

# Enterprise, Business and IT Architecture and the Integrated Architecture Framework

# Contents

<b>1</b>	<b>Introduction</b>	<b>1</b>
<b>2</b>	<b>Background</b>	<b>2</b>
2.1	The Need for Architecture	2
2.2	Defining Architecture	3
<b>3</b>	<b>Architecture the Capgemini Way</b>	<b>4</b>
3.1	A Holistic View	4
3.2	Architecture and the Business Lifecycle	6
3.3	What is “Good Architecture”?	7
<b>4</b>	<b>The Value of Architecture</b>	<b>8</b>
<b>5</b>	<b>Capgemini's Integrated Architecture Framework</b>	<b>10</b>
5.1	Principles and Characteristics of IAF	11
5.2	Capgemini IAF Credentials	12
<b>6</b>	<b>An Outline of the Integrated Architecture Framework</b>	<b>13</b>
6.1	Abstraction Levels	14
6.2	Fundamental Artifacts	15
6.3	Aspect Areas	15
6.4	Views	17
6.5	Solution Alternatives	18
<b>7</b>	<b>Applying the Integrated Architecture Framework</b>	<b>19</b>
7.1	Engagement Roadmaps	19
7.2	Tools and Techniques	20
7.3	Using IAF for Enterprise Architecture	21
7.4	Using IAF for IT Solution Architecture	22
7.5	Solution Alternatives	25
<b>8</b>	<b>Building an Architecture Capability</b>	<b>26</b>
<b>9</b>	<b>Supporting and Developing the Capability within Capgemini</b>	<b>28</b>
9.1	Architects Certification	28
9.2	Architects Training	29
9.3	Ongoing Development	30
<b>10</b>	<b>IAF, TOGAF and IEEE 1471-2000</b>	<b>31</b>
<b>11</b>	<b>Summary</b>	<b>32</b>

# 1 Introduction

Enterprise and Solutions Architecture are increasingly seen as paramount for business and project success. The role of architecture is maturing rapidly, adding tangible value, and significantly contributing to the success of businesses.

Capgemini recognized the value of architecture in the early nineties, developing the first components of its architecture framework and approach, the Integrated Architecture Framework (IAF), as early as 1993. IAF has been steadily enhanced since to become a mature and comprehensive framework. Now in its fourth major version, IAF was approved by The Open Group as a “Recognized IT Architecture Method” in their IT Architecture Certification (ITAC) program in 2006.

IAF is fully supported by a comprehensive education program, an established certification scheme and a broad, experienced and active community of practice. Supported by this, Capgemini has developed one of the largest global Enterprise and Solutions Architecture practices in its industry.

This document provides an introduction to Capgemini’s positioning of architecture within Business and IT, together with an introduction to the Integrated Architecture Framework.

## 2. Background

Over the years, IT has evolved from delivering point solutions to a complex, interrelated landscape of applications, interfaces and infrastructure that support the business processes of an organization and the productivity of its people. More recently, this has started to include an architectural view of business change, so that Business and IT function seamlessly to deliver the goals of the business.

Architecture has always played a role in the development of systems. However, until the early to mid 90's, it was almost exclusively used in technical infrastructure, and commonly referred to as Systems Architecture.

As applications and systems increased in number and complexity, the need for a clear and consistent view of the complete picture, together with a structured approach to integration, became apparent. Gradually, the term architecture was extended to include all areas involved; initially ranging from technical infrastructure to information systems, and then towards information, processes and business.

More recently, the differences between architecture at an Enterprise level and at a Solution (or project) Level have become more clearly recognized and defined: Architecture at the Enterprise level is oriented to the overall business, information and systems landscape, whereas at the project or Solutions level, architecture is more focused on a definition of solution direction and high level design.

### 2.1 The Need for Architecture

Uncontrolled growth of information systems and technology in the late 1990s (often as a result of decentralized decision making) resulted in information and systems landscapes becoming complex, costly and difficult to manage. As a result, responding quickly and efficiently to new business challenges has become increasingly difficult. Typical symptoms include (in no specific order):

- Management remaining dissatisfied with the performance of IT or unclear about targeted business benefits from IT.
- Too many projects that are still not delivering their expected benefits or are aborted prematurely.
- Lots of talk about the latest IT “trends” that is not coupled to realizable business benefits.
- High and seemingly unmanageable IT operational costs, often as a result of too many different and standalone systems and not enough standardization.
- IT landscapes that include legacy systems, standard packages and tailor-made software with many point-to-point interfaces.
- Weaknesses in security management, for example complexity in registering (or removing) users on multiple systems.
- Inability of IT to keep pace with the desired business change without huge corresponding increase in costs.

In addition to these challenges, there are ever increasing demands on organizations to be able to:

- Compete with traditional and new entrants, and be able to adapt more rapidly to their competitors and market change.
- Rationalize overlapping and conflicting solutions arising from mergers and acquisitions.
- Conform to ever increasing regulations.
- Drive down costs.

Not all organizations will necessarily have all of these issues or needs, nor can all of these be solely addressed through the use of architecture. However, architecture can provide insight, support decision making and help structure potential solutions in many of these areas. The need for architecture can therefore be summarized as the need to:

- Transform IT into an enabler for business by offering better alignment of business and IT;
- Deliver more flexibility for business and IT, whilst balancing the often contradictory needs of business; and
- Manage complexity better, mitigating risk and aiding overall decision-making.

## 2.2 Defining Architecture

When looking for a clear and unambiguous definition of architecture (within a Business and IT context), it becomes clear that there are still many different perspectives, often as a result of their focus.

The Institute of Electrical and Electronics Engineers, Inc. (IEEE) who publish IEEE 1471-2000, “Recommended Practice for Architectural Description of Software-Intensive Systems”, define architecture as:

*“The fundamental organization of a system embodied in its components, their relationships to each other, and to the environment, and the principles guiding its design and evolution.”*

This definition is somewhat static, but highly applicable though it is more focused on Solution Architecture than Enterprise Architecture.

Another definition is:

*“Architecture shows the relationships and interdependencies between the organization, its processes and the information, IT system and infrastructure that it uses. Architecture is an effective and consistent set of principles, models and guidelines that give direction and set boundary conditions for programs, projects or systems.”*

This definition is more oriented to Enterprise Architecture, but is also applicable for Solution Architecture.

All of the definitions have a common focus on defining the **structure** and **relationships** of a system or enterprise with reference to a set of governing **principles** that provide **guidance** and **support** for **direction** and **decisions**.

Furthermore, architecture must provide a coherent and holistic view of the system or enterprise within an overall context of the wider eco-system (much like building architecture), with a clear understanding of the “big picture” as well as the detail. To achieve this, the use of abstraction and viewpoints is critical.

# 3. Architecture the Capgemini Way

Capgemini started developing its architectural approach in 1993 and has steadily evolved a framework around it, called the Integrated Architecture Framework (IAF). This goes far beyond Technical, Software or Systems Architecture.

Capgemini views architecture as providing a comprehensive and coherent view across Business, Information, Systems and Technology; not just to guide the design of IT systems but to deliver business change supported and enabled by IT. Architecture is therefore a lever to help transform an organization.

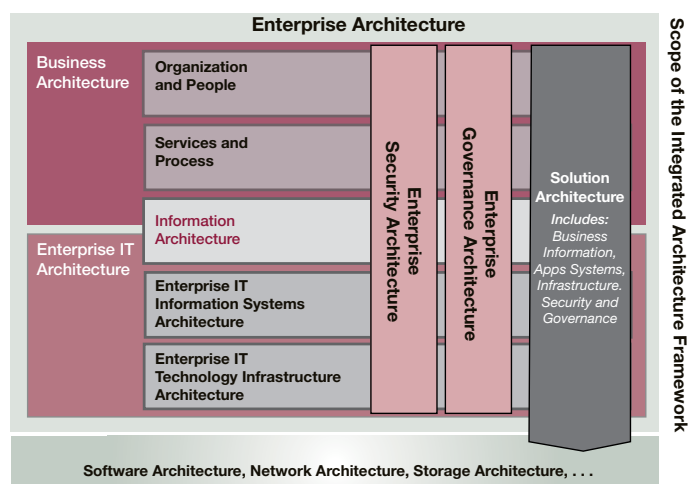
This holistic view of the business through the use of architecture is becoming even more critical in shaping the business as organizations start incorporating the approaches and architectural styles described as Service-Oriented Architecture (SOA) and, when using this thinking at a business level, the Service-Oriented Enterprise (SOE).

## 3.1 A Holistic View

Clients and the industry as a whole are moving towards a standard (but not yet universally defined and agreed upon) set of terms that describe different types of architecture. Typically, these encompass terms such as Enterprise Architecture, Solutions Architecture, and even Security or Governance Architectures, as well as the more usual Technical, Applications or Business Architectures.

The following diagram illustrates how Capgemini relates these types of architecture to one another, demonstrating the inclusion of Business Architecture within a full Enterprise Architecture, as well as the need for Solution Architecture to span from Business to Technology.

Figure 1. Types of Architecture



It is important to note that each type of architecture will address different levels and types of insight that may span business, information, systems, etc. Within this model:

- **Enterprise Architecture** details the structure and relationships of the Enterprise, its business models, the way an organization will work, and how and in what way Information, Information Systems and Technology will support the organization's business objectives and goals. Enterprise Architecture provides an all-encompassing, holistic, end-to-end view of the business in terms of people, process, governance and technology, within (and external to) the business that supports these objectives and goals. Enterprise Architecture is often likened to "City Planning."
- **Enterprise Business Architecture** (or **Business Architecture**) defines the integrated structure of the overall business itself (in terms of organization, people and processes). Business Architecture supports business change with a more holistic perspective. This approach is becoming more important with the move towards Service-Oriented Architecture at the business level, often termed the Service-Oriented Enterprise.
- **Enterprise IT Architecture** defines and describes the structure and relationships of IT systems at the Enterprise level in terms of how IT supports the organization to achieve its business goals. This typically includes standards and guidelines that are applied within Solution Architectures.
- **Solution Architecture** defines architecture for a specific solution that is either business or IT related. It provides structure, standards and guidance for the detailed design of a solution, and is typically guided by Enterprise Architecture. Solution Architecture is often described as Solution IT Architecture or sometimes as Project Architecture, and is often likened to "Building Architecture."
- **Governance Architecture** defines not only the traditional IT Systems Management capabilities, organization and systems, but also addresses business governance (how to manage overall business processes, both formal and informal). It is increasingly critical for legislation and compliance.
- **Security Architecture** defines not only traditional IT security but also addresses business and information security, as well as resulting organizational and business-related services to deliver the required security. It is often linked to governance aspects to address security management.

This holistic view of architecture is directly reflected in Capgemini's IAF approach with specific "Aspect Areas" that focus on Business, Information, Information Systems, Technology Infrastructure, Security and Governance.

*Note that the "Software, Network and Storage Architecture(s)..." shown in the diagram are outside the scope of IAF. Capgemini positions these as being in the engineering/design focused methods such as the Rational Unified Process (RUP) for Software Engineering and Capgemini's Infrastructure Design Framework (IDF) for Network, Storage, etc. Together, these all form a coherent suite of frameworks in Capgemini's Quality System, DELIVER.*

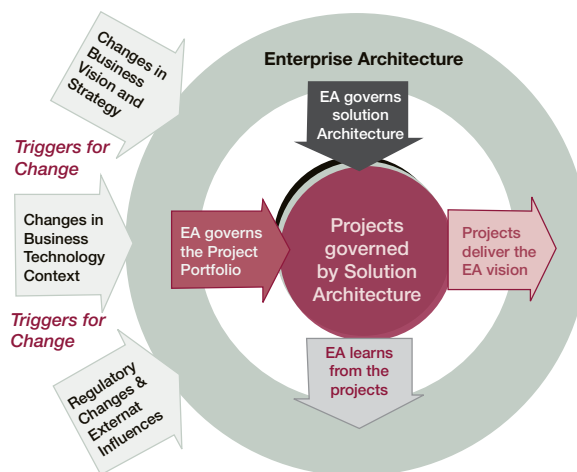
### 3.2 Architecture and the Business Lifecycle

Capgemini's experience is that architecture only delivers maximum value when it is an integral part of the overall business change lifecycle. In this way, the whole enterprise (business and technology) can be designed together, informing and supporting the business and IT strategies as well as shaping the business and IT itself.

As organizations have to respond to changes in market conditions, the Enterprise Architecture must be updated to reflect new business situations. Figure 2 below demonstrates the way in which Enterprise Architecture drives and responds to the overall Business and IT environment changes, once it has been established, and governs and learns from the specific solutions needed to deliver on this vision.

Stepping through this, it is clear that there is a symbiotic relationship between Enterprise Architecture and Solutions Architecture:

**Figure 2. The “Learning” Enterprise Architecture**



- The Enterprise Architecture reacts to the changes inside and outside of the organization so that it can continue to provide a complete and coherent view of how it will support delivery of the business vision and goals.
- The Enterprise Architecture informs and governs the business and IT project portfolios (both business and IT) needed for the organization to move towards the resulting target architecture.
- The Enterprise Architecture also informs and governs the solutions themselves by providing the structure, principles, guidelines and standards to which the projects should adhere. This ensures that individual projects move the organization towards its target architecture.
- The Solution Architectures provide the detailed structure, principles, guidelines and standards that govern and support the delivery of specific initiatives within the overall Enterprise Architecture. In general, these are focused on a small part of the overall architecture, although in absolute terms this may still be significant.
- The Enterprise Architecture must learn the lessons from the development and deployment of solutions, ensuring that it remains practical and pragmatic, and not just an “ivory tower.”



Architecture thus bridges the gap between Business/IT Strategy and the projects that are needed to deliver this strategy. Aligning projects (business or IT) to an overall Enterprise Architecture provides an often missing link in the governance chain between vision, strategy and implementation. Architecture is, in effect, a major part of the continuous improvement function for the Enterprise.

Architecture is *a means to an end* and not specifically an end in itself.

### 3.3 What is “Good Architecture?”

One common challenge when designing architecture is that it is easy for it to become an end in its own right, rather than something that is there to help the business. As a result, it can be difficult to assess when to stop designing the architecture.

In fact, the reality for a majority of businesses is that, due to inevitable cost and time constraints, changes to business objectives or strategy mean that the architecture will rarely be 100% complete, perfect or even fully achieved! Architecture represents the aspiration (or target to reach) and provides the support framework to make decisions along a journey. The deciding factor revolves around when the Architecture is “good enough” for its scope and objectives to ensure that results deliver expected business benefits.

A number of ways can help an organization to understand when it has “good architecture,” much of which is commonly understood as leading practice for architecture frameworks. These include:

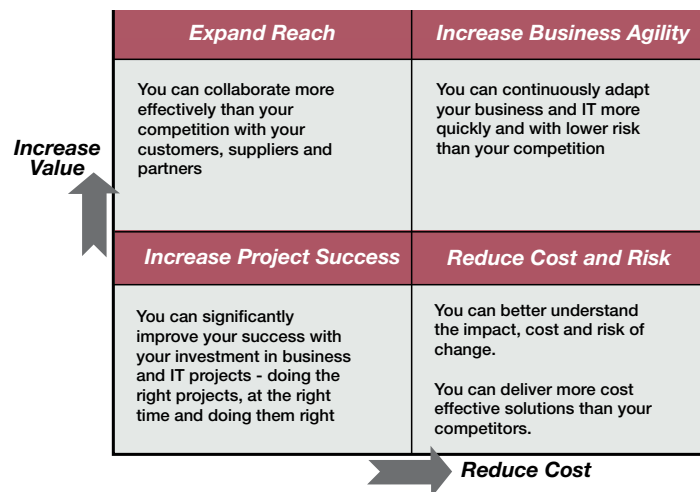
- Understanding the **Scope and Objectives** of the architecture work, to know when the results are “good enough.”
- Understanding the Business (and IT) **Context**, including external facts (regulation, etc.) that may affect the results.
- Formalized and traceable **Business Objectives** and **Principles**, driven by the **Business Mission** and **Vision**.
- Looking at the Solution or Enterprise in a **holistic** manner across disciplines to understand the impact of decisions.
- Documenting the **Rationale** for all Architectural and Design Decisions, ideally reflecting the Principles/Business Needs.
- Providing clear Traceability back to the **Business Objectives** within the architecture.
- **Investigating Solution Alternatives** to ensure that decisions are made in a holistic manner and not in isolation.
- Capturing, validating and managing any **Assumptions** and **Constraints** that affect the architecture.
- Proactively **Managing Risks and Issues**, both of the process as well as the results.

As covered later, Capgemini’s Integrated Architecture Framework (IAF) has been specifically designed to enable architects to deliver these criteria, by providing the necessary structure and architectural artifacts together with documented best practice, supported by a comprehensive education program.

## 4 The Value of Architecture

Architecture must not be seen as just a purely academic exercise, but it must clearly deliver (and continue to deliver) value to a business. There are many ways that this value can be realized, either through reduced cost or through increased value/competitiveness:

**Figure 3. The Value of Architecture**



The following are some examples of the values that can be realized through the effective deployment and use of architecture.

### Value for the Business

1. Providing a full and coherent overview and understanding of an enterprise, and where the competitive value exists i.e. people, roles, processes, organization, goals, policies, rules, events, locations, etc.
2. Enabling business process improvement by structuring the business according to key services needed by the enterprise, based on a clear understanding of the goals and drivers of the business.
3. Identifying and eliminating (or resolving) duplication across the enterprise, enabling a move towards a “shared service” model, including identification of those non-core services that may be better sourced externally.
4. Ensuring business compliance.

### Value for IT

5. Reducing solution delivery time and development costs by maximizing reuse of architecture models and existing systems, services and solutions.
6. Improving project success by reducing risk and complexity and having early visibility of IT and business issues inside and outside the project.
7. Reducing the risk of IT non-compliance with key regulations, especially as business becomes more regulated, e.g. HIPAA, Sarbanes-Oxley, etc.

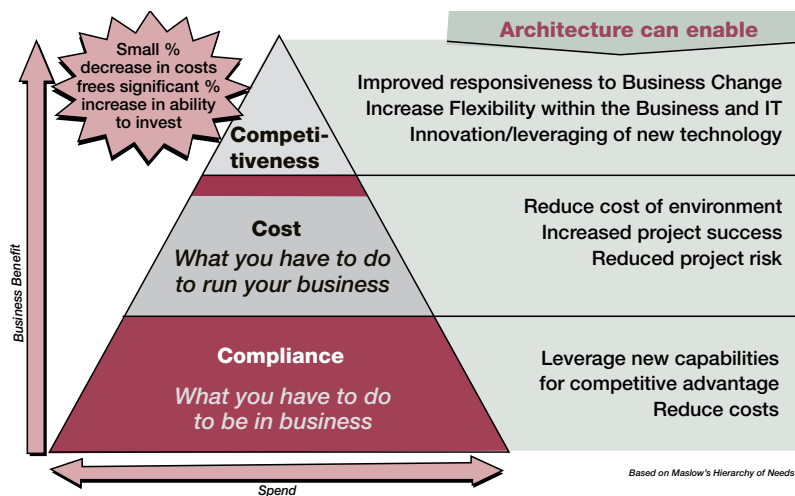
8. Improving IT planning and the management of IT roadmaps and portfolios, also enabling improved planning for resource skills and training.
9. Implementing and managing security by design instead of reacting to breaches as they are discovered.
10. Delivering solutions that meet IT Service Level definitions that are linked back to real business objectives. This will reduce instances of costly, over-engineered solutions.
11. Reducing the cost of “Business As Usual” by better managing operational costs through the consideration of Governance as part of the overall architecture and not, as is often the case, an afterthought.

#### Value for Business and IT

12. Improving Business and IT alignment, allowing, for example, the identification of misalignment of individual projects with strategic outcome in early stages.
13. Cost Control and Improved ROI by ensuring departmentally-focused project teams can understand what shared or reusable services are available and long-term costs of not using these.
14. Increased Agility and Competitiveness where IT becomes an enabler and partner for the business, instead of being seen as a cost or constraint.
15. Helping Deliver Strategy and Better Business/IT Alignment through the governance model for solution development and portfolio management from an Enterprise Architecture.
16. Ensuring alignment of data and information management with business objectives (e.g. partnerships)
17. Creating and maintaining a common vision of the future that is shared by both the Business and IT communities.

Thus, the effective use of architecture within an organization can help reduce business and IT costs in those areas needed to run the business (e.g. for regulatory compliance, etc.), freeing up resources for new investment in areas that can really deliver improved competitiveness.

**Figure 4. The Three C's in Business**

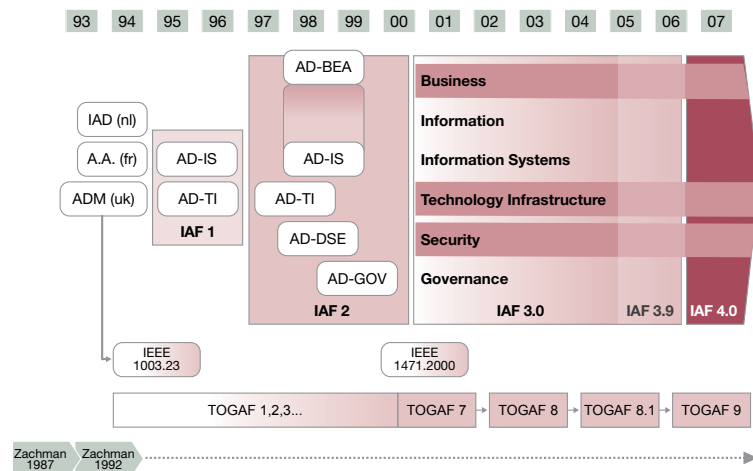


The above illustration shows how a small improvement in the cost of “normal business” can free up proportionately more funds for investment in delivering improved competitiveness.

## 5. Capgemini's Integrated Architecture Framework

In 1993, the architecture approaches that were to become the basis for the Integrated Architecture Framework were developed by Capgemini in the UK, France and the Netherlands in response to specific engagements. The value of a repeatable and portable architectural approach in these areas was quickly recognized, leading to the development of the first version of the Integrated Architecture Framework (IAF) and the first formal training for architects.

**Figure 5. Evolution of 1AF**



Since its inception, IAF has evolved and matured as a result of real life experiences of Capgemini's global Architecture Community. Training events which often comprise more than 16 nationalities is evidence of the international adoption of IAF across Capgemini. As a result, major versions have been delivered to reflect increased breadth of the framework, incorporation of Business Architecture and greater maturity of the discipline as a profession.

In 2001, Capgemini released the third major iteration (IAFv3), when Business and Information became fundamental aspects of thinking, and "services" based elements (which have always been a part of IAF) were further infused into the approach. IAFv3 has been successfully used in hundreds of major programs with many clients, and has been deployed in a number of major client organizations as the basis for their Architecture Framework.

In 2006, Capgemini released a significant update, IAF 4.0, to clarify material and incorporate Business and Information aspects based on its field experience over the previous five years.

### 5.1 Principles and Characteristics of IAF

In developing IAF, Capgemini specified the framework based on key requirements and fundamental principles:

<b>Value focused</b>	The approach must be focused on delivering value to clients
<b>Traceable to business</b>	The architecture and any decisions made as part of the architecture must be clearly justified and traceable back to the needs of the business.
<b>Address Complexity</b>	Architecture structures complex problems; the way to address this is by using different levels of abstraction.
<b>Holistic &amp; integrated</b>	The architecture approach must integrate the full scope of business and technology issues.
<b>Considers different aspects</b>	Architecture must support different business issues and domains of architecture.
<b>Allows special focus</b>	Developments in business and technology require the capability to provide special attention to specific areas.
<b>Stable</b>	The architecture approach requires a stable content that is easy to handover and easy to communicate.
<b>Flexible</b>	The approach must support architecture work in projects and stand-alone architectural services. The approach must not contain a prescriptive methodology, but must provide a stable platform for innovation.
<b>Scalable</b>	The approach must scale from Solution to Enterprise level architecture.
<b>Fast and efficient</b>	The market demands that the architecture approach be as fast and efficient as possible.
<b>Provides a common language</b>	Use of a common language improves communication between business and IT, leads to more efficient team working and is crucial to knowledge sharing.

To achieve these, the Integrated Architecture Framework explicitly separates Process from Content; the content is formally described in the content framework, whilst process is incorporated in Engagement Roadmaps, supported by tools and techniques.

## 5.2 Capgemini IAF Credentials

The Integrated Architecture Framework (IAF) enables architecture to be defined and justified in business terms and provides a reference model to plan, design and implement required services. It achieves this by capturing the business need and aspirations primarily in terms of guiding principles. These principles provide a reference point throughout the engagement, which is used to ensure that the developing solution continues to meet the overriding business need.

IAF also helps create an early “mock-up” of the final solution, which enables the client to analyze and evaluate the impact of organizational principles and requirements without the need to go into an expensive design or prototype project. This capability is even more important where work is moved offshore by organizations.

IAF has been successfully used throughout Capgemini on hundreds of engagements covering IT Solution Architectures for systems development, systems integration and package-based solutions, Business Architectures and Enterprise Architectures. This includes engagements with a number of high profile clients in North America, Europe and Asia, spanning all sectors, for example:

- Cadbury Schweppes  
[http://www.capgemini.com/resources/success-stories/cadbury\\_schweppes/](http://www.capgemini.com/resources/success-stories/cadbury_schweppes/)
- Corus plc, UK  
<http://www.capgemini.com/resources/success-stories/corus/>
- Croydon Borough Council, UK
- Ericsson, Sweden
- Electricité de France (EDF)
- HM Revenue and Customs, UK
- KBC Group, Belgium  
[http://www.capgemini.com/resources/success-stories/kbc\\_group/](http://www.capgemini.com/resources/success-stories/kbc_group/)
- NATO  
<http://www.capgemini.com/resources/success-stories/nato/>
- UK Ministry of Defence (DECS)
- Vodafone, Sweden

IAF has been extremely well received by our clients, and in a number of cases, Capgemini has been engaged to assist them in developing their own internal architectural capability supported by frameworks based on IAF and tailored to their specific needs, for example, at KBC, Dutch Rail, Corus and Cadbury Schweppes.

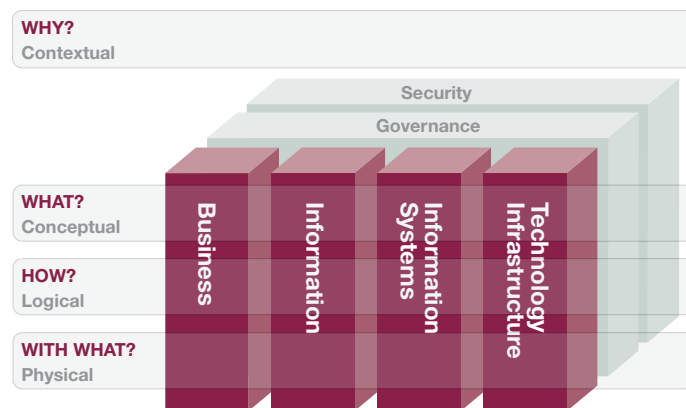
## 6. An Outline of the Integrated Architecture Framework

The Integrated Architecture Framework is used to structure and define the architecture content. The framework:

- provides a model for architecture development and usage;
- describes the format and content of elements of the architecture;
- specifies the way in which these elements relate to each other.

The following diagram shows the basic structure of IAF. The model is broken down into Aspect Areas and Abstraction Levels. Each “cell” in this model has a defined set of Artifacts. Views then allow architects to bring together and visualize the artifacts to help model the architecture and communicate results with the various stakeholders.

**Figure 6. The Integrated Architecture Framework**



Within this framework, IAF describes the architecture using two basic constructs. The first construct, **Artifacts**, describes the architecture elements. Artifacts belong to, and are derived from specific areas in the architecture framework.

The second, **Views**, is used to analyze and present the architecture from different perspectives and to document relationships between Artifacts. Views show why the architecture is what it is, providing both traceability of, and the justification for decisions made when developing the architecture. Views also provide a way to present architecture in an appropriate form for various stakeholders, thereby building acceptance.

The following sections describe in a little more detail what IAF consists of. More detailed information and guidance is available to IAF users through detailed reference manuals, courses and internal knowledge repositories.

### 6.1 Abstraction Levels

Abstraction allows a consistent level of definition and understanding to be achieved in each area of the architecture. It is especially useful when dealing with large and complex architectures, as it allows relevant issues to be identified before further detailing is attempted. This approach is found in most architectural approaches including The Open Group Architecture Framework (TOGAF) and the Zachman Framework for Enterprise Architecture. The Integrated Architecture Framework (IAF) defines four levels of abstraction:

The **Contextual Level**, characterized by “Why?”, is not about understanding what the new architecture will be. It helps to identify boundaries (i.e. scope and objectives) for the new architecture and its context. Specifically, this level focuses on the business aspirations and drivers, capturing the Principles on which the architecture will be based. Unlike some approaches, these Principles are formally described to include their rationale, implications, priority and even assurance measures for compliance, so that they reflect the often conflicting requirements of stakeholders in a business.

The **Conceptual Level**, characterized by “What?”, is when requirements and objectives are analyzed and elaborated. It ensures that all aspects of the scope are explored, relevant issues identified and resolved, without concern over how the architecture will be realized.

The **Logical Level**, characterized by “How?” helps to find an ideal solution that is independent from implementation. From this, several “solution alternatives” can be developed that either provide the same outcome, or alternatively “test” different priorities and scenarios to understand the implication of different potential outcomes. The outcome of logical level analysis is the vision of the desired to-be state.

The **Physical Level** (“With what?”) helps to determine the real world structure and organization, by translating the “desired” logical level structure and organization into an implementation-specific one bounded by standards, specifications and guidelines. At the physical level, the outcome is a description of how the desired state will be achieved. The physical level may produce several “physical” architectures depicting a series of steps along a road to achieving the desired state, or simply the first, depending on the architecture objectives.

The physical architecture provides standards, guidance and a degree of specifications within which detailed design will take place. It does not replace detailed design.

It is important to remember that any architecture model cannot include the complete functional, data or user requirements for a solution at a detailed level. The selection of physical products therefore has to be driven by detailed functional/user criteria in addition to architectural fit.



## 6.2 Fundamental Artifacts

There are a number of “fundamental” Artifacts used across IAF to make the model as consistent and simple as possible. These are detailed in the Aspects Areas (e.g. Business Service) and, together with aspect-specific Artifacts, make up the IAF model.

**Services** are a fundamental construct in IAF and describe specifically what is required (but not how it is done). Services are defined at the conceptual level and describe the capabilities, or what must be done in each aspect area to support business objectives. Services interact with other services and this interaction is described through Collaboration Contracts.

Many services within a system are not technology services. They can have many attributes and effects that are not defined or measured by technology. In IAF, Services reflect not only the characteristics at the lower levels (e.g. technology) but also the impact of higher level agreements (e.g. business KPIs).

**Components** are Logical or Physical entities in IAF that represent the solution with a clearly defined scope and role. Logical Components provide an implementation independent description of the solution, whilst Physical Components provide the implementation-specific description, including standards and potential products.

Components deliver one or more services (or logical components in the case of physical components) and there is usually more than one way to organize them (see Solution Alternatives in section 6.5).

**Collaboration Contracts** describe the behavior of the interaction between the services (or components). This is distinct from the characteristics of the services (or components) themselves, allowing for rigorous analysis of integration requirements and enables the decoupling required for Service-Oriented Architecture (SOA).

Collaboration Contracts are first derived between Services at the Conceptual Level. These contracts are then used to define the required Collaboration Contracts between the Components, first at the Logical, and then Physical levels.

## 6.3 Aspect Areas

To break down the complexity of the architecture, IAF recognizes four major “Aspect Areas” which focus exclusively on the core aspects of the overall architecture—Business, Information, Information Systems and Technology Infrastructure. The Business aspect area is especially important, as this not only allows modeling of the business to deliver IT solutions, but also provides a way to architect the Business.

IAF also explicitly recognises two additional, special Aspect Areas that specifically address the Governance and Security perspective of the architecture. These are deemed special (and are shown in the third-dimension of the model) because they:

- represent a set of requirements driven across all core aspect areas
- apply to all the other aspect areas but may be applied stand-alone
- use artifacts from the other aspect areas to describe themselves
- may significantly change the architecture structure across one or more core aspect areas.

The **Business** aspect area adds knowledge about business objectives, activities, and organizational structure. Key artifacts in this aspect area include:

- Business Role
- Business Activity
- Business Goal
- Business Service
- Business Object
- Logical Business Components
- Business Actor
- Physical Business Component
- Business Specification
- Business Guidelines
- Business Standards

The **Information** aspect area adds knowledge about information that the business uses, its structure and relationships. Key artifacts in this area include:

- Information Object
- Business Information Service
- Logical Information Component
- Logical Business Information Service Component
- Business Communication Specification/Guidelines/Standards
- Information Specification/Guidelines/Standards

The **Information System** aspect area adds knowledge about types of information systems (packaged or bespoke) that can automate and support the processing of information used by the business. Key artifacts include:

- Information System Service
- Logical Information System Component
- Physical Information System Component
- Standards, Specifications and Implementation Guidelines

The **Technology Infrastructure** aspect area adds knowledge about types and structure of components that support the information systems and actors. These may be hardware or network related. They may include fundamental services such as databases, etc. and key security and other commodity shared services. Key artifacts include:

- Technology Infrastructure Service
- Logical Technology Infrastructure Component
- Physical Technology Infrastructure Component
- Standards, Specification and Implementation Guidelines

The **Governance** aspect area focuses on the manageability and quality of the architecture implementation (both business and IT) that is required to satisfy the services levels required by the business for its processes and systems. The artifacts for this area are all fundamentally defined within the core aspect areas (Business, Information, Information Systems and Technology Infrastructure), although the outcome from this aspect area will be new specialized Services and Components to deliver the governance.

The **Security** aspect area focuses on the mitigation of known risks to the architecture implementation (both business and IT). The artifacts for this area are also all fundamentally defined within the core aspect areas (Business, Information, Information Systems and Technology Infrastructure). The outcome from this aspect area will be new specialized Services and Components to deliver the required security.

#### 6.4 Views

Views are a fundamental part of the approach defined in the Integrated Architecture Framework. They are used to present the architectural model to various stakeholders. They offer an important tool to help architects develop the architecture by allowing them to inspect and validate it as a whole from one perspective (viewpoint) to build a complete, composite and consistent picture of the solution across all areas.

Views are highly context dependant. Their applicability and use will depend on the client, stakeholders and engagement type. Some views that may be needed include:

**Models** and **Cross-Reference** Views are two techniques to link services and/or components in IAF. Interaction Models capture links between artifacts of the same type, helping identify interfaces and the “Collaboration Contracts” needed. Cross-Reference Views capture connections between different types of artifacts (e.g. Business to IS) providing traceability across aspect areas and to business needs.

**Major Information System Interfaces Model** helps visualize major Information System Service Interactions.

**Integration View** allows logical components from the perspective of Collaboration Contracts to be visualized, highlighting different integration approaches needed.

**Distribution View** visualizes the distribution of components of the solution, typically across topographical or geographic areas such as data centers and office locations.

**Security View** to focus on how security components or requirements are overlaid on other aspects of the architecture, typically as an end-to-end view across the architecture showing security domains and services that will be required.

**Governance View** to focus on how the architecture will be governed in terms of quality objectives such as availability, performance and restorability, and how they will be addressed by governance components.

**Migration view** to illustrate how the architecture will be implemented over time, describing different stages of the migration and linking them to available capabilities within the organization.

## 6.5 Solution Alternatives

In determining the most appropriate architecture solution, it is critical that different options are considered and the rationale for specific design decisions captured. Solution Alternatives are a way to achieve this within IAF.

Solution Alternatives are used in the Logical and Physical levels to work through implications of different options, either architecture-wide or at the major component (or sub-system) level. They are often used to demonstrate the impact of conflicting needs expressed by the business (e.g. 24x7, secure, flexible, etc.).

The selection of the various candidate Solution Alternatives and the identification of the “best fit” solution is driven from the principles and priorities originally defined in the Contextual level, and refined throughout the rest of the architecture process. This ensures that the solution and design decisions reflect, and are traceable back to, business requirements.

Typically, at least two Solution Alternatives will be considered in both the Logical and Physical levels. Seen as a fundamental part of the architecture approach, this is recognized in most frameworks as the way to help make informed decisions. The use of Solution Alternatives ensures that wider implications of available options can be seen in context rather than allowing individual selections to be applied in isolation.

## 7. Applying the Integrated Architecture Framework

The previous section describes the overall structure and language that Capgemini has developed to be able to deliver architectures. To use this model to deliver architectures, the content is supplemented by:

- **Tools** including templates and supporting tools, etc.
- **Techniques** including Workshops, Focused Interviews, etc.
- **Engagement Roadmaps** to bring all the outputs together.

These elements of the approach were deliberately separated from the content definition to provide the flexibility required by clients when adopting IAF, making it more agile and able to evolve with the industry. This approach also ensured that the overall model defined (the Layers, Aspects and Artifacts) could be kept as simple as possible whilst supporting the use of IAF in a wide range of diverse architecture situations and engagements.

Despite the approach having been developed in 2001, its benefit is demonstrated through regular and successful use of IAFv3 to deliver SOA-based solutions well before the industry and analysts started viewing Service-Oriented Architecture as an important differentiator for enterprises.

### 7.1 Engagement Roadmaps

The Engagement Roadmap provides the process element for an architectural engagement to bring together:

- clear definition of the scope and focus across various aspect areas of IAF, including artifacts and required views
- plans (typically describing outcomes/milestones) that include stakeholder interactions and other communication activities
- definition of deliverables from the work, both in terms of scope and content as well as format.

The Engagement Roadmap also identifies key tools and techniques to be used in the study, for example Templates, Reference Architectures and Patterns, Workshops and Focused Interviews. The construction of the Engagement Roadmap is dependant on the specific context, architectural objectives and scope of the architecture work. There are a number of patterns that provide the basis for many types of architectural engagements to help accelerate the creation of the appropriate Engagement Roadmap.

This clear separation of content from process allows IAF to provide the content for other, industry frameworks such as The Open Group Architecture Framework (TOGAF), with the TOGAF Architecture Development Method (ADM) providing the process for IAF's content.

## 7.2 Tools and Techniques

The final aspect of applying the Integrated Architecture Framework is the use of relevant tools and techniques.

**Tools** can include anything from standard templates through standard office tools such as Microsoft Word, Excel, PowerPoint and Visio, through to specialized Enterprise Architecture tools.

Given the wide range of clients and engagements that Capgemini architects are involved with, it is often the case that the office tools provide the necessary flexibility for Capgemini and accessibility for the client. Furthermore, as communication with stakeholders is such a critical element of any architectural engagement, the use of tools such as Microsoft Word and PowerPoint will almost always be required.

This range of clients also brings with it a diverse range of corporate standards for tools (business, EA and development). IAF is inherently flexible so that it can be captured in many of these tools, allowing the architectural content to be easily linked to the development process. Examples of tools that have been used to capture IAF artifacts include Metis, Mega, System Architect and iServer, as well as development tools such as Rational.

When organizations are developing an internal architecture capability, the question of tools support takes on a different perspective. There is a clear need to be able to manage vast amounts of information (including understanding the impact of potential changes) across a number of teams. Capgemini leverages its experience implementing various Enterprise Architecture tools to support EA functions using IAF.

The concept of **techniques** allows various approaches to be used to gather information, make decisions and solve problems across disparate environments, for different types of architecture work as well as different types of businesses and corporate cultures.

These techniques can include various approaches to workshops, use of focused interviews and “war rooms” to show work in progress as well as derive specific techniques like launch Business Services.

IAF, when applied using relevant tools and techniques through an agreed Engagement Roadmap, delivers the combination of flexibility and rigor required to support design principles for an organization (section 5.1).

### 7.3 Using IAF for Enterprise Architecture

At an Enterprise level, the architecture focus is broad and decisions are much more strategic in nature, concerned with setting direction and policy. In this context, answering “What” is the priority along with a broad indication of “How.” “With what” tends to drive out policies and principles to be followed. In some cases this may extend to products and standards often in the form of architecture constraints, for example, “We will use our current investment to support all subsequent ERP solutions.”

This is where the architecture scope and objectives are crucial to selecting the correct areas of the framework to use, and even more importantly, the level of detail required to achieve the architecture objectives. For example, is the architecture being used to answer a **Business Transformation** objective or an **IT Enablement** question? In the former, the focus may be to view the Business and Information aspects in more detail, whereas the latter will focus more on the IS aspects.

The deliverables from the two examples would often be the same but with different focus and detail:

- **Business and Technology Context** focusing on business context and principles for Business Transformation and on the IT context, and business and IT principles for IT Enablement.
- **Enterprise Architecture** covering the requirements and derived Logical Architecture together with Standards and Guidelines needed to govern Solution Architectures:
  - Business Transformation will focus on Conceptual and Logical Business and Information aspects and the Business policies and Guidelines;
  - IT Enablement will focus on Conceptual and Logical Information, Information System/Technology Infrastructure aspects together with the Standards and Guidelines for the use and development of Information, IS and IT.
- **Project Portfolio** plans or guidance and/or Roadmaps to show how the architecture vision is achieved over time, informing either the Transformation strategy or the IT Strategy.
- **Governance Model** to use the Enterprise Architecture to guide (and learn from) solutions being delivered.

## 7.4 Using IAF for IT Solution Architecture

When using IAF to develop an IT Solution Architecture, the overall approach will depend on the availability of appropriate input. Ideally, an existing Enterprise Architecture will exist, although care should be taken to ensure its scope and objectives are aligned to the scope and objectives of the Solution Architecture.

Using the example from the previous section, it is unlikely that the IT enablement Enterprise Architecture would be sufficiently complete to support the elaboration of a Business Solution Architecture, although it would provide a lot of valuable information. This is a very common trap (irrespective of approach, tools and methods used) where the presence of an “Enterprise Architecture” leads to assumptions about completeness of information to support Solution Architectures.

It is also worth remembering that the IAF is a content framework, not a process framework. This means that relationships between artifacts indicate starting points for each aspect area. Completeness of information required from other aspect areas to support a specific aspect comes from all levels. For example, the organizational disposition of business components in reality is not the outcome of logical business levels but part of the physical business specification, i.e. similar specifications exist in the physical information specification for the disposition of master data sources. Whilst the desired logical state of business and information would support a desired IS solution, the absence of this information could significantly affect the physical outcomes of an IS/IT Solution Architecture.

Deliverables from such an engagement would therefore typically include clear documentation of the:

- Business, Technology and Architecture Context together with the Overarching, Business and IT Principles
- Conceptual Architecture covering the detailed requirements, often with the relevant Business Architecture
- Resulting Logical Architecture including the rationale for any decisions made and relevant Solution Alternatives
- The Physical Architecture, covering Specifications, Products, Standards and Guidelines needed to govern the design.

### 7.4.1 IT Solutions Architecture and the “Design Continuum”

Successfully delivering IT solutions requires architecture to reflect the type of solution being addressed and link effectively into design stages of the overall project. To this end, the architecture has to be seen as just part of the overall process to deliver a solution.



Figure 7 below shows the context of IT Solution Architecture within the overall solution lifecycle, including the clear need for architectural governance (the Technical Design Authority role) throughout the design and implementation stages of the project.

**Figure 7. IT Solution Architecture and the “Design Continuum”**

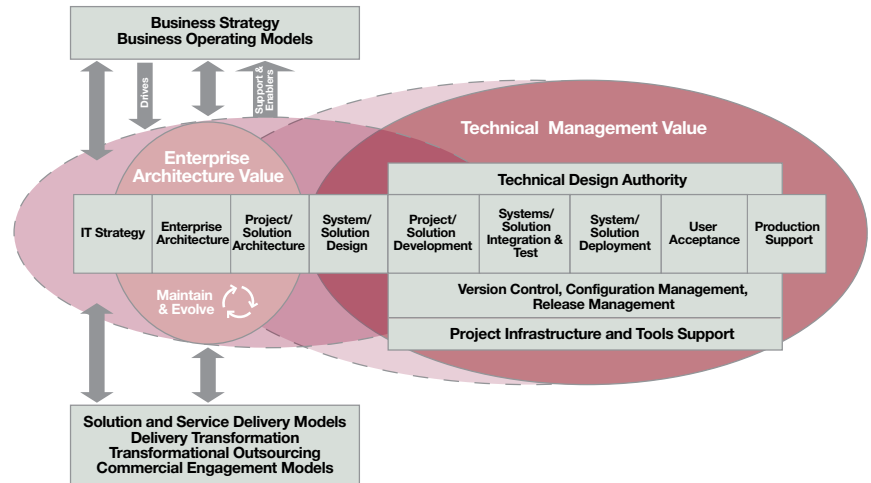
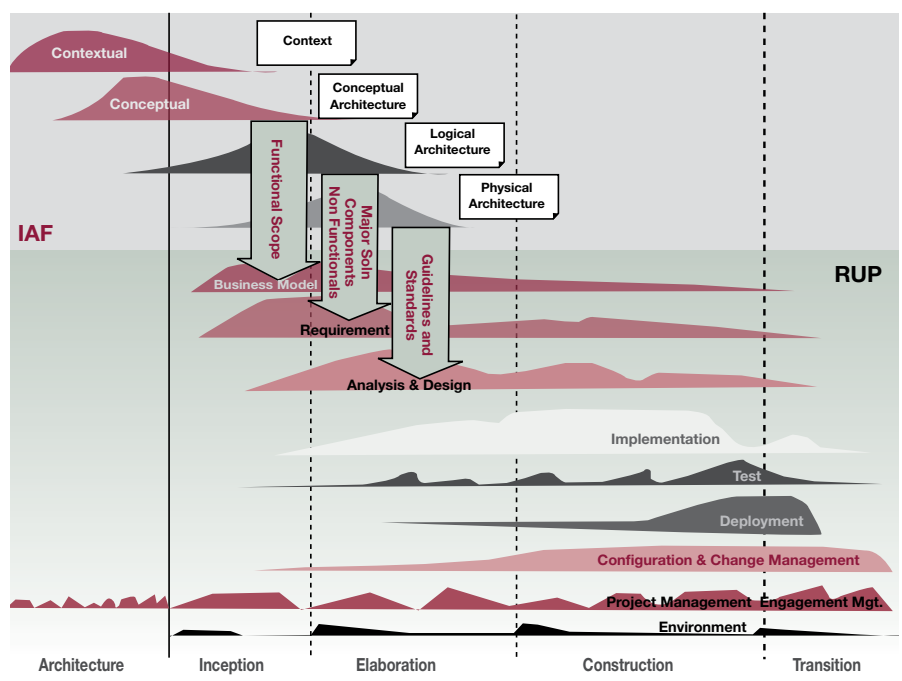


Figure 8 below illustrates how IAF aligns/works with existing design methods (in this case, RUP, the Rational Unified Process) to ensure that the outputs from architecture feed directly into design.

It is worth noting that, to ensure this “design continuum” in a Solution Architecture, it is important that the lead Software, Infrastructure and other Engineers are involved in the development of the Physical Architecture wherever possible, aiding both feasibility and handover.

**Figure 8. Alignment of Architecture (IAF) and Design (RUP)**



#### 7.4.2 IT Solution Architecture for Package-Based Solutions

Package-Based Solutions, for example Enterprise Resource Planning (ERP) packages such as SAP, Oracle Applications or Microsoft Dynamics have become increasingly important for many organizations. Although it is often thought that such packages do not need an IT Solution Architecture (as it is believed that “the package defines the architecture”), experience shows that there is just as much need for an architecture when deploying Package-Based Solutions as there is for other solutions.

The IT Solution Architecture approach for Package-Based Solutions is fundamentally no different from that required for custom solutions, although the focus of the architecture may be somewhat different. The key architectural challenge faced with such packages is often that, whilst they impose constraints on all of the architecture aspects, (primarily because the “services” and inter-relationships in a package are predetermined, to a greater or lesser extent), they exist within and must integrate with the organization’s wider application (and business) landscape.

Irrespective of whether the package is to be selected as part of the project, or (as is often the case) has already been selected and needs to be deployed and integrated with other systems, the architecture work will therefore typically need to focus on:

- validation of business objectives and the business architecture against the package in context identifying areas where a package may need to be customized and/or extended
- identifying and designing how the package (services) relate and interact with other services (package or custom, new or existing)
- understanding the information architecture aspect, to provide guidelines and specifications for Master Data Management
- understanding requirements that the package in context will place on the infrastructure (and any resulting changes)
- ensuring appropriate levels of security and governance for the overall solution.

Capgemini’s IAF successfully enables and supports the architecture required for Package-Based Solutions, both for package selection and for the implementation and integration of a specific package.

The need for architecture becomes even more important now that Package-Based Solution vendors are re-orienting (and often fundamentally redeveloping) their products to be more “Service-Aware”. This drive towards a Service-Oriented Architecture (SOA) approach is intended to enable these packages to become more agile, enabling the organizations using them to develop more adaptable solutions to meet, and often develop, emerging or new ways of working, potentially even building completely new markets. To support the desire for agility, there is also a push to develop specific business processes rather than relying on a package’s embedded processes. This means that the architecture approach used to support these changes needs to have an enterprise-wide, services-based holistic view of both business and IT. However, whilst the new “service-aware” Package-Based Solutions enable and support this flexibility, many of the vendors’ deployment approaches are still based on the view of a package as a “black box” and a new approach is needed.

IAF successfully delivers an architectural approach that supports and enables this business agility with a holistic view of business and IT underpinned by its clear linkage from business drivers and objectives through to the deployed services.

## 7.5 Using IAF for Business Solution Architecture

Using an architectural approach to support and drive business change brings many benefits, including the holistic approach and rigorous analysis that is fundamental to architecture. As more organizations look to evolve towards the Service-Oriented Enterprise, Business Architecture helps develop a service-based view of the business—an important first step.

Capgemini's IAF delivers this by providing support for stand-alone Business Architecture or for concurrent Business and IT Architecture support as described in "7.3 - Using IAF for Enterprise Architecture."

It would be rare for the Business Architecture to not incorporate extensive IT considerations. The IAF supports this by providing a common language to describe business and IT elements and more importantly, demonstrate linkages and traceability between these different aspects

Using IAF to produce "stand-alone" Business Architecture will focus on the Business and Information aspects, and more importantly, the Security and Governance aspects, as these two should be regarded as business issues especially critical in today's world of compliance (IT merely implements security and governance policies).

Business Architecture may still be a largely undefined concept, so the IAF Business Aspect area focuses on key structural aspects of business, primarily in terms of:

- What activities does the business conduct?
- What roles are needed to support those activities?
- How are those activities and roles organized and governed?
- Required levels of resource and information to support these?

Deliverables from such an engagement would therefore typically include clear documentation of the:

- Business Context together with the Overarching and Business Principles
- Conceptual Business Architecture providing a holistic view of the detailed requirements, often for the first time, in which case it may be used to inform the Business Strategy
- Logical Business Architecture covering roles, organizational structure and logical processes
- Physical Architecture covering Specifications, Products, Standards and Guidelines needed to govern the detailed design of the organization, roles/capabilities and processes

## 8. Building an Architecture Capability

Developing an architecture capability (especially at Enterprise level) is an important (and growing) objective for clients. To be credible and successful within an organization, an architecture function needs to be sponsored and supported at the board level. It demands close collaboration between the business and technical functions of the entire organization.

The function also needs a well defined governance structure, clearly defined roles, as well as the development of architecture processes and how they integrate into the business change process. The architecture function will also need to develop training and succession plans as well as considering whether to implement some form of certification and accreditation schemes.

Experience shows that there are some fundamental challenges to move Enterprise Architecture from a good idea to a mature, value-adding professional discipline. Capgemini's practical and proven approach helps clients overcome these challenges and accelerates the realization of tangible business benefits of Enterprise Architecture.

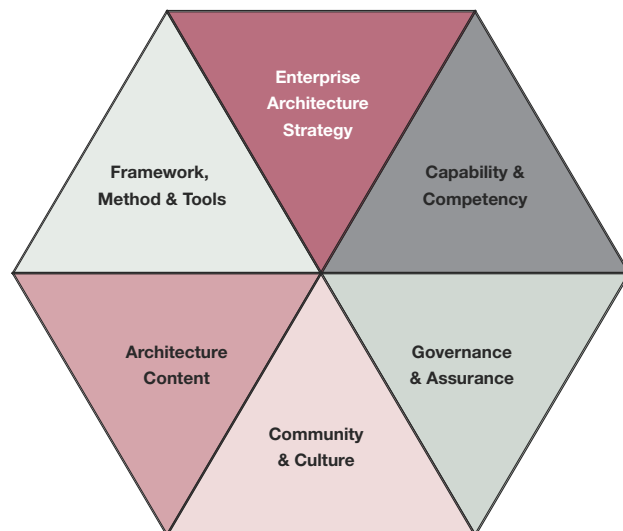
A number of key ingredients must be combined to create an effective internal Enterprise Architecture capability. Developing an Enterprise Architecture capability needs to address the following areas:

- **Enterprise Architecture Strategy.** Enterprise Architecture translates the strategic objectives and vision of an enterprise into a realizable blueprint for business and IT change. There must therefore be a clear strategy, value case and mandate for the role of Enterprise Architecture within the organization. Without such a strategy and vision to steer overall direction and principles, there is little chance of Enterprise Architecture demonstrating tangible value.
- **Framework, Method and Tools.** Enterprise Architecture occupies a broad spectrum from strategic planning to project-level solution design. There are tools and techniques that support activities across this, but no single tool or technique provides the whole answer. The organization must therefore choose a framework, method and tools that are robust, scalable and sustainable for both architecture development and its ongoing maintenance.
- **Capability and Competency.** Enterprise Architecture is complex and requires a strong blend of capabilities, competencies and experiences. A common misconception is that IT people are best suited for this role. Experience shows that it is essential to achieve a balance between technical, business and managerial skills, supported by well-structured skills development and training.
- **Architecture Content.** Enterprise Architecture is expressed through often complex and interdependent content that defines the business and technology landscape of an organization. Whilst it is essential to have knowledge and understanding of the current landscape to plan for and define what the future should look like, it is critical to focus on content that addresses the strategic change agenda and presents a realizable vision of the future. Many Enterprise Architecture initiatives have failed because one or more of these ingredients is missing. Even where projects possess all of them, it is often tempting to focus on a particular enterprise problem, resulting in an output that cannot evolve into a sustainable Enterprise Architecture capability.

- **Community and Culture.** Enterprise Architecture is expressed through often complex and interdependent content that defines the business and technology landscape of an organization. Whilst it is essential to have knowledge and understanding of the current landscape to plan for and define what the future should look like, it is critical to focus on content that addresses the strategic change agenda and presents a realizable vision of the future.
- **Governance and Assurance.** Enterprise Architecture is a knowledge-intensive activity. Experience shows that good governance and a well-defined architecture management process is critical to ensure that knowledge is captured effectively so that it can be applied, managed and maintained at all stages from its initial creation through business and IT change projects.

By bringing ingredients together in the **right order**, at the **right time** and involving the **right people**, it is possible to create the basis of a successful and sustainable Enterprise Architecture function.

**Figure 9. Enterprise Architecture Capability**



Capgemini uses a practical and proven approach that ensures all key ingredients are in place to facilitate return on investment to meet strategic business and IT goals for an organization. The approach is iterative to ensure that the right balance is struck between investment in capability development, strategic needs of the business and capacity of an organization to embrace Enterprise Architecture as a professional discipline. It comprises the following phases:

- Define
- Design
- Setup and Establish
- Test (Value)
- Implement and Embed
- Refine and Evolve

The work is “framework independent” with one of the activities being selection and customization of the most appropriate framework. However, use of Capgemini’s IAF as the framework (or the basis) offers many advantages to organizations building such a capability. It offers a proven, comprehensive and coherent framework complete with supporting material and training.

More details on the approach can be found in a separate Thought Leadership paper “Enterprise Architecture, developing the capability to deliver value.”

## 9. Supporting and Developing the Capability within Capgemini

Capgemini's architecture capability is delivered throughout the world by experienced professionals across the organization. A global Community of Practice, formed at the very start of IAF development, supports individuals and remains at the core of the capability to support its evolution.

At the time of writing, the worldwide organization has around 1000 professionals delivering architecture services as experienced Business or IT specialists. The Global Architecture Community numbers some 1500 active members, including senior designers and engineers as well as technical specialists. This Community is supported by comprehensive knowledge and collaboration tools.

The Community represents a vast amount of experience and knowledge, both through technology as well as a global network of people who share experiences with each other as well as delivering benefit to clients. Regular Architects Week (A-Week) events delivering the Architecture Learning Program allow networks to be built and refreshed.

The Community also owns and undertakes development of the approach (IAF) as well as training and certification programs. This ensures that the framework and supporting training and certification evolve in line with the real world. An elected Community Council facilitates the latter, providing necessary governance and prioritization.

The Architecture Learning Programme (ALP) and Capgemini Architects Certification Programme are a critical part of Capgemini's support for the Architects' profession.

### 9.1 Architects Certification

Certification for Architects was launched within Capgemini in 1998. This program is based on candidates demonstrating their architecture capabilities, their experience of delivering architecture and knowledge and experience of IAF.

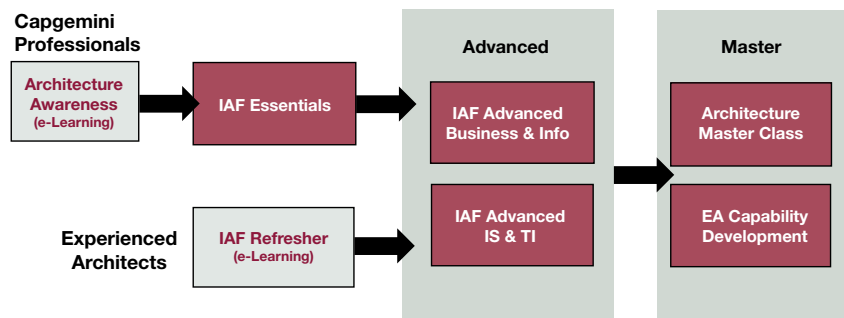
Capgemini is also working closely with organizations, including The Open Group and Microsoft, who have themselves launched industry Certification programs for IT Architects. The specific schemes launched are The Open Group IT Architect Certification (ITAC) and Microsoft Certified Architect (MCA).

Investment in these training and certification programs is clear evidence of the importance of architecture to Capgemini.

## 9.2 Architects Training

The Architects Learning Programme (ALP) is the premier program for architects in Capgemini and is designed to nurture professionalism amongst those with no architecture experience as well as experienced architects looking to sharpen their skills and adopt best practice:

**Figure 10. Architecture Learning Program**



Development and delivery (facilitation) of the material is undertaken by experienced Capgemini Architects, bringing their knowledge and experience of real-world projects into the material and the classroom.

Training is run around six times a year at the Capgemini University near Paris, as part of a week-long training event, “A-Week,” attended by professionals from across the group (often over 16 nationalities). Additional events are run in North America and India.

Since the inception of training at the University, around 55 A-Weeks have been run worldwide, which together with specific courses run at country levels, have reached over 2,500 attendees.

Courses can be customized and delivered to clients who have already adopted IAF as their framework.

### **9.3 Ongoing Development**

The overall development approach for IAF and the ALP is based on a Community Development Model, tapping into the members of the Architects Community worldwide to incorporate feedback and real-world experience from clients.

The Integrated Architecture Framework was updated to IAF 4.0, and the Architecture Learning Programme courses were refreshed during 2006.

At the same time, Capgemini is actively engaging with industry bodies like The Open Group and OASIS (the Organization for the Advancement of Structured Information Standards) to share best practice and lessons learned from thousands of man-years of experience across the Capgemini community.



## 10. IAF, TOGAF and IEEE 1471-2000

During the evolution of IAF, and various other industry standards, many areas have converged in terms of overall positioning. IAF is compatible with The Open Group Architecture Framework (TOGAF) and with IEEE 1471-2000 *“Recommended Practice for Architectural Description of Software-Intensive Systems.”*

As an example, the following key definitions are taken directly from TOGAF version 8.1, Developing Architecture Views (Introduction):

*“The architecture of a system is the system’s fundamental organization, embodied in its components, their relationships to each other and to the environment, and the principles guiding its design and evolution.”*

*“A view is a representation of a whole system from the perspective of a related set of concerns.”*

Both of these key definitions are compatible with the use of these terms within IAF, especially when you consider “system” to cover both Business and IT “systems.” It is also worth noting that both of these definitions are based on, and compatible with those definitions in IEEE 1471-2000.

In looking at TOGAF it is clear that it provides best practice around the organization and processes required for an Enterprise Architecture function within an organization, but does not restrict the architecture models and language to be applied. This allows organizations to select a model that is most appropriate for their business.

IAF itself provides a complete and consistent way to describe the architecture, which is applied for different clients and in different contexts using the relevant Engagement Roadmap. TOGAF can be used as the basis for the process and organization for an architecture function (providing the “Engagement Roadmap” for IAF) with IAF providing the architectural models and language.

The Open Group has formally accepted IAF as a recognized method within its IT Architect Certification (ITAC) program.

# 11. Summary

Since 1993, Capgemini has been using Business and IT Architecture to help reduce project risk, improve Business/IT Alignment and add value to client businesses.

Architecture is ***all about the business***: even for IT-centric projects, the solution must deliver business value and be clearly aligned to the business direction if it is to be successful. For architecture to be able to deliver this, all decisions must be clearly justified and traceable to business needs.

The Integrated Architecture Framework (IAF), underpinned by the Architects Learning Programme, Capgemini's Architects Community and Architects Certification Programme, provides the foundation on which architecture is delivered by Capgemini.

The Integrated Architecture Framework is also successfully deployed in a number of major client organizations, as part of their architecture capability, and offers these advantages to the client organization.

Further information on the organisations, frameworks and certification schemes mentioned in this document can found on the Internet using the following links (correct at the time of publication):

- IEEE 1471-2000  
<http://www.ieee.org>
- The Open Group  
<http://www.opengroup.org>
- The Open Group Architecture Framework (TOGAF)  
<http://www.opengroup.org/togaf>
- Zachman Framework for Enterprise Architecture  
<http://www.zifa.com>
- The Open Group's IT Architect Certification (ITAC)  
<http://www.opengroup.org/itac>
- Microsoft's Certified Architect (MCA)  
<http://www.microsoft.com/learning/mcp/architect>
- Organization for the Advancement of Structured Information Standards  
<http://www.oasis-open.org>



## About Capgemini and the Collaborative Business Experience

Capgemini, one of the world's foremost providers of Consulting, Technology and Outsourcing services, has a unique way of working with its clients, called the Collaborative Business Experience.

Backed by over three decades of industry and service experience, the Collaborative Business Experience is designed to help our clients achieve better, faster, more sustainable results through seamless access to our network of world-leading technology partners and

collaboration-focused methods and tools. Through commitment to mutual success and the achievement of tangible value, we help businesses implement growth strategies, leverage technology, and thrive through the power of collaboration.

Capgemini employs approximately 68,000 people worldwide and reported 2006 global revenues of 7.7 billion euros.

More information about our services, offices and research is available at [www.capgemini.com](http://www.capgemini.com).

### Disclaimer

All advice given and statements and recommendations made in this document are:

1. Provided in good faith on the basis of information provided by you, third parties and/or otherwise generally available or known to Capgemini at the time of writing.
2. Made strictly on the basis that in no circumstances shall they constitute or be deemed to constitute a warranty by Capgemini as to their accuracy or completeness. Capgemini shall not be liable for any loss, expense, damage or claim arising out of, or in connection with the making of them in this document or for any omission from them.
3. The information contained within this document is and shall remain the property of Capgemini. This White Paper is supplied in strict confidence and must not be reproduced in whole or in part, used in tendering or for manufacturing purposes or given or communicated to any third party without the prior consent of Capgemini.

**France**

Coeur Défense Tour A110  
esplanade du Général de Gaulle  
92931 Paris La Défense  
+33 (0)1 49 67 30 00

**Germany**

Berliner Straße 76  
D-63065 Offenbach am Main  
+49 (0) 69 95 150

**Netherlands**

Papendorpseweg 100  
3528 BJ Utrecht  
Postbus 2575  
3500 GN Utrecht  
+31 30 689 00 00

**United Kingdom**

76-88 Wardour Street  
London W1F 0UU  
+44 870 238 8779

**United States**

750, 7th Avenue  
New York, NY 10019  
+1 917 934 8402