Enterprise Architecture: A Governance Framework

Part I: Embedding Architecture into the Organization

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Introduction

Enterprise Architecture, the holistic view of an enterprise's processes, information and information technology assets as a vehicle for aligning business and IT in a structured and therefore more efficient and sustainable way, has attracted significant attention over the last two to three years.

Our experience and research shows that enterprise architecture hardly ever fails because of inadequate content. The challenges usually arise around how to link the enterprise architecture efforts into the overall enterprise processes, and how to leverage them as assets used regularly by a variety of stakeholders.

This paper is the first of two parts. Part I describes how to embed an enterprise architecture function into an organisation effectively. After an overview of Infosys' perspective on the subject, it introduces the governance dimensions of leadership, organisation and investment governance. For each dimension, practices which have proven effective in the past are described.

Part II will focus on how to operationalize enterprise architecture, using the dimensions of policies and principles, processes, measurement and tool enablement.

September 2005

Enterprise Architecture – An Infosys Perspective

Enterprise Architecture (EA) provides the tight cohesion and loose coupling between the Business and IT strategies. It is the "glue" that allows both Business and IT strategy to enable and drive each other. Therefore, an effective enterprise architecture is one of the key means to achieving competitive advantage through Information Technology.
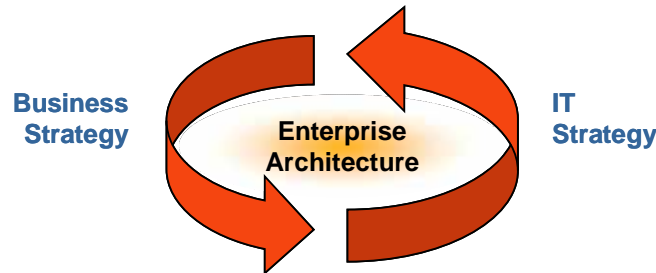

Figure 1 - Enterprise Architecture – "The Glue"   *Source: Infosys Technologies Ltd.*

Today's CEOs know that the effective management and exploitation of information assets through IT is a key factor to business success. A rapidly changing technology and business landscape demands innovation and agility. Having a technology architecture that supports the IT Strategy and provides the flexibility to achieve the right balance between IT efficiency and business innovation is a keystone to business adaptability and growth.

An Enterprise Architecture defines the components or building blocks that make up the overall enterprise system, "their interrelationships, and the principles and guidelines governing their design and evolution".[1] This systemic view of the enterprise is not limited to IT, but also comprises business processes and their underlying information architecture. It relates them and thus enables the organization to manage IT investment in a way that meets the needs of the business.

Establishing EA artifacts and processes can yield compelling benefits that clearly justify the effort. A properly executed EA can provide various advantages:

- Business Benefits
    - Agility of Enterprise
    - Product Time to Market
    - Flexible sourcing of value chain components
    - Improved and consistent information exchange
    - Risk reduction

- Financial Benefits
    - Alignment of IT business case to value of strategic initiatives

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[1] TOGAF Version 8.1, Frequently Asked Questions – „What is architecture? "

- o Reuse
- o Time Savings
- o Lower support cost
- o Lower acquisition cost
- o Technical Adaptability
- • Other Corporate Benefits
  - o Increased flexibility of staffing
  - o Scale of skill pools

These benefits are observable and perceivable by the architecture's stakeholders, as proven by industry research:

Benefits Resulting From Technical Architecture

Benefit	Percentage
Improved ability to share data	~75
Improved ability to share functional components	~62
Lower development costs	~40
Reduced time to market	~36

(Percentage of respondents giving a rating of 6 or 7 on a 7-point scale)

Source: Structure Architecture to Win Business Buy-In / Compliance, Mary Knox, Gartner, 23 January 2004
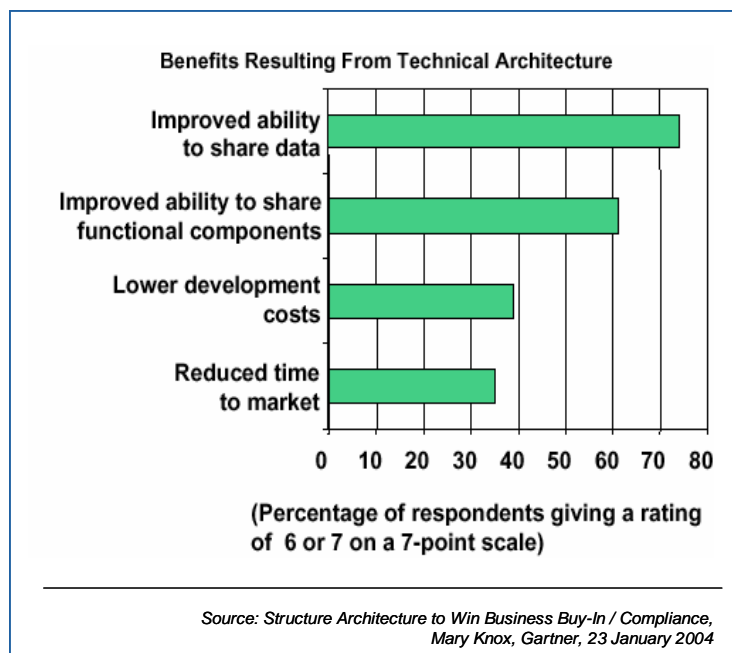
Figure 2 - Benefits from Technical Architecture   *Source: Gartner Research*

Reaping these benefits requires a successful, effective enterprise architecture programme. Infosys believes that such a programme consists of two critical constituents: the *Enterprise Architecture Content* and the *Enterprise Architecture Governance Framework*.

The *Enterprise Architecture Content Framework* is the methodology for defining the various models that will describe the Enterprise Architecture. This usually includes the Enterprise Architecture artifact identification and definition, processes, standards and guidelines for artifact development and the associated modeling notations that enable common understanding and collaboration.

The major schools of thought are not fundamentally different from each other. At the very core, they attempt to define a set of models along four major dimensions – business, application,

information, technology architectures that represent the enterprise. Selection and customization of a framework should be driven by the stakeholder needs identified earlier.
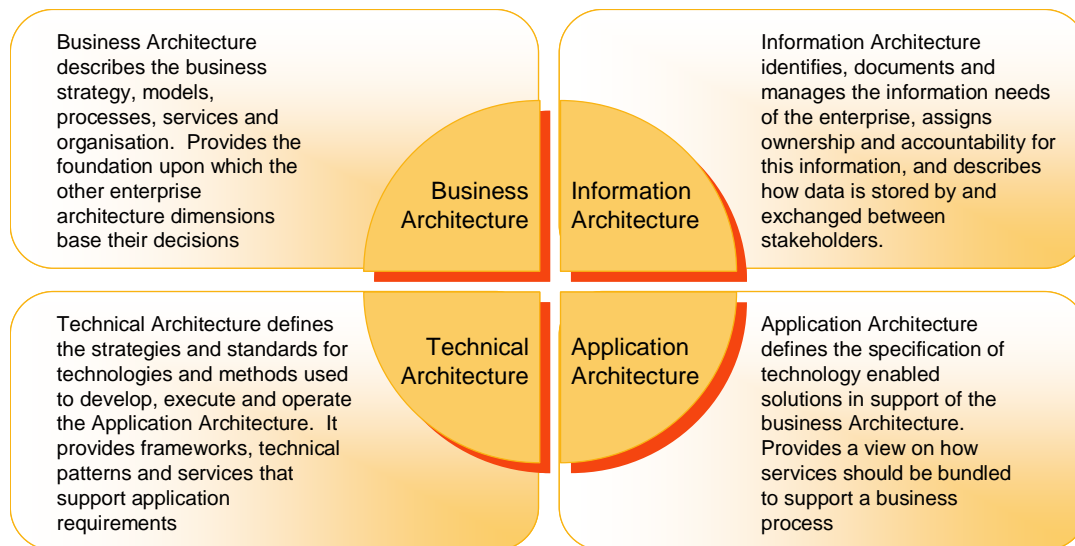

Business Architecture describes the business strategy, models, processes, services and organisation. Provides the foundation upon which the other enterprise architecture dimensions base their decisions

Business Architecture

Information Architecture

Information Architecture identifies, documents and manages the information needs of the enterprise, assigns ownership and accountability for this information, and describes how data is stored by and exchanged between stakeholders.

Technical Architecture defines the strategies and standards for technologies and methods used to develop, execute and operate the Application Architecture. It provides frameworks, technical patterns and services that support application requirements

Technical Architecture

Application Architecture

Application Architecture defines the specification of technology enabled solutions in support of the business Architecture. Provides a view on how services should be bundled to support a business process

Figure 3 - Disciplines of Enterprise Architecture   *Source: Infosys Technologies Ltd.*

We found that many organisations are struggling with implementing the content framework. An important contributing factor is that most of these frameworks/ methodologies require significant expertise and effort to understand, implement, rollout and maintain. Due to the "heavy" nature of these frameworks, organizations usually find it difficult to define the business justification for instituting an Enterprise Architecture program.

Infosys is taking an approach to this challenge which is focused around the stakeholders of EA. Their needs, painpoints and expectations – the way they are applying EA – are the important driver to tailoring a framework, allowing delivery of value not only with less effort, but also aligned to the shorter time frames of an increasingly dynamic enterprise landscape.

Once the EA Content Framework is identified and customized for the context of the enterprise, it is critical to define an *Enterprise Architecture Governance* that ensures the successful development, integration and management of this content in the context of the organization. Infosys has developed a proprietary governance framework based on experience and industry best practices.

We believe that while developing the disciplines of Enterprise Architecture is a threshold achievement for a successful IT organization, well functioning Enterprise Architecture Governance, delivered by an appropriate framework, will enable IT to become a key differentiator in creating an agile, adoptable enterprise.

Enterprise Architecture Governance Framework

Enterprise architecture often is considered to be of limited impact on the day to day life of an IT function. "Shelf ware production" and "ivory tower exercises" are common allegations against teams which are putting significant effort – and in most cases an excellent skill set – onto the challenge of understanding, planning and controlling the architecture of a large organisational unit. What is going wrong?

More often than in the quality of architectural deliverables, the issues are rooted in aspects like inefficient communication of architectural content, in a lack of influence due to inappropriate organisational positioning, or in a lack of involvement in the decision making processes of strategic projects. It often is difficult to prove an influence of architecture, as no metrics are in place to measure its impact. All these samples refer to deficiencies which are less in the architectural content itself than in what we call *governance.*

Architecture governance is the set of mechanisms through which architecture is enacted in the enterprise. It consists of more than processes only – it is an integrated set of dimensions providing the mechanism for defining, implementing, managing and measuring the effectiveness of the Enterprise Architectural disciplines.

Architecture Governance taps into an enterprise's technology and business processes to provide the direction and control, ensuring that the expected value of its investment in IT is realised.

It is also responsible for taking up external influences – global business drivers, industry trends, and the corporate strategy, but also technology trends and opportunities – and identify how the enterprise architecture needs to adopt in order to accommodate them. To close the gaps between today's state and tomorrow's needs, alignment projects are scoped and handed over to the enterprise program management office (PMO) for implementation.
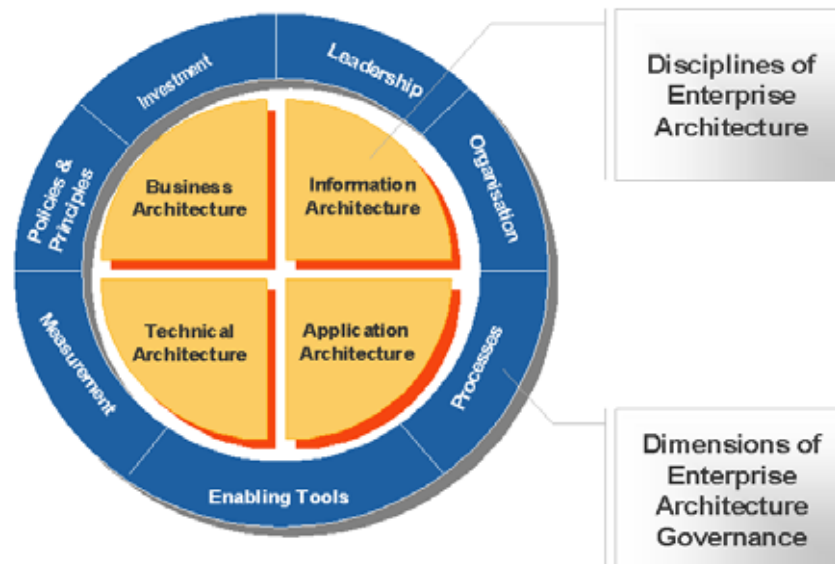

Figure 4 - Enterprise Architecture Governance Framework   *Source: Infosys Technologies Ltd.*

Based on our experience from various projects, we assume seven dimensions of enterprise architecture governance to be critical constituents of a successful enterprise architecture effort:

- Leadership
- Organisation
- Investment
- Processes
- Policies and Principles
- Measurements
- Enabling Tools

These dimensions spawn the space of effective governance. We believe that each of them is indispensable to allow an architecture effort achieve its objectives. The following sections describe the first three dimensions of Leadership, Organisation and Investment that are critical for initially embedding the Enterprise Architecture function. The remaining dimensions will be described in part 2 of the paper.

Leadership

The leadership dimension is defined by the vision, the mandate and the sponsorship of an Enterprise Architecture program.

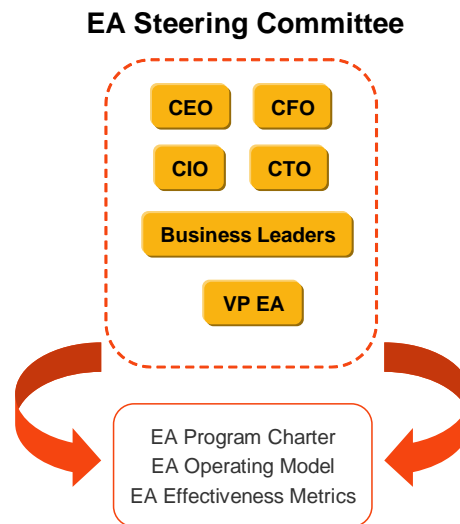**EA Steering Committee**

Figure 5 - Sample Leadership Structure   *Source: Infosys Technologies Ltd.*

Establishing a defined enterprise architecture is an objective which not only promises vast benefits, but which is sure to induce some short-term pain – ending quick-and-dirty ad-hoc solutions, enforcing some discipline on – even strategic – projects, taking effort to understand and adjust to guidelines. Aligning a large number of stakeholders to buy into such effort requires to

create a strong and attractive idea of the goal, an almost tangible picture of the future and its benefits.

Establishing such a shared *vision* is the major challenge of leading an architecture initiative. Establishing it in a core group of strong influencers within the organisation is of highest importance for creating buy-in with other stakeholders which still stand aside.

Usually, such a vision emanates from the CIO or a person in his immediate environment. It is required to transfer its ownership to an architecture steering committee which encompasses a group of key decision makers in the company. On its behalf, the Chief Architect evangelizes and further develops it.

On the other side, the architecture team needs to be empowered to implement the vision. Its scope of responsibility is defined by the *mandate* given to it. In assigning the task, the organisation – represented by the CIO – transfers authority to the team.

The architecture team will sometimes require help to open doors to senior business executives. It needs buy-in from stakeholders throughout the enterprise, at various hierarchical levels and across functional groups. As it is impossible for an EA group to identify and address the concerns of every individual across business groups and geographies, it depends on the enterprise's organisational structure to identify, reach and influence its target group.

Executive sponsorship provides access to an audience with the decision making power to influence implementation of architectural guidelines. Making this selected group understand and influence the EA roadmap definition will not only bring in the organisation's experience, but also foster adoption.

We (and others) have found the following practices of establishing leadership for an EA function to be effective:

- Define Architecture Steering committee involving all senior business and technology leaders to ensure senior leadership sponsorship, involvement of all business units and a process for arbitration
- Identify a Chief Architect who understands and identifies with business, but is yet technology savvy
- Management support depends on buy-in from 1) the most powerful players or 2) a base majority in each of three constituent groups:
    - Senior line-of-business (LOB) leaders
    - Middle management
    - Distributed technical staff and IT "power users"
- These groups have different concerns and motivations that must be understood and addressed[2]

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[2] Obtaining Management Buy-In for Enterprise Architecture, Gartner research note COM-17-0026

- Accept that there are groups and individuals with conflicting interests. Decide how to handle them. There are battles which do not have to be fought.

Organization

The organization of enterprise architecture defines roles and responsibilities of individuals and internal organizations involved in executing the architecture definition, implementation and governance processes.

Enterprise Architecture (EA) responsibilities cover a broad range of business, technical and managerial activities like

- Understanding business strategies
- Envisioning, leading and guiding the development of the enterprise architecture
- Technology incubation, product evaluation and recommendation
- Management of Exceptions

This requires a sizeable number of skills, represented by individuals and organizational units.

An established practice is to structure the architecture team into

- a core EA team, responsible for architecture creation and governance
- an extended EA team from the lines of business, bringing in specific needs and evangelizing the architecture in the development groups
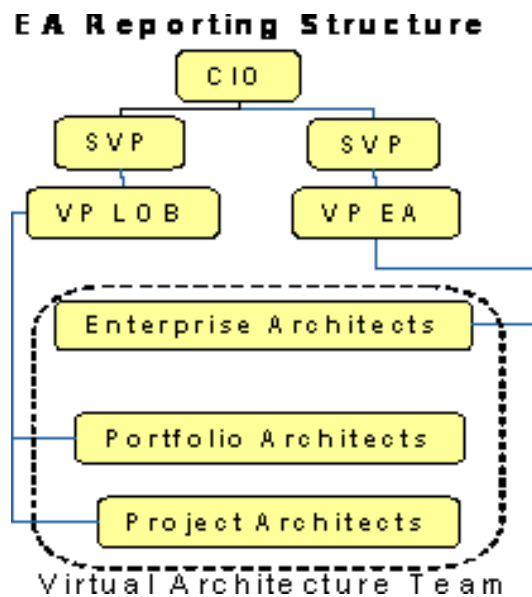- Vendor partners

Figure 6 - Sample EA Reporting Structure   *Source: Infosys Technologies Ltd.*

A well defined RACI matrix will enable EA to conduct itself in a structured and organized manner.

Process Name	Responsible	Accountable	Consulted	Informed
Architecture Planning Process	VP EA	SVP EA	SVP LOB	All
Architecture and design review processes	Project Architects	Portfolio Architects	Portfolio Architect	Enterprise Architects
Exception management process	Portfolio Architects	Portfolio Architects	Enterprise Architects	Enterprise Architects
Component reuse processes	Portfolio Architects	Enterprise Architects	Portfolio Architects	All
IT investment review process	VP EA	CIO	Portfolio Architects	All

Table 1 - Sample RACI matrix for EA organisation   *Source: Infosys Technologies Ltd.*

When structuring an Enterprise Architecture team, experience suggests to consider the following practices:

- Enterprise Architecture team members require adequate business and behavioural skills in addition to technical competencies.

- Regular involvement of extended architecture teams out of LOBs brings in bottom-up feedback on architecture standards, guidelines and processes and prevent "Ivory Tower" syndrome.

- The extended architecture team is a highly efficient leaver both to build buy-in as well as to ensure that architecture goals are met. Virtual team in architecture can contribute well in content definition, ratification and dissemination.

- Enterprise Architecture teams should not get involved in development activity unless it is in the Technical Architecture domain with Proof-Of-Concepts and Product Evaluation.

- Vendor partners can be used for executing select architecture processes. These include architecture content definition, architecture reviews and architecture documentation. Architecture maturity assessments can drive improvement of governance.

Investment

The investment dimension defines investment and funding models that drive the adoption and proliferation of architecture principles and design practices.

The Enterprise Architecture team needs separate investment for its activities, including:

- Definition and evolution of the enterprise architecture disciplines
- Enterprise wide strategic IT initiatives such as Enterprise Integration Architecture, Enterprise Security Architecture, etc.
- Compliance: Conducting reviews, standards exception tracking and management
- Incubation projects: Tracking and piloting the use of new technologies, architectural concepts
- Subsidizing the development of reusable components (both business and technical)

Funding Source	Business Units	Business Units	EA	EA
Funding Type	One-time charge	Recurring charge	One-time expense	Recurring expenses
	Cap-Ex	Op-Ex	Cap-Ex	Op-Ex
Architecture Review Board				X
Reusable component development	X			
Annual Maintenance charges for reusable component		X		
Performance tracking				X
EA artifacts updation		X		
Enterprise Service Bus conceptualization			X	
Product evaluation		X		

Table 2 - Various funding sources for EA processes   *Source: Infosys Technologies Ltd.*

Depending on the type of project, different funding models are required. These models – in the spectrum from corporate tax to consulting fees – on the one hand side need to ensure sufficient funding of the enterprise wide strategic role of EA, and should allow the involvement of the EA team in all relevant projects; on the other side, they also need to discourage extensive (ab-)use of EA resources by development projects for project level tasks.

To ensure both stability and economic use of EA resources, almost all teams adopted a combined funding approach:

- Central funding for the EA team is required in every scenario for core Enterprise wide architecture artifacts such as standards, processes and policies
- Remainder of activities (operating expenses) are funded through corporate tax and consulting fees

Conclusion

Enterprise architecture is a critical enabler for improving and proving the business value of IT.

Developing enterprise architecture content does not necessary mean that it will be used effectively. The development and proactive governance of each architecture discipline is critical to the impact of the enterprise architecture strategy. An enterprise architecture governance framework is a critical tool to ensure that the enterprise architecture matures in a competency enhancing fashion that enables both the Business and IT Strategies.

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