Service-Oriented Architecture Governance for the Services Driven Enterprise

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John Wiley & Sons, Inc.

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Dedication

This book is dedicated to two special Fathers in my life: Nicholas Dardeno and Lyle Thomas Marks.

Preface

I began this book with a lofty goal: to clarify and simplify the concepts of Service-Oriented Architecture (SOA) governance such that organizations could understand the breadth, richness, and scope of SOA governance in the context of their entire enterprise. As SOA interest and adoption has accelerated rapidly despite still being in its infancy as a discipline, the challenges of governance have risen to the fore across the entire industry. Absent a governance model, SOA adoption will be stilted and hampered by a lack of engagement with key enterprise stakeholders in the important decisions and management processes that will help ensure business value through SOA. This exposes one of the Catch 22s of SOA—SOA governance is critical to SOA success, yet SOA governance is very challenging in and of itself, so much so that, to their peril, organizations may choose to avoid confronting the governance issue. This possibility would represent a major lost opportunity for any organization. After all, could it be that the ultimate value of implementing SOA in your enterprise is that you implement an appropriate enterprise governance model as a result? Imagine, we started out doing SOA and ended up fixing our enterprise governance along the way.

I will also confess that this has been the most challenging book project I have undertaken. Governance is a complex topic, fraught with organizational impacts far and wide depending on what you are governing and how you want to govern. And now, add to this volatile mixture the nuances of behavior and corporate culture, sociopolitical issues, incentive and reward dynamics, and funding and budgeting issues, and you can see how governance becomes a very difficult concept to wrap your arms around. For this book, I have explored a variety of governance approaches and concepts from our own federal government, from the

community models of the open source community to the self-governance approaches that exemplifies the early days of the Internet. I have researched command and control structures and market-based models of resource allocation, where the dynamics of organizations evolve around the relative scarcity of resources. And I have, of course, explored the rise of IT governance and corporate governance as these disciplines assumed critical roles in the decision-making processes of both public and private corporate enterprises.

Whenever a major challenge such as governance arises, the software and tool vendors are always first responders with claims that their particular tool is the answer, the silver bullet for that particular challenge. However, with all due respect to my colleagues and friends who work for the many excellent software companies out there, the domain of enterprise SOA governance, or any form of governance for that matter, is more of a social sciences discipline—cultural anthropology, sociology, psychology, and social engineering—than it is of software tools and automation. This is most certainly the case, to be sure, in the early phases of governance in most organizations.

SOA governance has been co-opted by technologists to some extent, and this has been a disservice, leading to an over-focus on tools and technology standards and not enough emphasis on the processes and organizational models of governance. This technical emphasis has also falsely led to an overemphasis on either the design-side processes of an SOA and Services Development Lifecycle, or on the runtime aspects of the lifecycle, focusing on management of services once they are operational in a production setting. Of course, this leads to tools and technologies, which are more tangible than the social and behavioral aspects of governance, which play a much more profound and dramatic role in the success of governance.

This SDLC-focused perspective leads to underemphasis on the precursors to the delivery processes of an organization, such as portfolio management disciplines, enterprise architecture, funding and budgeting, and more. Of course, then you must consider the federated enterprise model that is very typical of large enterprises today, and the allocation of corporate roles and responsibilities aligned to and supportive of business unit-specific roles and responsibilities.

This book is also imperfect. There is no way to adequately address the nuances of governance at an operational level that would satisfy all the various approaches and perspectives on governance. While I recognize the stakeholder model for this book is broad, and I have tried to adequately represent them, there are probably another ten chapters I could have written to address all governance perspectives and stakeholders. Governance is a broad subject no matter how you focus it on a particular domain. Data governance has many of the same challenges as IT governance: Who is accountable, who “owns” the resources, who “owns” the data, and Who are the participants—the data providers and data consumers—who are stakeholders? These are fundamentally social and cultural questions, not technical questions. Enterprise governance is indeed a social science. SOA governance adds technology challenges to the social sciences, which forms a simmering brew indeed. SOA adds many technical governance challenges to an already complex task, which is why IT governance approaches are too lightweight and board-centric to address the technical, architectural and interoperability requirements of enterprise SOA governance.

As I delved into the concepts of governance, I developed a greater appreciation of why many organizations either reduce to governance boards at one extreme, or implement governance tools at the other extreme. As I dug deeper, I

realized that an integrated approach to governance must find a model to enable the integration of all three governance enforcement mechanisms—boards and tools, integrated with governance processes. An overemphasis on governance boards, which is a common mistake for SOA governance, reduces the effort to an organizational design effort, which often creates overhead, generates more meetings on busy calendars, and usually does not solve the core governance needs of the enterprise. However, reducing governance to a tool, such as a repository or a service registry, or any other governance tool (or tool claiming some partial governance functionality), does a similar disservice to your enterprise. The tool-centric approach falls short because it does not accommodate the broad view of policy models, and enforcement as a combination of boards, processes and of course supporting tools. The key word is "supporting." Tools cannot do the job in and of themselves.

With this backdrop, I began this project with the following high-level objectives:

- Develop a general model for enterprise governance. In this book, we develop a governance assessment and model design framework that will work for any enterprise governance challenge—corporate governance, IT governance, enterprise architecture governance, portfolio management, or program and project governance across your SDLC. Our definition of SOA governance can be simplified to encompass any form of governance. After all, all forms of governance have at their core ensuring appropriate stakeholder representation in critical decisions around the best use of resources to accomplish organizational goals.
- Address SOA governance from an enterprise governance perspective. Our premise is that SOA governance can only be adequately implemented in the context of other enterprise governance processes

and activities. Thus, we use the Four Tiers of Enterprise Governance to establish appropriate enterprise context for your SOA governance model. If you begin SOA governance without having appropriate enterprise context, it will end up as a limited scope, bottom-up governance model without executive support and lacking enterprise alignment.

- Develop a unified approach to enterprise policies. This book explores the lack of unified industry standards for enterprise policies, and offers a conceptual policy framework for developing a unified policy model. Such a unified policy model will integrate technical policy approaches of the WS-Policy genre with corporate policies that are often codified in documents and enforced by oversight boards. Our view of governance and integrated policy enforcement requires a unified policy model.
- Develop a framework for integrated policy enforcement. Another important goal of this book is to debunk the notion that SOA governance can be accomplished using technology alone. As we discuss in Chapters 3 and 4, implementing and enforcing enterprise policies requires a multi-pronged fabric of policy enforcement. SOA governance demands an integrated policy enforcement “fabric” comprised of three types of policy enforcement mechanisms: governance boards, governance processes, and governance technology and tools. None of these is sufficient to realize an effective SOA Governance model based on definition, provisioning, and enforcement of policies. The reality is that enterprise SOA governance requires policy enforcement using governance boards, integrated with governance processes and supported by governance technology and tools.

- Build upon the Weill and Ross foundation. This book explores the complexities and nuances of IT and SOA governance that go far deeper than Peter Weill and Jeanne Ross in their excellent book IT Governance: How Top Performers Manage IT Decision Rights for Superior Results (Harvard Business School Press, 2004). I give tremendous credit to Weill and Ross for their work in establishing the foundation for much of today's emphasis on IT governance. However, SOA governance and policy-driven governance demand and require the details and moving parts of a complete governance model to be understood. We build on Weill and Ross, and in many respects establish an operational governance model framework that will implement right-sized, tangible governance at all levels of your enterprise.
- Evolve governance from "art" to "science": In many respects, governance seems like more of an art than a science. I believe that the artistic side of governance derives from its tendency to be viewed as a collection of boards and committees, which are constructed to provide the stakeholder representation and also to assuage political concerns in the enterprise. Often, a governance model is required to overcome inherent weaknesses in the organizational structure of an enterprise and the subsequent sociopolitical structure that evolves from the physical structure. Thus the art of governance is to create governance boards, name them, charter them, and staff them with the "right" members to create the desired sociopolitical alignment and outcomes. The science of governance we attempt to establish is through an enterprise policy model that is deployed to and enforced by an integrated enforcement model comprised of boards, processes, and tools with appropriate feedback. This science explicitly recognizes the merits of blending

resource allocation models such as command hierarchies, market economies, and community models into a cohesive framework that provides maximal engagement with the entire enterprise of stakeholders, not just those who have power and authority for decisions in the enterprise.

- Establish a new conversation and language of governance. We felt that we needed to address governance from a holistic and far-reaching perspective, and address some of the industry challenges that have inhibited the progress of governance to date. These include the lack of industry standards for enterprise policies, the lack of integration of various tools and technologies, and the failure to address the concept of integrated policy enforcement using boards, processes, and tools. We hope that this book will create a new generation of thinking around enterprise governance much as Weill and Ross did with their seminal book in IT governance.

These goals are clearly aggressive and far reaching. We clearly viewed the subject of enterprise governance from a perspective that is well beyond current perspectives, and well beyond today's technologies, tools, and industry standards. However, we feel we have pushed the discipline of governance ahead in ways that are within the grasp of organizations and within the grasp of a new generation of tools and industry standards as well. As you read the book, focus on the chapters or sections that make sense for you. The chapters are sequential in nature, so this is not necessarily a book you can jump around in. We establish the foundation concepts in Chapters 1, 2, and 3, we establish a governance modeling framework in Chapters 4, 5, and 6, and we facilitate implementation in Chapters 8 and 9. Chapter 10 serves as a future-focused chapter on gaps and

challenges that need to be addressed. Below are summaries of each of the chapters.

Chapter 1 presents the landscape of governance and some of the common mistakes organizations make as they focus their efforts on governance. This chapter sets the stage by establishing a definition of enterprise SOA governance that is adaptable and applicable to any kind of governance. Remove “SOA” from the definition and you can apply our governance definition to any form of governance. The chapter finishes with common mistakes and best practices to be cognizant of with respect to SOA governance.

Chapter 2 develops an SOA Governance Reference Model to help decompose the concept of governance into bite-sized chunks that are easier to digest. In this SOA Governance Reference Model, we explore various “layers” of governance, explaining what the “moving parts” within each of the layers are. In addition, we establish the foundation for funding and budgeting as a governance activity, and we also develop the concept of “Governance Performance Management,” or the discipline of sustained enterprise governance over time.

In Chapter 3, we transform the SOA Governance Reference Model into the Four Tiers of Enterprise Governance. These tiers are then broken down into more detailed tiers to show the interplay of enterprise governance processes with SOA governance process, all of which impact enterprise architecture and SDLC delivery processes of an enterprise. This chapter also details the many processes that comprise enterprise governance by these various tiers. This enterprise governance process catalog serves as a baseline from which you can develop your own processes for governance.

Chapters 4 and 5 present a governance model assessment and design framework that is based on years of

accumulated experience from the trenches of enterprise SOA governance. Chapter 4 develops the SOA governance tools and assessment framework to baseline your current enterprise SOA governance model and capabilities. Chapter 5 develops the elements of a complete enterprise SOA governance model and establishes a process for building your own enterprise SOA governance model.

Chapter 6 is a pioneering chapter focused on establishing a unified view of policies for an enterprise. This chapter exposes some of the challenges with enterprise policy enforcement, especially if you want to establish an enterprise governance framework that incorporates SOA into it. The concept of “policy” is imperfect, and we suggest a policy metamodel to help unify the concept of policies from an enterprise perspective and from an integrated policy enforcement perspective.

Chapter 7 focuses on various governance organizational models for consideration as your governance model adapts and evolves in concert with coevolving your SOA maturity. We establish a range of governance organizational models and concepts, including one we call an SOA Center of Gravity, which we think is a superior governance construct for the early phases of governance and SOA adoption.

Chapter 8 presents some concepts and discussion of SDLC governance. This chapter was contributed by Brent Carlson, a clear industry thought leader on design time and SDLC governance. This chapter develops the provider—and consumer—side aspects of services lifecycle governance, and offers some best practices for refining SDLC governance.

Chapter 9 covers the governance enabling technology and tools landscape as developed by the SOA governance reference model, and as suggested by the policy enforcement model concepts developed in Chapter 6. This chapter was spearheaded by Dennis Nadler, a colleague

with tremendous experience with the broad range of SOA tools, technologies, and standards.

Chapter 10 concludes with some concepts and ideas for how we believe governance should evolve going forward. We believe that governance is an enterprise core competency that must continue to be adapted and refined through time. Governance should thus be an organization, headed by an executive position reporting to the chief executive officer or managing director of an organization.

I would like to thank the many friends and colleagues who have helped make this book a reality. I also want to thank you, the reader, in advance. I hope we have created an opportunity to advance the industry and the field of enterprise governance, as well as the discipline of SOA governance in particular. For feedback on this book, I encourage you to email me anytime at emarks@agile-path.com. No book is possible without the ideas and thinking of those before us. This book owes much to many, yet I happened to hold the proverbial pen. I hope I have done the industry a service with a book focused entirely on governance, not only on SOA governance, but a book focused on enterprise governance. Enjoy. I know I have.

Acknowledgments

This book would not have been possible without the contributions and support of many colleagues, friends, and supporters. I would like to acknowledge those who have helped make many of the concepts of this book possible. First, to my contributors, whose support for a few key chapters and reviews has been critical to this book's completion: Brent Carlson, Dennis Nadler, and Vince Snyder.

Next, there have been a few thought leaders in the SOA community who have been critical to moving this industry forward and helping develop some of the concepts contained in this book. Thanks to the following people in alphabetical order: Alan Belisle, Bill Clarke, David Cohn, Ben Morland, Jim Schultz, Mark Stender, Umesh Vemuri, Steve Verba, Adam Vincent, and Rob Vietmeyer. These people have been on the front lines of governance innovation along with me.

Of course, I have to acknowledge Peter Weill and Jeanne Ross, whose book IT Governance: How Top Performers Manage IT Decision Rights for Superior Results established the current foundation for IT governance in the industry such that we could advance our own concepts of Enterprise SOA Governance in this book.

Finally, I have to thank my family for their support and patience as I have gone through yet another writing project. Diane, Jonathan, Jessica, your unyielding support has been my strength!

1

The SOA Governance Imperative

Since my last Service-Oriented Architecture (SOA) book, in which I dedicated an entire chapter to the topic of SOA governance, industry interest in governance has exploded. The challenges of enterprise SOA governance have moved to the foreground across the IT industry as interest in SOA has increased, and as the many SOA practitioners out there have reached the same conclusion: SOA governance is mandatory for any measure of SOA success. Understanding and implementing effective SOA governance has become a corporate imperative, and thus the topic requires the depth of coverage that this book provides. Yet, despite all the interest in the topic, governance is one of the most misunderstood, emotionally charged, and enigmatic concepts in the industry. We will attempt to address these challenges in the chapters of this book.

THE INEVITABLE SOA TREND

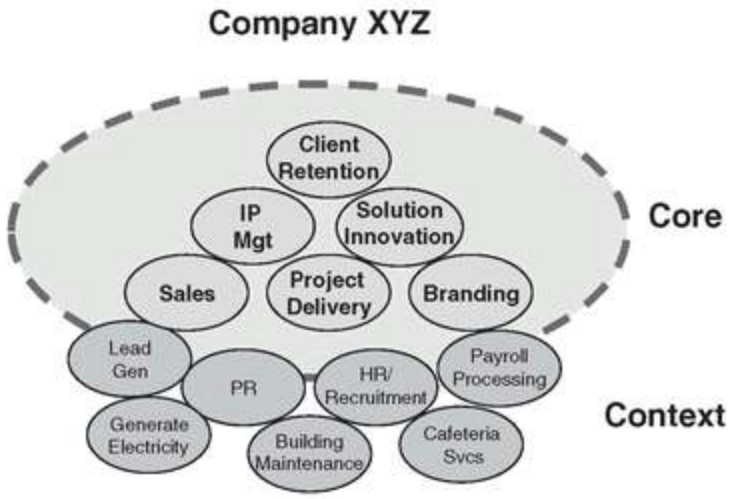
SOA is one of the most important trends in Information Technology today. SOA is now a top priority in most organizations. SOA is receiving all this attention because of the great potential value it offers to those who pursue it. If an organization achieves a mere fraction of the total potential value of SOA, it will be significant to that organization’s bottom line, competitive posture, and overall operational effectiveness. That is why SOA is such an important strategic initiative to pursue. SOA makes too much sense technically and financially not to implement.

I like to define SOA as a combination of a Business Model, an IT strategy, an architectural approach, and an

implementation pattern, all predicated on the concept of “Services.”

In the SOA business model sense, an organization is essentially an economic engine assembled from a combination of internal and external processes and capabilities, all of which in combination enable the end-to-end execution of business processes that achieve the organization’s objectives. A for-profit corporation is created to make money for its shareholders. Thus, maximum profits are achieved by optimizing execution of business

Exhibit 1.1 Core vs. Context (Make vs. Buy vs. Rent)



transactions. If an organization can accomplish business transactions more efficiently and at a lower cost by performing them internally, it will do so. If, however, overall efficiency and cost optimization is achieved by others outside of the organization performing those transactions, the best model is outsourcing of those functions. These ideas are derived from the work of Ronald Coase, whose work on transaction theory provides a perfect foundation for SOA as a business model.[1] (See Marks and Bell 2006 for a discussion of Ronald Coase and transaction theory applied to SOA and services.)[2] Exhibit 1.1 illustrates the concepts of core and context, and as an extension, the combination of

internal and external services to optimize the overall transactional cost and efficiency of an organization.

Per our set-up discussion above, a corporation continually evaluates the relative cost of performing business transactions internally versus externally to best optimize its overall profitability. In fact, Ronald Coase would argue that the relative size of a company, and its interactions with the marketplace, are ultimately based on relative costs of business transactions. Combining the transaction theory of Ronald Coase with the core and context concepts of Geoffrey Moore give us a tremendous foundation to apply SOA concepts to.

Many small businesses outsource human resources, payroll processing, and even their Information Technology (IT) in their early startup days, instead focusing on the innovations that will help the company grow. However, as those functions become more critical to the enterprise, and as the cost of performing them is lower than in an internally-provided service, the organization may eventually insource those functions. In this manner, the service-oriented business model is one of optimizing core and context processes (per Geoffrey Moore's book Living on the Fault Line[3]), and leveraging service providers as necessary to achieve the overall optimal structure of internally- and externally-provided transactions in support of the business model. This is SOA as a business model.

SOA as an IT strategy is an extension of the SOA business model. An SOA-enabled IT strategy explicitly embraces concepts of service providers and service consumers, and seeks to optimize IT services provided to the business by leveraging SOA concepts. Thus, the combination of IT services will be optimized through a combination of internally- and externally-provided services, which helps realize the profitability goals of the enterprise. The SOA IT

strategy perspective also means that there is an SOA strategy, that the SOA strategy enables the SOA business model, and that it is expressed technically through a clearly defined and articulated enterprise architecture and the resulting portfolio of services that, when exposed and implemented, enable the optimal end-to-end execution of business transactions for maximizing profit. Again, this is from the perspective of a for profit enterprise.

SOA is also an architecture approach or paradigm, along with a supporting implementation pattern that realizes that architectural approach in support of the IT strategy and the SOA business model. SOA extends an organization's enterprise architecture to include concepts of services, both logical and physical descriptions of services, as well as the required SOA infrastructure and tools, and the SOA platform for service design, quality assurance and testing, and service runtime operations.

The SOA implementation pattern includes the implementation of the SOA platform and enabling technology as well as the SOA-enabled services/ software development lifecycle (SDLC) that accommodates both service provider processes and service consumer processes of the enterprise. The SOA implementation pattern enables business applications or capabilities to be assembled through the consumption of services provided through the SOA architecture and SOA implementation patterns. The assembly of business applications from reusable services is how an organization realizes SOA value through services reuse, integration avoidance, agility through application assembly and rapid time to market, and the many other benefits of SOA.

Although the definition is technically accurate, SOA is far more than an "architecture" comprised of "services." SOA is an architectural approach and operating model predicated on the concept of reusable "services," or chunks of business

logic or business processes that are shared by enterprise consumers. Services are message-invoked modules of business logic, process activities, chunks of data that offer value to the enterprise through the sharing and reuse of these modular services. In an SOA, services are exposed using a standards-based interface that abstracts or “hides” its technical implementation from the service consumers. When consumers access the functionality of a service, they do so via its exposed interface using message-based communications. The service interface, by virtue of its standards-based construction, offers a simple mechanism for service consumers to find or discover a service, develop a client or access mechanism to the service, and then begin consuming the service in support of a desired business outcome. The technical complexity of the implementation is hidden behind the service interface, which enables a more simplified model for building service-based applications.

SOA offers many business and IT benefits to an organization. From a business perspective, the following SOA benefits are typically expected:

- Business agility
- Reduced time to market
- Easier to do business with
- Reduced technology costs
- Right-sized business model based on core and context —can add or subtract service providers easily

From an IT perspective, the following SOA benefits are often targeted:

- Reduced software development costs
- Reduced software maintenance costs
- Reuse of services accelerates application delivery
- Reuse of services increases software quality
- Allows easier procurement of application software as services

- Allows faster IT response to business change
- Provides for graceful evolution of IT architecture, which leads to lower operating costs and total cost of ownership

SOA as a business or IT initiative presents several challenges with which organizations must contend before they can begin to realize the benefits of SOA. An SOA strategy is a critical requirement. An SOA business case should be established. An SOA reference model and SOA enterprise architecture should be created.

First and foremost of these is an actionable SOA strategy. An SOA strategy is essential to help focus and galvanize organizational efforts, identify the appropriate uses of SOA for business benefits, and to explicitly identify the business or mission outcomes desired from investing in an SOA initiative. SOA governance is mission critical to guide and manage all the “moving parts” of an SOA strategy. An enterprise SOA governance model must be informed by an actionable SOA strategy, since SOA governance helps enable the realization of your SOA strategy.

In our experience, most organizations have skipped the definition of a reasonable SOA strategy, and until recently the same organizations have bypassed developing an enterprise approach to SOA governance. However, as interest in governance intensifies, this should spur a concomitant interest in SOA strategy development as well. To set the stage for the remainder of the book, let’s explore the rise of governance as a discipline, the industry and business drivers for governance, and then translate that into the SOA-SPECIFIC instantiations of governance.

INTRODUCTION TO GOVERNANCE

SOA governance, information technology (IT) governance, and corporate governance are currently hot industry buzzwords. But what is SOA governance really? What is governance in the general sense? Governance is a simple concept to understand, yet it is made complex by vendors, management consultants, and opportunists who see the increasing emphasis on governance as a chance to augment or enhance their power base in an organization. However, governance, be it IT, SOA, or corporate, does not have to be that complicated.

Governance is the process of making correct and appropriate decisions on behalf of the stakeholders of those decisions or choices. In its corporate application, governance is the process of ensuring the best interests of a company's or organization's stakeholders are met through all corporate decisions, from strategy through execution. In its IT application, governance focuses on appropriate oversight and stakeholder representation for IT spending and overall IT management.

Corporate governance has become critically important as a result of corporate accounting scandals, stock option backdating and related corporate mismanagement episodes. Corporate governance is essential to apply oversight and balanced stakeholder representation for all corporate decisions relating to hiring and retaining key executives, executive compensation, strategic direction and execution. Corporate governance in publicly traded companies is the process by which firms are managed to ensure stakeholder interests are met by corporate decisions. Stakeholders include shareholders, employees, management, and even customers. The corporate governance process is normally achieved by a board of directors, who are either appointed or elected to provide objective, balanced oversight on such key issues as executive compensation and performance and corporate

strategy and decision making. The board of directors normally is comprised of inside and outside directors to ensure all stakeholder interests are represented in a balanced fashion. When corporate governance fails, it is usually because of a lack of objectivity (e.g., board members appointed by the Chief Executive Officer [CEO] of the organization, or board membership weighted too heavily toward inside interests versus external shareholder interests). Most recently, corporate governance has been in the news due to the stock option backdating scandal. Corporate governance failed in this case due to a lack of decision transparency, which enabled a few executives to unilaterally or multilaterally enrich themselves by backdating stock option agreements. In the general sense, any governance will fail if stakeholders of critical decisions are not engaged in the processes of governance. This is why governance is first and foremost about engagement of critical stakeholders in key decisions of an organization.

INTRODUCTION TO ENTERPRISE SOA GOVERNANCE

What is enterprise SOA governance? SOA governance is the process of ensuring all business and IT stakeholders' interests are served by the planning, funding, and execution of an enterprise SOA initiative. One of the early pioneers of SOA governance is the company WebLayers, located in Cambridge, Massachusetts. WebLayers defines SOA governance as follows:[4]

> SOA governance is the ability to ensure that all of the independent (SOA) efforts (whether in the design, development, deployment, or operations of a service) come together to meet enterprise requirements.

WebLayers developed the concept of a policy-driven SOA governance approach where in effect SOA governance is predicated on developing, formalizing, and enforcing a body of SOA policies that ensure conformance to enterprise SOA business and technology goals. In my opinion, this whitepaper paved the way for the industry to understand the scope, breadth, and criticality of policies in a SOA governance framework.

However, SOA governance must be approached from an enterprise perspective and from a comprehensive and holistic viewpoint. An enterprise approach to SOA governance offers a more robust model than focusing narrowly on SOA governance. While explicitly defined SOA policies are essential to formalize and encode the enterprise requirements for SOA governance, SOA governance must also address the convergence of other forces such as organizational structure, IT and governance processes, organizational culture, behavior and political dynamics, and metrics that help measure governance. Thus, to better address the holistic nature of SOA governance, I defined SOA governance as follows:[5]

> SOA governance refers to the organization, processes, policies, and metrics required to manage an SOA successfully. A successful SOA is one that meets defined business objectives over time. In addition, an SOA governance model establishes the behavioral rules and guidelines of the organization and participants in the SOA, from architects and developers to service consumers, service providers, and even applications and the services themselves. These behavioral rules and guidelines are established via a body of defined SOA policies. SOA policies are