Enterprise Architecture Frameworks

The Zachman Framework

- John Zachman introduced this framework in 1987.
- It was previously called "Framework for Information Systems Architecture" and was recognized as the first comprehensive framework for enterprise architecture.
- It is a logical structure for classifying and organizing the descriptive representations of an enterprise, which are significant to business management and enterprise system development (Lankhorst, 2017).
- This framework involves these basic interrogatives: *what*, *how*, *where*, *who*, *when*, and *why*.
- This framework addresses an enterprise as a whole wherein issues can be easily mapped to understand its nature, implications, and possible solutions (Lankhorst, 2017).
- The framework is an ontology and not a methodology.

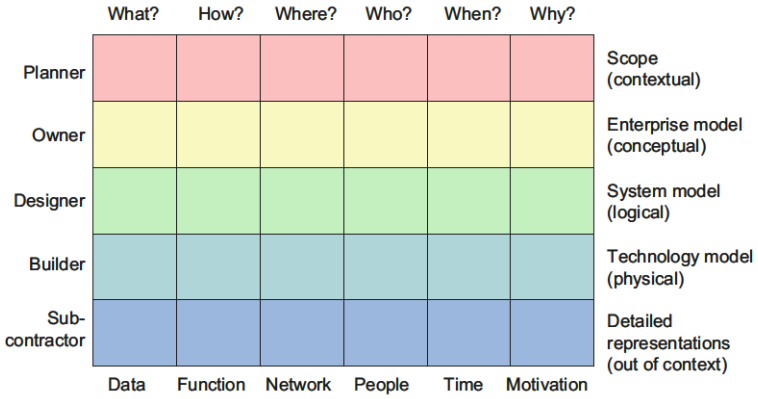

Figure 1. The Zachman Framework
Source: Enterprise Architecture at Work Modeling, Communication and Analysis (4th ed.), 2017. p 25

The Open Group Architecture Framework (TOGAF)

- It originated as a generic framework and a methodology for developing technical architectures, which evolved into an enterprise architecture framework and method (Lankhorst, 2017).
- **TOGAF Standard Version 9.2** is the latest version of TOGAF which provides guidance, error correction, improved document structure, updated business architecture and content meta-model (The Open Group, n.d.).

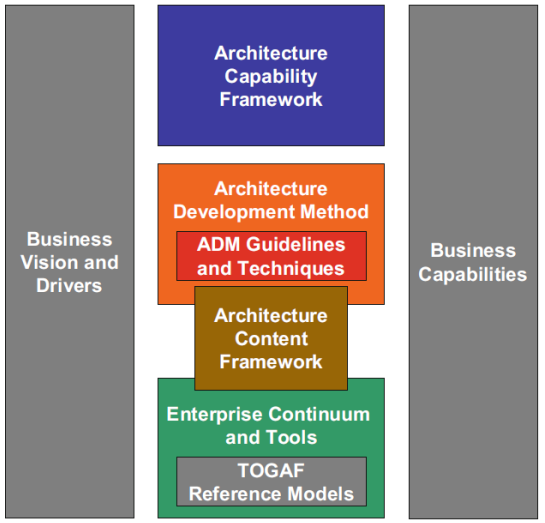

Figure 2. Structure of TOGAF Standard
Source: Enterprise Architecture at Work Modeling, Communication and Analysis (4th ed.), 2017. p 26

MAIN COMPONENTS OF TOGAF (Lankhorst, 2017)

- **Architecture Capability Framework** – This addresses the organization, processes, skills, roles, and responsibilities required to establish and operate an architecture within an enterprise.
- **Architecture Development Method** –This provides the "way of working" for architects. It is considered as the core of TOGAF, which consists of the stepwise cycle approach for the overall enterprise development and centers requirements management. These are the following processes involved in the stepwise cycle approach:
  - Architecture vision
  - Business architecture
  - Information systems architectures
  - Technology architecture
  - Migration planning
  - Opportunities and solutions
  - Implementation governance
  - Architecture change management
- **Architecture Content Framework** – This considers four (4) closely related architectural structures in an enterprise, namely:
  - Business architecture
  - Data architecture
  - Application architecture
  - Information Technology (IT) architecture

- **Enterprise Continuum** – This comprises various reference models that illustrate how architectures are developed across a wide variety of foundational architectures such as common system architecture, industry-specific architecture, and individually-owned enterprise. These are the following reference models in an enterprise continuum:
    - Technical Reference Model
    - Building Blocks Information Base
    - Open Group's Standards Information Base (SIB)

The Model-Driven Architecture of Object Management Group (OMG)

Model-Driven Architecture (MDA) aims to provide an open and vendor-neutral approach to interoperability and raises the level of abstraction in enterprise architecture (Lankhorst, 2017). It provides guidelines for structuring software specifications that are expressed as models. It also separates the business and application logic from the underlying platform technology (Object Management Group, n.d.).

MDA was built upon the following OMG's key modeling technologies (Object Management Group, n.d.):

- **Meta-Object Facility (MOF)** – It provides a standard repository of MDA model and defines structures that help multiple groups work with a model while having a standard view.
- **Common Warehouse Metamodel (CWM)** – It is an established industry standard for data repository integration, standardized database model representation, schema transformation models, and data mining models.
- **XML Metadata Interchange (XMI)** – This mapping expresses Unified Modeling Language (UML) models in Extensible Markup Language (XML) and allows it to be moved around an enterprise as it progresses from analysis to modeling and to application.

Mapping is a key feature of MDA, which is a set of rules and techniques used to modify one (1) model to come up with a new model.

MDA has three (3) abstraction levels with mapping in between (Lankhorst, 2017). These are the following:

- **Computation Independent Model (CIM)** – This includes the business requirements and business model or domain model that describes the state of the enterprise where the system will be integrated. This abstracts the automated data processing system.
- **Platform-Independent Model (PIM)** – This describes the internal structure of an operating system while abstracting specific details for a particular platform. This also shows that a certain part of a complete set of specifications does not change from one platform to another.
- **Platform-Specific Model (PSM)** – This combines the specifications in the PIM and the details on how a system uses a particular type of platform.

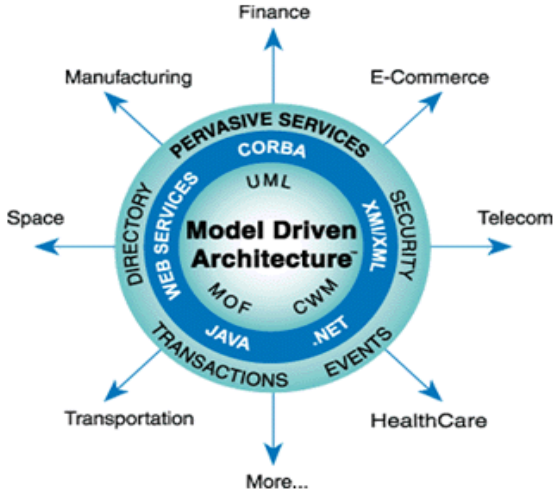

Figure 3. OMG's Model-Driven Architecture
***Source**:* https://www.omg.org/mda/

References:
Lankhorst, M. et al. (2017). *Enterprise architecture at work modeling, communication and analysis* (4th ed.). Berlin, Germany: Springer Nature.
MDA® – The architecture of choice for a changing world. (n.d.). In *Object Management Group*. Retrieved from https://www.omg.org/mda/ on November 4, 2019
OMG's model-driven architecture [Image]. Retrieved from https://www.omg.org/mda/ on November 4, 2019
TOGAF | The Open Group. (n.d.). *About the TOGAF Standard, Version 9.2*. Retrieved from https://www.opengroup.org/togaf on November 3, 2019
Zachman, J. (n.d.). *The Concise Definition of The Zachman Framework by: John A. Zachman*. Retrieved from https://www.zachman.com/about-the-zachman-framework on November 4, 2019