

**From Inception to Implementation:  
Delivering Value Through Enterprise Architecture**  
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**Rational** software



# **From Inception to Implementation: Delivering Business Value Through Enterprise Architecture**

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## Introduction

Organizations are always searching for creative methods to innovate in order to maintain competitive advantage, align IT resources to line-of-business missions and optimize spending. The problem is exacerbated by the increasing complexity of business operations and their supporting systems. Over time, numerous information systems are typically developed individually to resolve an organization’s specific business issues. Unless each new system is integrated into the whole as it is developed, the result will be a new “stovepipe.” As many organizations have come to realize, maintaining a large number of different systems performing similar functions can become an impossible task. So it is no surprise that integration is the number-one concern of CIOs today<sup>1</sup>—it is no longer seen as a specialized activity but as a fundamental, core part of the business. Integration decisions therefore must be driven by real business requirements.

Today, the lion’s share of integration is still done through complex custom coding; and most of that coding will not last long once in production. As organizations strive to become adaptive, uncovering opportunities for horizontal process and supporting technology infrastructure integration has emerged as a key imperative (see Figure 1).

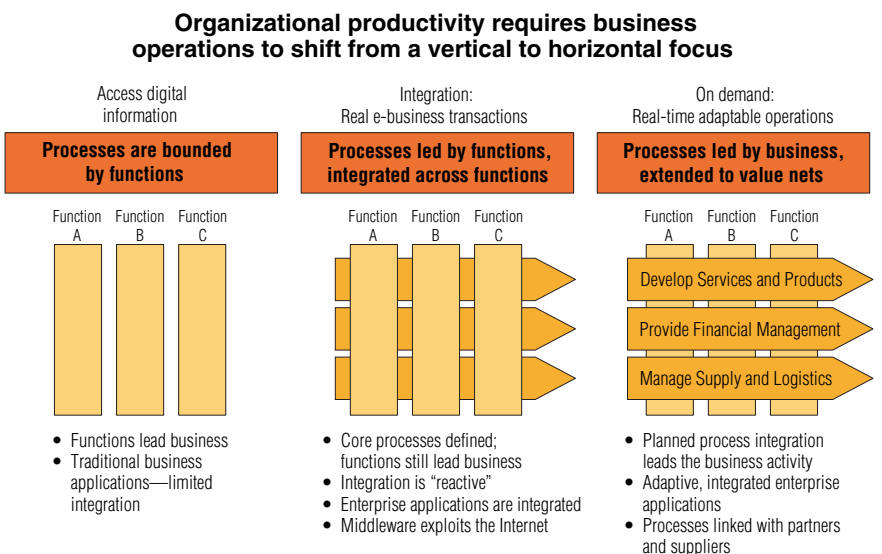


Figure 1: On demand businesses uncover opportunities to integrate horizontal processes and reduce stovepipes

<sup>1</sup> “State of the CIO Report: April 2003 Top Spending Priorities.” *CIO Magazine*. <http://www.cio.com/archive/040103/results.html>.

As software's role as a core business process and as a key factor in corporate survivability continues to grow, the answers to the following questions have taken on new significance:

- *Where are the opportunities and risks for program collaboration, data sharing and shared business processes?*
- *Where do we have redundant buying? Where are we over- or under-invested? How do we know? What metrics do we need?*
- *Where do we spend program funds and how effective are our investments?*

Enterprise architecture (EA)—coupled with a process for development, acquisition and maintenance—is becoming widely accepted as a mechanism for on demand transformation. An EA is an enabler for linking IT activities to a business's mission, integrating and modernizing systems, and ensuring deployment of IT in the most cost-effective, efficient manner. Enterprise architecture's value extends beyond IT—architecture has emerged as a strategic discipline in part due to its ability to help structure and implement innovation in the face of constantly changing business drivers. While adoption of EA has seen a quick uptake in industries such as government due to mandates like the U.S. Clinger-Cohen Act of 1996, according to industry analysts at META Group, by 2006, unified management and governed evolution of the enterprise architecture will become dominant best practices in 60% of Global 2000 enterprises.<sup>2</sup>

“Organizations are struggling to keep up with rapid changes driven by business pressures to achieve competitive advantage. Business units are turning to IT organizations to facilitate this advantage through the effective use of technology. The key is to build an adaptive architecture and use robust program management to implement it. These factors enable IT to respond to the increasingly diverse demands of the business, while managing the ongoing complexity of integrating disparate infrastructure and applications. Organizations must plan for this critical issue's continued significance.”

**George Paras**

Vice President,  
Enterprise Planning and Architecture Strategies  
META Group

<sup>2</sup> META Group Inc. Enterprise Planning and Architecture Strategies META Trends 2004-2005.

Enterprise architecture is fundamentally a management tool whose real value results in making better decisions for the business. “Studies have shown that with a solid EA practice in place, enterprise application integration cost savings of 25 to 40 percent can be realized in the development and architecture phases.” Implementing an EA can provide benefits, such as:

- *Increased collaboration with multiple stakeholders—through precise, standardized communication about the essential elements and functioning of the enterprise*
- *Centralized, stable and consistent information about the enterprise and its assets such as applications, hardware, databases and human resources*
- *Faster response and flexibility in the face of change—making it easier for an organization and its system partners to manage changes as they occur*
- *Improved return on investment (ROI) on an organization’s various IT implementations—by reducing the duplication and inconsistencies in the information and accelerating the delivery of systems from integration or outsourcing partners*
- *More predictable results—when the information about the enterprise is more precise and supported by automated traceability, higher quality and better decision making can be achieved*

This white paper provides an overview of enterprise architecture’s role in the enterprise transformation process: common definitions, frameworks and views, the EA linkage to solution architectures and service-oriented architectures, the business value of EA and a summary of implications that EA imposes on successful software development.

### **Demystifying the definitions**

An enterprise architecture is the representation of all the enterprise systems and their relationships, as well as the process of creating and maintaining that business. A system is “an integrated set of elements to accomplish a defined objective. These include hardware, software, firmware, people, information, techniques, facilities, services and other support elements.”<sup>3</sup>

Enterprise architectures capture a consistent layer of functioning in the enterprise, a description of the entities that make up the enterprise and specifications of how the systems work together to meet the enterprise’s

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<sup>3</sup> International Council on Systems Engineering. 1998. <http://www.incose.org>.

For more background on these estimates, reference Forrester Research’s (report from Giga Information Group acquisition) “The EA Business Case.” 8/2002. G. Leganza and M. Cecere. Planning Assumption RPA-082002-00024.

***Given the complex, multiplatform, concurrent, multilingual and distributed nature of systems today, understanding and defining the architecture's different perspectives and stakeholders is a key tenet of good enterprise architecture practice.***

purpose or mission. Given this definition, enterprises can exist within enterprises. For example, a business unit could be considered an enterprise if it could be operated independently. Typically, there is not a single EA but a series of interrelated architectural views that are created from different perspectives and levels of an organization (department, division, operating unit or cross-division group). Given the complex, multiplatform, concurrent, multilingual and distributed nature of systems today, understanding and defining these different perspectives and stakeholders is a key tenet of good EA practice.

Consider the definition of an enterprise in the financial services industry. To leverage retail banking relationships, many financial services providers expanded their businesses into insurance and investment management. By default, this merger and acquisition activity has left many CIOs' heads spinning with how to reconcile numerous decentralized technology infrastructures and application stovepipes. A lack of consolidated customer information (chances are the same customer number is not used for each line of business related to a customer's account at the banking institution), numerous Web sites and duplicate links with the same suppliers are all symptoms of stovepipe thinking. Yet revenue optimization and cost reduction can be realized when a holistic approach of the enterprise view is embraced. An EA should encompass the extensions of an enterprise, so suppliers and customers are not forced to view each line of business as a separate and distinct organization.

The term architecture has existed for thousands of years; every system has an architecture, whether intentional or not. This is because "every system can be shown to be composed of elements and relations among them."<sup>4</sup> The Institute of Electrical and Electronic Engineers (IEEE) defines an architecture as "the structure of the components, their relationships and the principles and guidelines governing their design and evolution over time."<sup>5</sup> Barry Boehm and his students at the University of Southern California (USC) Center for Software Engineering define a software system architecture as follows:<sup>6</sup>

- *A collection of software and system components, connections and constraints*
- *A collection of system stakeholders' need statements*

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<sup>4</sup> Len Bass, Paul Clements and Rick Kazman. *Software Architecture in Practice*. 2003.

<sup>5</sup> For more information, visit <http://www.ieee.org>.

<sup>6</sup> Boehm et al. 1995. For more information about Boehm's work, visit <http://sunset.usc.edu/cse>.

- *A rationale which demonstrates that the components, connections and constraints define a system that, if implemented, would satisfy the collection of system stakeholders' need statements.*

This definition concentrates on rationale for decisions, which highlights an important point. Why does the architecture look the way it does? What purpose does it serve? Does it inform decision making? Who are the main stakeholders and users of the architecture's systems and components? If you cannot explain why something is the way it is, then it is not an architecture. Based on this premise, IBM Rational defines software architecture<sup>7</sup> as encompassing the set of significant decisions about the organization of a software system, including:

- *Selection of the structural elements and their interfaces by which a system is composed*
- *Behavior as specified in collaborations among those elements*
- *Composition of these structural and behavioral elements into larger subsystems*
- *Architectural style that guides this organization*

As the complexity of business- and software-intensive systems has multiplied, the focus on architecture has evolved to become a strategic part of an organization's business strategy. Many of the business drivers for EA, including mandates such as the U.S. government's Clinger-Cohen Act of 1996, have been documented, and EA's prominence has moved up the corporate ladder steadily—from the desks of a few skilled architects to functional reporting to the CIO's office, where it underpins the investment or capital planning review process. By 2006, 25 percent of Global 2000 organizations will integrate holistic EA, enterprise program management, enterprise strategy/planning and IT portfolio management into a common set of IT management processes under the auspices of the CIO's office.<sup>8</sup>

In the simplest terms, EA is a planning discipline (see Figure 2) that provides a blueprint and process to guide and optimize an organization's IT investments or portfolio and to translate business strategies into implementable technology solutions. It encompasses three basic concepts: where are you ("as-is" state), where you want to go ("to-be" or desired state) and the process for getting

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<sup>7</sup> G. Booch, P. Krutchen, K. Bittner and R. Reitman. *The Rational Unified Process – An Introduction*. 1999. Definition derived from Mary Shaw's definition presented in 1995 at the First International Workshop on Architectures for Software Systems.

<sup>8</sup> META Group Inc. Enterprise Planning and Architecture Strategies. META Trends 2004-2005.

**Enterprise architecture is a planning discipline that provides a blueprint and process to guide and optimize an organization’s IT investments and to translate business strategies into implementable technology solutions. It bridges the gap between systems and application discovery, development and deployment and is a critical part of enterprise transformation.**

there. Although it may sound visionary or out of touch to say these are basic concepts—potentially implying they are easy to define—the reality for most organizations is that EA is undertaken in phases, masked by some other activity and characterized by increasing capability in one domain, slowly leading to a convergence of multiple disciplines in a coordinated fashion.

EA bridges the gap between systems and application discovery, development and deployment and is a critical part of enterprise transformation. As a strategic planning discipline that serves to both define and enforce technology decisions of the enterprise, IT management and line-of-business budget owners can embrace a common, systematic approach to answer questions such as, “How

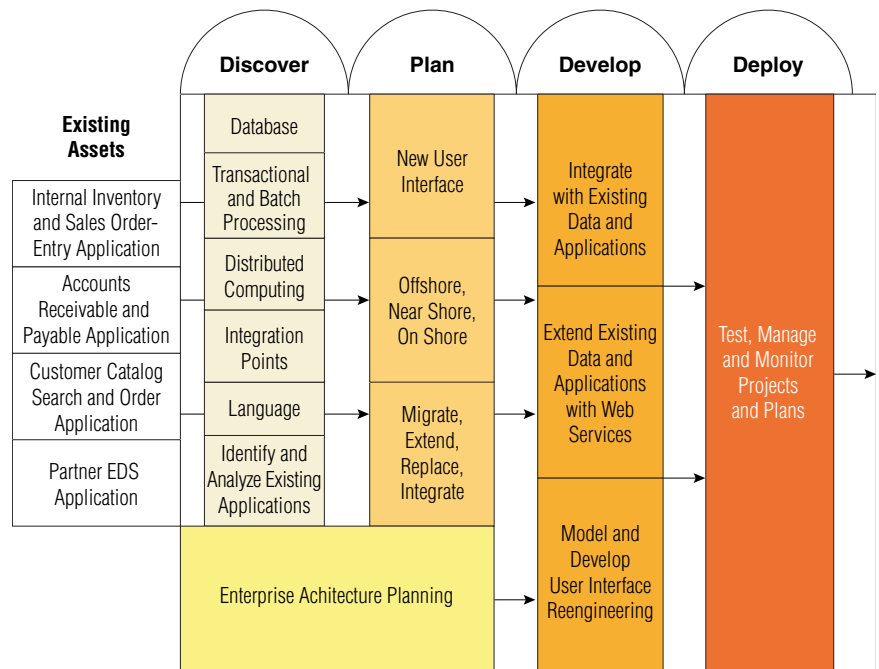


Figure 2: Enterprise architecture anchors the planning phase of enterprise transformation activities

do I build the business to meet stakeholder needs, maintain competitive advantage, spot value migration before it happens, optimize resources and increase revenue growth?”

**Architecture components, frameworks and views**

An EA consists of four components that together form a complete picture of the organization’s business vision, mission and information resource management goals. Creating and maintaining an EA is a very complex undertaking, because it represents multiple views of an enterprise: its business and functional processes,

organizational structure and information requirements as well as the underlying technical infrastructure. Maintaining an accurate and consistent representation for each of these views as well as across the views is critical for organizations that need to deploy an enterprise solution in a rapidly changing environment.

<b>Business architecture</b>	Provides a framework that reflects both current and future business environments and guides future IT investment and implementation decisions
<b>Information architecture</b>	Provides a profile for data, giving it additional descriptive characteristics; the data profile provides a multidimensional understanding of data that is essential for data reuse, security and quality
<b>Application architecture</b>	Represents the functions and capabilities that support business processes; describes how business is enabled through various applications
<b>Technology architecture</b>	Sets the organization's IT standards; these standards are developed to guide decision making to conform with the EA, but also can serve as an impetus for changing the EA to meet new demands

Figure 3: The four architecture components of EA

Creating and documenting architectural models that demonstrate the interaction of components and their linkage to business strategy are often represented in a type of structure. A multitude of EA frameworks exist, from John Zachman's seminal work first published in *IBM Systems Journal* in 1987<sup>9</sup> to industry-specific variations such as the Federal Enterprise Architecture<sup>10</sup> and C4ISR (Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance) framework.<sup>11,12</sup>

<sup>9</sup> J.A. Zachman. "A Framework for Information Systems Architecture." *IBM Systems Journal*, Vol. 26, No. 3. 1987. (Reprinted in 1999 in a special double issue of the *IBM Systems Journal*, Vol. 38, Nos. 2 and 3. 1999.) For more information about Zachman's work, visit <http://www.zifa.com>.

<sup>10</sup> For more information, visit <http://www.feapmo.gov>.

<sup>11</sup> For a comprehensive mapping of IBM Rational Suite® support for DoDAF/C4ISR, see "IBM Rational Suite Support for the U.S. Department of Defense Enterprise Architecture/C4ISR Framework" by Emmanuel Verge at <http://www3.software.ibm.com/ibmdl/pub/software/rational/web/whitepapers/C4ISR.pdf>.

<sup>12</sup> Analyst firms and noted EA experts can provide several summaries on the value and content of such frameworks. For more information, see "Standards For Enterprise Architecture: Mix And Match To Suit Your Enterprise Needs" by Randy Heffner with Kimberly Q. Dowling, Forrester Research, March 17, 2004; and *How to Survive in the Jungle of Enterprise Architecture Frameworks: Creating or Choosing an Enterprise Architecture Framework* by Jaap Schekkerman (published 2003).



Regardless of the chosen or, in some cases, mandated framework used, the need for a holistic approach to EA becomes clear. An integrated software development platform is required for business- and application-level modeling in which teams leverage meta-model standardization to capture and communicate system information; elicit, document and manage requirements; and ensure traceability throughout development and testing.

**Enterprise architecture, solution architectures and service-oriented architectures**

If good architectures serve as a vehicle for precise, standardized communication about the essential elements and functioning of the enterprise and its environment, then EA must move beyond a sketchy, paper-and-pencil top-level design and documentation exercise. Architectures should be systematically evaluated against functional and quality requirements, risks and key system attributes or properties. Architecture artifacts or work products from software processes—such as requirements, models, source code and tests—require periodic reviews, and prototypes should be tested to ensure resiliency and quality. These artifacts exist at many functional levels, from systems and application architecture to models and components. Assets are collections of artifacts that are organized around a particular solution space for a given problem in the form of frameworks, patterns or templates.

The relationship between the EA and the solution architecture (SA) illustrates an important distinction. An EA guides, constrains and leverages multiple IT solutions, whereas an SA's domain is limited to a specific program or project. Both the EA and SA are linked through a governance process, and the need for traceability among the artifacts becomes increasingly apparent (see Figure 4).

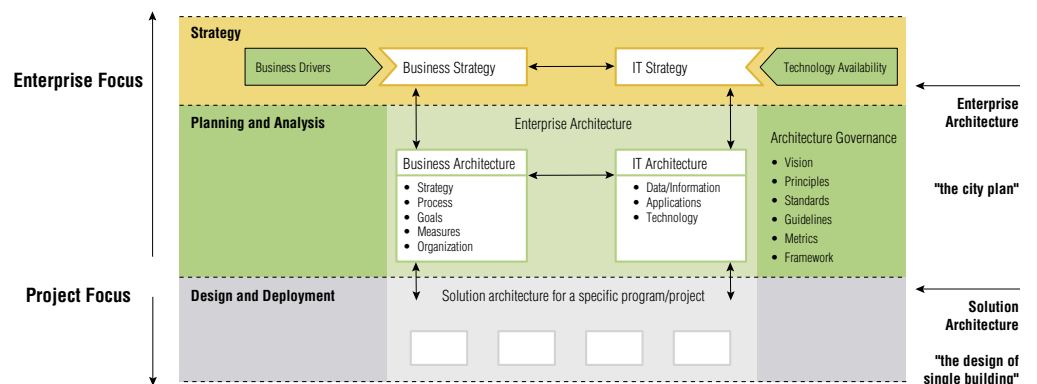


Figure 4: Enterprise architecture versus solution architecture: Relationship as described in the IBM Global Services EA method

The rising industry prominence of service-oriented architectures (SOAs) has a relationship to enterprise architecture concepts. Its basic tenet—to gain true efficiencies, IT organizations and partners must be organized, designed and packaged as services that support the automation of the business model—requires holistic enterprise architecture thinking that unifies design, testing and implementation with solid program management fundamentals. SOAs are providing value in practice today. For example, Web services leverage legacy systems providing “new” or composite applications.

Because business processes are intertwined with an organization’s IT infrastructure, the ability to respond quickly to market changes can be hampered. One of SOA’s biggest benefits—reuse—is the key to agility and efficient use of resources. Asset reuse can be “packaged” as patterns and

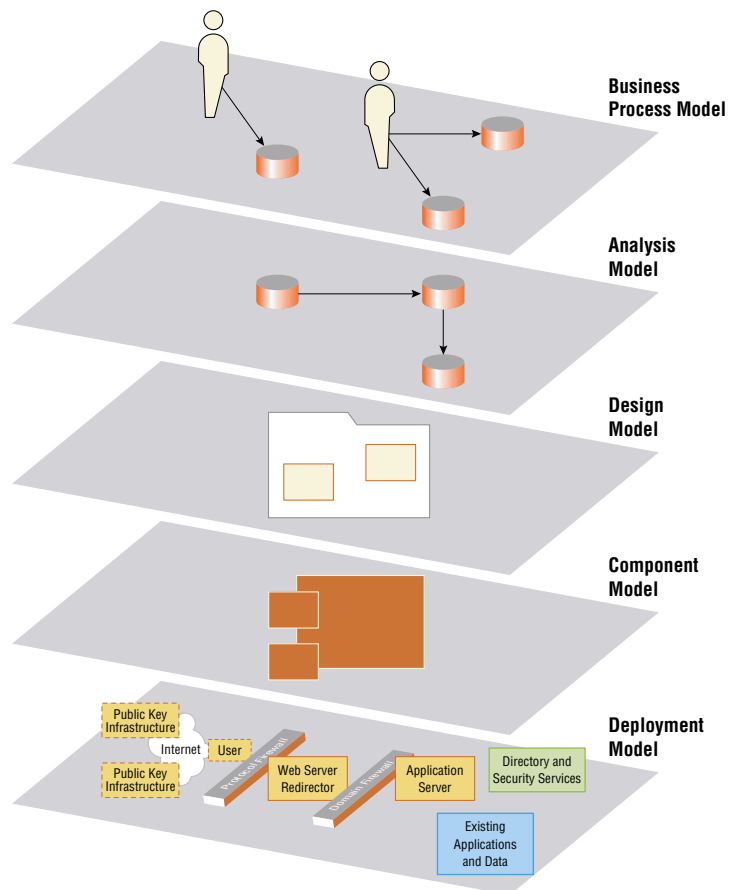


Figure 5: Models of the various layers must be created leveraging industry standards such as UML and traced from business process inception to deployment

components.<sup>13</sup> Patterns specify the business context and the general IT infrastructure to support the business. The business patterns are mapped to a component architecture, which realizes the business functions and is deployed on a run-time infrastructure. To enforce consistency and communication, models of the various layers must be created leveraging industry standards such as the Unified Modeling Language (UML) and traced from business process inception to deployment (see Figure 5).

How is this being realized in practice? A U.S. government agency case study provides insight. The President's Management Agenda for Expanded Electronic Government espouses "simplified delivery of services to citizens,"<sup>14</sup> and the Office of Management and Budget will not provide funding unless the agency submits the EA and business case in OMB 300 form. The U.S. Patent and Trademark Office chose to leverage the IBM Rational® 4+1 View Model,<sup>15</sup> because it puts citizens and the services they receive at the center of the EA.<sup>16</sup> In Figure 6, use-case diagrams specify services as use cases and citizens as actors. Use cases<sup>17</sup> define the way in which the system must perform its job for the user (the actor, or someone who interacts with the system).

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<sup>13</sup> For more information about managing EA artifacts and assets, see the IBM Rational presentation by Charles Stack, Flashline and Grant Larsen at the Enterprise Architect 2004 Summit, available at [http://www.ftponline.com/eaea/magazine/summer2004/online/slides/08\\_stack\\_larsen.ppt](http://www.ftponline.com/eaea/magazine/summer2004/online/slides/08_stack_larsen.ppt).

<sup>14</sup> For more information, see President George W. Bush's memo at <http://www.whitehouse.gov/news/releases/2002/07/20020710-6.html>, or refer to the Federal Enterprise Architecture Program Management Office Web site at <http://www.feapmo.gov> for additional federal EA guidelines.

<sup>15</sup> For more information, see "Architectural Blueprints—The '4+1' View Model of Software Architecture" by Philippe Krutchen at <http://www3.software.ibm.com/ibmdl/pub/software/rational/web/whitepapers/2003/Pbk4p1.pdf>.

<sup>16</sup> For more information, see "An SOA for the Federal Enterprise" by Rick Murphy in *Enterprise Architect Magazine*, Fall 2003.

<sup>17</sup> Use-case modeling is a core part of the Unified Modeling Language. For more information, see *The Unified Modeling Language User Guide* by Grady Booch, James Rumbaugh and Ivar Jacobson (published 1999).

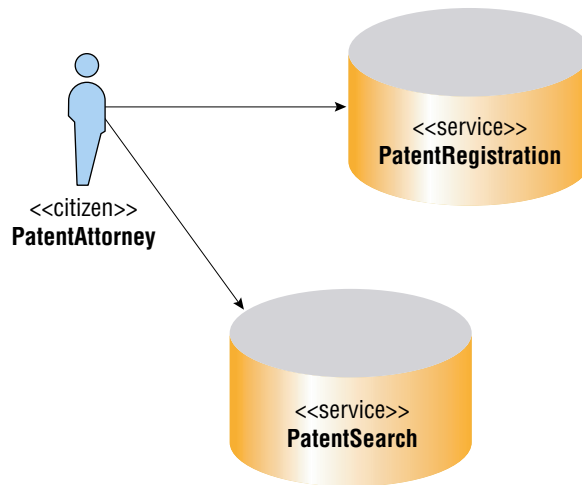


Figure 6: A patent attorney (the actor) searching a patent database and applying for a patent at the U.S. Patent and Trademark Office (the use case)

After a use-case diagram is created, a component diagram that associates roles and responsibilities of the Patent Registration and Patent Search use cases is modeled (see Figure 7).

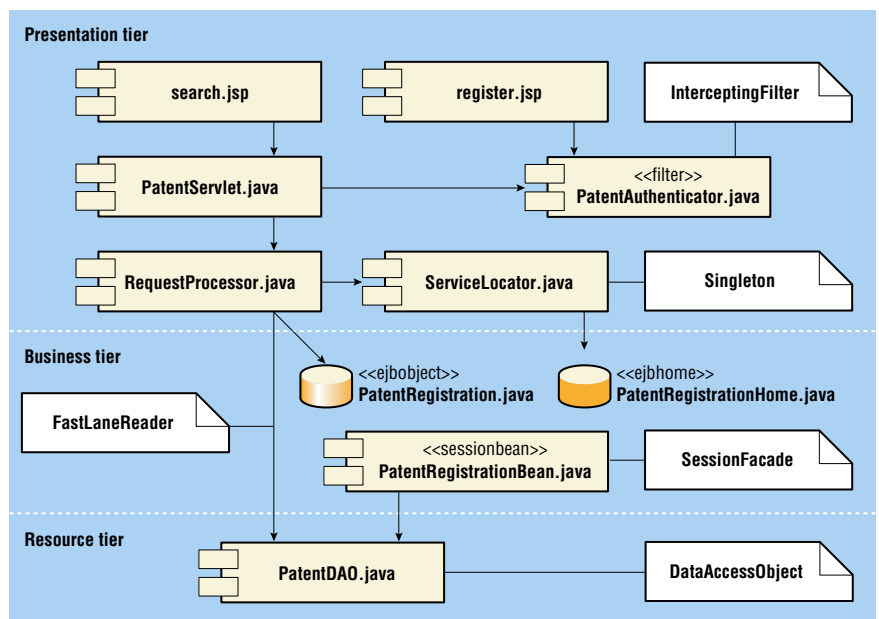


Figure 7: A U.S. Patent and Trademark Office service-oriented component diagram decomposes the application vertically down to its tiers and strategically aligns the agency EA as a citizen- and service-centered representation of its activities

What is significant about this approach is that by logically decomposing the application vertically down its tiers—not horizontally across the application—and by leveraging a use-case view, it strategically aligns an EA with the President’s Management Agenda and the Office of Management and Budget’s reference models. Citizens and the services they receive are at the center of the architecture.<sup>18</sup>

Charles O’Duell, the U.S. Commissioner of the Patent and Trademark Office in 1899, suggested that everything worth inventing had already been invented and his office should be closed. He would probably be dumbfounded not only by the rate of innovation today, but also by the pioneering status his agency plays in the use of SOAs for the federal enterprise.

#### **Making the case for EA: Bottom-line benefits**

While functional silos that lead and manage IT processes independently still exist (as shown earlier in Figure 1), these independent silos have cost businesses. Without the benefit of an architecture and plan, these independently conceived and developed solutions can lead to expensive, heavily reworked systems that do not fit well together. Codifying the business value of EA can take shape in many forms, ranging from the tangible to intangible benefits.

According to a *CIO Insight* article,<sup>19</sup> AXA Financial’s Senior Vice President religiously tracked his company’s architecture-related initiatives. And though this required AXA to spend about US\$35 million over the past 11 years on planning, development, testing and implementation, the company saved US\$55 million by avoiding the need to create unnecessary software. This highlights the linkage between EA and application development. In fact, true ROI of an EA effort is realized in the application and systems development activities of an organization. Executing the EA so that it does not merely become a documentation exercise yields tangible benefits, because these resulting “projects” are leveraging the EA’s guidance. Other benefits *can* include:

- *Cost avoidance or reduction (as the AXA example illustrates)*
- *Reduction in development and deployment cycles*

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<sup>18</sup> For more information, see “An SOA for the Federal Enterprise” by Rick Murphy in *Enterprise Architect Magazine*, Fall 2003.

<sup>19</sup> Gary A. Bolles. “This Old Infrastructure: Enterprise Architecture.” *CIO Insight*. January 2004. <http://www.cioinsight.com/article2/0,1397,1457001,00.asp>.

- *Reduction in support or maintenance costs*
- *Improvement in time-to-market for applications needed to grow the business*
- *Risk mitigation—by limiting the acquisition of incompatible architectures or systems*

Another example of measuring the value of enterprise architecture is the correlation with evaluating third-party products and services or the systems acquisition function. Imagine the costs involved when new applications do not meet requirements and are terminated. The following example illustrates how cost avoidance and more predictable systems acquisition can be achieved.

When the U.S. Capitol Police (USCP) Business Systems Modernization Project Office was mandated by the Office of Management and Budget to evaluate and reduce the costs of maintaining twenty-five stand-alone systems supporting mission-critical law enforcement and administrative functions, the organization developed a series of enterprise IT views to capture the multidimensional nature of the systems.<sup>20</sup> Like most government agencies, the USCP outsources application development and systems integration to a vendor.

Serving as the consulting enterprise architect for requirements and modeling, Frank Armour, president of Armour IT, helped the agency adopt IBM Rational software development tools to streamline the request for proposal (RFP) process. “RFP processes in the federal government are absolutely critical to successful deployment and implementation of systems that meet user needs and come in on time,” says Armour. By modeling project requirements in IBM Rational Rose<sup>®</sup> software, the USCP was able to clearly communicate needs to potential vendors and then accurately assess proposed solutions. “That helped us determine accurate costs and accurate schedules so that there were no surprises downstream.”

The intangible benefits of EA—encompassing the “softer” side of organizational dynamics—may be more challenging to measure but are no less valuable. These include:

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<sup>20</sup> For more information, see “IBM Rational Guides U.S. Capitol Police Modernization Efforts” in *Government Computer News*, November 2003, at [http://www.gcn.com/research\\_results/ea-enabling2.html](http://www.gcn.com/research_results/ea-enabling2.html). Additional content available in IBM Rational video testimonials by the USCP, available at <http://www-306.ibm.com/software/success/cssdb.nsf/CS/JENS-5WFT4Z?OpenDocument&Site=admin>.

- *A common vision and shared principles between the business and IT— known as alignment*
- *Consensus-driven creation of deliverables and processes/governance as an organization*
- *Enhanced communications and knowledge*
- *Common language and centralized information*

### **Making the EA operational: Architectural enforcement, governance and capital planning**

Because EA is a dynamic process that should reflect the current and desired state of the organization, it must be integrated with a governance or capital planning process to ensure IT is deployed in the most cost-effective manner. The convergence of life-cycle program management, architectural enforcement, governance and capital planning disciplines lies at the heart of the shift between strategy and implementation. Once the portfolio of systems, applications and assets that comprise the EA is “discovered” (as shown earlier in Figure 2), planning the implementation and migration activities involves enforcement of the architecture. Expediting integration of legacy and new systems and supporting the migration of legacy applications to the evolving EA can be realized more easily when compliance linkages and enforcement are clear. According to Gartner, companies that place a high value on linking EA with compliance report a 78 percent migration of their legacy applications to their technology architectures, compared to the 48 percent realized by lower-value counterparts. According to Forrester Research, these companies that focus on compliance are also achieving 93 percent compliance for new application architectures versus the 83 percent that their counterparts report.<sup>21</sup>

Governance is most effective when policies, processes and people are linked from a portfolio management perspective. According to Giga Information Group,<sup>22</sup> there are four primary approaches to governance:

1. Publish architecture documentation and simply expect adherence
2. Link IT purchasing to architecture standards and control purchasing for projects
3. Convene an architecture review board to approve projects for construction
4. Provide architecture consulting

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<sup>21</sup> M. Knox Research Note TG-21-9410. Gartner Group. “Structure EA to Win Business Compliance.” January 23, 2004.

<sup>22</sup> G. Leganza Planning Assumption RPA-062002-00007. Forrester Research. “Structures and Processes for Effective Enterprise Architectures.” June 12, 2002.

<b>Governance Approach</b>	<b>Benefits</b>	<b>Drawbacks</b>
<b>EA documentation</b>	<ul style="list-style-type: none"> <li>• Requires low resource commitment</li> </ul>	<ul style="list-style-type: none"> <li>• Can be ineffective</li> </ul>
<b>Purchasing control</b>	<ul style="list-style-type: none"> <li>• Makes standards adherence ironclad</li> <li>• Can be made to accommodate standard choices</li> </ul>	<ul style="list-style-type: none"> <li>• May be too rigid or authoritarian for some cultures</li> <li>• By itself, does not provide forum for discussing need for variations or choosing among options</li> </ul>
<b>Architecture review board</b>	<ul style="list-style-type: none"> <li>• Offers excellent vehicle for communicating technical project information to IT community</li> <li>• Allows reviews to significantly improve project quality</li> <li>• Can serve as early-warning system for controversial designs</li> </ul>	<ul style="list-style-type: none"> <li>• Can be seen as bureaucratic solution</li> <li>• Limits flexibility because end of design phase is too late to make substantive changes</li> <li>• May be ineffective if review boards identify problems but are pressured into approving them to accommodate schedules</li> </ul>
<b>Internal consulting</b>	<ul style="list-style-type: none"> <li>• Seen as proactive, not oppressive</li> <li>• Brings best practices to bear on new development</li> <li>• Can significantly speed up design time</li> </ul>	<ul style="list-style-type: none"> <li>• Can create bottlenecks, depending on consultant availability; a single project can lock up a consultant</li> <li>• May be insufficient if technical staff lacks needed "soft skills"</li> <li>• May not be feasible because of funding model</li> </ul>

Table 1: Benefits and drawbacks to architecture governance

Source: Forrester Research

Table 1 describes the primary benefits and drawbacks of architecture governance. The Forrester Research recommended approach for architecture governance is to use all four techniques at appropriate times within the system development life cycle. “As the architecture effort effectively consolidates the knowledge within the enterprise and establishes enterprise best practices, and as the major enterprise architecture processes exert influence over the technical decisions at the project level, risk is minimized by exposing each technology and design decision to the accumulated knowledge of the organization.”<sup>23</sup>



Regardless of the method used, architecture methodology, deliverables, governance and application or systems development processes should be aligned.

### **Conclusion**

Applying technology for business's sake is a seemingly obvious goal but one that can elude most sophisticated organizations. The number of technology choices and the inherent complexity of software-based systems versus the requirement to be "lean" and to cut overhead often results in short-term thinking or analysis paralysis. With the debate looming about whether IT matters to business<sup>24</sup>—which asserts that IT, now commoditized, has lost its strategic value—perhaps the typical under-resourced architecture function deserves a fresh look. Architecture's capability to harness and structure distinctive business process competencies and leverage them within and outside the traditional value net of an enterprise's domain is unmatched and compelling. Embracing an architecture-centric approach to understand, build, acquire, optimize and manage enterprise systems is the first step to unlocking the possibilities.

The following summary of software development implications should be considered in the context of enterprise architecture:

- *Iterative approaches work best that are supported by process guidance. One of EA's core disciplines is program management—do not overlook the fundamental requirements and structure needed to manage an EA program.*
- *EA is not just a modeling effort. Value is derived by making the architecture actionable and realized in the system capabilities that are built, acquired, integrated or extended.*
- *EAs are dynamic by design and therefore require institutionalizing best practices for change management.*
- *Aligning business process models with application models is critical.*
- *Develop and implement a reuse strategy. Maintenance and compliance costs can be reduced with properly classified, harvested and reused artifacts and assets.*

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<sup>23</sup> G. Leganza Planning Assumption RPA-062002-00007. Giga Information Group. "Structures and Processes for Effective Enterprise Architectures." June 12, 2002.

<sup>24</sup> For more information, see "IT Doesn't Matter" by Nicholas G. Carr's in the *Harvard Business Review*, 2003 (product number 3566).

- *Frameworks exist to provide structure to constraints, interdependencies and process flows, and they are suitable for adaptation. Regardless of the chosen framework, a use case-driven, architecture-centric and iterative approach to developing quality software will help focus results that meet the needs of different stakeholder “views” and result in the necessary artifacts.*
- *Standards such as UML exist to bridge the communication and complexity divide. Model-driven architecture approaches support such standards.*
- *Traceability of the EA—from inception through implementation—should be supported with an automated toolset.*
- *Communicate. An EA effort ultimately affects many people outside the CIO’s office, program management office (PMO) or architecture standards group. Line-of-business owners and others are also stakeholders. This is not just a technology endeavor; it is a strategic business function that requires “marketing” to constituents.*

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