Exploring the Role of Enterprise Architecture in Organizational Design
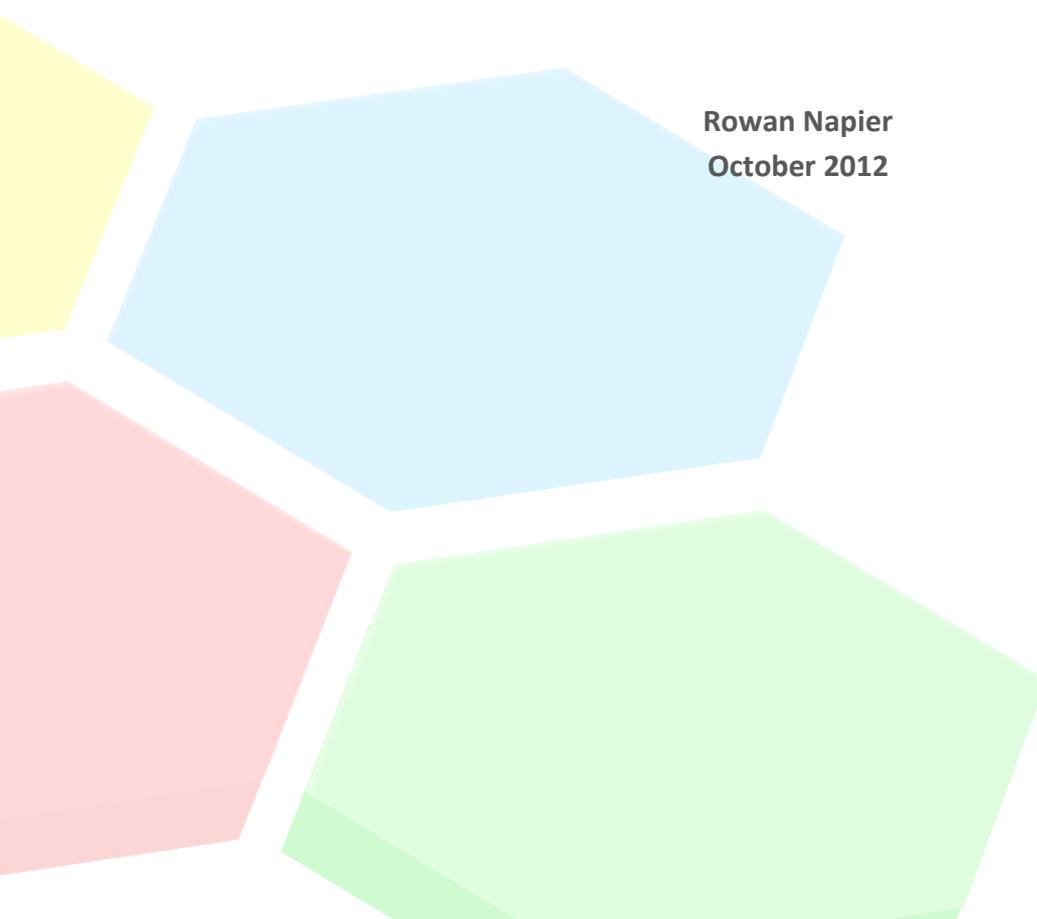
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October 2012

Introduction

An enterprise architecture capability, like any other business function, requires a number of elements such as **people**, processes, technology, and information in order to operate effectively. This paper aims to explore how we are organized to do the work as efficiently as possible within the EA function and considers the contributing role that the EA function has in the larger enterprise organizational design context and taking into account the operating model of the enterprise.

Key to understanding this we need to explore why we are organizing in the first place, organizational theory suggests that organizing on purpose ("Why" interrogative) i.e. the purpose for which a group exists should be the foundation for everything its members do including the choice of an appropriate way to organize.

The idea is to create a way of organizing that best suits the purpose to be accomplished, regardless of the way in which other, dissimilar groups are organized. "Architecture is about constraining decision-making options; it is about the things that have to be done a particular way to ensure that a **solution is *fit* for purpose for its mission in those environments** where it may be deployed" as written by Leonard Fehskens, VP, Skills and Capabilities at The Open Group.

The EARF defines Enterprise Architecture as the continuous practice of describing the essential elements of a **socio**-technical organization, their relationships to each other and to the environment, in order to understand complexity and manage change.

We can clearly see that defining an "organizational" architecture to understand "Who" will do the work of the enterprise relative to the other facets (Figure 1) to support its purpose is important. The end-object is to engineer and manufacture the enterprise and not simply to build and run systems.

John Zachman in his framework standards mentions that an enterprise (enterprise in this context referring to the scope i.e. enterprise, division, business unit scope, under consideration) can be viewed from individual facets or abstractions as seen below in Figure 1, this indicates the focus and the Organizational Facet will be the focus for this paper.

The Enterprise is like a hologram
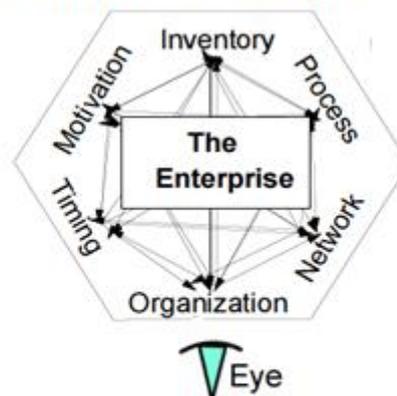
If you only look at the Enterprise through a single facet, you see everything relative to that facet.

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A **complete** "organizational" architecture of the enterprise from the Organizational Facet would have to include descriptive representations i.e. models, from all intersecting abstractions from this facet (Motivation, Timing, Inventory, Process and Network) as well as from the various perspectives of the users of these models (Executives, Business Management, Architecture, Engineers and Technicians).

I feel that in order for the EA function to effectively support the organizational design teams the EA Function should be responsible for the development of primitive models and composite integrations at the Business Management perspective to ensure a robust organizational architecture on which organizational designers and builders can move forward.

So the first composite model to be built in my opinion would be between the motivation (*means and ends concepts*) and the Organization **concepts** across the Business Management perspective in support of the organization theory of organizing around **purpose**, see Figure 3.

This is communicated in the OMG's Business Motivation Model in Figure 2 below where the decomposition of Business Policies, Courses of Action, and Desired Results and assignment of responsibilities within the enterprise is often guided by (or, at least, consistent with) the definition of units within the organization structure.
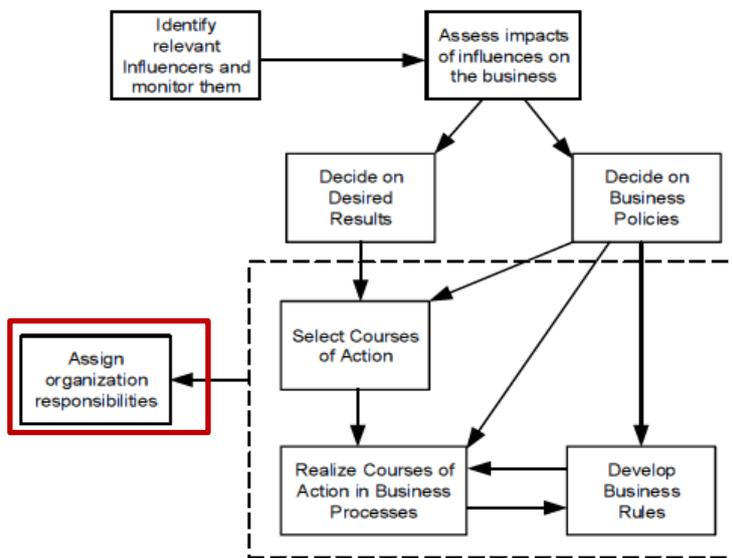

Figure 2: Logical progression through the Business Motivation Model

Organizational Theory

Organizational Theory
Theorists today believe that there is no one best way to organize. What is important is that there be a *fit* between the organization's structure, its size, its technology, and the requirements of its environment. This perspective is known as **"contingency theory"**.

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When we organize we seek to direct, or pattern, the activities of a group of people toward a common outcome. How this pattern is designed and implemented greatly influences effectiveness.

Patterns of activity that are complementary and interdependent are more likely to result in the achievement of intended outcomes. In contrast, activity patterns that are unrelated and independent are more likely to produce unpredictable and often unintended results.

- Structure is designed to enhance communication and information flow among people.
- Systems are designed to encourage individual responsibility and decision making.
- Technology is used to enhance human capabilities to accomplish meaningful work. The end product is an integrated system of people and resources, tailored to the specific direction of the organization.

Architecture Thinking

Enterprise Modeling

To remain competitive, enterprises must become increasingly agile and integrated across their functions. Enterprise models play a critical role in this integration, enabling better designs for enterprises, analysis of their performance, and management of their operations.

We need to be able to explore alternative models in the design of enterprises spanning organization structure and behaviour. To reason about alternative designs for enterprises, we need to reason about different possible sets of **constraints** for enterprises within the model. **These constraints are informed by the chosen operating model and environment in which the enterprise operates.**

Enterprise-Modeling ontologies are distinguished by their scope and the central role of integrating multiple ontologies. The ontologies must be able to **represent and define** concepts in the domains of activity, time, resource, product, service, organization, goal, and policy.

Further, these ontologies **must be integrated** to support reasoning that requires the use of multiple ontologies and support interoperability among tools using different ontologies.

I submit that the Zachman Framework be used as an integrated Enterprise Ontology as the basis for defining enterprise implementations in a standard, defined and repeatable manner.

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Operating Model Determinants

The operating model decision i.e. how your company intends to deliver goods and services to its customers, has a definite impact on how it will go about implementing business processes and its IT infrastructure .

I find that the operating model decision is crucial to inform as well as constrain the organizational design of the enterprise when using an Enterprise Architecture approach to define business processes and IT infrastructure in a way that reflects the *integration and standardization* requirements of the companies *operating model*.

The *standardization* and *integration* dimensions referred to are:

a) The standardization of business processes and systems
b) And integration of shared data across organizational units to support common business objectives, this data can be between processes (1-1) or across processes (1-*).

Each of the operating model characteristic described below provides ideas as to which business concepts should be considered from the business management perspective.

	Coordination • Shared customers, products, or suppliers • Impact on other business unit transactions • Operationally unique business units or functions • Autonomous business management • Business unit control over business process design • Shared customer/supplier/product data • Consensus processes for designing IT infrastructure services; IT application decisions made within business units.	**Unification** • Customers and suppliers may be local or global • Globally integrated business processes often with support of enterprise systems • Business units with similar or overlapping operations • Centralised management often applying functional/process/business unit matrices • High-level process owners design standardised processes • Centrally mandated database • IT decisions made centrally
	Diversification • Few, if any, shared customers or suppliers • Independent transactions • Operationally unique business units • Autonomous business management • Business unit control over business process design • Few data standards across business units • Most IT decisions made within business units	**Replication** • Few, if any, shared customers • Independent transactions aggregated at a high level • Operationally similar business units • Autonomous business unit leaders with limited discretion over processes • Centralised (or federal) control over business process design • Standardised data definitions but data local owned with some aggregation at corporate • Centrally mandated IT Services

Y-axis: **Business Process Integration** (High / Low)

X-axis: Low — High — **Business Process Standardization**

Figure 3: Characteristics of Four Operating Models

Looking at a definition of organizational design "*it is a formal, guided process for integrating the people, information and technology of an organization. It is used to match the form of the organization as closely as possible to the purpose(s) the organization seeks to achieve*" we can begin to see the impact between the selected operating model i.e. the general vision of how a company will enable and execute strategies and the appropriate organizational design.

A high-level enterprise architecture at the Business Management (owners) perspective of *business concepts* creates a shared understanding of how a company will operate, but the convergence of people, process, and technology necessary to implement that architecture demands shared understanding of process and data at a more detailed level within the Architecture (Designers), Engineering (Builders) and Technicians (Implementers) perspectives.

Encapsulating this high-level enterprise architecture in a core diagram, **The Operating Model is a viewpoint** on the guiding policies that expresses the integration and standardization intentions.

This simple one page picture is a high-level view of the process, data, and technologies constituting the desired foundation for execution. *In essence I feel that this viewpoint manifests itself as an architected composite from the Business Management perspective of each of the individual business concepts across interrogatives, Figure 3.*

Figure 4: Zachman Framework 3.0: The Enterprise Ontology

Figure 3, Row 2 - Model of the business (Owner's view): This defines — in business terms —the nature of the business, including its structure, functions, organization, and so forth.

This viewpoint should be used by managers responsible for building out and exploiting the enterprise architecture. **It also has implications for the design of organizational roles and structures.**

By this I mean that the roles and structures defined could and will be influenced by the definitions and integrations between cells untill they are all integrated enterprise wide in scope.

For the complete enterprise description you would have to build each of these models Conceptually (from the perspective of the business "Owners"), Logically (from the perspective of the systems, "Designers") and Physically (from the perspective of the technology "Builders"). You would have to add the Scope and Out of Context perspectives to complete the framework.

For the purposes of organizational design viewpoint the **roles and reporting relationships also need to be aligned with the enterprise the enterprise architecture.**

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The operating model, one in place, becomes a driver of business strategy. In addition, the required architecture-as well as the management thinking, practices, policies, and processes characteristic of each operating model-is different from one operating model to another. **As a result, the operating model could be a key driver of the design of separate organizational units.**

Having different operating models at different organizational levels allows an enterprise to meet the multiple objectives of large, complex companies while keeping organizational design reasonably simple at the individual operating company level so that it can simultaneously meet the companies and its own business objectives.

Industry Determinants

An enterprises particular industry focus could also be used to identify the primitive concepts that should next be defined and integrated with the organization (Who) column of the framework as a second composite model to supplement the characteristics of your chosen operating model.

	WHAT	HOW	WHERE	WHO	WHEN	WHY	
SCOPE							VISIONARIES
BUSINESS	Financial Service	Manufacturers	Transportation, Retailers	Consulting, Education, Government	Emergency Services, Call Centres	Church, United Nations	EXECUTIVE LEADERS
SYSTEM							ARCHITECTS
TECHNOLOGY							ENGINEERS
COMPONENT							IMPLEMENTERS
OPERATIONS							WORKERS
	RESOURCES	FUNCTIONS	NETWORKS	ORGANISATIONS	TIMINGS	MOTIVATIONS	

Figure 5: Zachman Framework Default Industry Focus

Environmental Determinants

Environmental considerations also need to be taken into account when looking at organizational design when analysing your existing design or your intended design.

Adaption	Organizations actively adapt to their environments. For example, organizations facing complex, highly uncertain environments typically differentiate so that each organizational unit is facing a smaller, more certain problem.
Natural Selection	Organizations whose structures are not fitted to the environment will not perform well and will fail. If the environment is stable, this selection process will lead to most organizations being well-adapted to the environment, not because they all changed themselves, but because those that were not well-adapted will have died off.

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Dependence	• The economy is a giant network of organizations linked by buying and selling relationships. Every company has suppliers (inputs) and customers (outputs). Every company is dependent on both their suppliers and their customers for resources and money. To the extent that if a company needs it's suppliers less than they need it, the company has power or vice versa. • Organizations that have power over others are able to impose elements of structure on them e.g. accounting systems, cost controls, manufaturing techniques.
Institutionalisation	Under conditions of uncertainty, organizations imitate others that appear to be successful with intention that they would get the same results without understanding the reason for the organizational structure. One reason why this happens is the fear of litigation or simply blame.

World Class EA

When establishing your EA Function there are key General Business Capabilities that need to be developed, in particular, the highlighted ones below that have an **organizational design implication**.
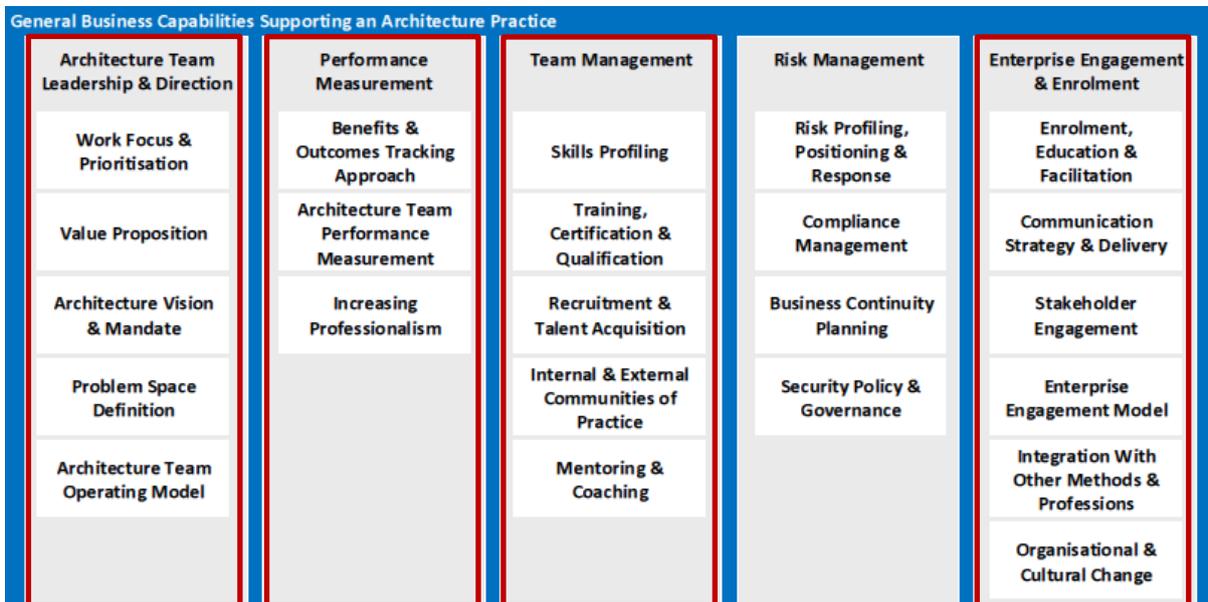

Figure 6: World-Class Enterprise Architecture Capability Model – General Business Capabilities

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Architecture Team Leadership and Direction	– which establishes a mandate for the group, appoints a leader, develops a compelling value proposition for the architecture team, and ensures an **appropriate architectural team operating model** is in place, including the **assignment of accountabilities to individuals.**
Team Management	– which **assigns people to the architecture function** and ensures **appropriately skilled** and supported in order to be effective in their **roles**, including to communities of practices, training, certification, and mentoring and coaching.
Performance Measurement	– which sets targets for the **architecture function** and its members. **Measures performance** against targets and takes the appropriate action in order to deliver to the required performance levels.
Enterprise Engagement & Enrolment	– which keeps interested parties involved and informed about current activities. Aligns the architecture activities to other methods and professions, develops a **stakeholder management model**, and ensures architects have an awareness of **organizational and cultural change.** Also, shares relevant **outputs** from activities within the **operating unit**.

The General Business Capabilities that should be developed will be informed by completing the "Identify the Business Drivers for EA" step in addition to the operating model that was chosen when following the approach to world class enterprise architecture.

Figure 7: World-Class Enterprise Architecture Approach

It is this current stage of development that provides an insight into the rationale behind an enterprises existing structure, challenges, and drivers, which thus helps identify the next steps that the organization needs to undertake in order to further its development.

TOGAF Deliverable

Organizational Model for Enterprise Architecture
One of the outputs from the Preliminary Phase is the organizational model for enterprise architecture; this deliverable should be tailored for use within your organization, but could typically be used to describe the organization model of the EA Function which would include the correct identification and definition of EA roles and responsibilities within the enterprise. The scope of any other organizations that may be impacted, a maturity assessment, gaps and resolution approach, internal as well as external constraints and highlight the governance structure and support strategy.

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Organizational Model for Enterprise Architecture	Preliminary	Preliminary, A, B, C, D, E, F, G, H, Requirements Management

Figure 8: Deliverable/Artifact to ADM Phase Mappings

Organizational Model for Enterprise Architecture	In order for an architecture framework to be used successfully, it must be supported by the correct organization, roles, and responsibilities within the enterprise.

Figure 9: Deliverable/Artifact Descriptions and Templates

ROLES AND RESPONSIBILITIES CHART FORMAT

BUSINESS PROCESS (A major process identified by the BPE Team to be analyzed through Roles and Responsibilities Charting) ACTIVITIES (An action that is one of several sequential steps in the completion of a business process)	FUNCTIONAL ROLES			
	Role1	Role2	Role3	Role4
Activity 1	R	A	C	I
Activity 2	I	R	A	C
Activity 3	C	I	R	A
Activity 4	A	C	I	R

Figure 10: Example Process, Roles and Responsibilities Chart Format

Contained below are some examples of primitive associations and architected composites i.e. derived from primitive models for implementation purposes that you may want to consider for inclusion into your organizational model for enterprise architecture deliverable.
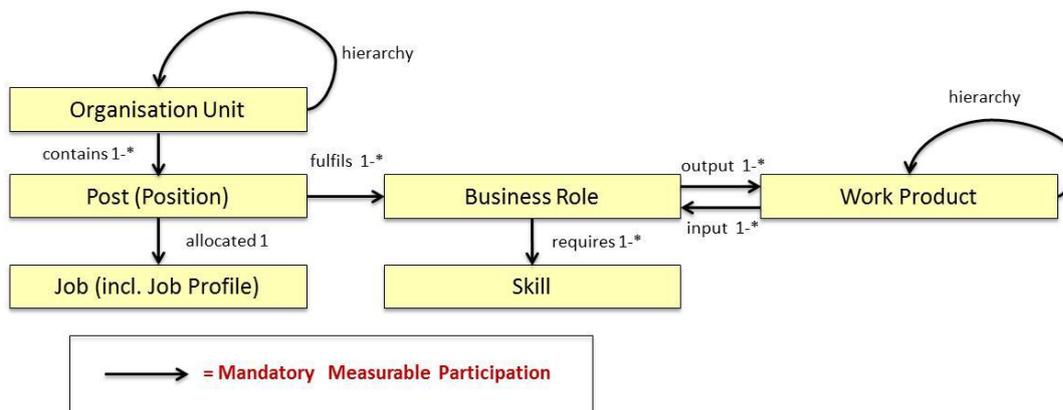
**Figure 11: Example Associations between Primitive Organizational Concepts**

The primitive engineering models (not shown) can be modelled in an enterprise architecture tool like Orbus's iServer by making use of the Archimate language. In this instance the primitives have been extracted for communication purposes into MS-PowerPoint.

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	Domain Architect	Domain Modeller	Business Analyst	BPM Repository Administrator	BPM Quality Regulator	Enterprise Architect	BPM Technical Specialist	BPM&A Domain Trainer	BPM&A Change Leader
L3 Define BPM Framework	C	I	I	I	I	RA	I	I	I
L3 Define BPM Governance	C	I	I	I	I	RA	I	I	I
L3 Define BPM Vision	C	I	I	I	I	RA	I	I	I
L3 Develop BPM Plan	C	I	I	I	I	RA	C	I	I
L3 Develop BPM Training And Communication Plan	C	I	I	I	I	RA	I	I	R

Figure 12: Example Role / Process Responsibility Matrix
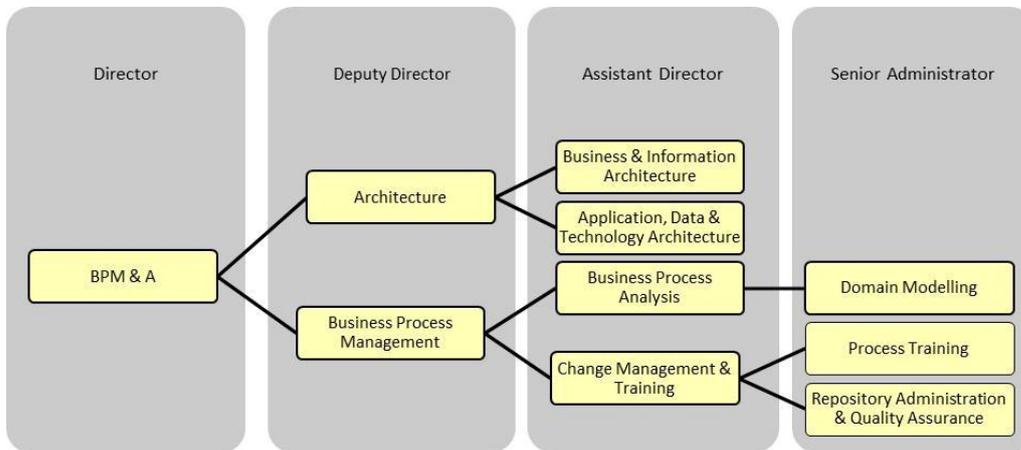
Figure 13: Example Organization Chart

	Domain Architect	Domain Modeller	Business Analyst	BPM Repository Administrator	BPM Quality Regulator	Enterprise Architect	BPM Technical Specialist	BPM&A Domain Trainer	BPM&A Change Leader
Dir: BPM & A						x			x
D Dir / Ass Dir: Architecture	x	x				x			
D Dir / Ass Dir: BPM	x	x	x					x	x
Ass Dir: Domain Architecture	x	x					x		
Ass Dir: Change Management			x		x		x		x
S Admin: QA & Repository Admin				x			x		

Figure 14: Example Position / Business Role Matrix

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	Domain Architect	Domain Modeller	Business Analyst	BPM Repository Administrator	BPM Quality Regulator	Enterprise Architect	BPM Technical Specialist	BPM&A Domain Trainer	BPM&A Change Leader
Consultancy	X		X			X			X
Technical Specialism		X		X	X	X	X	X	
Business Process Improvement	X		X			X		X	X
Enterprise And Business Architecture Development	X		X			X			
Methods And Tools	X	X	X	X		X	X	X	

Figure 15: Example Skill / Business Role Matrix
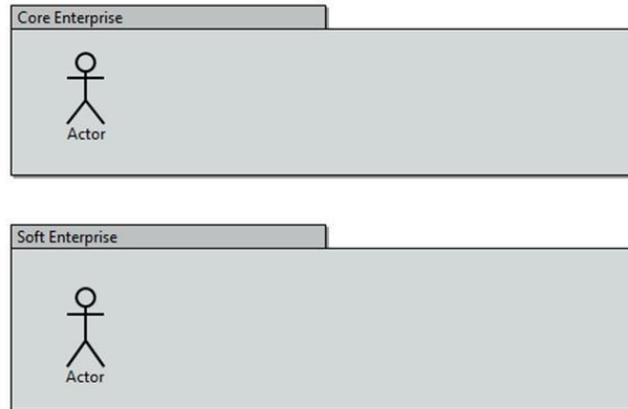
Figure 5: Example of Organizations Impacted

|	Modelled Business Process	Business Process Procedure	BPM&A Meta-Model Change Request	BPM&A Meta-Model	BPM&A Products Requirement	BPM&A Impact Analysis Report	BPM&A Products Proposal	Modelled ICT Solution	Modelled Information Model	BPM&A Logical QA Feedback	BPM&A Quality Report	BPM&A Technical QA Feedback
L3 Develop Business Process Models	X	X										
L3 Develop BPM Meta-Model			X	X								
L3 Develop BPM Products					X	X	X					
L3 Develop ICT Solution Models								X				
L3 Develop Information Models									X			
L3 Quality Assure BPM Models										X	X	X

Figure 16: Example Process / Work Product Matrix

Conclusion

Building out the "Who" column primitives initially from a Business Management (Owners) Perspective enables the organization units of the enterprise in support of its purpose to be understood, enables the roles to which various work product responsibilities to be allocated and enables the business concepts relative to your industry default column e.g. Motivation ("Why") to be defined.

This technique uses an enterprise ontology is a repeatable and scientific way to maintain alignment of the organizational design relative to the opportunities being pursued within a given operating model.

References

1. *TOGAF 9.1* http://pubs.opengroup.org/architecture/togaf9-doc/arch/index.html
2. *Zachman Framework for Enterprise Architecture 3.0* http://www.zachman.com/
3. *Archimate* https://collaboration.opengroup.org/projects/archimate/protected/
4. *World Class Enterprise Architecture – White Paper By: The Open Group Adoption Strategies Working Group* http://www.opengroup.org/bookstore/catalog/w102.htm
5. *What is Organizational Design?* Roy H. Autry, MBA, Ph.D
6. *Enterprise Architecture as Strategy: Creating a Foundation for Business Execution* Jeanne W. Ross, Peter Weill and David C. Robertson.
7. *Organizational Theory: Determinants of Structure* Stephen P. Borgatti
8. *Basic Dimensions in Organizations* Carter McNamara
9. *EARF -* http://hufee.meraka.org.za/Hufeesite/collaborations/earf/definition-for-ea-as-defined-by-the-group
10. *Enterprise Modeling* Mark S. Fox and Michael Gruninger
11. *Leonard Fehskens – The Open Group*
12. *Business Motivation Model 1.1* - http://www.omg.org/
13. *The New Zachman Framework v 01.01-* Paul van der Merwe