

Enterprise Architecture

Knut Hinkelmann



Business Model

Strategy

Organisation and Processes

Information Systems

Infrastructure

Changes and Alignment of Business and IT

- Change can affect the alignment of business and IT on both strategic and operational level
- On strategic level the alignment of business and IT has to deal with problems like the following:
 - ◆ What IT innovations are needed to react on market requirements?
 - ◆ How can we successfully integrate new firms after an acquisition?
- On the operational level questions can be:
 - ◆ Which business units and users will be affected by the migration of an application?
 - ◆ What information does the business process need and how can it be stored?
 - ◆ What applications and infrastructure technologies do we require to run new or redesigned business processes?
- Many organisations lack transparency due to the number and frequency of their organisational changes and have problems to answer these questions.



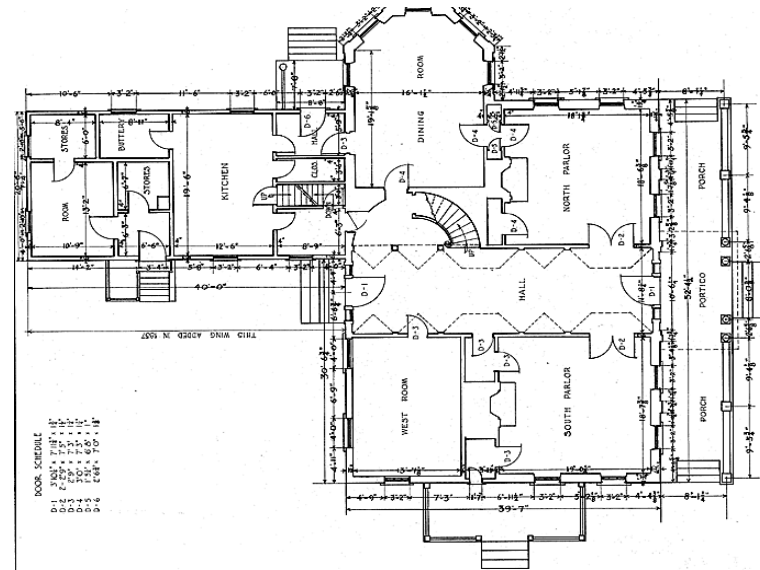
Architecture – What is it?

- Is this an Architecture?



Architecture – What is it?

- Is this an Architecture?



Architecture – What is it?

"Architecture" names that which is fundamental about a system; the set of essential properties of a system which determine its form, function, value, cost, and risk. That which is **fundamental** to a system takes several forms:

- ◆ its **elements**: the constituents that make up the system;
- ◆ the **relationships**: both internal and external to the system; and
- ◆ the **principles of its design and evolution**

ISO/IEC/IEEE 42010 - <http://www.iso-architecture.org/ieee-1471/cm>

Enterprise Architecture

An **Enterprise Architecture** contains all *relevant*

- ◆ **Business structures** (e.g. organisation structure, business processes)
- ◆ **IT structures** (e.g. information systems, infrastructure)
- ◆ and their **relationships**

Organisation and Processes

Information Systems

Infrastructure

Architecture and Architecture Description

- An **architecture** is a **conception of a system** – i.e., it is in the human mind. An architecture may exist without ever being written down.
- An **architecture description** (AD) is an **artifact** used to define and document an Architecture to share with others.
 - ◆ An AD is what is written down as a concrete work product. It could be a document, a repository or a collection of artifacts
 - ◆ Architects and other system stakeholders use Architecture Descriptions to understand, analyze and compare Architectures.

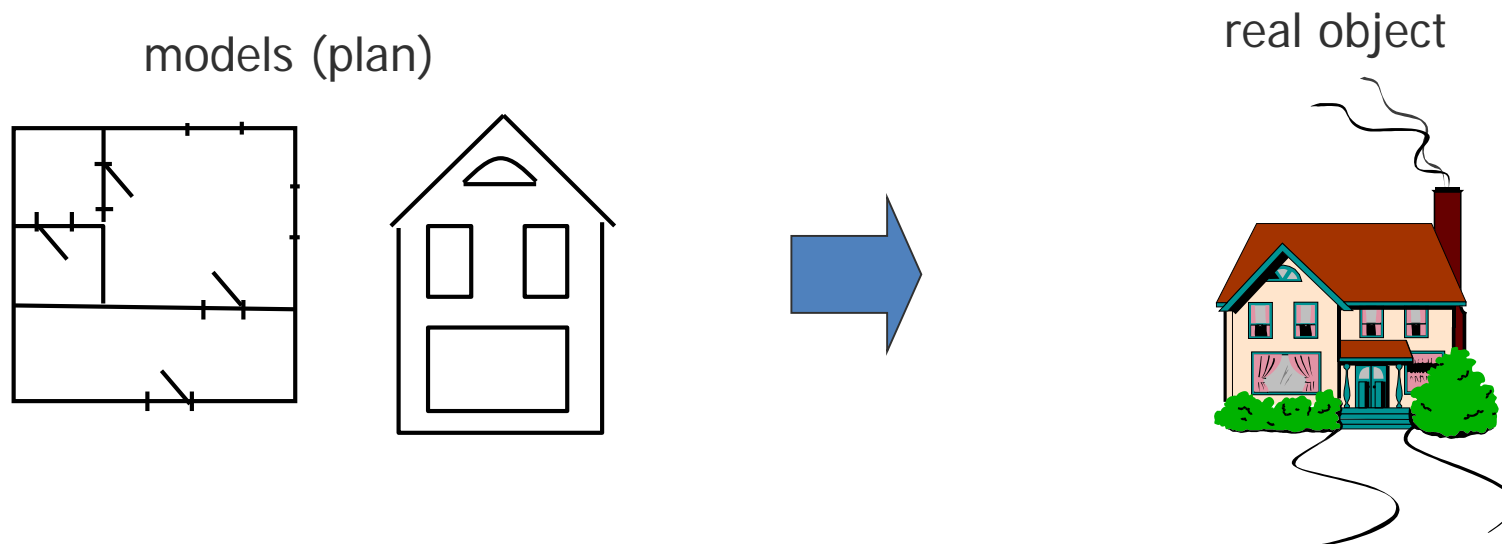
Enterprise Architecture (Description) – What is it?

- An *Architecture Description* would be the total set of *models* relevant for describing a complex system (e.g. enterprise), that is, the descriptive representations required
 - ◆ to create a (coherent, optimal) system and
 - ◆ to serve as a baseline for changing the system



Architecture Description and Architecture Models

- A Model is a reproduction of a *relevant* part of reality which contains the essential aspects to be investigated.



Why Enterprise Architecture Description?

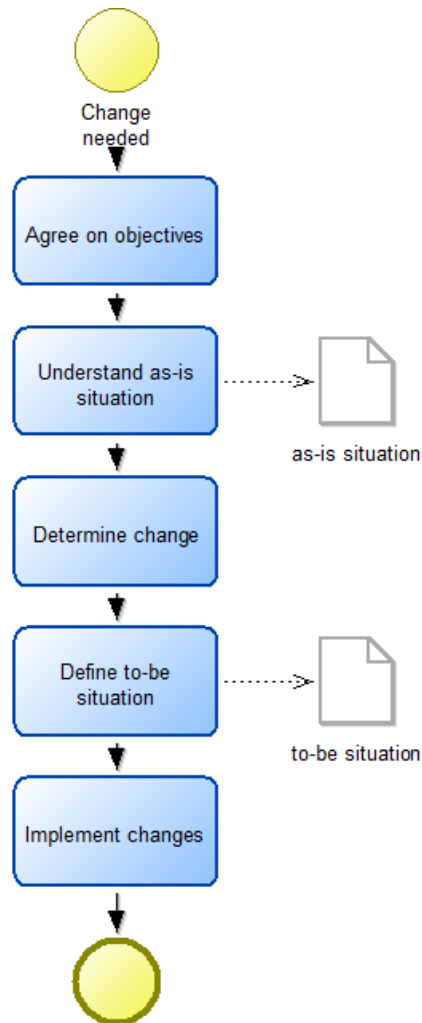
■ Manage change of complex system

- ◆ Baseline for complex, interdependent enterprise decisions
- ◆ Communication of decisions to organization stakeholders.
- ◆ *If architecture is not explicit, there is a high risk that the implementation is not what is intended*

■ Continuous, coordinated organisation change

- ◆ Continuously update Enterprise Architecture to reflect changes
- ◆ Coordinate change between different projects

Typical (Change) Projects



- Typically organisations go through several stages in a change project:
 - ◆ recognizing the need to change
 - ◆ agreeing on the objectives of the change and a vision that describes a better future
 - ◆ understanding what the organisation is changing from (as-is model)
 - ◆ determine what needs to change
 - ◆ designing the new way of working and its support and management (→ to be model)
 - ◆ testing and implementing changes

Architecture: Dealing with Complexity and Change

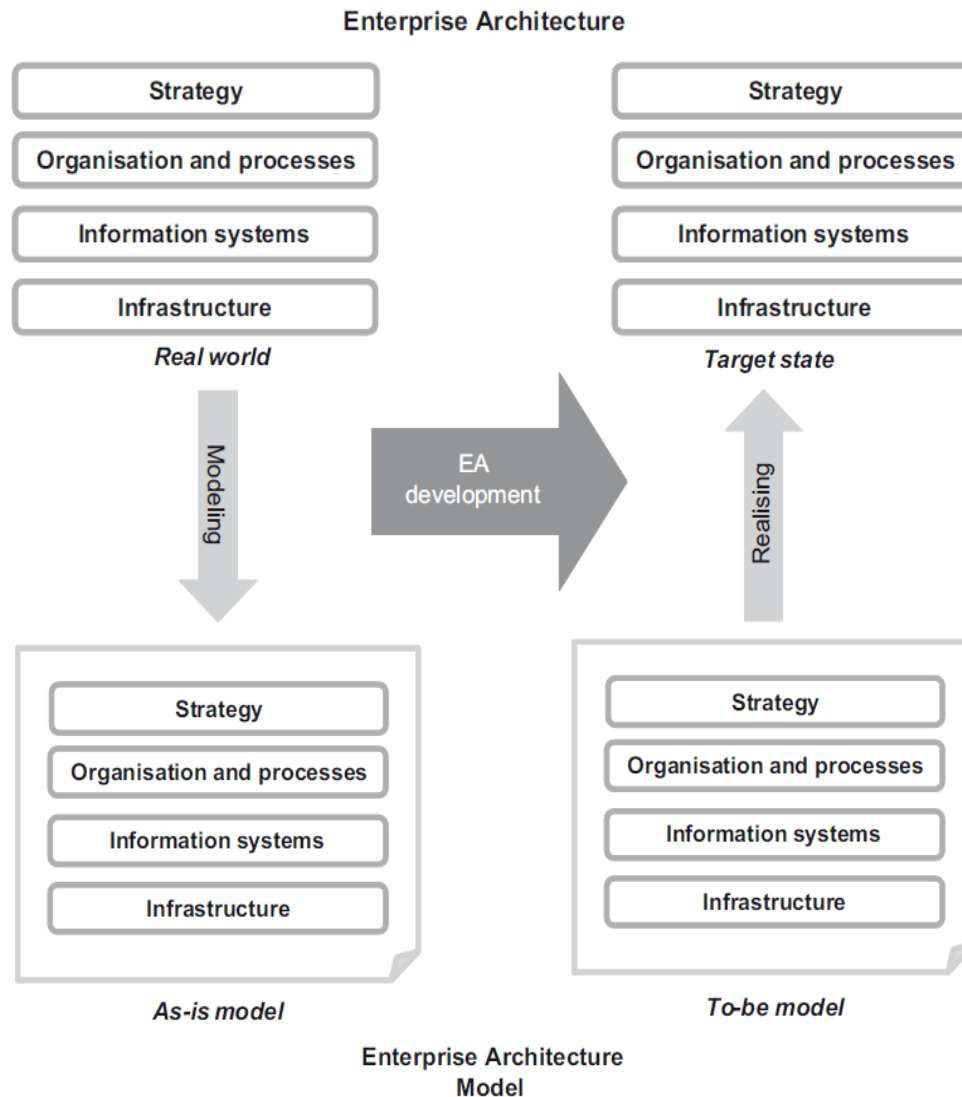


- If the object you want to create or change is simple, and it is not likely to change, then you can do it directly.
- On the other hand, if the object is **complex**, you can't see it in its entirety at one time and it is likely to **change** considerably over time, you need a description or model.
- You need a description of the **Architecture**.



(John Zachmann, 2012)

Change the Model before you Change the System!



(Ahlemann et al. 2012, p. 17)



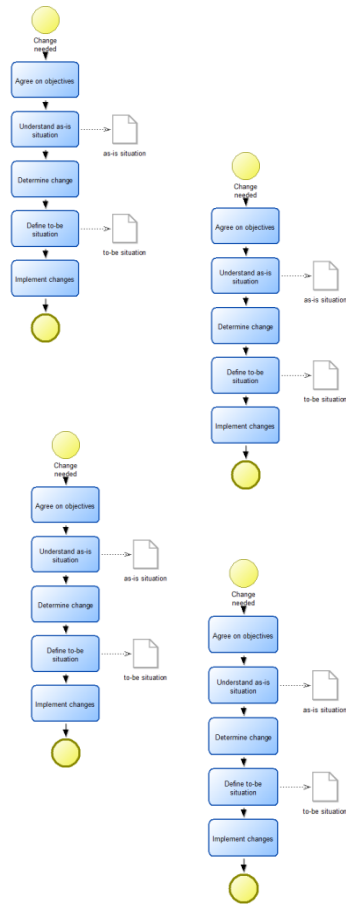
Architecture Description for Continuous Change

- If you don't retain the descriptive representations after you create them (or if you never created them in the first place) and you need to change the resultant implementation, you have only three options:
 - ◆ Directly change the system and see what happens. (High risk!)
 - ◆ Recreate ("reverse engineer") the architectural representations from the existing ("as is") implementation.
(Typical for many projects - Takes time and costs money!)
 - ◆ Scrap the whole thing and start over again.
- Better: **Retain description of your enterprise architecture**

(John Zachmann, 2012)



Architecture Descriptions in an Enterprise



Typically ...

... there are a large number of projects

- ◆ running concurrently or
- ◆ building on the result of previous projects

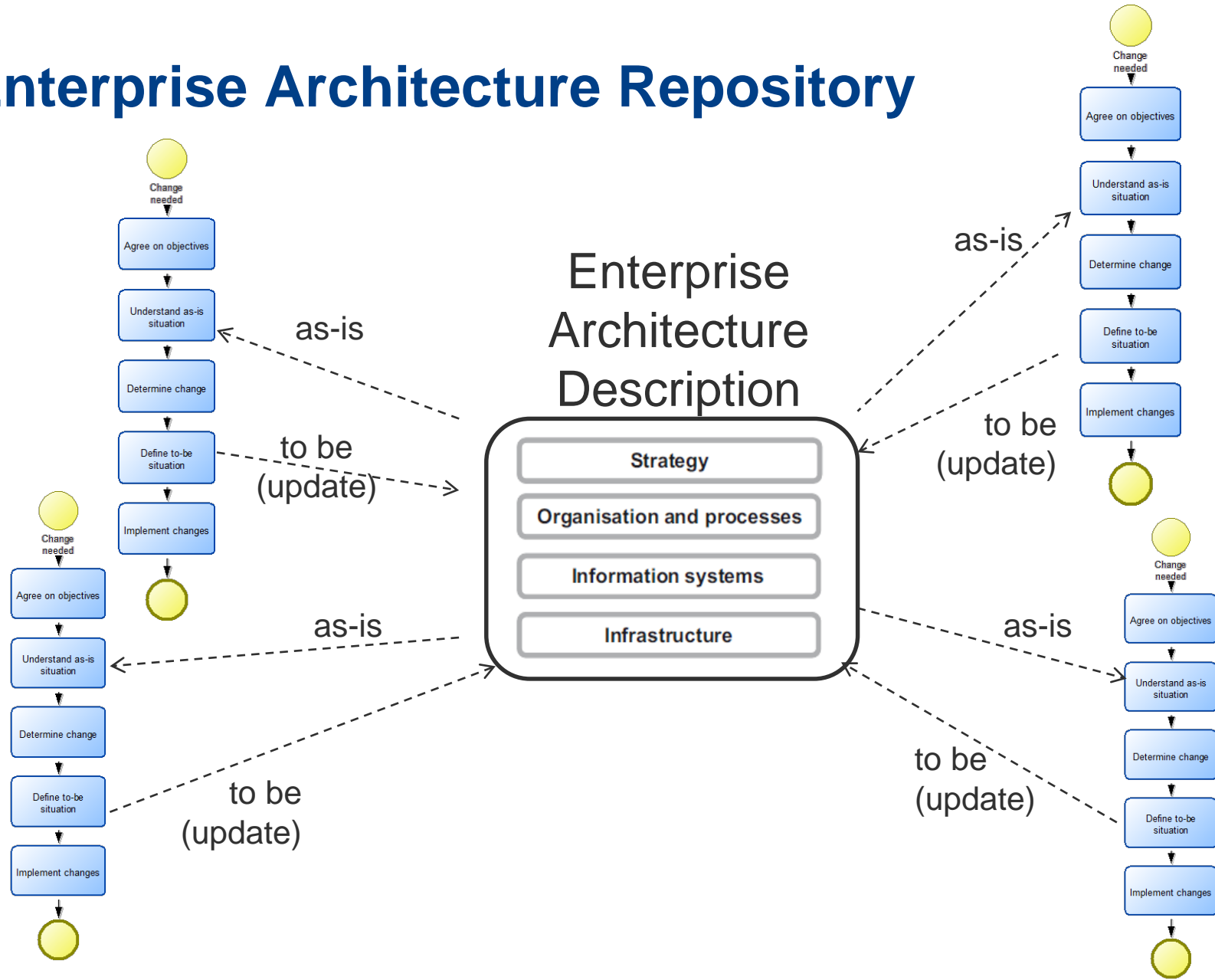
... projects have an extensive documentation of their (intended) result

... each project manages its own documentation which is not available for other projects

... there is a lack of coordination between projects



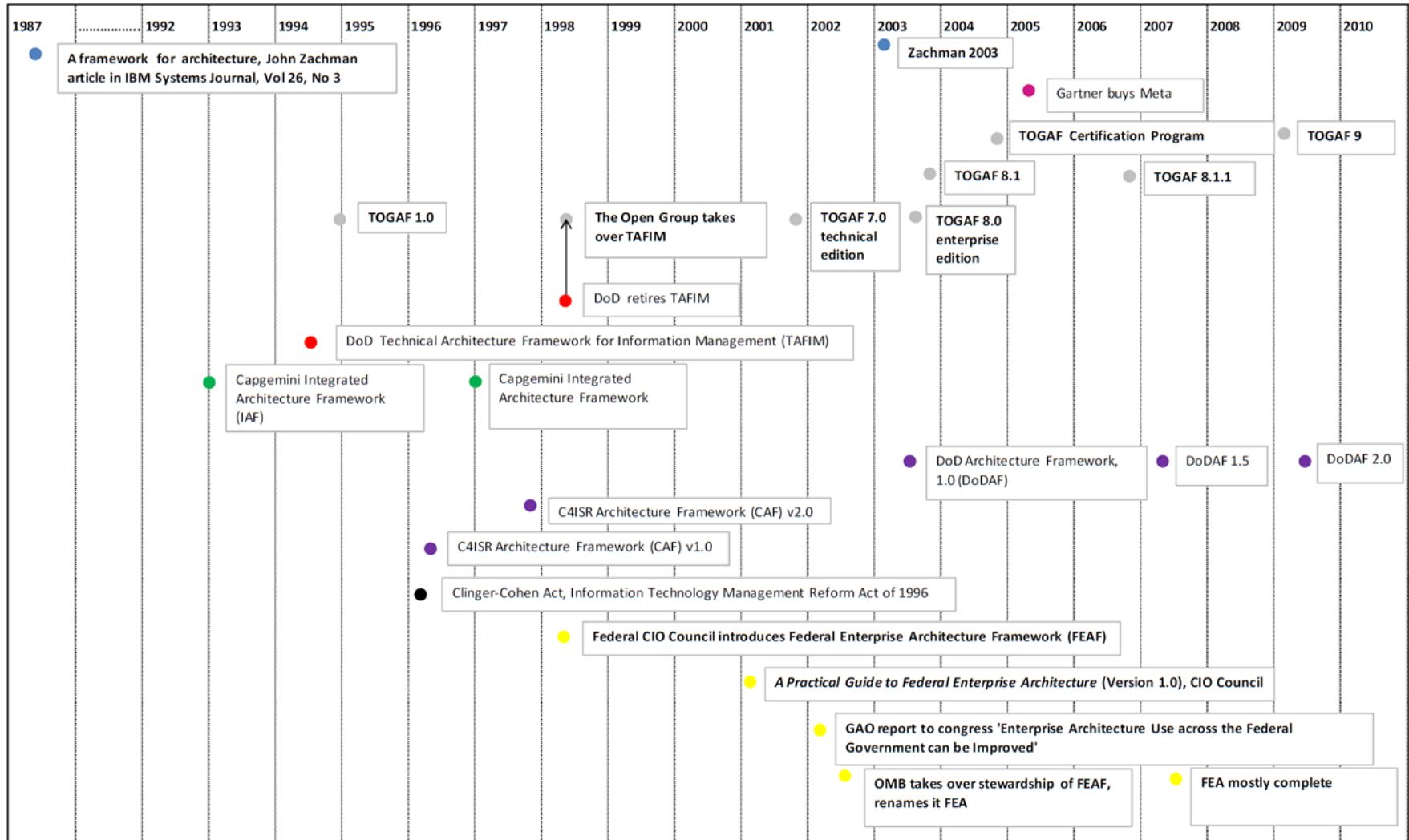
Enterprise Architecture Repository



Architecture Framework

- An *Architecture Framework* establishes a common practice for creating, interpreting, analyzing and using architecture descriptions
- It is a logical structure for classifying and organising the descriptive representations of a system

Timeline of Enterprise Architecture Frameworks



(Bespoke Systems 2012)



Enterprise Architecture Frameworks

- We can distinguish two main types of structures for Enterprise Architecture Frameworks:

- ◆ **Matrix** of aspects and perspectives, e.g.

- **Zachmann Framework**

- An enterprise ontology



- ◆ **Three layer architecture** with business, applications and technology, e.g.

- **TOGAF - The Open Group Architecture Framework**

- A methodology for architecture development

- **ArchiMate**

- A modeling language for EA

- **Best Practice Enterprise Architecture**

