Preface

The mainstreaming of enterprise architecture as a management discipline is well underway. This is a far cry from the earlier notion of it being used as an IT planning methodology. In other words, enterprise architecture is being re-architected, re-shaped, and re-configured. A Harvard Business Review paper in June 2012 identifies architecture as one of the pre-requisites to effective leadership. Much has been discussed, debated, and written about how the traditional avatar of enterprise architecture tends to be highly IT-centric and IT-driven. While IT itself is becoming more ubiquitous and democratized, the role of the IT department in the context of enterprise architecture has never been openly contested. Most of today’s enterprise architects are not able to convincingly articulate the value they bring to enterprises. As a result, they are marginalized, and their opinions and views are not sought during critical business decisions. In addition, being tucked away inside IT departments exacerbates the situation even further. Most current enterprise architects are primarily Senior IT Managers with glorified job titles of “enterprise architects.” They lack the influence to architect enterprises in the truest sense. Lack of influence makes enterprise architects inward-oriented and isolated, thereby amplifying this vicious circle.

Enterprises are no longer grappling to have access to the latest technologies; harnessing technology to enable business outcomes is a given. Emergence and confluence of several mega-trends are exposing enterprises to unprecedented levels of complexities. Therefore, it is only natural that when enterprises are exposed to complexities they become complex themselves. In today’s world, no one enterprise (organizations, governments, and even nations) can hope to thrive in total isolation completely insulated from the ensuing complexities. This then elevates the importance of tackling complexities as a critical success factor in ensuring sustained growth, long-term impact, and effective leadership. The role of enterprise architecture in making this happen cannot be overstated.

As a supra-departmental activity, enterprise architecture is on the cusp of change. It is increasingly being viewed as a method to comprehend enterprise complexities and suggest interventions to tackle such complexities. In other words, enterprise architecture is being adopted with the intent and aim of managing enterprise complexity. This thinking resonates well with the senior leadership as managing complexity has indeed surfaced as the single most important management priority. The fact that enterprise architecture (and enterprise architects) provides the potential to demonstrate the ability to address this priority takes them to some sort of rarefied strata in terms of impact and influence. This is hugely different from traditional enterprise architects, who in most cases have difficulty in gaining access to true enterprise level architecture and getting appropriate and continued management attention.

While using enterprise architecture as the method to tackle complexity makes sense, it is also crucial to understand that such an approach has to be anchored around compelling business priorities. This enables enterprise architects to focus and direct their energy to something that the enterprise sees as important. This book represents the first formal work of literature in this seminal area. The aim is to elevate the
level of maturity of enterprise architecture discipline and practice. It is achieved through a compilation of chapters covering theory, concepts, examples, and case studies in a balanced manner. The chapters were selected carefully and reviewed for consistency to the book’s overall message. Beyond advocacy, this book aims to encourage original thinking, demonstrate current advancements, and even highlight gaps or areas requiring further work.

This book is structured into three sections, consisting of fourteen chapters in all. The chapters were carefully selected after being subjected to a rigorous review process spearheaded by the Editorial Advisory Board (EAB). In addition to rigor, relevance, and applicability, I have also attempted to make the book representative of the different regions in the world. This selection is deliberate as it allows readers insights into a multitude of country-specific challenges, peculiarities, and nuances. It is obvious such initiatives would be ongoing activities, thus the chapters represent snapshots in time, representing the current state of practice. The following paragraphs provide an overview and summary of book sections and chapters:

SECTION 1: SHAPING ENTERPRISE ARCHITECTURE: THE NEXT FRONTIER

This first section, consisting of one chapter, aims to provide the genesis to the entire book. Chapter 1, “Systemic Enterprise Architecture as Future: Tackling Complexity in Governments in the Cusp of Change,” introduces the concept of a strategic systems-based approach to enterprise architecture, discusses enterprise complexity and how this impacts enterprises, and elaborates how systemic enterprise architecture provides the mechanism for enterprises to tackle such complexities. This is accomplished through a detailed case study from the healthcare sector in Singapore. The primary motivation for this chapter is to position systemic enterprise architecture as a more pragmatic approach to effective and impactful business outcomes. The chapter goes into detail with elaborate descriptions taking enterprise architecture to the next level of maturity. To establish the framework for greater adoption and capability development, this chapter culminates with ten broad principles of systemic enterprise architecture. This is deliberate because the subsequent chapters have been logically sequenced to demonstrate the realization of these principles by way of new theories, concepts, and case studies.

SECTION 2: CREATING ECOLOGIES OF INNOVATIONS: DEVELOPMENTS AND CONVERGENCE

Consisting of six chapters, this section aims to establish the theoretical foundations of systemic enterprise architecture. Chapter 2 “Enterprise as Complex Systems: Extended Axiomatic Design Theory and its Application in Enterprise Architecture Practice,” builds on the primary notion introduced in Chapter 1 (i.e. enterprises are complex adaptive systems). Typically, leaders and architects tend to detest this concept of enterprises being both complex and dynamic, wherein ambiguity, interdependence, diversity, and flux are the norms. Current management theories and practices prefer to ignore these fundamental traits found in all enterprises. Enterprises are approximated as complicated yet predictable entities and architected and operated accordingly. Chapter 2 demonstrates why enterprises are (and should be) considered as system-of-systems, and their design should be part of this system. Using an extension of Suh’s axiomatic design theory, Chapter 2 shows how complexity is tackled by adopting self-design at each level of hierarchy.
Chapter 3, “Complex Adaptive Systems Thinking Approach to Enterprise Architecture,” corroborates the ten principles of systemic enterprise architecture from Chapter 1, by proposing a Complex Adaptive Systems Thinking – Enterprise Architecture approach. The efficacy of this approach is evidenced in its ability to comprehend and reduce uncertainty by creating intelligence. This is critical, as uncertainty is a source of risk. The proposed approach in this chapter successfully weaves in the Cynefin framework and makes an effort to explicitly differentiate complicated and complex systems (usually used interchangeably and incorrectly). The CAST-EA approach successfully leads to double and triple loop learning in enterprises.

As is evident from the definition of enterprise architecture in Chapter 1, creating and sustaining coherent enterprises is the preeminent goal, Chapter 4, “A Theory for Enterprise Coherence Governance,” presents and discusses an approach to govern enterprise coherence. This is actualized using three essential steps; firstly, by evaluating the degree to which enterprises govern their coherence; secondly, by explicitly establishing coherence between different elements such as business, finance, and culture, among others; and finally by gauging and improving enterprise coherence during major transformation initiatives. The theory proposed in this chapter was created with the involvement of twenty organizations and, therefore, is validated for practical applicability.

Chapter 5, “Architecture Leadership and Systems Thinking,” reiterates the centrality to systems thinking in the context of enterprise architecture. It is critical for leaders to embrace holistic perspectives and propagate this throughout the enterprise. Too often business leaders and management are busy within their own silo of the enterprise, mostly at the cost of completely ignoring how their silo is inter-connected to the rest of the enterprise. They exhibit the classic trait of being micro-smart and macro-dumb, which time and again creates conflicting requirements and competition for resources and management attention. Chapter 5 demystifies systemic enterprise architecture using TOGAF as an example coupled with a conceptual case study. The choice of TOGAF is deliberate, as it is by far the most popular of the current enterprise architecture framework that is also vendor agnostic. The chapter demonstrates the realization of boundary-less enterprise through the adoption of systemic enterprise architecture.

The scope and nature enterprise architecture typically varies, usually depending on the desired goal. This means that the environment or the ecosystem that is relevant to the enterprise also varies. When enterprise architecture initiatives move above and beyond IT to include other critical aspects, it creates a larger set of stakeholders, conflicting interests, and radical increases in the overall complexity to be tackled. It increases the number and nature of business and management concerns that enterprise architecture needs to contend with. Chapter 6, “Enterprise-in-Environment Adaptation: Enterprise Architecture and Complexity Management,” posits the EiEA approach to respond to the increased demand for complexity management and elaborates the cultural changes enterprises need to embrace in order to effectively steer architecture initiatives with larger footprints.

Chapter 7, “A Systemic View on Enterprise Architecture Management: State of the Art and Outline of a Building Block-Based Approach to Design Specific Enterprise Architecture Management Functions,” looks into the issue of multiple approaches to enterprise architecture management that exists in the literature today. A plethora of such practices leads to inconsistency and absence of convergence. Obviously, each approach may have their own group of enthusiasts who proclaim its superiority (over others). This chapter presents a building block-based approach making use of some of the current best practices in enterprise architecture. Building blocks enable modularization and allow enterprises to choose, configure, and adapt their architecture management to suit specific requirements and expectations. This way of tailoring assumes there is no one-size-fits-all when it comes to architecture management and that the enterprises need to be given the flexibility and capability to shape architecture management practices according to their requirements.
SECTION 3: THE NEW SCIENCE OF PRACTICE: EXPERIMENTS, CASES, AND EXAMPLES

Building on from the theories and concepts in the previous section, this section presents cases and examples to give insights into the current state of practice. The cases and examples covered in this section span multiple industries and sectors. This is deliberate, as it provides a better grasp of the finer nuances of the discipline to all readers. Consisting of the next seven chapters, this section starts with Chapter 8, “Enterprise Architecture of Sustainable Development: An Analytical Framework,” which uses sustainable development as the use case to demonstrate the benefits of enterprise architecture. This example is particularly useful because the notion of sustainability brings forth a multitude of stakeholders, their conflicting (and vested) interests, existence of diversity, inter-dependence, ambiguity and flux, operations that work in an heterarchical mode, little direct authority, and emergence. In other words, almost all characteristic traits described in Chapter 1 are seen in action in this example. This chapter shows the use of enterprise architecture as the means to bring in more clarity, facilitate communication, foster cooperation and partnerships, and ultimately enhance policy coherence. Policy coherence is an important building block towards enterprise coherence.

Chapter 9, “Competitive Pattern-Based Strategies under Complexity: The Case of Turkish Managers,” demonstrates how current enterprise architecture frameworks and practices can be strengthened and made more effective by becoming more pattern-based. The objective of incorporating patterns is to create conditions to make better strategic decisions. This chapter discusses the pattern-based enterprise architecture approach in Turkey. Derived from primary data collected through a survey and subjected to rigorous statistical analysis, the chapter provides guidelines for business managers, with the purpose being a better understanding of the competition, the overall business landscape, and more effective strategies. In short, this chapter facilitates better strategic thinking crucial to management of business complexity.

Over the years, it has been seen that dictatorial or a purely compliance-based approach to enterprise architecture seldom sustains. This can primarily be attributed to its misfit with organizational realities and its difficulty in inclusion of emerging complexities. In other words, such approaches tend to be more suited to simple enterprises that operate in a strictly hierarchical manner. In the same context, federated approaches are gaining ground because of the advantages they bring to the table and their suitability to deal with business complexities. However, current literature seems to be equating federation with decentralization, which the chapter dispels. This is where the Chapter 10, “Federated Enterprise Architecture: Meaning, Benefits, and Risks,” comes in. The chapter clearly explains federation is a model of governance and contrasts it with decentralization. The chapter then elaborates the rationale of, benefits derived from, implications of, and risks introduced by adopting the federated approach to enterprise architecture. It argues why the federated approach is potentially the most effective mechanism to deal with scalability issues when enterprises factored in are large and by right complex.

Chapter 11, “Transitioning to Government Shared Service Centers: A Systems View,” is a transformation case study from Denmark. Usually government enterprise architectures overly focus on government processes and how efficiently they can be automated, making the entire business architecture very operational and transactional in nature. Moving away from processes to services is easier said than done, as it entails a complete change of mindset. A service includes other soft and often subjective, yet critical factors like culture, organization, and management. It goes beyond mere transaction and looks...
into citizen or customer engagement. Therefore, an aggregation of several factors raises complexity. This chapter elaborates on all of these issues and goes further in recommending changes that need to be brought in the way policies are crafted and implemented. This is where embracing a systems view brings in advantages and benefits and makes government transformation more desirable and outcome-based.

Disaster-relief presents a unique set of characteristics. By its very nature, it is a time-sensitive, highly intense activity that demands well-orchestrated actions and has the potential to impact people and their lives. Coordination and ability to think-outside-the-box play a critical role because of the inherent unpredictability. At times, it may seem as though the whole operation is very chaotic, wherefore agility is crucial. Chapter 12, “Navigating Complexity with Enterprise Architecture Management,” shows why adopting a holistic and systemic approach during disaster-relief can make a very significant difference. This chapter uses the fractal concept in chaos theory to identify six common alignment dimensions in enterprises. The chapter demonstrates how enterprises can then utilize these alignment dimensions to anchor the architecture management activities. All of these unique interesting aspects are explained with an illustration of disaster-relief.

Chapter 13, “Enterprise Architecture’s Identity Crisis: New Approaches to Complexity for a Maturing Discipline,” argues that even though enterprise architecture as a discipline has traditionally emerged from IT, and has been used to build and manage better IT systems, it is time for enterprise architecture to grow and spread its wings to the entire enterprise. This is consistent with the first of the ten guidelines of systemic enterprise architecture presented in Chapter 1. Chapter 13 presents the case of the criticality of managing complexity as the biggest reason for enterprise architecture. The chapter lists activities like design, synthesis, design-thinking, perspective, and problem negotiation as primary capabilities for enterprises to be able to manage complexity. It then elaborates these ideas with examples from Australia’s electronic government experience. The chapter concludes with a list of to-dos that enterprise architecture must include as a discipline to continue to stay relevant for the next decade and beyond. This chapter is a unique blend of several aspects of the journey of enterprise architecture as a discipline and reiterates key points from earlier chapters.

Chapter 14, “Growing Complexity and Transformations of the Power Sector: India as an Example of Developing Regions using Enterprise Architecture and Smart Grids,” the final chapter of the book, expands the scope of the enterprise to an entire sector, not limited to a single organization. Chapter 14 is an in-depth case study of the use of enterprise architecture as a means to transform power distribution in India. The uniqueness of this case study comes from the fact that large emerging economies exhibit very distinctive characteristics. The entire production (generation), transmission, and distribution activities are often not economically viable. Their operations and profitability are constrained by the consumers’ limited ability to pay for services; yet given the social dimension involved, they cannot be denied electricity (like healthcare presented in Chapter 1 and disaster-relief in Chapter 12). The chapter presents Smart Grid as one of the promising solutions to address some (if not all) of problems and constraints plaguing the power distribution companies. That said, adoption of Smart Grid demands changes and deep reforms in how the power is distributed. The entire value network needs an overhaul. Balancing distributor and consumer priorities is paramount, and Smart Grids is plausibly the most pragmatic solution to this complex problem.
In being the first book that views management of complexity as the rationale to embrace a systemic perspective to enterprise architecture, this is a seminal work. The compilation, besides balancing theory and practice, reveals the current state of art in this area. As the chief editor, I view this book as a beginning to a new era in the life of enterprise architecture. My vision is shared and supported by the authors, who contributed their high-quality chapters. I hope and sincerely expect that this book will spur further work by sparking curiosity.

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2013