

Why does Enterprise Architecture Matter?

A White Paper by:

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Executive Summary

Alignment between business and IT within an organization is a fundamental challenge facing all organizations today. This White Paper addresses the topic of why Enterprise Architecture matters to business today.

Topics addressed in this White Paper include:

- An introduction to Business Operations and Enterprise Architecture
- The need for Enterprise Architecture
- The business benefits of Enterprise Architecture

A business enterprise, whether in the private or public sector, grows from the vision of individuals to meet the requirements of others.

Introduction

This White Paper addresses why Enterprise Architecture¹ (EA) matters for businesses today and is organized as follows:

- The first section provides an easy-to-understand explanation of how businesses and organizations operate, and identifies in **bold** those terms that we identify as being key parts of an enterprise's architecture and that are further developed and modeled in TOGAF 9.
- The next section addresses the need for enterprise architecture.
- The final section provides a set of tables with example benefits, rationale, and potential Key Performance Indicators (KPIs) for use in any benefits realization process.

Business Operations and Enterprise Architecture

So what are businesses?

A business enterprise, whether in the private or public sector, grows from the vision of individuals to meet the requirements of others. As a business grows it often reaches the stage where it needs investment and may turn to stocks and shareholders to satisfy that need. The business is delivered through a hierarchy of **organizations** that form relationships, sometimes contractually, with suppliers and with one or more interested parties or partners.

Whether formally defined or not, the **vision** determines current business **goals** and the longer-term **strategy**. **Goals** are often broken down into shorter-term tactical **objectives**, owned by individual **actors** (i.e., employees or service providers), which collectively should contribute to realize the associated **goal**. **Goals** and **objectives** are defined, tracked, and monitored by defined **measures**, such as KPIs.

Inevitably, there are external market **drivers**, which have a direct impact on the **objectives** and **goals**. Over time, these external **drivers** can re-shape the original **vision** and business direction. The drivers can be external – e.g., the price or differentiating features of a competitor's service or product, or region-specific legislation – or internal – e.g., margin targets or the need to cut costs.

The business operates within specific external **constraints** that can prevent the organization from pursuing particular approaches to meet its **goals**; for example, a tightly-defined regulatory environment, or trade restrictions.

¹ Enterprise Architecture in the context of this White Paper is as documented in The Open Group Architecture Framework (TOGAF), Version 9, ISBN: 9-789087-532307, available from www.vanharen.net.

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To achieve greater efficiency and flexibility in its approach, an organization can decompose its functions into specific defined business services, such as customer contact management, or spare parts stock control.

One of the main routes for a business to become more effective at what it does, is to automate certain key business processes using Information Technology.

A business generates **products**, such as automobiles or consumer goods, and provides business **services**, such as payroll services or plant maintenance services, for the market, which are manufactured or delivered to appropriate standards or guidelines.

A business is an **organization** that contracts **actors** (its employees or service providers) to perform various **functions** usually with other **actors**. **Actors** are assigned to defined **roles** in the organization that have defined responsibilities and skills; for example, financial accountants with book-keeping skills. The business **organization's actors** are typically organized around the business **functions**, and third-party suppliers support these **functions**. In this context, the operation of a **function** is described by a set of **processes**. **Organization units**, and their respective **actors**, are based across many geographic **locations**.

The above concepts form the strategic context within which the business operates, and are a significant proportion of the architecture of a business.

Although **functions** are also appropriate to the business architecture, the business's **functions** are realized through **actors** performing one or more **processes**. **Processes** show the flow between **functions** or the operation of a **function**. A **process** can be decomposed into triggered or resulting **events**, the business outputs or **product** of the process, **controls** or decision-making steps that are carried out, and the **functions** required to execute the process.

To achieve greater efficiency and flexibility in its approach, an organization can decompose its functions into specific defined business services, such as customer contact management, or spare parts stock control. Specific **business services** are defined where the function can be defined by an explicit interface and where it needs explicit control and governance. The degree of granularity of the service is determined by the **objectives** and focus of the organization.

In order to ensure that interactions between service providers and service consumers agree on the expected outcome, a **service contract** is formally defined. This will ensure that the service provides agreed **qualities** or levels of service.

So how can businesses become more effective?

One of the main routes for a business to become more effective at what it does is to automate certain key business **processes** using Information Technology. Not all parts of an organization are worth automating; not all automation that is feasible is necessarily desirable. The key for any business is to ensure the right alignment between its business architecture and automation architecture so that it achieves the maximum return on its investment.

An organization may choose to automate an existing business service using information systems; in this case, that **business service** becomes dependent

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The need for integration depends on an organization's operating model, which shows the business requirement for integration of business processes (sharing data) across business areas.

If a business chooses to automate a business service as an information systems service, it will need to enable the service through a technical platform service.

on one or more units of application functionality, referred to as **information system services**.

Business services provide or consume information in order to deliver their outcome. Information can be broken down into specific **logical information components**, such as product configurations, or customer details. Information components can be broken down further into individual **data entities**, such as customer and contact.

The **physical information components** are represented as data store(s) that relate to other data store(s), which reside in computerized data repositories, populated by actors, each performing specific roles.

Moving into the specific applications architecture, **information systems services** are supported by a portfolio of **application components** that represent deployed and functioning IT systems. In order to manage the complexity of technology, **application components** are often encapsulated as **logical application components** that provide logical sets of features – for example, the stock control system – or physically deployed **physical application components**. **Physical application components** may be very coarse-grained applications, such as a deployed instance of an ERP system, through to deployed instances of granular (web-oriented) enterprise services, which reside on computers.

Application components interface with other application components, maintain data stores of information components, encapsulate data entities, are used at locations, are used by service business organization units and actors, and are available over a communications network.

The need for integration depends on an organization's operating model, which shows the business requirement for integration of business processes (sharing data) across business areas. [[Ref. 1](#)]

How do the automated systems relate to each other?

Technically, the **application components** that make up the service are delivered using **technology components**, or acquired IT products that run on platforms built from computers and networks.

Whereas technology components are typically generic and acquired from the market, application components are configured and deployed for a particular organization to directly automate business functions.

The complex array of technology components available lends itself to a classification into **logical technology components**, or classes; for example, databases, operating systems, and networks. These are then realized by the most appropriate **physical technology components** for the job in hand, such as the SAP Netweaver application platforms, Oracle databases, or UNIX operating systems. All of these are located at specific geographical **locations** (such as warehouses, data centers, office premises, etc.).

Why does Enterprise Architecture Matter?

In order to ensure that the organization's goals, objectives, measures, and requirements are met, they can be distilled into qualitative statements of business need or principles, which can then be used to govern the organization's transformation.

Ultimately, the benefits of enterprise architecture derive from the better planning, earlier visibility, and more informed designs that result when it is introduced.

If a business chooses to automate a **business service** as an **information systems service**, it will need to enable the service through a technical **platform service**. **Platform services** will include, for example, the provision of centralized backup and recovery services.

How can businesses align to the right automated capabilities?

Given the rate of change in an organization, and the speed of technological advancement, it is all too easy for an organization to spend significant time and effort on automating the wrong function, or using the wrong technology.

An organization's vision, its defined goals, objectives, and measures will contain explicit and implicit **requirements** that define the business needs.

These requirements will often be based upon **gaps** that exist between where the organization currently is, and where it wants to be. Once defined, these **gaps** can be filled by defining a set of dependent **work packages**, such as programs or projects, whose aim is to deliver business transformation.

In order to ensure that the organization's goals, objectives, measures, and requirements are met, they can be distilled into qualitative statements of business need or **principles**, which can then be used to govern the organization's transformation. In order for the transformation to be formally planned and effectively designed and governed, a set of architecture models or **architecture building blocks** can be used to describe aspects of the organization.

The Need for Enterprise Architecture

Supporters of enterprise architecture who believe in the value of it, often do so on the general grounds that it is simply the smart thing to do.

In a similar way to disciplines such as project management, enterprise architecture is now seen as common sense; *why would you not adopt it as a core discipline in your organization?*

However, as in any new initiative, there will be time, cost, and effort needed to design, initiate, and embed it within an organization.

It is important, therefore, to provide a more comprehensive description of the benefits of enterprise architecture, but also the measures to use to overcome the generalities and convince people of its merit.

As ever, there are different stakeholders to consider – business users and IT practitioners – and the values of enterprise architecture must be considered and presented in different ways to gain support from both groups if the introduction of enterprise architecture is to succeed. [Ref. 2]

Why does Enterprise Architecture Matter?

An effective enterprise architecture is critical to business survival and success, and is the indispensable means to achieving competitive advantage through IT.

Business users want a fast response from IT; they want IT aligned to its business strategy, and a dependable, stable environment, in order to improve business performance.

IT practitioners want to make their own job easier and faster, and more reliable. This means reducing complexity and cost.

Ultimately, the benefits of enterprise architecture derive from the better planning, earlier visibility, and more informed designs that result when it is introduced.

There are two key reasons why you need enterprise architecture, as follows:

1: Critical to business survival and success

An effective enterprise architecture is critical to business survival and success, and is the indispensable means to achieving competitive advantage through IT. Today's CEOs know that the effective management and exploitation of information through IT is the key to business success. An enterprise architecture addresses this need, by providing a strategic context for the evolution of the IT system in response to the constantly changing needs of the business environment.

2: Enables managed innovation within the enterprise

An enterprise architecture enables you to achieve the right balance between IT efficiency and business innovation. It enables managed innovation within the enterprise. Individual business units can innovate safely in their pursuit of competitive advantage. At the same time, the needs of the organization for an integrated IT strategy are assured, permitting the closest possible synergy across the extended enterprise.

Details of the specific benefits of enterprise architecture are provided in the following section.

The Business Benefits of Enterprise Architecture

The specific benefits of enterprise architecture can be categorized into two key groups:

- Business Benefits to which enterprise architecture contributes
- IT Benefits to which enterprise architecture contributes

The tables that follow provide example benefits, rationale, and potential Key Performance Indicators (KPIs) for use in any benefits realization process.

Why does Enterprise Architecture Matter?

Stakeholder	Benefit Type	Benefit	Rationale	KPI
Business	Helps achieve business strategy	<p>Without an understanding of business, applications, and technology architecture, a business doesn't know what it is going to take to align and to implement IT to execute its business strategy. In essence, it doesn't know what it has or doesn't have.</p> <p>This ensures when planning programs and projects that effort is targeted onto those aspects that really matter, and this adds to the strengths of the enterprise.</p> <p>It means that IT investment is targeted at the key business goals and performance.</p> <p>It ensures that the business can be early adopters of new innovations and is not held back by IT.</p>	<p>This is the ability of IT to leverage an organization's capability by a direct focus through understanding the strategy and intent. If everyone sees the same future, more can be done to achieve it.</p> <p>It is difficult to estimate this value in monetary terms, but it can be appreciated regardless.</p> <p>Spin-off benefits include eliminating changes required by heading in the wrong initial direction.</p> <p>Without enterprise architecture, organizations frequently approve projects that, from all outward appearance, are not associated with any business strategy.</p> <p>Organizational clout, supposedly self-funding business cases, and compartmentalized decision processes drive these behaviors.</p> <p>If you cannot easily identify the strategy supporting the funding decision, then there probably isn't one.</p>	<p>Alignment of investment with business strategy (This can be monitored qualitatively via opinion survey targeted at the CxO-level executives.)</p> <p>Number of projects approved that are in compliance/not in compliance with business strategy</p>

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Stakeholder	Benefit Type	Benefit	Rationale	KPI
Business	Faster time-to-market of new innovations and capabilities	<p>If IT can introduce new technologies and functionalities faster to key business areas, this ensures that the organization can respond faster to competitive pressures, and deploy differentiating capabilities faster. These areas are most likely to be spotted when business and IT staff collaborate closely in the enterprise architecture process. The outcome is that technology is ready when it is needed, transitions are smoother, and unnecessary change is minimized.</p>	<p>Enterprise architecture gives users faster delivery of new functionality and modifications, and easier access to higher quality, more consistent, and more reliable information. Well-architected systems can more quickly link with external business partners. A common symptom in organizations without a robust enterprise architecture is project overruns. When new, important strategic projects are created, without a comprehensive understanding of the current state, the desired state, or the interrelationships of processes, people, and technology affected by that project, unforeseen problems will occur resulting in project overruns. If the architecture of the organization is known and familiar, the relative time to implement new systems or capabilities is reduced. Dependent opportunities to upgrade items or refresh the estate can be identified early, and their impact on projects reduced.</p>	<p>New business capabilities or features or service implemented faster Number of project overspends/overruns >x months or x% of budget</p>

Why does Enterprise Architecture Matter?

Stakeholder	Benefit Type	Benefit	Rationale	KPI
Business	More consistent business processes and information across business units	<p>Enterprise architecture can unlock the power of information, unifying information silos that inhibit business processes.</p> <p>It identifies the processes, applications, and data that need to be consistent if consistent business decisions are to be made.</p> <p>Enterprise architecture identifies opportunities for integration and re-use that prevents the development of inconsistent processes and information.</p>	<p>If an organization does not have visibility of its business process, information, and how this relates to IT infrastructure, information silos and inconsistent systems will result.</p> <p>This symptom has been exacerbated in recent years by mergers and acquisitions. These have added to the complexity of an organization's IT estate resulting in duplicate processes.</p> <p>Especially important to users is the capability of integrating the information among applications and across data warehouses and data marts. By understanding an organization's data architecture, it can develop a standard data dictionary, and develop metadata standards to minimize data inconsistency.</p>	<p>Relative ease-of-access to information (This can be monitored qualitatively via opinion survey targeted at the specific user groups.)</p> <p>Response time to business demands (This can be monitored qualitatively via opinion survey targeted at the specific user groups.)</p>
Business	More reliability and security, and less risk	<p>Enterprise architecture provides clear traceability between business processes, data, user roles, applications, and infrastructure.</p> <p>A reliable architecture model aids consistency and manageability, and an organization has a much better chance of implementing corporate standards and planning and managing to those standards on an ongoing basis.</p>	<p>When changes occur that cause unplanned downtime or other problems, and no one understands who did it, how it happened, or why it happened, then the odds are high that it will happen again.</p> <p>The IT environment itself is in a constant state of change. A change to two or three cycles in the past may not have an impact until the worst possible moment sometime in the future, cascading across the enterprise.</p> <p>If an organization does not have a clear model of its business, applications, and technology architecture, and the dependencies and inter-relatedness, and installed processes and standards to manage that environment, then there will be no traceability or accountability.</p>	<p>Rate of disruptions, availability of systems, number of untraced security incidents</p>

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Stakeholder	Benefit Type	Benefit	Rationale	KPI
Business/IT	Better traceability of IT costs	<p>Enterprise architecture provides greater understanding of the inter-related nature of business, applications, and infrastructure assets. This enables greater understanding of how the architecture is structured, and enables more accurate cross-charging or service billing.</p> <p>It enables high-cost areas of the IT estate to be identified more accurately, and a fairer cost model to be developed.</p>	<p>Most organizations can identify the individual cost of an asset. However, many cannot understand the cost of an asset as it relates within the organization with all its inter-relatedness and interdependencies.</p> <p>IT departments can typically identify that a server costs so much, but they can't identify what organizations that server supports, what the maintenances costs are, or what critical business applications are using that server.</p> <p>In many cases, organizations don't have a mechanism to understand holistically all the costs associated with those related assets.</p>	% of IT OPEX that can be allocated to specific applications or business units
IT	Lower IT costs – design, buy, operate, support, change	<p>A clear understanding of as-is and to-be architecture, and the migration plan of how to progress from one to the other, will enable the implementation of duplicate systems to be avoided, and acquisition integration to be accomplished effectively.</p> <p>By understanding what it has, what it needs, and what is redundant, an organization can tailor its investment to the areas of most need, and identify re-use more frequently.</p>	<p>If development standards and guidelines are in place that define the boundaries of what it is possible for the application developer or infrastructure builder to do, and in effect describe how to behave when creating new capabilities, this can increase the efficiency of development projects whilst also enabling the solution designer to have considerable freedom of choice in creating a solution where appropriate.</p>	<p>Cutover costs for upgrades/conversions</p> <p>Support cost (reduced due to less asset diversity)</p> <p>Monitoring/tracking-level (costs reduced)</p>

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IT	Faster design and development	The development of enterprise architecture enables earlier preparation for new technologies, smarter timing of projects, and the re-use of development best practices, standard designs, and components.	The re-use of existing services, components, and infrastructure, and the application of standards, can reduce development time and reduce support requirements.	Level of re-use (leveraging costs, implement faster, better)
IT	Less complexity	Enterprise architecture is an ideal tool to identify duplicate and overlapping processes, services, data hardware, and software. Standardization drives IT procurement efficiencies due to economies of scale. Reduced skills maintenance, training, fewer support staff, and simpler upgrades also result. To solve duplication and overlap, an organization needs a comprehensive view of its applications, software, and infrastructure and their inter-relatedness.	CIOs should regularly monitor the size and complexity of their IT infrastructure and application portfolios. It is common to see organizations that have no defined management mechanism to identify an “end of life” technology or optimize application portfolios. The increasing complexity adds overhead costs, while also increasing risk to project delivery schedules. Savings estimates range from 10 to 30% of infrastructure costs, which are typically 50% of IT operating budgets. A 2001 Meta Group survey reported a 30% average reduction in IT total cost of ownership for companies with mature IT architectures and standards. Fewer products, as opposed to many, means higher unit volumes and better ability to support the products and plan timely transitions that respond both to the business need and the technology progress rate. Familiarity also provides experience on performance, risk, and maintenance. Sound choices enable an ability to monitor and track the system in ways that help deliver better client service.	Product diversity (more of fewer products; number of products per class in place, guidelines, new systems) Number of consolidated multiple redundant systems Number of avoided purchases (e.g., another enterprise RDBMS) Technical infrastructure skills diversity

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IT	Less IT risk	<p>Developing a to-be architecture and a managed migration plan will mean that the IT function will be prepared to deliver the new capabilities in a timely manner – generally, faster than the competition.</p> <p>The IT effort will be aligned with the strategy and unexpected surprises and demands will be avoided. This will enable efficient transitions to new capabilities.</p> <p>Capacity planning and monitoring improves as system retirements and upgrades can be planned in advance.</p>	<p>A clear two to three-year plan for the enterprise is a typical product of enterprise architecture. Using this, the organization can forecast the required budget, make realistic commitments, and plan in good time for IT changes.</p> <p>An organization without a strategic plan is often consumed day-to-day with the next “emergency”. While some may say: “What’s wrong with that? Everyone is focused on what matters.”, the situation is not healthy for IT or for the business.</p> <p>With focus on the short term, and without adequate time to plan, each new solution is at risk for becoming another silo. Increasingly, more time is spent trying to make each new solution “fit in” than on the solution itself.</p> <p>Capacity planning becomes very difficult in such environments, which in turn causes further unplanned capacity and system upgrades. This causes further project overruns.</p>	<p>Rate of urgent infrastructure projects (reactive)</p> <p>Downtime/availability</p> <p>Occurrence of short-lived products (more stable)</p> <p>Number of projects in compliance, not in compliance, returned for modifications, proceeded without change, requested waiver(s), waivers granted/rejected</p> <p>% of projects accepted into service delivery without issue</p> <p>Cost/time <i>versus</i> original budget adjusted by % of original requirements/% high severity defects</p>

References

Ref. 1: Enterprise Architecture As Strategy: Creating a Foundation for Business Execution by David Robertson, Jeanne Ross, & Peter Weill; Harvard Business School Press (2006).

Ref. 2: Can the Value of Enterprise Architecture Be Measured? Proceedings of Gartner Symposium/ITxpo (2006).

About the Author

Simon Townson is an Enterprise Architect with SAP. He has over 16 years' experience in the IT industry. Prior to joining SAP, Simon was head of the Architecture team at Atos Consulting (UK), and he has also worked for a variety of companies and public sector departments developing their enterprise architecture. For the past six years, he has been a strategic IT management consultant advising at CxO level, working on all elements of IT Governance, IT Strategy, Enterprise, Applications, and Technical Architectures. Simon is one of the main contributors to the new Version 2 of the SAP Enterprise Architecture Framework, and is an accredited practitioner of The Open Group Architecture Framework (TOGAF).

About The Open Group

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