

Preface

Overview

We dedicate this book to describing the concept, application, development, and maintenance of the enterprise technical architecture. Our overall objectives for this text are as follows:

- Describe what a technical architecture is, how and where it is used within the organization, and what benefits can be derived from its use
- Position technical architecture (compare and contrast) as a discipline and against other forms of architecture (including information architecture, business architecture, and application architecture) and strategic business planning
- The introduction of a significant framework in the area of enterprise technical architecture development—that is The Open Group’s Architectural Framework (TOGAF)
- Provide a step-by-step walkthrough of each phase of TOGAF’s architecture development method (ADM)
- Introduce the concept of technical architectural governance and the benefits of building a technical architectural capability within the organization

Many organizations enact a strategic view of business, defined through their business strategies and marketing functions, because to survive in business it is critical to understand what the organization is, where it is going, and how it is going to get there. It is obvious, therefore, that most organizations would apply exactly the same disciplines to technology. Unfortunately, we have witnessed many organizations (both large and small) that fully understand the value of business planning but continue to take a remarkably tactical approach to information tech-

nology (IT)—many with ingrained cultural “strategies” to adopt “technology du jour”, without a reasoned understanding why.

On the other hand, organizations that do apply strategy to their technology are continuing to be frustrated by the pace at which technology is changing. The rapid uptake of the Internet in the mid-1990s has dramatically changed the technology landscape, forcing many organizations to rethink their own technology environments. For many, the speed of change within the industry has forced them to take an increasingly tactical view. The alternative being to use cumbersome and overly prescriptive architectural methodologies. No longer can an organization afford the commitment of time and resources to apply a 6-month (step back and smell the flowers) technical planning window. While such architectural development methods are still common in large organizations, especially government, today, maneuverability is the key.

We assert that an organization can both develop its technology environment based on reasoned planning and strategic incentives and maintain the ability to react quickly to new technical directions. By focusing on key strategic IT principles and adopting rapid and adaptable IT strategic methods, an organization can meet both requirements. An effective enterprise technical architecture provides this framework.

A technical architecture is not a product that can be purchased. It does not have a finite lifetime. It is a capability, a discipline, and an approach used to define, apply, and maintain the technology environment within the organization. It embodies the life cycle of defining the organization’s technical strategy, setting and adopting technical standards, and maintaining the technology environment through changes in both business and technology. It can be thought of as the technical equivalent of the business strategy (i.e., the future shape of the business given the current environment).

This book provides the reader with a framework for developing and maintaining an organization’s technical architecture. We present tools and approaches for defining the technology architecture, providing direction for the mitigation of some common IT problems. The development of the corporate technical architecture is based on The Open Group’s Architectural Framework (TOGAF), an open source framework that embodies significant intellectual property and experience in architectural development. Throughout this book, we use a representative (and fictitious) organization to provide examples of the architectural concepts embodied within the framework.

Organization and Features

This book presents a wide treatment of the development of an organizational technical architecture. The structure of the book is essentially

derived from the TOGAF architectural development method (ADM). Although we attempt to provide necessary detail in many areas, the aim of this book is to cover the entire life cycle of architectural development from the realization of the need for technical architecture development to the organizational issues that affect its maintenance. With this objective in mind, the text is clustered into three logical sections.

Section One: Architectural Rationale

This section is targeted as an overview of the concepts of technical architecture development. Its objective is to establish in the minds of the reader the rationale for conducting a technical architecture project. In this section are:

Chapter 1 considers how the term architecture has evolved and how it applies to a considerable number of IT disciplines. We look at a number of different definitions for the term, including technical architecture, application architecture, business systems architecture, and information architecture. We position the technical architecture within this spectrum of enterprise architecture disciplines. This chapter also takes a brief walk through the history of information technology and how it shaped the development of technical architectures.

Chapter 2 reviews a number of real-world IT problems that many readers may find familiar. We introduce some of the issues associated with the explosion of the Internet as a sales and marketing channel and some of the effects the Internet can have on the organization's IT environment. The overall aim of this book is to show how the application of an architectural approach to IT can mitigate the problems identified.

In Chapter 3 we review the many facets of strategic planning and position them in context with the technical architecture. We look in more detail at business (and e-business) strategies, the information systems strategic plan (ISSP), and the information and business systems architecture. Finally, we introduce the fictitious organization that will be used to provide examples of the phases of architectural development.

Chapter 4 analyzes the key criteria to use when selecting a framework for development of an organization's technical architecture. We discuss a number of architectural development alternatives, including government frameworks such as TAFIM and C4ISR. Our chosen development framework, the use of which in defining an enterprise technical architecture will be described in the remainder of this text, is The Open Group's Architectural Framework (TOGAF). We introduce its constituent parts through the concept of the enterprise continuum and include discussion relating to the architectural development method, the technical reference model, and the standards information base.

Chapter 5 details the first major phase of the TOGAF architectural development method—initiation and framework. This is a key phase. It

establishes a business basis for the development of the architecture by gathering the relevant strategic information to initiate the architectural program. We discuss artifacts such as the request for architectural work, the scope of work, and the terms of reference. These documents provide the basis for beginning the architectural work and in essence provide a contract between the business and the program.

Section Two: Technical Architecture Development Process

This section delves deeply into the technical aspects of developing the technical architecture. It represents the crux of the TOGAF ADM, and considers the detailed modeling required to build the organization's target architecture. This section has significant technical content.

Chapter 6 investigates the process of discovering the organization's technology baseline. It provides a number of techniques to complete this task. In this chapter, we also introduce in more detail the fundamental TOGAF artifacts including the foundation architecture, the technical reference model, the concept of the TOGAF platform, the standards information base, and architectural views.

Chapter 7 describes a method for slicing through a complicated architecture to support increased understanding and better analysis of both current systems and the target architecture. Using a technique known as architectural views, it is possible to extract specific areas from the architecture and analyze them separately. In this chapter we consider the following views: business process domain, functional, management, security, builders, data management, user, computing, and communications.

Chapter 8 continues with techniques for assessing the current systems environment. In this chapter, however, we provide a method for viewing the current systems in TOGAF terms. We review how aspects such as architectural constraints and principles should be captured and their importance in understanding how the target architecture will be directed. We also view how to translate the current systems into TOGAF services, and we describe their placement in the technical reference model and the standards information base. Finally, we tackle the issue of keeping the architecture on track through the application of requirements traceability and describe artifacts such as the key question list and technology selection criteria.

Chapter 9 demonstrates how TOGAF can be extended due to its framework nature. In this chapter, we present the concept of super services. The standard TOGAF services (defined by the foundation architecture and service taxonomy) employs only limited methods for establishing service hierarchies—services that use lower layer services—yet this is the basic tenet of the life cycle of functionality within the platform. Services begin their lives close to the application. As they become in-

creasingly commoditized, they descend into the platform to be replaced by more contemporary services. This is the basic characterization of a super service.

Chapter 10 considers the development of the organization's target architecture. The efforts applied to understanding the current environment, the enterprise requirements, and the identified issues and gaps are applied to the development of the target architecture. The target architecture is defined in two stages. This chapter discusses the definition of the logical services that will make up the final IT environment. Services are discovered in the journey along the architectural continuum. Beginning at the foundation architecture and finishing with the organizational architecture, we transition through common services and industry architecture discovery.

Chapter 11 scrutinizes techniques necessary to realize the logical service portfolio as physical technologies that will make up the IT environment. This continues the target architecture phase of the ADM. This chapter uses artifacts such as the standards information base, service functionality tables, and service instance maps to define the technological state of the organization's target architecture. Also discussed are industry standards and how they should be treated within the architecture.

Section Three: Project Management and Governance

The last section addresses the project management activities involved with successfully implementing a program that delivers to the target technical architecture. Beyond implementation, the final part of this section looks at the ongoing maintenance of the architecture, how to reduce divergence, and organizational aspects that can effect its success.

Chapter 12 explains the first of TOGAF's implementation phases, opportunity and solution and migration planning. In this chapter we consider the general effects of change on organizations and the specific implications of architectural change. A number of change-management strategies are considered. The implementation of the target architecture is discussed along with techniques for identifying the work packages that will be required to transition to the target architecture. We also take a look at the initiation of the architectural projects. This includes methods for the development of cost-benefit analysis, and processes for project prioritization.

Chapter 13 reviews the final implementation phases of TOGAF, the actual implementation of the architectural projects and the post-implementation maintenance of the architecture. We discuss mechanisms to control and manage the delivery of the architectural projects. The delivered architecture cannot be viewed as a static edifice. From the moment it is delivered, erosion begins. We look at strategies for man-

aging the architecture through the long term, controlling drift, and ensuring that the value of the architecture is maintained.

In Chapter 14, we look at some of the organizational issues that plague architectural initiatives. The concept of architectural drift was introduced in the last chapter. The formalization of an architectural governance structure is critical in controlling drift. We discuss a number of factors that can lead to a failed architecture and mechanisms to avoid such failures.

Audience

This text is targeted at those who are involved with:

- Organizational technology strategic planning
- Technology procurement
- Management of technology projects
- Consulting and advising on technology issues
- The management and planning within technology subject areas
- The management of the total cost of IT ownership

The various organizational roles targeted by this book include IT managers, IT development planners, technical and application architects, project managers, and solutions designers. This book is not exclusively focused on internal organizational roles. It also provides a viable framework for organizations that sell IT products and services such as solutions architects, trainers and educators, and IT consultants.

The definition and adoption of technical architectures is not only the domain of the planners. For it to be successful, anyone working within IT in an organization should have an understanding of what a technical architecture is and why it is important. In many cases, the adoption of architectural “mandates” can be in conflict with other IT imperatives (such as immediate project requirements), and therefore it is important that everyone associated with IT appreciate the importance of its strategic value.

Acknowledgments

We have always felt strongly about the disciplines embodied within the concept of technical architecture and the benefits available to the organization in adopting an architectural approach to its IT environment—perhaps because this is what we do for a living. However, it is also an interesting and dynamic part of the occupation we all call IT. The discipline requires continually keeping abreast of technology and technology advancements, both through research and implementation projects.

We have always considered technical architecture a widely explored field but also felt that its influence had been waning in the face of e-time, especially in New Zealand. We therefore felt an urge to present a paper on the relevance of technical architectures in enabling organizations to support e-business initiatives. The article, titled “Blueprint for a Flexible Enterprise”, was published in *Intelligent Enterprise*, and we would like to thank CMP Media for starting us on the long road in the production of this book.

In a typical example of the reach of the Internet, we were contracted by Springer-Verlag. Referring to the article, they inquired whether we had considered writing a book on the subject. We would like to thank Wayne Yuhasz of Springer-Verlag, for considering the article worthy of a book and for his and Wayne Wheeler’s support throughout its development.

The model we have used for architectural development within many organizations is The Open Group’s Architectural Framework (TOGAF). We have found the model flexible, simple to understand, and effective in producing corporate technical architectures. When planning the book, we felt that TOGAF should be its central theme. We are indebted to The Open Group, and in particular to John Spencer, the Director of Architectures at The Open Group, for allowing us to use TOGAF and for providing us with help and assistance when we were stuck.

Finally, we would like to thank the management team at AMR & Associates, who were required to “ignore” the fact that members of their

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