing readers to judge the applicability of the findings to other settings. Consistent with qualitative inquiry, the study privileges analytical rather than statistical generalisation; the purposive, criterion-based sample of experienced South African EAPs is intended to yield depth and contextual relevance rather than population coverage (Patton 2014).

Dependability, the counterpart of reliability, is addressed through an auditable research trail: the coding template, the iterative template-analysis cycles, the Atlas.ti outputs (Tables 3 to 5), and the documented development of the framework together make the analytical process transparent and repeatable. Confirmability is supported by anchoring each construct in the literature and the coded evidence, by retaining synonyms only as entry points to definition-based coding, so that the conclusions can be traced to the data rather than to researcher bias.

Finally, methodological rigour and practical relevance are secured through the DSR cycles: the artefact is built on a rigorous knowledge base (the rigour cycle) and evaluated against real-world practitioner needs (the relevance cycle), with the formal evaluation reported in Chapter 7 using the Framework for Evaluation in Design Science (FEDS) (Venable, Pries-Heje & Baskerville 2016) and the design-science evaluation guidance of Gregor and Hevner (2013).

2.7.3 DATA ANALYSIS

The data collected in this study were analysed in two stages, corresponding to the two data sources. The literature data were analysed using the thematic (template) analysis process detailed in Chapter 3, which produced the factors, dimensions, and concrete concepts of the framework. The expert-interview data gathered during evaluation were analysed using the same thematic-analysis logic (Braun & Clarke 2006; Clarke & Braun 2013), adapted to interview transcripts, so that both the construction and the evaluation of the artefact rest on a consistent analytical approach.

The interview data were analysed through the following steps. First, each interview was audio-recorded and transcribed using Microsoft Teams, and the transcripts were exported to a secure platform. Second, all personally identifying information was removed and each participant was

assigned a code (P1 to P5) to preserve anonymity. Third, familiarity with the data was gained by reading the anonymised transcripts. Fourth, the transcripts were coded against the CSMF factors and the evaluation questions. Fifth, the codes were organised into themes and patterns describing participants' views on the framework's completeness, applicability, layering, and value. Sixth, the responses to each evaluation question were categorised as affirmative, qualified or mixed, or negative, and an approximate level of agreement was derived from these proportions. Finally, the themes were interpreted against the framework to identify confirmations, refinements, and areas for future work.

This procedure provides an auditable trail from the raw transcripts to the reported findings and applies the trustworthiness measures described in Section 2.7.2. The detailed results of the interview analysis are presented in Chapter 7.

Because the study did not track individual capabilities longitudinally, the impact relationships in the framework were inferred rather than observed over time. The direct and indirect impacts were derived analytically from cross-sectional evidence — the co-occurrence and groundedness patterns identified in the literature (Chapter 3) together with the professional judgement of the expert participants — rather than from repeated measurement of a capability as it changed. The temporal element of each relationship, namely that a change in one factor propagates to another over time, is therefore an analytical inference about how the factors interact and not a directly observed sequence of events.

The interview evidence is, moreover, explicitly retrospective. Participants drew on their accumulated experience of past enterprise-architecture projects to judge whether, and how, a change in one factor had affected others over the life of a capability; their accounts are recollections of prior practice rather than real-time observation, and are therefore subject to the usual limitations of retrospective self-report, including recall and hindsight bias. To corroborate these temporal claims the study relied on triangulation rather than on any single account: a relationship was treated as credible where the retrospective interview evidence converged with the literature-based co-occurrence patterns and with the independent accounts of other participants, as reflected in the levels of agreement reported in Chapter 7, and was treated as tentative where such convergence was absent. The impact classifications are accordingly best understood as evidence-based design propositions, corroborated across sources but awaiting confirmation through longitudinal study of capabilities in use — a direction recorded among the limitations and recommendations for future work.

2.8 SUMMARY AND DISCUSSION

This chapter set out the research strategy through which the study's questions were answered. It located the work within a design science research (DSR) methodology, framed by the pragmatic and interpretive paradigms, and detailed the research plan, goals, and the data sources and collection methods used to evaluate the artefact. Data collection comprised semi-structured expert interviews, audio-recorded and transcribed to preserve accuracy and analysed through thematic analysis against the framework's factors.

Purposive sampling was appropriate given the limited population of senior enterprise-architecture practitioners in South Africa; participants were drawn from the finance, telecommunications, and public-service sectors to obtain experienced, contextually relevant perspectives. A small, expert sample of this kind trades statistical generalisability for analytical depth, and the study strengthened trustworthiness by triangulating the interview evidence against the literature and maintaining an auditable analytical trail.

The study was conducted under UNISA's ethical clearance, with informed consent, de-identification, and secure data handling protecting participant rights and confidentiality throughout, in accordance with applicable data-protection law. With the research strategy established, the next chapter applies the thematic-analysis method to the enterprise-architecture and capability literature to derive the factors that shape capability stability.

The chapter details a careful data collection process combined with ethical standards which produce dependable and trustworthy research results.

3 CHAPTER 3: THEMATIC ANALYSIS DESIGN PROCESS

Chapter 2 set out the research strategy, including the design science research approach and the thematic-analysis method used to interrogate the literature. This chapter applies that method, documenting the design and conduct of the thematic analysis through which the dimensions and factors that shape capability stability are derived from the enterprise-architecture and capability literature.

The chapter is organised to follow this analytical progression. It first sets out the six-step thematic-analysis procedure, operationalised through template analysis, and then reports the resulting dimensions, factors, and concrete concepts. These factors provide the empirical basis for the business capability ecosystem developed in Chapter 4 and for the capability stability model presented in Chapter 5.

Thematic analysis is an interpretive data analytic process involving immersing the researcher in the data to identify common ideas or themes. These themes provide an understanding of the phenomenon under investigation and resonate with the research question(s) posed in the study. Thematic analysis through qualitative analysis presents classifications and themes (patterns) from the data associated with a phenomenon. This process details data and interprets diverse subjects (Alhojailan & Ibrahim 2012). Thematic analysis allows the researcher to precisely determine the relationships between concepts and compare them with the replicated data (Alhojailan & Ibrahim 2012).

According to Clarke and Braun (2013), thematic analysis consists of six steps, as depicted in Figure 9.

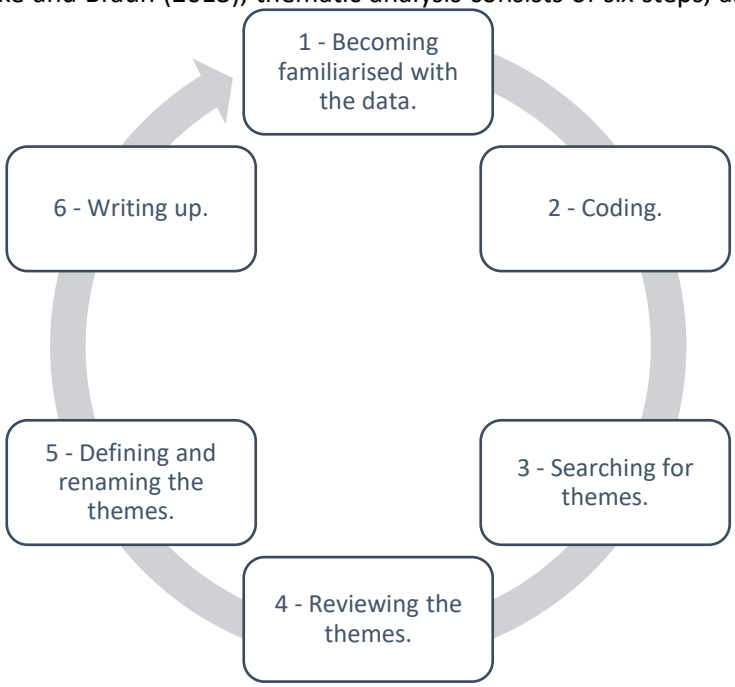


FIGURE 7 THE SIX STEPS OF THEMATIC ANALYSIS

The researcher fulfils the purpose of each step of thematic analysis, as described in Figure 9, by conducting a literature review and template analysis. Template analysis is implemented by developing a coding template based on the literature review results and then applying that template to other data sets, thereby improving the original coding template with each new application cycle (Brooks et al. 2015; King & Brooks 2016). Unlike other thematic approaches to data encoding, template analysis does not suggest a set sequence of encoding levels in advance and introduces flexibility in style and format (King & Brooks 2016). As such, analysts can develop detailed themes where the richest data (concerning the research question) are found. In addition, template analysis does not insist on an explicit distinction between descriptive and interpretation topics or a specific position for each type of theme in the code structure (Brooks et al. 2015).

The approach followed to solve the problem is outlined as follows:

3.1 THE SIX STEPS OF THEMATIC ANALYSIS

3.1.1 STEP 1 — BECOMING FAMILIARISED WITH THE DATA

- Use a literature review to identify the factors relating to business capabilities as found in the literature. The results are found in section 3.2.
- Add these factors to a template as a priori themes that form the template's basis.

3.1.2 STEP 2 — CODING

- Assign a code to each factor in the template.

3.1.3 STEP 3 — SEARCHING FOR THEMES IN AN EXPANDED DATA SET

- Apply the codes from Step 2 to the expanded data set — the additional peer-reviewed articles sourced from the ACM Digital Library and ResearchGate for this study, listed in Appendix A and described, together with the inclusion criteria, in Section 3.2.
- Analyse the results to confirm the a priori themes.

3.1.4 STEP 4 — REVIEWING THE THEMES

- Refine themes based on the number of occurrences of the factors in the expanded data set.
- Code the refined themes to perform a second thematic analysis cycle.

3.1.5 STEP 5 — DEFINING AND RENAMING THE THEMES

- Based on the number of occurrences of the factors in the second data set, determine their importance relative to ecosystems and the stability of capabilities.

3.1.6 STEP 6 — WRITING UP

- Define capability ecosystem and capability stability and produce the capability stability ecosystem meta-model.

Before completing steps 1 and 2, the initial grouping and coding were completed using template analysis based on the information collected during the literature review and described in section 2.3. Atlas.ti was used to perform the analysis.

During the literature review, the researcher set up the software with codes representing the factors defined as a priori themes. Consistent with a conceptual, definition-based approach to coding (Saldaña 2021; MacQueen et al. 1998), each factor was assigned a working definition drawn from the literature, and text segments were coded to a factor only where their meaning corresponded to that definition, rather than on the basis of surface word matches. This aligns the analysis with latent, theoretical (deductive) coding as described by Braun and Clarke (2006), in which codes are applied to the underlying conceptual content of the data rather than to its literal wording. To locate candidate passages, the researcher used Atlas.ti's built-in synonym function, which proposes terms that share the same contextual meaning as a given code within a thematic analysis (Friese 2019); the synonyms listed for each factor in Table 2 are the contextually equivalent terms returned by this function. These synonyms were treated not as coding criteria but as lexical entry points — search cues that surfaced candidate passages for closer reading — with the final coding decision always resting on definitional fit rather than on the presence of a listed term. Because the English language expresses similar concepts through many near-equivalent terms, this tool-assisted approach widened the net of candidate text and reduced the risk that relevant material would be overlooked owing to terminological or cultural variation.

Academic articles were required to analyse a secondary data set to validate the dimensions and factors. The articles used for the analysis had to be picked without bias. The following platforms were used to source articles:

- ACM Digital Library
- ResearchGate – access to various, multiple online journals

For clarity, the sourcing process for the literature is described in more detail. Each publisher’s online search engine was accessed directly, using the standard search functionality without advanced operators. This approach was chosen deliberately to widen the search scope and avoid narrowing the results prematurely, thereby reducing potential selection bias. By relying on default search settings, the process ensured that articles relevant to enterprise architecture, business capabilities, and their associated concepts were not unintentionally excluded.

The two sources were selected because they offer complementary coverage at different levels of abstraction. The ACM Digital Library is a curated, publisher-controlled index of peer-reviewed computing and information-systems literature, providing focused, discipline-specific results of consistent scholarly quality. ResearchGate, by contrast, is a broad, cross-disciplinary scholarly platform that aggregates author-deposited work and therefore returns a wider but more heterogeneous set of material, including preprints and other items that may not have been peer-reviewed. Using the two together balanced depth against breadth: the ACM Digital Library anchored the search in curated enterprise-architecture and capability research, while ResearchGate extended reach to adjacent journals and disciplines. To manage the risk of admitting non-peer-reviewed material through

ResearchGate, the peer-review inclusion criterion was applied throughout, so that only peer-reviewed academic publications were retained.

The following search terms were used, individually and in combination, across the different publisher platforms: “enterprise architecture”, “capability”, “business functions”, “impacts on…”. These terms were selected to capture a broad set of publications addressing EA foundations, capability concepts, interactions between capabilities and business functions, and contextual influences.

Because these broad terms, combined with default search settings, returned large and heterogeneous result sets, articles were screened manually rather than through automated filters. Each candidate was assessed against the inclusion criteria directly: its topical relevance to enterprise architecture, business capabilities, and the associated dimensions and factors; its peer-reviewed status; and whether its content could be mapped to the a priori factor codes used in the analysis. Consistent with the decision not to impose restrictive filters on publication date, venue, or study type, this relevance- and quality-based screening — rather than a pre-set time window or venue ranking — was the mechanism used to reduce the initial results to the final set of articles carried forward into the coding.

Articles were included where they were peer-reviewed academic publications, retrievable through the ACM Digital Library or ResearchGate, and addressed enterprise architecture foundations, capability concepts, the interaction between capabilities and business functions, or the contextual influences acting on capabilities. No restrictive filters on publication date, venue type, or research method were applied beyond this topical relevance; the default search functionality was used deliberately to widen the search scope and avoid excluding relevant work prematurely. In total, 120 articles met these inclusion criteria and formed the basis of the thematic analysis. The complete list is provided in Appendix A, as it falls outside the scope of this chapter.

The frequency and recurrence of factors across the reviewed literature were then examined to refine the initial mapping of factors to their respective dimensions. This step determined the relative degree of influence each factor exerts within the capability ecosystem. Based on this refined mapping, broader analytical themes were identified, and each theme was assigned a corresponding code to support systematic organisation and subsequent thematic analysis. The software was updated with the changes, and the new themes and the analysis were run again on the same set of articles to confirm the mapping of the dimensions and factors relating to the themes on the degree of influence. This output was used to define the capability ecosystem and capability stability and produce the capability stability ecosystem meta-model. The next section will detail the results obtained using the research strategy.

3.2 RESULTS

The following results were obtained using the steps outlined in the research design. The provenance of the results tables is as follows. The a priori themes, code-occurrence, code-distribution, and

concrete-concept tables are direct outputs of the Atlas.ti coding of the sourced article set listed in Appendix A; each cell reports a frequency, groundedness, or co-occurrence value computed by Atlas.ti from the coded segments. The per-factor impact tables and the relationship matrix presented in Chapter 6 are not raw counts but are derived from these codings: each direct or indirect impact entry is assigned from the co-occurrence evidence and the direct/indirect analysis described in Section 3.2 (Steps 2–4) and Section 4.4.

The data source for each results table is set out below.

TABLE 3 DATA SOURCE FOR EACH RESULTS TABLE

Results table	Data source and provenance
Code Occurrences; Code Distribution by Document	Direct Atlas.ti output from coding the sampled article set (Appendix A): per-code and per-document occurrence counts and groundedness values.
Concrete Concepts in Atlas.ti; Concrete Concepts per article	Atlas.ti groupings of the codes into the concrete concepts defined in Table 4, reporting per-document groundedness across the sampled article set.
Definitions of the CSMF constructs	Consolidated definitions of the a priori factors from the coding scheme (Table 2), confirmed by the thematic-analysis results in Section 3.2.
Per-factor impact tables (Governance, Cost, Performance, Measure, Capacity, Engagement, People, Process, Technology)	Derived rather than raw counts: each direct or indirect entry is assigned from the co-occurrence evidence (Table 3) and the direct/indirect analysis of Section 3.2 (Steps 2–4) and Section 3.3, following the systematic determination described in Section 4.4.
CSMF Relationship Matrix	Consolidation of the nine per-factor impact tables into a single direct/indirect relationship matrix.
Co-Occurrence Validation of the Conceptual Model Factors	Atlas.ti co-occurrence scores for the factors, compared against the study's impact classification to test alignment (flagged items indicate literature–study divergence).

3.2.1 STEP 1 — BECOMING FAMILIARISED WITH THE DATA

The literature review was used to identify the factors relating to business capabilities as found in the literature. As shown in Table 2 below, the researcher identified these factors using template analysis and added them to the code template as a priori themes, each accompanied by a working definition and a set of synonyms generated by Atlas.ti's built-in synonym function. As explained above, the synonyms were not treated as coding rules but as lexical entry points that surfaced candidate passages for interpretation against the factor's definition; their inclusion accommodates the many near-equivalent terms the English language uses for similar concepts and helps to avoid jargon or cultural bias.

TABLE 4 A PRIORI THEMES

Factor	Synonym
People	human, human being(s), any person, colleague, role, personnel, individual, board of directors, staff, organisation, somebody, someone, company
Process	activity, action, manner, procedure, routine, technique, methodical, approach, method, operation
Technology	none
Performance	execution, fulfilment, observance, response, reaction
Measure	appraise, calculate and evaluate a device for measuring, standard, measurement, quantity, scope
Capacity	ability, aptitude, capability, efficiency, responsibility
Engagement	association, connection, commitment, responsibility, commission, demand, request, requisition, engaging, meeting
Governance	regulation, control, discipline, principle, standard, direction
Cost	budget, expenditure, expense, fee, price, charge, disbursement
Enterprise Architecture	none
Adaptability	going together well, flexibility, versatility, agile, nimble
Design	blueprint, plans, pattern, plan, aspiration, intention, composition, structure, representation

The factors in Table 2 are grounded in the enterprise architecture and strategic-management literature, while their synonyms are the contextually equivalent terms returned by Atlas.ti's built-in synonym function rather than a manually assembled thesaurus (Friese 2019). The three constituents of a capability — people, process, and technology — follow established business-capability definitions (The Open Group 2010; Rosemann & vom Brocke 2015; Zhu et al. 2016), while the evaluative factors (performance, measure) and contextual factors (governance, cost, engagement) reflect recurring constructs in the capability-measurement and dynamic-capabilities literature (Teece, Pisano & Shuen 1997; Helfat & Peteraf 2003). Particular care was taken with the closely related terms ability, capacity, and capability, which this literature treats as distinct: capacity denotes the potential or volume of resources available, ability denotes an individual competence, and capability denotes the organised, repeatable means of achieving an outcome through the combination of people, process, and technology (Teece, Pisano & Shuen 1997; Helfat & Peteraf 2003; The Open Group 2010). Although the synonym function grouped ability and capacity under the factor “Capacity”, these terms were retained only as lexical entry points and segments were coded to that factor solely where the underlying meaning concerned available potential, so as not to conflate them with the study's focal construct of business capability. Enterprise Architecture and Technology were assigned no synonyms because their meanings are definition-bound and, in the case of EA, contested — enterprise architecture carries several competing definitions in the literature (Lapalme 2011; Lankhorst 2009; The Open Group 2010)

— making surface synonymy unreliable; these factors were therefore coded strictly on definitional match.

To avoid confusion, it is important to clarify that neither “results” nor “external parties” were discarded during the analysis. Instead, these elements were consolidated under broader, more analytically coherent categories for the purposes of thematic analysis.

“Results” remains conceptually present but is grouped under the broader factor “measure”, which captures all evaluative aspects associated with capability assessment. This grouping avoids duplicating overlapping evaluative constructs and ensures that measurement is treated as an integrated analytical theme rather than a fragmented set of standalone items.

Similarly, “external parties” was not removed; rather, it was incorporated into the broader environmental context dimension. In this consolidated structure, external stakeholders operate as part of a wider contextual influence rather than as an isolated factor. This allows the thematic analysis to focus on higher-order categories without losing the underlying meaning originally assigned to external parties.

This grouping approach maintains the integrity of the original constructs while ensuring that the thematic analysis reflects a streamlined and conceptually consistent set of factors.

3.2.2 STEP 2 — CODING

Each factor identified in Table 2 was used as a code during the thematic analysis, with the code name corresponding directly to the factor and each code applied according to its working definition. The concepts of capability ecosystems and capability stability highlight that while EA designs business capabilities for a specific purpose, these capabilities must also adapt to environmental changes while maintaining their stability within the broader organisational ecosystem.

In addition to the primary codes derived from the factors in Table 2, supplementary analytical codes were added to ensure that the thematic analysis captured concepts central to this study’s research focus. The primary codes—such as people, process, technology, performance, measure, capacity, engagement, governance, and cost—were applied consistently to text segments that aligned with the factor definitions and their associated synonyms.

However, because this study examines capability stability within an enterprise architecture context, the data also contained insights that could not be meaningfully coded using only the factor set. To address this, additional codes were incorporated into the coding template to capture themes directly linked to the conceptual model. These included Enterprise Architecture, Adaptability, and Design. Their inclusion enabled the analysis to account for how adaptability is embedded in EA design and how these design principles support the stability of business capabilities in dynamic organisational environments.

Introducing these supplementary codes did not alter or replace the factor-based coding structure; rather, they complemented it by capturing higher-order concepts specifically relevant to the research

objectives. This ensured that the coding process remained systematic while still reflecting the theoretical and practical dimensions of capability stability.

3.2.3 STEP 3 — SEARCHING FOR THEMES IN THE EXPANDED DATA SET

Atlas.ti was used to perform the analysis. The software was set up with the codes in steps 1 and 2. The codes, seen as concepts or representations of similar things, were then added to the system coding template and the synonyms required for the analysis. The articles listed in Appendix A were uploaded to the system, and the codes were applied using the system. The analysis was run, and the results are shown in Table 3.

TABLE 5 CODE OCCURRENCES

Code	Doc 1	Doc 2	Doc 3	Doc 4	Doc 5	Doc 6	Doc 7	Doc 8	Doc 9	Doc 10	Total
Adaptability	0	0	0	0	2	17	0	0	7	6	32
Capacity	53	23	25	37	38	69	74	16	166	165	666
Cost	2	1	2	2	5	2	14	2	2	7	39
Design	40	46	7	26	16	16	11	50	29	20	261
Engagement	25	34	7	21	19	29	43	36	84	55	353
Enterprise Architecture	14	9	0	10	28	1	16	27	49	27	181
Governance	36	11	2	24	6	3	5	6	19	11	123
Measure	8	6	4	3	3	9	1	2	41	24	101
People	40	23	3	15	23	21	56	21	40	25	267
Performance	8	5	3	4	6	8	8	1	24	41	108
Process	24	50	20	33	26	21	50	24	53	54	355
Technology	18	9	0	1	14	29	18	3	35	50	177
Total	268	217	73	176	186	225	296	188	549	485	2663

All Atlas.ti results follow the same convention. To read the table, use the following information: The codes are displayed in the first column, and the documents are in the top row. The Totals column indicates how often a given code is applied in the analysed documents (articles). The number in each cell indicates how often a given code is applied in the specific document. Below a document are the total number of occurrences in each document. Below a document, the second number gives the number of occurrences for all documents. The Totals column at the bottom shows the total codes in each document. The Gr code below the codes indicates the groundedness of the code. Groundedness indicates a systematic qualitative research method that collects empirical data and then creates a theory “grounded” in the results (Lawrence & Tar in press; Bryant 2012). Appendix A contains the analysed documents.

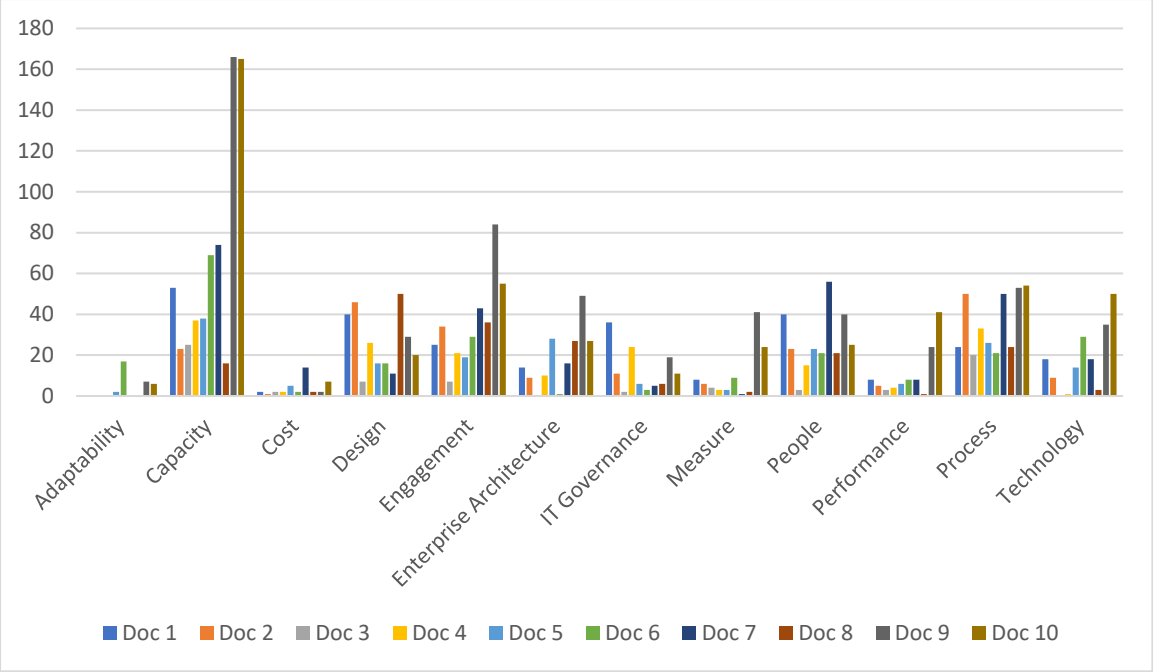


FIGURE 8 BAR CHART OF CODE RELEVANCE

Figure 10 confirms that all the factors (codes) are relevant to business capabilities. Relevance is important as it shows that all these factors should be present when considering capabilities. Figure 11 shows that all codes are represented in all documents, showing coverage of the codes and relevance to the capability ecosystem and the stability of the ecosystem.

The total occurrence (groundedness) of each code across the sampled documents is presented in the table below for legibility; the full code-by-document matrix is given in Table 3.

TABLE 6 CO-OCCURRENCE PER CODE

Code	Total occurrences (Gr)
Capacity	666
Process	355
Engagement	353
People	267
Design	261
Enterprise Architecture	181
Technology	177
Governance	123
Performance	108
Measure	101
Cost	39
Adaptability	32
Total	2663

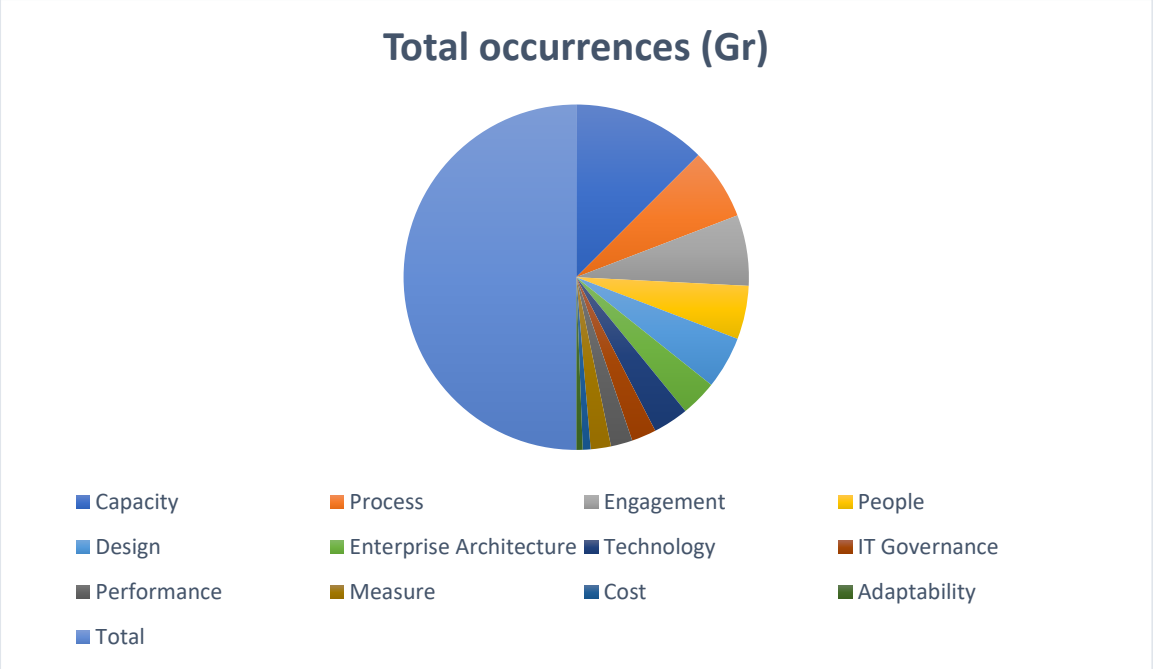


FIGURE 9 PIE CHART DEPICTING CODE OCCURRENCE

The results of the initial thematic analysis on the secondary data set confirm that the factors identified during the literature review are relevant to the capability ecosystem and capability stability concepts.

3.2.4 STEP 4 — REVIEWING THE THEMES

To refine the themes, related codes were grouped into higher-order code groups, allowing individual codes that frequently co-occurred in the data to form broader, more analytically meaningful concepts. This process enabled the identification of concrete concepts that reflect how the literature collectively discusses capability-related constructs at a higher level of abstraction. For example, the codes people, process, and technology were grouped because of their recurrent co-occurrence in the data, forming the concrete concept of a capability.

Within this logic, “result” emerges as a concrete concept because it represents the combined evaluative meaning conveyed by the codes performance, measure, capacity, and engagement. Although each of these codes captures a different aspect of evaluation, they consistently appear together in the literature as part of the broader assessment of how well a capability or service performs. When these four codes co-occur, they collectively describe the outcome or result of a capability’s operation. Thus, “result” functions as a concrete concept that synthesises multiple evaluative dimensions into a single higher-order construct.

This grouping approach ensures that the analysis distinguishes between the granular level of individual codes (which reflect specific data expressions) and the aggregated level of concrete concepts (which reflect meaningful patterns across the literature). Table 4 therefore presents “result” not as a standalone factor that replaces earlier constructs, but as a thematic synthesis of the evaluative codes that together describe the outcomes associated with capability performance.

Table 4 shows these code groups and their concrete code.

TABLE 7 CONCRETE CONCEPTS IN ATLAS.TI

Concrete Concept	Code Group
Capability	People
	Process
	Technology
Result	Performance
	Measure
	Capacity
	Engagement
Governance	Governance
	Cost
Enterprise Architecture & Design	Enterprise Architecture
	Design
Adaptability	No grouping of codes

The analysis was run again in Atlas.ti, using the concrete concepts as codes. Table 5 below shows the number of grouped codes per paper:

TABLE 8 CONCRETE CONCEPTS PER ARTICLE

CONCRETE CONCEPT	DOC 1	DOC 2	DOC 3	DOC 4	DOC 5	DOC 6	DOC 7	DOC 8	DOC 9	DOC 10	TOTAL
ADAPTABILITY	0	0	0	0	2	17	0	0	7	6	32
ENTERPRISE ARCHITECTURE & DESIGN	50	49	7	31	40	17	24	60	76	46	400
GOVERNANCE	38	11	4	26	11	4	17	7	20	18	156
CAPABILITY (PEOPLE, PROCESS, TECHNOLOGY)	54	65	20	39	37	55	85	41	94	93	583
RESULT (PERFORMANCE, MEASUREMENT, CAPACITY, ENGAGEMENT)	65	54	26	43	48	84	87	40	212	188	847
TOTAL	207	179	57	139	138	177	213	148	409	351	2018

The higher the number of code words, the more relevant the document and concrete concept would be to capability ecosystem and capability stability, that is the more grounded the concept is.

In the code-distribution tables and in Figure 12, each sourced article is labelled “Article N” followed by its Atlas.ti document identifier in brackets — for example, Article 1 (203755). These identifiers are assigned automatically by Atlas.ti when the documents are loaded into the project; they are retained

only so that each table row and chart segment can be traced back to its underlying source, and they are neither publication years nor code counts. The articles to which they correspond are listed in full in Appendix A.

FIGURE 10 CODE DISTRIBUTION BY DOCUMENT

The same data is presented in the table below for legibility:

TABLE 9 CODE DISTRIBUTION BY DOCUMENT

Document	Adaptability	EA & Design	Governance	Capability (PPT)	Result (PMCE)	Total
Article 1 (203755)	0	50	38	54	65	207
Article 2 (203755)	0	49	11	65	54	179
Article 3 (308410)	0	7	4	20	26	57
Article 4 (327757)	0	31	26	39	43	139
Article 5 (332264)	2	40	11	37	48	138
Article 6 (343229)	17	17	4	55	84	177
Organisational…	0	24	17	85	87	213
Platani…	0	60	7	41	40	148
Unders…	7	76	20	94	212	409
Van de Wetering et al.	6	46	18	93	188	351
Total	32	400	156	583	847	2018

Table 7 indicates that adaptability is represented strongly across all documents in the secondary set when the concrete concepts are applied with EA and capability as the secondary main concepts.

3.2.5 STEP 5 — DEFINING AND RENAMING THE THEMES

The importance of the occurrences of the factors relative to the ecosystems and stability of capabilities, are based on the number of occurrences of the factors in the second data set. Table 13 shows the factors (people, process, technology, capacity, measurement, engagement, results, governance and cost) and how often they co-occur with the three main themes of Enterprise Architecture, Design and Adaptability.

3.2.6 STEP 6 — WRITING UP

The final step involved integrating the outputs of the thematic analysis into a coherent narrative that accurately reflects the patterns identified across the data. At this stage, the refined themes and concrete concepts developed in Step 5 were consolidated and translated into a structured explanation of the capability ecosystem and the concept of capability stability.

This step required synthesising the relationships identified during the coding cycles—namely the role of internal capability components, the evaluative dimensions of capability measurement, and the wider environmental influences that shape capability functioning. The researcher organised these insights into a comprehensive account that explains how capabilities operate, adapt and maintain stability within their organisational context.

The writing-up phase also involved constructing the capability stability ecosystem meta-model. This representation draws directly from the co-occurrence patterns observed in the data and illustrates how the various factors and conceptual dimensions interact. The model is therefore grounded in empirical evidence from the analysis rather than theoretical abstraction alone.

Overall, Step 6 focused on presenting the findings in a clear, logical, and academically rigorous manner, ensuring that the analytical outcomes are understandable, traceable to the data and aligned with the study's research objectives.

	• Adaptability Gr=32	• Design Gr=261	• Enterprise Architecture Gr=181
• Capacity Gr=666	28	136	90
• Cost Gr=39	1	6	8
• Engagement Gr=353	15	107	73
• IT Governance Gr=123	2	46	25
• Measure Gr=101	7	20	13
• People Gr=267	5	98	55
• Performance Gr=108	5	17	10
• Process Gr=355	11	112	52
• Technology Gr=177	6	39	25

FIGURE 11 CO-OCCURRENCE OF ADAPTABILITY, DESIGN, EA, AND FACTORS

Figure 13 presents the co-occurrence patterns between the central themes—Adaptability, Design, and Enterprise Architecture—and the underlying capability factors. As reflected in Table 13, the strongest associations emerge between Design and Enterprise Architecture on the one hand, and the factors Capacity, Engagement, People, and Process on the other. This pattern suggests that, across the literature, discussions of EA and capability design are most often anchored in the human, procedural, and operational dimensions of capability development. These factors appear to be central to how scholars conceptualise the construction, functioning, and adaptability of capabilities within enterprise environments.

Moderate co-occurrence with Governance and Technology indicates that while these elements remain relevant to EA and capability stability, they are treated more as contextual enablers than primary drivers. Their positioning in the mid-range implies that governance mechanisms and technological foundations are recognised as necessary, but they do not dominate scholarly discourse in the same way as the core operational factors.

By contrast, Cost, Measure, and Performance show comparatively weaker connections to the three themes. This suggests that although these factors form part of the broader capability landscape, they receive less explicit theoretical attention in relation to EA design and adaptability. Their lower prominence may indicate that the literature tends to treat them as outcomes or secondary considerations rather than as central components of capability stability.

The Sankey diagram visually reinforces these patterns by illustrating the relative strength of the relationships across the documents. The wider flows highlight where scholarly attention is concentrated, revealing the analytic weight placed on particular combinations of themes and factors. In this way, the diagram not only summarises the distribution of co-occurrences but also illustrates the conceptual structure of the field, showing where academic discourse clusters and where it is comparatively sparse.

Atlas.ti uses network groups to depict relationships. Figure 14 shows how the network groups were set up between the codes:

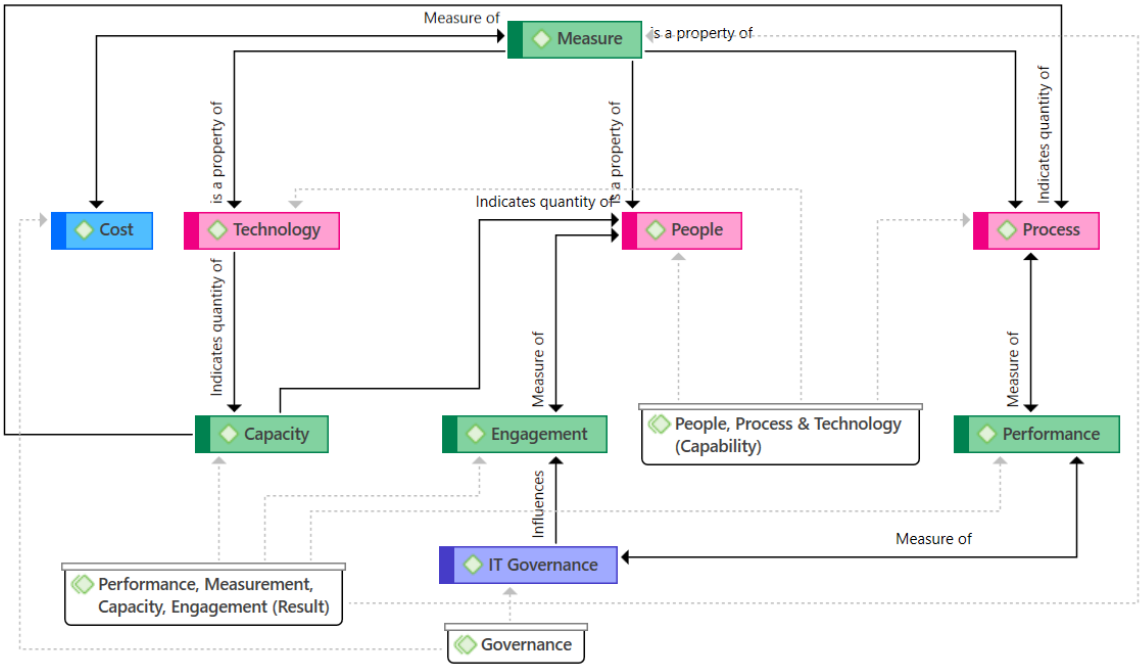


FIGURE 12 DATA RELATIONSHIPS NETWORK

The next step, shown in Figure 15, was to overlay the code groups on the network and add the number of quotations to see how grounded the factors were.

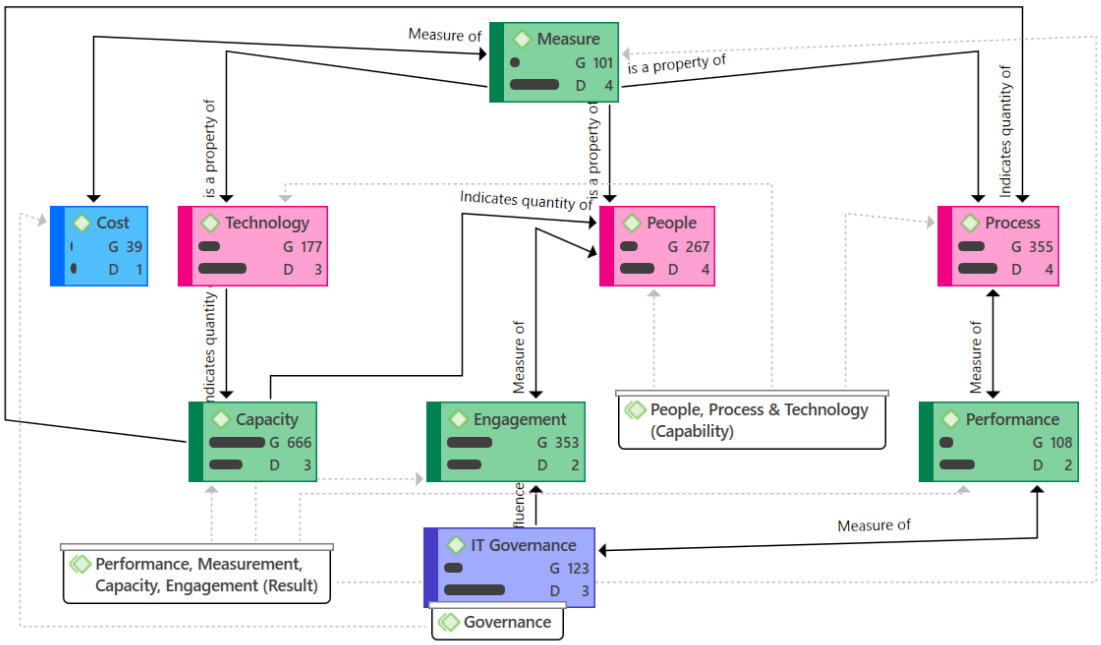


FIGURE 13 GROUNDING OF FACTORS

Cost and governance have a total of 162 occurrences.

Measure, Capacity, Engagement and Performance have a total of 1228 occurrences.

People, Processes and Technology have a total of 739 occurrences.

This output was used to define the capability ecosystem and capability stability and produce the capability stability ecosystem meta-model. These outputs are described in more detail in the following sections.

3.3 SUMMARY AND DISCUSSION

This chapter documented the thematic analysis through which the factors that shape capability stability were derived from the enterprise-architecture and capability literature. The six-step procedure, operationalised through template analysis in Atlas.ti, surfaced the people, process, and technology components that constitute a capability; the performance, measure, capacity, and engagement attributes through which capabilities are evaluated; and the governance and cost influences exerted by the environment, together with enterprise architecture, design, and adaptability as integrative concerns. These empirically grounded factors provide the basis for the business capability ecosystem developed in the next chapter, and ultimately for the capability stability model presented in Chapter 5.

4 CHAPTER 4: THE BUSINESS CAPABILITY ECOSYSTEM – A CONCEPTUAL FRAMEWORK

4.1 INTRODUCTION

Chapter 1 provided the rationale for this study, described the research problem and posed the research questions. The thematic analysis in Chapter 3 then derived the factors that shape capability stability; this chapter organises those factors, together with the enterprise-architecture and capability literature, into the conceptual framework of the business capability ecosystem. The objective of this chapter is to answer the first two sub-research questions and conclude the two first sub-research goals. The sub-research questions are:

- SRQ 1 - Sub-Research Question 1: What is capability stability?
- SRQ 2 - Sub-Research Question 2: What dimensions and factors are required to describe a business capability?

To answer these sub-research questions, the researcher had to complete a conceptual framework to develop the answer to these questions, which resulted in the first two goals for this study:

SRG 1- Sub-Research Goal 1: Develop a definition for capability stability.

- SRG 2- Sub-Research Goal 2: Define a capability stability ecosystem conceptual model.

The goals create a common vocabulary and a shared understanding of the underlying aspects of addressing the greater problem.

This chapter is positioned within the reasoning cycle of the DSR process, which refers to the iterative progression of reasoning modes—analogy, reflection, and induction—that guide the development and

refinement of design knowledge in the Design Research Cycle proposed by Vaishnavi and Kuechler (2004) (see Figure 2 above). Section 2.2 outlines the rationale for adopting a pragmatic orientation in this study, emphasising the need for a conceptual framework and presenting the literature review on enterprise architecture and business capabilities. The review highlights the shared characteristics and interactions of these domains, which in turn inform the dimensions and factors used in the development of the framework. These dimensions and factors are derived from a thematic analysis of the literature; the thematic-analysis process is described in full in Chapter 3, which documents the analysis before the resulting factors are consolidated into the conceptual model.

The review is scoped to literature directly relevant to business capability stability and the enterprise-architecture context in which capabilities operate; sources are included only where they inform the capability ecosystem or its management, rather than being surveyed for their own sake. It is organised to make the bigger picture visible: it moves from the theoretical context that frames stability (systems thinking and homeostasis), to enterprise architecture and business capabilities as the domains in which stability must be managed, and then to the three ecosystem dimensions — capability enablement, capability measurement, and capability influencers and environmental context — that structure the factors carried forward into the conceptual model. Each body of literature is therefore tied explicitly to the research problem and to the dimension of the capability ecosystem it informs.

4.2 AWARENESS OF THE PROBLEM – INTRODUCING STABILITY

General systems thinking provides a theoretical framework for understanding the organisation as an integral component of a broader system, particularly within the context of the business environment (Giachetti 2016; Hoogervorst 2004). Systems theory states that organisations, similar to other complex systems, operate interdependently within their environment by interacting dynamically with other systems (Giachetti 2016; Laszlo & Krippner 1998; Whitchurch & Constantine 1993). This theoretical perspective explains the need for organisations to maintain stability and performance when external factors can impact this stability (Pacheco-Cubillos, Boria-Reverter & Gil-Lafuente 2024). This theory also closely relates to homeostasis, which refers to a system's capacity to sustain stability and ensure that it functions according to its original design (Kandjani et al. 2012; Korhonen et al. 2016).

The discussion surrounding homeostasis within complex systems is particularly significant within systems theory, business science, and EA (Khan 2013; Korhonen et al. 2016). In biological systems, homeostasis ensures internal stability by adjusting the biological system to external conditions to maintain life. When applied to organisations, homeostasis becomes a critical lens through which organisational stability, resilience, and adaptability can be examined (Korhonen et al. 2016; Leong 2024; Liu, Tong & Sinfield 2021). The extensive examination of homeostasis within business studies reflects a growing recognition of its centrality to organisational performance in volatile and dynamic business ecosystems (Bernus et al. 2016; Korhonen et al. 2016; Leong 2024; Liu et al. 2021; Maurer 2020).

From a systems theory perspective, homeostasis in organisations implies the regulation and optimisation of internal processes to maintain operational stability, even as external conditions change (Gharajedaghi 2011; Korhonen et al. 2016). The business ecosystem in which organisations operate is characterised by constant flux, driven by technological advancements, market shifts, regulatory changes, and competitive pressures (Bente et al. 2012; Kale 2019). Therefore, the capacity for homeostasis becomes essential to an organisation's ability to navigate these external dynamics while maintaining its functional integrity (Maurer 2020).

In the context of business science, the notion of homeostasis is closely related to concepts of resilience, agility, and organisational learning (Bernus et al. 2016; Korhonen et al. 2016; Maurer 2020). Organisations that maintain homeostasis are not static entities; rather, they must continually adjust their processes and structures to ensure alignment with shifting environmental demands (Bernus et al. 2016; Khan 2013; Korhonen et al. 2016; Leong 2024). The capacity for homeostasis allows an organisation to withstand external shocks and adapt to changes without compromising its fundamental stability or strategic objectives (Bernus et al. 2016; Khan 2013; Korhonen et al. 2016; Leong 2024). Consequently, the ability to maintain this balance is critical to ensuring long-term organisational survival and success (Bernus et al. 2016; Khan 2013; Korhonen et al. 2016; Leong 2024).

The dynamic interplay between stability and adaptability in organisations necessitates a deep understanding of how homeostasis functions within complex systems (Gharajedaghi 2011; Kandjani et al. 2012; Korhonen et al. 2016). Business science literature frequently addresses this issue, often linking the concept of homeostasis to broader frameworks that emphasise organisational flexibility and responsiveness, such as agile management, dynamic capabilities, and strategic resilience (Korhonen et al. 2016; Liu et al. 2021; Maurer 2020).

Thus, the view of homeostasis within business studies goes beyond mere operational efficiency. It encompasses strategic alignment, resource optimisation, and the continuous balancing of internal processes with external demands (Ross et al. 2006; Tamm et al. 2011). This equilibrium ensures that organisations remain functional and capable of fulfilling their objectives, even as they operate in an environment of uncertainty and change. Therefore, maintaining homeostasis or stability is a key determinant of organisational effectiveness and resilience in complex and dynamic business ecosystems.

The next section outlines the key concepts to provide the theoretical context for the study and introduces components required to understand EA and business capabilities.

4.3 THEORETICAL CONTEXT

The researcher conducted a literature review to determine what models and frameworks currently exist that will assist EAPs in managing capabilities when the underlying technology in a capability is changing rapidly. The literature review constitutes a central component (Hevner, Vom Brocke & Maedche 2019; Peffers et al. 2007). It serves to acquaint the researcher with the body of knowledge

pertinent to the thesis topic (Cahenzli 2022). It allows the researcher to review key theories, methodologies, and findings, thereby creating a foundation for the research and providing the context and structure for the development of the thesis (De Sordi 2021; Gregor & Hevner 2013). The literature review also assists in demarcating the scope of the research, sometimes allowing for an increase or decrease of scope depending on the outcome of the literature review (Herwix 2024).

Scholars such as Herwix (2024), Hevner et al. (2019), Gregor and Hevner (2013), and Peffers et al. (2007) recognise the importance of conducting a literature review in DSR. By conducting a literature review, researchers could identify gaps which could be addressed through their research (Vom Brocke & Maedche 2019).

Literature reviews that are not conducted thoroughly and impartially are of little scientific value and negatively impact the rigour required in DSR studies (De Sordi 2021; Myers & Venable 2014). This argument provides the basis for conducting a literature review. One difficulty to note when using a literature review in technology-related research is that IS and EA terms are used inconsistently, and a profusion of technology-related terminology is used in different publications and across disciplines (Chakraborty & Liebel 2024).

The researcher must record the steps that are used in the development of the literature review. Okoli and Schabram (2015), adhering to this procedure, provide a standardised method for conducting clear, impartial, balanced, and rigorous literature reviews. Figure 4 below depicts the steps that Okoli and Schabram (2015) state to conduct a literature review:

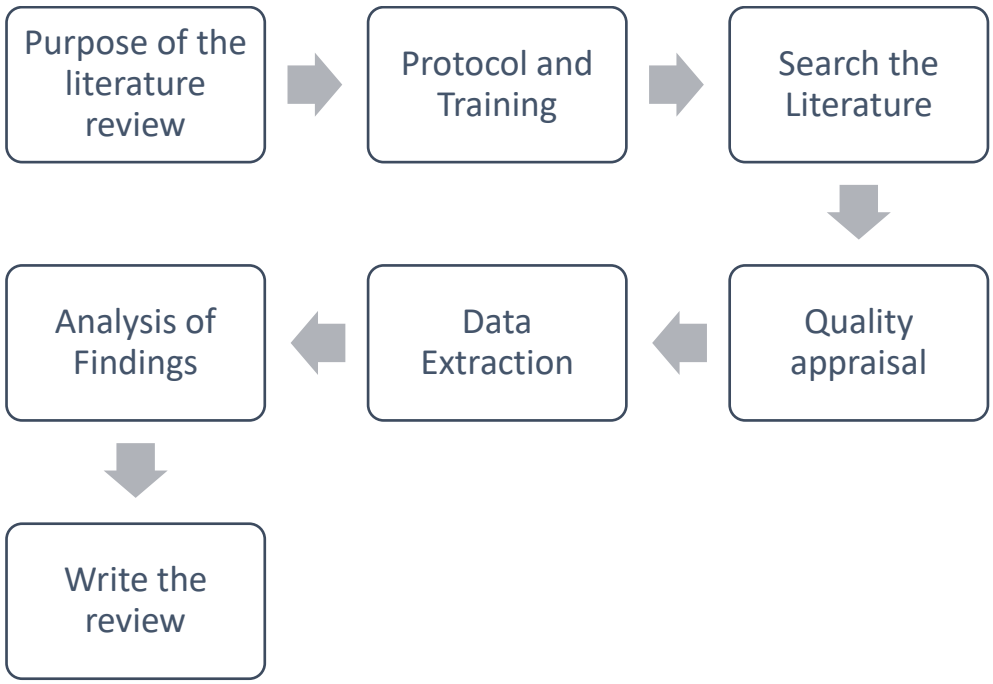


FIGURE 14 LITERATURE REVIEW PROCESS STEPS (OKOLI & SCHABRAM 2015)

The researcher conducted the first literature review to provide an understanding of business capabilities, and their design and management, and to see if any mechanism exists for managing

business capabilities in a manner other than using the traditional EA approach of as-is, to-be, and then big transition projects (Bente et al. 2012; Korhonen et al. 2016).

The researcher analysed the results of this literature review using the thematic analysis process described in Chapter 3. The rest of section 2 reports the results of the first literature review.

4.4 THE NEED FOR A CONCEPTUAL FRAMEWORK

The literature continues to emphasise the importance of relationships in capability design, particularly in the context of digital transformation, innovation, and agile business practices (Warner & Wäger 2019; Van de Wetering et al. 2021). Designing a business capability is not a single act but the coordinated design of the elements that constitute it: the organisational structures, roles, and processes through which the capability operates (Azevedo et al. 2015; The Open Group 2010; Rosemann & vom Brocke 2015); the performance metrics by which its contribution is measured (Cenfetelli & Bassellier 2009; Tamm et al. 2011); and the governance mechanisms that direct and control it (De Haes, Van Grembergen, Joshi & Huygh 2019). As organisations operate in increasingly complex and dynamic environments, studies highlight that these elements must be designed to be strategically aligned with the enterprise's objectives while remaining adaptable to technological and market change (Ross et al. 2006; Chen et al. 2014; Teece 2007).

Before proceeding, it is necessary to clarify how the several notions of “capability” used in the literature relate to the focus of this study. Scholars distinguish a number of capability types: IT capability, the firm's ability to mobilise and deploy information-technology resources (Bharadwaj 2000); operational (or ordinary) capabilities, which perform an organisation's existing, day-to-day functions; dynamic capabilities, the higher-order capacity to build, integrate, and reconfigure operational capabilities in response to changing environments (Teece, Pisano & Shuen 1997; Helfat & Peteraf 2003; Teece 2007); digital capabilities, operational or dynamic capabilities enabled and reshaped by digital technologies (Warner & Wäger 2019; Van de Wetering 2019); and organisational capabilities, the broad superset encompassing all of the above. The unit of analysis in this study is the business capability — the organisation-level combination of people, process, and technology through which an enterprise performs a defined function to achieve a strategic outcome (as defined in Section 1.2; The Open Group 2010; Ross et al. 2006; Van de Wetering et al. 2021). A business capability is thus an operational capability viewed from an enterprise-architecture perspective, while dynamic-capabilities theory is drawn on not as the object of study but as the lens that explains why a business capability must remain stable yet adaptable as its environment changes. Accordingly, throughout Sections 2.4 to 2.7 the unqualified term “capability” denotes a business capability; the qualifiers “IT”, “digital”, “dynamic”, “operational”, and “organisational” are used only where a distinct construct is specifically intended.

Warner and Wäger (2019) discuss how digital transformation has shifted the focus toward capabilities that support continuous innovation and agility. They emphasise the relationships between digital

technologies, organisational capabilities, and business models as critical in driving competitive advantage. Organisations must integrate digital capabilities with existing resources and establish new relationships with external partners and stakeholders, creating an ecosystem that supports innovation and flexibility.

Research on enterprise architecture shows that capabilities interact closely with business processes and information systems, forming integrated structures that enable organisational functioning (Loucopoulos et al., 2015; Azevedo et al., 2015). This work emphasises that IT capabilities must be aligned with business strategy to create value, while also recognising that contemporary digital ecosystems require capabilities that are adaptable, flexible, and responsive to ongoing change (Chen et al., 2014; Warner & Wäger, 2019; Van de Wetering et al., 2021). Organisations maintain their competitive advantage by adjusting their capabilities based on the demands of external environments.

The literature emphasises the difficulty in developing detailed organisational structure documentation due to its inherent complexity and required effort. While these models are designed to present a complete system blueprint, they frequently result in only a partial or incomplete understanding of business capabilities in operation. Models that emphasise structural and design aspects fail to account for the dynamic and evolving characteristics of capabilities in actual operational settings.

Bente et al. (2012) and Korhonen and Poutanen (2013) emphasise that the complexity of creating these models can lead to a lack of clarity in how EAPs define, design, and manage capabilities within both local and broader business ecosystems. While EAPs aim to provide a structured approach to capability design, fully documented models often fail to capture the dynamic interactions between capabilities and their environment, creating gaps in understanding operational stability and adaptability.

The work of Al Nuaimi, Singh, and Ahmad (2024) explores the use of dynamic capabilities by firms to innovate service-based offerings while demonstrating the linkages between organisational routines and market demands as well as technological progression. The capacity to develop capabilities in reaction to environmental changes plays a key role in achieving sustained success because it demonstrates how connections between capabilities and external environments help to preserve agility and innovation.

Van de Wetering (2019) focuses on the role of digital platforms in fostering dynamic capabilities, arguing that the relationships between digital platforms, organisational processes, and external ecosystems are key to creating flexible and responsive organisations. Without strong relationships between internal processes and external changes, organisations risk becoming static and unresponsive, leading to a misalignment between their capabilities and operational environments.

Mikalef and Pateli (2017) argue that building strong relationships between IT capabilities and business strategy is crucial for ensuring scalability and adaptability in the context of cloud computing. They emphasise the need for capabilities to align with business objectives and allow for agility in response

to technological advancements and market shifts. This view aligns with the broader theme that static, fully documented models struggle to reflect modern business operations' real-time, continuous nature.

Organisations require continuous change to remain adaptable and flexible, which presents management challenges when organisations operate within EA frameworks. EA takes responsibility for handling these changes while addressing the complexities that emerge during organisational evolution. EA concentrates on maintaining business capabilities when managing organisational changes yet reveals a critical gap at this point. EAPs regularly work to provide structured methods for synchronising IT functions with business strategies. EAPs consistently struggle to develop a complete understanding of both ecosystem dynamics and capability stability.

The earlier discussed literature offers extensive understanding regarding the manifestation of this problem. The detailed blueprints of organisational systems are the objective of fully documented models proposed by The Open Group in 2010. While these models extensively detail static structural elements, they do not adequately represent the dynamic operational interactions of capabilities in real-world conditions (Kotusev & Kurnia 2021; Van de Wetering 2019). The detailed process needed to create fully documented models results in an incomplete comprehension of capability functionality when affected by continuous business ecosystem alterations (Kotusev & Kurnia 2021; Lange et al. 2016; Ross et al. 2006; Van de Wetering 2019). When organisations cannot clearly define operational capabilities, they struggle to maintain agility and responsiveness to market or environmental changes (Ross et al. 2006; Van de Wetering 2019).

The problem intensifies because EAPs focus on the connections between capabilities, resources, and business processes during design but do not ensure that capabilities remain stable over time (Van de Wetering 2019; Rahimi et al. 2017; Ross et al. 2006). According to Bente et al. (2012) as well as Korhonen and Poutanen (2013), neglecting operational stability of capabilities leads to misalignments when these capabilities require adaptation to new circumstances. Capabilities are created to achieve targeted business goals but fail to maintain their effectiveness under changing environments and thus experience instability when business situations shift (Helfat & Peteraf 2015; Ross et al. 2006; Teece 2007; Van de Wetering 2019).

This creates a major challenge: EAPs require a conceptual model that clearly defines the operating ecosystem for capabilities and details methods for sustaining their stability over time (Kotusev & Kurnia 2021; Rahimi et al. 2017; Ross et al. 2006; Van de Wetering 2019). The initial design process maps connections between capabilities and stakeholders along with resources and external factors but the literature indicates an absence of understanding about how these connections change over time (Kotusev & Kurnia 2021; Rahimi et al. 2017; Teece 2007; Van de Wetering 2019). According to Warner and Wäger (2019), modern business settings exhibit growing dynamism while relationships among organisational capabilities, digital technologies, and external stakeholders remain in constant flux.

Organisations typically create capabilities based on fixed interpretations of these relationships, which restricts their capacity to handle ongoing changes necessary for flexibility (Warner & Wäger 2019).

Moreover, the dynamic capabilities literature, as explored by Al Nuaimi, Singh, and Ahmad (2024), reinforces that organisations must continuously adapt their capabilities in response to external changes in markets and technology. Yet, organisations may struggle to implement the necessary changes without a framework that captures the ongoing evolution of capabilities and their relationships with stakeholders (Rahimi et al. 2017; Teece 2007; Van de Wetering 2019; Warner & Wäger 2019). The absence of this framework also means that organisations have limited visibility into how capability components—such as processes, technology, and people —interact with external stakeholders and adapt to environmental demands.

The problem, therefore, is about managing change or complexity in isolation and the lack of a means to comprehensively understand a capability and its components, its relationships with stakeholders, and its role within the broader business ecosystem. Without such an understanding, EAPs cannot fully support the long-term stability and adaptability of capabilities, leaving organisations vulnerable to disruption as they navigate complex, evolving environments.

Before this problem can be addressed, the secondary problem can be stated as a lack of means to understand a capability, its components, its relationships with stakeholders, and the capability itself.

To address this gap, this chapter defines a conceptual model derived from the literature that includes the concepts of a capability ecosystem, capability stability, and the associated dimensions and factors of a capability. All of this must be combined into a conceptual framework which is called a business capability ecosystem. This business capability ecosystem allows for a common understanding and discourse about business capabilities and how to maintain the stability of the capability when change happens. The next section details the findings of the literature review, which also becomes the input for the coding of the thematic analysis process discussed in Chapter 3.

4.5 ENTERPRISE ARCHITECTURE

EA serves as the critical lens through which organisations view and attempt to address the challenges of capability stability and adaptability in complex and dynamic environments. EA provides a structured approach to aligning business goals with technology infrastructure, offering a pathway to manage the complexities and changes inherent in modern enterprises. The Open Group (2010) defines EA as the “fundamental organisation of a system, embodied in its components, their relationships to each other, and the environment, and the principles governing its design and evolution.” This conceptualisation establishes EA as an organisational framework which enables businesses to comprehend and develop their capabilities while adapting to changing requirements and external demands. The literature shows that EA frameworks provide clear guidelines for capability design but fail to include systems that maintain operational stability and adaptability over time.

4.5.1 DEFINING ENTERPRISE ARCHITECTURE

EA is often described as the foundation for aligning organisational strategy with technology. According to The Open Group (2010), EA is a framework for developing, implementing, and maintaining enterprise-wide architecture to support business objectives. This definition shows EA's role in simplifying the complexity of modern organisations by structuring processes, systems, and technologies to work in harmony. EA enables organisations to map and manage the relationships between business capabilities through this structured approach, ensuring that these capabilities align with the overall business strategy.

Lapalme (2011) further emphasises that EA is intended to improve organisational strategy and technology alignment by creating a shared understanding of the enterprise. This understanding is required in navigating the complex nature of modern business ecosystems, where changes require constant coordination between technology and business functions. EA ensures that these elements are not just aligned when they are designed but can be adapted and adjusted over time.

4.5.2 COMMONLY USED EA FRAMEWORKS

The widespread adoption of multiple EA frameworks stems from their capacity to handle organisational complexity while ensuring business capabilities align with technology strategies. TOGAF together with the Zachman Framework and the Federal Enterprise Architecture Framework (FEAF) stand out as the most accepted frameworks for EA in both public and private organisations, according to Bente et al. (2012). Organisations can address alignment challenges between technology infrastructure and business needs by using these frameworks which offer structured EA management methods. The widespread use and recognition of these frameworks show their importance as instruments for comprehending EA's approach to managing complex systems and capability design. While these frameworks provide structured methods, significant challenges in maintaining both adaptability and operational stability of capabilities remain over time especially within

This study does not propose a further general-purpose framework of this kind. Comprehensive frameworks such as TOGAF and the Zachman Framework, together with the Federal Enterprise Architecture Framework, provide broad methods and ontologies for describing and governing an enterprise's architecture end to end. The CSMF developed in this thesis is narrower and complementary: it is a focused lens for anticipating how a change propagates through a single business capability, intended for use within the review and governance activities that these established frameworks already define, rather than as a replacement for them.

In terms of the three schools of enterprise architecture identified earlier (Lapalme 2011), this study adopts primarily the ecosystemic, ecological-adaptation view — treating a business capability as an interdependent ecosystem that must co-evolve with its environment — complemented by the socio-technical view in its attention to people, process, and governance. TOGAF (The Open Group 2010) is taken as the operational reference point for enterprise-architecture practice, as the most widely

adopted industry standard. This ecosystemic yet practice-grounded stance is maintained consistently throughout the thesis and underpins the capability stability ecosystem developed in the chapters that follow.

4.5.3 EA FRAMEWORKS AND CAPABILITY DESIGN

Each of these frameworks—TOGAF, Zachman, and FEAF—can be seen as crucial in providing structured approaches to managing complexity and aligning capabilities with organisational objectives.

TOGAF is one of the most widely used EA frameworks and provides an iterative methodology for defining, developing, and managing EA (Kotusev & Kurnia 2021). TOGAF emphasises four core domains: business, data, application, and technology architectures (The Open Group 2010). Through these domains, TOGAF helps organisations design capabilities that align with their strategic objectives (The Open Group 2010). However, TOGAF's focus on documenting and formalising the architecture can lead to static models that struggle to support rapid adaptability in dynamic environments.

TOGAF's treatment of capability warrants closer examination, because the framework contains a component explicitly named the Architecture Capability Framework (ACF), and it is important to be clear about what this component does and does not address. The ACF is concerned with establishing and operating the enterprise's capacity to practise architecture — the organisational structures, governance bodies, roles, skills, and maturity models required to run an architecture function — rather than with the stability of the individual business capabilities that the enterprise delivers (The Open Group 2010). The term 'capability' in the Architecture Capability Framework therefore denotes the ability to do enterprise architecture, and not the people-, process-, and technology-based business capabilities that form the unit of analysis in this study.

A comparable distinction applies to the way TOGAF manages change. Adaptation is handled principally through Phase H (Architecture Change Management) of the architecture development method, which monitors technological and business developments, assesses change requests, and determines whether a change is significant enough to trigger a new development cycle (The Open Group 2010). Phase H thus governs change to the architecture and its artefacts, ensuring that the enterprise's architecture capability continues to meet current requirements; it does not provide a mechanism for anticipating how a change to any single factor propagates through, and potentially destabilises, a particular business capability. Even TOGAF's most explicitly capability- and change-oriented components therefore operate at the level of the architecture practice and its governance rather than at the level of sustaining an individual capability's equilibrium under continuous change — the gap that the capability stability management framework developed in this thesis is intended to address.

The Zachman Framework organises an enterprise into a matrix based on six fundamental questions—"What," "How," "Where," "Who," "When," and "Why"—each from different perspectives, including planner, designer, and builder (Nogueira, Romero, Espadas & Molina 2013; Zachman 2003). This framework offers a view of the relationships between capabilities and other business elements but

focuses more on structure and classification rather than on operational flexibility (Nogueira et al. 2013; Zachman 2003).

FEAF is one of several internationally recognised enterprise architecture frameworks and provides structured guidance for aligning business processes with IT resources across large, multi-entity organisations. Its emphasis on governance, compliance, and standardisation illustrates how EA frameworks ensure that capabilities are consistently documented and managed to support organisational accountability (McCarthy, 2012). However, as with TOGAF, its structured, top-down approach can sometimes limit the flexibility required for fast-changing environments (McCarthy 2012).

4.5.4 EA's APPROACH TO COMPLEXITY AND CHANGE

Organisational complexity management and change navigation rely on business capabilities as their foundation according to traditional EA practices (Boh & Yellin 2006; Haki et al. 2012; Kotusev & Kurnia 2021; Leong 2024;). A business capability reflects the organisation's ability to execute designated functions through alignment with business objectives alongside technological support structures (Haki et al. 2012; Kotusev & Kurnia 2021; Ross et al. 2006). EA frameworks like TOGAF simplify large organisational structures by turning capabilities into structured models that show component interactions and how they support organisational goals (Haki et al. 2012; Kotusev & Kurnia 2021; Ross et al. 2006; The Open Group 2010).

Organisations can manage complexity through the use of EA frameworks which structure their capabilities and align them with overarching strategic objectives (Haki et al. 2012; Ross et al. 2006). TOGAF, one of the most widely adopted EA frameworks, employs its architecture development method as an iterative process that is designed to refine architectural models and ensure continued responsiveness to changing business requirements (The Open Group 2010). This cyclical approach enables organisations to evaluate, adjust, and optimise their architectures to maintain coherence between strategic intent, operational processes, and technology infrastructure (Kotusev 2019; Ross et al. 2006). By adopting iterative architectural practices, organisations can more effectively navigate complexity, as the continuous review and realignment of capabilities help sustain strategic fit and adaptability in evolving business environments (Haki et al. 2012; Kotusev 2019; The Open Group 2010).

Digital transformation and rapid technological advancement require organisations to exhibit high levels of agility and responsiveness to remain competitive in evolving environments (Warner & Wäger 2019). However, traditional EA frameworks often fail to provide adequate support for such agility because they rely on static, highly documented architectural models that cannot easily adapt to dynamic business and technological conditions (Kotusev 2019; The Open Group 2010). These frameworks generally emphasise formal governance structures and predefined development cycles, which can restrict responsiveness and innovation within fast-changing digital contexts (Haki et al. 2012; Ross et al. 2006). Consequently, traditional EA approaches that depend on top-down governance and

rigid change management protocols impose limitations on organisational flexibility and slow the capacity for timely adaptation (Kotusev 2019; Warner & Wäger 2019).

EA frameworks provide extensive documentation of the ideal structure and operation of organisational capabilities, yet they often fail to address the dynamic stability aspects required for these capabilities to remain effective under changing conditions (Kotusev 2019; Ross et al. 2006). The complexity and effort associated with producing and maintaining detailed architectural documentation can lead to an incomplete operational understanding of how capabilities function in practice, particularly during periods of rapid environmental or technological change (Bente et al. 2012; Lange et al. 2016). This limitation exposes a fundamental weakness within traditional EA practices, which tend to conceptualise capabilities as static organisational assets rather than dynamic, adaptive components that require continuous evolution and refinement to maintain alignment with business needs (Teece 2007; Van de Wetering 2019).

An analysis of leading EA frameworks such as TOGAF, the Zachman Framework, and FEAF illustrates the central role of business capabilities, as these frameworks position capabilities as fundamental structures that organise and guide enterprise architecture practice (The Open Group, 2010; Zachman, 2003; McCarthy, 2012). Business capabilities describe how organisations create and deliver value by aligning resources, processes, and technologies into coherent structures that support strategic objectives (Ross, Weill & Robertson, 2006; Loucopoulos et al., 2015; Azevedo et al., 2015). Within EA, capabilities serve as the central building blocks that organisations design, document, and manage to navigate complexity and change (Haki et al. 2012; Kotusev 2019). However, discussions within EA literature reveal that conceptualising business capabilities as static entities restricts their capacity for adaptive growth and stability in dynamic business environments (Bente et al. 2012; Van de Wetering 2022). Business capabilities therefore require systematic review to evaluate their adaptability, resilience, and contribution to sustained enterprise agility (Teece 2007; Warner & Wäger 2019). This review further examines how business capabilities evolve and retain functionality over time through interactions with external stakeholders, technological infrastructures, and organisational processes (Rahimi et al. 2017; Ross et al. 2006). Developing a deeper understanding of business capabilities enables organisations to address long-standing deficiencies in traditional EA practice while establishing methods to effectively manage capability evolution within complex and continuously changing ecosystems (Kotusev 2019; Van de Wetering 2022).

4.6 BUSINESS CAPABILITY ENABLEMENT, MEASUREMENT, AND ENVIRONMENTAL INFLUENCERS

The concept of capability is found in many disciplines and is broadly defined as an ability to do something (Loasby 2013). A business capability was defined in Section 1.2. More generally, EA researchers define a capability as the combination of people, processes, and technology through which an organisation performs a function. A business capability is a specific type — a subset — of this broader notion of capability, namely its enterprise-architecture instantiation (Van de Wetering et al.

2021). A business can execute a strategy by combining people, processes, and technology (capability) with predefined processes (Kotusev & Kurnia 2021; Lankhorst 2009; Lapalme 2011; Ross et al. 2006; Tamm et al. 2011).

Although the integration of people, processes, and technology is frequently conceptualised as a capability from an EA perspective, it can also be understood as a business function within organisational practice. This highlights the close relationship between business capabilities and the functions through which organisations deliver value, demonstrating their interdependence in supporting strategic and operational goals (Ross et al., 2006; Gregor, Hart & Martin, 2007; Op't Land et al., 2008). This relationship is fundamental because it illustrates how business capabilities—representing an organisation's ability to deploy and coordinate resources effectively—translate into specific functions that deliver business value (Gregor et al. 2007; Ross et al. 2006). Business capabilities and functions are therefore not isolated constructs; rather, they are interdependent components committed to providing value-added services to other functions while ensuring alignment with regulatory and governance requirements (Haki et al. 2012; Ross et al. 2006).

Business services emerge as tangible deliverables that stem from these capabilities and functions, designed to meet both organisational needs and external customer demands (The Open Group 2010; Ulrich & Rosen 2011). They represent the operational realisation of capabilities through coordinated execution, in which people, processes, and technology collaborate to produce defined outcomes for internal stakeholders and external clients (Bente et al. 2012; Van de Wetering 2022). Organisational operations therefore depend on a diverse portfolio of services—such as customer support, IT management, logistics, and regulatory reporting—to maintain efficient and compliant functioning (Haki et al. 2012; Rahimi et al. 2017).

The successful execution of business services relies on the core architectural building blocks formed by business capabilities and functions (Kotusev 2019; Ross et al 2006). An organisation's ability to deliver these services efficiently is contingent upon its capacity to design and manage capabilities that are strategically aligned and operationally optimised (Teece 2007; Warner & Wäger 2019). EA provides the structural mechanism through which essential resources, processes, and technologies are orchestrated to support the delivery of business services (Bente et al. 2012; The Open Group 2010). The relationship between business services and the organisational capability architecture consequently requires adaptability and flexibility to respond to changes in demand, market dynamics, and regulatory constraints (Van de Wetering 2022; Warner & Wäger 2019).

Business services also serve to make the operational dimensions of business capabilities explicit and observable (Kotusev 2019; Ulrich & Rosen 2011). While business capabilities represent the potential to perform specific functions, business services demonstrate the practical realisation of that potential in measurable operational outcomes (Ross et al. 2006; Teece 2007). For example, a human resources capability encompasses recruitment, learning, and employee management functions, while human

resources business services operationalise this capability through activities such as onboarding, performance appraisal, and professional development (Ulrich & Rosen 2011; Haki et al. 2012). Thus, business services act as a critical bridge that transforms organisational capabilities into actionable business functions and measurable results, providing the operational expression of how capabilities create value in practice (Ross et al., 2006; Op't Land et al., 2008; Haki et al., 2012).

The following four figures develop the business-capability picture cumulatively, each adding one layer that the conceptual framework later formalises as a dimension. Figure 5 establishes what a business capability is composed of — the people, process, and technology that enable it. Figure 6 shows how that capability is measured, through the performance, measure, capacity, and engagement metrics. Figure 7 shows what shapes the capability from outside, through the environmental influencers of governance and cost within the external environmental context. Figure 8 then integrates these layers into a single view of the inferred relationships among the factors. Read together, Figures 5 to 8 move from the internal composition of a capability, to its measurement, to its environmental context, and finally to their synthesis, mirroring the three dimensions — enablement, measurement, and influencers — set out in Section 4.7.

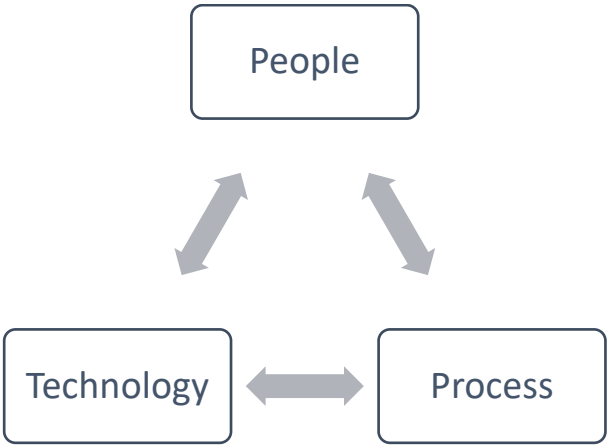


FIGURE 15 A BUSINESS CAPABILITY (ZHU ET AL. 2016; ROSEMANN & VOM BROCKE 2015; THE OPEN GROUP 2010)

From an EA perspective, Figure 5 shows the essential interconnected components of business capability as people, process, and technology. A triangular shape demonstrates the interdependent relationship between these three essential components. The term "people" describes the individuals or teams who manage specific tasks and functions. Process defines necessary workflows which guide people toward achieving specific goals while technology delivers systems that support these processes for efficient operation. The arrows moving both ways between each part demonstrate that all components work together and none function independently. Processes require people to put them into action and yet these people depend on technology to perform their tasks effectively. Technology plays a vital role in supporting people's workflows thus creating an ongoing cycle of dependency between processes and tools. Business capabilities function through the integration of these three components which enables efficient service delivery and business operations. These elements work

together to allow business capabilities to remain stable and effective while adapting to changing business requirements.

4.6.1 THE MEASUREMENT OF CAPABILITIES

A business capability must be provided at a certain performance level to meet service standards that are acceptable to other business functions and external parties. As shown in Figure 6 below, capabilities are measured across four critical metrics—performance, measure, capacity, and engagement—which collectively ensure the business capabilities' efficiency, effectiveness, and overall alignment with organisational goals and external expectations (Morganwalp & Sage, 2004; Ross et al. 2006; Saleem & Fakieh, 2020; Van de Wetering, 2019).

Similarly, a business service needs to be provided at a certain performance level to meet the acceptability of service standards of other business functions and external parties. Services are also measured in terms of performance, measure, capacity and engagement metrics (Morganwalp & Sage 2004; Ross et al. 2006; Saleem & Fakieh 2020; Van de Wetering 2019).

- Performance: Morganwalp and Sage (2004) emphasise that performance metrics are vital in assessing whether capabilities deliver the expected output within the designated time and resource constraints. The authors discuss the importance of evaluating how efficiently and effectively a business capability operates to meet the required reliability, speed, and quality standards.
- Measure: Saleem and Fakieh (2020) underscore the importance of measuring results as part of capability delivery to ensure alignment with organisational goals. Results focus on comparing the actual service output against key performance indicators to evaluate whether the service meets the expected deliverables.
- Capacity: Ross et al. (2006) discuss capacity as a critical factor in managing resources efficiently to meet service-level agreements and the expectations of both internal and external stakeholders. Capacity refers to a capability's ability to meet demand, including its scalability and resource flexibility to maintain performance under varying levels of demand.
- Engagement: Van de Wetering (2019) examines engagement metrics to determine how well a capability interfaces with its stakeholders through interaction and satisfaction levels. The quality of interaction between service providers and users demonstrates engagement through satisfaction and participation which serve as primary indicators of service effectiveness and acceptance.

The individual authors listed above study distinct aspects of business capability measurement which together provide a comprehensive perspective on optimising capabilities to achieve performance targets and fulfil stakeholder expectations.

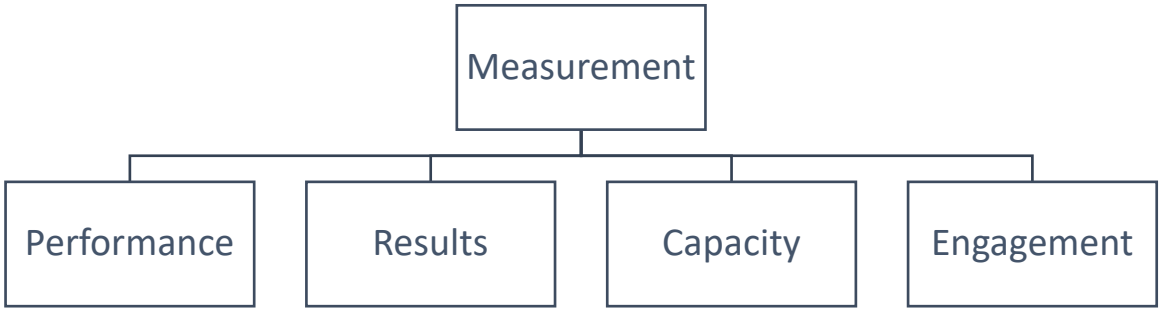


FIGURE 16 METRICS TO MEASURE THE PERFORMANCE OF A CAPABILITY AS DEVELOPED FROM THE LITERATURE

Figure 6 identifies core measurement dimensions through which business capabilities are evaluated to fulfil performance requirements for both internal functions and external stakeholders. Performance, measure, capacity, and engagement serve as essential measurement factors for evaluating if services achieve the required efficiency and effectiveness standards.

Organisations can confirm their operational success by measuring performance, measure, capacity, and engagement, which are essential business capability metrics. Different metrics enable analysis of service efficiency and effectiveness which facilitates service management and optimisation to meet organisational goals and stakeholder requirements.

4.6.2 BUSINESS CAPABILITIES AND ENVIRONMENTAL CONTEXT

Business capabilities provide functions and services to outside parties, according to Op't Land, Proper, Waage, Cloo, and Steghuis (2008). Ross et al. (2006), Morganwalp and Sage (2004) and Lankhorst (2009) provide additional context. External parties could include other business capabilities needing input or output from the business capability or parties outside the organisation (Hoogervorst 2004; Op't Land et al. 2008; Ross et al. 2006). Business capabilities must function effectively and adhere to regulatory requirements for external parties to use them (Op't Land et al. 2008). Op't Land et al. (2008) along with Getter (2007) and Gregor et al. (2007) describe the need for business capabilities to function properly and meet regulatory standards. The business service availability results in both external and internal costs, according to Ross at al. (2006), Tamm et al. (2011), and Op't Land et al. (2008). The environmental context shapes service delivery, according to Beese and his colleagues' research findings. The capabilities mentioned are shaped by the environmental context (Beese et al. 2023; Van de Wetering 2019) where government institutions operate under different laws compared to private sector companies (Ajer & Olsen 2018; Janssen & Kuk 2006; Lee, Oh & Nam 2016).

While we recognise the need to measure business capabilities through the performance, measure, capacity, and engagement metrics, we must also understand how the broader environmental context influences these metrics. Figure 7 illustrates that business capabilities function in a context where external parties along with cost and governance factors exert influence. The delivery, management, and optimisation of services depend on these elements. Business services need to satisfy expectations

along with regulatory requirements established by external parties which include other business capabilities and external stakeholders (Op't Land et al. 2008; Ross et al. 2006). Service provision costs emerge from both internal resource management and surrounding environmental factors (Kotusev & Kurnia 2021; Lapalme 2011; Tamm et al. 2011). According to Janssen and Kuk (2006) and Ajer and Olsen (2018), governance frameworks establish the legal requirements and regulatory obligations that services need to follow, especially in industries where sector-specific regulations exist. Measurement reveals the internal effectiveness of capabilities but understanding the environmental context is necessary to align these capabilities with outside demands for sustained operational performance.

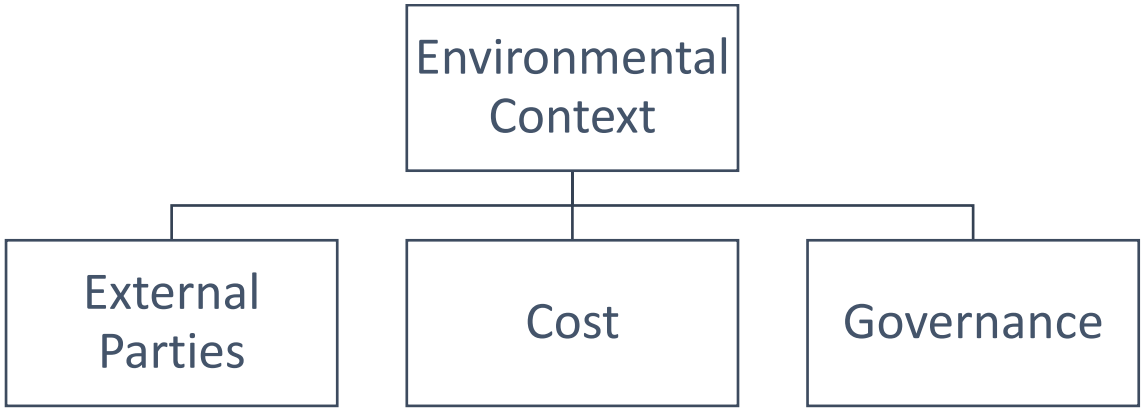


FIGURE 17 ENVIRONMENTAL CONTEXT OF A CAPABILITY (DE HAES, VAN GREMBERGEN, JOSHI & HUYGH 2019; THE OPEN GROUP 2010; ROSS ET AL. 2006)

Figure 7 illustrates how the environmental context of a business service is shaped by the factors governance and cost, situated within its external environmental context. These elements collectively influence how a business capability operates and meets its objectives:

Within the thematic analysis, the placement of external parties within the governance theme is not merely a classificatory convenience but a theoretically substantiated conclusion grounded in the nature of capability ecosystems. Foundational enterprise architecture literature consistently shows that capabilities are shaped not only by internal organisational structures but also by a constellation of external actors whose expectations and requirements are embedded in the capability's design and operation. Hoogervorst (2004) emphasises that external stakeholders form an integral part of the architecture's socio-technical environment, influencing how capability boundaries are defined and how integration, stability, and compliance must be maintained. This framing is reinforced by Op't Land et al. (2008), who argue that governance in enterprise architecture is inseparable from the institutional and regulatory constraints imposed by actors outside the organisation. From a strategic execution perspective, Ross et al. (2006) similarly demonstrate that capabilities operate within externally shaped conditions of legitimacy, regulatory compliance, and value exchange, embedding external expectations directly into the structural requirements of the capability.

The thematic patterns that emerged from the coding supported this theoretical position. Segments concerning external parties did not cluster around general stakeholder engagement or environmental analysis; rather, they consistently aligned with obligatory compliance practices, regulatory oversight mechanisms, mandated reporting structures, and non-negotiable standards of performance. These elements are described in the literature as governance pressures rather than relational dynamics. Getter (2007) highlights how regulatory bodies shape enterprise behaviours through prescriptive interventions that constrain the organisation's operational freedom, while Gregor et al. (2007) show that government and public-sector regulatory environments impose institutional expectations that directly determine how capabilities may function, evolve, and interact. The coded data reflected this same pattern: external parties were not represented as optional collaborators but as agents whose expectations set the conditions of permissible capability behaviour.

This analytic trajectory also explains why external parties appear less visible in subsequent phases of the research. Their influence becomes internalised within governance mechanisms rather than remaining explicit as stakeholder interactions. Once external requirements become codified—through institutionalised routines, standardised compliance obligations, and embedded regulatory expectations—they cease to present as active dependencies and instead operate as implicit structural constraints. As Op't Land et al. (2008) note, the governance impact of external actors becomes part of the architecture's logic itself, shaping capability boundaries even when not directly invoked. In this respect, the apparent diminishment of external parties in later stages does not reflect a true reduction in influence but a transition from explicit stakeholder pressure to latent institutionalised governance.

The thematic grouping therefore reflects the deeper insight that external parties do not function merely as environmental factors but as boundary-setting forces whose expectations and regulatory authority actively stabilise capability behaviour. Their influence constrains variability, defines acceptable performance, shapes compliance obligations, and enforces alignment with legal, strategic, and institutional norms. In a capability stability context, their governance role is both structural and enduring: even when invisible as actors, they remain embedded in the capability's operating logic, shaping its evolution and delimiting its possible trajectories. Thus, the consolidation of external parties under the governance theme emerges as a logically consistent and theoretically grounded outcome of both the literature and the empirical coding process.

- Cost: Delivering business capabilities comes with both internal and external costs. These costs include financial expenses, time, and resource allocation that are necessary for maintaining and optimising the service (Kotusev & Kurnia 2021; Lapalme 2011; Tamm et al. 2011; Ross et al. 2006). The cost aspect is heavily influenced by the broader environmental conditions in which the service operates, impacting decisions on resource allocation and efficiency (Op't Land et al., 2008).
- Governance: The concept of governance encompasses regulatory, legal, and organisational controls which direct business capabilities towards proper function and regulatory

compliance. Governance frameworks vary across different industries and sectors. According to studies by Janssen and Kuk (2006), Ajer and Olsen (2018), and Lee, Oh, and Nam (2016), government institutions operate under more rigorous regulatory standards compared to private sector businesses. Governance establishes compliance with internal standards and external legal regulations which determine business service delivery and maintenance within their operational environment (Beese et al. 2023; Van de Wetering 2019).

By incorporating the factors governance and cost—together with the external parties that constitute the surrounding environment—as Figure 7 highlights, the environmental context influences business capabilities' operation, compliance, and cost-effectiveness. The capability dimensions provide the initial foundation for conceptual model development.

The next step in the development of the conceptual model is to conduct a literature review to examine the relationships of the factors and how they relate and influence each other. A capability is built upon the capability enablement dimension — the three essential elements of people, process, and technology. The collaborative interaction of these components ensures the capability performs its designated function effectively. Its performance is assessed through the capability measurement dimension — the metrics of performance, measure, capacity, and engagement — which together establish operational success. The capability influencers and environmental context dimension — the factors governance and cost, within the external environmental context — dictates how the capability performs and interacts with business functions and regulatory compliance requirements. Figure 8 situates the capability within a complex structure that provides a complete overview of both internal and external elements that are vital to business capability achievement.

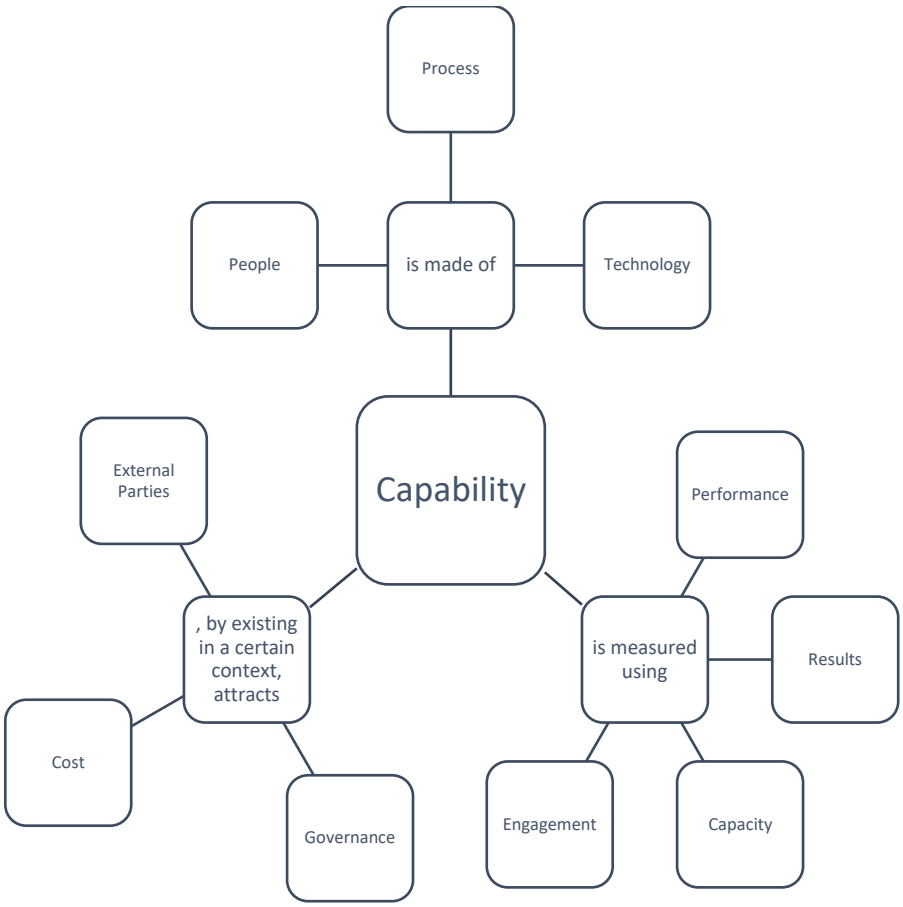


FIGURE 18 INFERRED RELATIONSHIPS OF THE FACTORS OF A BUSINESS CAPABILITY

Figure 8 consolidates the three preceding layers — the composition shown in Figure 5, the measurement dimensions in Figure 6, and the environmental influencers in Figure 7 — into a single visual representation of business capability and its components, demonstrating their interconnections based on insights from numerous academic publications. All parts of the capability, alongside its relationships, originate from essential discussions found in EA and business capability service management literature. Figure 8 therefore constitutes the conceptual framework of the business capability ecosystem promised by this chapter's title: it consolidates the factors and their three dimensions into a single conceptual model of the ecosystem. Chapter 3 then extends this framework into the capability stability ecosystem model (Figure 16) by incorporating stability and adaptation.

The following aspects are relevant to Figure 8:

- The central concept of the diagram represents business capability which demonstrates how organisations use people, processes, and technology to achieve specific results. The understanding of capabilities corresponds to definitions provided by Ross et al. (2006) and Lankhorst (2009), who identify capabilities as crucial elements for organisational strategy.
- Three essential elements define capabilities, namely people, process and technology, together forming the capability enablement dimension. These elements work together to enable the capability's function and to provide effective operation and achievement of business

objectives for the capability. The tripartite framework stands as a widely accepted model for capability comprehension. Op't Land et al. (2008), Ross et al. (2006) and Morganwalp and Sage (2004) support this framework.

- Four key metrics—performance, measure, capacity, and engagement—serve as evaluation criteria to determine how well the capability satisfies both organisational needs and external expectations, together constituting the capability measurement dimension. The foundational structure for capability measurement originates from the studies of Morganwalp and Sage (2004), Saleem and Fakieh (2020), Ross et al. (2006), and Van de Wetering (2019) which emphasise these factors as essential for capability success evaluation.
    - Morganwalp and Sage (2004) demonstrate that performance involves the capability's efficiency and dependability.
    - According to Saleem and Fakieh (2020), results demonstrate the concrete outcomes created by these capabilities.
    - Ross et al. (2006) extensively discuss the term "capacity" as the ability of capabilities to adapt to different demand levels.
    - Van de Wetering (2019) explains that engagement assessments evaluate both stakeholder relationships and their satisfaction levels.
- Governance and cost—together with the external parties that constitute the surrounding environment—form the capability influencers and environmental context dimension that shapes the capability's broader environment. The capability meets external expectations based on its environmental context.
    - Business units, partners, and external stakeholders who depend on the capability's outputs function as external parties. Research by Op't Land et al. (2008), Ross et al. (2006), and Hoogervorst (2004) addresses external parties.
    - Cost includes internal and external expenses for operating and maintaining business capabilities as defined by Ross et al. (2006) along with Tamm et al. (2011) and Lapalme (2011).
    - The regulatory, legal, and compliance frameworks that direct the operation of the capability are defined as governance in works by Janssen and Kuk (2006), Ajer and Olsen (2018), and Lee, Oh, and Nam (2016).

The comprehensive visualisation in Figure 8 demonstrates the creation and measurement of capabilities and their interaction with external environments that connects homeostasis and ecosystem principles in EA. As previously examined, homeostasis focuses on maintaining system stability within dynamic environments, which guarantees that core capability functions remain operational despite external changes. Foundational stability that is required for maintaining balance emerges from internal components namely people, process, and technology. The capability responds to its ecosystem by adapting to external influences from external parties as well as cost and governance factors. When operating in a business ecosystem, external factors like regulatory changes along with

stakeholder expectations and cost variations test the capability's ability to sustain homeostasis. Organisations can evaluate their capability's success against external pressures while preserving its fundamental purpose by monitoring key metrics including capacity, measure, performance, and engagement. The relationship between internal components and external influences reflects ecosystem dynamics which need ongoing adaptation to sustain balance and shows why organisations must match their capabilities to internal consistency and external adaptability. Figure 8 illustrates a comprehensive perspective on capability construction while showing measurement methods and external environmental impacts. The existing literature provides a foundation for understanding how both internal components (people, process, technology) and external factors (external parties, cost, governance) integrate to determine business capability success.

4.6.3 THE THREE DIMENSIONS OF BUSINESS CAPABILITIES

The three-dimensional framework of capability influencers and environmental context, capability measurement, and capability enablement helps to define the business capability ecosystem. This perspective demonstrates the ongoing interaction between internal enabling elements and external influencing factors of capabilities. The strategic grouping of capability building blocks and external parties into specific dimensions improves our understanding of how business capabilities operate within their ecosystem. The reorganisation of these factors into a nested view makes the connection between capabilities and their environment clearer, which proves that capabilities exist within larger systems that adapt to both internal and external forces.

Every capability dimension provides details about the capability's impact on external environments along with its performance metrics and structural components. Capability enablement establishes the foundation of a capability through the integration of people, processes, and technology, ensuring that the necessary resources and structural elements are in place to support effective operational functioning (Ross et al., 2006; Lankhorst, 2009; Op't Land et al., 2008). The dimension governs the capability's internal configuration and structure which enables it to function effectively towards its intended purpose. The capability links to its external environment because its function depends on stable and integrated building blocks.

The capability measurement dimension consists of performance, measure, capacity, and engagement metrics which allow analysis of real-time capability functionality based on findings by Johnson, Clarkson and Huppert (2010) and (Teece 2007). The metrics allow organisations to assess the performance of capabilities by measuring their efficiency and effectiveness against internal standards and external requirements. The measurement factors function as feedback systems which preserve the capability's equilibrium in its ecosystem by adapting to changes in demand and external pressures while satisfying stakeholder needs and maintaining essential functions.

The capability influencers and environmental context dimension includes external elements such as governance, cost, and broader environmental conditions. These influences shape how capabilities

operate and adapt, as highlighted in studies examining regulatory pressures, organisational environments, and external dependencies (Teece, 2007; Janssen & Kuk, 2006; Ajer & Olsen, 2018; Lee, Oh & Nam, 2016; Van de Wetering, 2019). External elements may affect capability effectiveness without needing direct contribution from the business capability. Whenever regulatory updates occur or market dynamics transform, capabilities must adapt to meet new requirements. Operating within an ecosystem displays its complexity through external influences that significantly impact performance capabilities. The dimension emphasises the requirement for capabilities to remain adaptable and responsive through continuous adjustments to environmental changes while ensuring operational stability.

The division of capabilities into three dimensions—capability enablement, capability measurement and capability influencers and environmental context—makes it obvious that capabilities operate within a broad ecosystem that engages with internal enablers and external pressures. Organisations become more effective at capability management when they grasp these dimensions which reveal success-shaping factors and the ways to sustain balance and adaptability throughout business landscape changes.

A detailed description of every element in the existing categories and dimensions of capability enablement, capability measurement, and capability influencers and environmental context is necessary to perform thorough thematic analysis and create a solid conceptual model. A thorough understanding of these elements formalises their definitions and roles when shaping business capabilities within their ecosystem based on the identified factors and dimensions, as well as enables the next step of thematic analysis which needs detailed element descriptions to ground the conceptual framework.

The subsequent section examines every dimension closely to explain how factors are assigned within those dimensions.

4.7 FACTORS AND DIMENSIONS

This section discusses each dimension and the allocation of factors in each dimension of the conceptual model in more detail.

4.7.1 THE CAPABILITY ENABLEMENT DIMENSION

The capability enablement dimension contains the factors that describe the capability's composition. The three components of a capability (people, process, and technology) are critical to defining and establishing a capability (The Open Group 2010; Van de Wetering 2019). The three components of a capability are the factors which influence this dimension. These factors allow the business to describe a capability within its operation, services, and functions to enable the business to fulfil its strategic objectives (Kurniawan & Suhardi 2013; Loucopoulos et al. 2015; Ross et al. 2006).

4.7.1.1 The People Factor

The human element within a capability serves as a fundamental component that determines both the operational effectiveness and success of business capabilities. TOGAF (The Open Group, 2010) defines this factor as the people, organisations, or systems that hold specific roles and perform functions within a business capability. Human resources function as core components for capability development through identification of internal resources who complete essential tasks and external partners who interact with capabilities through different processes and services. It is critical to differentiate between internal human resources who work at the operational core of the capability and external stakeholders who affect outcomes without holding internal employee positions.

A successful business capability depends on people resources to establish and maintain operations according to EA principles. The integration of people resources with processes and technology ensures that business capabilities remain effective and can adjust to evolving business requirements (Bente et al. 2012; Op't Land et al. 2008; Wißotzki & Sonnenberger 2017). The correct allocation and alignment of personnel resources is essential for a capability to perform its designated roles and achieve its objectives. The right skill set combined with organisational alignment enables teams and individuals to perform designated tasks within a business framework.

In EA, the "people" factor requires more than basic human resource allocation because it demands defined roles and responsibilities along with sufficient support and development opportunities that enable individuals to perform their tasks efficiently. The ongoing advancement and refinement of human resources support capability enablement goals which demand flexibility to changing external and internal demands. People fulfil essential roles in leadership and specialised skills or perform operational duties that drive process execution and technology use, making them a critical component for achieving capability success.

Performance and engagement metrics within the capability measurement dimension closely associate with this factor. The performance outcomes depend on the effectiveness of the people engaged while engagement shows the degree to which internal resources support strategic goals and daily operations of business capabilities. The "people" factor functions as both an enabler and a primary force behind continuous improvement and innovation, which enables business capability adaptability.

4.7.1.2 The Process Factor

The "process" factor defines the organised method through which business capabilities perform their work. A process represents a collection of tasks that proceed in a specified order, from an initial trigger or input until they reach a tangible and measurable end result (Lankhorst 2009; Ross et al. 2006). A process serves as more than just a sequence of steps since it functions as an essential component to achieve consistent execution of work while maintaining efficiency and business goal alignment. Through measurable outcomes, organisations measure performance and effectiveness to achieve specific goals with processes which provide systematic methods (Hoogervorst 2004; Lapalme 2011).

Business capability depends heavily on process integration because it introduces standardised execution methods (Lankhorst 2009; Ross et al. 2006). Embedded process-level standards guarantee that task execution remains consistent and repeatable. EA depends on such standards because they establish executable processes which shape the capability's overall structure and functioning, according to Op't Land et al. (2008). The process layer within EA acts as a critical component for operational effectiveness and efficiency which ensures that business capabilities produce consistent measurable outcomes.

Processes need to be standardised to achieve dependable outputs that meet the organisation's strategic objectives. The ability to achieve predictable and measurable results is essential because processes constitute the fundamental structure of business capability design, according to Meyer (2015) and Ross et al. (2006). The performance of business capabilities depends on processes that structure tasks and workflows to optimise efficiency while minimising execution variability. Any alterations in the process steps or resources used or standards followed will generate significant effects on business capability. The effects of process changes extend from task execution efficiency adjustments to complete performance and capability output transformations.

The process factor in a capability involves more than simple task execution. The process factor links not only to task execution but also to capability enablement elements like people and technology. People use processes to fulfil their responsibilities in conjunction with technological tools which help automate and streamline their tasks. Technology functions as an essential support mechanism by automating repetitive tasks, which enables the execution of defined workflows to occur more efficiently and consistently. The process factor serves as a connecting point between human skills and technological tools while organising their use to meet the capability's intended results.

Within the larger framework of EA, processes hold both operational value and strategic importance. To achieve both scalability and adaptability, organisations need to refine and standardise their processes as they work to optimise capabilities and align them with business strategies. Processes serve as foundational elements that enable change management to occur effectively within capabilities. Processes require adaptability to maintain their effectiveness when external conditions and market demands change or internal strategies evolve.

4.7.1.3 The Technology Factor

The technology factor represents the set of technological capabilities that enables a business capability to construct, adapt, and modify its technological resources in alignment with organisational objectives. Technology does not merely support capability execution but determines how effectively capabilities evolve and remain stable under changing conditions. As argued by Wißotzki and Sonnenberger (2017) and Van de Wetering (2019), technology shapes how organisations design and implement context-specific solutions, particularly when adapting global architectures to local requirements. For this study,

the technology factor encompasses IT systems, software applications, hardware, and infrastructure required for capability process execution and workforce enablement.

The functioning of business capabilities depends critically on technology because it provides the operational foundation for process automation, data management, and service delivery. This factor integrates both physical resources—such as computers, servers, and networking equipment—and digital resources, including software platforms, cloud environments, and analytics systems. The strategic integration of these assets automates, optimises, and scales organisational processes to meet capability demands, reinforcing Beese et al.'s (2023) argument that technology is central to capability performance and organisational agility.

Technology management further relies on the effective handling of information, which underpins decision-making and process execution. Information systems within the technological infrastructure capture, store, and analyse data to generate actionable insights and ensure operational alignment between people, processes, and systems (Wißotzki & Sonnenberger 2017). This dynamic flow of information enhances both efficiency and adaptability, establishing technology as a source of continuous learning and innovation rather than a static resource.

Ultimately, for business capabilities to remain effective, organisations must continuously develop and adapt their technological foundations to suit regional contexts, regulatory environments, and industry-specific demands. The adaptability of technology directly influences the resilience and scalability of capabilities, enabling them to absorb disruption and integrate emerging innovations. This demonstrates that the long-term stability of business capabilities depends on the organisation's ability to manage technology as an evolving system—one that balances operational efficiency with innovation to sustain competitiveness in fluctuating environments (Beese et al. 2023; Van de Wetering 2019).

The next section describes the capability measurement dimension and the factors that influence it.

4.7.2 THE CAPABILITY MEASUREMENT DIMENSION

The capability measurement dimension groups and describes the factors that control the business capability and manage the output and internal change decisions of the business capability (Hoogervorst 2004; Johnson et al. 2010; Ross et al. 2006; Van de Wetering 2019; Wißotzki & Sonnenberger 2017) This dimension encompasses several key factors that collectively shape a business's operation, adaptation, and achievement of strategic objectives.

4.7.2.1 The Performance Factor

Organisations must manage capability performance but they frequently lack proper definitions and integration methods (Kumar & Premnath 2012; Tamm et al.2011). Research from Van de Wetering (2019) together with studies by Gregor et al. (2007) support the idea that capability performance management is essential for every organisation. The performance of a capability refers to the specific

actions it performs to carry out its designated function. The ability to execute performance functions is the main focus of capability performance (Gregor et al. 2007; Op't Land et al. 2008; Ross et al. 2006; Van de Wetering 2019).

The core component of capability performance is function execution (Hoogervorst 2004; Korhonen & Molnar 2014; Ross et al. 2006; Wißotzki & Sonnenberger 2017). The capability demonstrates its potential through performance that meets the specific role or function assigned to it within the organisation (Boh & Yellin 2006; Op't Land et al. 2008; Ross et al. 2006). The execution of particular tasks and operations supports the achievement of organisational objectives, according to Tamm et al. (2011) and Op't Land et al. (2008). The function execution of manufacturing capabilities means producing goods to specified standards and customer service capabilities focus on resolving customer inquiries both promptly and satisfactorily. When capabilities execute functions effectively, they accomplish their designated tasks both efficiently and reliably, according to research by Ross et al. (2006) as well as Shanks et al. (2018) and Hoogervorst (2004).

Capability performance heavily depends on process efficiency (Hoogervorst 2004; Shanks et al. 2018; Van de Wetering, Kurnia & Kotusev 2020). The capability performance relates to effective management of resources, time, and effort to fulfil targeted results (Bente et al. 2012; Lapalme 2011; Ross et al. 2006). Process efficiency requires the optimisation of workflows together with waste reduction to improve productivity within capability operations, according to Ross et al. (2006) and Bente et al. (2012). This performance management dimension targets the maximisation of output using minimal resources through process streamlining and bottleneck elimination and the implementation of best practices (Bente et al. 2012; Lapalme 2011). Operational effectiveness and competitive advantage both benefit from process efficiency improvements which also help decrease costs (Tamm et al. 2011). Ross et al. (2006) along with Boh and Yellin (2006) demonstrated process efficiency improvement which enhances operational effectiveness.

According to Bente et al. (2012) resource utilisation significantly impacts capability performance. Effective support for capability functions requires the management and deployment of resources such as human capital, technology, equipment, and finances, according to Hoogervorst (2004) and Lankhorst (2009). Maximum resource utilisation enables capability operations to achieve full potential while eliminating waste and inefficiencies. Resource management requires establishing strategic alignment for resource distribution while continuously tracking resource usage to adjust according to dynamic needs or circumstances (Hoogervorst 2004; Lapalme 2011).

Wißotzki and Sonnenberger (2017) along with Lankhorst (2009) identify quality assurance and control as essential elements for measuring capability performance. The capability must produce outputs and deliverables that adhere to predefined quality standards and requirements (Lankhorst 2009; Op't Land et al. 2008; Saint-Louis & Lapalme 2018). Quality assurance is about putting processes and procedures in place to stop defects before they happen while quality control requires monitoring outputs to find

and fix any quality standard deviations (Lankhorst 2009; Ross et al. 2006; Op't Land et al. 2008). The implementation of effective quality assurance and control measures results in improved performance satisfaction while reducing risks and maintaining the capability's standing for reliability and excellence (Bente et al. 2012; Ross et al. 2006; Op't Land et al. 2008).

The management of capability performance depends on essential tools called performance metrics and key performance indicators (Op't Land et al. 2008; Ross et al. 2006; Tamm et al. 2011). Tamm et al. (2011) developed quantifiable measures that evaluate the effectiveness and efficiency along with the impact generated from capability functions and processes. Lankhorst published relevant findings in 2009. Organisations can use performance metrics analysis to discover their capabilities' strengths and weaknesses as well as improvement opportunities which support better decision-making and ongoing improvement processes (Gregor et al. 2007; Op't Land et al. 2008).

4.7.2.2 The Measure Factor

Results and performance are sometimes used interchangeably but are different. Performance dictates the actions you take and how well you execute them (Op't Land et al. 2008; Ross et al. 2006). The "results" factor includes different core measures which guide capabilities to determine what they need to measure for a selected aspect.

The three major groupings of results characteristics are: operational, technical, and strategic (Ross et al. 2006; Simon et al. 2013). Measures are divided into direct and derived measures: direct measures do not require another measure to be calculated, whereas derived measures are calculated using a combination of measures (Lagerström, MacCormack, Dreyfus & Baldwin 2019; Monteban 2018). The existence of a capability depends on the results; the necessary changes to achieve the required results will impact the business capability, and the impact may be profound if unknown (Azevedo et al. 2015; Lankhorst 2009). The fundamental principle for the measurement of results should be to support achieving business objectives (Foorthuis et al. 2016; Ross et al. 2006).

Operational measures focus on the day-to-day activities and processes that directly impact the operational efficiency and effectiveness of a capability (Boh & Yellin 2006; Bente et al. 2012; Op't Land et al. 2008). These measures typically include metrics related to productivity, resource utilisation, service levels, and operational costs (Foorthuis et al. 2016; Lange et al. 2016; Ross et al. 2006). For example, a manufacturing capability might measure production output, defect rates, and downtime to gauge operational performance and identify areas for improvement.

Technical measures pertain to the specific technical aspects or capabilities required to deliver products or services (Boh & Yellin 2006; Tamm et al. 2011). These measures often involve assessing technological capabilities, infrastructure performance, software reliability, and maintenance metrics (Foorthuis et al. 2016; Lange et al. 2016).

Strategic measures focus on outcomes that align with broader organisational goals and strategic objectives (Ross et al. 2006; Shanks et al. 2018; Tamm et al. 2011). These measures encompass metrics

such as market share, customer satisfaction scores, revenue growth, and competitive positioning (Ross et al. 2006; Simon et al. 2013). Strategic measures help assess the overall contribution of capabilities to achieving organisational success and competitive advantage in the marketplace (Ross et al. 2006; Tamm et al. 2011; Van de Wetering 2019).

The existence and sustainability of a capability depend heavily on its ability to achieve desired results as defined by these measures (Lange et al. 2016; Morganwalp & Sage 2004; Tamm et al. 2011). Organisations use measurement frameworks to monitor performance, identify areas for improvement, and make informed decisions to optimise capabilities (Boh & Yellin 2006; Op't Land et al. 2008; Shanks et al. 2018; Tamm et al. 2011).

Importantly, the fundamental principle for results should always be to support the achievement of business objectives (Morganwalp & Sage 2004; Lankhorst 2009; Op't Land et al. 2008; Ross et al. 2006; Tamm et al. 2011). By aligning results practices with strategic goals, organisations ensure that capabilities are developed, managed, and optimised to contribute effectively to overarching business strategies. This strategic alignment not only enhances results but also enables organisations to adapt to changes in the business environment, mitigate risks, and capitalise on opportunities for growth and innovation.

4.7.2.3 The Capacity Factor

The "capacity" factor evaluates both the ability to perform tasks and the throughput required to meet varying levels of demand, as discussed by Ross et al. (2006) and further supported by studies emphasising scalability, resource flexibility, and the organisation's ability to sustain performance under changing conditions (Morganwalp & Sage, 2004; Van de Wetering, 2019). When capacity gets added, it results in enhanced performance of existing capabilities (Ross et al. 2006; Saleem and Fakieh 2020; Van de Wetering 2019). Business capability faces potential disruption when capacity constraints occur through technology limitations or process inefficiencies which lead to changes in responsibilities or process modifications to manage shortfalls (Azevedo et al. 2015). The work of Azevedo et al. (2015) together with studies by Boster et al. (2000) and Op't Land et al. (2008) show that capacity constraints may lead to a shift in responsibilities and outputs or process alterations to manage shortfalls.

The capacity factor plays a critical role in capability management because it directly influences how efficiently an organisation can deliver products or services to satisfy customer demand (Korhonen & Halén 2017). A capability delivers expected outputs without constraints when it possesses enough capacity to function smoothly (Azevedo et al. 2015; Korhonen & Halén 2017; Ross et al. 2006). Capacity constraints develop when a capability's resources, technology, processes, or workforce reach their full potential (Azevedo et al. 2015; Korhonen & Halén 2017; Ross et al. 2006).

The capacity of capabilities can be restricted by technological constraints which impede the efficiency or functionality of equipment or software systems (Boh & Yellin 2006; Janssen & Kuk 2006; Ross et al.

2006). Process constraints manifest when business workflows or operational procedures demonstrate inefficiency or lack flexibility (Bente et al. 2012; Ross et al. 2006).

Workforce limitations concerning skills availability and employee capacity cause people constraints, according to Tamm et al. (2011). The work of Ross et al. (2006) provides foundational insights. When capabilities lack skilled personnel or sufficient training, they struggle to perform tasks effectively which reduces both output quality and quantity (Boh & Yellin 2006; Bente et al. 2012; Hoogervorst 2004). By implementing workforce planning alongside training initiatives and strategic hiring practices, organisations can overcome workforce constraints and ensure their capabilities operate efficiently with the necessary talent and expertise, according to Ross et al. (2006) and Bente et al. (2012).

Organisations need to adjust their operations when they recognise capacity constraints to lessen the effects on their business capabilities (Azevedo et al. 2015). Organisations need to adapt to capacity constraints by implementing changes in business capabilities, as demonstrated in studies by Azevedo et al. (2015) together with research from Ross et al. (2006) and Boh and Yellin (2006). Organisations could manage capacity limitations through actions like redistributing team responsibilities, modifying production timelines or by increasing resource investments (Op't Land et al. 2008; Ross et al. 2006). Organisations face disruptions to their existing workflows and must make additional investments and operational strategy changes when they implement these adjustments (Mulder 2023; Ross et al. 2006).

When organisations face capacity constraints, they may respond by redesigning processes, upgrading technology infrastructure, or reallocating work to alternative internal or external service arrangements to improve efficiency and scalability. Such adaptations reflect the need to maintain performance under changing demand conditions and align operational capacity with organisational objectives (Ross et al., 2006; Morganwalp & Sage, 2004; Van de Wetering, 2019). Organisations make strategic choices to maximise capacity use and guarantee that their capabilities stay aligned with increasing market demands and customer expectations (Boh & Yellin 2006; Hoogervorst 2004; Op't Land et al. 2008; Ross et al. 2006).

4.7.2.4 The Engagement Factor

The "engagement" factor measures how the business capability interacts with its environment. Engagement should be derived from both the capability and organisational needs (Tamm et al. 2011; Tambo 2017; Ross et al. 2006). These needs are driven by customer outcomes (expectation management), business objectives, improvement objectives, and statutory and regulatory requirements (Lapalme 2011; Tamm et al. 2011). Activities performed within an engagement should be aligned with the engagement objectives (Gregor et al. 2007; Morganwalp & Sage 2004; Op't Land et al. 2008). Because engagements drive the need and output of capabilities, they would impact the business capability when there is a change in the engagement model and processes that the business capability is currently following (Tamm et al. 2011; Van de Wetering 2019). More stringent service level agreement hours might require higher output from supporting technologies.

The engagement factor in capability management is essential in understanding how a business capability interacts with its environment, encompassing both internal organisational needs and external requirements (Tambo 2017; Tamm et al. 2011; Ross et al. 2006). This interaction is important as it directly influences the effectiveness, efficiency, and alignment of capabilities with broader business objectives (Ross et al 2006; Tambo 2017; Tamm et al. 2011).

4.7.2.4.1 Engagement within a capability context involves different viewpoints

Expectation management in customer outcomes fundamentally influences customer engagement levels (Op't Land et al. 2008; Ross et al. 2006). The effective delivery of products and services depends on businesses understanding and managing customer expectations so that they fulfil or go beyond customer needs (Bente et al. 2012; Tamm et al. 2011). By aligning capabilities with customer-centric goals, this aspect enhances both satisfaction and loyalty.

The strategic direction and priorities of an organisation are shaped through its business objectives, which provide the foundation for aligning resources, capabilities, and architectural decisions (Azevedo et al., 2015; Simon et al., 2013). Business engagements should drive strategic goals by promoting major outcomes such as revenue growth and market expansion while also enabling cost savings and innovation (Bente et al. 2012; Op't Land et al. 2008; Ross et al. 2006). When capabilities align with business objectives, they direct their efforts towards activities that create value and establish competitive advantage.

Improvement objectives function to boost capability performance by applying continuous improvement initiatives (Van de Wetering 2019). Through engagements, organisations can discover improvement opportunities to adopt best practices and implement innovative solutions that enhance capability outcomes and operational efficiency (Hoogervorst 2004; Tamm et al. 2011; Van de Wetering 2019).

The activities inside engagements must correspond with defined objectives to achieve clarity alongside consistent and effective results (Bente et al. 2012; Rahimi et al. 2017; Tamm et al. 2011). Through proper alignment, capabilities achieve efficient deployment and resources reach their optimal usage to produce desired results.

Modifications to engagement models or processes carry substantial implications for business capabilities. More rigorous service level agreements demand increased output capabilities together with improved responsiveness and enhanced quality to fulfil contractual requirements. Maintaining compliance and performance standards may require organisations to enhance supporting technologies or adapt operational procedures and make additional resource investments.

The combination of technological progress and changing market dynamics may require organisations to modify their continuous engagement strategy. Organisations need to exhibit agility and proactivity in their response to changes, which involves revisiting engagement frameworks and reassessing objectives to align capabilities with changing customer needs and business priorities.

The next section describes the factors in the capability influencers and environmental context dimension.

4.7.3 THE CAPABILITY INFLUENCERS AND ENVIRONMENTAL CONTEXT DIMENSION

The capability influencers and environmental context dimension groups factors that are almost always external to the capability. Even though this impacts the design and function, changes in this dimension are not within the control of the business capability itself.

4.7.3.1 The Governance Factor

IT governance is a complex system with several critical aspects. The essential components of IT governance include leadership structures and decision rights within organisations, along with scalable processes and enabling technologies (Maleh, Sahid & Belaissaoui 2019). Organisations' IT assets are managed through IT governance which follows principles outlined by Tamm et al (2011) and Shanks et al. (2018). The management of IT assets together with their role in business abilities makes this governance component an external factor for business capability evaluation and maintenance which warrants further definition (Shanks et al. 2018; Tamm et al. 2011).

IT governance serves as a fundamental mechanism that directs the management and use of IT assets to support and strengthen business capabilities effectively (Ross et al., 2006; Simon et al., 2013).

The function of IT governance serves as an essential factor outside the organisation that determines how business capabilities are measured and preserved (Boh & Yellin 2006; Gregor & Hevner 2013; Op't Land et al. 2008). IT governance strengthens business capabilities by implementing clear control frameworks for IT assets, synchronising IT strategies with business goals, driving operational efficiency, managing risks effectively, and supporting innovation (Korhonen & Halén 2017; Van de Wetering 2019). Through robust IT governance, organisations can better use technology investments, respond to market changes, and secure sustainable growth within competitive markets.

4.7.3.2 The Cost Factor

The complete IT operating budget must be considered and then decomposed into hardware, software, and human resource costs to define the operating cost (Teece 2007). When summarising the costs and associated risks against the actual operating costs, decisions might be made to hold off on software upgrades, impacting the pace of change in the business capability.

4.7.3.3 The Environmental Context Factor

Organisations that operate in different environmental conditions require different management behaviours. Based on the dynamic capabilities concept, the ecological context is not just that of the domain of the business but a business "ecosystem" that includes all organisations, institutions and individuals affecting the company's business (Jongbloed, Enders & Salerno 2008). The regulatory landscape with the applicable laws relating to the business domain is also covered in this factor (DuBois 2022).

The three dimensions, along with their factors, provide context when looking at which factors influence what the capability should be able to do and how it should perform its activities. Business capabilities are architected for specific outcomes, using specific factors within a specific context. The design is done so that these dimensions work harmoniously to get the desired results. Based on this conceptual dimensional view, with all the factors which can influence the working of a business capability, stability is essential because business capabilities are designed to perform (people, capacity) activities (process) in a defined standardised (governance) manner in various systems (technology) to achieve specific outcomes (capability measurement, performance and measure) with multiple stakeholders (engagement) at one particular cost. The next section introduces ecosystems and stability.

4.8 CAPABILITY ECOSYSTEMS AND STABILITY

Section 2.7 outlines how the systems theory-derived homeostasis concept is essential to comprehend how business capabilities need to operate within their overall ecosystem. Systems theory uses homeostasis to describe how a system keeps a stable internal balance even when faced with external environmental changes. Business capabilities must sustain internal stability while responding to external influences in order to perform as intended, reflecting systems and homeostasis principles that emphasise balance between internal structure and environmental conditions (Gharajedaghi, 2011; Laszlo & Krippner, 1998; Merali, 2006).

The achievement of homeostasis becomes particularly complex when business capabilities must interact within their ecosystem alongside other capabilities and external elements such as stakeholders and regulations while adapting to changing market conditions. The structure of a business capability includes people, processes, and technology as interconnected elements that form a unified system to deliver particular functions and services. To ensure effective functioning, businesses must maintain proper internal equilibrium between their components when they operate together. When a business capability undergoes major changes in its components, like technology improvements or process re-engineering, it disrupts the system's equilibrium, which can result in performance issues (Gharajedaghi 2011; Merali 2006).

The capability ecosystem develops through both internal and external determinants, such as governance structures and regulatory requirements, alongside cost frameworks and stakeholder expectations. External factors and environmental perturbations can affect business capability either directly or indirectly since the capability needs to adapt constantly in order to remain stable in a changing environment. Changes in regulatory requirements or technological advances in the market may require updates to processes or technology that disrupt the capability's equilibrium. Business capability requires constant equilibrium management which involves both internal changes and responses to external factors.

The capability functions as an integrated system where each component depends on the others so that disruptions in one area will trigger subsequent impacts throughout the system. The components people, process, and technology within the capability function together as interdependent elements that support the system as a whole. A technological change triggers the need to modify existing processes while providing additional training for employees. The interconnected components of business capability need to function together in harmony to ensure its productivity and functionality within its ecosystem. The interaction demonstrates systems theory fundamentals because it treats complex entities as networks of interdependent parts that need each other to function correctly.

Homeostasis represents an active self-regulating mechanism that enables business capability to adjust to new situations while preserving essential operational functions (Laszlo & Krippner 1998). When the operational ecosystem of a capability faces transformation through external elements like market trends, technological advancements, and regulatory changes, stakeholder demand shifts. The capability must modify its internal components to regain equilibrium when necessary changes occur. Capability stability operates dynamically through ongoing monitoring and adjustment which ensure continued delivery of its intended functions.

Viewing business capability as part of an ecosystem enables stakeholders to grasp its operational dynamics and evolutionary patterns in greater depth. Systems theory establishes the framework for understanding capabilities as networks of interdependent elements which together support the overall system stability and adaptability (Gharajedaghi 2011). Management of internal homeostasis within the capability needs to consider the broader external environmental context to maintain performance stability despite environmental disruptions.

After explaining and defining each factor of the conceptual model, the study evaluates the factors' significance and examines their integration within the conceptual model.

4.9 SUMMARY AND DISCUSSION

This chapter established the conceptual foundations for managing business capability stability. It positioned enterprise architecture as the context in which capabilities are designed and governed, and characterised a business capability as an integrated system of people, processes, and technology. A central take-away is that traditional EA practice tends to treat capabilities as static structures — documenting their ideal form but offering little for the dynamic stability they need to remain effective as conditions change.

To address this, the chapter reframed the business capability as part of a wider ecosystem and organised the review around three dimensions: capability enablement, capability measurement, and capability influencers and environmental context. Together these dimensions, and the factors within them, describe what a capability needs in order to function, how its performance can be judged, and the external forces that act upon it.

Systems thinking and the principle of homeostasis provide the organising logic that binds these dimensions together. A capability remains stable not by staying fixed but by continuously regulating the internal equilibrium among its people, processes, and technology while adapting to external change; stability is therefore a dynamic, self-regulating property rather than a static state. The key message for the reader is that capability stability must be understood and managed at the level of the ecosystem, balancing internal coherence against environmental disruption.

These three dimensions and their factors are consolidated into the capability stability ecosystem conceptual model. The full assembly of that model — the derivation of its factors through a thematic analysis of the literature and their organisation into the layered ecosystem — is presented in Chapter 3, which builds directly on the foundations set out here.

5 CHAPTER 5: THE CAPABILITY STABILITY MODEL AND PROPOSED SOLUTION

This output was used to define the capability ecosystem and capability stability and produce the capability ecosystem stability meta-model. These outputs are described in more detail in the following sections.

5.1 THE CAPABILITY STABILITY ECOSYSTEM CONCEPTUAL MODEL

This study's research goal to create a framework that manages capability stability throughout the organisational ecosystem matches the researcher's decision to employ systems thinking. Extensive research on systems thinking and EA exists but lacks studies about its use in capability ecosystems for stability management. This research targets the literature gap to create a systems thinking-based framework for capability management challenges that offers fresh insights for stabilising and adapting capabilities within changing environments (Lankhorst 2009; Op't Land et al. 2008). This section investigates potential solutions to IS problems through an EA philosophical approach.

Each element interpreted below was introduced, defined, and justified earlier: the capability enablement, capability measurement, and capability influencers and environmental context dimensions and their factors are set out in Sections 4.6 and 4.7; enterprise architecture, design, and adaptability are discussed in Sections 4.5.3 and 4.5.4; and all were confirmed by the thematic analysis in this chapter. The people, process, and technology layers form the centre of the capability ecosystem because these elements define the fundamental structure of a capability. Surrounding this core is the second dimension, consisting of engagement, measure, capacity, and performance. These factors emerged as the most prominent evaluative attributes in the thematic analysis and represent how a capability's functioning is assessed in practice. The outer layer consists of governance and cost, which exert influence on capability performance but do so at a more external and contextual level compared to the inner layers.

Taken together, these layers illustrate how capabilities are constructed, assessed, and influenced within their organisational environment. Governance and cost operate as external pressures shaping capability behaviour; performance, measure, capacity, and engagement function as internal attributes used to evaluate capability effectiveness; and people, process, and technology form the structural foundation upon which the capability itself is built.

Considering that enterprise architecture, design principles, and adaptability are central to how capabilities are established and evolve over time, these concepts are reflected in the meta-model as integrative influences. They shape how capabilities are configured, how their supporting structures are aligned, and how they adjust in response to environmental changes. The meta-model can therefore also be interpreted as follows:

- governance and cost influence the capability from the outer context;
- performance, measure, capacity, and engagement operate as capability attributes;

- people, process, and technology constitute the core components of a capability; and
- capability establishment and evolution are informed by architectural design and the need for adaptability.

This interpretation emphasises that capability stability results from the interaction between internal structure, evaluative attributes, and external contextual forces, all of which are shaped through ongoing architectural and design considerations.

The ultimate goal of EA is thus to design a capability for stability using the capability ecosystem as a reference model. A change in the business environment implies possible disruption in the ecosystem, which, in turn, could impact the capability in unknown ways. A clear understanding of the concepts of capability and its relationship to the ecosystem is needed so that the impact itself can be studied. Despite the importance of these concepts and the demand for EA to align strategy and IT enablement, the literature does not provide a clear, concise definition of capability ecosystems or stability. In response to this lack, this study clarified that a capability ecosystem comprises the most prevalent factors mentioned in the literature and the analysed articles.

The factors are core to the capability ecosystem, and each plays an essential role in determining the capability's function and output. Therefore, a capability ecosystem consists of the concepts, factors, and attributes grouped by influence dimensions that collectively constitute the capability.

The analysis also defines Capability Stability as follows:

Capability Stability is the capacity of a capability to remain in, or return to, a state of equilibrium when disruption occurs. It refers to the capability's strength to endure disruption and to tolerate changes to the defined factors of its capability ecosystem — those grouped within the capability enablement, capability measurement, and capability influencers and environmental context dimensions — without loss of the capability's core function.

Figure 16 integrates all of the preceding results into a single diagram and is derived as follows. The factors identified in the thematic analysis (Table 2 and Table 3) were grouped into the concrete concepts of Table 4 and then organised into the three dimensions established in Chapter 2 — capability enablement, capability measurement, and capability influencers and environmental context. These dimensions are arranged as concentric layers around the business capability: capability enablement (people, process, and technology) forms the inner core; capability measurement (performance, measure, capacity, and engagement) forms the middle layer; and capability influencers and environmental context (the factors governance and cost, within the external environmental context) forms the outer layer. Enterprise architecture, design, and adaptability act as integrative influences that cut across the layers, shaping how the capability is configured and how it adapts to change. The resulting model expresses capability stability as the equilibrium maintained across these interconnected layers, and it is this synthesis that Figure 16 presents.

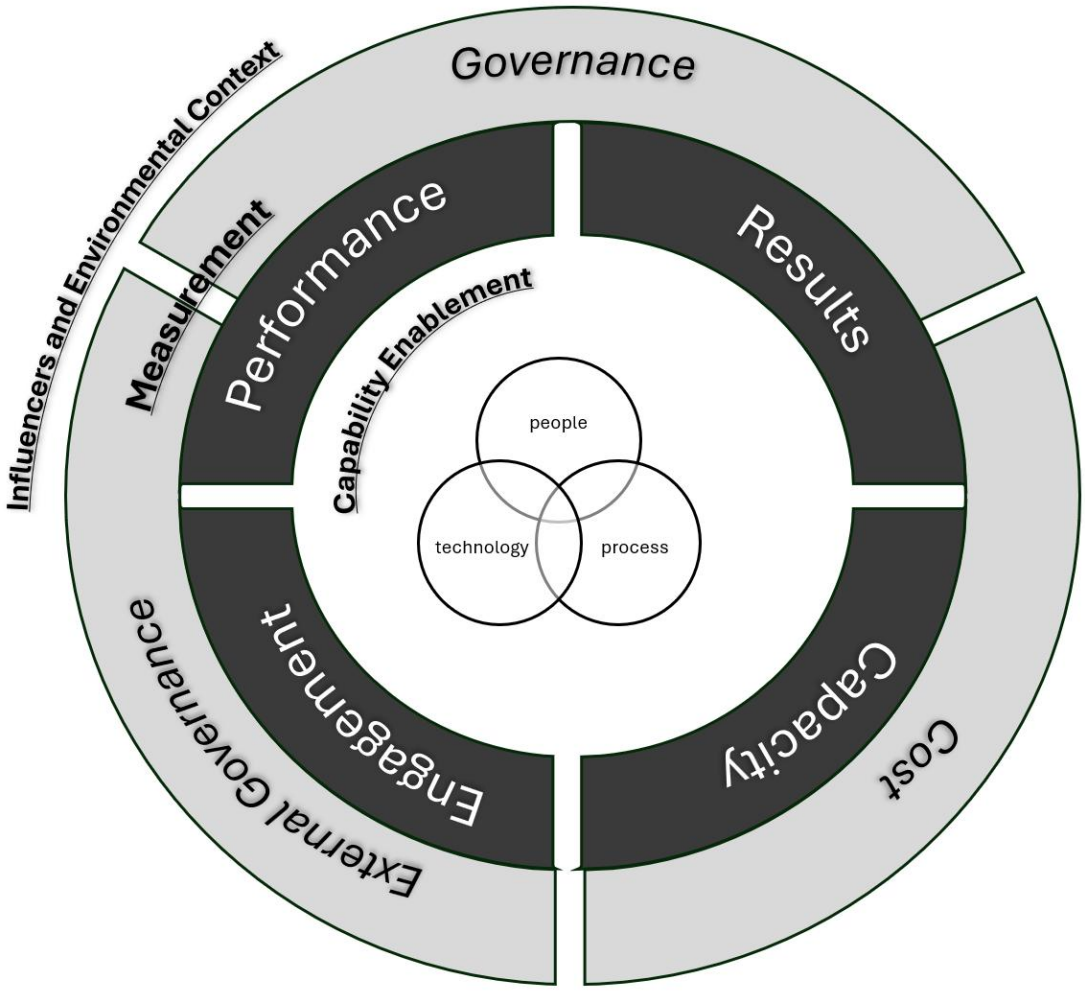


FIGURE 19 THE CAPABILITY STABILITY ECOSYSTEM CONCEPTUAL MODEL

Figure 16 represents the Capability Stability Ecosystem Conceptual Model which provides a structured understanding of how business capabilities operate and are influenced by various internal and external factors. The diagram visualises the core components of a business capability—people, process, and technology—and their relationship to performance metrics, and external influencers and environmental context. These components form the backbone of a business capability, which must maintain stability and adaptability in its broader ecosystem to perform optimally.

5.1.1 INNER LAYER: CAPABILITY ENABLEMENT

Three foundational components define a business capability according to the diagram: people, process, and technology. The Open Group (2010) identifies these elements as essential for carrying out the specified functions of a capability. The internal human resources who execute tasks and oversee the capability are defined as people, according to Wißotzki and Sonnenberger (2017) and Bente et al. (2012). Processes establish the operational framework through structured tasks and workflows that support a capability's functionality (Ross et al., 2006; Lankhorst, 2009). The term technology in this context includes all IT systems and equipment along with the software that supports information management systems to maintain business capability operations. The three components

serve as the core building blocks for enabling business capability. The combined elements ensure operational functionality and enable business function delivery for the capability.

5.1.2 MIDDLE LAYER: CAPABILITY MEASUREMENT

The diagram's middle layer shows the measurement metrics which examine the capability's ability to deliver the services it was designed for. This dimension consists of four key factors: performance, measure, capacity, and engagement. The metrics reveal how a capability is measured in delivering the services and its ability to satisfy both internal and external expectations. The performance metric evaluates the business capability's efficiency and reliability while measuring its effectiveness in delivering intended services (Morganwalp & Sage 2004). Results measure the concrete deliverables of the capability to confirm alignment with organisational objectives (Saleem & Fakieh 2020). Capacity measures how well the capability can increase its operations to meet different demand levels and keep its quality stable (Ross et al. 2006). Engagement indicates how well stakeholders both inside and outside the organisation interact with each other and feel satisfied with their experiences (Van de Wetering 2019).

The four metrics serve as factors to consider for measuring the health of the capability and deciding if improvements or adaptability changes are required.

5.1.3 OUTER LAYER: INFLUENCERS AND ENVIRONMENTAL CONTEXT

The diagram's outermost layer depicts external factors which determine how the capability functions and maintains stability in the business ecosystem. A proper understanding of how the capability engages with and adjusts to outside pressures demands knowledge of influencers and environmental context elements. Governance, cost, and external parties represent the three principal factors in this layer.

The term governance describes the rules and guidelines from regulatory frameworks and compliance standards that govern the capability's functioning, according to Janssen and Kuk (2006) and Ajer and Olsen (2018). Organisations need to adhere to the existing regulations to stay compliant and maintain functionality in their ecosystem.

The cost factor represents both monetary and resource expenditures that are essential for operating the capability, which covers technological investments and expenses related to personnel and infrastructure (Ross et al. 2006; Tamm et al. 2011). The sustainability and efficiency of the capability are mainly affected by cost considerations.

The term external parties refers to customers and partners as well as regulatory bodies that engage with the capability or affect its functionality according to Op't Land et al. (2008) and Hoogervorst (2004). The capability operates under the influence of external factors that either engage directly with it or establish performance standards and compliance requirements.

5.1.4 INTERCONNECTION AND HOMEOSTASIS

The diagram emphasises the interconnectedness of the capability's internal and external components, reflecting systems theory and the concept of homeostasis. The capability enablement layer (people, process, and technology) must maintain equilibrium while responsive to the capability measurement factors and the influencers and environmental context. Any changes in external factors, such as governance or cost, can impact the capability's performance, measure, and capacity, potentially disrupting its internal balance.

This capability stability ecosystem conceptual model has allowed the research to answer:

- SRQ 1 – Sub-Research Question 1: What is capability stability?
- SRQ 2 – Sub-Research Question 2: What dimensions and factors are required to describe a business capability?

The framework has also allowed the researcher to realise the first two sub-research goals:

SRG 1 – Sub-Research Goal 1: Develop a definition for capability stability.

- SRG 2 – Sub-Research Goal 2: Define a capability stability ecosystem conceptual model.

By viewing the business capability as part of a broader ecosystem, the framework illustrates how internal and external forces work together to maintain or disrupt the stability of the capability. The ability of a business capability to achieve homeostasis—its capacity to remain stable despite external perturbations—depends on its adaptability and responsiveness to changes in the ecosystem. This dynamic interaction is key to ensuring the long-term viability and success of the capability within the organisation and its broader business context.

The definitions of a capability stability ecosystem and the term capability stability provides a structured conceptual model which can be used to meaningfully discuss how capability stability can be managed and how to determine which factors are most likely to cause issues with the stability of the capability if a change should occur.

The next section discusses the main research problem—Question 1: What can be used to manage capability stability to maintain the value or purpose for which the capability was designed?—and theorises on how to potentially solve this problem now that there is a conceptual model to assist in discussing the factors and dimensions.

The main research problem requires a pragmatic approach and design. It is also important to ensure that the contribution can be used academically and practically.

5.2 ENTERPRISE ARCHITECTURE ARTEFACTS AS MECHANISMS FOR SOLVING IS PROBLEMS

EA utilises artefacts, including how-to guides and methodologies, to solve IS challenges. Artefact types offer distinct methods for solving complex problems which range from tactical task-based solutions to

comprehensive strategic alignment. The practical nature of how-to guides lies in their ability to provide sequential instructions that transform theoretical frameworks into practical actions. Methodologies establish organised problem-solving systems through embedded principles and practices which direct task execution, thereby bringing order to complex systems. Frameworks represent the most widely-used EA artefacts because they maintain a balance between structure and flexibility while delivering adaptable solutions that unify all architecture components. The artefacts serve as essential tools for aligning information system solutions with organisational objectives while enabling adaptation to evolving environmental conditions. The upcoming sub-sections conduct an in-depth analysis of these artefacts by focusing on their strengths and limitations as well as their functions within EA.

5.2.1 HOW-TO GUIDES: PRACTICAL, TASK-ORIENTED SOLUTIONS

Within EA, how-to guides provide detailed, step-by-step instructions that translate strategic frameworks into executable actions for specific tasks (Bente et al. 2012; Jackson 2024). They simplify complex processes and enable immediate action, but operate within restricted scopes: they address particular tasks without the broader context or adaptability of methodologies and frameworks, serving as aids within a larger plan rather than as complete solutions (Jackson 2024).

5.2.2 METHODOLOGIES: STRUCTURED APPROACHES TO PROBLEM-SOLVING

A methodology in the context of IS and EA is a comprehensive set of principles, processes, and practices that guide the execution of tasks and achieving goals (Bente et al. 2012; Niemi & Pekkola 2017). Methodologies are philosophical because they embody a worldview about how problems should be approached and solved (Frank 2006).

Philosophically, methodologies contribute to IS problem-solving by imposing order on complexity (Foorthuis et al. 2016). They offer a structured way of thinking about problems, ensuring that all relevant factors are considered, and solutions are developed logically and systematically. However, while methodologies are powerful tools, they can sometimes be rigid and challenging to adapt to unexpected changes or unique organisational contexts (Lapalme 2011; Ross et al. 2006).

5.2.3 FRAMEWORKS: THE PREFERRED SOLUTION IN EA

The most frequently developed artefact within the EA discipline to address organisational and IS challenges remains the framework (Simon et al. 2013). Frameworks provide an ordered yet adaptable method for structuring and addressing the diverse components of enterprise systems, offering a modular approach to problem-solving (Simon et al. 2013). While methodologies typically prescribe detailed, step-by-step procedures, frameworks define essential components and relationships that enable EAPs to tailor them to organisational contexts and requirements (Simon et al. 2013; Venable et al. 2016).

Frameworks demonstrate philosophical strength through their ability to provide structured architectural guidance while remaining sufficiently flexible to accommodate organisational context and change. This balance between stability and adaptability is reflected in widely used EA frameworks

such as TOGAF, which offers a structured methodology and common vocabulary yet allows customisation to organisational needs (The Open Group 2010). Similarly, Op't Land et al. (2008) emphasise that EA frameworks serve as integrative mechanisms that direct architectural coherence while supporting contextual variation across business environments. They deliver a holistic view that is compatible with EA's systemic approach, which integrates business processes, data, applications, and technology into a unified enterprise perspective (Bente et al. 2012; Op't Land et al. 2008; Lankhorst 2009). This integration ensures that IS are developed as coherent parts of the enterprise rather than as disconnected solutions (Bente et al. 2012). Their effectiveness in solving IS challenges lies in their adaptability to diverse organisational needs and rapidly evolving technological environments (Bente et al. 2012; Gong & Janssen 2019; Tamm et al. 2011). Frameworks thus serve as dominant solutions in EA because they provide a standardised structure that can still be customised to meet specific contexts (Bente et al. 2012; Van de Wetering, Kurnia & Kotusev 2020).

Despite their strengths, however, frameworks are not without limitations. Many existing EA frameworks remain overly abstract, offering conceptual completeness but limited practical guidance for real-world application (Kotusev & Kurnia 2021; Van de Wetering et al. 2021). Their extensive documentation requirements and assumption of linear, predictable change are often in conflict with the complex and adaptive nature of modern digital ecosystems (Rahimi et al. 2017; Warner & Wäger 2019). As a result, frameworks can become rigid structures that fail to evolve with the dynamic operational realities of organisations (Ross et al. 2006; The Open Group, 2010).

Nevertheless, these limitations do not diminish the value of frameworks as a problem-solving artefact but rather highlight the need for their refinement. A design that incorporates adaptability, iterative validation, and feedback mechanisms can address the rigidity of traditional frameworks while maintaining their structural strengths. Building on design science principles, this research develops a framework that retains the conceptual clarity and modularity of existing models but extends them with adaptive mechanisms for managing capability stability. By embedding continuous evaluation, contextual alignment, and stakeholder-driven flexibility, the proposed framework responds to both theoretical gaps and practical demands within EA. This approach acknowledges the constraints of traditional frameworks yet deliberately advances their evolution toward supporting sustained capability stability within dynamic enterprise environments.

5.3 FOR THIS STUDY — THE PROPOSED SOLUTION

By developing an EAP framework as part of the PhD research, this study integrates academic inquiry with professional practice. This approach ensures that the doctoral work not only contributes theoretically to the IS discipline but also responds directly to the practical demands faced by enterprise architecture practitioners in industry. The development of this framework requires the integration of existing theories and practices into a flexible, structured method which solves real-world challenges in IS. The ability to convert scholarly research into practical tools proves essential in the multifaceted IS field where technology meets business processes and organisational strategies. The research develops

a framework which creates valuable additions to both theoretical knowledge and practical EAP tools while connecting academic research with industrial application (Bente et al. 2012; Kotusev & Kurnia 2021).

EA demands an understanding of multiple components including technology infrastructure, data systems, business operations and organisational strategic planning. The multifaceted nature of EA requires integrated solutions which organisations can customise to fit their unique environments while addressing emerging challenges. Frameworks provide a structured management approach to handle complexity through consistent methodologies which guide practitioners to align their IT solutions with their organisation's strategic objectives (Niemi & Pekkola 2017; Ross et al. 2006). Frameworks provide clarity and coordination which serve as a navigation tool for EAPs when dealing with the intricate aspects of EA (Lankhorst 2009).

Developing a framework stands out as advantageous because it maintains a balance between structural organisation and adaptable flexibility. The dynamic nature of the IS environment makes inflexible methods ineffective because technology and business requirements change quickly. Frameworks, however, are inherently adaptable. They provide a solid structure that supports customisation for different organisations or project requirements (Bente et al. 2012). Because of their adaptability, frameworks maintain usability across multiple scenarios, which turns them into versatile instruments for EAPs. The capacity for frameworks to be customised to target challenges demonstrates the dynamic essence of EA since solutions require continual adaptation to technological, business strategy shifts, and external environmental factors (Tamm et al. 2011).

The application of frameworks substantially improves interactions and teamwork between all parties that participate in EA activities. The success of EA project execution depends on achieving coordinated efforts between IT departments and business management teams along with operations units. Frameworks establish uniform structures and terminologies which enable different project groups to bridge their differences and attain a shared understanding of project objectives and methods (Op't Land et al. 2008). IS projects demand effective communication and alignment across different domains to succeed because misalignment causes inefficiencies and project failure (Simon et al. 2013).

Frameworks combine their adaptability and communication benefits with scalable and reusable properties to create cost-effective solutions. Frameworks exhibit flexibility to meet any task size and complexity whether they are used for vast enterprise-wide projects or minor initiatives. The ability to scale the framework amplifies its usefulness while broadening its reach throughout many different applications (Morganwalp & Sage 2004). The reuse of frameworks allows organisations to capitalise on previous achievements which leads to an ongoing enhancement of EA strategies through continuous improvement and implementation of best practices (Foorthuis et al. 2016). Organisations can conserve resources while establishing an environment that supports continuous refinement and development through this approach.

The ability to adapt to fast technological changes and evolving business requirements represents fundamental aspects of the IS sector which frameworks make possible. Organisations must rapidly adjust to emerging challenges and stay strategically aligned in an ever-changing environment (Bente et al. 2012). EAPs receive a flexible tool from rigorous academic research to keep their solutions effective and relevant because it evolves with industry trends alongside new developments (Niemi & Pekkola 2017). The ability of frameworks to maintain organisational focus on long-term goals while enabling innovation and responsiveness to change makes them a popular choice in EA (Korhonen & Halén 2017).

The creation of an EAP framework stands as the central theme of this PhD research and represents a strategic and effective solution. The framework handles EA complexity through its adaptable structure which enables communication and scalability while supporting reusability and flexibility to manage the changing IS environment. The framework maintains effectiveness and sustainability in IS solutions while supporting organisational goals and delivers meaningful advancements to both scholarly research and industry operations. Framework development serves as the perfect study approach because it combines academic thoroughness with practical implementation to unite theoretical research with enterprise requirements.

5.4 THE CAPABILITY STABILITY MANAGEMENT FRAMEWORK AS A PROPOSED SOLUTION

The research problem's solution involves creating a structured framework that ensures capability stability for EA practices. Section 5.1 introduces the CSMF which provides a solution to the research question through its theoretical foundation and practical usability.

During the design and development of the CSMF, this study operated within a doctoral research project scope using the DSR methodology with the process model by Vaishnavi and Kuechler (2004) as a guide. The research process initiates with the Awareness of the Problem phase that requires researchers to pinpoint existing challenges and knowledge gaps as explained in Section 4.2. The stage is informed by a comprehensive literature review presented in Chapter 2 which describes the dimensions and factors affecting capability stability. The foundational understanding serves as a critical element for guiding the development of later stages in framework design.

The research moves into the suggestion phase after setting up the problem context by developing an initial conceptual model for the CSMF as described in Chapter 4. The conceptual model incorporates existing theoretical work and established best practices from EA. At this stage, this study aimed to create an early design model that addresses the major challenges and establishes the foundation for building the framework.

Chapter 4 explains the development stage that transforms the conceptual model into a functioning artefact. Domain experts from EA provide expertise-driven feedback during every iterative step throughout the collaborative design process. During this phase, theoretical concepts transform into

practical functional tools which become essential Time constraints and limited opportunities for sustained stakeholder engagement meant that the doctoral research had to adopt a deliberately bounded framework scope. This narrower focus ensured that the study remained feasible within the available resources while still producing a theoretically grounded and practically relevant contribution. The prototype demonstrates research feasibility throughout this period by concentrating on fundamental principles and primary practices essential for capability stability management. The systematic development process through deliberate stages produces clarity and manageability which establishes a strong foundation for further improvements.

The CSMF evaluation described in Chapter 7 illustrates the critical research phase. During this phase, EAPs participated in structured interviews to provide empirical evaluations of the framework. The research project applied the collected feedback to assess how well the framework addresses specific issues while making necessary final changes. Given the inherent extensibility of the framework, its development is understood as an ongoing endeavour rather than a finite outcome. Achieving a “perfect” version would require iterative refinement over a period far exceeding the doctoral programme’s time constraints. Accordingly, this study delivers a fully functional working version of the framework that is sufficiently robust to address the research problem within the timeframe permitted for completion of the doctorate. This version establishes a solid foundation while allowing future research and practice-based iterations to extend and mature the framework beyond the scope of this study. The framework's design and functional validation during this phase enabled its submission as the preliminary deliverable for DSR. The initial iteration's limited scope serves as the foundation for future research which will broaden its capabilities and applications.

The development of frameworks within doctoral research is greatly impacted by the availability of resources. The research completed one DSR iteration and would consider a second iteration only if enough resources and time became available. Each phase of the complete DSR iteration cycle requires significant work throughout problem identification to empirical evaluation stages. The primary iteration seeks to develop an initial prototype that combines theoretical foundations with practitioner insights according to academic timelines.

The project encountered several resource constraints that shaped the evaluation process and limited the extent to which real-world assessments could be conducted. Securing expert evaluators required significant coordination, and the availability of practitioners with relevant EA expertise was restricted, particularly for multiple iterative cycles. These limitations meant that this study could not obtain broad or repeated expert participation within the available timeframe and organisational capacity. As a result, the first evaluation stage was conducted in a controlled setting rather than through a full-scale organisational deployment. Despite these constraints, the targeted evaluation generated meaningful insights, validated key elements of the artefact, and provided direction for future refinement of the framework beyond the doctoral study.

This study initially planned to complete one full DSR cycle and, depending on available resources, to initiate a subsequent refinement cycle to enhance the framework's utility and address any evaluation limitations. This study successfully completed the first DSR cycle and included all key phases: problem identification, objective definition, design and development, demonstration, and evaluation. During this cycle, a functional framework was developed, grounded in established theoretical foundations and informed by literature on capability stability and adaptability within EA. The artefact was evaluated through expert and practitioner feedback, which confirmed its conceptual soundness and practical relevance while identifying opportunities for refinement related to usability and alignment with practitioner workflows.

Due to time and resource constraints, this study could not execute the follow-up refinement cycle. However, findings from the initial cycle informed specific recommendations for future iterations. The research design ensured that each DSR phase was strategically planned and executed to maximise both academic rigour and practical impact. Consequently, the final deliverable met scholarly standards while demonstrating tangible value for EAPs seeking to manage capability stability within dynamic and evolving enterprise environments.

5.5 SUMMARY AND DISCUSSION

This chapter developed the conceptual foundation, analytical processes, and methodological positioning required to define and explore the capability stability ecosystem. It began by formulating the Capability Stability Ecosystem Conceptual Model, which synthesises the dimensions and factors that influence how business capabilities are constructed, evaluated, and affected by their organisational environment. The framework is structured around three nested layers. At its centre lie the enabling components—people, process, and technology—which constitute the structural foundation of any capability. These are surrounded by measurement attributes—performance, measure, capacity, and engagement—which emerged as the most consistently referenced evaluative factors in the thematic analysis. The outermost layer comprises governance, cost, and the broader environmental context, which operate as external influences directing how capabilities function and adapt within their ecosystems.

Through this layered view, the chapter clarifies that capability stability stems from the interaction between internal structure, evaluative attributes, and contextual pressures. The thematic analysis confirmed that these factors collectively shape how a capability endures disruption, maintains equilibrium, and responds to environmental change. This insight supported the development of two core theoretical contributions: a definition for a capability ecosystem and a formal definition of capability stability. Together, these contributions create a conceptual basis for analysing how changes to any factor—structural, evaluative, or contextual—affect the stability of the capability.

Building on the design science research approach and the systems thinking perspective established in Chapter 2, the chapter positions the framework as an artefact that must balance academic rigour with real-world usability while reflecting the interconnected nature of enterprise systems.

The chapter further positioned EA artefacts as essential mechanisms for addressing IS problems and evaluated three artefact types—how-to guides, methodologies, and frameworks. It concluded that frameworks provide the most appropriate vehicle for solving the research problem because they balance structure and flexibility, support stakeholder communication, enable scalability, and accommodate organisational variation. This evaluation directly justified the study's decision to design a framework rather than another artefact type and connected this choice to the identified research gap concerning capability stability management.

Finally, the chapter outlined the proposed solution—the CSMF—and described how its design, development, and evaluation were shaped by methodological requirements and resource constraints. It acknowledged that the doctoral research cycle allowed for one complete iteration of the DSR process and justified the delivery of a working, extensible framework that solves the research problem within the boundaries of time and available expert access. The discussion illustrates how the initial iteration provides a functional and validated artefact while intentionally allowing space for future refinement, extended evaluation, and broader organisational deployment. Chapter 6 develops this proposed solution into the Capability Stability Management Framework (CSMF), detailing its design criteria, building blocks, and use.

Overall, this chapter establishes the conceptual clarity, methodological grounding, and practical rationale required for developing the CSMF. It connects theoretical constructs to empirical analysis, situates the artefact within a systems-oriented interpretation of capability behaviour, and prepares the foundation for the framework's detailed design and evaluation in subsequent chapters.

6 CHAPTER 6: THE CAPABILITY STABILITY MANAGEMENT FRAMEWORK

6.1 INTRODUCTION

The fifth chapter describes DSR methodology and its design phase. This essential phase turns theoretical knowledge and research data into a practical solution that addresses the identified problem. The design process at this stage combines established conceptual foundations from previous stages, namely the literature review and thematic analysis, to develop a practical solution that aligns with the context. The DSR principles steer the design process by highlighting iterative development and utility while maintaining alignment with stakeholder requirements. This stage presents the systematic procedures used to develop and refine the proposed artefact based on findings from the literature review and thematic analysis employed to create foundational conceptual models. The chapter thoroughly describes the artefact's conceptual development process which covers its theoretical foundations and structural elements as well as practical mechanisms while maintaining alignment with research goals and managing capability stability demands.

6.2 DESIGN CRITERIA

The development of the framework elements for capability stability management using a DSR methodology involves a sequence of interconnected phases that reflect the four components of a structured evaluation lens (Framework, Evaluation, Design, and Synthesis). Each phase contributes to the iterative progression from conceptual understanding to practical artefact design, ensuring that the resulting framework is theoretically grounded while remaining aligned with practitioner needs (Vom Brocke & Maedche 2019; Hevner & Chatterjee 2010). The primary goal of this framework is to establish a systematic approach to manage business capabilities' stability because maintaining their value and purpose remains essential in dynamic organisational contexts. The framework's building blocks represent fundamental aspects of capability management based on findings from literature reviews combined with thematic analysis and theoretical contextualisation (Gregor & Hevner 2013).

The framework component serves as the structural base that supports the whole design structure. The definition of fundamental elements within a capability ecosystem requires the synthesis of existing research insights related to capability management and organisational stability. The framework developed in this study incorporates capability modelling and performance metrics alongside stability factors as key dimensions because they impact business capability evolution and maintenance. The framework dimensions establish the capability ecosystem structure and outline the connections between different organisational elements such as business processes, IT systems, and human resources which support capability stability (Gregor & Hevner 2013).

The design phase maintains a strong connection to both the framework and evaluation because it concentrates on producing the artefact. Organisations define structural components and processes

along with guidelines to ensure capability stability remains consistent over time. The design process requires evaluation of external influences including market volatility and technological change since they affect capability sustainability. The design process functions through an iterative approach which enables framework adjustments based on evaluation outcomes and maintains adaptability to organisational dynamics (Peffers et al. 2007).

6.3 DSR BUILDING BLOCKS

A systematic and iterative sequence of steps guides the DSR process for creating a framework to manage capability stability while each step adds to both the rigour and relevance of the final research artefact. The first stage of the process requires problem awareness which involves pinpointing essential challenges and examining the contextual elements of capability stability in dynamic organisations. Researchers perform an extensive examination of existing research gaps through literature reviews and initial scoping studies that define the problem area.

After identifying the relevant issues, this study formalised them into a structured problem statement which defines the problem. This phase focuses on precise communication of essential challenges while maintaining alignment between research focus and both theoretical importance and practical demand. The phase establishes criteria and requirements that define what constitutes a viable solution by detailing the measurable objectives and expectations which the framework needs to accomplish.

The next stage involves discovering primary concepts that serve as the theoretical foundation for the framework. During this phase it is necessary to define both "business capability" alongside "capability stability" and "capability ecosystem" and to analyse how these elements interact with one another across their individual dimensions. Common understanding of the examined constructs emerges during conceptualisation and this process forms the basic structure necessary for framework design. In this phase, element characteristics and dimensions are defined and component relationships connected to construct a robust theoretical framework. The CSMF was developed through refining the examined constructs. Development of the framework relies on theoretical principles such as homeostasis to ensure business capabilities remain stable yet adaptable.

Once the framework design phase completes, a problem-solving loop begins to refine the framework through iterative adjustments derived from initial evaluations. The framework undergoes evaluation by applying predefined benchmarks and conditions to detect potential areas for advancement. The iterative process within this phase enables the framework to develop through repeated feedback and refinement cycles which result in improved alignment with theoretical and practical requirements. The framework undergoes formative artificial testing which applies controlled or hypothetical scenarios to evaluate its structure and feasibility as well as its logical integrity. The evaluation process examines both internal consistency and theoretical integrity of the framework while pinpointing areas that need further improvement.

The evaluation findings are matched with insights gathered from thematic analysis to serve as an extra validation step. Thematic analysis examines relevant patterns and themes within the framework to ensure an accurate representation of capability stability influencing factors. The framework undergoes adjustments which result in better integration of theoretical knowledge and empirical data after conducting the analysis. The last phase of the procedure requires refining the conceptual model based on accumulated evaluations along with thematic analysis and iterative testing feedback. The enhanced framework stands as a theoretically sound and practically applicable artefact that has been developed to effectively manage capability stability challenges across various organisational settings. Following the structured DSR process enables the creation of a framework that is both solidly grounded and delivers significant impact.

6.3.1 DEVELOPING THE FRAMEWORK

The capability stability ecosystem serves as the starting point for the building blocks of the CSMF:

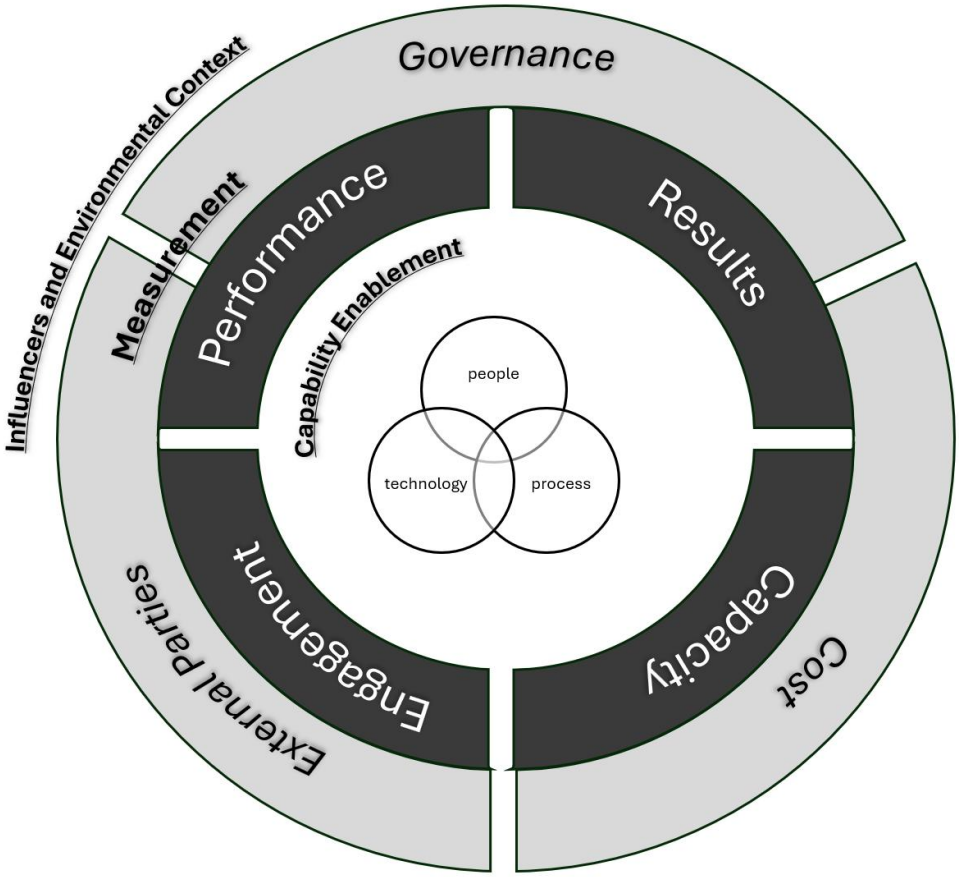


FIGURE 20 CAPABILITY STABILITY ECOSYSTEM

As established, the dimensions and factors shown in Figure 20 describe a capability and all of the factors that can change the capability's design. The definitions listed below consolidate the study's coding scheme and concept set: each defined construct is one of the a priori factors from the coding scheme in Table 2, confirmed and, where relevant, grouped into concrete concepts through the thematic-analysis results reported in Section 3.2 (Tables 3 to 5). This table therefore introduces no new

constructs; it formalises, for use in the CSMF, the same factors and concepts established during the thematic analysis. To start the development of the framework, this study formalised the work done to develop the conceptual model as a list of definitions when using this framework and how they should be interpreted and used while using the CSMF:

TABLE 10 DEFINITIONS

		Definitions
1	Enterprise Architecture	*A holistic approach for aligning an organisation's business, information, application, and technology domains to achieve coherence, integration, and strategic execution (Ross et al. 2006; Lankhorst 2009; Op't Land et al. 2008).*
2	Business Capability	*A representation of what an organisation is able to do, enabled through a combination of people, processes, information, and technology components (Azevedo et al. 2015; Wißotzki & Sonnenberger 2017).*
3	People	*The human actors who perform tasks, make decisions, or contribute expertise to execute and sustain capability operations, including individuals, roles, and organisational groups (Bente et al. 2012; Wißotzki & Sonnenberger 2017).*
4	Process	*The structured sequence of activities, workflows, and procedures through which a capability delivers its intended outcomes (Ross et al. 2006; Lankhorst 2009; Rosemann & Vom Brocke 2015)*
5	Technology	*The information systems, platforms, tools, and digital infrastructure that support capability execution and enable information processing and service delivery (Lankhorst 2009; Chen et al. 2014; Zhu 2004). The term technology in this context includes all IT systems and equipment along with the software that supports information management systems to maintain business capability operations*.
6	Performance	*The effectiveness and efficiency with which a capability delivers its intended outcomes, measured through reliability, service quality, responsiveness, and ability to meet organisational objectives (Morganwalp & Sage 2004; Saleem & Fakieh 2020).*
7	Measure	*The mechanisms, indicators, and evaluative criteria used to assess capability effectiveness and guide internal decision-making, including metrics related to output, quality, and operational control (Morganwalp & Sage 2004; Johnson, Clarkson & Huppert 2010).*

		Definitions
8	Capacity	*The capability's ability to handle workload volume and scale operations while maintaining service quality, reflecting throughput, resource availability, and potential for expansion (Ross et al. 2006; Van de Wetering 2019).*
9	Engagement	*The degree of interaction, participation, and satisfaction experienced by stakeholders who interface with the capability, reflecting the quality of relationships and user experience (Van de Wetering 2019; Jongbloed et al. 2008).*
10	Governance	*The structures, rules, decision rights, and oversight mechanisms that ensure capabilities operate in a controlled, compliant, and strategically aligned manner (De Haes et al. 2019; Op't Land et al. 2008; Saha 2008).*
11	Cost	*The financial and resource expenditure required to maintain and operate a capability, including technology, infrastructure, and human resource costs (Ross et al. 2006; Zhu 2004).*
12	Capability Ecosystem	*The concepts, factors, and attributes grouped by dimensions of influence that constitute the whole capability.*
13	Capability stability	*The capacity of a capability to remain in, or return to, a condition of equilibrium when disturbed — the strength to endure disruption and to tolerate changes to the defined factors of the capability ecosystem without loss of core function.*

Construct mapping — Figure 16 (Chapter 3) to the frozen constructs of Figure 20

TABLE 11 CONSTRUCT MAPPING

Frozen construct (Figure 20)	Dimension	Label in Figure 16
Business Capability	Central construct	Business capability (centre)
People	Capability enablement	People
Process	Capability enablement	Process
Technology	Capability enablement	Technology
Performance	Capability measurement	Performance
Measure	Capability measurement	"Results" — standardised to Measure
Capacity	Capability measurement	Capacity
Engagement	Capability measurement	Engagement
Governance	Capability influencers & environmental context	Governance

Cost	Capability influencers & environmental context	Cost
Enterprise Architecture	Cross-cutting influence	Enterprise Architecture
Capability Ecosystem	The whole model	The complete diagram
Capability stability	Emergent property	Equilibrium across the layers Three labels used in earlier drafts of the ecosystem figure are reconciled to the frozen constructs above. "Results" is the collective concept for the four measurement factors and is standardised to the factor Measure. "External parties" denote the external environmental context surrounding the capability rather than a discrete factor, so the outer-layer factors are Governance and Cost. Adaptability and Design were supplementary analytical codes used during the thematic analysis and are treated as capability properties and design considerations, not as frozen framework constructs.

The original intention was to complete a full DSR cycle and, if time and resources permitted, proceed with an additional refinement cycle to strengthen the framework and address limitations emerging from evaluation activities. Within the constraints of the doctoral project, one full DSR cycle was completed, covering all essential phases from problem identification through to evaluation. This cycle produced a functional framework grounded in established theoretical foundations and informed by the capability stability and adaptability literature within EA. The resulting artefact represents a validated first iteration that meets the requirements of the doctoral study while establishing a solid base for future refinement beyond the project's timeframe.

Each factor contributing to capability stability was mapped systematically through insights obtained from the literature review and thematic analysis. The mapping process involved identifying the frequency of occurrence of each factor within the reviewed sources and analysing its relationships with other factors to determine the nature of its influence. Relationships were categorised as either direct or indirect by analysing how each factor influenced capability stability during the thematic and conceptual mapping processes described in Section 3.2 (Steps 2–4). Direct relationships were assigned where a factor demonstrated a consistent and observable influence on stability, meaning its presence, absence, or variation could be expected to alter the behaviour of a capability in a measurable way.

Indirect relationships were identified when a factor shaped capability stability through broader contextual or environmental conditions rather than through immediate functional impact. This categorisation was refined further during the analytical consolidation phases outlined in Section 3.3, where the interaction patterns across the capability ecosystem layers were examined. Factors that appeared repeatedly across the secondary data set, demonstrated strong co-occurrence with architectural or adaptive constructs, or consistently influenced other factors during the analysis were designated as "impacted" to indicate their significance within the conceptual model. This reflects the study's systematic determination, explained in Section 4.4 as part of the research process, of which elements exert meaningful influence on capability stability either directly or through contextual interdependencies.

The framework was formalised in three steps. First, the constructs confirmed by the thematic analysis were fixed as the definitions in Table 9, each being one of the a priori factors from the coding scheme (Table 2). Second, the factors were organised into the three dimensions established in Chapter 2 and confirmed in Chapter 3: capability enablement (people, process, and technology); capability measurement (performance, measure, capacity, and engagement); and capability influencers and environmental context (governance and cost, situated within the external environment). The dimension labelled "Capability Influencers and Environmental Context" used in the tables that follow is therefore not introduced here; it is the outer dimension derived in Sections 2.6.3 and 2.7.3 and reused to classify each factor. Third, each factor was given an impact table (the tables below), derived from the direct and indirect analysis reported in Section 3.2 (Steps 2–4) and the systematic determination described in Section 4.4.

The artefact underwent evaluation through targeted expert and practitioner feedback, which confirmed its conceptual validity and practical applicability while highlighting areas for future enhancement. Although a subsequent refinement cycle could not be initiated due to the project's time and resource limitations, the insights gained from this first evaluation provided a clear direction for future development. The research process was therefore structured to ensure that the completed DSR cycle delivered an artefact that meets academic expectations and offers practical value for EAPs operating in dynamic enterprise environments, even as further iterations remain both possible and desirable beyond the scope of the doctoral study.

A direct impact is coded where a change in one factor is likely to alter another in a consistent, observable way, without an intervening factor.

An indirect impact is coded where any influence is mediated by other factors or by the surrounding environment, so that the effect is minor — or should be minor if the capability has been correctly designed and architecturally aligned.

Direct and indirect impacts were distinguished during the analysis phases described in Chapter 3, specifically in the thematic analysis and the subsequent mapping of factors to influence dimensions. A

direct impact was recorded when the analysis showed that a change in one factor was likely to alter, in a consistent and observable way, another factor's behaviour or stability within the capability ecosystem. An indirect impact was assigned where the relationship reflected contextual influence rather than a definitive causal link. In these cases, any potential effect should remain minimal if the capability is correctly designed and architecturally aligned. These distinctions supported the categorisation of relationships used in the conceptual modelling stages of the research and informed the interpretation of influence paths within the capability stability framework.

The direct/indirect distinction was applied as an explicit coding rule rather than a subjective judgement. For each ordered pair of factors, the relationship was coded Direct when two conditions held together: (i) the reviewed literature showed the two factors co-occurring, as reported in the co-occurrence results of Section 3.2; and (ii) the analysis in Section 3.2 (Steps 2–4) indicated a plausible mechanism by which a change in the trigger factor could be expected to alter the affected factor's behaviour or stability without an intervening factor. Where only mediated or contextual influence was evident — that is, where any effect would pass through a third factor or through the surrounding environment — the relationship was coded Indirect. Two boundary conditions governed borderline cases. First, where co-occurrence was present but no plausible mechanism of direct influence could be identified, the pair was coded Indirect by default. Second, where a correctly designed and architecturally aligned capability would reduce the effect to a negligible level, the pair was likewise coded Indirect. This conservative default reserves the Direct code for relationships that have both evidentiary (co-occurrence) and mechanistic support, and it is the reason several intuitively plausible relationships in the tables that follow are nonetheless recorded as indirect.

The rule can be illustrated with worked examples drawn from the tables below. In the Governance table, a change in Governance is coded as a Direct impact on Performance: where governance functions are not automated through the technology layer, the additional control work falls to people and process and measurably reduces the capability's ability to perform as designed, so the trigger factor alters the affected factor without an intervening factor. By contrast, a change in Governance is coded as an Indirect impact on Cost, because — depending on the chosen solution across people, process, and technology — there is no consistent correlation between an increase in governance and cost, so any effect is mediated by other factors. Correspondingly, in the Cost table a change in Cost is coded as an Indirect impact on Governance, since a change in the cost of a capability does not, on its own, alter its governance requirements. Every rationale cell in the tables that follow records these same two elements: the assigned code (Direct or Indirect) and the mechanism that justifies it.

These coding decisions are consistent with the peer-reviewed enterprise-architecture and capability literature from which the factors were derived. For direct impacts, Hendrickx (2019:5) reports that "process innovation … has a significant direct impact on competitive performance", mirroring the Direct coding of a process change on performance. For indirect impacts, Hendrickx (2019:13) observes that "both EA and dynamic capabilities do not affect competitive performance directly, but rather

through mediators" — the pattern captured by the Indirect code. The excerpts below are drawn from the wider EA-capability literature to illustrate the coding logic; they corroborate, but do not form part of, the Atlas.ti-coded article set listed in Appendix A. The table below maps representative excerpts to the factor relationship each evidences and the code assigned.

TABLE 12 ILLUSTRATIVE LITERATURE EXCERPTS CORROBORATING THE DIRECT AND INDIRECT CODING DECISIONS

Factor relationship	**Impact code**	**Illustrative excerpt from the literature**	**Source**
Process → Performance	Direct	"process innovation … has a significant direct impact on competitive performance"	Hendrickx (2019:5)
Enterprise architecture / dynamic capabilities → Performance	Indirect	"both EA and dynamic capabilities do not affect competitive performance directly, but rather through mediators"	Hendrickx (2019:13)
Process → Capability (enablement)	Direct	"A business process enables the capability to execute the expected activities and outcome"	Du Toit & Tanner (2015:8)
Technology → Measure	Direct	"the measurement on each logical IT system component is based upon transactions and data functions which determine the complexity"	Du Toit & Tanner (2015:7)
Engagement → Performance	Indirect	"stakeholder capability enhancement can bring about cooperative and competitive advantages to stakeholders"	Kassa & Mentz (2021:15)

Technology → Cost	Direct	"the … cost of integrating the two sets of IT resources"	Toppenberg et al. (2015:8)

Below is the breakdown for each factor and the rationale for why the factor might be impacted in each scenario. The tables that follow serve as a practical reference tool for users of the Capability Stability Management Framework. Each table is designed to assist practitioners in determining whether a change in a specific factor has a direct or indirect impact on the remaining factors within the capability ecosystem. In every table, the row represents the factor undergoing change, while the columns indicate how that change influences the other factors and the overall capability design. To avoid unnecessary repetition, the rationale and process for interpreting each table are provided here once and apply equally to all factors. Each table supports users of the framework in determining how a change in a specific factor may influence the remaining elements within the capability ecosystem. The purpose of the tables is to guide practitioners in identifying which elements are affected, assessing whether the impact is direct or indirect, and then defining the actions required to restore or maintain stability. This structured approach ensures that every factor is evaluated consistently when determining its influence on the overall capability design. In each table the Dimension row records which of the three dimensions the trigger factor belongs to, the Factor row names the trigger factor whose change is assessed, and the Factor Analysis Rationale rows record, for each of the nine factors, whether the change has a direct or indirect impact and why. Because each factor's influence on every factor in the ecosystem is assessed, the trigger factor also appears once among these rows; that row records the factor's self-referential impact — for example, in the Governance table the Governance row captures how a change in one governance function affects other governance functions — and does not denote a second construct:

6.3.1.1 GOVERNANCE

TABLE 13 GOVERNANCE

Rationale & Factors in Managing Capability Stability		
Dimension	**Capability Influencers & Environmental Context**	
Factor	**Governance**	
	Factor Analysis Rationale	
Governance	*Indirect*	Changes in governance functions have an indirect impact on other governance functions. Factors to be verified include whether all governance requirements are aligned, where they contradict, what controls and measures to

		put in place, and the rationale for the implementation decision.
Cost	*Indirect*	Changes in governance have an indirect impact on the cost of the capability. Depending on the solution, people, process, or technology, there is no clear correlation between an increase in governance and cost.
Performance	**Direct**	Changes in governance have a direct impact on the capability's performance. Where governance functions are not enabled via the technology layer and are automated, additional governance work becomes a people and process issue. This usually adds additional checks and balances, directly impacting the capability's ability to perform as designed.
Measure	**Direct**	Changes in governance have a direct impact on capability measurement. Typically, governance requires some form of evidence or control and the associated reporting of this. Thus, a change in governance will necessitate changing what is being measured.
Capacity	**Direct**	Changes in governance have a direct impact on capability capacity. The more governance is applied, the less time can be spent on actual output, and the more time will be spent on control and evidentiary practices.
Engagement	*Indirect*	Changes in governance have an indirect impact on a capability's engagement. Additional regulatory reporting requirements might also exist, but these will affect the measures more than the capability's engagement.
People	**Direct**	Changes in governance have a direct impact on the people in the capability. Changes in governance will require awareness and training, as well as updates on the procedures to be

		followed, in some cases, system training for automation of integrity walls
Process	**Direct**	Changes in governance have a direct impact on processes. For every change, a new control procedure or step needs to be included in the process in order to measure the capability to measure the control effectiveness in the process.
Technology	**Direct**	Changes in governance will directly impact technology. Although not all governance changes can be made to the line of business systems supporting the capability, some technology will have to be implemented to measure control effectiveness.

A change in the governance factor directly impacts performance, measure, capacity, people, process and technology. As it directly impacts six factors, a governance change could be predicted to have a medium impact on the capability design.

6.3.1.2 COST

TABLE 14 COST

Rationale & Factors in Managing Capability Stability		
Dimension	**Capability Influencers & Environmental Context**	
Factor	**Cost**	
	Factor Analysis Rationale	
Governance	*Indirect*	Changes in cost have an indirect impact on governance. An increase or decrease in the cost of a capability should not have any impact on governance.
Cost	*Indirect*	Changes in cost have an indirect impact on other cost. The rationale is that an increase in technology cost might lead to reduced people costs.

Performance	*Indirect*	Changes in cost have an indirect impact on performance. New technology might increase the cost but reduce the process time, thus increasing performance. However, unhappy people might lower the performance of a capability if salary revisions are not satisfactory.
Measure	*Indirect*	Changes in cost have an indirect impact on measures. Cost might be a measure, but a change in cost would not necessarily necessitate a change in measure.
Capacity	*Indirect*	Changes in cost have an indirect impact on capacity. Financial constraints impact people's choices and technology. Thus, lower cost might limit a capability's capacity; however, with a streamlined, automated process, smaller, capacitated capabilities might outperform capabilities with less streamlined processes.
Engagement	*Indirect*	Changes in cost have an indirect impact on engagement. Higher costs may limit the availability or sophistication of communication mechanisms—for example, requiring the use of slower file-transfer methods instead of real-time application programming interface integrations when interface development becomes cost-prohibitive. However, this does not eliminate the engagement channel itself. Rather, it indicates that the channel may operate in a less optimised or less efficient manner due to cost-related constraints, without fundamentally preventing stakeholder interaction.
People	**Direct**	Changes in cost have a direct impact on people. Skilled resources are expensive.
Process	**Direct**	Changes in cost have a direct impact on the process. Cost optimisation typically favours manual workarounds instead of making the necessary technology changes.

Technology	**Direct**	Changes in cost have a direct impact on technology. Best-of-breed systems that enable straight-through processing are more expensive than multiple smaller niche systems that have to be integrated. The cost of integration also impacts the capability's design and the technologies chosen.

A change in the cost factor directly impacts people, processes, and technology. As it directly impacts three other factors, a cost change could be predicted to have low to no impact on the capability design.

6.3.1.3 PERFORMANCE

TABLE 15 PERFORMANCE

Rationale & Factors in Managing Capability Stability

Dimension	**Capability Measurement**	
Factor	**Performance**	
	Factor Analysis Rationale	
Governance	*Indirect*	Changes in performance have an indirect impact on governance. A decrease or increase in performance does not correlate with the governance procedures implemented.
Cost	*Indirect*	Changes in performance have an indirect impact on cost. A decrease or increase in performance does not correlate with the cost of running the capability. A decrease in performance due to design inefficiency may necessitate an increase in cost, but implementing new technologies increases performance but decreases the running cost.
Performance	*Indirect*	Changes in performance have an indirect impact on other performance. While a decrease in the performance of one element might increase the performance of an element in another, there is no direct correlation between the changes.

Measure	*Indirect*	Changes in performance have an indirect impact on capability measures. While performance is a measure in and of itself, it will not necessarily necessitate a change in the measures of the capability.
Capacity	**Direct**	Changes in performance have a direct impact on capacity. When a capability performs poorly, it is often because it is *under-capacitated* in one or more of its core enablers—people, processes, or technology. Insufficient capacity in these areas reduces the capability's ability to meet required performance levels, creating a direct and observable link between performance degradation and capacity constraints.
Engagement	*Indirect*	Changes in performance have an indirect impact on engagement. Poorly performing capabilities lack the level of engagement expected of them, but this does not mean the engagement model must change.
People	**Direct**	Changes in performance have a direct impact on people. Poorly performing capabilities have many manual workarounds and too few people doing the work, resulting in a direct impact on the people in the capability.
Process	**Direct**	Changes in performance have a direct impact on processes. Manual workaround and inefficient processes will degrade the capability's performance.
Technology	*Indirect*	Changes in performance have an indirect impact on technology. Technology is an enabler of performance; the more a capability performs, the better it uses its technology elements to increase performance. However, it will not impact the technology implementation if the number of completed actions is 1 or 10.

As seen, a change in the performance factor will directly impact capacity, people, and processes. As it directly impacts three factors, a performance change could be predicted to have low to no impact on the capability design.

6.3.1.4 MEASURE

TABLE 16 MEASURE

Rationale & Factors in Managing Capability Stability

Dimension	**Capability Measurement**	
Factor	**Measure**	
	Factor Analysis Rationale	
Governance	**Direct**	Changes in measures have a direct impact on governance. If the measure of a capability changes, the input and output will change, which will impact the capability's controls and regulatory reporting.
Cost	*Indirect*	Changes in measures have an indirect impact on cost. Though additional measures might increase cost, new measures might also highlight areas for performance improvement, which could result in a decrease in costs.
Performance	*Indirect*	Changes in measures have no direct impact on performance. Measures might indicate the performance of the elements, but a change in measurements should not affect the capability's designed performance.
Measure	*Indirect*	Changes in measures have an indirect impact on them. Adding or removing measures might impact the combined elements used for measures, but they should not affect the measurement design.
Capacity	*Indirect*	Changes in measures have an indirect impact on capacity. Most managers would agree that what is being measured is what gets done; however, a change in a measure might not affect the capability's capacity.

Engagement	*Indirect*	Changes in measurement have an indirect impact on engagement. Though engagement is a measure in and of itself, changes to how engagement is measured should not have a direct impact on its design.
People	*Indirect*	Changes in measure have an indirect impact on people. What is being measured should not impact the people component of the capability's functional operating model.
Process	**Direct**	Changes in measurement have a direct impact on processes. Measures gather criteria for success/failure at a certain point in a process. A change in process is required to enable a new measurement.
Technology	*Indirect*	Changes in measurement have an indirect impact on technology. If the technology changes with the process, it might have an impact, but a change in reporting will not impact the choice of technology.

As seen, a change in the measure factor will directly impact governance and the process. As it directly impacts two factors, a measure change could be predicted to have low to no impact on the capability design.

6.3.1.5 CAPACITY

TABLE 17 CAPACITY

Rationale & Factors in Managing Capability Stability		
Dimension	**Capability Measurement**	
Factor	**Capacity**	
	Factor Analysis Rationale	
Governance	**Direct**	Changes in capacity have a direct impact on governance. The incapacity to perform the required functions per the governance controls that have been put in place will negatively affect the capability's ability to be governed correctly.

Cost	*Indirect*	Changes in capacity have an indirect impact on cost. Reduced staff might reduce costs, while new systems might increase them.
Performance	**Direct**	Changes in capacity will have a direct impact on performance. An increase in capacity should increase performance, but this is not always the case. New people will have to be trained, and new systems might introduce new processes that need to be streamlined.
Measure	**Direct**	Changes in capacity directly impact the capability's measurement design. The more capacity a business capability has, the better its performance, as there is more capacity for output.
Capacity	**Direct**	Changes in capacity have a direct impact on other capacity. Increased technology capacity might have an impact if people's performance decreases, especially when considering task automation.
Engagement	**Direct**	Changes in capacity have an direct impact on engagement. Though capacity is a measure in and of itself, changes to how much capacity a capability has should directly impact the engagement. The more capacity, the more requests can be managed.
People	**Direct**	Changes in capacity have a direct impact on people. More staff, training, and new technology and processes impact people, and these changes will impact the people working in the capability.
Process	*Indirect*	Changes in capacity have an indirect impact on processes. Technology and people might have increased capacity, but this should not influence the process design.
Technology	**Direct**	Changes in capacity have a direct impact on technology. Better systems also impact technology; more users might require more licenses or new modules.

A change in capacity directly impacts governance, performance, capacity, engagement, people, and technology. As it directly impacts seven other factors, a capacity change could be predicted to significantly impact the capability design.

6.3.1.6 ENGAGEMENT

TABLE 18 ENGAGEMENT

Rationale & Factors in Managing Capability Stability

Dimension	**Capability Measurement**	
Factor	**Engagement**	
	Factor Analysis Rationale	
Governance	**Direct**	Changes in engagement have a direct impact on governance. Though the design or engagement model might change, the engagement controls will be impacted. Relevant considerations include new service level agreements and related controls.
Cost	*Indirect*	Changes in engagement have an indirect impact on cost. Though the technology or process that facilitates the implementation of the engagement model might change, the impact on cost would not be directly influenced by the change in engagement itself.
Performance	**Direct**	Changes in engagement have a direct impact on performance. Performance might decrease if the capability is dependent on output from another capability; however, a change in the engagement model should have a direct impact on performance increases and decreases.
Measure	*Indirect*	Changes in engagement have an indirect impact on measures. Though the engagement is being measured, changes here will only change the result, not the measurement itself.
Capacity	**Direct**	Changes in engagement have a direct impact on capacity. If the engagement model changes, the capacity will change accordingly. If a process is automated, a chatbot's capacity increases.
Engagement	*Indirect*	Changes in engagement have an indirect impact on other engagement. Changes to one channel might or might not impact another channel, but if the mode of engagement changes, it will impact the design.
People	**Direct**	Changes in engagement have a direct impact on people. When the engagement model changes, people need to adapt to the new model, and inputs and outputs may differ.

Process	**Direct**	Changes in engagement will have a direct impact on processes. If the engagement model changes, the process will need to change to facilitate the new engagement model.
Technology	**Direct**	Changes in engagement will have a direct impact on technology. Engagement on inputs and outputs typically needs to be recorded on a system of record. Changes in the engagement model will change the capability's technology landscape.

As seen, a change in engagement will directly impact governance, performance, capacity, engagement, people, process, and technology. As it directly impacts six factors, an engagement change could be predicted to impact the capability design significantly.

6.3.1.7 PEOPLE

TABLE 19 PEOPLE

Rationale & Factors in Managing Capability Stability		
Dimension	**Capability Enablement**	
Factor	**People**	
	Factor Analysis Rationale	
Governance	*Indirect*	A change in people will indirectly impact governance, especially if people are required to hold certifications or have skill sets relating to the performance of governance functions within the capability. However, there is no direct impact if people with the certifications change, for example.
Cost	**Direct**	A change in people will have a direct impact on cost. People leaving will reduce the operating cost, and hiring new people might increase it, especially if the salary of the newly hired employee is more than that of an employee who left.
Performance	**Direct**	A change in people will directly affect the performance of the capability. More people will

		have to take on more tasks to contain the loss in performance. Adversely, losing people might also positively affect performance, especially in the case of underperforming employees or when technology automation requires fewer people to perform a certain task.
Measure	*Indirect*	A change in people will not affect the measures imposed on the capability.
Capacity	**Direct**	Because capacity has a design element, a change in people would affect the capacity, depending on how skills are exchanged with the change of people.
Engagement	**Direct**	A change in people will directly affect the capability's engagement with other business capabilities. Skills, knowledge, and experience all will affect this factor.
People	*Indirect*	Changes in people will have an indirect impact on other people. The staff reduction might result in an increased workload, but changes in leadership might also positively impact morale. These changes, though operational, will not have a direct impact.
Process	**Direct**	A change in people will have a direct impact on processes. When the number of people increases or decreases, roles might be combined or collapsed, directly impacting how the process is executed.
Technology	**Direct**	A change in people will directly impact the technology because the technology processes are mapped to the capability processes.

A change in people directly impacts cost, performance, capacity, engagement, process, and technology. As it directly impacts six factors, a change in people could be predicted to have a moderate impact on the capability design.

6.3.1.8 PROCESS

TABLE 20 PROCESS

Rationale & Factors in Managing Capability Stability

Dimension	Capability Enablement	
Factor	Process	
	Factor Analysis Rationale	
Governance	**Direct**	A change in process will directly impact the governance of a capability. Changes in the process need to consider governance tasks and outcomes which will impact the process design.
Cost	**Direct**	A change in process will directly impact the cost of a capability. While other areas may measure the impact, a change in process will impact cost. For example, automation could lower the people cost but increase the technology cost.
Performance	**Direct**	A change in process will have a direct impact on performance. A more complex process will likely result in decreased performance, whereas simple processes could increase the performance of the capability.
Measure	**Direct**	A change in process will directly impact the measures of a capability. Measures are used to determine acceptable levels of process execution. The direct impact will be realised when the number of processes is changed.
Capacity	*Indirect*	A change in process will have an indirect impact on capacity. If the number of steps in a process increases, or the number of processes increases, it would not directly diminish the capability's capacity but would have an impact measured in other dimensions, such as people or technology.
Engagement	**Direct**	A change in process will have a direct impact on the way a capability engages within its environment. Cross-capability processes, hand-over steps or required inputs and outputs will be affected when there is a change in the process.
People	**Direct**	A change in process will directly impact people and change the way they perform tasks.

Process	**Direct**	A change in process will directly impact the processes of the capability. Processes are interrelated and rely on inputs and outputs from various other processes.
Technology	**Direct**	A change in process will impact technology. Principle capability processes should be mapped to the technical processes. Although people tend to start using manual processes to avoid technological change, this will negatively impact the capability ecosystem. The change should also be reflected in the technology.

As seen, a process change will directly impact Governance, Cost, Performance, Capacity, Engagement, People, Process, Technology, and Capability Design. As it directly impacts eight factors Process change could be predicted to impact capability design significantly.

6.3.1.9 TECHNOLOGY

TABLE 21 TECHNOLOGY

Rationale & Factors in Managing Capability Stability		
Dimension	**Capability Enablement**	
Factor	**Technology**	
	Factor Analysis Rationale	
Governance	*Indirect*	A technological change will not have a direct impact on governance. While technology facilitates the adherence to governance, it does not dictate governance but rather supports it.
Cost	**Direct**	A change in technology will directly impact the cost of the capability. Different systems will have different costing models associated with them, and the addition or removal of modules will impact the cost.
Performance	*Indirect*	A technological change influences the capability's performance only indirectly. While new technology may automate tasks or improve processing speed, these improvements do not change performance on their own. Instead, performance shifts arise from how the technological change affects other factors—such as processes, capacity, or engagement—which then collectively shape the overall performance outcome.

Measure	*Indirect*	A change in technology will have an indirect impact on capability measures. While technology facilitates the outcomes that are measured, it will not influence what should be measured.
Capacity	*Indirect*	A change in technology will have an indirect impact on the capability's capacity. While technology facilitates the amount of capacity available, it will not reduce or increase capacity.
Engagement	**Direct**	A change in technology will have a direct impact on a capability's engagement. Technology facilitates communication channels, and a change will have a direct impact on how these channels function.
People	**Direct**	A change in technology will directly impact the people in a capability. New technology will require training and a change in the way people think and operate within the technology environment.
Process	**Direct**	A change in technology will directly impact the processes of a capability. Therefore, the technology processes must be mapped to the capability processes.
Technology	*Indirect*	A technological change will have an indirect impact on other technology. Changes may be required to integrate or secure at a non-functional level, or a new module or patch/upgrade can change how the technology functions. However, a version upgrade will not have a direct impact on other technology; think about regression testing.

A technological change directly impacts four factors, namely Cost, Engagement, People, Process, and Capability. As it directly impacts four factors, a technological change could be predicted to have a low impact on the capability design.

6.3.1.10 THE CSMF RELATIONSHIP MATRIX

The details of each factor help train the EAP to consider changes that could impact the capability's stability. To get an overview of the impacts, a relationship matrix was developed to summarise the CSMF factors and their impacts:

TABLE 22 CSMF RELATIONSHIP MATRIX

	Influencer (Trigger)								
Factor impacted	**Governance**	**Cost**	**Performance**	**Measure**	**Capacity**	**Engagement**	**People**	**Process**	**Technology**
Governance	*Indirect*	*Indirect*	*Indirect*	**Direct**	**Direct**	**Direct**	*Indirect*	**Direct**	*Indirect*
Cost	*Indirect*	*Indirect*	*Indirect*	*Indirect*	*Indirect*	*Indirect*	**Direct**	**Direct**	**Direct**
Performance	**Direct**	*Indirect*	*Indirect*	*Indirect*	**Direct**	**Direct**	**Direct**	**Direct**	*Indirect*
Measure	**Direct**	*Indirect*	*Indirect*	*Indirect*	**Direct**	*Indirect*	*Indirect*	**Direct**	*Indirect*
Capacity	**Direct**	*Indirect*	**Direct**	*Indirect*	**Direct**	**Direct**	**Direct**	*Indirect*	*Indirect*
Engagement	*Indirect*	*Indirect*	*Indirect*	*Indirect*	**Direct**	*Indirect*	**Direct**	**Direct**	**Direct**
People	**Direct**	**Direct**	**Direct**	*Indirect*	**Direct**	**Direct**	*Indirect*	**Direct**	**Direct**
Process	**Direct**	**Direct**	**Direct**	**Direct**	*Indirect*	**Direct**	**Direct**	**Direct**	**Direct**
Technology	**Direct**	**Direct**	*Indirect*	*Indirect*	**Direct**	**Direct**	**Direct**	**Direct**	*Indirect*
Totals	6	3	3	2	7	6	6	8	4

The relationship matrix shows, at a glance, the impact on the capability design if the change trigger is known.

To validate the matrix, the co-occurrences of the thematic analysis, shown in Table 6 below, were added to ensure alignment between the findings of the literature review and the conceptual model.

TABLE 23 CO-OCCURRENCE VALIDATION OF THE CONCEPTUAL MODEL FACTORS

Factor	Total	%	Co-Occurrence Score RE Design	%	Design
Governance	6	67%	46	26%	Misaligned
Cost	3	33%	6	3%	Aligned
Performance	3	33%	17	10%	Aligned
Measure	2	22%	20	11%	Aligned
Capacity	7	78%	136	77%	Aligned
Engagement	6	67%	107	60%	Aligned
People	6	67%	98	55%	Aligned
Process	8	89%	112	63%	Misaligned
Technology	4	44%	39	22%	Aligned

<=4	<=40	
>4 <7	>40 <100*	
		*100/140= 70%
>=7 and above	>=100	

The structured classification framework employed in this analysis provides a systematic method for evaluating the impact and alignment of key EA factors. This approach categorises factors based on their level of impact within the system and their degree of design alignment, enabling a comprehensive assessment of systemic interdependencies. Such classification methodologies are grounded in EA evaluation principles, aligning with established, tiered classification models such as the five-level Capability Maturity Model (CMM) for software-process assessment (Paulk, Curtis, Chrissis & Weber 1991) and business process management frameworks (Van der Aalst 2013). The framework facilitates structured decision-making by applying a dual-layered categorisation of impact and alignment. It allows organisations to identify architectural strengths, weaknesses, and potential areas for optimisation.

6.3.2 SYSTEMATIC CLASSIFICATION FRAMEWORK FOR IMPACT AND ALIGNMENT

The classification process follows a step-by-step methodology to ensure a rigorous assessment of enterprise system components:

6.3.2.1 IDENTIFICATION OF RELEVANT FACTORS

The first stage involves identifying key factors that influence system architecture. The factors analysed—governance, cost, engagement, measure, capacity, performance, people, technology, and

process—represent distinct dimensions of EA, including, for example, governance structures, financial constraints, operational efficiency, and technological infrastructure.

6.3.2.2 MEASUREMENT OF FACTORS IMPACTED

The relationship matrix was designed to show, at a glance, how each factor influences the overall capability design when a specific change trigger occurs. To validate the matrix empirically, a combined quantitative and qualitative approach was used, grounded in the literature review and thematic analysis. Each factor was coded across the dataset, and its relational links to other factors were identified.

For every factor, two key numerical measures were calculated. The first, RE-Design, represents the number of other factors a given element interacts with in the relational matrix. This value reflects the degree of systemic connectivity for that factor, i.e., how many relationships exist between it and the rest of the capability structure. The maximum possible number of relationships is nine (one for each factor), so each factor's RE-Design percentage was computed as the proportion of relationships it maintains out of nine. For example, if Governance interacts with six other factors, the co-occurrence score equals 6 ÷ 9 = 0.67 (67 %).

The second measure, Design, indicates the frequency with which each factor co-occurs with the "Design" theme in the coded data. These frequencies were drawn directly from the thematic analysis results, where each occurrence of a factor within a "Design" context was tallied. The resulting count was normalised against the total number of Design-coded segments (n = 178) to determine the percentage contribution of that factor to overall design considerations. Thus, if capacity appeared 136 times within Design-coded segments, its normalised weight equals 136 ÷ 178 = 0.77 (77 %).

After calculating both measures, each factor was classified according to predefined impact thresholds:

- Low (L) = ≤ 4 relationships (limited systemic influence),
- Medium (M) = > 4 but < 7 relationships (moderate influence),
- High (H) = ≥ 7 relationships (strong systemic influence).

The same logic was applied to alignment, where Design frequencies were categorised into low, medium, or high tiers based on percentage distribution: ≤ 40 (low), 41–99 (medium), ≥ 100 (high). These thresholds were derived from the distribution pattern observed in the dataset and follow the precedent of tiered maturity- and process-assessment models (Paulk et al. 1991; Ross et al. 2006; Van der Aalst 2013).

This dual-layered classification—impact and alignment—provides a systematic way to interpret the relational complexity of capability factors. Factors with high relational counts but low design alignment were marked "misaligned," indicating potential instability or inconsistency between their theoretical importance and their operational role in design. Conversely, factors with high alignment and strong interconnectivity were considered critical contributors to capability stability. This structured analytical

logic ensures coherence between the conceptual model, the literature findings, and the data-driven thematic results, providing transparent validation for the framework's underlying relationships.

This classification aligns with the enterprise-architecture principle that more highly interconnected components exert greater systemic influence, consistent with the systems-theory basis established in Chapter 2 (Ross et al. 2006).

6.3.2.3 THEMATIC ANALYSIS FOR CO-OCCURRENCE SCORE CALCULATION

The study implemented a thematic analysis method developed by Clarke and Braun (2013a) to calculate the co-occurrence score which tracks how often a specific factor appears together with other factors in EA documents. This is outlined in Chapter 3. The application of thematic analysis improves classification interpretation while providing data-driven insights that support the quantitative evaluation of factor relationships (Gharajedaghi 2011).

6.3.3 EVALUATION OF DESIGN ALIGNMENT

The numerical values used for the co-occurrence validation and design alignment were derived directly from the thematic analysis conducted during the first DSR cycle. Each factor—governance, cost, engagement, measure, capacity, performance, people, technology, and process—was coded across all literature sources and framework references that informed the conceptual model. The coding process captured both the *frequency* with which each factor appeared in association with others and the *context* of its occurrence in relation to design considerations.

The co-occurrence counts were obtained by reviewing the coded dataset to identify the number of instances where a given factor appeared together with another factor in a single data segment (for example, governance and process co-occurring in a framework discussion). Each co-occurrence was recorded as a relationship within the matrix, with a maximum possible count of nine, corresponding to the nine identified factors. These counts indicate the relative impact level of a factor—factors with more interconnections were interpreted as having greater systemic influence. The co-occurrence percentage was calculated using the formula:

$$\text{Co-occurrence percentage} = \frac{\text{Number of relationships for a factor}}{9} \times 100$$

For instance, if the process factor appeared in eight relationships, its impact score equalled 8/9=89%8/9 = 89\%8/9=89%.

The design frequency numbers were extracted from the thematic analysis where the "Design" code was applied. The total number of Design-coded segments across all data sources (n = 178) served as the denominator for calculating design alignment percentages. For each factor, the number of occurrences within Design-coded segments was divided by 178 to yield its proportional

representation. For example, capacity appeared in 136 Design-coded instances, resulting in a score of 136/178=77%136/178 = 77\%136/178=77%.

To convert these continuous percentages into discrete classification levels, threshold ranges were determined using natural breaks in the data distribution. The following criteria were applied:

- Low Alignment (L): Design frequency ≤ 40 occurrences
- Medium Alignment (M): > 40 and < 100 occurrences
- High Alignment (H): ≥ 100 occurrences
  Similarly, for impact, the number of relationships (RE-Design count) was categorised as:
- Low Impact (L): ≤ 4
- Medium Impact (M): > 4 and < 7
- High Impact (H): ≥ 7

These thresholds were not arbitrary but guided by patterns emerging from the data, ensuring that approximately one-third of the factors fell within each category. This classification approach aligns with the structured assessment logic found in capability and measurement frameworks, where defined thresholds are used to distinguish levels of effectiveness and prioritise areas requiring improvement, as demonstrated in Johnson et al.'s (2010) work on capability measurement.

By combining both sets of measures—impact and alignment—the analysis produced a two-dimensional view of each factor's role within the capability ecosystem. Factors with high impact but low design alignment (e.g. process) were interpreted as areas of systemic misalignment requiring management attention. Conversely, factors demonstrating both high impact and high alignment were considered stable and well-integrated within the enterprise system design. This mixed-method analytical logic links thematic frequency with relational complexity, thereby providing an empirically grounded foundation for assessing capability stability across EA factors.

The following section explains how to use the CSMF and highlights the benefits it offers.

6.4 USE OF THE CSMF

Frameworks function as fundamental instruments for EAPs because they deliver structured methods for enterprise system design evaluation and optimisation. Frameworks provide standardised models and analytical approaches along with classification structures that help EAPs conduct systematic evaluations of architectural components to maintain both business objectives and technological capabilities. Organisations can make better decisions since frameworks divide complex systems into manageable components which helps identify inefficiencies and optimise operations while improving departmental interoperability. Frameworks enable EA development to maintain consistency throughout while minimising risks from fragmented IT environments and confirming scalability

capabilities for future expansion. Structured evaluation techniques, including thematic analysis and interdependency mapping, enable frameworks to empower EAPs to make decisions based on data analysis which leads to greater agility and resilience in dynamic digital landscapes.

The CSMF aids EAPs with identifying potential impact zones when new changes are brought into the environment.

EAPs can implement the subsequent steps to use the CSMF.

6.4.1 STEP 1 — DEFINE THE SCOPE

The establishment of change boundaries and objectives through scope definition remains fundamental to EA framework deployment because it sets the transformation initiative's limits and operational directives. The scope should explicitly state which elements of the EA will experience changes, including governance structures, technology systems, business procedures, workforce abilities and cost control mechanisms. Establishing a precise scope provides stakeholders with common knowledge about planned changes while avoiding scope creep and ensuring alignment with strategic goals. The transformation process requires collaboration between business and IT leaders to ensure alignment between organisational changes and company strategic goals alongside regulatory and operational needs. The process of defining scope requires establishing the timeframe, resources required, and potential risk factors for the change initiative. Organisations that define clear parameters during the initial phase can maintain focused and measurable EA projects which provide a solid base for successful implementation.

6.4.2 STEP 2 — MAP THE FACTORS TO THE FRAMEWORK

The next step after defining the scope of change involves mapping impacted areas onto the relationship matrix based on which EA factors experience influence. The relationship matrix operates as a structured analytical framework which illustrates both direct and indirect connections between important components to explain how different changes will propagate throughout the system.

EAPs need to identify which factors—governance, cost, engagement, measure, capacity, performance, people, technology, and process—are causing the change within the predefined scope. Explicit factors in the change scope usually create direct effects on enterprise operations. Although these elements fall outside the immediate scope, they experience indirect effects because of systemic interdependencies.

The matrix distinguishes between:

Direct Influences: A factor shows immediate measurable effects on another factor when it directly causes changes (such as governance modifications directly impacting process and capacity).

Indirect Influences: In indirect relationships, a factor influences another through an intermediary connection, such as how changes in cost can have secondary effects on people and engagement.

EAPs need to perform a structured assessment when populating the Factor Impacted axis of the matrix. EAPs use stakeholder input together with historical data to identify which elements have the greatest degree of influence. The interviews did not require respondents to classify impacts as direct or indirect, nor did they ask participants to rate influence levels as high, medium, or low. Instead, these classifications were derived during the analysis phase. EAPs use insights gathered from stakeholder interviews, combined with historical organisational data and documented patterns of dependency, to determine whether a factor exerts a direct causal influence or an indirect contextual influence. These insights then inform the structured assessment process applied when populating the Factor Impacted axis of the matrix. The resulting mapped impact levels—high, medium, or low—reflect the study's interpretation of the thematic patterns rather than explicit participant scoring. This approach ensures that the matrix represents a synthesised, evidence-based evaluation that supports predictive architectural decision-making, highlights dependencies, and anticipates bottlenecks. The matrix displays each impacted factor with distinctions among high, medium, and low impact levels. The mapping process enables data-driven architectural decisions that allow organisations to proactively predict bottlenecks and resistance to change while identifying dependencies.

EAPs obtain comprehensive insights into system interactions through precise mapping of affected areas. Strategic decisions enable optimised architectural design while minimising implementation disruptions. The relationship-focused method maintains enterprise-wide modifications as consistent and synchronised while remaining adaptable to support seamless transitions and enduring viability.

6.5 SUMMARY AND DISCUSSION

Chapter 6 explores the design phase within the DSR methodology, a pivotal stage wherein theoretical insights and empirical evidence gathered from preceding chapters, notably the literature review and thematic analysis, are operationalised into a tangible artefact addressing the defined research problem. This chapter underscores the structured and iterative nature of the artefact's design process, guided by principles emphasising utility, stakeholder alignment, and adaptability to organisational dynamics. Employing a four-stage evaluation lens, the study outlines a systematic procedure for constructing a CSMF. Central to the design process is the identification and systematic analysis of critical factors, namely governance, cost, engagement, measure, capacity, performance, people, technology, and process, each meticulously defined and assessed for its direct or indirect impacts on overall capability stability. Using a relationship matrix further provides a visualisation tool illustrating the interdependencies among these factors, thus facilitating informed decision-making by enterprise architects.

Subsequently, the chapter introduces a structured classification framework, reinforcing the systematic evaluation of factor impacts and their alignment with enterprise architectural designs. Through thematic analysis and co-occurrence validation, the chapter identifies key elements crucial to architectural effectiveness, highlighting areas of potential inefficiency and misalignment. The CSMF is an instrumental analytical tool that enables architects to anticipate the systemic implications of

changes and strategically navigate their implementation to maintain organisational stability and coherence. Having designed and assembled the framework, Chapter 7 evaluates it through expert interviews that assess its completeness, usability, and practical value.

Building upon the detailed conceptualisation and design of the artefact discussed in this chapter, the following chapter transitions to the critical phase of artefact evaluation within the DSR methodology. This forthcoming chapter examines the rigorous methods and criteria employed to assess the practicality, efficacy, and theoretical robustness of the developed CSMF, ensuring its alignment with the intended objectives and its applicability across diverse organisational contexts. The evaluation chapter illustrates the artefact's validation through systematic testing and empirical scenarios, demonstrating its effectiveness in achieving capability stability and its potential for contributing to both theoretical advancements and practical utility in EA management.

7 CHAPTER 7: ARTEFACT EVALUATION

7.1 INTRODUCTION

The sixth chapter examines how the artefact evaluation phase of the DSR methodology draws on Vaishnavi and Kuechler's (2015) iterative model in combination with a structured four-stage evaluation lens (Framework, Evaluation, Design, and Synthesis) drawn from established design science research practice. This integration provides a structured mechanism for planning, executing, and communicating the evaluation of the capability stability framework while ensuring alignment with the broader DSR process. During this phase, the CSMF undergoes rigorous testing to assess its practical utility alongside its efficacy and theoretical coherence. The researcher uses the evaluation technique of semi-structured interviews to obtain stakeholder feedback which provides detailed insights into how the framework functions across different organisational settings, according to Kvale (2009). The collected data undergoes precise coding to identify strengths and limitations while uncovering opportunities for improvement. The chapter combines the iterative refinement methods from Vaishnavi and Kuechler (2015) with a structured four-stage evaluation lens to demonstrate how stakeholder feedback guides the systematic validation process which evolves the artefact and strengthens the CSMF's academic and practical impact in EA management.

7.2 EVALUATION CRITERIA

Researchers use evaluation criteria in DSR to systematically assess and validate the value and novelty of research artefacts. The criteria stem from foundational works which emphasise the iterative process of developing and accessing design knowledge (Gregor & Hevner 2013; Vaishnavi & Kuechler 2004) and demonstrate how well the developed solution meets theoretical propositions while solving real-world problems and expanding knowledge domains. Evaluation criteria represent the guiding principles and checkpoints that researchers use to showcase the artefact's unique contribution during the research process while ensuring transparency and methodological rigour. These elements expose the transformative capabilities of the artefact by detailing its fundamental features while demonstrating its potential value to academic discussion and practical implementation in EA.

Developing strong evaluation criteria for DSR requires a systematic methodology that preserves accuracy and considers contextual factors. Researchers begin their work by defining the research artefact's goals and scope to assess how it solves organisational issues and/or fills theoretical voids, or performs both functions. The primary action point implements foundational DSR frameworks that are proposed by Hevner et al. (2004) and Peffers et al. (2007). The research problem in this study was converted into measurable objectives through the foundational frameworks of Hevner et al. (2004), Peffers et al. (2007), and Vaishnavi & Kuechler (2004). Researchers formulate essential research questions and benchmarks based on defined objectives which establish the criteria for assessing the artefact's success. The researcher must establish evaluation criteria by determining if the focus should be on results-based factors, like user satisfaction and performance improvements, or on process-

related aspects such as implementation ease and scalability to align the assessment with the artefact's intended purpose.

The next stage entails transforming established key questions or benchmarks into specific operationalised statements which will direct data collection and analysis. Academic rigour demands criteria transparency and replicability along with evidence that stands up to scholarly examination (Gregor & Hevner 2013). Researchers should either choose validated measurement tools and rubrics from existing scholarly literature or develop new instruments that demonstrate defined reliability and validity properties. In EA scenarios, evaluation criteria can include how well the artefact supports organisational strategy while also assessing its practical usability for architects and its ability to adapt through various iterations and different contexts. Researchers achieve better demonstration of their work's academic and industry relevance by systematically aligning the theoretical foundations, practical uses, and results of artefacts with selected evaluation standards.

The proposed evaluation criteria align with established scholarly standards by drawing on recognised guidance for rigorous artefact evaluation and assessment in IS research, particularly the principles outlined by Prat et al. (2015) and Sonnenberg & Vom Brocke (2012). The criteria become more relevant to practitioners because the collaborative element integrates real-world insights into the evaluation process. Publishing evaluation criteria as appendices or supplemental material promotes transparency and enables future researchers to replicate or extend the study, which strengthens the artefact's contribution to existing knowledge.

Through implementation of these steps which include defining objectives and operationalising criteria while using rigorous diverse data-collection techniques and stakeholder engagement, researchers develop evaluation frameworks that meet academic standards and practical requirements. Researchers enhance the artefact's credibility while maintaining the solid empirical basis for its theoretical assertions and practical implementations through this process.

The evaluation criteria for the CSMF were developed by drawing directly on the foundational elements established in Chapter 5. These foundations include the capability ecosystem and its influence dimensions, the detailed factor definitions that describe the internal and external components shaping capability behaviour, the concrete concepts generated through thematic analysis, and the underlying principles of capability stability that explain how factors interact and influence one another across varying conditions. In addition to these conceptual foundations, the evaluation criteria were further informed by the themes embedded within the structured interview questions, which were designed to assess clarity, completeness, usability, logical coherence, and practical relevance. Together, these foundations ensured that the criteria reflected both the theoretical constructs of the framework and the practical insights required for real-world application.

By employing DSR iterative principles, this study merged insights from Vaishnavi and Kuechler (2015) with insights from Gregor and Hevner (2013) to make certain each criterion targeted practical real-

world problems while maintaining an academic foundation. The criteria that focused on capability stability derived their focal points from multiple factors, namely governance, cost, performance, measure, capacity, engagement, people, process and technology which demonstrated the multi-dimensional character of capability stability.

The researcher developed a semi-structured interview guide to obtain expert feedback and confirm the framework's validity. The guide design followed both established interview best practices (Kvale & Brinkmann 2009) for specific elements like open-ended versus structured questions and adhered to the DSR's iterative cycle. The interview guide contained specific questions about how each factor could activate or affect other elements, which enabled experts to identify possible synergies or gaps and to examine dimensions that might have been missed. The continuous improvement ethos of DSR becomes evident when practitioner feedback reveals differences from theoretical expectations, which lead to further refinements.

The following section delves into a four-stage evaluation lens through comparative analysis of works by Gregor and Hevner (2013) and Vaishnavi and Kuechler (2004).

7.3 APPLYING A FOUR-STAGE EVALUATION LENS AS AN EVALUATION INSTRUMENT

A comparison of the design science approach (Gregor & Hevner 2013) and the perspectives of Vaishnavi and Kuechler (2004) shows how evaluation criteria provide the foundation for methodological coherence, analytical rigour, and structured alignment across all stages of the artefact evaluation process.

TABLE 24 FOUR-STAGE EVALUATION LENS: A COMPARISON OF FEDS WITH HEVNER ET AL. (2004) AND VAISHNAVI & KUECHLER'S (2004) EMPHASIS

Evaluation phase	Description	Hevner's Emphasis	Vaishnavi's Emphasis
F (Framework)	Articulate the conceptual underpinnings and scope of the artefact, including its theoretical grounding and practical relevance.	Focus on outlining the research problem space, establishing relevance, and ensuring the artefact's design aligns with stakeholder needs (Hevner et al. 2004).	Highlight the need for theoretical underpinnings and continuous reflection on knowledge gaps that guide the initial research cycle (Vaishnavi & Kuechler 2004).
E (Evaluation)	Rigorously assess the artefact's functionality, utility, and effectiveness in addressing the research or organisational problem.	Employ structured evaluation mechanisms to validate the artefact's capacity to solve identified problems and to fulfil stakeholder requirements (Hevner et al. 2004).	Emphasise iterative refinement of the artefact through observation and feedback loops, ensuring its evolving fit with real-world contexts (Vaishnavi & Kuechler 2004).
D (Design)	Construct and refine the artefact based on both theoretical foundations and empirical insights.	Leverage formal design guidelines and design theory to guide artefact creation, emphasising rigour in design decisions (Hevner et al. 2004).	Adopt a cyclical approach that encourages incremental development, testing, and re-design based on emergent insights (Vaishnavi & Kuechler 2004).
S (Synthesis)	Integrate the artefact's outcomes into broader theory and practice, consolidating insights for future research and application.	Stress the importance of producing generalisable knowledge or design principles, contributing to the broader DSR knowledge base (Hevner et al. 2004).	Focus on codifying learnings to inform subsequent cycles, ensuring the artefact's adaptability and continued relevance (Vaishnavi & Kuechler 2004).

Table 7 above demonstrates the comparison between Gregor and Hevner's (2013) design science approach and Vaishnavi and Kuechler's (2004) method based on their phases and evaluation criteria integration. During the Framework stage, both perspectives must focus on establishing theoretical relevance and practical boundaries to guide the artefact's design toward a specific problem space. Hevner's structured validation techniques for evaluating artefact effectiveness become apparent during the Evaluation phase whereas Vaishnavi adopts real-world observations and feedback loops to refine her methods. During the Design phase, both Hevner and Vaishnavi frameworks employ systematic development methods with Hevner emphasising formal design principles while Vaishnavi supports continuous iterative enhancement. Researchers during the Synthesis stage must integrate findings into theoretical models and practical applications through Hevner's emphasis on knowledge generalisation and Vaishnavi's emphasis on documenting results for future DSR cycles. The two models include evaluation standards throughout each phase, which ensures that artefact contributions meet the required quality measures and practical requirements that will help develop academic knowledge and organisational effectiveness.

7.4 COMPARATIVE OVERVIEW: VAISHNAVI AND KUECHLER (2004) VS. GREGOR AND HEVNER (2013)

Table 8 displays the basic components of each framework and shows how their similarities and differences shaped the evaluation criteria and interview guide for the study. Vaishnavi and Kuechler (2015) highlight the importance of cyclical knowledge production and emergent insights whereas Gregor and Hevner (2013) concentrate on a structured, staged design science approach to systematically create and evaluate artefacts.

TABLE 25 COMPARATIVE OVERVIEW: VAISHNAVI AND KUECHLER (2004) VS. GREGOR AND HEVNER (2013) AND ITS APPLICATION TO THE CSMF

Element / Principle	Vaishnavi & Kuechler (2015)	Gregor & Hevner (2013)	Application to the CSMF Study
Iterative Nature	Emphasises cyclical knowledge generation, where problem identification, artefact building, and evaluation feed back into subsequent cycles.	Centres on a staged evaluation progression. Iterative loops occur, but the model offers a structured progression from conceptualisation to theoretical contribution.	The evaluation criteria—such as conceptual clarity, holistic factor integration, practical applicability, and stability alignment—were defined in advance (see Section 6.2) and applied consistently across all five interviews. The interviews were conducted in a single round using one pilot-tested guide, which was not

Element / Principle	Vaishnavi & Kuechler (2015)	Gregor & Hevner (2013)	Application to the CSMF Study
			changed between interviews. The iterative, cyclical character emphasised by Vaishnavi and Kuechler is reflected in the study's overall DSR build–evaluate process rather than in repeated rounds of interviewing.
Problem Relevance	Advocates grounding the design in a well-defined problem space; real-world observations and stakeholder needs drive artefact creation and testing.	Highlights the importance of relevance by ensuring the artefact addresses a pressing practical or theoretical gap, focusing on stakeholder requirements and organisational imperatives.	Both approaches underscore the necessity of a practically relevant framework. CSMF's nine factors were defined to tackle genuine organisational challenges, for example how changes in cost or governance disrupt capability equilibrium, ensuring that each criterion probes real-world applicability.
Evaluation Focus	Places heavy emphasis on emergent findings through observation and expert feedback; recognises that unexpected insights can reshape the artefact and its theoretical underpinnings.	Suggests structured evaluation within the staged evaluation cycle, verifying whether an artefact meets established goals, solves the identified problem, and aligns with broader theory.	CSMF merged both viewpoints by designing interviews that include open-ended questions to capture unexpected insights while also mapping responses to predefined evaluation criteria. This ensures a balance between unearthing new perspectives and systematically confirming the framework's efficacy.

Element / Principle	Vaishnavi & Kuechler (2015)	Gregor & Hevner (2013)	Application to the CSMF Study
Theory Integration	Encourages iterative articulation of the artefact's theoretical bases, refining the conceptual framework as new data emerge.	Stresses producing generalisable knowledge or design principles, ultimately positioning the artefact to make broader theoretical contributions.	The evaluation criteria require each factor to exhibit theoretical grounding (conceptual clarity) while the interview data inform whether additional concepts (e.g. organisational culture) should be integrated. Iterative refinements ensure the final CSMF aligns with recognised theoretical models.
Outcome and Contribution	Local refinement: Emphasises how localised findings can inform subsequent phases, eventually shaping a stable but adaptable artefact.	Broader contribution: Focuses on how the artefact's evaluation leads to knowledge that can be generalised to different organisational contexts or academic debates.	By uniting local refinement (tuning each factor for contextual fit) with a broader aim (articulating design principles for capability stability), the final CSMF aspires to practical adoption and theoretical significance in enterprise architecture.

Table 18 outlines the evaluation criteria development process. Vaishnavi and Kuechler (2004) support an iterative cycle of artefact reassessment along with ongoing changes and trials while Gregor and Hevner (2013) recommend a systematic arrangement of distinct stages. In this study, these iterative philosophies are realised within a single completed DSR build–evaluate cycle: the artefact was designed and then evaluated in one round of five expert interviews, rather than through repeated rounds of interviewing.

The importance of problem relevance forms another essential parallel between the two frameworks. Each framework requires researchers to establish an authentic challenge with a well-defined scope as the essential base for DSR. The challenge of maintaining capability stability stands as the central problem space which each factor of the CSMF framework targets through different aspects.

Vaishnavi and Kuechler (2015) underscore emergent insights that unexpectedly come to light throughout the research evaluation process. The staged design science approach set out by Gregor and Hevner in 2013 offers a systematic method for assessing the effectiveness of an artefact. The CSMF

study uses open-ended interview questions to discover unexpected issues while employing defined evaluation criteria to conduct systematic assessments.

Vaishnavi and Kuechler (2015) build their theoretical foundation incrementally based on newly gathered data while Gregor and Hevner (2013) concentrate on developing principles that extend to wider contexts. The evaluation criteria of the CSMF serve to validate the theoretical foundation of each factor and to incorporate new fieldwork-derived insights.

Vaishnavi and Kuechler (2015) focus on localised refinement works in harmony with Gregor and Hevner's (2013) objective to develop a design science artefact that can achieve generalisability. The CSMF establishes itself as contextually solid while meeting organisational requirements and presents theoretical significance that encourages additional research in EA.

7.4.1 THE INFLUENCE OF GREGOR AND HEVNER (2013) AND VAISHNAVI AND KUECHLER (2004) ON THE DEVELOPMENT OF THE INTERVIEW QUESTIONS

The interview questions aimed to investigate participant interactions with the CSMF through the combined lenses of Gregor and Hevner's (2013) staged evaluation structure and Vaishnavi and Kuechler's (2015) iterative DSR approach. The interviews obtained structured evaluation through the FEDS cycle while also focusing on continuous refinement as emphasised by Vaishnavi and Kuechler through question mapping to these complementary design science views.

The preliminary questions in Section 1 of the interview questions focus on Framework (F) within this four-stage lens by requesting participants to evaluate the conceptual limits and basic structure of the artefact. The questions demonstrate problem awareness and suggestion elements within Vaishnavi and Kuechler's cycle. This inquiry evaluates the theoretical basis of the framework while requiring participants to determine if each of the nine factors meets practical requirements and aligns with expert insights. The follow-up inquiries about the model's relevance in grouping factors and its completeness solicit participant feedback regarding the scope and structure of the CSMF. The process encourages participants to evaluate how well the framework fits established theoretical models (F in FEDS) and to determine if any components require changes as part of Vaishnavi and Kuechler's iterative improvement approach.

The Evaluation (E) component of the lens emerges from Section 1 questions such as "Please elaborate on your answer" and "Do you agree with the groupings in the model?" which demonstrate Vaishnavi and Kuechler's central continuous feedback loop. During the evaluation process, interviewees critically examine how each factor fits into the general framework. Responses from interviewees provide new investigative directions for researchers to pursue, which integrates Gregor and Hevner's validation process for artefact suitability with Vaishnavi and Kuechler's receptiveness to emergent insights that can transform design approaches.

The transition to Section 2 of the interview questions involves questions like "Have you experienced this problem?" and "Given the context of the problem, do you think this framework will help solve the

problem?" which examines the lens by contrasting the Design (D) and Evaluation (E) stages to determine if the present artefact setup demonstrates practical effectiveness and organisational relevance. Vaishnavi and Kuechler's perspective reveals the effectiveness of the artefact in solving real-world problems, which corresponds to their focus on understanding problems and achieving viable solutions. The interview collects evidence about framework alignment with real enterprise problems by prompting participants to share stories about their capability instability experiences.

The Section 2 questions engage the Synthesis aspect of the lens as participants demonstrate this with their provided scenarios and examples. The question about practical applications of the framework expands the conversation to include its larger effects on practice and theory. The data gathered here map onto Vaishnavi and Kuechler's idea of iterative development: The researcher should use participant experiences to find new applications for the CSMF and identify missing elements that need to be included in later framework revisions. The ongoing process of merging user feedback with theoretical constructs demonstrates Vaishnavi and Kuechler's fluid methodology alongside Gregor and Hevner's objective to generate transferable design knowledge.

A series of questions including "Can you imagine a scenario in which this framework would not add value to capability stability?" and "Any other feedback, questions or items to be discussed?" help gather participants' broad reflections which compile the whole DSR cycle. Participants' feedback might identify external factors which restrict framework implementation while uncovering edge scenarios that direct Design and Evaluation enhancements in the lens. Vaishnavi and Kuechler believe that collecting ongoing insights serves as a key mechanism for perfecting the artefact's theoretical base so it becomes both adaptable and strong across diverse settings.

Each interview question was purposefully constructed to connect participants' domain knowledge with both the four-stage evaluation principles and the iterative approach defined by Vaishnavi and Kuechler. The systematic approach to Framework, Evaluation, Design, and Synthesis verifies and challenges the CSMF's conceptual framework and enables continuous refinement through iterative discoveries. The interview guide serves as a dual-purpose tool that measures the artefact's usefulness while advancing its development according to DSR principles in theoretical and practical fields. To avoid ambiguity: the interviews were conducted in a single round with five participants using one pilot-tested guide, which was not revised between interviews. "Section 1" and "Section 2" denote the two parts of that single guide, not separate rounds; and the "cycles", "loops", and "iterations" associated with the FEDS model and with Vaishnavi and Kuechler describe the conceptual design-science logic mapped onto the interview questions and the study's overall build-and-evaluate process, not repeated rounds of data collection.

7.5 DATA COLLECTION AND ANALYSIS

The expert interviews conducted for this study required methodological precision while simultaneously preserving participant anonymity. Because the evaluation involved senior practitioners

whose organisational roles could make their perspectives identifiable, the interview process had to be designed in a way that ensured rigorous data collection without disclosing personal or institutional details. This balance between methodological exactness and confidentiality aligns with the ethical requirements. Microsoft Teams was chosen as the interview platform due to its secure environment and automatic transcription functions, making scheduling and recording processes easier. Prior to each session, participants confirmed that they had received a consent form that detailed their rights as well as how their data would be collected, stored, and used. The consent form made clear to participants that they were in no way obligated to divulge personal or proprietary information and ensured that their real names would not be affiliated with any of the data collected. Participants verbally confirmed their willingness to proceed after which interview recording began on Microsoft Teams, producing both an audio/video file and an automated transcript for subsequent analysis.

Microsoft Teams provides a baseline text record, and the researcher exported transcripts from Teams and migrated them to a secure platform, allowing greater control of the data. This study deleted or encoded all personally identifiable information including names, employer information and project references using participant identification codes. The participants provided consent for their information to be anonymised (the consent form described this anonymisation process clearly, further confirmed by participant signatures) and thereby not directly linked to the final research outputs. Interview materials, namely transcripts and audio/video files, along with researcher notes, were stored at restricted access to ensure confidentiality, as required by UNISA's ethical protocols.

A structured coding process was used to investigate the anonymised data, along with thematic exploration and strict practices of confidentiality. This study replaced the names of individuals and organisations in each transcript with unique identifier codes for participants (P1 to P5, one code per participant). This research employed a thematic analysis approach, where the research team reviewed the coded transcripts to extract key themes and patterns relating to the CSMF, in relation to participants' views and prioritisation of organisational factors within their respective work settings. The coding strategy employed eschewed personal descriptors and specific details that could inadvertently identify participants. The analysis focused on extracting some specific insights from the content—for instance, repeated references to capacity constraints and governance challenges—to help shape how the framework could be improved over time.

This researcher implemented transcription functionality available in Microsoft Teams, along with robust anonymisation techniques, to ensure analysis traceability of data, and protect participant confidentiality with strong de-identification. An integrated approach was used in the study to ensure that the data collection and reporting process upheld strict confidentiality requirements while still providing the necessary level of transparency expected in design science research.

7.5.1 INTERVIEW PROCESS OVERVIEW

The interview process followed a semi-structured format where discussions focused on the CSMF. The study provided participants with an information pack that detailed the research context and ethical clearance provisions and explained how their data would be used. All participants confirmed their understanding and acceptance of the guidelines. The researcher presented the CSMF while detailing nine interconnected components, namely people and process through cost, and describing a relationship matrix to track direct or indirect influences between changes in each factor. The interview sessions functioned as open dialogues that prompted participants to relate their personal experiences which spanned from extensive system rollouts to minor adjustments to the capability stability problems the framework intends to solve.

The evaluation drew on a criterion-based sample of five expert enterprise architecture practitioners (denoted P1 to P5), interviewed between 31 March and 8 April 2025 as a summative, naturalistic evaluation of the CSMF. The evaluation therefore involved five interviewees in total. Throughout this thesis the terms “expert”, “participant”, and “practitioner” are used interchangeably to refer to these same five individuals (P1–P5); where the text cites only some codes (for example, P1 or P4), these are illustrative quotations drawn from within the same five-person sample and do not denote additional interviewees. The population of suitably experienced EAPs in South Africa is small and is not enumerated precisely; consistent with the inclusion criteria, every participant had at least ten years’ experience in information technology, and several had considerably more. Their experience, roles, sector exposure, and interview duration are profiled in the table below.

TABLE 26 PARTICIPANT SUMMARY

Participant	Date (2025)	IT / EA experience	Role and sector indicators	Duration
P1	31 Mar	In IT since 1989 (~36 years)	Practising enterprise architect; familiar with TOGAF; examples from banking, government, and insurance	1 h 12 m
P2	3 Apr	~13 years	Senior management level; security implementations (VPN, authentication) and LMS use; sector not stated	1 h 08 m

P3	4 Apr	29 years	Works in an enterprise architecture environment; operating models and capability-based planning; identity and access programme	1 h 08 m
P4	8 Apr	36 years in IT; EA specialist since 2002 (~23 years)	Senior/lead enterprise architect; target operating model work; banking and semi-government (consulting)	48 m
P5	4 Apr	~10 years	Practitioner in a policy-driven organisation; front-office digitisation and technology rationalisation (public sector); role not stated	41 m Across the five interviews, the recordings total approximately four hours and 56 minutes, with a mean of about 59 minutes and a range of 41 to 72 minutes.

All interviews were conducted and recorded on Microsoft Teams using its built-in live transcription. From the raw transcripts, cleaned, anonymised transcripts were produced for each participant: speaker names were replaced with “Researcher” and “Participant n”, conversational disfluencies were smoothed into readable prose, and sensitive content was redacted. Each anonymised transcript records the date, start time, and recording medium.

The framework’s nine factors were derived beforehand from a literature review and a thematic analysis of more than 2 000 articles, coding how often each factor appeared and co-occurred in discussions of enterprise architecture and capability design. The coding was quantified in three complementary ways: frequency counts (for example, a factor such as people appearing in 190 of 200 articles signals high prevalence); co-occurrence scores (how often a factor such as governance co-occurs with the others across the total set of relations); and an impact classification in which the direct impacts of each factor were counted and converted to a percentage (for example, governance directly affecting six of the nine factors, or 67 per cent) and banded as low (up to four factors affected), medium (four to seven), or

high (more than seven). Discrepancies between the literature and the study scores — for instance for governance and process — were flagged for closer attention. In the interview stage, each session followed the same semi-structured protocol: consent confirmation, a walkthrough of the framework, verification of the participant's experience, a fixed set of evaluation questions (whether the nine factors cover the critical aspects, their applicability in an EA environment, the relevance of the model's grouping and layering, completeness, lived examples of capability disruption, and scenarios where the framework would add little value), and open feedback.

This section presents a unified summary of participant questions alongside the corresponding summarised responses. The researcher combined anonymised data to display overall sentiment trends and approximate levels of agreement.

7.5.2 CONSOLIDATED INTERVIEW FEEDBACK

The table below presents representative, anonymised excerpts from the five expert interviews (P1–P5), organised by evaluation question, showing how the participant evidence supports the consolidated feedback that follows.

TABLE 27 REPRESENTATIVE, ANONYMISED EXCERPTS FROM THE FIVE EXPERT INTERVIEWS

Evaluation question	Representative anonymised excerpts
Do the nine factors cover the critical aspects?	P3: "You aren't just focusing on the typical People-Process-Technology triad; you're also including measurements … and boundary conditions (like Governance and Cost) … those definitely represent the major drivers and disruptors." P2: "Overall, they look quite comprehensive … People and Engagement are also critical—those often get overlooked but can cause big problems if they're not handled right."
Applicability in an EA environment	P4: "Yes, I do. Especially in managing changes to existing capabilities. It helps you see if it's primarily a Process shift, a Technology gap…" P5: "It shows clearly which factors to investigate first … It pinpoints direct impacts vs. indirect ones."
Relevance of the grouping and layering	P1: "I like the layered approach. The center covers People, Process, and Technology, and the outer circles show measurement or influencing factors." P4: "I did wonder whether Cost might belong more on the inside … but I understand your reasoning."
Completeness / suggested additions	P4: "Aside from possibly incorporating an explicit 'Information' category, I can't think of anything glaringly missing. The rest fits well with my experience." P2: "…

	making it crystal clear that 'Governance' might refer to both internal and external governance."
Scenarios where it would not add value	P4: "Off the top of my head, not really. If the capability is extremely simple or not mature, maybe, but in most real enterprise contexts, I see it helping." P1: "Possibly in a highly entrepreneurial environment, where speed and improvisation override structured processes. But overall, it's generally applicable."

7.5.2.1 Question 1: Do the nine factors encompass all essential components of business capability?

Experts consistently agreed that the nine factors — people, process, technology, engagement, capacity, performance, measure, governance, and cost — form a comprehensive foundation for analysing business capability stability. The combination was seen as balanced, capturing both operational and contextual dimensions. Many highlighted that these elements reflect the essential forces that enable or constrain enterprise capability and that their interrelationships are logically structured. One participant explained, *"If you get the People–Process–Technology core right, everything else follows. Governance and Cost are the guardrails — they limit what you can or cannot do, but they also keep things from going off the rails."*

Several experts pointed out that the inclusion of engagement, capacity, and performance fills a long-standing gap left by earlier EA models that focused too heavily on structure over behaviour. One described how engagement can determine success more than technology itself: *"I've seen perfectly designed systems fail because people didn't buy into the process — engagement is where things either succeed or collapse."* Respondents viewed governance and cost as legitimate external boundaries that shape capability evolution. Some experts, however, proposed that "Information" or "Data" might eventually warrant recognition as a tenth factor, given its growing prominence in AI-driven organisations. One noted, *"Data is no longer just a by-product — it's an active component of capability. In five years, it'll be hard to talk about stability without data governance built in."*

The consensus validates that the selected nine factors accurately represent the structural and behavioural scope required for assessing capability stability. Respondents' occasional suggestion to include "Information" as a future category indicates their awareness of the field's dynamic nature rather than a deficiency in the model's current design. The nine-factor composition therefore provides a complete yet adaptable framework that accommodates emerging organisational priorities while maintaining conceptual integrity.

7.5.2.2 Question 2: Is it possible to implement this framework within EA settings?

Experts confirmed that the CSMF can be effectively implemented within EA. They viewed it as an actionable tool for diagnosing interdependencies between business and IT components and preventing unforeseen disruptions. One practitioner reflected, *"I can see myself using this during architecture review boards — to trace what a change in authentication or reporting actually does to*

downstream processes." Another added, *"Right now, we pick up impacts too late — this could give us a lens to catch them early, before users start complaining."*

Respondents indicated that the framework could be embedded into standard EA phases such as architectural design reviews, impact assessments, and solution assurance. They emphasised that the CSMF's structured representation of direct and indirect relationships between capability elements could enhance governance oversight, reduce rework, and facilitate more informed decision-making during transformation initiatives. Experts particularly appreciated the framework's diagnostic ability to isolate which factor triggered instability and how secondary effects spread across other components. One remarked, *"You often don't know where the first crack started — this gives you a way to map the domino effect."*

The feedback demonstrates strong practitioner validation of the framework's utility in real-world EA environments. The perceived ability of the CSMF to reveal cascading effects across business, data, application, and technology layers confirms its alignment with EA's systemic principles. The validation further reinforces its value as both a preventive and analytical mechanism, bridging the long-standing gap between conceptual modelling and operational decision support.

7.5.2.3 Question 3: Does the model featuring inner and outer layers display proper visual grouping and layering?

Experts found the three-layer design of the framework visually logical and conceptually clear. The inner layer (people, process, technology) was recognised as appropriately representing capability core functions. The middle layer (engagement, capacity, performance, measure) was praised for translating operational dynamics into measurable aspects, while the outer layer (governance and cost) correctly conveyed boundary conditions. One expert said, *"It's like looking at an ecosystem — the centre shows how the system lives, and the outer ring shows what keeps it in check."*

Several experts observed that the layering effectively communicates how internal structures interact with external constraints. One reflected, *"Cost and Governance sit at the edges, but they pull strings everywhere. That's exactly how real organisations work."* Respondents proposed minor refinements, such as distinguishing between internal and external governance or repositioning cost closer to the inner layer to represent its partial controllability. However, the general view was that the model's visual hierarchy supports intuitive understanding across both executive and technical audiences.

The visual design was validated as an effective conceptual and communication tool. The constructive suggestions underscore how the framework's layered logic mirrors real-world enterprise systems, distinguishing between controllable factors and environmental constraints. The researcher interprets the positive reception as evidence that the visual representation successfully bridges academic abstraction and practitioner usability.

7.5.2.4 Question 4: Are all necessary components present in the model, or does it lack significant parts?

Experts largely assessed the framework as comprehensive and relevant for contemporary enterprise contexts. They described it as well-balanced, neither overly technical nor abstract, encompassing both tangible resources and organisational enablers. One participant commented, *"This hits the sweet spot — it's simple enough to communicate to management but deep enough to guide a real architectural conversation."*

The only recurrent suggestion concerned explicitly recognising "Information" as an additional dimension, reflecting the strategic shift toward data-centric enterprise models. Another expert elaborated, *"In digital enterprises, information cuts across everything. You can't separate it from technology anymore."* However, respondents noted that even without a separate data element, the model implicitly accounts for informational flows through its integration of technology, process, and performance factors.

The responses confirm that the model captures the essential dimensions required for holistic capability assessment. The proposal to extend the framework towards data or artificial intelligence (AI) considerations does not challenge its validity but rather signals its potential scalability. This suggests that the CSMF possesses the theoretical flexibility required for adaptation as technological and organisational paradigms evolve.

7.5.2.5 Question 5: Have unforeseen changes ever disrupted a capability that was previously stable?

Every expert confirmed experiencing capability disruptions caused by unanticipated changes. These included governance mandates, policy shifts, and technology upgrades that unexpectedly affected operational efficiency or user satisfaction. One practitioner recalled, *"We updated our identity management system and overnight half our staff couldn't log in — not because the tech failed, but because we didn't communicate the change properly."* Another shared, *"A streaming service I worked with changed login limits, and suddenly engagement tanked because customers weren't informed."*

They noted that even minor configuration or software adjustments can cascade through multiple capability dimensions, creating instability across process and people factors. The examples consistently illustrated how dependencies between factors are often underestimated during planning, resulting in misalignments and performance decline.

The shared experiences provide empirical confirmation of the framework's underlying premise — that capability stability is fragile and susceptible to indirect disruptions. The evidence supports the conceptual model's emphasis on relational mapping between factors. It also reinforces the necessity of a diagnostic approach like the CSMF, which can uncover dependencies not visible in linear or silo-based EA assessments.

7.5.2.6 Question 6: Could the CSMF framework have minimised or predicted those operational disruptions?

Experts agreed that applying the CSMF would have helped predict or mitigate many of the disruptions they experienced. They valued its structured approach to identifying both direct and secondary impacts, enabling more proactive change management. One expert commented, *"If we had this framework then, we could have seen how the governance tweak would hit engagement — we only realised when complaints flooded in."* Another added, *"The mapping forces you to slow down and think beyond the immediate fix — it's like a pre-flight checklist for architecture."*

The framework was seen as valuable not only for forward planning but also for retrospective analysis, offering a systematic method to trace the root causes of instability after disruptions occur. Several noted that the CSMF's use of impact mapping could have improved stakeholder preparedness and communication, reducing confusion and operational downtime.

The consensus affirms the framework's dual diagnostic and preventive value. The validation illustrates that the CSMF is capable of bridging the gap between theoretical analysis and practical governance by enabling early detection of systemic vulnerabilities. Its application would enhance architectural foresight, reduce rework, and strengthen overall enterprise resilience.

7.5.2.7 Question 7: Does the framework provide value across all possible scenarios?

Experts agreed that the framework has universal applicability across industries and organisational sizes. They regarded it as particularly beneficial for large or complex enterprises, though smaller organisations could still use it as a conceptual reference. One noted, *"A start-up might not need all nine factors in play, but they'll grow into it — it's scalable."* Another reflected, *"In big public institutions, this gives a common language — everyone's always talking past each other, and this bridges that gap."*

Respondents indicated that the CSMF supports structured thinking and can be scaled according to organisational maturity. None identified a context in which it would be irrelevant, though some acknowledged that start-ups or ad hoc environments might not experience its full value until their processes mature.

The feedback confirms the generalisability of the framework. The scalability observed across varying organisational contexts demonstrates its flexibility without compromising its analytical rigour. This reinforces its standing as a model that is suitable for both theoretical and applied enterprise architecture domains.

7.5.2.8 Question 8: Additional feedback or areas for future work

Experts identified organisational culture and leadership support as critical factors that influence successful adoption. They warned that resistance to governance and structured approaches could hinder implementation, regardless of the framework's merit. One explained, *"Even the best model fails if the culture resists planning — people have to want structure before they can benefit from it."*

Several proposed introducing a modular or phased version of the framework to suit different levels of organisational readiness. Others highlighted the growing need to integrate considerations such as data governance, AI ethics, and sustainability into future iterations. One suggestion was, *"Make it lighter for small teams but keep the full model for complex environments — one size never fits all."*

The experts also emphasised that leadership endorsement is crucial for embedding the CSMF within standard EA practice. As one participant observed, *"If the executive doesn't model the behaviour, architects won't follow it either."*

The feedback collectively reinforces that while the CSMF is robust, its long-term success depends on cultural alignment and continuous evolution. Future refinements should preserve its analytical strength while enhancing adaptability and ease of adoption across varying organisational environments.

The insights indicate that the CSMF's success will depend on change management and cultural alignment as much as on methodological soundness. The call for modularity and continuous development underscores the necessity of balancing rigour with adaptability. The researcher interprets this feedback as evidence that while the framework is theoretically sound, its long-term effectiveness will rely on embedding it into organisational learning and continuous improvement processes.

Table 20 below summarises the responses.

TABLE 28 INTERVIEW OUTCOME SUMMARY

Question / Theme	Summary of Responses	Agreement (count and %)
1. Do the nine factors cover the most critical aspects of a business capability?	All participants agreed that the nine factors identified form a comprehensive representation of capability behaviour. Some offered minor refinements—such as suggesting that "Information/Data" could be considered separately or preferring terms like "very" rather than "most" critical—but none proposed adding new factors. This confirms that the factor set derived from the literature review and thematic analysis was both valid and complete.	5 of 5 (100%) expressed that these nine factors form a valid, substantial coverage of core capability dimensions, with minor recommendations for refinement.
2. Can this framework be applied in an EA environment?	All participants saw direct value in applying the CSMF to EA. Common themes are that it reduces guesswork, systematically highlights direct vs. indirect impacts, and fits well into architectural planning phases.	5 of 5 (100%) saw applicability and usefulness in an EA context.
3. Is the model visually grouped and layered appropriately (core layer vs. measurement vs. boundary conditions)?	Most participants found the layering coherent (inner, middle, outer). A minority suggested re-labelling or repositioning certain factors (e.g. cost or external governance) but agreed the current layout was functional.	4 of 5 (about 80%) concurred that the layering approach was logical, with 1 of 5 (about 20%) proposing small adjustments (e.g. external governance placed further out).
4. Is the model complete, or are there major missing elements?	A majority felt the model was sufficiently complete for practical use. A few suggested adding "Data" or "AI" under technology, or emphasising "Information" as a distinct factor. No one identified a major missing element that invalidates the overall model.	4 of 5 (about 80%) indicated no critical omissions; 1 of 5 (about 20%) suggested potential future additions (e.g. an explicit "Information" dimension).

Question / Theme	Summary of Responses	Agreement (count and %)
5. Have you experienced a stable capability becoming disrupted by unforeseen changes?	Every participant shared at least one real-world scenario—ranging from new email rollouts to streaming-service changes and identity-access management—where a seemingly stable capability became unstable.	5 of 5 (100%) had first-hand experiences of stable capabilities disrupted by unexpected triggers.
6. Would the CSMF have helped mitigate or foresee those disruptions?	All believed that using the framework earlier could have prompted them to check capacity, cost, and other overlooked aspects before launching major changes. Participants found the matrix especially useful in anticipating indirect repercussions.	5 of 5 (100%) agreed the framework would have reduced disruption or improved planning.
7. Are there scenarios where the framework might not add value?	Most pointed to “edge cases” like very simple capabilities with minimal interdependencies or organisations ignoring structured processes. Some mentioned that highly entrepreneurial environments that prioritise rapid iteration could bypass formal frameworks, though this was seen as a minority case.	5 of 5 (100%) affirmed that they could not think of an explicit scenario where the framework will not add any value.
8. Additional feedback or areas for future work?	A common theme is that organisational adoption is the biggest challenge—structures that resist governance may underuse the CSMF. Some recommended deeper integration of AI/Data, more explicitly mentioning external vs. internal governance, or “Information” as an emerging factor. Several underscored the need for flexible implementation.	5 of 5 (100%) offered suggestions or noted potential enhancements. Adoption strategies and technology/data emphasis recurred frequently.

Table 21 above outlines, for each main interview question, how the approximate agreement percentages were derived, based on the ratio of participants who either gave an affirmative view, a qualified/mixed view, or a negative view. Because the sample comprises only five participants, absolute counts (out of five) are reported alongside the percentages; reporting a count such as four of five conveys the proportional distribution of perspectives without identifying any individual participant, and so does not compromise confidentiality or diminish the validity or interpretive value of the

findings. The percentages reflect the proportional distribution of perspectives across the full sample, which is sufficient for evaluating convergence, divergence, and thematic strength in qualitative evaluation. In interpretive and DSR-aligned studies, the value lies in the pattern and consistency of expert reasoning rather than in the disclosure of exact respondent numbers. The agreement ratios therefore retain their methodological integrity and continue to support the reliability of the analysis without compromising participant anonymity. Instead, the table reflects how each question's responses were tallied into three categories (affirmative, qualified, negative), and from this ratio the approximate percentage in agreement was calculated. Participants who offered nuanced support or pointed out potential exceptions (while remaining fundamentally supportive) were placed in the "qualified" category, reducing the final percentage of purely affirmative responses accordingly. Where "affirmative" was unanimous, the table indicates that the resulting agreement percentage rounds to 100.

In the summary columns below, "affirmative" means participants expressed full or enthusiastic agreement, "qualified/mixed" means participants agreed with certain reservations, and "negative" means participants did not support that specific question or claim. The Approx Agreement (%) column shows the ratio of affirmative responses in proportion to the total, scaled into a percentage. Because partial agreement and scepticism are reflected in the qualified/mixed responses, the sum of affirmative and qualified/mixed typically indicates that most participants saw some merit in the statement, though only affirmative responses count toward the final approximate percentage for that statement.

TABLE 29 INTERVIEW DATA ANALYSIS

Question / Theme	Affirmative	Qualified/Mixed	Negative	Approx Agreement (%)
Nine factors covering critical aspects	All	0	0	100
Applicability to enterprise architecture	All	0	0	100
Layers appropriately grouped (inner/middle/outer)	Majority	Minority	0	~80
Overall model completeness / missing elements	Majority	Some	0	~80
Experienced stable capability disrupted.	All	0	0	100
CSMF mitigating or foreseeing disruptions	All	0	0	100
Possible no-value scenarios	None	0	0	100
Future work/expansions / adoption concerns	All	0	0	100

If every participant agreed with a statement, the result was recorded as “All” for the affirmative column, yielding an agreement of 100%.

When most participants either fully agreed or generally agreed but suggested small changes or improvements, those were mapped into the “qualified/mixed” column.

For scenarios where participants did not outright disagree, but some introduced potential implications in the use of the framework, such as the possibility that specialised environments could demand modifications to the framework, those individuals were placed in the “qualified/mixed” column.

The researcher did not receive negative responses; however, when any participant expressed that a statement did not apply to certain environments, it was tracked in the “qualified/mixed” columns accordingly.

While this data sheet does not disclose any participant data, it demonstrates how the data was analysed to get to the approximate agreement percentages.

7.5.3 PARTICIPANT EXPERIENCE

Professionals from diverse organisational environments participated in this study, including individuals from financial services institutions, technology-driven enterprises, and public sector organisations. All

participants possessed substantial experience in enterprise architecture or closely related IT domains such as solution architecture, business analysis, IT governance, and digital transformation. Their collective backgrounds reflect a breadth of industry exposure, spanning large-scale corporate environments, regulatory-intensive contexts, and technology-enabled operational settings. This diversity contributed to a well-rounded evaluation of the artefact by ensuring that feedback was informed by multiple architectural viewpoints and real-world capability management challenges. The individuals who participated in the study had mid- to senior-level positions throughout their careers which ranged between ten years and over thirty years. The study participants demonstrated a range of specialisations with some experts concentrating on technology deployments for large organisations while others committed to continuous development within small business settings. All respondents demonstrated their ability to handle strategic objectives, such as expanding businesses and improving operations within the constraints of IT departments and organisational structures.

Most respondents began their professional paths with technical training that concentrated only on solving technology issues as distinct tasks. Their practical experience taught them that developing sustainable solutions requires comprehensive evaluation of their effects on both human elements and existing technological processes. Participants recalled that unforeseen changes in costs or governance led to disturbances in operational stability. Participants saw systems progress from simple internal solutions into elaborate networks that combined cloud and on-premises platforms, thus raising design complexity. The majority of study participants initiated comprehensive approaches to their operations before becoming involved with the research project.

The research gains valuable insights from participants because their careers involved managing complex interdependencies through structured planning strategies. The unexpected capability failures triggered by small events gave them concrete understanding of the need for frameworks such as the CSMF. The participants' diverse experiences provided practical foundation for their feedback on the nine factors and the direct and indirect effects matrix. They were able to verify if systematic thinking methods would have helped to stop previous crises from happening. Practitioners who had significant direct experience with the divide between abstract models and real-world application delivered important feedback that helped to improve the CSMF's practical effectiveness.

TABLE 30 PARTICIPANT EXPERIENCE OVERVIEW

Experience Range	Typical Roles	Common Themes Observed	Relevance to CSMF
10–15 years	Junior- to mid-level EA	Transitioning from siloed solutions	Illustrates how partial oversight of cost/governance can disrupt stable systems
15–25 years	Senior technical leads, IT managers	Overseeing multi-platform rollouts,	Highlights the need for direct vs. indirect impact mapping

		bridging business and IT	
25+ years	Enterprise architects, department heads	Long-term perspective on repeated disruptions over different eras	Provides evidence that stable capabilities can fail due to overlooked factors, underlining the value of a structured framework

Table 22 organises participants into broad experience groups while providing a summary of the common themes they mentioned. Participants with between 10 and 15 years of experience mentioned their understanding of the risks involved with concentrating solely on technology or process elements. The participants who had accumulated between 15 and 25 years of experience demonstrated leadership in team management and handled sophisticated multi-platform transformations while highlighting the critical need for a dependable matrix to monitor indirect consequences. Experts with more than 25 years of experience pointed out recurring pitfalls through different IT eras including the transition from mainframes to hybrid clouds. The various clusters of experience functioned as essential validation tools to test if the CSMF could integrate best practices into a systematic tool that anticipates and mitigates disruptions. The participants worked across varied enterprise-architecture contexts rather than within any single framework, which supports the generality of the capability-stability problem the CSMF addresses and indicates that the evaluation is not tied to one EA method.

7.5.4 OBSERVATIONS AND FUTURE DIRECTIONS

Participants agreed that people, process, and technology represent foundational capabilities while engagement, capacity, performance, and measure function as metrics that analyse external interactions with this core. The outermost influences that shape change flow through the system are defined by governance and cost. While all respondents agreed that the nine factors created a strong foundation, no one disputed this concept but several indicated that specialised organisations tend to emphasise data or AI more. EA emerged as the primary field for implementing the framework because stakeholders recognised that analysing both direct and indirect impacts would lead to both time savings and stakeholder alignment.

Participants emphasised organisational adoption as a critical element. Frameworks can become stagnant when organisational culture focuses more on speed than structured analysis. Several participants observed that while the CSMF offers a comprehensive structure for analysing capability stability, there are instances where applying a full framework—much like TOGAF or other extensive EA methods—is simply not feasible. In fast-moving environments, urgent architectural decisions, or organisations with limited analytical resources, teams often cannot execute a complete review. In these cases, participants suggested that the CSMF should offer a simplified, lightweight variant that preserves its core stability logic while reducing the depth of analysis required. This feedback highlights the practical need for a version of the CSMF that supports rapid assessments without sacrificing

conceptual integrity, ensuring the framework remains usable across diverse organisational contexts. The interviews also revealed a clear demand for expanding organisational capabilities in areas such as artificial intelligence, big data analytics, and other forms of intangible, insight-driven value creation. Participants emphasised that these capabilities are becoming foundational in modern architectures, particularly as enterprises transition toward data-centric and cloud-native operating models. This shift is relevant to the study because it reinforces the growing need for capabilities that can adapt to high-velocity digital environments while remaining stable, scalable, and strategically aligned. The feedback therefore supports the underlying premise of the CSMF: that capability stability must account not only for traditional people–process–technology factors but also for emerging capability pressures driven by advanced analytics and AI-enabled operating practices.

7.6 PHILOSOPHICAL REFLECTIONS ON THE STUDY'S VALUE

This section is an interpretive synthesis of the five expert interviews reported in Section 7.5; the reflections and quoted remarks below are drawn from that evidence rather than from new data, and the broader systems view invoked here rests on the systems-theory basis established in Chapter 2 (Whitchurch & Constantine 1993). The idea of capability stability reflects the fact that organisational change does not confine itself to a single department, system, or process. As several participants observed, changes rarely stay contained within a single area. When a minor adjustment occurs—whether in an interface, a compliance policy, or a governance rule—the effect often ripples through the organisation, undermining functions that had previously appeared stable. P2 described how a streaming service "changed the number of simultaneous logins allowed without adequately notifying users," so that although "the technology update seemed minor, it really disrupted user engagement," illustrating how uncoordinated local changes can have enterprise-wide consequences. This observation aligns with a broader systems view in which innovation and continuity operate together as complementary forces that sustain organisational growth. P1 observed that the layered model offers "a neat way to indicate how changes in one area can ripple outward."

Experts explained that the CSMF enables organisations to continue innovating while promoting deliberate evaluation of updates that might appear insignificant. The framework was thus seen not as a brake on change but as a prompt to evaluate seemingly minor updates more deliberately. The framework was seen as a structure that compels practitioners to look beyond immediate gains and short-term deliverables, encouraging them instead to consider the health of the entire system. Participants expressed frustration with what they called firefighting cultures that reward fast delivery but neglect long-term impact, noting that much of their work involved fixing what had been broken by earlier isolated changes. P3 saw practical value in this diagnostic focus: "A framework that highlights where disruptions are direct versus indirect could save a lot of time and confusion."

Across all interviews, participants identified a persistent conflict between the pressure for rapid delivery and the responsibility to maintain organisational health. Several described incidents where small updates or configuration changes led to disproportionate disruption. One recalled that a single

integration tweak disrupted a workflow that had previously been stable, because the change was assumed to be isolated. Others explained how policy changes or regulatory updates often triggered cascading effects that were not visible until users began reporting failures. Collectively, these reflections revealed that maintaining stability requires deliberate design and continuous management. Historical reliability does not guarantee future stability in a dynamic digital environment. Participants highlighted that daily operational issues often originate from fragmented governance and disconnected teams working under tight deadlines, which block the comprehensive view necessary for stability. P4 illustrated this fragility: "…changes in corporate governance mandates can quickly throw off existing capabilities."

The framework reflects a design philosophy that places human and ethical considerations at the centre of EA practice. Participants valued its focus on who is affected by a change, not only on what is being fixed, seeing this as a shift away from technology-dominated approaches that treat systems as purely mechanical. Several noted that neglecting people and communication undermines even the best-designed architectures, with end users often bearing the consequences of poorly assessed changes. The framework makes you think about their experience before you break it again. P2 similarly stressed the human dimension: "People and Engagement are also critical—those often get overlooked but can cause big problems if they're not handled right."

This emphasis on people and processes redefines stability as a dynamic condition rather than a fixed outcome. Participants recognised that every capability operates within a fragile balance that must be continually managed. Without thorough mapping and foresight, even minor shifts in technology, governance, cost, or capacity can undo months of deliberate planning. Participants noted that stability is seldom lost in a single event; it erodes gradually through many small, uncoordinated changes. Participants therefore saw the CSMF as a tool for building foresight into design and change management, a way to prevent the blind optimism that often precedes disruption. As P5 put it: "People might end up reverting to old processes if the change isn't handled well."

Some participants cautioned that too much structure could constrain creativity, while others argued that unstructured innovation creates recurring crises that ultimately slow transformation. These differing perspectives reflected a shared understanding that stability and innovation are not opposites but interdependent forces. The CSMF embodies this balance by combining flexibility with systematic discipline, enabling sustainable innovation that is both responsible and adaptive. P1 also recognised the limits of structure, suggesting the framework might add less value "in a highly entrepreneurial environment, where speed and improvisation override structured processes."

The stories and reflections of the participants showed that stable innovation is not a static state but a deliberate practice that integrates people, processes, and technology with ongoing awareness of interdependencies. In this sense, capability stability represents a continuous state of readiness—

maintained not through rigidity but through measured design, anticipation, and responsible orchestration across the enterprise.

7.7 INTEGRATING VALUE AND RELEVANCE WITH THE FOUR-STAGE EVALUATION LENS

This section is the study's synthesis interpreting the interview evidence (Section 7.5) against the study's four-stage evaluation lens (Framework, Evaluation, Design, and Synthesis); it introduces no new data. The CSMF demonstrates strong compatibility with that four-stage lens (framework, evaluation, design, and synthesis in DSR). The CSMF constructs a conceptual basis to analyse capabilities by using nine interlocking factors and their direct or indirect interconnections during the framework phase. The basic structural unit operates as a theoretical framework alongside a practical tool enabling enterprises to predict and handle potential triggers in advance. Through exploration of the matrix, participants understood its potential alignment with industry models, which enabled them to integrate conceptual clarity into their decision-making processes.

During the evaluation stage, interviews acted as critical testing grounds for measuring the framework against actual events. Participants detailed incidents where failures occurred because essential elements were missed yet agreed that the CSMF would have helped to avoid these mistakes. The framework received collective support through targeted recommendations about external governance and data treatment which established its potential for iterative evaluation and enhancement. The step demonstrated how design science operates through iterative refinement by working closely with practitioners and end users in a collaborative manner.

The participants demonstrated their understanding of the framework through their conceptualisation of its application to future projects. The connection of the framework to EA reviews along with risk assessments and project governance boards indicates that CSMF serves a practical purpose beyond theoretical perspectives. The framework functions as a systematic design tool which helps identify both direct and indirect impacts of new changes. The mapping function becomes an essential element of organisational design discipline by necessitating continuous reflection during critical decision-making moments.

The synthesis process combined participants' experience-based insights and the framework's theoretical foundations to build upon existing ideas. The proposed methods for incorporating data elements and modularising strategies for smaller firms demonstrated potential pathways for the CSMF to maintain its relevance within new and emerging environments. Through the identification of gaps such as external governance nuances or AI-driven processes and subsequent refinement of the matrix with these lessons, the framework evolves from a static proposal to a dynamic tool that develops with each application. The integration of expert insights and structured design science creates a knowledge base that stands strong in theory and demonstrates practical value which enables the framework to expand alongside modern business requirements.

7.8 DSR AND EVALUATION CYCLES

The following is a description of the study's own design-and-evaluation process rather than a report of external findings; the cycles apply the iterative DSR logic of Vaishnavi and Kuechler (2004) and are evidenced by the literature review and thematic analysis (Chapter 3), the framework development (Chapter 6), and the expert interviews (Section 7.5). The project's DSR approach featured repetitive cycles that resolved distinct insights and flaws discovered during its process. This outline details the progression of each cycle and shows how they contributed to both the creation and preliminary evaluation of the CSMF.

7.8.1 CYCLE 1

The researcher started by posing a fundamental issue: organisations face the challenge of maintaining capability stability because even minor adjustments can create widespread effects among employees and organisational procedures as well as system operations. Researchers planned to develop a framework by directly referencing existing literature. The initial examination of academic articles and textbooks showed very few studies that provided structured insights into "capability stability". Most academic works investigated organisational capability design and resilience while only a few discussed a unified “ecosystem” approach. The researcher understood that the initial cycle concluded and recognised the necessity for a well-defined conceptual model.

7.8.2 CYCLE 2

The researcher started crafting a conceptual model through targeted literature review and thematic analysis because existing studies lacked a standardised framework for capability stability. The second cycle established a structure for capability stability by identifying key elements including people, processes, technology, cost and governance which were then arranged in a layered way known as the capability stability “ecosystem” to understand their impact on stability. The initial map produced during this process proved functional yet highlighted the requirement for further testing and refinement to confirm how these elements appear together or interact within real organisational settings.

7.8.3 CYCLE 3

After creating the preliminary conceptual model, an initial exploration was conducted to determine its feasibility. In retrospect, this early modelling exercise constituted an essential point of departure for the overall study. Prior to engaging in the full literature synthesis and the structured thematic analysis, a concise, exploratory assessment was undertaken to test whether the emerging ecosystem possessed sufficient conceptual plausibility to justify deeper investigation. This assessment deliberately drew on a small but targeted body of literature, complemented by informal observations accumulated through sustained engagement with enterprise architecture practice.

Although modest in scope, this preliminary exploration played a critical role in evaluating whether the nascent model adequately reflected the underlying dynamics of the phenomenon. It offered an initial

test of intelligibility: whether the proposed relationships cohered logically, whether the structural configuration mirrored practitioner realities, and whether the early constructs captured the essential mechanisms that were later theorised in greater depth. This feasibility check was not intended to generate findings; rather, it served to ensure that the conceptual starting point was grounded, defensible, and analytically viable before advancing to more rigorous methodological phases.

Viewed from the vantage point of Chapter 7, this step emerges as a formative moment in the research trajectory. It enabled the iterative refinement of assumptions, highlighted conceptual gaps requiring systematic interrogation, and provided early insight into the areas of the model most in need of empirical substantiation. More importantly, it helped maintain coherence across the study by ensuring that the conceptual model entering the formal analysis was not artificially imposed but already tentatively aligned with both theoretical literature and empirical sensibilities.

As the research progressed, the preliminary model underwent substantial refinement; however, the initial feasibility exploration acted as an anchor that kept subsequent development tethered to observed patterns of capability behaviour. In this sense, the early assessment functioned not only as a conceptual checkpoint but also as a stabilising mechanism that supported the eventual convergence between the preliminary model, the empirical themes, and the final framework presented in this chapter.

The outcomes of this preliminary exploration indicated that the model held conceptual promise but also revealed the need for a systematic methodology to determine whether the hypothesised relationships among factors genuinely existed. The researcher concluded that an evidence-based, rigorous analytical process was required to validate both the comprehensiveness of the conceptual model and the relative importance ascribed to each factor. This realisation directly motivated the adoption of the structured thematic analysis that shaped the subsequent phases of the study.

7.8.4 CYCLE 4

For enhanced validation, a coded template was created and thematic analysis performed on an expanded collection of articles. This stage was designed to generate solid data on the joint occurrence of concepts and their practical descriptions. This study expanded the set of documents and calculated co-occurrence scores to gather quantitative insights that confirmed or questioned aspects of the conceptual model. The results provided a solid foundation for the nine key elements and clarified which factors frequently appear together in scholarly and practical discussions related to capability design, organisational change, and enterprise architecture.

7.8.5 CYCLE 5

The researcher expanded upon the findings to complete the CSMF development by merging the conceptual model with operational elements including a relationship matrix that maps both direct and indirect influences. The researcher established evaluation criteria and arranged interviews to review the framework for clarity, completeness, and practical utility after developing its initial version. The

interviews served to evaluate if the CSMF enabled practitioners to detect and rectify elements that damaged capability stability. Real-life examples and participant feedback by the end of this cycle affirmed the usability of the baseline framework. The CSMF's layered approach and factor mapping enabled them to predict and manage changes that had previously resulted in unplanned disruptions.

Through these cycles, the DSR process served as a systematic function that converted the general inquiry of managing capability stability into the validated CSMF. The first four cycles improved the foundational concepts and empirical aspects through consecutive steps of literature review, conceptual modeling, and comprehensive analysis while the final cycle assessed the practical artefact through interviews. Upon completion of the fifth cycle, this study achieved a foundational framework that is ready for enhancements, such as AI integration but robust enough to direct EA decisions toward stable and comprehensive organisational capability treatment. Figure 21 below illustrates the five design science research cycles followed in this study, showing how the framework evolved from initial inquiry through conceptualisation, validation, thematic expansion, and final evaluation.

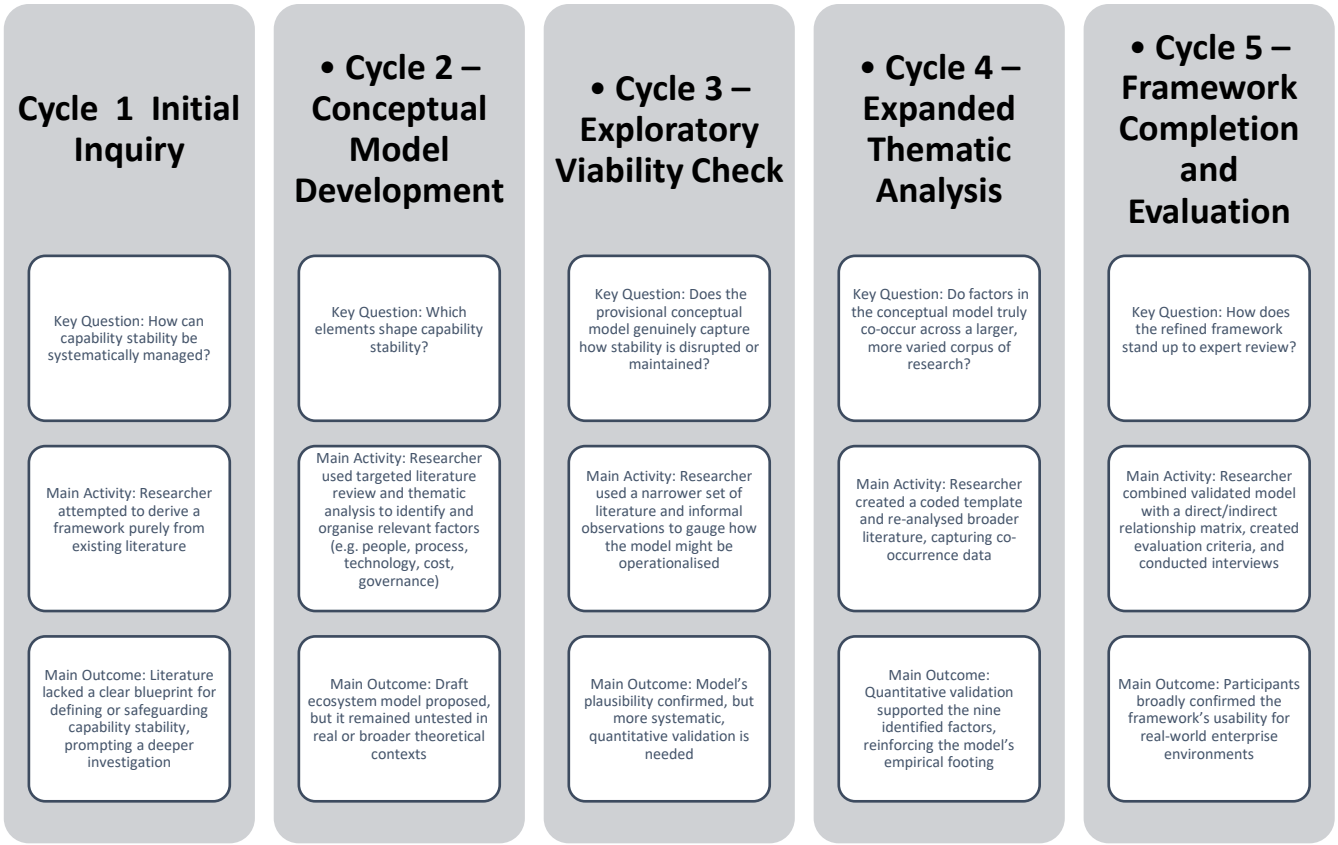


FIGURE 21 DSR AND EVALUATION CYCLES

7.9 SUMMARY AND DISCUSSION

This concluding section synthesises the evidence presented earlier in the chapter and introduces no new data. Chapter 7 focused on thoroughly evaluating the CSMF to ascertain whether it could reliably address the complexities of maintaining capability stability in diverse enterprise environments. Building upon earlier DSR cycles, this chapter elaborated on both the methodology for assessing the

framework's practicality and the actual interviews conducted with practitioners. The intent was to determine if the refined conceptual model and its associated direct–indirect relationship matrix offered actionable insights that would help enterprise architects and other IT professionals anticipate the ripple effects of changes in people, processes, technology, and supporting factors such as governance and cost.

To that end, the researcher first formulated clear evaluation criteria based on the conceptual foundation, the thematic analysis findings, and the design science principle of iterative refinement. These criteria asked, among other things, whether the nine factors in the framework were sufficiently comprehensive, whether the model's layered depiction (inner, middle, outer) facilitated ease of understanding, and whether the matrix of direct vs. indirect triggers could help decision-makers forestall the hidden disruptions that commonly arise after technology or organisational changes. Upon establishing these criteria, semi-structured interviews were carried out with participants having a broad spectrum of experience in EA, technical leadership, and organisational governance. The conversations aimed to elicit whether, in the participants' own real or hypothetical scenarios, the CSMF would have reduced confusion or conflict, improved readiness, or streamlined project governance.

The chapter explained the data collection method and described participant selection procedures and confidentiality measures while detailing how all interviews used identical central questions to allow response comparison. The synthesis of participant feedback identified both broad consensus and specific points of disagreement regarding the systematic framework and its role in clarifying indirect repercussions and the appropriate placement of factors like external governance and cost within the model layers. The chapter presented a basic data sheet that demonstrates the calculation method for approximate agreement percentages while maintaining ethical standards by keeping exact participant numbers confidential. The research found that although the CSMF could use lightweight versions or specialised expansions for data-heavy or AI applications, it functioned effectively as a practical tool for understanding organisational capability stability through small changes. The positive feedback from participants as well as their next steps recommendations created a foundation for the future enhancement and wider implementation of the CSMF in current EA processes. Chapter 8 concludes this study.

8 CHAPTER 8: CONCLUSION

8.1 INTRODUCTION

Chapter 8 presents the culmination of a sustained inquiry into how EA can effectively manage the stability of business capabilities in environments defined by continuous change and digital disruption. This research introduces the CSMF, an artefact designed to equip EAPs with a structured yet adaptable method for maintaining architectural coherence in evolving organisational ecosystems. Developed through DSR, the framework responds to a central question: How can EA maintain agility, relevance, and systemic balance as technological innovation and market volatility reshape organisational landscapes?

Within the context of the Fourth Industrial Revolution, digital transformation has magnified the complexity of enterprise environments. Many established EA processes remain rooted in static documentation practices that fail to accommodate the pace of technological change. The study recognises that EAPs must navigate multidimensional interdependencies—among people, processes, technology, and governance—while safeguarding the integrity of core capabilities. The CSMF positions itself as a navigational instrument for practitioners, bridging the gap between theoretical insight and applied architectural design.

EA itself represents a pluralistic discipline that encompasses both technical and socio-technical perspectives. Some practitioners approach EA as an IT control system, whereas others emphasise its integrative governance function, aligning people, processes, and technology with strategic intent. Regardless of orientation, all perspectives share a commitment to design as the organising principle of enterprise coherence. Architectural change, when not properly assessed, can disrupt operational goals; yet when managed deliberately, it can reinforce them. The CSMF responds to this tension by providing a mechanism for anticipating how changes propagate through a capability ecosystem, enabling pre-emptive responses that sustain organisational stability.

This final chapter consolidates the artefact's theoretical and empirical foundations, situating it within broader DSR discourse and highlighting its contribution to EA as both scholarship and practice. It closes the inquiry by interpreting research outcomes, identifying implications for practice, and outlining avenues for further refinement to ensure that EA continues to evolve as a discipline that is capable of managing complexity with precision and foresight.

8.2 RESEARCH SUMMARY

The research advances EA by introducing a coherent method for managing capability stability—an area previously underexplored in both theory and practice. By conceptualising stability as a dynamic equilibrium rather than a static state, the study repositions capabilities as living systems that adapt within an enterprise ecosystem. Using DSR, the research integrates theoretical integrity with operational relevance, producing an artefact that demonstrates both conceptual soundness and practical usability.

The first phase identified the essential components of capability stability through literature synthesis and thematic analysis. The findings revealed that stability depends on the constant alignment of interdependent elements—people, processes, and technology—mediated by environmental factors such as governance, cost, and performance. Nine interrelated factors emerged as core to the stability construct: governance, cost, performance, measure, capacity, engagement, people, process, and technology. These factors were organised into a layered conceptual model that depicts their interdependencies and hierarchical influence on capability resilience.

Subsequent DSR cycles refined this conceptual foundation into the operational CSMF. Iterative testing, expert evaluation, and co-occurrence validation ensured that each version aligned with both theoretical models and practitioner requirements. The final artefact integrates a layered model with a relationship matrix that maps direct and indirect influences across factors, allowing for diagnostic assessment of capability stability under varying conditions.

The study confirms that stability is not an inherent property but an actively maintained balance. By framing capabilities as ecosystems that are subject to continuous internal and external pressures, the research bridges conceptual abstraction and enterprise application.

Table 12 below outlines how the study realised its research objectives.

TABLE 31 RESEARCH OBJECTIVES AND THEIR REALISATION

Research Question / Sub-Research Question / Goal	How It Was Addressed / Achieved
Main Research Question (RQ): What can be used to manage capability stability to maintain the value or purpose for which the capability was designed?	A CSMF was developed using the DSR methodology. The framework was iteratively designed, refined, and evaluated through conceptual modelling, thematic analysis, and expert interviews.
SRQ1: What is capability stability?	Addressed by synthesising findings from the literature on systems thinking, EA, and capability management. Capability stability was defined as a state of dynamic equilibrium that is maintained through continuous internal alignment and responsiveness to change.

Research Question / Sub-Research Question / Goal	How It Was Addressed / Achieved
SRQ2: What dimensions and factors are required to describe a business capability?	Addressed through thematic analysis and modelling that identified a layered structure of nine interrelated factors grouped into capability enablement, measurement, and influencing layers. This formed the foundation for the capability ecosystem model.
SRG1: Develop a definition for capability stability.	Achieved through critical engagement with literature and qualitative coding that resulted in a formal definition that is anchored in systems theory and organisational resilience.
SRG2: Define a capability stability ecosystem conceptual model.	Achieved by organising the nine key factors into a three-layered conceptual model, validated through co-occurrence analysis and cross-referencing with industry-based definitions and EA theory.
RG1: Develop a mechanism to manage capability stability.	Achieved through the design of the CSMF by integrating the conceptual model with a relationship matrix to map direct and indirect impact pathways across all factors.
SRG3: Decide on the best mechanism to manage capability stability.	Achieved through reviewing and selecting DSR as the appropriate methodology, based on its suitability for artefact development in information systems and EA contexts.
SRG4: Design the mechanism to be practically used to manage capability stability.	Achieved through iterative refinement and structuring of the CSMF, ensuring usability and logical flow of factor interdependencies.
SRG5: Identify the level of influence of all the factors in the capability ecosystem.	Achieved through the development of a direct/indirect relationship matrix supported by co-occurrence validation using thematic analysis. This enabled prioritisation of factors based on their stability impact potential.

Research Question / Sub-Research Question / Goal	How It Was Addressed / Achieved
SRG6: Package the mechanism in a manner that is easy to use and consume.	Achieved by integrating the conceptual model, stability matrix, and evaluation criteria into a single framework that is suitable for use by EA practitioners. Structured representations were supported by simplified application logic for practical implementation.
SRG7: Evaluate the mechanism with other EAPs for input and validity.	Achieved through a series of semi-structured interviews with EAPs. Responses were thematically analysed, and feedback confirmed the framework's applicability, relevance, and value in real-world EA environments.
RSG1: Obtain the necessary certifications for ethical clearance.	Achieved through university ethics processes prior to data collection.
RSG2: Obtain ethical clearance for the study.	Achieved by submitting a full research ethics application and receiving approval to conduct interviews with human participants.
RSG3: Understand and document the DSR process for this study.	Achieved by mapping and reflecting on each DSR iteration throughout the research process, with Chapters 3, 4, and 5 fully documenting the cycles.
RSG4: Understand Atlas.ti and the use of thematic analysis.	Achieved through formal engagement with Clarke and Braun's (2013) framework for thematic analysis, operationalised in Atlas.ti for coding literature and participant interview data.

The outcomes demonstrate that all research questions were addressed systematically and that each objective was achieved through evidence-based iteration. The CSMF integrates conceptual clarity with empirical validation, producing a tool capable of guiding practitioners in identifying, assessing, and mitigating instability. The DSR methodology combined with thematic analysis ensured rigour, transparency, and replicability, substantiating the research's academic and practical contribution to the EA discipline.

8.3 MERIT AND SIGNIFICANCE OF THE RESEARCH

This research establishes significance by bridging the divide between EA theory and applied practice. Historically, EA studies have prioritised structure, maturity, and governance, often neglecting the

operational stability of business capabilities. The present study advances the discipline by defining capability stability as a distinct, measurable, and manageable dimension of enterprise performance.

The conceptual contribution lies in the precise definition of capability stability. The study positions stability as a dynamic equilibrium—maintained through the capability's capacity to adjust internally and respond to external triggers without losing intended function. This definition replaces static conceptions with an active systems perspective grounded in organisational resilience. It also provides the theoretical foundation for evaluating capabilities as adaptable entities that require continual stewardship rather than as fixed design artefacts.

Complementing this definition is the layered capability ecosystem model which structures complexity into three logical tiers: core enablers (people, process, technology), mediating and measurement factors (engagement, capacity, performance, measure), and external influencers (governance, cost). This model visualises the systemic nature of capabilities and explains how disturbances in one layer can reverberate through others.

The most tangible contribution is the CSMF itself—a practical artefact developed through DSR and validated through practitioner engagement. Unlike purely conceptual frameworks, the CSMF was tested for applicability, usability, and diagnostic clarity. Participants found it effective for identifying hidden interdependencies and predicting secondary impacts, capabilities not typically achieved through traditional EA tools. The positive practitioner response underscored its real-world value.

Beyond its immediate artefact, the study demonstrates that academically rigorous design can yield tools that are directly beneficial to professional practice. It contributes a common vocabulary, analytical method, and structure that enable both scholars and practitioners to evaluate capability resilience with greater precision. In doing so, the study establishes a new research and practice stream within EA that focuses on sustaining capability stability during transformation.

The integration of academic inquiry and professional practice was built into the study's design science methodology, which pursues rigour and relevance together. Rigour is provided by the systematic literature review and the thematic analysis of more than two thousand articles, from which the factors, dimensions, and definitions were derived; relevance is provided by grounding the artefact in, and evaluating it against, the experience of practising enterprise architects. The CSMF was therefore not developed in isolation and then presented to practice, but shaped for practitioner use — as a diagnostic aid for enterprise-architecture review and change management — and then tested with practitioners in a naturalistic, summative evaluation.

In this study, that practitioner engagement took the form of individual, semi-structured expert interviews with five experienced enterprise architects, rather than practitioner panels or facilitated validation workshops. This choice suited a first, exploratory evaluation and protected participant confidentiality, but it also means that the collective, deliberative validation that panels or workshops can provide remains an avenue for future work (Section 7.7).

The evidence supporting the framework's practice relevance is drawn from this evaluation. All five participants judged the nine factors applicable and useful in an enterprise-architecture context, and each supplied concrete examples of stable capabilities disrupted by seemingly minor changes drawn from their own work — spanning security and access management, public-sector technology rationalisation, and long-running operational systems. Participants also located the CSMF within existing practice, linking it to enterprise-architecture reviews, risk assessments, and project-governance decisions, and identified adoption as the principal implementation challenge. Taken together, this feedback indicates that the framework addresses a recognised practical problem and can be operated within the processes practitioners already use, while formal, larger-scale validation remains for future work.

8.4 RESEARCH CONTRIBUTIONS

The study delivers three interconnected contributions: a conceptual definition, a structured model, and a validated framework.

The conceptual contribution formalises the definition of capability stability as a dynamic state of balance sustained through adaptation to disruptions. This reframing challenges static interpretations of capability and opens new theoretical pathways for studying enterprise resilience and adaptability.

The model contribution organises capability complexity through the layered capability ecosystem which integrates the nine identified factors into a cohesive structure. The model elucidates the interdependencies among enablers, measurement mechanisms, and contextual boundaries. In academic terms, it advances systems-based analysis of organisational design; in practice, it functions as a visual diagnostic tool for evaluating capability health.

The framework contribution materialises in the CSMF, a systematic approach that operationalises the conceptual model into a practical diagnostic mechanism. Through its matrix of direct and indirect relationships, it provides a two-dimensional view of stability impact and alignment. Practitioners validated its effectiveness in managing transformation initiatives, assessing cascading effects, and enhancing communication across EA layers.

Methodologically, the study demonstrates how DSR combined with thematic analysis can produce artefacts of both theoretical depth and operational precision. The integration of qualitative coding and iterative prototyping sets a methodological precedent for future EA research seeking to merge academic rigour with applied utility.

The primary domain of contribution is enterprise architecture, and specifically the management of business capabilities: the study equips EA practice with a construct (capability stability), a model (the capability stability ecosystem), and an artefact (the CSMF) for anticipating how change propagates through a capability. Two secondary contributions follow. Methodologically, the study contributes to design science research by applying a full design-and-evaluation cycle, structured through a four-stage evaluation lens, to the previously under-specified problem of capability stability. Conceptually, it draws

on systems thinking and complexity to treat a capability as an interdependent ecosystem whose stability is an emergent, homeostatic property rather than the sum of its parts.

These contributions connect to the existing literature in three ways. First, they corroborate established work: the finding that EA-enabled capabilities shape organisational outcomes is consistent with the dynamic-capabilities strand of EA research (Teece 2007; Van de Wetering 2019; Hendrickx 2019), the emphasis on integration and interdependence as sources of both value and risk aligns with Ross et al. (2006) and Tamm et al. (2011), and the treatment of a capability as an interdependent whole in which stability is maintained through balancing feedback is consistent with systems theory (Whitchurch & Constantine 1993).

Second, the study extends this literature. Whereas the dynamic-capabilities and EA-agility strands focus on change, flexibility, and competitive performance (Van de Wetering 2019; Hendrickx 2019), this study foregrounds stability — the capacity to retain designed value under change — as a complementary and equally consequential goal, and gives it a formal definition. It also extends capability meta-modelling (Du Toit & Tanner 2015) from representation towards diagnosis by adding the direct-and-indirect relationship matrix, a device not present in prior EA capability frameworks, which makes the propagation of change across factors explicit and analysable.

Third, the findings qualify parts of the literature. The prevailing EA and digital-transformation emphasis on continual change is complemented, and in places counterbalanced, by evidence that uncoordinated change is itself a principal source of instability, so that continuity deserves standing alongside agility. In addition, the thematic analysis showed that the study's impact classifications did not always match raw co-occurrence frequencies in the literature — for example for governance and process — which cautions against inferring a factor's causal importance from citation frequency alone, consistent with concerns about the theoretical grounding of EA raised by Kotusev and Kurnia (2021).

These contributions hold within stated boundaries. Theoretically, the definition and the ecosystem apply to business capabilities constituted by people, process, and technology in enterprise settings; the nine factors are those salient in the analysed literature and the expert sample, and data- or AI-intensive capabilities may require extension — for instance an explicit information dimension, as one participant suggested. Practically, the CSMF is a qualitative decision-support aid for use within EA review, risk-assessment, and governance processes rather than an automated or predictive instrument, and its direct and indirect classifications require practitioner judgement. Because the artefact was developed through a single design science cycle and evaluated with five expert practitioners in a South African context, its transferability rests on analytical rather than statistical generalisation and awaits longitudinal, multi-sector validation.

8.5 SUMMATION OF KEY FINDINGS

The findings clarify that capability stability functions as a dynamic condition that is maintained through balanced interactions among internal and external factors. The study defines stability as contingent on the coherence of people, process, and technology, moderated by governance and cost constraints.

The second major finding—the capability ecosystem—reveals the layered organisation of these interdependent factors. It demonstrates that stability outcomes are emergent properties of the system as a whole, not the result of isolated optimisation. The model's ability to visualise these dependencies provides a holistic view of enterprise function.

The development of the CSMF represents the study's third key outcome. By embedding the conceptual model into a relational matrix, the framework enables EAPs to diagnose potential instabilities before they manifest. It allows scenario analysis of change triggers and their cascading effects, offering predictive insight into areas most susceptible to disruption.

Empirical validation through expert interviews confirmed that the nine factors and their relationships accurately reflect real-world conditions. Practitioners acknowledged that unmanaged changes frequently compromise stability and recognised the framework's diagnostic value in reducing such risks. The combination of DSR and thematic analysis ensured both conceptual integrity and empirical grounding, establishing the CSMF as a scientifically credible and operationally effective artefact.

Collectively, the findings affirm that capability stability is measurable, manageable, and essential for maintaining enterprise coherence during continuous transformation.

Drawing these findings together, the study provides an explicit answer to each of its research questions.

Main research question — What EA-based framework can be designed to guide the management of business capability stability in enterprises? The study answers this question with the Capability Stability Management Framework (CSMF). The CSMF couples a conceptual ecosystem model — nine factors arranged in three layered dimensions — with a direct-and-indirect relationship matrix and a set of use steps, giving enterprise architects an EA-based instrument for anticipating and managing the effects of change on a capability's stability.

Sub-research question 1 — What is capability stability? Capability stability is defined as the capacity of a business capability to retain the value or purpose for which it was designed when one or more of its constituent factors change. It is therefore not a static state but a dynamic condition, sustained through balanced interaction among the capability's people, process, and technology and moderated by its measurement and environmental factors.

Sub-research question 2 — What dimensions and factors are required to describe a business capability? The study identifies nine factors organised into three dimensions: capability enablement (People, Process, and Technology); capability measurement (Performance, Measure, Capacity, and

Engagement); and capability influencers and environmental context (Governance and Cost). Together these constitute the capability stability ecosystem, in which stability emerges from the interaction of the whole rather than from the optimisation of any single factor.

Sub-research question 3 — What governance mechanisms are required to support the management of business capability stability? Governance operates in the framework in two connected ways. As a factor in the outer, environmental dimension, changes in governance are themselves assessed for their direct and indirect effects on the other factors. As a mechanism, the CSMF's impact-and-alignment classification — the relationship matrix that distinguishes direct from indirect impacts — provides a repeatable basis for evaluating proposed changes; applied within existing EA review, risk-assessment, and project-governance processes, it enables architects to decide which changes to permit, sequence, or mitigate in order to preserve stability.

Building on Sub-research questions 1 and 2, the refined research question asked what can be used to manage capability stability so as to maintain the value or purpose for which a capability was designed. The study's answer is the CSMF, and specifically its relationship matrix: by mapping how a change in any one factor propagates to the others, it allows practitioners to protect a capability's designed value before disruptions materialise.

These answers are not asserted in the abstract but are grounded in the study's design and evaluation. The definition and the ecosystem of factors were derived from a thematic analysis of the literature (Chapter 3), formalised into the CSMF (Chapter 6), and tested against the experience of expert practitioners (Chapter 7), who confirmed that the nine factors and their direct and indirect relationships reflect real-world conditions and that the framework offers practical diagnostic value. Taken together, the answers demonstrate that the study has met its aim: to deliver an EA-based, evidence-grounded framework that makes business capability stability explicit, analysable, and manageable.

8.6 LIMITATIONS OF THE RESEARCH

Despite its theoretical and practical significance, the study recognises limitations related to scope, participant diversity, and contextual applicability.

The evaluation phase involved a purposive sample of senior EAPs with expertise in strategic capability design. While their insights ensured high-level validation, perspectives from operational managers, technical implementers, and policy leaders were not included. As such, the framework's adoption across the full organisational spectrum remains to be empirically assessed.

The CSMF was designed for large, digitally transforming enterprises with formal EA functions. Its applicability to small or agile organisations without established governance structures remains untested. Variations in maturity, budget, and governance may alter stability dynamics in such contexts.

Temporal limitations also apply. Validation was based on point-in-time interviews rather than longitudinal observation. Future studies should assess the framework's sustained impact through repeated application across multiple transformation cycles.

Although DSR and thematic analysis provided methodological rigour, qualitative interpretation is inherently subjective. Coding and theme construction rely on analytical judgment, and different researchers may emphasise alternative perspectives. Additionally, the framework currently operates as a standalone artefact without integration into EA toolsets or digital platforms.

These limitations, however, present valuable opportunities for subsequent inquiry. The CSMF establishes a foundation that can be extended, digitised, and adapted for diverse organisational settings, inviting collaboration between academia and industry to further refine its scope and functionality.

8.7 SUGGESTIONS FOR FUTURE WORK

Future research should focus on expanding, digitising, and empirically testing the CSMF. Extended application across multiple enterprises and over longer durations will provide evidence of its predictive reliability and scalability. Longitudinal studies can examine how the framework performs during transformation programs and how stability indicators evolve over time.

There is potential to embed the CSMF within EA platforms such as ArchiMate-based modelling tools or architecture repositories. Digital integration would enable automated impact mapping, scenario simulation, and real-time stability tracking—functions that could significantly enhance its operational utility.

Methodological expansion should include quantitative validation using large-scale datasets. Statistical modelling and survey-based research could measure correlations between capability stability, performance, cost, and transformation success. This would strengthen the framework's empirical basis and broaden its generalisability.

Future exploration should also consider behavioural and cultural dynamics. Leadership alignment, communication efficacy, and resistance to change are critical variables that affect capability stability. Integrating these human factors will deepen the CSMF's explanatory power.

Finally, theoretical cross-pollination with adjacent disciplines such as resilience engineering, complexity science, and dynamic capabilities theory may yield further conceptual richness. Such interdisciplinary engagement would reinforce the positioning of capability stability as a distinct and mature construct within EA and IS research.

8.8 CONCLUDING STATEMENT

This study concludes a comprehensive academic inquiry into one of EA's most persistent challenges: sustaining the stability of business capabilities amid relentless change. Originating from a real-world disruption caused by a seemingly minor technological update, the research evolved into a systematic

exploration of how such disruptions cascade across organisational systems. The resulting CSMF offers both theoretical and practical means to mitigate these effects.

Through the development of a formal definition, a layered capability ecosystem model, and the operational CSMF, the study delivers a coherent suite of interdependent tools for restoring and maintaining architectural stability. These outputs, refined through DSR and validated through expert engagement, transcend theoretical abstraction to achieve demonstrable practitioner value.

The CSMF redefines how EAPs approach design, governance, and adaptation. It empowers them to predict, analyse, and manage systemic vulnerabilities, ensuring that technology, process, and people remain synchronised with strategic objectives. The research confirms that stability is not antithetical to innovation but foundational to sustainable transformation.

Ultimately, this work marks a pivotal advancement in EA scholarship and practice. It establishes capability stability as a central construct for managing complexity, offers a validated framework for operational governance, and provides a durable reference point for future research. The CSMF stands as both an academic milestone and a practical instrument that equips EAPs to design organisations that remain coherent, resilient, and purpose-driven amid continuous evolution.

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APPENDIX A- THE LIST OF PAPERS USED FOR THE THEMATIC ANALYSIS:

TABLE 32 LIST OF ARTICLES USED

Article Title	Author(s)	Year	Publisher	DOI / URL
Development and Validation of a Multi-Dimensional Business Capabilities Measurement Instrument	A. Zafer Acar, C. Zehir	2009	Journal of Transnational Management	https://doi.org/10.1080/15475770903120160
The harmonized effects of generic strategies and business capabilities on business performance	Avni Zafer Acar, Cemal Zehir	2010	Journal of Business Economics and Management	https://doi.org/10.3846/jbem.2010.34
Strategic Enterprise Architecture Management: Challenges Best Practices	F. Ahlemann, E. Stettiner, M. Messerschmidt, C. Legner	2012	Springer Science & Business Media	https://link.springer.com/book/10.1007/978-3-642-
A bibliometric analysis of international impact of business incubators	G. Albort-Morant, D. Ribeiro-Soriano	2016	Journal of Business Research	https://doi.org/10.1016/j.jbusres.2015.10.054
What are dynamic capabilities and are they a useful construct in strategic management?	V. Ambrosini, C. Bowman	2009	International Journal of Management Review	https://doi.org/10.1111/j.1468-2370.2008.00251.x
Enhancing Strategic IT Alignment Through Common Language	A. Khodabandeh Amiri, H. Cavusoglu, I. Benbasat	2015	ResearchGate	https://www.researchgate.net/publication/2814382
Assessing the dynamic capabilities view: Spare change everyone?	R. J. Arend, P. Bromiley	2009	Strategic Organization	https://doi.org/10.1177/1476127008100132
Business Capabilities Centric Enterprise Architecture	T. Barroero, G. Motta, G. Pignatelli	2010	Springer	https://www.semanticscholar.org/paper/Business-C Motta/227967f07fef40a7cbc3f56e6f6d8d92eb4186
Modeling Digital Preservation Capabilities in Enterprise Architecture	C. Becker, G. Antunes, J. Barateiro, R. Vieira, J. Borbinha	2011	ACM Digital Library	https://www.researchgate.net/publication/2202680
Enterprise Architecture: A Practitioner's Handbook	G.K. Behara, S.S. Paradkar	2015	Meghan-Kiffer Press	https://www.amazon.com/Enterprise-Architecture-P
An Introduction to Enterprise Architecture (3rd Edition)	S.A. Bernard	2012	AuthorHouse	https://books.google.com/books/about/An_Introduc
From Dynamic Capabilities to ERP Enabled Business Improvements	E.W. Bernroider, C.W. Wong, K.-H. Lai	2014	International Journal of Project Management	https://doi.org/10.1016/j.ijproman.2013.05.006

Article Title	Author(s)	Year	Publisher	DOI / URL
Digital Business Strategy: Toward a Next Generation of Insights	A. Bharadwaj, O.A. El Sawy, P.A. Pavlou, N.V. Venkatraman	2013	MIS Quarterly	https://doi.org/10.25300/MISQ/2013/37.2.03
Information System Capabilities as a Driving Force in Enhancing Organizational Performance	R. Bi, K.X. Smyrnios, B. Kam	2010	PACIS	https://aisel.aisnet.org/pacis2010/26/
Connecting Enterprise Architecture with Strategic Planning Processes	S. Blomqvist, M. Halén, M. Helenius	2015	IEEE 17th Conference on Business Informatics	https://doi.org/10.1109/CBI.2015.33
Criteria for the Evaluation of Implemented Architectures	E. Bouwers, J. Visser, A. van Deursen	2009	IEEE International Conference on Software Maintenance	https://doi.org/10.1109/ICSM.2009.5306305
Digitalisation	J.S. Brennen, D. Kreiss	2016	Wiley-Blackwell	https://doi.org/10.1002/9781118766804.wbiect111
Enabling Dynamic Capabilities Through Agile IT and Beyond Budgeting Practices	M. Curley	2010	Springer	https://doi.org/10.1007/978-3-642-16116-2_1
Fundamentals of business process management	M. Dumas et al.	2013	Springer International Publishing	https://link.springer.com/book/10.1007/978-3-642-3
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Social enterprise and social entrepreneurship research and theory	M. L. Granados et al.	2011	Social Enterprise Journal	https://doi.org/10.1108/17508611111182368
Conceptual integration of enterprise architecture management and security risk management	E. Grandry, C. Feltus, E. Dubois	2013	IEEE (EDOCW)	https://doi.org/10.1109/EDOCW.2013.17
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The Factors Affecting Institutionalization of Enterprise Architecture in the Organization	T. Iyamu	2009	IEEE Conference on Commerce and Enterprise Computing	https://ieeexplore.ieee.org/document/5231382
The IT4IT reference architecture version 2.1	A. Josey	2017	Van Haren Publishing	https://pubs.opengroup.org/it4it/2.1/
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A bibliometric analysis of the knowledge exchange patterns	S. Sarin, C. Haon, M. Belkhouja	2018	Journal of Product Innovation Management	https://doi.org/10.1111/jpim.12431
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Business Architecture: The Art and Practice of Business Transformation	W. Ulrich, N. McWhorter	2010	Meghan-Kiffer Press	https://www.amazon.com/Business-Architecture-Pr
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Industry 4.0: Managing The Digital Transformation	A. Ustundag, E. Cevikcan	2018	Springer International Publishing	https://link.springer.com/book/10.1007/978-3-319-
It's all B2B...and beyond: Toward a systems perspective of the market	S. L. Vargo, R. F. Lusch	2011	Industrial Marketing Management	https://doi.org/10.1016/j.indmarman.2010.06.026
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A review of the literature on citation impact indicators	L. Waltman	2016	Journal of Informetrics	https://doi.org/10.1016/j.joi.2016.02.007

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Capability stretching in product innovation	T. Wang, Y. Chen	2015	Journal of Management	https://doi.org/10.1177/0149206315594847
Leading Digital: Turning Technology into Business Transformation	G. Westerman, D. Bonnet, A. McAfee	2014	Harvard Business Press	https://hbr.org/product/leading-digital-turning-techn
Development of an Enterprise Architecture Management Capability Catalog	M. Wißotzki, H. Koc, T. Weichert, K. Sandkuhl	2013	Springer	https://link.springer.com/chapter/10.1007/978-3-64
An Exploration of Capability Research	M. Wißotzki	2015	IEEE International Enterprise Distributed Object Computing Conference	https://www.researchgate.net/publication/3086481
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The Relation Between Authentic Leadership Business Capabilities And Business Performance	Cemal Zehir, İsa Hemedan, Yasin Şehitoğlu, Esra Erzengin	2019	Future Academy	https://doi.org/10.15405/epsbs.2019.01.02.65
Organisational Impact of Enterprise Architecture and Business Process Capability in South African Organisations	Charl Van Zijl, Jean-Paul Van Belle	2014	International Journal of Trade, Economics and Finance	https://doi.org/10.7763/IJTEF.2014.V5.407
Digital enterprise architecture transformation for the internet of things	A. Zimmermann et al.	2015	IEEE (EDOCW)	https://doi.org/10.1109/EDOCW.2015.16

APPENDIX B – THE INTERVIEW PACK

Towards a framework for managing capability stability

Name of researcher: Judith van der Linde

Interview schedule

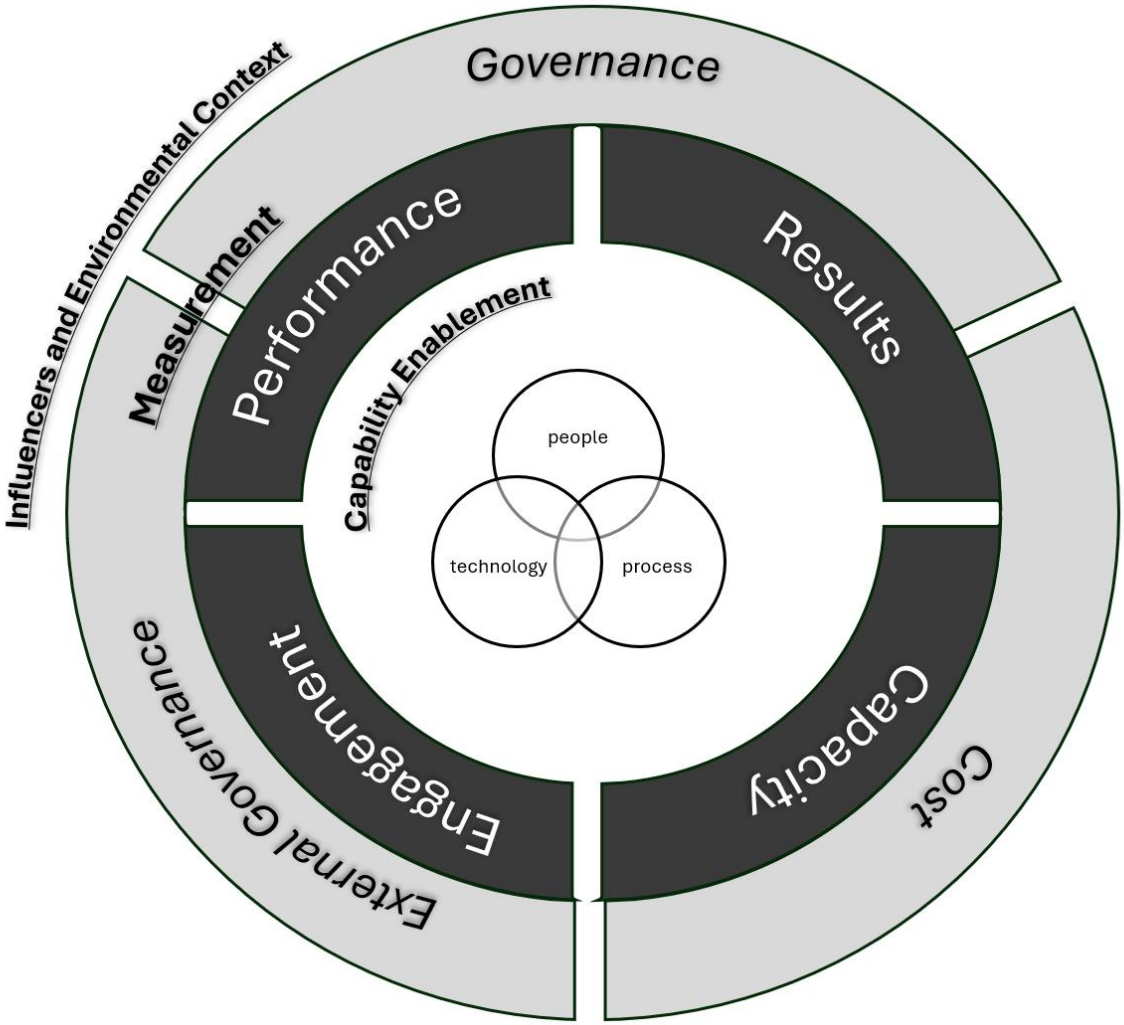
Firstly, confirm with the participant that the signed consent form has been received, that they are comfortable having the interview recorded, and that the interview can proceed.

The questions included in this interview primarily raised aspects about establishing and designing business capabilities from an enterprise architecture viewpoint. Written consent must be provided by you [participant] that you voluntarily took part in the interview. The participant must also provide written consent so that no disclosure of any of the research findings until the study has been published. The following questions will be asked during the interview conducted with you. The interview consists of 2 sections, and all questions will be asked during the interview, which will take approximately 1.5 hours. Also, note that the questions must be answered in a professional expert capacity and are not necessarily related to any specific business or the organisation at which you are currently employed.

The interview is structured to foster discussion. All questions will prompt discussion and elicit expert opinions.

The researcher will explain the concepts of capability ecosystem and capability stability to the participant using the conceptual meta-model developed during the study. The researcher will also explain to the participant the thematic and theoretical analysis that led to the discovery of these factors, which are encapsulated in the conceptual model. The purpose of this section of the interview is to validate the framework in terms of the influencing factors, specifically the triggering factor, and whether there is a direct or indirect impact from the trigger on the influencer.

Therefore, a capability ecosystem consists of the factors grouped by dimensions that constitute the whole capability. There are 3 dimensions with 9 factors spread across the model.



Capability Stability is the inherent state of the quality, state, or degree of stability, such as the strength to stand or endure being disturbed from a condition of equilibrium or to endure changes to any of the factors in the capability ecosystem.

The Capability Stability Management Framework- CSMF

In this section, the researcher will explain the capability stability management framework. The purpose of this section of the interview is to work through the different dimensions verify the definition of the dimension and verify the relationship direction of the various triggers to the impacted dimension.

Capability Stability Management Framework (CSFM)			
Definitions	**Dimensions**	**Factors**	**Relationships**
Enterprise Architecture	Capability Influencers & Environmental Context	Governance	Capability Measurement
Business Capability		Cost	Capability Enablement
People			
Process			
Technology			
			Capability Influencers &
Performance	Capability Measurement	Performance	Environmental Context
Results		Results	Capability Enablement
Capacity		Capacity	
Engagement		Engagement	
Governance			
Cost			
			Capability Influencers &
Ecosystem	Capability Enablement	People	Environmental Context
Capability stability		Process	Capability Measurement
		Technology	
		Capability design	

	Influencer (Trigger)								
Factor impacted	**Governance**	**Cost**	**Performance**	**Measure**	**Capacity**	**Engagement**	**People**	**Process**	**Technology**
Governance	*Indirect*	*Indirect*	*Indirect*	**Direct**	**Direct**	**Direct**	*Indirect*	**Direct**	*Indirect*
Cost	*Indirect*	*Indirect*	*Indirect*	*Indirect*	*Indirect*	*Indirect*	**Direct**	**Direct**	**Direct**
Performance	**Direct**	*Indirect*	*Indirect*	*Indirect*	**Direct**	**Direct**	**Direct**	**Direct**	*Indirect*
Measure	**Direct**	*Indirect*	*Indirect*	*Indirect*	**Direct**	*Indirect*	*Indirect*	**Direct**	*Indirect*
Capacity	**Direct**	*Indirect*	**Direct**	*Indirect*	**Direct**	**Direct**	**Direct**	*Indirect*	*Indirect*
Engagement	*Indirect*	*Indirect*	*Indirect*	*Indirect*	**Direct**	*Indirect*	**Direct**	**Direct**	**Direct**
People	**Direct**	**Direct**	**Direct**	*Indirect*	**Direct**	**Direct**	*Indirect*	**Direct**	**Direct**
Process	**Direct**	**Direct**	**Direct**	**Direct**	*Indirect*	**Direct**	**Direct**	**Direct**	**Direct**
Technology	**Direct**	**Direct**	*Indirect*	*Indirect*	**Direct**	**Direct**	**Direct**	**Direct**	*Indirect*
Totals	6	3	3	2	7	6	6	8	4

Section 1: General Impressions

Question 1: In your expert opinion – do you agree that the 9 factors cover the most critical aspects of a business capability?

Question 2: Please elaborate on your answer.

Question 3: Can this framework be applied in an enterprise architecture environment?

Question 4: How relevant is the model in grouping the factors?

Question 5: Is the model complete?

Question 6: Do you agree with the groupings in the model?

Section 2: Addressing the problem

The researcher explains the problem that this framework intends to solve. Given the environmental context in which the business capability must live in the business ecosystem, it follows that the components that define a business capability and its inner workings must be in a state of homeostasis. If there are changes to the components of the business capability, homeostasis is affected. This capability ecosystem must be maintained for the optimal functioning of the business capability. Thus, the context of capabilities, services and functions is shaped by their ecosystems. Hence changes in the ecosystem will impact their situational conditions (Johannesson *et al.*, 2015). When one or more of the components in the business capability changes, it could adversely affect the business capability's ability to perform the functions as it was initially designed and what it was intended for. The issue is then what is the effect of this change on the capability of homeostasis. If there is a change, the ecosystem will be disrupted, and the capability will be affected. For this impact to be described and defined, there must first be a common model or view that promotes a singular, concise view of a business capability and how it is defined and measured.

Question 1: Have you experienced this problem?

Question 2: Given the context of the problem, do you think this framework will help solve the problem?

Question 3: Can you think of a few practical examples where this framework can be applied to solve this problem? NB: disclosure of company names is not required.

Question 4: Can you imagine a scenario in which this framework would not add value to capability stability?

Question 5: Any other feedback, questions or items to be discussed?