

The Art of Enterprise Information Architecture

A Systems-Based Approach for
Unlocking Business Insight

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Foreword

Ron Tolido

In the past two years, I have become more involved in what my company, Capgemini, has fondly started to describe as the “business technology agora,” a place where IT and business people meet, discuss, make decisions, and prepare for action. Like in the old Greek cities, this agora proves to be a catalyst for dialogue, a gathering place for different stakeholders to reach out to the others and improve understanding.

By using the principles of the Business Technology Agora, we carefully identify the most important business drivers of an organization, map these to technology solutions in different categories, and discuss impact, timing, and implementation issues. Categorizing solutions in different areas helps to simplify the technology landscape, but it also provides us with a wealth of insight into what areas of IT truly matter to the business of our clients.

If there is one dominant category that we have identified in these two years of business technology sessions across the world, it is no doubt “Thriving on Data.” The abundant, ubiquitous availability of real-time information proves to be the single most important requirement to satisfying the needs of the business.

Organizations envision thriving on data in many different ways. One way might be to simply get more of a grip on corporate performance by creating a more integrated view of client-related information and having management dashboards that truly show the actual state of the business. Another way, being used more often, is to carefully analyze data from inside and outside of the enterprise to predict and understand what might happen next. Above all, the exchange of meaningful data is the glue that binds all the actors (man, machine, anything else) in the highly interconnected, network of everything that nowadays defines our business environment; data literally gets externalized and becomes the main tool for organizations to reach out to the outside world.

Given the extreme importance of data today, it is surprising that many organizations do not seem to be able to govern their data properly, let alone use data in a strategic way to achieve their objectives. Data is often scattered across the enterprise. There are no measures to guarantee consistency, and ownership is unclear. The situation becomes even more difficult when different business entities are involved or when data needs to be shared between organizations. This is a truly complex problem and businesses need a much more architectural approach for leveraging their data.

In my other role as a board member of The Open Group, I have come to value the role of architecture as a tool not only to bring structure and simplification to complex situations, but also to bridge the views of the different stakeholders involved. If we are to achieve boundary-less information flow inside and between organizations, which is the ultimate goal of The Open Group, we need standards. Standards aren't only about the terms of definitions and semantics but about the methodologies we apply and the models that we build on. After all, ever since the rise and fall of the Tower of Babel, we know that successful collaboration depends on the ability to share the same ways of working, to share the same objectives, to build on a common foundation, and to be culturally aligned. Essentially, it is about speaking the same language in the broadest sense of the word.

The authors of this book aim for nothing less than creating an architectural perspective on enterprise information, and they have embarked on a mission of epic proportions. By bringing together insights and best practices from all over the industry, they provide us with the models, methodologies, diagnostics, and tools to get a grip on enterprise information. They show us how enterprise information fits into the broader context of enterprise architecture frameworks, such as The Open Group Architecture Framework (TOGAF). They introduce a multi-layered information architecture reference model that has the allure of a standard, common foundation for the entire profession. They also show us how Enterprise Information Architecture (EIA) alludes to emerging, contemporary topics such as SOA, business intelligence, cloud-based delivery, and master data management.

However, most of all, they supply us with a shared, architectural language to create oversight and control in the Babylonian confusion that we call the enterprise information landscape. When the business and IT side of the enterprise share the same insights around the strategic value of information and when they mutually agree on the unprecedented importance of information stewardship, they start to see the point of this book—how to unleash the power of enterprise information and how to truly thrive on data.

Ron Tolido

*VP and Chief Technology Officer, Capgemini Application Lifecycle Services
Board Member, The Open Group*

Foreword

Dr. Kristof Kloeckner

Senior business and technical executives are becoming increasingly concerned about whether they have all the critical information at their disposal to help them make important decisions that might impact the future of their companies. They need to anticipate and adequately respond to business opportunities and proactively manage risk, while also improving operational efficiency. At the same time, the world's political leaders are being challenged with the opportunity to improve the way the world works. As populations grow and relocate at a faster pace, we are stressing our aging infrastructures. Smarter transportation, crime prevention, healthcare, and energy grids promise relief to urban areas around the world.

What these business, political, and technical leaders have come to realize is that a key enabler across all these pressure points is *information*. During the past 20 plus years, the IT industry has focused primarily on automating business tasks. Although essential to the business, this has created a complex information landscape because individual automation projects have led to disconnected silos of information. As a result, many executives do not trust their information. Redundancy reigns—both logically and physically. This highly heterogeneous, costly, and non-integrated information landscape needs to be addressed. Value is driven by unlocking information and making it flow to any person or process that needs it—complete, accurate, timely, actionable, insightful information, provided in the context of the task at hand. Advanced insight, new intelligence, predictive analytics, and new delivery models, such as Cloud Computing, must be fully leveraged to support decisions within these new paradigms.

These information-centric capabilities help enable a fundamental shift to a smarter, fact-based *Intelligent Enterprise* and eventually enable building a *Smarter Planet*—city by city, enterprise by

enterprise. To facilitate these changes, an innovative, comprehensive, yet practical, *EIA* is required. It is one that technically underpins a more analytical information strategy and paves the way for more intelligent decisions to build a smarter planet within the enterprise and globally.

The Art of Enterprise Information Architecture delivers a practical, comprehensive cross-industry reference guide that addresses each of the key elements associated with developing and implementing effective enterprise architectures. Industry-specific examples are included; for instance, the intelligent utility network is discussed and how EIA enables the new ways in which energy and utility companies operate in the future. It also elaborates on key themes associated with unlocking business insight, such as Dynamic Warehousing and new trends in business analytics and optimization. Crucial capabilities, such as Enterprise Information Integration (EII) and end-to-end Enterprise Metadata Management, are presented as key elements of the EIA. The role of information in Cloud Computing as a new delivery model and information delivery in a Web 2.0 World rounds off key aspects of the EIA. This book serves as a great source to the information-led transformation necessary to becoming an intelligent enterprise and to building a smarter planet. It delivers an architectural foundation that effectively addresses important business and societal challenges.

Moreover, the authors have applied their deep practical experience to delivering an essential guide for every practitioner from EIA to leaders of information-led projects. You will be able to apply many of the best practices and methods provided in this book for many of your information-based initiatives.

Enjoy reading this book.

Dr. Kristof Kloeckner

CTO, Enterprise Initiatives

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Preface

What Is This Book About?

EIA has become the lifeline for business sustainability and competitive advantage today. Firms of all sizes search for practical ways to create business value by getting their arms around information and correlating insights so business and technical leaders can confidently predict outcomes and take action. For all business and technical executives around the world, the information era poses unique challenges: How can they unlock information and let it flow rapidly and easily to people and processes that need it? How can they cost-effectively store, archive, and retrieve a –virtual explosion of new information? How do they protect and secure that information, meet compliance requirements, and make it accessible for business insight where and when it is needed? How can they mitigate risks inherent in business decision making and avoid fraudulent activities in their own operations?

Senior leaders have come to realize that intelligence, information, and technology will radically and quickly change how business is done in the future. Globally integrated enterprises require that business become more intelligent and more interconnected day by day. With these changes come amazing opportunities for every business: It is now possible to gain intelligence of information created by millions of smart devices that have been and even more will be deployed and connected to the Internet. The fundamental nature of the Internet has changed into an Internet of interconnected devices communicating with one another. Individuals are also creating millions of new digital footprints with transactions, online communities, registrations, and movements. To cope with this explosion of data, creating new data centers with exponentially larger storage and faster processing is necessary but by itself is not sufficient. Businesses now require new intelligence to manage the flow of information and surface richer insights to make faster, better decisions.

Consequently, what business leaders realize is that a new approach to EIA is needed. They realize that an architectural foundation is necessary to effectively address these business challenges to provide best practices for how to unlock business insight and for how to apply architectural patterns to business scenarios supported by reference models, methodologies, diagnostics, and tools. With *The Art of Enterprise Information Architecture: A Systems-Based Approach for Unlocking Business Insight*, we've outlined the right methods and tools to architect information management solutions. We've also outlined the right environment to enable the transformation of information into a strategic asset that can be rapidly leveraged for sustained competitive advantage.

This book explains the key concepts of information processing and management, the methodology for creating the next generation EIA, how to architect an information management solution, and how to apply architectural patterns for various business scenarios. It is a comprehensive architectural guide that includes architectural principles, architectural patterns, and building blocks and their applications for information-centric solutions. The following is what you can expect from reading the chapters of this book:

- **Chapter 1, “The Imperative for a New Approach to Information Architecture”**—In this chapter, we introduce business scenarios that illustrate how intelligence, information, and technology are radically changing how business will be conducted in the future. In all these scenarios, we outline how new sources and uses of enterprise data are brought together in new ways to shake the foundation of how companies will compete in the “New Economy.”
- **Chapter 2, “Introducing Enterprise Information Architecture”**—This chapter introduces the major key terms and concepts that are used throughout this book. The most important foundational concept is Reference Architecture, which we apply to the key terms, such as Information Architecture and EIA, to finally derive our working model of an EIA Reference Architecture.
- **Chapter 3, “Data Domains, Information Governance, and Information Security”**—This chapter introduces the scope associated with the definition of data in the EIA and the relevant data domains which are Metadata, Master Data, Operational Data, Unstructured Data, and Analytical Data. We describe their role and context, and most important, we briefly describe how these domains can be managed successfully within the enterprise through a coherent Information Governance framework. This chapter also takes a brief look at the current issues surrounding Information Security and Information Privacy.
- **Chapter 4, “Enterprise Information Architecture: A Conceptual and Logical View”**—This chapter first introduces the necessary capabilities for the EIA Reference Architecture. From that, we derive the conceptual view using methods such as an Architecture Overview Diagram that groups the various required capabilities. We introduce architecture decisions that we then use to drill-down in a first step from the conceptual view to the logical view.

- **Chapter 5, “Enterprise Information Architecture: Component Model”**—This chapter introduces the component model of the EIA Reference Architecture covering the relevant services with its descriptions and interfaces. We describe the functional components in terms of their roles and responsibilities, their relationships and interactions to other components, and the required collaboration to allow the implementation of specified deployment and customer use case scenarios.
- **Chapter 6, “Enterprise Information Architecture: Operational Model”**—This chapter describes the operational characteristics of the EIA Reference Architecture. We introduce the operational-modeling approach and provide a view on how physical nodes can be derived from logical components of the component model and related deployment scenarios. We also describe with the use of operational patterns how Information Services can be constructed to achieve functional and nonfunctional requirements.
- **Chapter 7, “New Delivery Models: Cloud Computing”**—This chapter covers the emerging delivery model of Cloud Computing in the context of Enterprise Information Services. We define and clarify terms with regard to Cloud Computing models with its different shapes and layers across the IT stack. Furthermore, we provide a holistic view of how the deployment model of Enterprise Information Services will change with Cloud Computing and examine the impact of the new delivery models on operational service qualities.
- **Chapter 8, “Enterprise Information Integration”**—In this chapter, we outline the fundamental nature of an Enterprise Information Integration (EII) framework and how it can support business relevant themes such as Master Data Management (MDM), Dynamic Warehousing (DYW), or Metadata Management. We describe a large number of capabilities and technologies to choose from which include replication, federation, data profiling, or cleansing tools, and next generation technologies such as data streaming.
- **Chapter 9, “Intelligent Utility Networks”**—This chapter covers business scenarios that are typical for the utility industry demanding for improved customer services and insight, improved enterprise information, and integration. We introduce specific Information Services for the Intelligent Utility Network (IUN), such as automated metering, process optimization through interconnected systems, and informed decision making based on advanced analytics.
- **Chapter 10, “Enterprise Metadata Management”**—This chapter details new aspects in the generation and consumption of Metadata. We describe the increasing role of enterprise-wide Metadata Management within information-centric use case scenarios. Primarily, we concentrate on the emerging aspects of Metadata and Metadata Management, such as Metadata to manage the business, aligned Business and Technical Metadata, Business Metadata to describe the business, or Technical Metadata to describe the IT domain.

- **Chapter 11, “Master Data Management”**—In this chapter, we describe relevant sub-components and provide component deep dives of MDM solutions. We explore relevant capabilities and how architects can apply them to specific business scenarios. With the use of Component Interaction Diagrams, we discuss the applicability of MDM Services of exemplary use cases, for instance the Track and Trace aspects of a Returnable Container Management solution in the automotive industry.
- **Chapter 12, “Information Delivery in a Web 2.0 World”**—This chapter covers the use of Mashups as part of the next phase of informational applications. We describe how Mashups fit into a Web 2.0 world and then outline the Mashup architecture, its place within the Component Model, and some scenarios that use Mashups. This should allow the architect to understand and to design typical Mashup applications and how to deploy them in operational environments.
- **Chapter 13, “Dynamic Warehousing”**—This chapter explores the role of the EIA components in the new Dynamic Warehousing approach. We address the challenges imposed by demands for real-time data access and the requirements to deliver more dynamic business insights by integrating, transforming, harvesting, and analyzing insights from Structured and Unstructured Data. We focus on satisfying the shrinking levels of tolerance the business has for latency when delivering business intelligence.
- **Chapter 14, “New Trends in Business Analytics and Optimization”**—The business scenarios discussed in this chapter provide examples of the newer trends in the use of advanced and traditional Business Intelligence (BI) strategies. We explore powerful infrastructures that enable enterprises to model, capture, aggregate, prioritize, and analyze extreme volumes of data in faster and deeper ways, paving the road to transform information into a strategic asset.

Who Should Read This Book

The Art of Enterprise Information Architecture: A Systems-Based Approach for Unlocking Business Insight has content that should appeal to a diverse business and technical audience, ranging from executive level to experienced information management architects, and especially those new to the topic of EIA. Whether newcomers to the topic of EIA or readers with strong technical background, such as Enterprise Architects, System Architects, and predominately Information Architects, should enjoy reading the technical guidance for how to apply architectural models and patterns to specific business scenarios and use cases.

What You Will Learn

This book is intended to provide comprehensive guidance and understanding of the importance and nature of the different data domains within EIA, the need for an architectural framework and

reference architecture, and the architectural modeling approach and underlying patterns. Readers learn the answers to questions such as:

- How to keep up with ever-shortening cycle times of information delivery to the lines of business by applying architectural patterns?
- How to design Information Services with a methodological approach, beginning from conceptual and functional building blocks down to operational requirements satisfying specific service levels?
- How to apply advanced technologies and tools to systematically mine new Structured and Unstructured Data?
- How to outline new intelligence leveraging more and more real-time operating capabilities?
- How to create instant reaction and proactive applications in smarter businesses by applying architectural building blocks for specific business scenarios?
- How to design next generation EII connecting data and leveraging the flow of information?

How to Read This Book

There are several ways to read this book. The most obvious way is to read it cover to cover to get a complete end-to-end picture of the next generation of EIA. However, the authors organized the content in such a way that there are basic reading paths and appropriate deep dives with related business scenarios and application of architectural patterns.

To understand the key design concepts of the EIA Reference Architecture and the architectural patterns that can be applied ranging from conceptual views to logical views and down to physical views, we suggest reading Chapter 1 through Chapter 6. This should provide the reader with a clear understanding of EIA and how to design and implement the relevant components in the enterprise. Additionally, Chapter 7 provides a view of how Enterprise Information Services will change with Cloud Computing. To understand detailed solution patterns, we suggest reading Chapters 5 and 6 to understand the Component Model and the Operational Model of the EIA. Chapters 8 through 14 can be investigated in any order the reader desires to learn about industry solutions such as Intelligent Utility Networks, or focus on more details of Enterprise Information Services such as Enterprise Information Integration, Enterprise Metadata Management, Master Data Management, Mashups, Dynamic Warehousing, and Business Analytics and Optimization.

The scope of this book is a discussion of EIA from a business, technical, and architectural perspective. Our discussion of EIA is not tied to specific vendors' software and thus is not a feature-oriented discussion. However, based on the solid architecture guidance provided, an IT architect can make appropriate software selections for a specific, concrete solution design. To

give an IT architect a quick start when performing the software mapping as part of the Operational Model design, we provided a complementary Web resource on www.ibmpressbooks.com/artofeia. This online resource lists software offerings from IBM and some other vendors by functional area. We decided to put this section online because we also provide links to the corresponding product homepages for easier access. There are numerous standards relevant for EIA and information management in general. These standards range from the *lingua franca* SQL for databases or more recent ones such as RSS for information delivery in Web 2.0. Whenever a standard or a technical acronym is mentioned where the reader might be interested, we provide an online appendix for Standards and Specifications (Appendix B) and Regulations (Appendix C). See the Web page <http://www.ibmpressbooks.com/artofeia> where we list all technical standards and acronyms used throughout the book. Because references to standard or regulation documents and other resources are in most of the cases online resources, the reader should have easier access by just following the online links provided.

The Imperative for a New Approach to Information Architecture

The scenarios in Table 1.1 illustrate how intelligence, information, and technology will radically change how business is done in the future. In each of these scenarios, new sources and uses of enterprise data are brought together and analyzed in new ways to shake the foundation of how companies will operate in this “smarter” world.

Unfortunately, most businesses struggle with even the most basic applications of information. Many companies have difficulty getting timely, meaningful, and accurate views of their past results and activities, much less creating platforms for innovative and predictive transformation and differentiation.

Executives are increasingly frustrated with their inability to quickly access the information needed to make better decisions and to optimize their business. More than one third of business leaders say they have significant challenges extracting relevant information, using it to quantify risk, as well as predict possible outcomes. Today’s volatile economy exacerbates this frustration. Good economies can mask bad decisions (even missed opportunities), but a volatile economy puts a premium on effective decision making at all levels of the enterprise. Information, insight, and intelligence must be fully leveraged to support these decisions.

This concept is shown in Figure 1.1 where you can see the results of a recent IBM survey.¹ While executives rely on dubious and incomplete information for decisions, they simultaneously struggle with the complexity and costs of the larger and oftentimes redundant information environments that have evolved over time. The inefficiencies and high costs associated with maintaining numerous, redundant information environments significantly hinder an organization’s capability to meet strategic goals, anticipate and respond to changes in the global economy, and use information for sustained competitive advantage. The redundant environments might also

¹ For more details on the IBM Institute for Business Value (IBV) Study see [1].

Table 1.1 New Business Scenarios

#	Scenario	Description
1	Imagine getting good stock picks from... Facebook.	Imagine a financial advisor who can understand investor decisions not only from precise monitoring of each and every stock transaction, but from mining every broker e-communication, and every company's annual report in the same instant.
2	Imagine a... talking oil rig.	Imagine an oil rig that constantly "speaks" to its production supervisors by being connected to their control room, and that control room is connected to their supply chain planning systems, which is connected to the oil markets. The oil markets are connected to the pump. Each change in the actual petroleum supply can inform the entire value chain.
3	Imagine if car insurance policies used... cars.	Imagine a car insurer measuring policy risk not only by tracking claim data, but by putting that together with the collective Global Positioning System (GPS) record of where accidents take place, police records, places of repair, and even the internal vehicle diagnostics of an automobile's internal computer.
4	Imagine if every employee had... a thousand mentors.	Imagine students and young employees using social networks to find experts and insight as they grow into their chosen career, enabling them to have a thousand virtual mentors.
5	Imagine an ocean shipping lane that was... always sunny.	Imagine orchestrating a global logistics and international trade operation that was impervious to changes in the weather because of an uncanny capability to predict how global weather patterns affect shipping routes.
6	Imagine if repairmen learned how to fix things... while they fixed things.	Imagine a new breed of super repairmen who service thousands of different complex power grid devices. The intelligent grid senses its own breakdowns and inefficiencies through sensors in the network and intelligent metering. The repairmen are deployed automatically based on their location and availability. Upon arriving to do the repair, they are fed every metric they need, the troubleshooting history of the equipment they are repairing, and likely solutions. Schematics are "beamed" to screens within their goggles, overlaying repair instructions over the physical machine. Their own actions, interpretations, and the associated data patterns are stored in the collective repair history of the entire grid.
7	Imagine energy consumers... able to predict their energy consumption.	Imagine a portal based consumer interface that allows energy consumption to be predicted on a customer-specific basis over a defined period of time. Furthermore, allowing individual energy consumers to choose from a set of available services and pricing options that best match their energy consumption patterns, which leverages predictive analytics to provide advanced consumer insight.

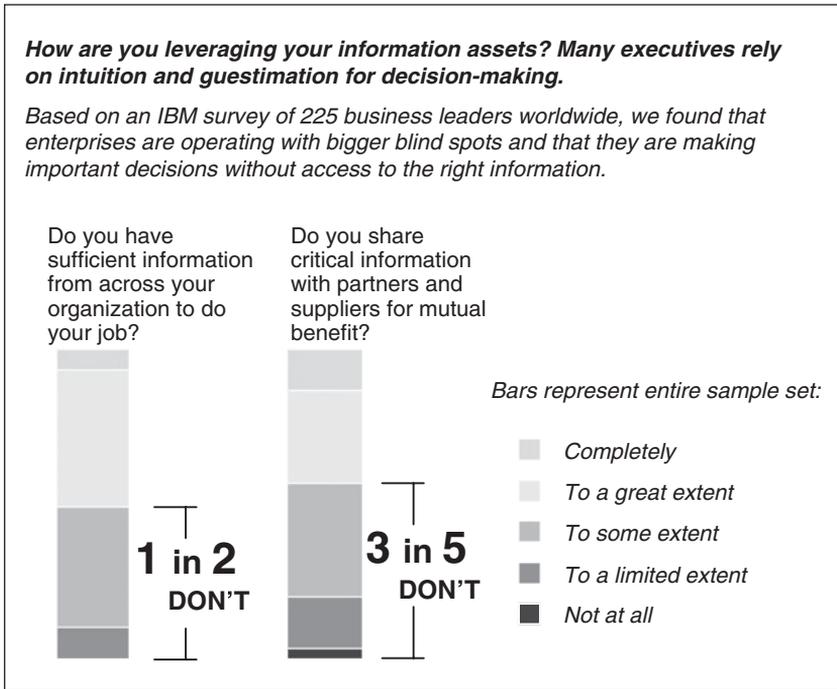


Figure 1.1 The IBV Study

provide inconsistent information and results which increases executives’ apprehension about the quality and reliability of the underlying data.

A new way forward is required. That new way must revolve around an Enterprise Information Architecture and it must apply advanced analytics to enable a company to begin operating as an “Intelligent Enterprise.”

1.1 External Forces: A New World of Volume, Variety, and Velocity

Our modern information environment is unlike any preceding it. The volume of information is growing exponentially, its velocity is increasing at unprecedented rates, and its formats are widely varied. This combination of quantity, speed, and diversity provides tremendous opportunities, but makes using information an increasingly daunting task.

1.1.1 An Increasing Volume of Information

Even in the “primitive” times of the information age, where most data was generated through transactional systems, data stores were massive and broad enough to create processing and analytical challenges. Today, the volume is exploding well beyond the realm of these transaction applications. Transistors are now produced at a rate of one billion transistors for every individual

on Earth every year.² In capturing information from both people and objects, these transistor-based “instruments” are able to provide unprecedented levels of insight—for those organizations that can successfully analyze the data. For example, individuals can now be identified by GPS position and genotype. In the world of intelligent objects, it’s not only containers and pallets that are tagged for traceability, but also banalities such as medicine bottles, poultry, melons and wine bottles that are adding deeper levels of detail to the information ecosystem. How is it possible for organizations to make sense of this virtually unlimited data?

1.1.2 An Increasing Variety of Information

Data is no longer constrained to neat rows and columns. It comes from within and from outside of the enterprise. It comes structured from a universe of systems and applications located in stores, branches, terminals, workers’ cubes, infrastructure, data providers, kiosks, automated processes and sensor-equipped objects in the field, plants, mines, facilities, or other assets. It comes from unstructured sources, too, including: Radio Frequency Identification (RFID) tags, GPS logs, blogs, social media, images, e-mails, videos, podcasts, and tweets.

1.1.3 An Increasing Velocity of Information

The speed at which new data and new varieties of data are generated is also increasing.³ In the past, data was delivered in batches, and decision makers were forced to deal with historical and often out-dated post-mortems that provided snapshots of the past but did little to inform them of today or tomorrow. Today, data flows in real time. This has resulted in a world of real time decision making. Therefore, business leaders must be able to access and interpret relevant information instantaneously and they must act upon it quickly to compete in today’s changing and more dynamic world.

Other external business drivers contribute to the increasing complexity of information. Globalization, business model innovation, competition, changing and emerging markets, and increasing customer demands add to the pressures on business decision makers. Business leaders are also now looking beyond commercial challenges to see how their enterprises contribute to and interact with societies, including how they impact the environment, use energy, interact with governments and populations, and how they conduct their business with fairness and ethics.

In the context of this changing external environment, information becomes an important differentiator between those who can’t or won’t cope with this information challenge and those ready to ride the wave into the future.

² For more details on the growth rate, see [2] and [3].

³ The speed of increasing volumes during data generation reached in some scenarios is at a point where the volume of data can’t even be persisted anymore. This demands the capability to analyze data while the data is in motion. Stream analytics are a solution to this problem and are introduced in several solution scenarios in Chapters 8 and 14.

1.2 Internal Information Environment Challenges

Chief Information Officers (CIOs) and business leaders are starting to take a careful look inward to see how their own Enterprise Information environment is evolving, and the results are not encouraging. Some of the existing information challenges are:

- Accurate, timely information is not available to support decision-making.
- A central Enterprise Information vision or infrastructure is not in place or commonly accepted. The information environment was built from the bottom up without central planning.
- Data repositories number in the hundreds, and there is no way to count or track systems.
- A governance of systems across function, business lines, or geography is lacking.
- Severe data quality issues exist.
- System integration is difficult, costly, or impossible.
- Significant data and technology redundancy exists.
- There is an inability to tie transactional, analytical, planning, and unstructured information into common applications.
- Business leadership and IT leadership are at constant loggerheads with each other.
- Analytic information is severely delayed, missing, or unavailable.
- System investments are justified only at the functional level.
- The IT project portfolio is prioritized in a constant triage mode, and it is slow to respond to new business imperatives.
- The Total Cost of Ownership (TCO) is very high.

1.3 The Need for a New Enterprise Information Architecture

In this decade, businesses have leveraged technologies such as Enterprise Resource Planning (ERP) and Customer Relationship Management (CRM) to help enable their business process transformation efforts, propelling them to greater efficiencies and productivity. Today, it is the advances in information management and business intelligence that drive the level of transformation that empowers businesses and their people.

What “smart” company leaders realize is that a new approach to Enterprise Information Architecture is needed. The current chaotic, unplanned environments do not provide enough business value and are not sustainable over the longer term. The proclivity for system build outs over the years has created too much complexity and is now at a point where enterprise oversight and governance must be applied.

By embracing an enterprise approach, information-enabled companies optimize three interdependent business dimensions:

- **Intelligent profitable growth**—Provides more opportunities for attracting new customers, improving relationships, identifying new markets, and developing new products and services
- **Cost take-out and efficiency**—Optimize the allocation and deployment of resources and capital to improve productivity, create more efficiency, and manage costs in a way that aligns to business strategies and objectives
- **Proactive risk management**—Reduces vulnerability and creates greater certainty in outcomes as a result of an enhanced ability to predict and identify risk events, coupled with an improved ability to prepare and respond to them.

For the information-enabled enterprise, the new reality is this: Personal experience and insight are no longer sufficient. New analytic capabilities are needed to make better decisions, and over time, these analytics will inform and hone our instinctual “gut” responses. The information explosion has permanently changed the way we experience the world: Everyone—and everything—creates real time data with each interaction. This “New Intelligence” is now increasingly embedded into our Smarter Planet.TM

CASE IN POINT: SMARTER POWER AND WATER MANAGEMENT

IBM works with local government agencies, farmers, and ranchers in the Paraguay-Paraná River basin, where São Paulo is located, to understand the factors that can help safeguard the quality and availability of the water system.

Malta is building a smart grid that links the power and water systems; it will also detect leakages, allow for variable pricing, and provide more control to consumers. Ultimately, it will enable this island country to replace fossil fuels with sustainable energy sources.

1.3.1 Leading the Transition to a Smarter Planet

Today, Enterprise Information and Analytics is helping to *change the way the world works*—by making the planet not just smaller and “flatter,” but *smarter*. At IBM, we have coined the term *Smarter Planet* to describe this information-driven world. A central tenet of Smarter Planet is “New Intelligence,”⁴ a concept that is focused on using information and analytics to drive new levels of insight in our businesses and societies. We envision an Intelligent Enterprise of the future that is far more of the following:

- **Instrumented**—Information that was previously created by people will increasingly be machine-generated, flowing out of sensors, RFID tags, meters, actuators, GPS, and

⁴ See [4] for more information on “New Intelligence.”

more. Inventory will count itself. Containers will detect their contents. Pallets will report exceptions if they end up in the wrong place. People, assets, materials, and the environment will be constantly measured and monitored.

- **Interconnected**—The entire value chain will be connected inside the enterprise and outside it. Customers, partners, suppliers, governments, societies, and their corresponding IT systems will be linked. Extensive connectivity will enable worldwide networks of supply chains, customers, and other entities to plan and make interactive decisions.
- **Intelligent**—Advanced analytics and modeling will help decision makers evaluate alternatives against an incredibly complex and dynamic set of risks and constraints. Smarter systems will make many decisions automatically, increasing responsiveness and limiting the need for human intervention.

1.4 The Business Vision for the Information-Enabled Enterprise

As we've discussed, the future information environment will have unprecedented volumes and velocity, creating a virtual and constant influx of data, where enterprises that leverage this information will gain a significant competitive advantage over those that do not.

What does the information-enabled enterprise look like? What new capabilities set it apart and above the information powers of today? Looking forward, we can envision new characteristics for an information-enabled enterprise that empower it to combine vast amounts of structured and unstructured information in new ways, integrate it, analyze it, and deliver it to decision-makers in powerful new formats and timeframes, and give the organization a line of sight to see the future and anticipate change.

We can think of this as an evolution from traditional reporting to advanced predictive analytics. Many organizations still struggle with becoming effective reporters, meaning that even their weekly, monthly, or quarterly views of the past are not reliable or complete enough to help them fix what is broken. Some firms are beginning to advance to a level of being able to “sense and respond” where they can measure and identify performance, risks, and opportunities quickly enough to take corrective action based on a workable level of immediacy that is responsive to business stimuli. Then there are a few of the most sophisticated who are on a path to advance to the next step in analytic maturity that involves having the capability to “anticipate and shape.” In this mode, they leverage information in order to predict the road ahead, see future obstacles and opportunities, and shape their strategies and decisions to optimize the results to their ultimate advantage. This concept is shown in Figure 1.2 where you can see the evolution of the information-enabled enterprise.

In an information-enabled enterprise, these capabilities are achieved through better intelligence that is obtained through the sophisticated use of data, empowered by a new analytical vision of Enterprise Information Architecture. Table 1.2 describes characteristics of each phase of this evolution.

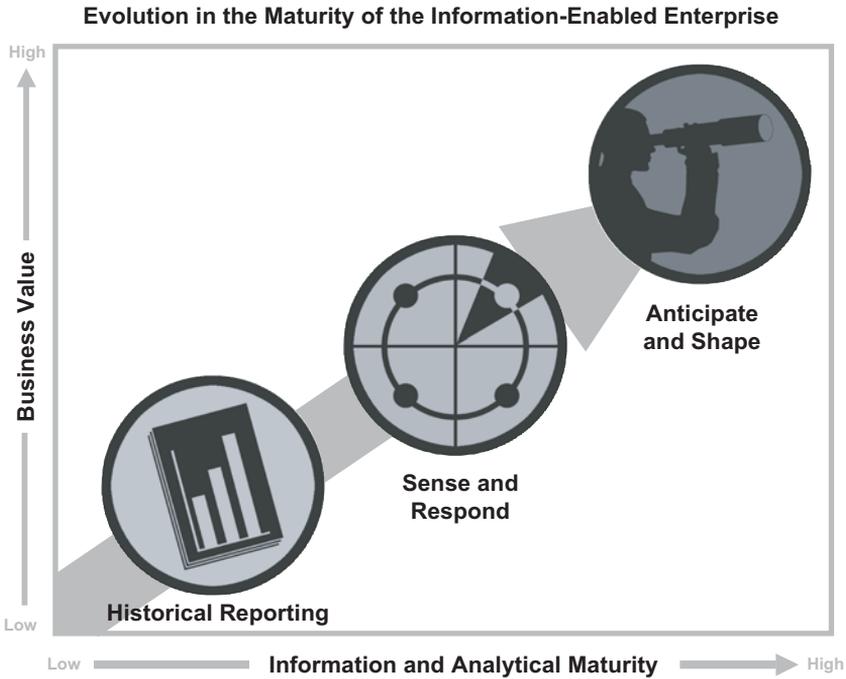


Figure 1.2 Information-enabled Enterprise Maturity

Table 1.2 Phases of Evolution

Focus Area	Historical Reporting	Sense and Respond	Anticipate and Shape
Information sources	Information is collected from internal transactional systems.	Event-based information is collected and integrated from transactional, planning, CRM, and external data providers.	Actionable data is analyzed and collected from many sources, including external sources, new instrumented data, and unstructured and societal data.
Processing	Some large databases are processed in batches and create snapshots of the past.	Large quantities of data process and deliver information quickly.	Large quantities of Structured and Unstructured Data are processed in real time.

Table 1.2 Phases of Evolution

Focus Area	Historical Reporting	Sense and Respond	Anticipate and Shape
Source of insight	Personal experience and informed guesswork are used to make decisions.	Many of the most important decision points are supported by data-driven facts.	Analytical tools are pervasive and user-friendly. Information is delivered anytime, anywhere, over the channels and devices of the user's choice.
Ability to see backward and forward	Historical data is used for "post-mortem" reporting and tracking.	Insights garnered through events enable decision makers to smartly consider future actions.	Sophisticated simulations and modeling are performed to more accurately predict outcomes.
Events	Events are identified and analyzed "after the fact."	Events are tracked in real time, and sophisticated rules enable the automation and rapid speed of response.	Events are anticipated and actions are taken before the event occurs.
Performance and risk	Although some performance measuring is in place, there is minimal measurement of risk factors.	Action is taken after a risk event occurs.	Actions are taken that mitigate risk and improve performance.
Knowing the facts	Information is coded and interpreted differently by Line of Business (LOB) and departments.	Many departments have integrated views of information.	The organization has "one version of the truth," which is defined and understood in the same way across the enterprise.
Summaries and details	Information has limited levels of detail and summary.	Information has many levels of detail and summary.	The needs of the individual and the environment are understood at different levels and delivered in personalized views.
Unstructured Data	Content and unstructured information is used only transactionally. For example, it is used for its primary purpose and then discarded or archived.	Vast stores of content are managed and analyzed, including e-mail, voice, Short Message Service (SMS), images, and video on a stand-alone basis.	Unstructured information is integrated with structured data and used for decision making and as knowledge at the point of interaction/use.

Table 1.2 Phases of Evolution

Focus Area	Historical Reporting	Sense and Respond	Anticipate and Shape
Wisdom and knowledge	Expertise and wisdom are products of experience and networking.	Information is gathered, stored, and accessed through knowledge systems.	New collective wisdom is generated via information and collaboration.
Lifetime of insight	Information is used for monthly, quarterly, and annual reporting.	Relevant information is used across the enterprise, having implications both up and down the value chain (for example, the flow from suppliers to customers).	Information is turned into institutional knowledge and accessed and used in new ways across the extended enterprise.
Integration	Linking of information across boundaries is difficult.	Key systems are integrated to capture important events.	People, systems, and external entities constantly connect and “speak” to each other seamlessly.
Timeliness and access	Users are not provided the information they need to make timely decisions.	Information is delivered in ways that are useful to the context of the situation.	Analytical results are timely, personalized, and actionable.
People	Significant time is spent “chasing and reconciling” data.	Time is spent responding to events as they occur.	People focus on planning, innovation, performance improvement, and risk mitigation.
Innovation	Innovation is seen as a discrete function of research and development or product managers.	Knowledge workers provide innovative responses to events.	Innovation is derived from all segments of the enterprise and from external sources.
Resource management	The enterprise continues to deploy more people to information management.	The enterprise actively seeks to optimize performance by making information more readily available.	Skills and culture are focused on improved analytical decision making at all levels of the organization.

Table 1.2 Phases of Evolution

Focus Area	Historical Reporting	Sense and Respond	Anticipate and Shape
Decision approval	Most decision making is top down and based on financial results.	Formal decision-making processes are in place to expedite approvals and executive sign-off.	Decision-making authority is delegated to more people and requires less managerial and administrative oversight. Employees are encouraged to solve issues immediately and locally.
Incentives	Incentives are aligned to key financial measures.	Incentives are performance- and decision-based.	Incentives are aligned to balanced performance measures with an emphasis on innovation.

These characteristics begin to “color in” the information-enabled enterprise. This said, the specific characteristics and capabilities for each enterprise are defined and built based on the needs and priorities of each organization. Determining this mix and establishing a vision for becoming an Information-Enabled Enterprise are the first and most important steps an organization can take on their enterprise information journey.

CASE IN POINT: SMARTER TRAFFIC IN STOCKHOLM

Traffic is a global epidemic. For example, U.S. traffic creates 45 percent of the world’s air pollution from traffic and in the UK, time wasted in traffic costs £20B per year. Stockholm was faced with similar challenges and decided to take action to reduce city traffic and its impact on the environment, especially during peak periods.

Critical to addressing this challenge was providing the city of Stockholm with the ability to access, aggregate, and analyze the traffic flow data and patterns required to develop an innovative solution. State of the art information integration capabilities for structured and unstructured (for example, video streams from traffic cameras) data are, thus, a key technical foundation of the solution.

As a result of performing this analysis, a new strategy was created that included “congestion charges” to influence the levels of traffic at peak times by using cost incentives to drivers. To accurately apply these charges, the city knew that the system had to be accurate on day one. Eight entrances were equipped with cameras that photograph cars from the front and back. These images are sent to a central data system to read the license plates via an optical character recognition (OCR) system to ensure the right cars are charged. Information is collected, aggregated and analyzed with the resultant simulations and algorithms used to determine fee structures based on road usage and traffic patterns.

Continued on the next page

Stockholm was able to implement the system within two months, and the results have been quite impressive.⁵ Over 99 percent of cars are identified correctly. The traffic has gone down 22 percent and air pollution has improved by 14 percent since deployment of the system. Besides innovating a new traffic business model, these improvements were made possible with an information-centric approach and by providing advanced and predictive analytical models to better understand and improve traffic patterns, especially during peak periods.

Other cities and countries are interested in the system. The “Smarter Traffic” system does more than paint a picture for the future; it demonstrates how information can be leveraged in new ways to help “drive” a Smarter Planet.

1.5 Building an Enterprise Information Strategy and the Information Agenda™

Enterprises need to achieve information agility, leveraging trusted information as a strategic asset for sustained competitive advantage. However, becoming an Information-Enabled Enterprise through the implementation of an enterprise information environment that is efficient, optimized, and extensible does not happen by accident. This is why companies need to have an Information Agenda⁶—a comprehensive, enterprise-wide approach for information strategy and planning. An *Information Agenda* as shown in Figure 1.3 is an approach for transforming information into a trusted source that can be leveraged across applications and processes to support better decisions for sustained competitive advantage. It allows organizations to achieve the information agility that permits sustained competitive advantage by accelerating the pace at which companies can begin managing information across the enterprise.

Like building a bridge, the architects and engineers must start by showing what the bridge will do and look like, and then carefully plot each component and system so that individual project teams can implement new or enhanced systems that are consistent with the long-term vision. Unlike a bridge, an enterprise continually changes. Therefore, the roadmap must be adaptable to accommodate changing business priorities.

Unlike past planning approaches that have typically been suited for single applications or business functions, the Information Agenda must take a pervasive view of the information required to enable the entire value chain. It must incorporate new technologies, an ever-growing portfolio of business needs, and the impact of new channels (for example, social networks or blogs). The Information Agenda must also take into account the significant investments and value associated with existing systems. The challenge becomes how to combine the existing information environment with new and evolving technology and processes to create a flexible foundation for

⁵ See [5] for more information on this scenario and its results.

⁶ See [6] for more information on IBM’s Information Agenda approach.

the future. New information management practices such as Master Data Management (MDM), Information Services within a Service-Oriented Architecture (SOA) environment, and Cloud Computing provide capabilities to further facilitate both the breadth and depth of capabilities required for a true Enterprise Information Architecture.

The Information Agenda must include the strategic vision and roadmap for organizations to:

- Identify and prioritize Enterprise Information projects consistent with the business strategy and based on delivering real business value.
- Identify what data and content is most important to the organization.
- Identify how and when this information should be made available to support business decisions.
- Determine what organizational capabilities and government practices are required to provision and access this data.
- Determine what management processes are required to implement and sustain the plan.
- Align the use of information with the organization's business processes.
- Create and deploy an Enterprise Information Architecture that meets current and future needs.

The Information Agenda becomes the central forum for business and IT leaders to begin taking a serious look at their information environment. It enables leadership to begin formulating a shared vision, developing a comprehensive Enterprise Information Strategy, and ultimately designing the detailed blueprints and roadmaps needed to deliver significant business value by truly optimizing the use and power of Enterprise Information.

Figure 1.3 displays the four key dimensions of the Information Agenda.

The following sections provide an overview of the four key phases associated with developing an Enterprise Information Agenda. Each of these represents a phase of work and decision making, and a set of specific work products that comprise an effective Information Agenda.

1.5.1 Enterprise Information Strategy

The key to building a successful Enterprise Information Strategy is to closely align it to your business strategy. In so doing, the development process is often as important as the strategy it produces. This process enables business leaders to consider, evaluate, reconcile, prioritize, and agree on the information vision and related roadmap. It should compel business executives to actively gain consensus, sponsor the strategy, and lead their respective organizations accordingly. This includes "leading by example" and, in some cases, delaying projects benefiting executives' own functions and departments to accelerate others that are in the best interests of the corporation. To this end, great care should be taken in defining the strategy development approach and ensuring that the right decision makers participate in its development and execution.

From a technology perspective, the information strategy establishes the principles which will guide the organization's efforts to derive an Enterprise Information Architecture and exploit

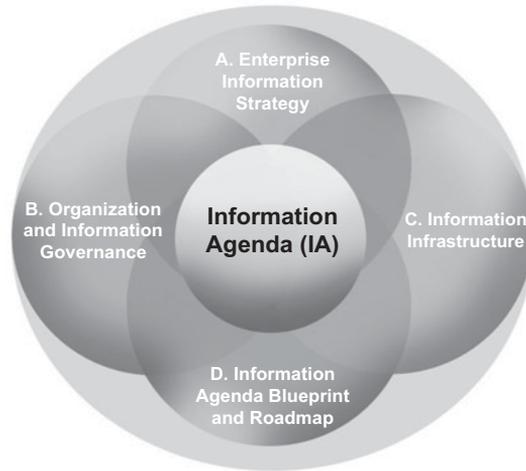


Figure 1.3 Information Agenda

the trusted information and advanced analytical insight that the architecture enables. As such, the enterprise information strategy provides an end-to-end vision for all aspects of the information.

As part of this process, there are three key steps that must be performed to establish the vision and strategy:

1. Define an Enterprise Information vision based on business value.
2. Determine future-state business capabilities.
3. Justify the value to the organization.

1.5.1.1 Define an Enterprise Information vision based on business value

From the outset, IT and business leadership must develop a comprehensive, shared vision for their Enterprise Information environment. This vision describes a long-term, achievable future-state environment, documenting benefits and capabilities in business terms and showing how information is captured and used across the enterprise. This vision must be driven from, and aligned with, the business strategy. In this sense, the information vision never evolves independently, but is always tied to the business strategy via its objectives and performance metrics. It includes operational, analytical, planning and contextual information, and it is designed to benefit almost everyone in the enterprise, from executive leadership to line workers, and from automated systems to end-customers and suppliers. The alignment and mapping of business and technical metadata, which is a key aspect of the Enterprise Information Architecture, enables this interlock between the information vision and the business strategy.

1.5.1.2 Determine your future-state business capabilities

This phase frames the key comparison between the current state (“where are we now?”) with the desired future state (“where do we want to be?”) from a business value perspective. The result is a gap analysis that identifies what needs to be changed and to what extent, or in other words, what effort is required to close the gap between where we are and where we want to be.

It is useful to develop an understanding of both current and future state by thinking in terms of maturity. Maturity is a measure of establishment, competence, or sophistication in a given capability. At this point in the strategy development process, both the maturity model and gap analysis are likely limited to a very high-level point of reference: This point of reference provides meaningful information on how much change is required within the enterprise information environment and provides guidance to ensure that the blueprint and roadmap are realistic and achievable. Its creation might require subjective opinions and the process might spark energetic debate between different business units and IT leaders. This said, it is not detailed enough to frame initiatives or transformation work. This happens within the blueprint and roadmap process.

1.5.1.3 Justify the value to the organization

Justifying the value to the organization provides a documented, value-based economic justification for enabling the process, organization, and technology capabilities set forth in the Information Agenda Roadmap. Although it is listed here as an end-product, the process of building the value case (also known more plainly as a “business case”) is an ongoing, iterative process throughout the entire strategy development cycle, and an ongoing measurement and maintenance activity throughout design and implementation.

The value case frames the benefits to the organization, typically expressed both in business-terms and quantifiable metrics, whenever possible. The value case is instrumental in the decision-making process and is also used to maintain commitment and energy for the transformation throughout the entire lifecycle. It is not uncommon for leaders to lose focus as they become involved in other important areas, yet the value case stands as an important reminder of their commitment and the reasons to continue with difficult project work.

Key components of the strategy are value drivers, or, in other words, the specific measurable benefits and attributes that create value, such as identifying new revenue opportunities, reducing costs, or improving productivity. These value drivers can number in the hundreds or even thousands for an enterprise, but generally are logically grouped by: customers, products, employees, financial management, supply chain, or other operational and functional areas.

By having a timely line-of-sight into these value drivers, executives can better identify those opportunities that represent the greatest value and return on investment for the corporation.

1.5.2 Organizational Readiness and Information Governance

After the vision and strategy are completed, the next step is to evaluate the readiness of the organization to embrace and implement these plans. While Enterprise Information is often thought of in terms of systems and technology, it is the people, processes, organization, and culture that ultimately contribute heavily to success.

Information Governance is a critical component in aligning the people, processes, and technology to ensure the accuracy, consistency, timeliness and transparency of data so that it can truly become an enterprise asset. Information Governance can help unlock the financial advantages that are derived by improved data quality, management processes, and accountability. Business performance and the agility of the Enterprise Information Architecture are also dependent on effective enterprise information definition and governance. This is done via common definitions and processes that drive effective strategy development, execution, tracking, and management. To this end, Information Governance is an important enabler for the Enterprise Information Architecture.

At the outset, it is essential to assess the organization's current information governance framework and processes to determine whether they are robust enough to sustain a competitive, long-term Information Agenda. To manage information as a strategic asset, managing the quality of data and content is critical and can be accomplished only with the right governance and processes in place, supported by appropriate tools and technology.

1.5.3 Information Infrastructure

Assessing and planning the Information Infrastructure is an integral part of developing the Information Agenda. And while there is a strong affinity of all phases of the Information Agenda to the Enterprise Information Architecture, it is an integral part of the Information Infrastructure phase. The ability to govern the Information Infrastructure and to analyze the efforts needed to get from the "as-is" state to the "to-be" state supporting new business needs requires a comprehensive map of all information systems in the enterprise. This map for the Information Infrastructure is the Enterprise Information Architecture and is thus an integral part of the Information Agenda blueprint. This architecture must include a company's current tools and technologies while at the same time incorporating the newer technologies that provide the requisite enterprise scalability and sustainability necessary to address both short term and longer term business priorities.

There are two important steps. First, you must understand the current information infrastructure environment and capture this in an Enterprise Information Architecture showing the current state. Second, you need to define the future information infrastructure and capture this in an Enterprise Information Architecture showing the future state. You can then identify important gaps determining what is needed to get from current to future state.

1.5.3.1 Understand your current Information Infrastructure Environment

This activity involves understanding the company's existing Information Infrastructure with a goal of leveraging, to the greatest extent possible, the investments that have already been made. The current state architecture can then be compared to the future state architecture to identify those technology areas where there might be redundant tools and technologies or, on the other hand, those areas where additional technology might be required now or in the future.

1.5.3.2 Define your future Information Infrastructure

As much as the business vision is essential in describing the desired future state, defining the future Enterprise Information Architecture describes a longer-term and achievable "to-be" state

for the Enterprise Information technology environment. Many different information stakeholders should participate in this process, including: Enterprise Architecture, Information Management, Business Intelligence, and Content Management, to name a few. The remainder of this book will describe the Enterprise Information Architecture process in much more detail.

1.5.4 Information Agenda Blueprint and Roadmap

The final step in the development of an Information Agenda is the most important. The three previous steps have each primarily focused on a single important dimension. In developing the Information Agenda Blueprint and Roadmap, these three elements come together and are expressed in the Blueprint via the end-state vision. This is complemented with a short-term tactical plan and a higher level, longer-term strategic plan included in the Roadmap. This Blueprint and Roadmap help ensure that the Information Agenda creates value for the organization, remains aligned with business dynamics and requirements, and prioritizes the necessary projects in the right sequence based on the delivered value.

In essence, the Blueprint describes the “what” the organization is going to do and “where” they are going, as it relates to the information management vision. And the Roadmap defines “how” to achieve this vision. Two key work streams guide this process to successful completion:

1. Develop the Information Agenda Blueprint.
2. Develop the Information Agenda Roadmap and Project Plans.

1.5.4.1 Develop the Information Agenda Blueprint

In this step of the Information Agenda development process, an operational view of the proposed Enterprise Information capabilities is developed, rendered, and described relative to how it exists in its proposed end state. It is a fusion of business capabilities, organizational design, and technologies required to enable the transformation. The Blueprint answers the question “What are we going to build?” This Blueprint, if fully developed, is the to-be state of the Enterprise Information Architecture.

Much like the blueprint for a house containing structural elements, such as plumbing, electrical, mechanical, and so on, the Information Agenda Blueprint provides the design for the new Enterprise Information environment.

Different from the vision, the Blueprint is described in operational terms. To continue the house analogy, the vision for the house might describe its size, number of rooms, whether it’s modern, has a warm design, or is ergonomic, and so on. The Blueprint is stated in terms of bricks, mortar, pipes, wires, and so on. In the Information Agenda context, the vision might be voiced in statements such as “Users are able to access real time performance data,” whereas the Blueprint might describe “an online performance data dashboard supported by a business intelligence database and rules engine.”

Although we describe the Blueprint as an end-state, a good Blueprint is designed for future extensibility, meaning that it will provide a flexible foundation for the future, as the business strategy, requirements, and technologies change over time.

1.5.4.2 Develop the Information Agenda Roadmap and project plans

This work stream involves creating the roadmap of prioritized Enterprise Information initiatives and projects designed to build out the processes, architecture, and capabilities designed in the Blueprint. The Blueprint answers the question “What are we trying to build?” The Roadmap answers the question “How are we going to build it?”

The ultimate product of the Roadmap is a prioritized portfolio of initiatives, projects, and waves that build out the features of the Blueprint. Each project (or group of projects) typically focuses on delivering specific functionality and includes an underlying work plan. These project plans typically include goals, resources, schedules, deliverables, milestones, activities, responsibilities, and budgets. Because of the relative complexity and magnitude of work required at an enterprise-level, a good roadmap needs to integrate these plans in a way that delivers short-term value “quick hits” while also specifying the longer term approach, consistent with the business priorities and the Information Blueprint. To this end, the following techniques are often used to develop the Information Blueprint Roadmap:

- **Varying levels of summary and detail in the roadmap**—These are used to describe progress and plans with different audiences. It is typical to develop a macro view of the entire roadmap, usually expressed on a single page with large, telegraphic chevrons that show the entire picture at an executive level. Supporting this will be detailed work plans developed for the first project(s).
- **Sequential prioritization of groups of projects**—These are usually defined as “waves,” which are collections of projects that happen in a sequence (for example, Wave 1, Wave 2, Wave 3, and so on) based on their importance to the organization, their likelihood to deliver immediate benefits or payback, commonality of the projects, and the dependency of their completion for future waves. Smartly organized and sequenced waves maximize the benefits of the projects to the organization. Oftentimes, companies are able to “fund” future waves with the benefits generated from the early waves.
- **A portfolio approach**—This is used to manage multiple, parallel projects to ensure the best use of valuable resources, to reduce and improve coordination among the various teams, to reconcile efforts with existing or in-flight projects, and to manage the resource impact (be it people or investment dollars) on the organization.
- **Center of Excellence (COE) or Center of Competency (COC)**—This is an organizational item—the previous bullets were project-related items. The COEs and COCs are deployed to accomplish this portfolio approach at many organizations. These centers are an effective way of building and enhancing key information management skills and then leveraging those skills across multiple projects.

The Roadmap represents the final and most important product produced from the Information Agenda process because it brings together the results from each of the other three Phases. However, many well-intentioned managers have the urge to skip the other phases of the Information

Agenda development process and attempt to draft their own individual project plans from the start, or perhaps right after the vision is set. From an enterprise perspective, this is a “recipe for disaster” as it commonly enables these teams to develop their own designs and select their own technologies for specific capabilities and functions without a view of the overall environment. In fact, this is how many Enterprise Information environments became the “jungle” that they are today when projects are spawned from the “bottom up” and not guided by a central vision, strategy, and plan.

The process described previously, while generalized, describes a proven and high-quality approach to an Information Agenda development. Each enterprise should tailor, weigh, and prioritize activities to suit its individual needs and situation. Different organizations will want to customize or add certain steps based on their individual circumstances and priorities. In general, these four activities represent the major decision points and deliverables needed to create a comprehensive, pragmatic, and flexible Information Agenda.

1.6 Best Practices in Driving Enterprise Information Planning Success

The Information Agenda development process is often challenging, with each situation requiring its own balance of structured approach, sensitivity to company culture, and the meshing of strong personalities and opinions from diverse teams. Based on IBM’s experience working with multiple organizations, the following sections discuss best practices and considerations for how to develop and deploy a successful Information Agenda.

1.6.1 Aligning the Information Agenda with Business Objectives

The top priority in developing an Information Agenda is ensuring that core business objectives drive the agenda. At a high level, these business objectives might be strategic in nature, such as revenue generation, competitive differentiation, cost avoidance, efficiency, or performance. At a line item or feature level they might be described in terms of “being able to mine voice data” or “access to sales data in real time.”

It is also important to be realistic and practical in defining the Information Agenda. Most leaders are wary of “boil the ocean” type strategies that appear too expansive and exhaustive to be practically implemented. Along these lines, being realistic with expected returns can be important when setting expectations. When a projected benefit looks too good to be true, it might be viewed with skepticism and disbelief. Lastly, pragmatism in the Blueprint and design approach might require choosing tactics that fit the organization’s strengths, even if it does not represent leading-edge thinking within the industry.

1.6.2 Getting Started Smartly

There are typically multiple entry points, competing priorities, and methods for getting started. Sometimes a case for an Enterprise Strategy finds its start in a specific area, such as data quality or risk management, that when examined, is revealed to be endemic of a larger

organizational data issue. Other times, the process starts from a strategic enterprise level, where the strategy is based on goals such as global integration, enterprise agility, and competitive differentiation. Regardless, the smart Information Agenda should ultimately take a strategic purview and be supported by advocates for improving the overall business, not just changing the technology, while at the same time identifying opportunities for deriving short-term benefits. It is essential to garner support and advocacy by cross-departmental or cross-functional leadership that includes and spans beyond IT. Although the CIO is a likely candidate to lead the Information Agenda initiative, he or she should have the full support of other top leaders in understanding, championing, and funding the Information Agenda process.

1.6.3 Maintaining Momentum

Constant, quality communications with the right stakeholders is an important way to ensure the project stays on track. Communication should be bidirectional, with the team accepting and responding to stakeholder input and reporting results and decisions.

Since the Information Agenda process will involve many different types of stakeholders, it is important to communicate in the various ‘languages’ they speak and understand. For example, a CEO might think in terms of competitive differentiation and shareholder value. The CFO will look for hard numbers and speak in financial terms. A CRM or marketing leader might think in terms of customer experience. The IT leaders think in terms of data and systems. Because of this, it is important to describe strategy in ways that engage these different audiences.

1.6.4 Implementing the Information Agenda

The Information Agenda is only as good as an organization’s capability to implement it. For the Information Agenda Roadmap to be successful, it must compel the organization forward toward the vision. At the same time, after the implementation begins, the organization cannot lose sight of the strategy. The vision, the Blueprint, and the value case must live on through the implementation as the “guiding lights” and “touchstones.” The ultimate strategic output is the Roadmap, as it is the short-term and long-term plan toward achieving the vision.

Lastly, a formal metrics and measurement program needs to be instituted and maintained. At the project level, milestones, schedules, and budgets should be tracked to ensure that the projects are executed on time and on budget. At a strategic business level, the value drivers should be monitored and quantified as the new Information Agenda operations come online.

1.7 Relationship to Other Key Industry and IBM Concepts

The concepts discussed in this book are related to, include, and span many other titles, practices and themes within the realm of using Enterprise Information Architecture. The wide use of different lexicon needn’t be a point of confusion or conflict; Enterprise Information practices are broad and varied, requiring many different terms, each with their own nuances and places. Many concepts overlap to a degree, and few claim to be exhaustive in their scope or vision.

This said, within all of these concepts there persists a central thread of *developing excellence in business performance and execution through the use of superior intelligence derived from enterprise information*.

During the past few years, the IBM Corporation and the industry have introduced several new terms that relate to the subject of Enterprise Information, some of which are used in this chapter and throughout this book. Therefore, to avoid confusion and to tie a few of these concepts together, we have taken the liberty to define a few of these key terms on the following pages.

The Relationship to Information On Demand (IOD): Information On Demand⁷ describes the comprehensive, enterprise-wide end-state environment, along with the competencies associated with an Information-Enabled Enterprise. These organizations have a masterful ability to capture, analyze, and use the right, critical, powerful information at the point of decision. Inherent within IOD is an extensible Enterprise Information Architecture that provides the technical foundation for gaining and sustaining a competitive advantage through the better use of information. First coined by IBM in 2006, the term IOD has been adopted by many in the industry.

The Relationship to Information Agenda Approach: Whereas IOD represents the end-state vision (the Blueprint), the Information Agenda (and its approach) explains *how* and with *whom* an organization can achieve it. The Information Agenda is a strategy and approach (the Roadmap) for the organization to move forward toward pursuing its IOD objectives.

The Relationship to the Intelligent Enterprise and the Information Enabled Enterprise: Both of these terms connote an organization that is progressing toward achieving their IOD objectives and has mastered the Enterprise Information strategies, programs, and capabilities to be exemplars in analytic and information optimization practices. They refer to “best in class” analytical companies, and their key uses are as models for organizations to emulate as they devise their own specific visions for the future.

The Relationship to Smarter Planet and New Intelligence: Smarter Planet and its sub-domain of New Intelligence are IBM-coined visions of how companies, governments, and societies utilize information, innovation, and analytics to improve quality of life and drive significant value in today’s changing world. Different from other concepts listed here, Smarter Planet’s purview goes beyond any one enterprise or functional area to describe relationships between global systems, people, and their environments. The Intelligent Utility Network outlined in Chapter 9 is one concrete example of Smarter Planet.

The Relationship to Business Analytics and Optimization (BAO): BAO is the next-generation practice and management discipline for the consulting services industry. It is how practitioners in this space identify the work they do or would characterize the skills that they have. It also describes the practices and disciplines organizations undertake, to deliver on the promise of IOD and Information Agenda. BAO includes all Information Management and Analytics disciplines, including: Business Intelligence (BI), Corporate Performance Management (CPM), Data

⁷ See Chapter 2 for more discussion on Information On Demand.

Mining and Predictive Analytics, Master Data Management (MDM), and Enterprise Content Management (ECM). It is a sub-domain of the Enterprise Information Architecture. Some of the new trends in this space are discussed in Chapters 13 and 14 in the context of solution scenarios such as Predictive Analytics in Healthcare or Dynamic Pricing in Financial Services Industry. These scenarios are of course just a subset of relevant ones across all industries where BAO is applicable.

1.8 The Roles of Business Strategy and Technology

This chapter sets a business and “how-to” context for what is primarily a technical manuscript to both introduce and reinforce the message that an organization’s Enterprise Information Architecture and associated strategy and objectives must be centered around the business value that enterprise information can deliver.

The business value conversation is critically important to even technical audiences. As has been noted throughout this chapter, organizations are not be able to effectively compete without having access to better and more timely information. At the strategic level, IT professionals must partner with business managers in devising, approving, funding, and enabling new capabilities.

At the tactical level, good business knowledge helps the technology professional better understand his or her own priorities and frame of reference as he or she creates technical solutions, by continuing to question “*What value is this creating for the organization or our customers? How will this solution best drive innovation, increase revenue, or improve efficiency?*” These types of inquiries can keep the Enterprise Information Architecture discussion firmly planted within the reality of the larger business context.

This book is the technology companion to an upcoming business discussion on analytics titled “*The Information-Enabled Enterprise: Using Business Analytics to Make Smart Decisions*” by Michael Schroeck. Those readers seeking a deeper business understanding of Enterprise Information Management should consider this book, as it will provide a more detailed discussion into the true value of enterprise information and business analytics.

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