

White Paper

Building Enterprise Architectures for Non-Architects

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Louw Labuschagne CBPA®

Louw is a Managing Partner at CS Interactive Training, a specialist IT consultancy focused on providing methodology consulting, training and systems to organizations who need to build internal capacity within their Analysis, Architecture, Design, and Requirements Management environments. Louw is passionate about all aspects of information management and has had the opportunity to act as strategist, architect, speaker, trainer, analyst, modeler and developer within this field over the past 20 years.



Enterprise architecture deals with the design and implementation of the high-level structure of the enterprise. It is the result of assembling a certain number of architectural elements in some well-chosen forms to satisfy the major functionality and performance requirements of the system, as well as some other, non-functional requirements such as reliability, scalability, portability, and availability.

Perry and Wolfe put it very nicely in this formula, modified by Boehm: Architecture = {Elements, Forms, Rationale/Constraints}



- source not mentioned to protect the innocent.

If you were nodding your head in agreement with the statement above, then you should read this white paper. If you read the above statement and did not have a clue what it meant, then you must **really** read this white paper.

Enterprise Architecture (EA), contrary to popular belief, is not about designing systems, processes, information flows or new technology, as stated above, but it is about **communication, risk** and managing **change** in the organization. When I hear the complaint from the business that “the EA team is locked in their ivory tower again” I immediately jump to the conclusion that the EA team is treating the business (or enterprise) as a software system and that the team members have not made the transition from IT Architecture to Enterprise Architecture.

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Apart from being technically proficient, a good Enterprise Architect must also have the ability to communicate his ideas and designs to a broad range of stakeholders inside and outside of the organization. Before you share information with someone in the organization, you need to be sure of the following facts; **who** you need to communicate with, **when** to organize a communication session, **what** needs to be shared, **how** to represent the content you want to share, **why** you are sharing the specific content and lastly **where** you will store the content for future reference.

Several frameworks and techniques exist to help an architect identify people inside and outside the organization (also known as stakeholders) that have a vested interest in the architecture (also known as stakeholders). In this white paper I will focus on a few that I found useful over the years.

I will start with a quick overview ISO/IEC 42010, a standard referenced by a large number of architecture practitioners (and also by the TOGAF 9 standard) to define key concepts like stakeholder, view and viewpoint that I will use later to make some recommendations on how to communicate with different non-architects. This will answer the question of **why** we are sharing specific content and with whom.

Following the section explaining the concepts I will briefly explain the TOGAF Architecture Development Method (expanding on **how** and **when** we present the information) and the ArchiMate Viewpoint library (expanding on **what** to share with **whom**). The white paper will conclude with an introduction to the Zachman framework, a framework for the thinking architect, and also a good guide to figure out **where** to store the information.

It's important to have all these frameworks available in an architecture toolbox that might just come in handy one day when you are trying to break down the walls of the EA ivory tower.

Why (ISO 42010)

The first question we want to answer is why do we want to involve other people (let's call them stakeholders) in the architecture activity? The answer is quite simple if you agree with the following definition of Enterprise Architecture. "EA is the practice of managing the complexities that drive change within an organization while identifying and reducing the risks involved in the change process.", if you don't agree then it would be best to just skip this section and go to the next question.

The best source for understanding why we involve other people is described in the diagram below explaining basic architecture concepts as defined in ISO 42010:2007, a standard that originated in the IEEE (Institute of Electrical and Electronics Engineers), now widely used in the architecture community and other architecture frameworks (including

TOGAF 9 – see the tip below for a link to the TOGAF 9 online document where the diagram is discussed in more detail).

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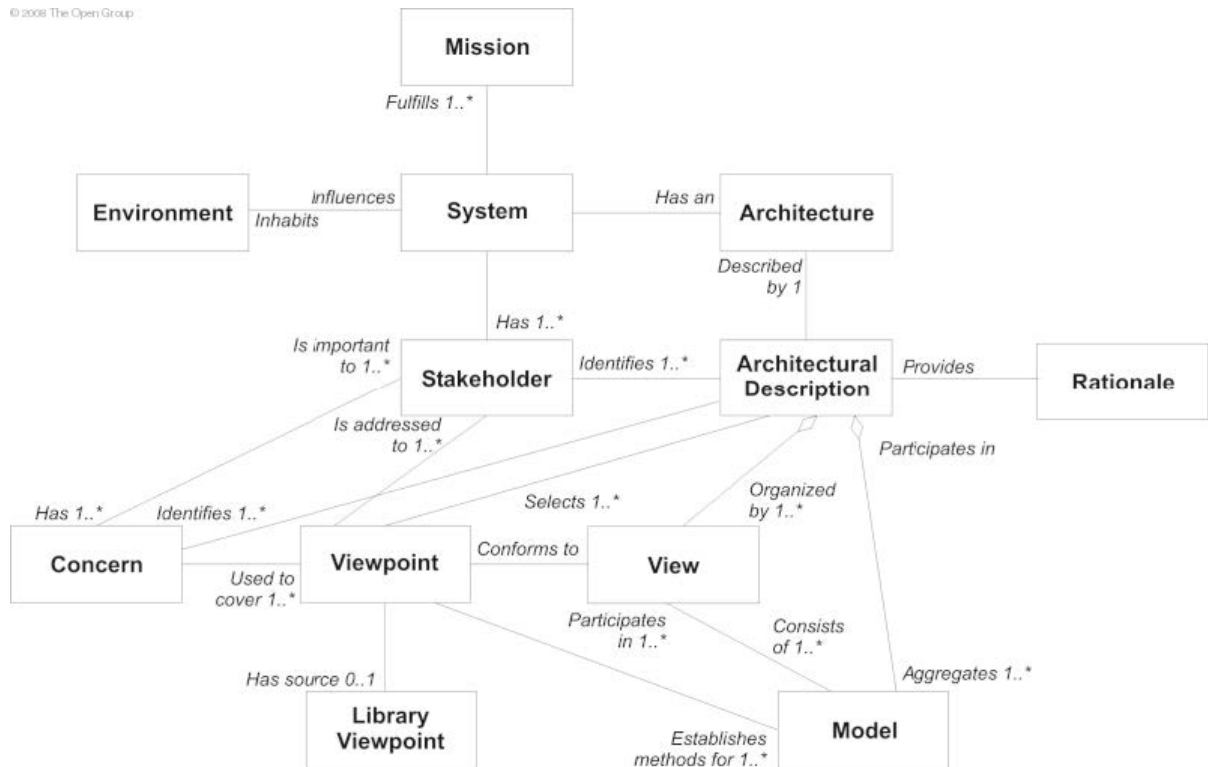


Figure 1: ISO/IEC 42010:2007 (published from TOGAF 9, Chapter 35)

In the diagram above the Stakeholders, their concerns and the architecture description are the key concepts that will answer the ‘why’ question. The other basic concepts will be discussed in the following sections.

Since we agree that Enterprise Architecture is about managing complexity in an Enterprise, we first need to identify the key elements in an organization and then document it. On the diagram the **Architecture** concept represents the key elements in the organization and their relationship with other elements and their environment, while the **Architecture Description** is the collection of models and views that represent the architecture in documented form.

We now have people inside and outside the Enterprise that have key roles in the Enterprise or who have concerns about the Enterprise, these people are called **Stakeholders**, and can be users, developers, managers, government regulators or key partners. Stakeholders can be individuals, teams, or organizations and all have different concerns about changes to or risk exposure of the Enterprise.

The key interests of the Stakeholders that are crucially important to them are called **Concerns** and addressing these concerns is crucially important in determining the acceptability of the risk or change within the Enterprise. It is the function of the EA team to ensure that Stakeholders’ concerns are being addressed by the architecture description, and the only way that it can be done is by creating **Views**. That is the reason **why** we create architecture views for stakeholders (to address their concerns).

The logical next question would now be, **what** information do I share with **whom**?



TIP: Download the next proposed update of ISO /IEC 42010 from this location: <http://www.iso-architecture.org/ieee-1471/docs/ISO-IEC-FDIS-42010.pdf> or view TOGAF 9 online and find a reference to the ISO / IEC 42020 diagram here: http://pubs.opengroup.org/architecture/togaf9-doc/arch/chap35.html#tag_35_01

What & Who (ArchiMate Viewpoints)

From the previous section we concluded that a stakeholder's **concerns** must be addressed by a **view**. The ArchiMate 1.0 standard defines a **view** as being part of the **architecture description** of the enterprise that addresses a set of related **concerns** of a set of stakeholders. The **viewpoints** defined in ArchiMate are used to specify which the concepts, models, analysis techniques, and visualisations are provided to its corresponding **view**.

I find the ArchiMate viewpoint framework very useful (http://www.opengroup.org/archimate/doc/ts_archimate/chap9.html) when I need to identify the most appropriate views to create for specific stakeholders. The framework contains two dimensions, the first dimension identifies the purpose of the viewpoints contained within and each purpose is coloured differently to enable easier classification:

- **Designing Viewpoints:** Formal modeling notations (e.g. UML or ArchiMate) that are used by architects and designers in the design process.
- **Deciding Viewpoints:** Decision support viewpoints support management and other business and IT professionals to analyse the architectural description of the enterprise offering insight into cross-domain architecture relations, normally using projections and intersections of underlying models, but also by means of analytical techniques.
- **Informing Viewpoints:** Customers and employees are normally associated with these viewpoints that can be used in conjunction with communication and other strategies to drive the Enterprise change and risk mitigation agenda.

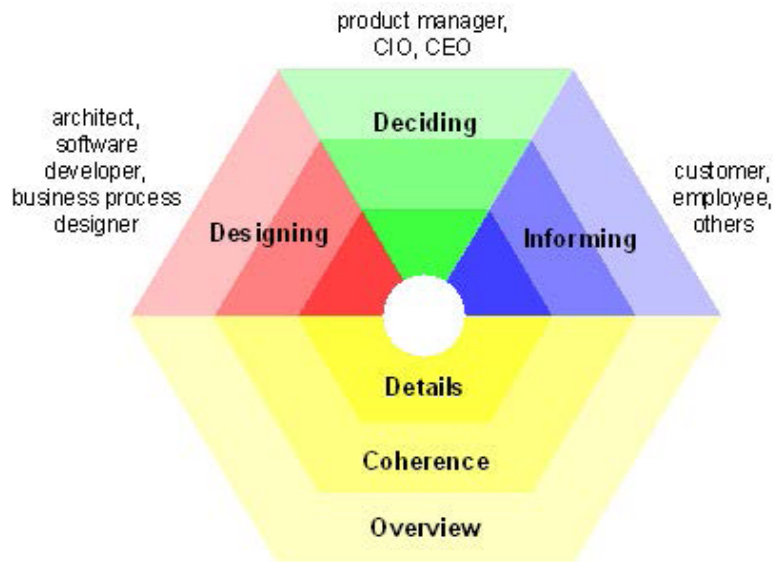


Figure 2: ArchiMate Viewpoint Classification

Once the purpose is selected and you understand **who** the stakeholder group is, then the second dimension can be discussed. To be able to identify a final stakeholder viewpoint, the right content abstraction level must be selected.

The content (**'what'**) is usually defined in the following three levels of abstraction:

- **Details:** Views on the detailed level typically consider one layer and one aspect from the ArchiMate framework.
- **Coherence:** At the coherence abstraction level, multiple layers or multiple aspects are spanned
- **Overview:** The overview abstraction level addresses both multiple layers and multiple aspects.

Working with an Example ArchiMate Viewpoint After identifying who the stakeholder is, and what abstraction level is required, an appropriate pre-defined viewpoint can be selected from the ArchiMate 1.0 standard. (http://www.opengroup.org/archimate/doc/ts_archimate/chap9.html)


Business Process Viewpoint		
Stakeholders	Process and domain architects, operational managers	
Concerns	Structure of business processes, consistency and completeness, responsibilities	
Purpose	Designing	
Abstraction Level	Detail	
Layer	Business layer	
Aspects	Behaviour	

Figure 3: Business Process Viewpoint Description

As part of the Architecture **Viewpoint Library**, the meta-model plus an implementation example are included for all the pre-defined viewpoints. The example I am using is the Business Process viewpoint that only contain business concepts. Other Viewpoints can be defined across domains, but the detail discussion of the ArchiMate Viewpoint Library falls outside the scope of this white paper.

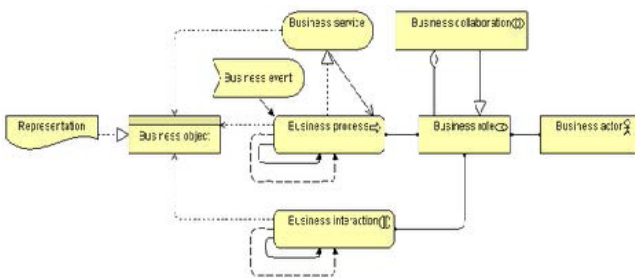


Figure 4: Business Process Viewpoint Meta-model

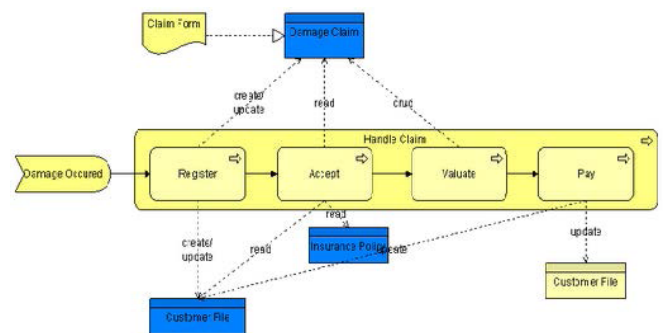


Figure 5: Example Business Process View

At this point you should have a list of Stakeholders (based on their concerns) and you should be able to identify the set of viewpoints from the ArchiMate Viewpoint library (http://www.opengroup.org/archimate/doc/ts_archimate/chap9.html) that you want to use.

The logical next step is to understand **how** to create a view from the viewpoint provided.

How & When (The TOGAF 9 ADM)

The Open Group Architecture Framework (TOGAF) is one of a very few Enterprise Architecture frameworks that contain a generic Architecture Development Method (ADM). The ADM enables architects to follow a best practice approach in developing a wide range of architectures. The ADM provide guidance on **how** views are created (see the Phase B: Business Architecture steps below for more detail) and the ADM lifecycle selected by the Enterprise will determine **when** the views will be created.

When are Architecture Views created?

The ADM phases A: Vision, B: Business Arch, C: Information Systems Arch, D: Technology Arch and E: Opportunities & Solutions form the core of the Architecture Development cycle on the larger project where views are created for different stakeholders.

The core architecture design views are created during Phase B- D and there is a strong link between these phases and the ArchiMate 1.0 standard architecture viewpoints layers; Business, Application and Technology (see the diagram below).

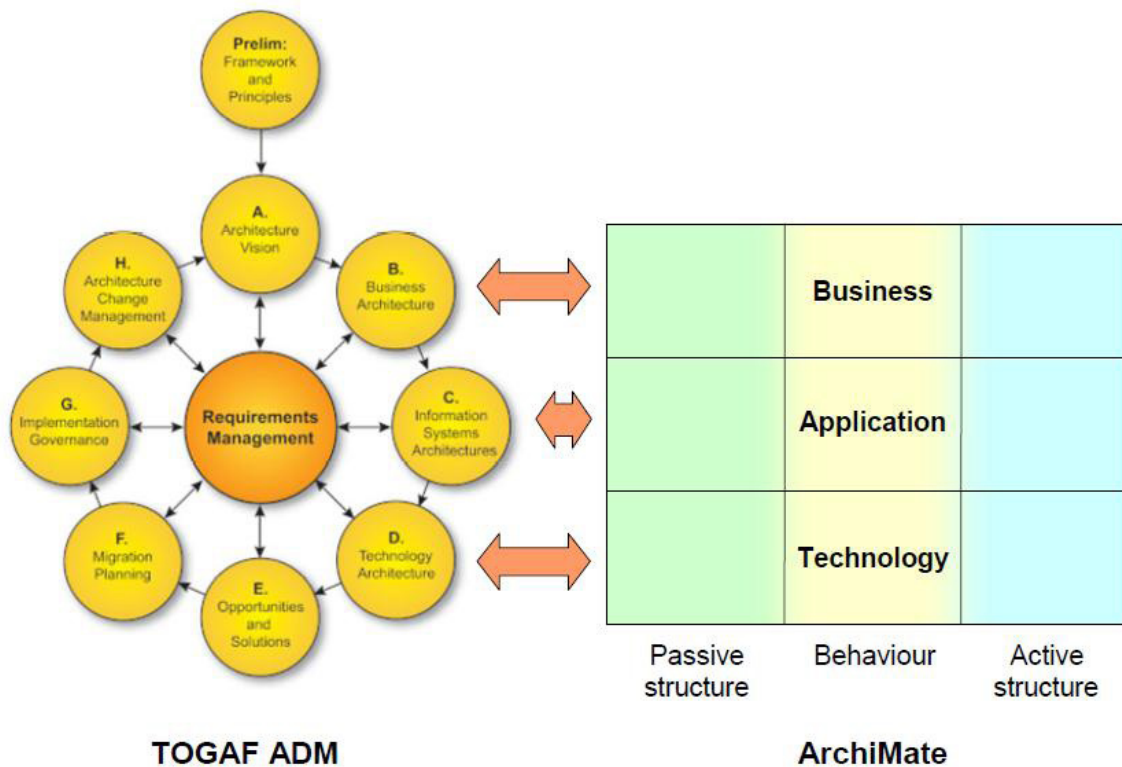


Figure 6: TOGAF ADM linked to ArchiMate Viewpoint Layers

How do I present information to stakeholders?

In the TOGAF 9 ADM Phase B steps below I've highlighted those activities in **red** that involve the definition of **how** the views will be created or used for a specific project during the Business Architecture definition phase.

TOGAF 9 ADM Phase B: Steps

1. Select Reference Models, **Viewpoints**, and Tools
2. Develop **Baseline Business Architecture** Description
3. Develop **Target Business Architecture** Description
4. Perform **Gap Analysis**
5. Define Roadmap Components
6. Resolve Impacts Across the Architecture Landscape
7. Conduct Formal Stakeholder Review
8. Finalize the Business Architecture
9. Create Architecture Definition Document

Figure 7: TOGAF ADM Phase B: Business Architecture Steps



TIP: This section on the TOGAF 9 ADM is a brief overview that is focused on explaining the links between frameworks. Go online and explore the TOGAF 9 online document (and especially the ADM in more detail) <http://pubs.opengroup.org/architecture/togaf9-doc/arch/toc-pt2.html>

Where (The Zachman Framework)

Now that you have created this magnitude of viewpoints for different stakeholders, **where** do you save the content for future re-use? How do you classify your information after the project is completed?

The best place to store artefacts would be in an architecture repository, but if you use an architecture repository to store the information, are you storing it in its primitive form, breaking all the views you have created into their smallest logical components (primitive elements)?

The Zachman framework is a 6 x 6 matrix that defines the total set of primitive models that you need in an organization and any view that you built before or are thinking about building in the future can be defined in the framework. The framework can also be used to define the composite views required by the organization, but for architects starting out, I normally recommend ArchiMate as a good clean start in building and defining views.

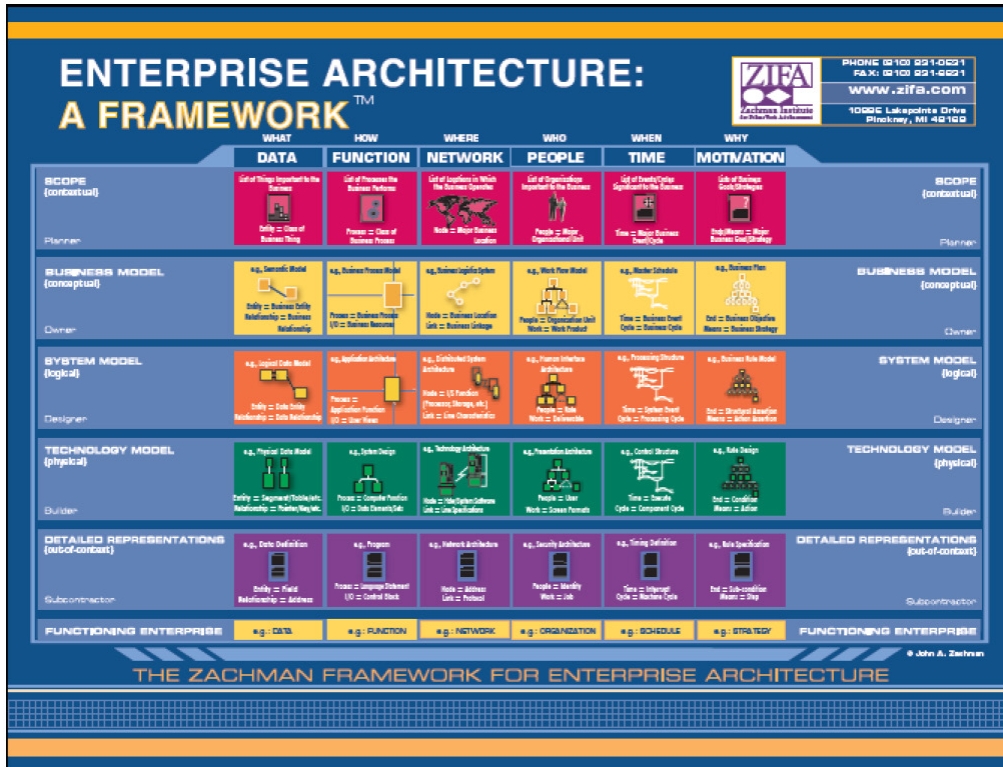


Figure 7: The Zachman Framework

To answer the Question: **where** to store the views created? I would suggest using a proper Enterprise Architecture Repository with a flexible meta-model that can be adapted to accommodate the enterprise ontology, specified by John Zachman.

Conclusion

Building Enterprise Architectures in an organization should not be internally focused, but should support the key stakeholders within (and external to) the enterprise.

In this white paper I briefly introduced a few frameworks and standards that can be used when working with stakeholders and I tried to make the elements involved in defining views easy to remember by asking 6 questions:

Why: Understanding stakeholders and their concerns and why we use views [ISO 42010]

Who: Identify stakeholders and classify types of stakeholders [ArchiMate Viewpoints]

What: Select the right viewpoints for the identified stakeholders [ArchiMate Viewpoints]

When: Identify the phase in the Architecture development cycle when the viewpoint will be used to build the view [TOGAF 9 ADM]

How: Understand how views fit into the activities performed during the Architecture development cycle [TOGAF 9 ADM]

Where: Select the right place to store the views and understand the value of a good repository that is flexible enough to store any view [Zachman Framework]

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Orbus Software

3rd Floor
111 Buckingham Palace Road
London
SW1W 0SR
United Kingdom

+44 (0) 870 991 1851
enquiries@orbussoftware.com
www.orbussoftware.com

