# Zachman Enterprise Architecture simplified

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## 1. Abstract

The goal on Enterprise Architecture is to ensure that the product 'Company' is built (or changed) optimally, towards its goals and strategy. All components such as people, relations, processes, assets, systems and information must be aligned with those goals and strategy. Proper architecture allows the product being created (the 'Company') to be the most efficient one.

This text briefly describes the Zachman-Sowa framework.

## 2. Context

This text is based on the Zachman-Sowa model, one of the most used approaches for Enterprise Architecture. It is normally called the Zachman model, which also refers to a previous version of the model written by John Zachman only.

Architecture is the set of descriptive representations that are required in order to create or change an object[1]. The principle is that definitions, plans and documentation are to be produced in a way that gaps are identified and excellence achieved.

In the Zachman model, when discussing the representation of an organization, one must take into consideration multiple dimensions and perspectives. For example the planner or investor perspective allows understanding the scope and basic shape of the intended organization in order to get the appropriate investment and high level planning; The technology perspective allows identifying which tools, methods, approaches and materials will be used to create the intended structure, in order to have appropriate actions in place.

For each perspective there is a set of questions that must be answered.

## 3. Zachman Framework

Principle is simple: Definitions, documentation and deliverables should be organized in a matrix, 6 rows x 6 columns.

[1] Simons G., Kappelman L., Zachman J., Using Language to Gain Control of Enterprise Architecture, https://www.zachman.com/resources/ea-articles-reference/303-enterprise-architecture-as-language

Lines represent different perspectives for distinct attendees. Columns represent several questions that must be answered for each of those perspectives.

On each line, the multiple perspectives[2,3] are:

| Perspective | Applies to… |
|---|---|
| Scope | Planner or investor perspective, to understand from a high level view the shape, result, investment, timelines or methods |
| Enterprise or Business model | Owner perspective, the one that will live with its daily routines, the team managing it. Represents the design of the business and shows business entities, processes and how they interact |
| System model | System architect or analyst perspective, who needs detailed requisites, data elements and functions that represent business entities and processes |
| Technology model | Builder perspective, who will assemble and build the components and need to understand constrains on tools, technology and materials that will be used |
| Components model | Subcontractor perspective that will build each component without knowing the overall landscape, needs definitions with a programmer detail so that objects and functions can be built |
| Functioning enterprise | User perspective or produced result. This view represents the actual result, actual instances of the processes, team members or network elements. As stated by Zachman, the Roman Coliseum is not Architecture, is the result of Architecture |

On each column, the multiple dimensions are:

| Dimension | Addressing… |
|---|---|
| What (data) | What information is needed? What entities are relevant for the business, requiring information to be maintained, what are their relations? |
| How (processes and functions) | How the organization will work, using which methods? Inputs and outputs are also considered in this column |
| Where (network) | Where activities and assets will reside, where information will be used? What are the geographical locations, how is the field organized? |
| Who (people) | Who is acting, what are the roles and teams, with what permissions and responsibilities, how are they related? |

[2] Wikipedia, https://en.wikipedia.org/wiki/Zachman_Framework
[3] Sowa J., Zachman J., 1992 IBM Systems Journal, Extending and Formalizing the Framework for Information Systems Architecture, https://www.zachman.com/resources/ea-articles-reference/50-1992-ibm-systems-journal-extending-and-formalizing-the-framework-for-information-systems-architecture

| Dimension | Addressing… |
|---|---|
| When (time) | When everything will happen, what are the relevant moments? |
| Why (motivation) | What is the business motivation? On each row what is the motivation for the other cells? |

On each cell resides the deliverables that reply to all questions for the specific perspective and actor.

Each row defines constraints that influence the lower levels.

The Zachman Framework[4] adapted matrix results as below

| | Data<br>What | Function<br>How | Network<br>Where | People<br>Who | Time<br>When | Motivation<br>Why |
|---|---|---|---|---|---|---|
| Scope (Contextual)<br>Planner | List of things important for the business | List of processes the business performs | List of locations where business operates | List of organizations important to business | List of events / cycles significant to the business | List of business goals and strategies |
| Business model (conceptual)<br>Owner | Semantic model, business entities and relationships | Business process model and needed resources | Business logistic systems, locations and link methods | Organization units, hierarchy, responsibility, work products | Master schedule, business events and cycles | Business plan, business objectives and strategy to achieve |
| System model (logical)<br>Designer | Logical data model, data entities and relationships | Application architecture, application functions and user views | Distributed system architecture, node types (processor, storage, line characteristics) | Human interface architecture, roles and deliverables | Processing structure, system events and processing cycles | Business rule model, structural and action assertions |
| Technology Model (Physical)<br>Builder | Physical data model, segments, tables, keys, relations | System design, computer functions and data sets | Technology architecture, needed hardware, base systems, line specifications | Presentation architecture, users and screen formats | Control structure, time execution constraints and rules | Rule design, conditions and actions |
| Detailed representations (out of context) | Data definition, fields and relation definitions | Language elements, pseudo-algorithms | Network architecture, address and protocols | Security architecture, identity and jobs | Interrupt specifications, event response rules | Rule specification, step instructions |
| Functioning enterprise | Data | Applications | Network | Organization | Schedule | Strategy |

[4] Zachman J., The Zachman Framework Evolution, https://www.zachman.com/ea-articles-reference/54-the-zachman-framework-evolution

## 4. Enterprise Architecture and documentation standards

Multiple and numerous formats are used to represent enterprise elements, their relations, processes and data. For example, flowcharts (since 1945), Entity Relationship diagrams, PBMN for business processes, UML, and a never-ending list of tools, methodologies and languages, mostly symbolic.

An Enterprise Architecture approach ensures that, regardless the approach, language or notation used to describe and analyze a problem, nothing is left out when analyzing an organization: Appropriate questions get an answer, appropriate perspectives are covered.

Zachman defined a framework to fully describe/design an organization in 1987. Multiple models descend from this initial model, including a review by Zachman and Sowe, written in 1992. Zachman model is the reference model for multiple Enterprise Architecture methodologies, such as EAP, C4ISR, TEAF, DoD or TOGAF[5].

## 5. Suggested reading

There are other Enterprise Architecture frameworks and approaches. As a starting point, recommended readings are:

- A nice article comparing the top four Enterprise Architecture methodologies, https://msdn.microsoft.com/en-us/library/bb466232.aspx.
- A Wikipedia overview and entry-point on EA Frameworks, https://en.wikipedia.org/wiki/Enterprise_architecture_framework.
- The Zachman framework also in on Wikipedia, https://en.wikipedia.org/wiki/Zachman_Framework
- The original Zachman-Sowe document, back from 1992, https://www.zachman.com/resources/ea-articles-reference/50-1992-ibm-systems-journal-extending-and-formalizing-the-framework-for-information-systems-architecture.

[5] Technical Communicators, The Zachman Enterprise Framework, http://www.technical-communicators.com/articles/zachman_framework.pdf