Enterprise Architecture

Modelagem de Arquitetura Corporativa

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Architecture

Architecture is the fundamental organization of a system embodied in its components, their relationships to each other, and to the environment, and the principle guiding its design and evolution.

IEEE Standard 1471-2000

Enterprise Architecture

Enterprise architecture: a coherent whole of principles, methods, and models that are used in the design and realization of an enterprise's organizational structure, business processes, information systems, and infrastructure.

The Open Group, 2002

Benefits of EA

- It captures the essentials of the business, IT and its evolution
- It provides a holistic view of the enterprise
- It facilitates alignment between business strategy and daily operations
- It facilitates communication among stakeholders

Flexibility

Enterprise Architecture need to accommodate changes

- The environment changes and new technological opportunities arise
- New insights as to what is essential to the business

Communication



Architecture Description Life Cycle



EA as a Management Instrument



Drivers for Enterprise Architecture

- Internal Drivers
 - Business-IT Alignment
 - Business Optimization/Efficiency
 - Support for development of IT solutions
- External Drivers

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- Wide World economics changes
- New "body of laws"
- Changes in economic sector

Examples of Architecture Frameworks

Zachman Framework

	Why	How	What	Who	Where	When
Contextual	Goal List	Process List	Material List	Organisational Unit & Role List	Geographical Locations List	Event List
Conceptual	Goal Relationship	Process Model	Entity Relationship Model	Organisational Unit & Role Relationship Model	Locations Model	Event Model
Logical	Rules Diagram	Process Diagram	Data Model Diagram	Role Relationship Diagram	Locations Diagram	Event Diagram
Physical	Rules Specification	Process Function Specification	Data Entity Specification	Role Specification	Location Specification	Event Specification
Detailed	Rules Details	Process Details	Data Details	Role Details	Location Details	Event Details

Fonte: https://en.wikipedia.org/wiki/Zachman_Framework

The Open Group Architecture Framework (TOGAF)



Business Process Modelling Notation (BPMN)



ARIS (Architecture of Integrated Information Systems)



UML (Unified Modeling Language)





Enterprise Architecture Foundations

Based on (Lankhorst, 2005)

Architecture Life Cycle



Design

- Architects should use a common and well-defined vocabulary to avoid misunderstandings
- Architects should be supported systematic/well-defined approaches
 - Methodical support, general and organisation-specific guidelines, best practices, drawing standards, etc.
- The usage of support for tracking architectural decisions and changes is desirable

Communication

- Architectures are shared with various stakeholders within and outside the organization (e.g., managers, system designers, and/or outsourcing patterns)
- It is important to offer precise and relevant aspects for a particular group of stakeholders
- Different domains (e.g., processes vs. applications), which may involve multiple groups of stakeholders
- Clear/consistent architecture models are very important.
 - "The original architect is often not available to explain the meaning of a design, so the architecture should speak for itself."

Realization

- It is important to establish links between design activities (and produced artifacts) and realization ones.
- Integration between design and realization tools is interesting to be established in order to favor traceability and architecture maintenance.

Change

- Assessment of impact of changes
- It is important consider the links between design and realisation for evaluate changes impact

Compositionality

- Enterprise architectures often comprise many heterogeneous models and other descriptions
- But... Why?
 - Complexity of enterprise architectures
- Many different architectures or architectural views co-exist within an organisation
- Compositionality: dealing with parts and their relations in the context of enterprise architectures

Integration of Architectural Domains



Describing Enterprise Architectures

- Architecture description may contain models and textual descriptions
- "[...] representation of the essence of an architecture in the unambiguous form of a model can be of great value."
- "A model is an abstract and unambiguous conception of something (in the real world) that focuses on specific aspects or elements and abstracts from other elements, based on the purpose for which the model is created".
- "[...] the rigour of a model-based approach also compels architects to work in a more meticulous way and helps to dispel the unfavourable reputation of architecture as just drawing some 'pretty pictures'".

Concerns

- Stakeholders are influenced by their particular interest in the observed enterprise (their concerns).
- "The concepts an architect is used to using (or trained to use) when modelling some (part of a) domain, will strongly influence the conception of that architect". (Lankhorst, 2005)
- 'If the only tool you have is a hammer, you tend to see every problem as a nail.' Abraham Maslow

Domains

- **Domain**: "any subset of a conception (being a set of elements) of the universe that is conceived of as being some 'part' or 'aspect' of the universe".
- **Model**: "a purposely abstracted and unambiguous conception of a domain".
- **Modelling**: "the act of purposely abstracting a model from (what is conceived to be) a part of the universe".
 - It also includes activities involved in the representation of the model by means of some language and medium.

Views and Viewpoints

- "[...] different viewers have different conceptions of the universe they perceive."
- **View**: a representation of a system from the perspective of a related set of concerns.
- Viewpoint: a specification of the conventions for constructing and using a view; a pattern or template from which to develop individual views by establishing the purposes and audience for a view and the techniques for its creation and analysis.
- "A view is specified by means of a *viewpoint* [...]"
- "[...] a view is what you see, and a viewpoint tells from where you are looking."
- Viewpoint is a kind of filter by means of what a view is generated

Views and Viewpoints (Example)

Application Structur	re Viewpoint	
Stakeholders	Enterprise, process, application, and domain architects	
Concerns	Application structure, consistency and completeness, reduction of complexity	f
Purpose	Designing	
Abstraction Level	Details	
Layer	Application layer (see also Figure 4)	
Aspects	Structure, information (see also Figure 4)	Home & Away Policy Administration
	Viewpoint	Risk sessment Customer data access Customer file data Claim data management Damage claim data
	View	Policy data management Insurance policy data
(The Open G	roup, 2012)	

Service-Orientation

Service-Orientation

- Service-Oriented Computing (SOC) paradigm
- Web services technology
- Service-Oriented Architecture (SOA)

Service-Orientation is more than technology

Service-Orientation

- Service concept applies equally well to the Business and IT viewpoints
- As such, it can be used not just in software engineering, but also at all other levels of the enterprise architecture
- Widely adopted concept: Even enterprises that are not directly related to Service sector act providing some services for their customers

Service-Oriented EA

- Why to use service in enterprise architecture design?
 - Service concept is used and understood in the different domains (Business-IT alignment)
 - New ways of collaborating with external patterns (service-oriented supply-chain)
 - New ways of thinking the dynamics and responsibility between internal departments and organizational units
 - Service orientation has a positive effect on:
 - Interoperability
 - Flexibility and Reuse
 - Cost effectiveness, etc.

Service-Oriented EA



Enterprise Architecture Modeling



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