PraXeme
Meaning in action

Initiative for a public method

« Theory without practice is useless; practice without theory is blind. »
Immanuel Kant

Enterprise Architecture in Action

What do we need to improve enterprises and their systems?

✉ dominique.vauquier@praxeme.org
☎ +33 (0) 6 77 62 31 75
http://www.praxeme.org
http://dvau.praxeme.org

Reference
SLB-23

Version
5/10/08

Presentation objective

- **Objective**

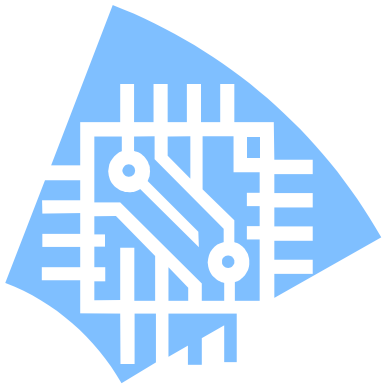
  Evaluate common needs to maximize EA and potential benefits

- **Topics**
  - Enterprise Architecture
  - TOGAF
  - Methodology
  - Modeling

Duration: 1/2 h

The concept

Enterprise / Architecture



Content

1. Two case studies
2. Lessons from experience
3. Methodology

1

Two case studies

- **First case study: SMABTP**
  - From SOA to governance
- **Second case study: AXA Group**
  - The place of EA in convergence and simplification

First case study (1/2)

- **Société Mutuelle d'Assurance du Bâtiment et des Travaux Publics**
  - An insurance company specializing in the buildings and works sector
    - 3000 collaborators
  - The project: redesigning the IS in SOA
    - Search for agility
      - Business driver: partnerships
    - Choice of the SOA approach
      - First attempt… (a very costly lesson)
      - The need for a methodology
      - Semantic modeling, MDA…
    - Contribution to the initiative for a public method

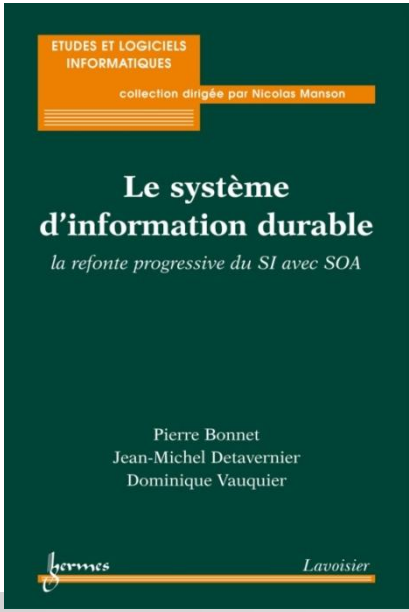
First case study (2/2)

- **Results**
  - Deployed application
  - Communication
    - Enterprise Architecture - born from the standpoint of IT improvement
    - The value proposition originated in the IT department

RESILIENT INFORMATION SYSTEMS

PROGRESSIVE RECASTING WITH SOA

Pierre Bonnet, Orchestra Networks, Jean-Michel Detavernier, SMABTP and Dominique Vauquier, Praxeme Institute
Wiley Ed.



Second case study

redefining / standards

- **AXA Group**
  - 50 companies globally
    - 130000 collaborators
  - Information System governance
    - Context
      - Largely decentralized culture but a strong drive toward convergence
      - Business initiatives
      - Legacy systems
    - Measures
      - TOGAF, “Preferred Architecture Training”, “Convergence training”
      - Committees: ISAC, ISSC
      - Procedures: Acquisition Request, Large Project Governance…

2

Lessons from experience

Difficulties

- **Main issue**
  - Communication between various populations
- **Confusion**
  - …with responsibilities on many aspects
- **Weakness**
  - …in modeling skills
- **Imbalance**
  - Technology/others
- **Organization**
  - Project mode…

Responses

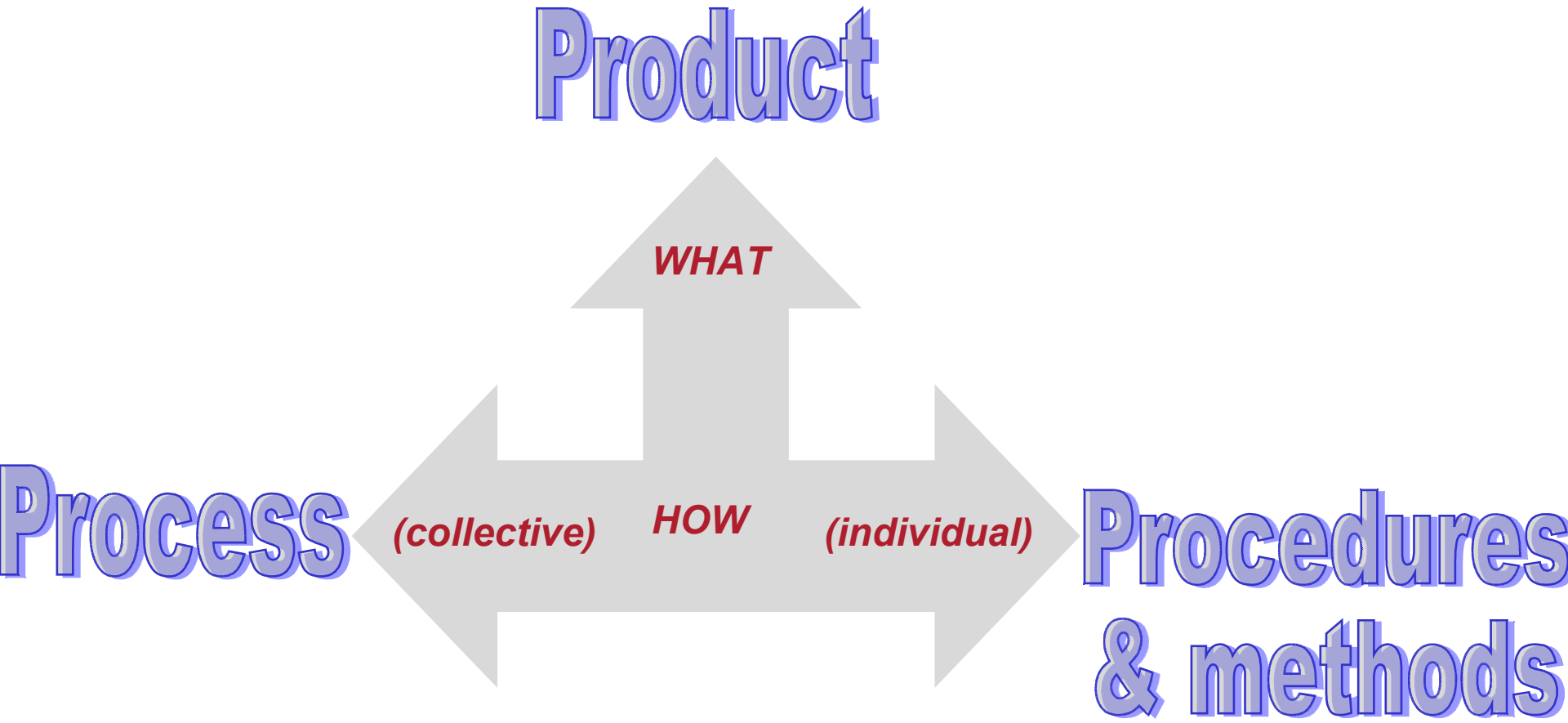
- **Adopt a comprehensive methodology**
  - All aspects of the enterprise
- **Restore the modeling competencies**
  - Formal representations
- **Articulate the aspects**
  - MDA approach
- **Establish the "agility chain"**
  - MDM, BRMS, BPM
  - Technical framework

3

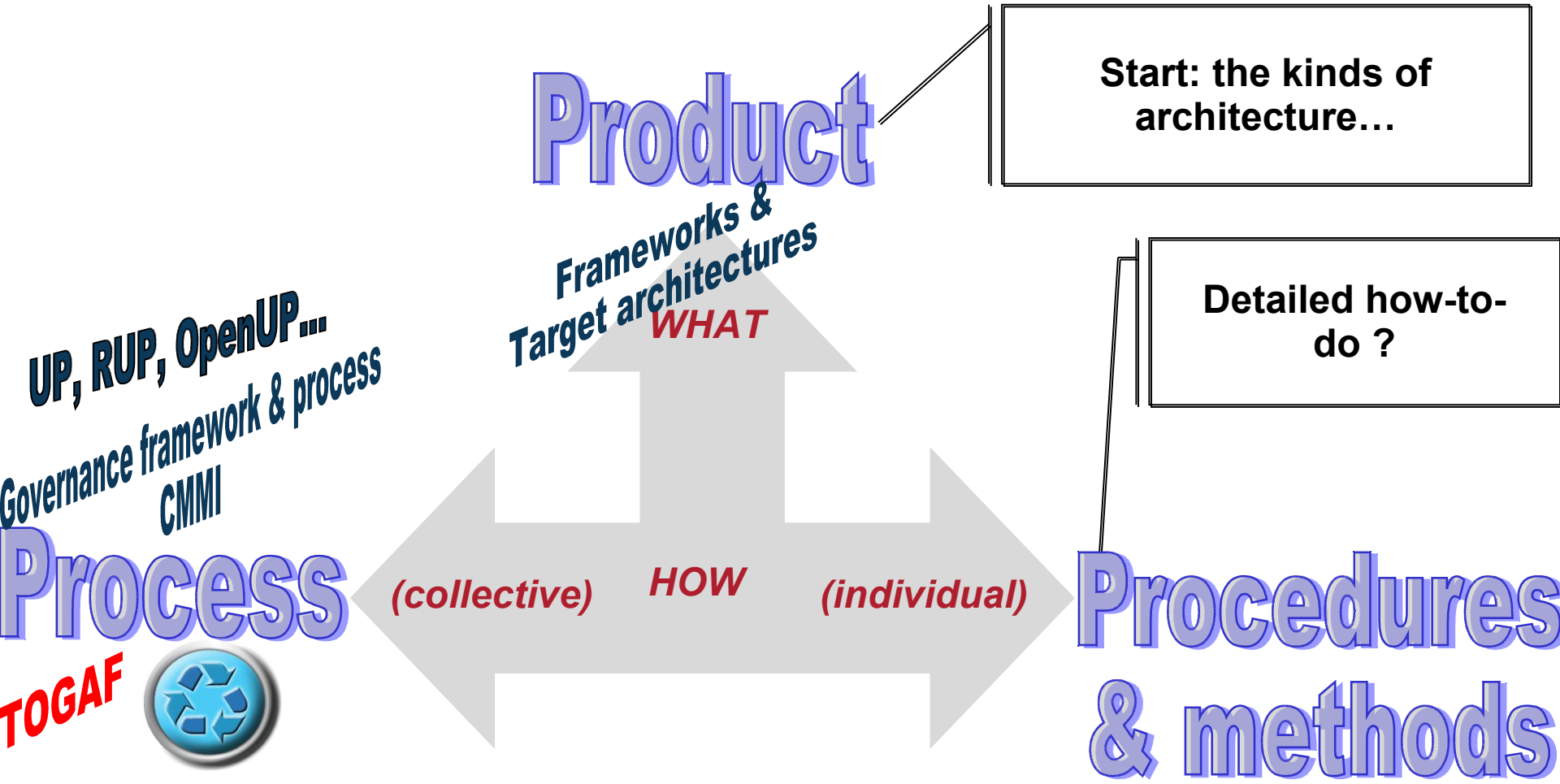
Methodology

1. **What is/should be methodology?**
2. **The state of the art in matter of Enterprise Architecture**
   - TOGAF
   - Zachman's Framework
   - Levels of representation
3. **Existing limitations and new directions**

The three chapters of methodology



Position of current assets



Definition

What it is:

=> A framework for providing a starting point for EA work

=> A reference document for best practices

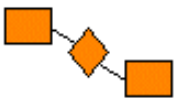
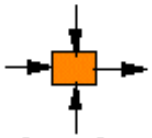
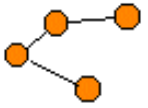
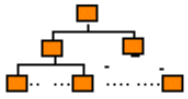
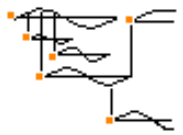
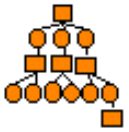
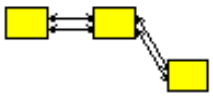
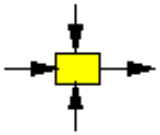
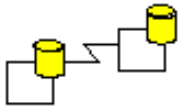
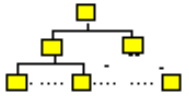
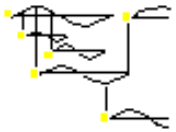
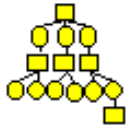
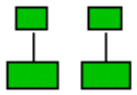
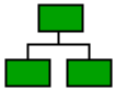
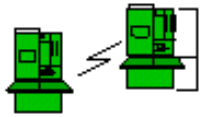
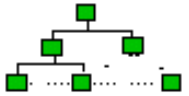
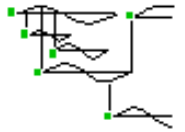
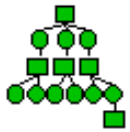
=> A collection of "world class" resources

=> A disciplined methodology

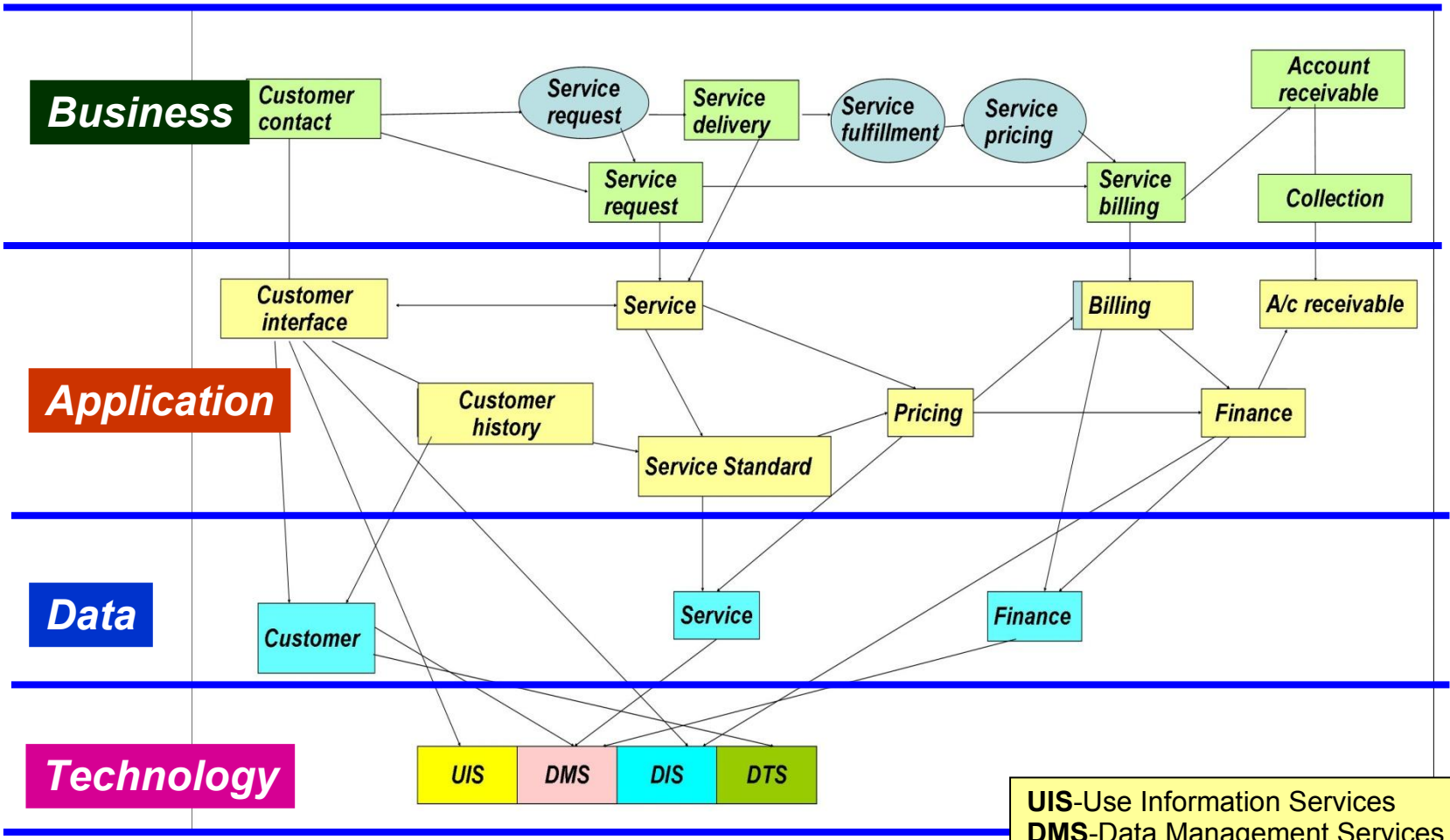
Origin: TAFIM (DOD USA)

TAFIM-Technical Architecture Framework for Information Management

ENTERPRISE ARCHITECTURE - A FRAMEWORK™

	DATA *What*	FUNCTION *How*	NETWORK *Where*	PEOPLE *Who*	TIME *When*	MOTIVATION *Why*	
SCOPE (CONTEXTUAL) *Planner*	List of Things Important to the Business  ENTITY = Class of Business Thing	List of Processes the Business Performs  Function = Class of Business Process	List of Locations in which the Business Operates  Node = Major Business Location	List of Organizations Important to the Business  People = Major Organizations	List of Events Significant to the Business  Time = Major Business Event	List of Business Goals/Strat  Ends/Means = Major Bus. Goal/ Critical Success Factor	SCOPE (CONTEXTUAL) *Planner*
ENTERPRISE MODEL (CONCEPTUAL) *Owner*	e.g. Semantic Model  Ent = Business Entity Rela = Business Relationship	e.g. Business Process Model  Proc. = Business Process I/O = Business Resources	e.g. Logistics Network  Node = Business Location Link = Business Linkage	e.g. Work Flow Model  People = Organization Unit Work = Work Product	e.g. Master Schedule  Time = Business Event Cycle = Business Cycle	e.g. Business Plan  End = Business Objective Means = Business Strategy	ENTERPRISE MODEL (CONCEPTUAL) *Owner*
SYSTEM MODEL (LOGICAL) *Designer*	e.g. Logical Data Model  Ent = Data Entity Rela = Data Relationship	e.g. 'Application Architecture'  Proc. = Application Function I/O = User Views	e.g. 'Distributed System Architecture'  Node = I/S Function (Processor, Storage, etc.) Link = Line Characteristics	e.g. Human Interface Architecture  People = Role Work = Deliverable	e.g. Processing Structure  Time = System Event Cycle = Processing Cycle	e.g., Business Rule Model  End = Structural Assertion Means = Action Assertion	SYSTEM MODEL (LOGICAL) *Designer*
TECHNOLOGY MODEL (PHYSICAL) *Builder*	e.g. Physical Data Model  Ent = Segment/Table/etc. Rela = Pointer/Key/etc.	e.g. 'System Design'  Proc.= Computer Function I/O = Screen/Device Formats	e.g. 'System Architecture'  Node = Hardware/System Software Link = Line Specifications	e.g. Presentation Architecture  People = User Work = Screen Format	e.g. Control Structure  Time = Execute Cycle = Component Cycle	e.g. Rule Design  End = Condition Means = Action	TECHNOLOGY CONSTRAINED MODEL (PHYSICAL) *Builder*
DETAILED REPRESENTATIONS (OUT-OF-CONTEXT) *Sub-Contractor*	e.g. Data Definition  Ent = Field Rela = Address	e.g. 'Program'  Proc.= Language Statement I/O = Control Block	e.g. 'Network Architecture'  Node = Addresses Link = Protocols	e.g. Security Architecture  People = Identity Work = Job	e.g. Timing Definition  Time = Interrupt Cycle = Machine Cycle	e.g. Rule Specification  End = Sub-condition Means = Step	DETAILED REPRESENTATIONS (OUT OF CONTEXT) *Sub-Contractor*
FUNCTIONING ENTERPRISE	e.g. DATA	e.g. FUNCTION	e.g. NETWORK	e.g. ORGANIZATION	e.g. SCHEDULE	e.g. STRATEGY	FUNCTIONING ENTERPRISE

Levels of representation

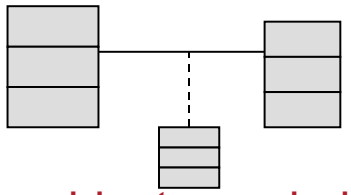


UIS-Use Information Services
DMS-Data Management Services
DIS-Data Interchange Services
DTS-Data Transformation Services

Business: the “good” description

Semantic aspect

Objects



Business objects, real objects
(Information+Transformation+Action)

Refers to

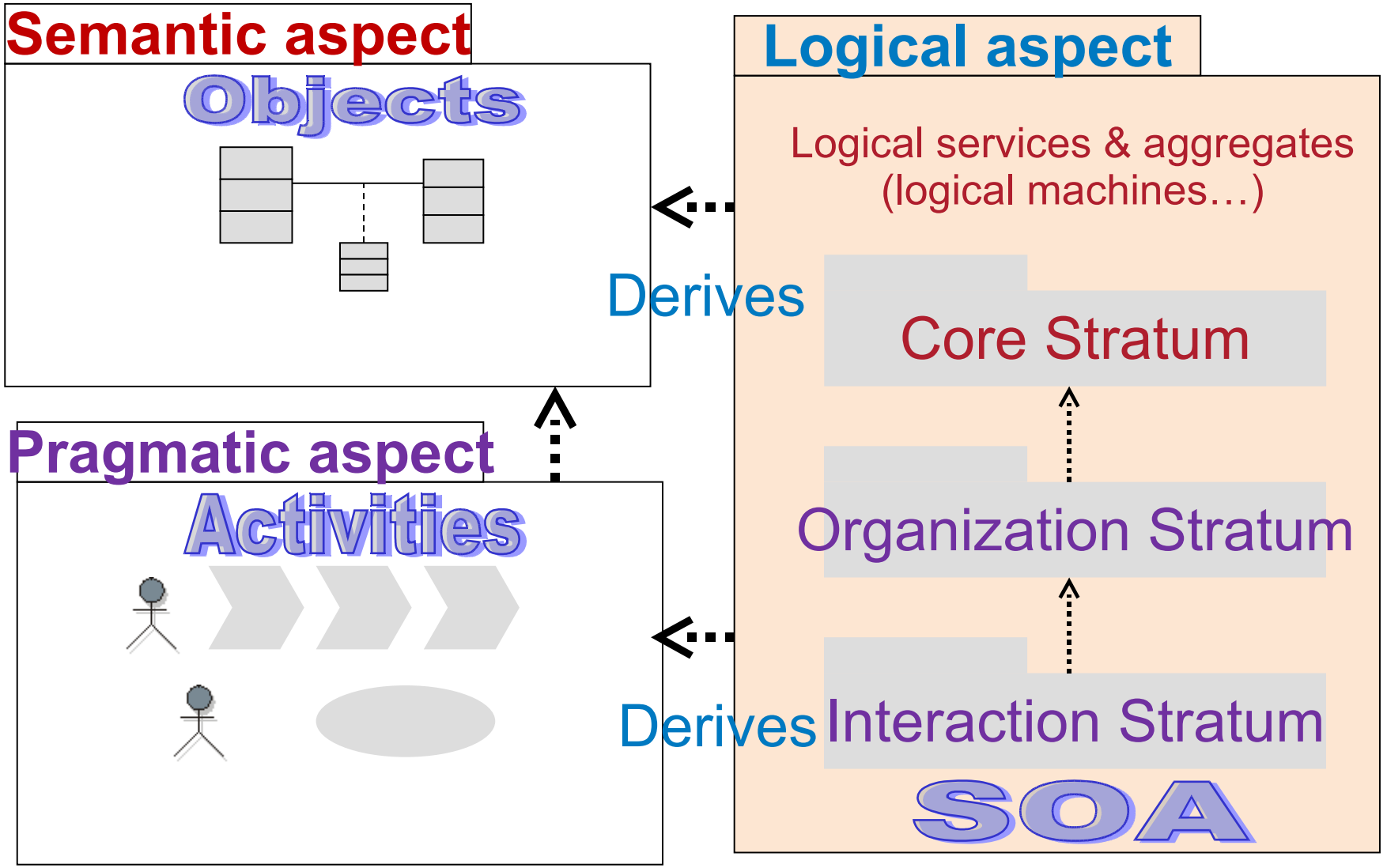
Pragmatic aspect

Activities

Actors & organisational entities
Process & use-cases

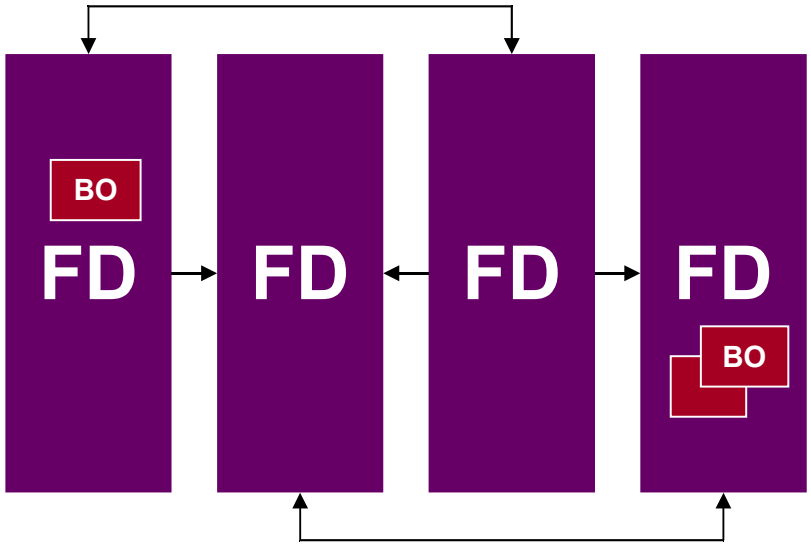
- **Approach by activities**
  - Classical approach
    - Flawed with local variation
    - Functional & hierarchical breakdown structure
- **Semantic modelling**
  - Additional approach
    - Move to genericity
    - New solution to cope with complexity

Software: the “good” structure



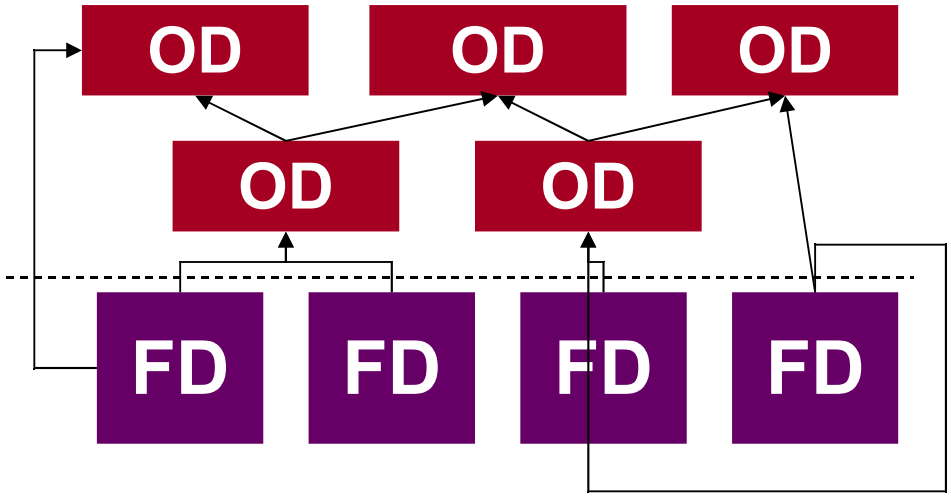
Logical architecture: a new approach

Caricature of an architecture based upon functional approach



Logical blocks take in charge functional domains
Which structure the pragmatic model
It stems from that important dependencies or redundancies since same business objects are used inside many functional domains

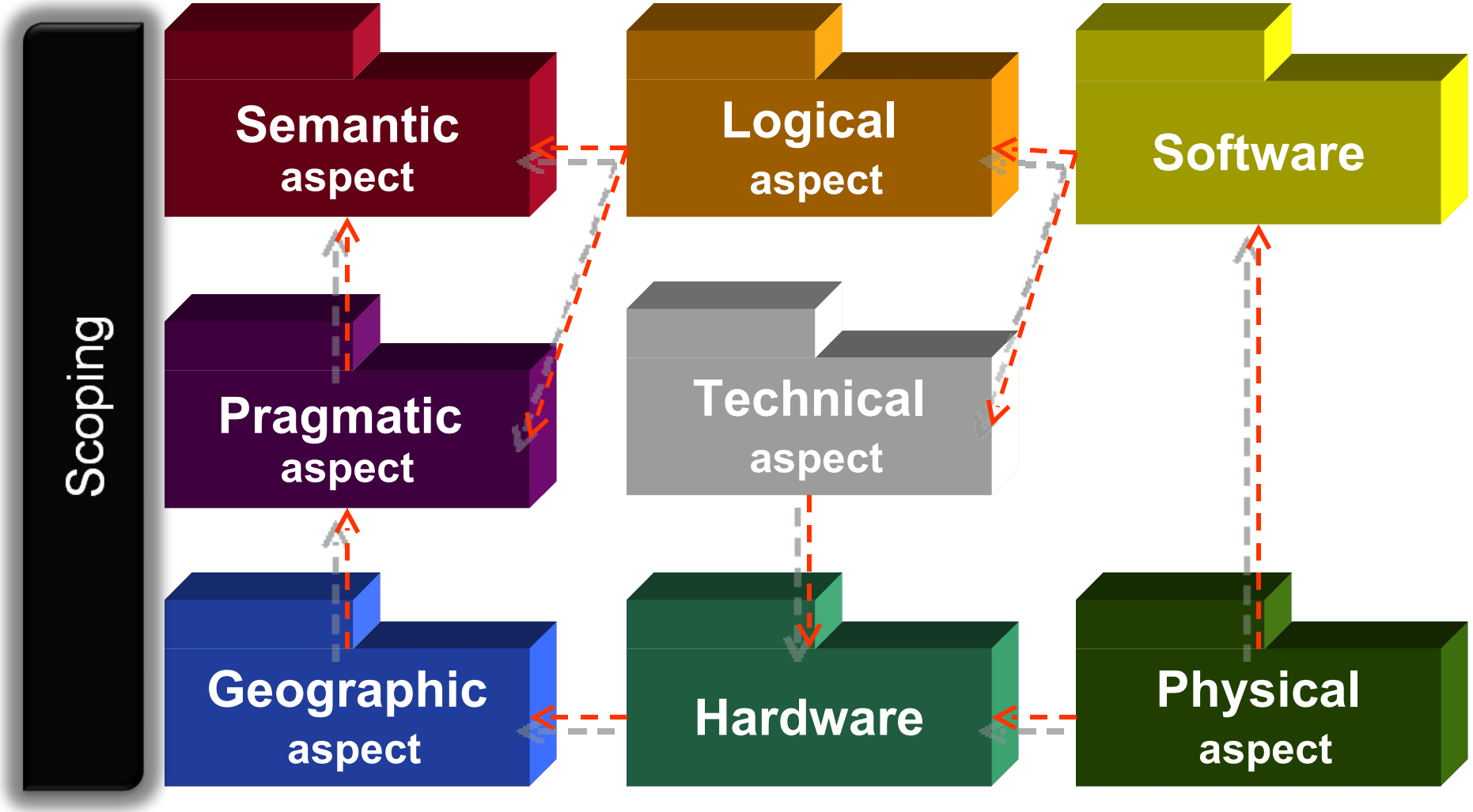
Outlined logical architecture according to Praxeme method



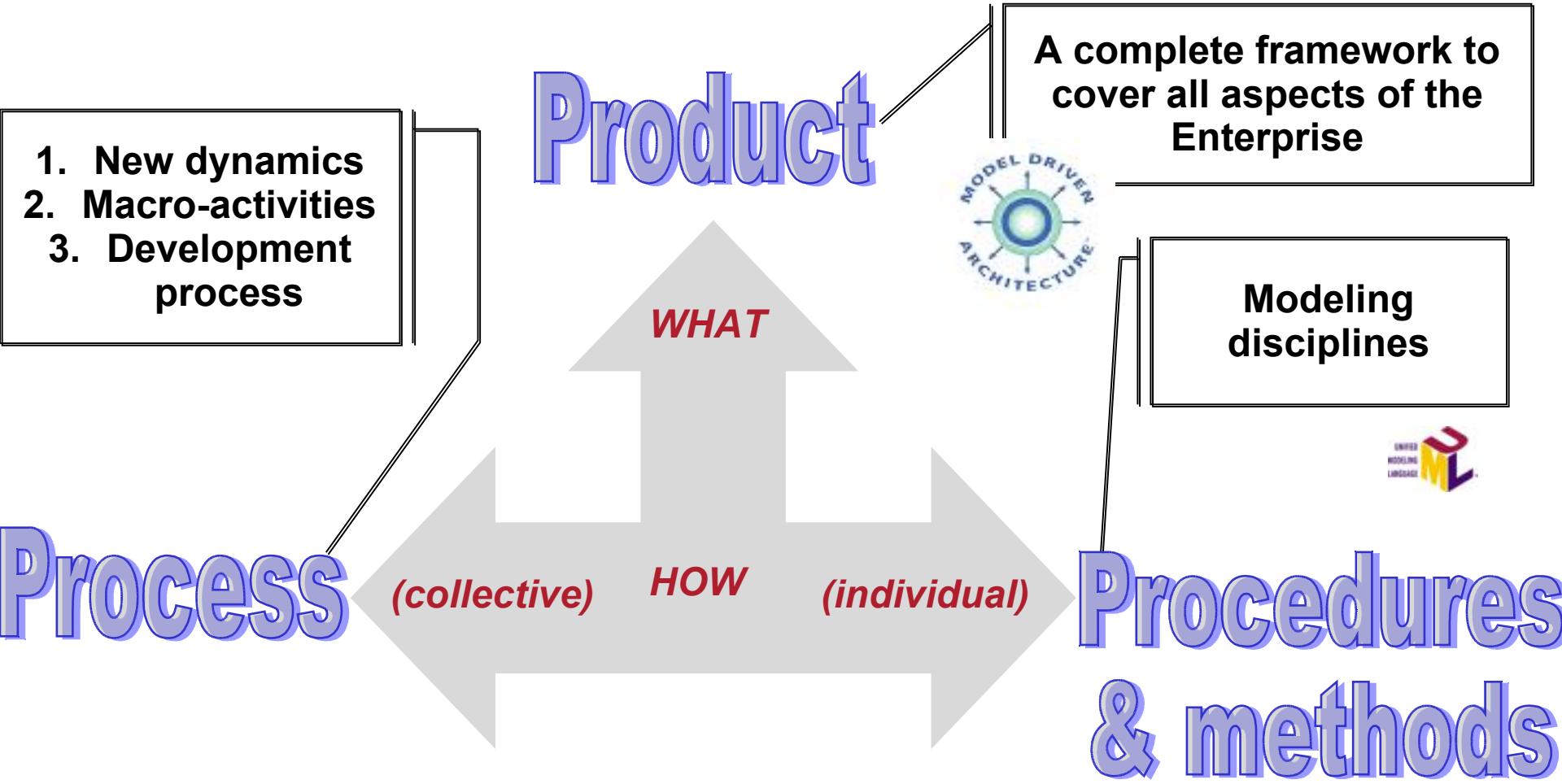
Several logical blocks match with the objects domains from semantic model.
Dependencies obey topological constraints
•Between strata (“Business Core”, “Organization”, “Interaction”)
•Coupling reducing,
•No dependency between FD, unless special cases,
•etc.

FD: functional domain
BO: business object
OD: objects domain

The Enterprise System Topology



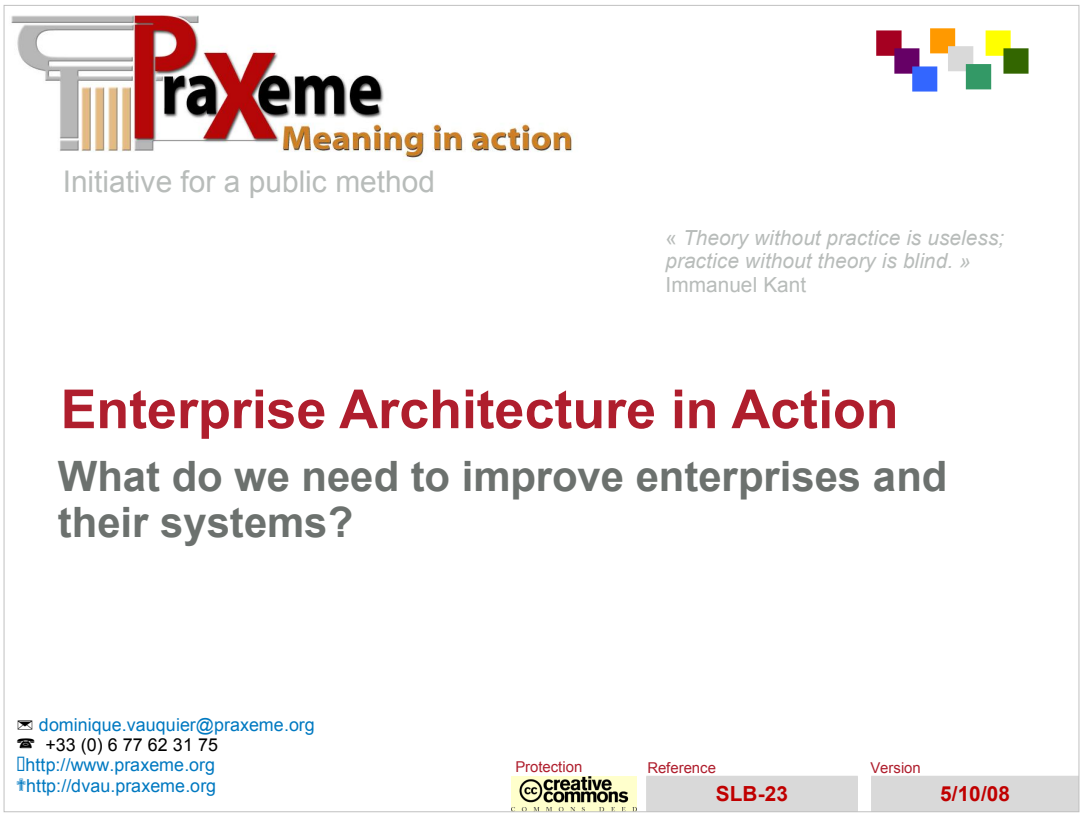
The main contribution from Praxeme methodology



Conclusion

- **For further information**
  - The site of the association "*Praxeme Institute*"
    - http://www.praxeme.org
  - The site of the "*Sustainable IT Architecture*" community
    - http://www.sustainableitarchitecture.com/
  - **Next events**
    - Presentation of the prebuilt models
    - Delivery of the development process
      - Contribution from the French Defense Department
  - Register
    - http://groups.google.com/group/Praxeme-Annonces

Help us to help you: please join us in our efforts!



First of all, I'd like to thank SUN Microsystems for giving me the opportunity of speaking before you.

SUN Microsystems shows a supportive interest in our works on methodology.

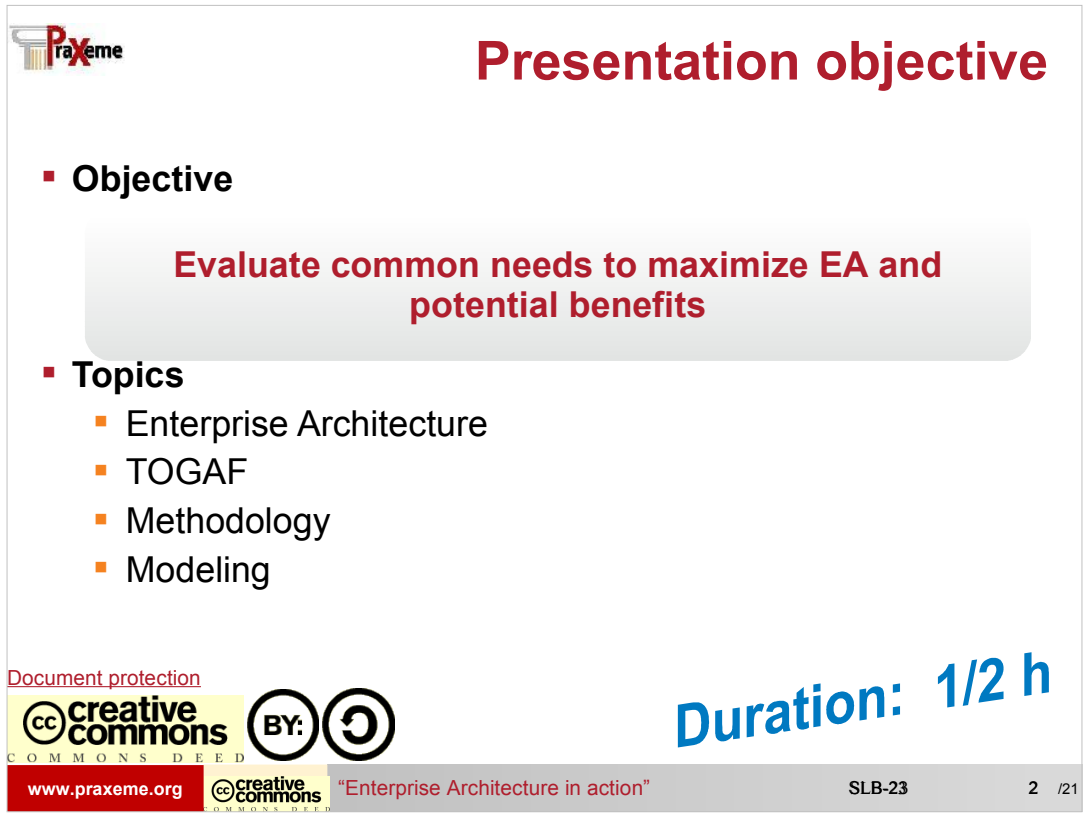
I'm here both as a senior architect in AXA Group and as a methodologist.

As an enterprise architect, I received TOGAF certification and I'm involved in the general policy of the group to drive convergence and simplification across the companies. I am also in charge of the IT Standards at AXA .

As a methodologist, I launched – 4 years ago – the initiative for a public method and I created, with others, the Praxeme methodology. Praxeme is an enterprise methodology, that is a set of principles and methods which encompass all the aspects of the enterprise.

Today, I will present how Praxeme and EA fit together in helping the enterprise.

Dominique VAUQUIER

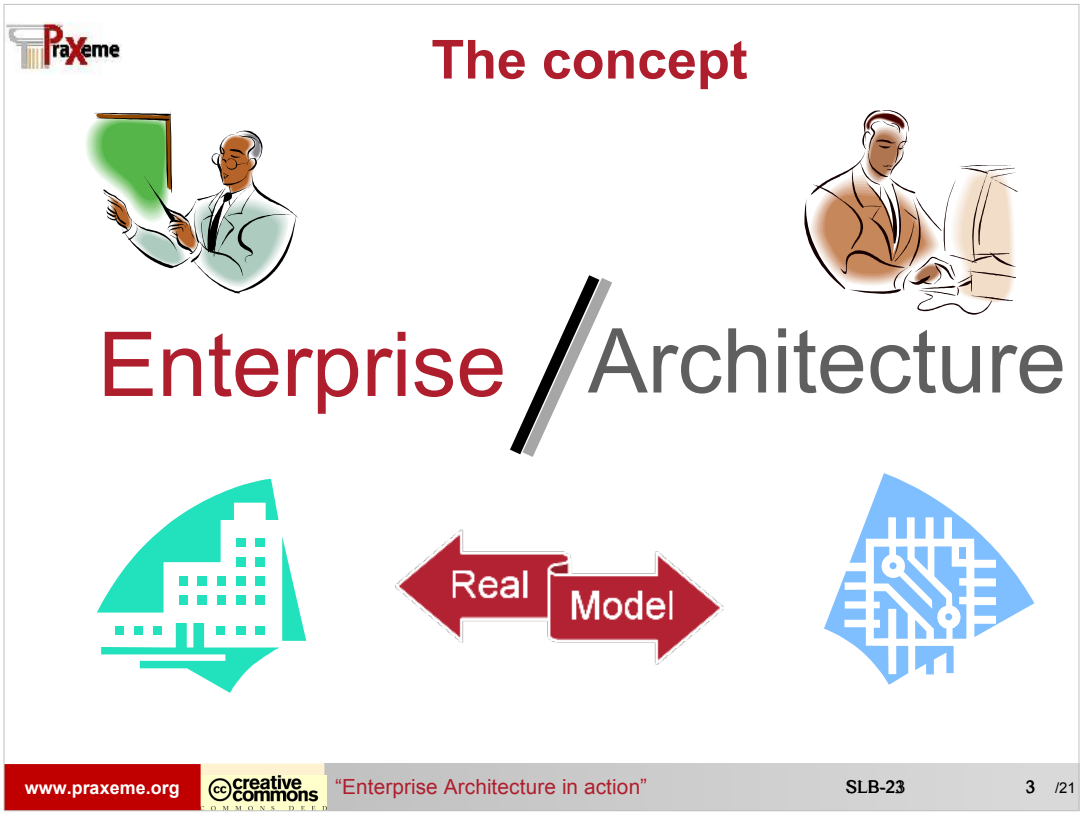


Enterprise Architecture is gaining momentum and audience. We can define it as a new trend and set of practices. As such, it brings a new standpoint in assessing the enterprise situation, especially regarding the enterprise transformation and the role of IT.

But, there are fears that this opportunity can/will be shattered by overselling hype and shallow understanding. This is all the more likely to happen since Enterprise Architecture is a loose concept and the repositories of practices are filled with loose notions. Good will is not enough to set up a revolution – at least, a deep change.

So, this presentation aims at exposing warning about difficulties EA initiatives encountered and it will conclude with the conditions and key success factors we think these initiatives ought to fulfill.

We will not have the time necessary to examine all theses conditions, so we will focus our attention on the most neglected topic: modeling techniques.



To start with, let us consider Enterprise Architecture as a unified concept. What does it bring to us? What is its genuine value?

I tend to trust the meaning of words and to interpret words as clues of the reality! In this phrase, there are two words. As a result, EA concept joins two points of view, put together two categories of people, skills and concerns.

•On one side, the enterprise itself, that is: the actors facing the environment.

•On the other side, the IT people with their abilities to propose software solutions that could enable the business activity.

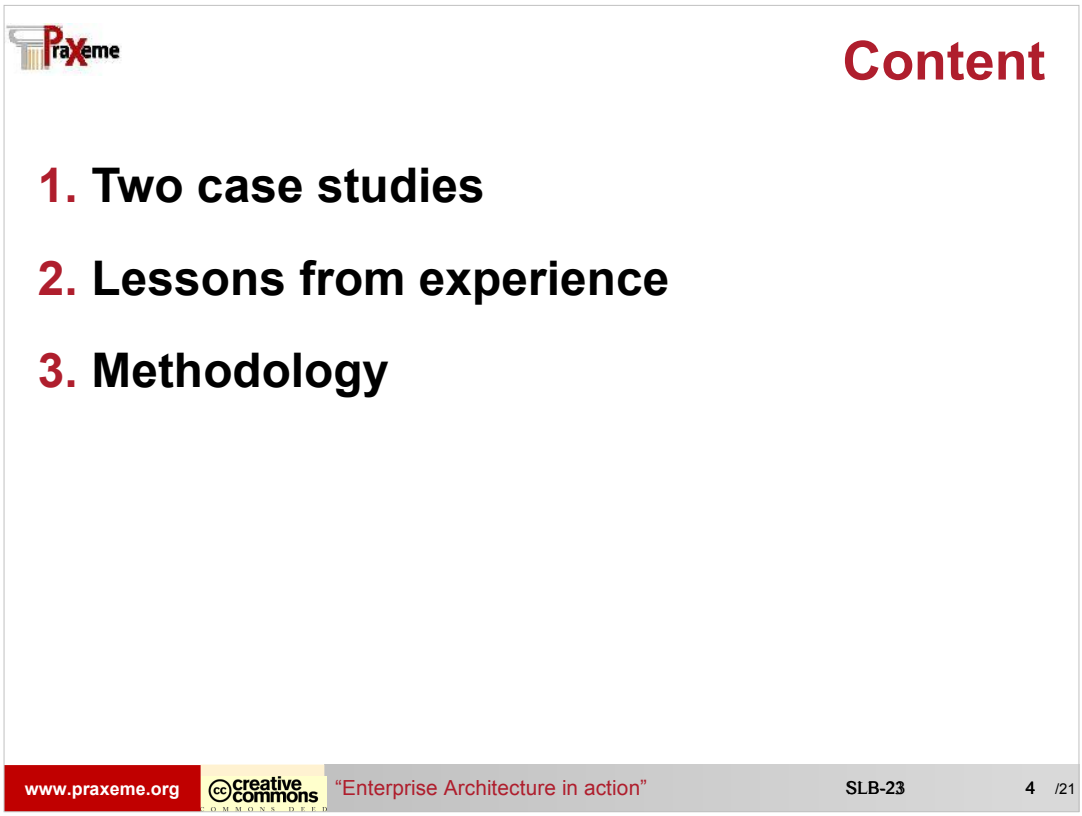
There are probably many cultural differences around this point, but it seems that, by and large, the communication between these two sides is not as simple and natural as we'd like.

Enterprise architecture is, first of all, an attempt to bridge the gap between business and IT.

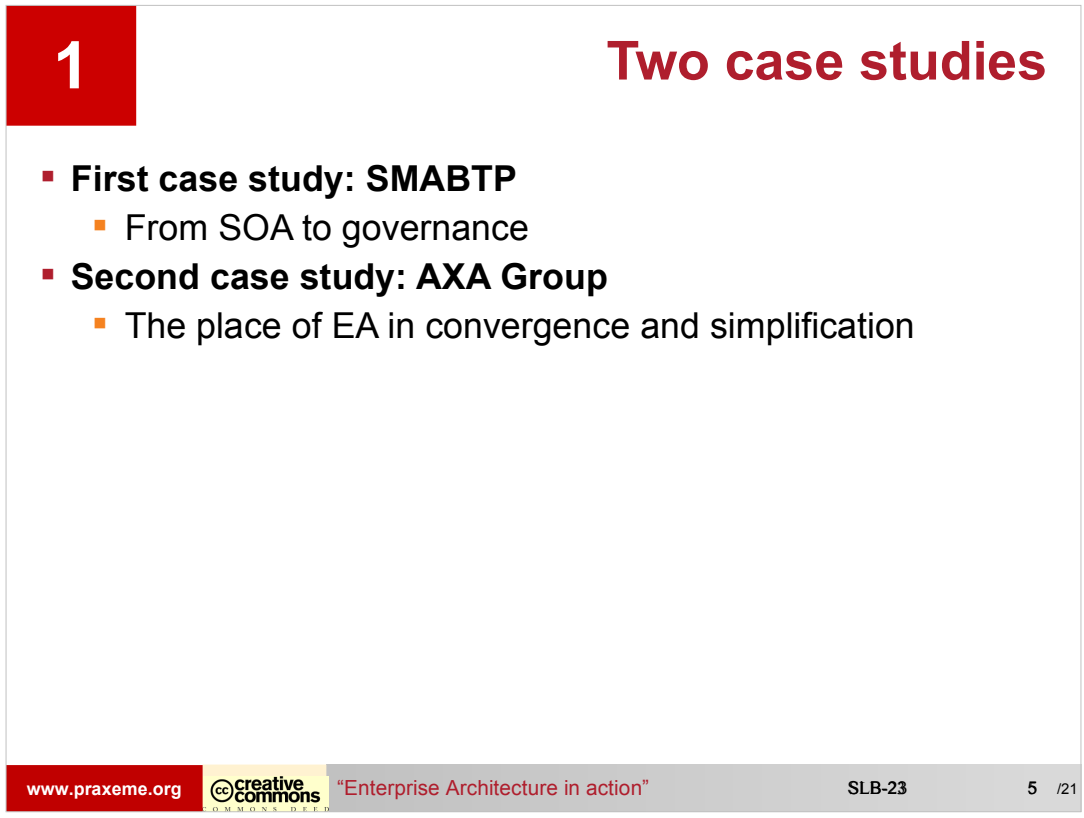
Business actors have the knowledge and are in position to detect opportunities for enhancing the services and/or products. But they lack the techniques appropriate for analyzing the situation in actionable terms.

IT people are well known for their focus on technologies and lack of awareness or understanding of the business reality. But, sometimes, they have the sense of what technology could bring to the enterprise. With their engineering training, they possess the means, techniques and the discipline to represent things in the formal way which is required for automation purpose.

In conclusion, the EA concept, in its core, is about communication across the enterprise, bringing together various points of view and helping the the enterprise rethink itself. We must keep this purpose in mind and go in search of the solution to leverage the communication and innovation.



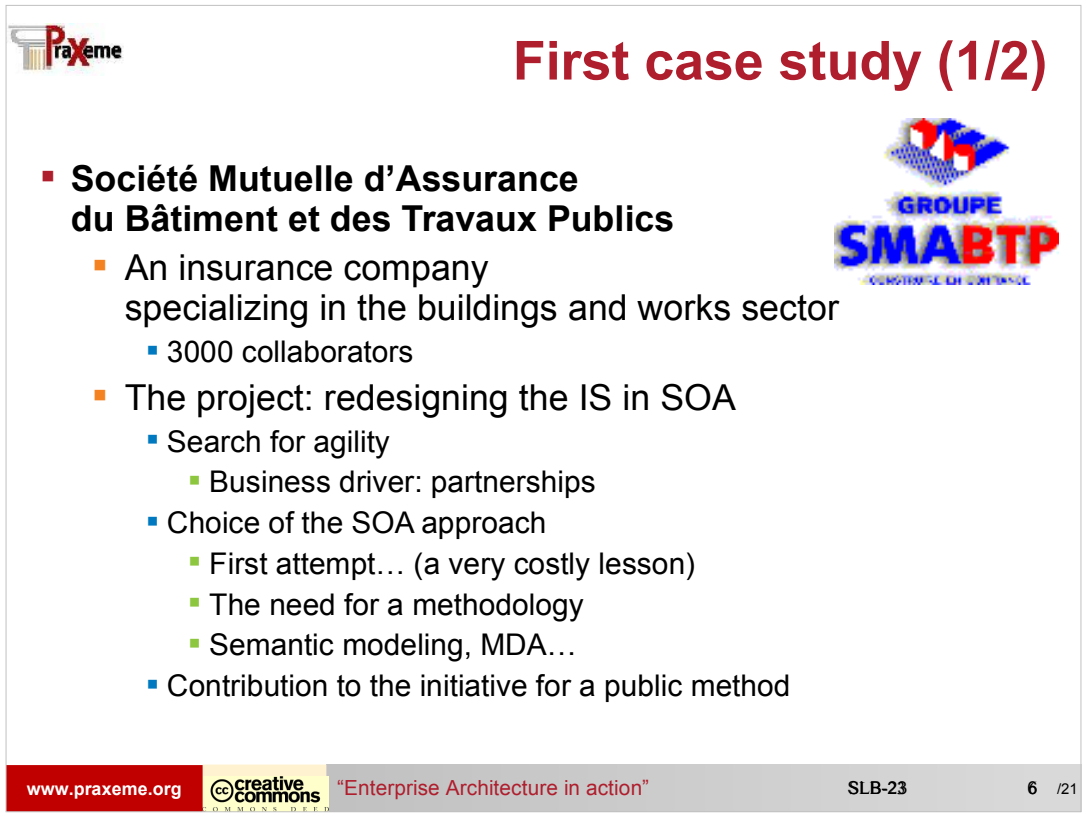
My presentation hinges on this communication intent of EA. It will be articulated in three parts, starting from practices and ending up with methodology as a summary and collation of good practices.



The two case studies have been chosen because they offer a kind of symmetrical effect. Not only these two firms differ by the size and history, but also the paths they follow are exact opposite.

2. At SMABTP, Enterprise Architecture and governance issues have been discovered as a result of an investment which was guided by an SOA decision. In a way, it resulted from a bottom-up approach.

3. At AXA Group, due to the organizational structure and culture of a large and decentralized group, governance was a prior choice. This choice led to Enterprise Architecture and the need is now to extend this top-down approach with a grasp at the grass roots level.



In this enterprise, SOA was a voluntary decision of the IT department with the full dedication of the deputy CIO.

The purpose was to build the entire information system, based on an SOA approach. The business driver was the partnership strategy. The board vaguely felt that this strategy will require the IT system to evolve.

At the beginning, the project wasted time on issues as the definition of the service notion and modeling techniques.

After six months of erratic attempts, the deputy CIO made his decision to acquire a method support. He chose the public method and decided to contribute to its development.

The context allowed for experimenting and establishing the SOA method. It gave the unexpected opportunity to put together many disciplines which are traditionally separated and not precisely eager to articulate.

In the meantime, an audit of the IT department was carried out. It agreed with the approach with proviso that the method must be shared by a large community.

Then, from inside the project, the staff enlarged the approach, with governance and Enterprise Architecture.

•On one hand, several organizational changes in the IT Department stemmed from the SOA style. For instance: a new balance between project mode and transversal activities; a new organization chart because of the change of the system structure.

•On the other hand, the methodology introduced semantic modeling, agility mechanism, logical architecture, proposals for business changes… all topics which appeal for business actors' involvement.

First case study (2/2)

- **Results**
  - Deployed application
  - Communication
    - Enterprise Architecture - born from the standpoint of IT improvement
    - The value proposition originated in the IT department

RESILIENT INFORMATION SYSTEMS

PROGRESSIVE RECASTING WITH SOA

Pierre Bonnet, Orchestra Networks, Jean-Michel Detavernier, SMABTP and Dominique Vauquier, Praxeme Institute
Wiley Ed.

As a result of this SOA investment, SMABTP has been driven into communicating and promoting Praxeme enterprise methodology.

A book – written with the deputy CIO – tells the success story and gives insight into the methodology and technology.

The first project focused on claims. Then the approach is being deployed to the other domains.

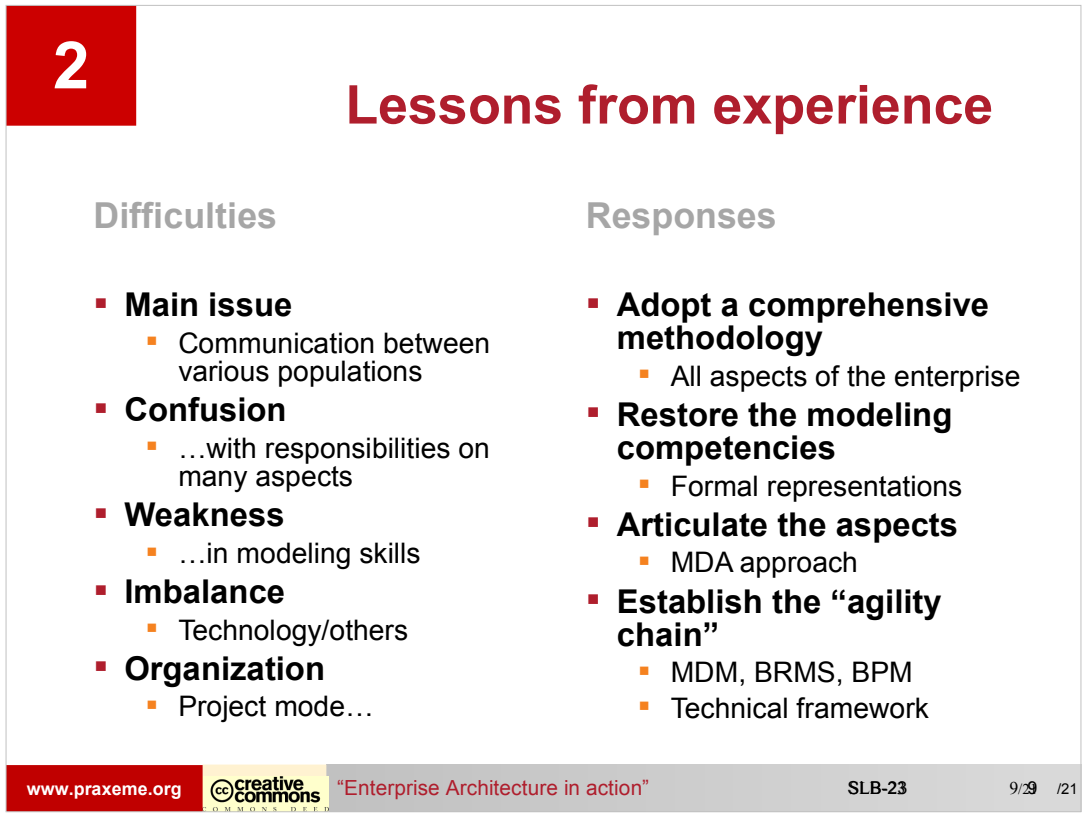
The IT people are trained thanks to an entire training offer which is available in the Praxeme corpus.

The AXA group employs about 10000 IT employees, in the four corners of the earth. For the most part, they are attached to a local company. At group level, the intent is to improve productivity of the staff and quality of the systems. In the insurance sector, information system clearly appears as a business enabler. In fact, several business and strategic initiatives have been launched and rely on information technology. For instance: multi-access, third-party distribution, customer centricity…

The Group Architecture team selected TOGAF as a reference. More than 100 enterprise architects from various AXA companies have been trained and are TOGAF certified. A complementary course, "Convergence & simplification" is in preparation, focusing on the project-level architects.

Enterprise Architecture is part of a broader mechanism for IS governance. There is a standing committee of CIOs from the largest companies that discusses the IT Investment strategy.

TOGAF as a common reference used by Enterprise Architects does help. However, when the discussion comes to detailed questions (How to compare architectures? What can be reused and under which conditions?), the practices are probably not enough similar from a company to another. The most obvious limitation concerns the representations of the system. For the moment, the main common representation is a "Business Capabilities Reference Model" against which the large projects and the strategic plans are assessed.



Placing things in the Enterprise Architecture perspective, the experience reveals some difficulties:

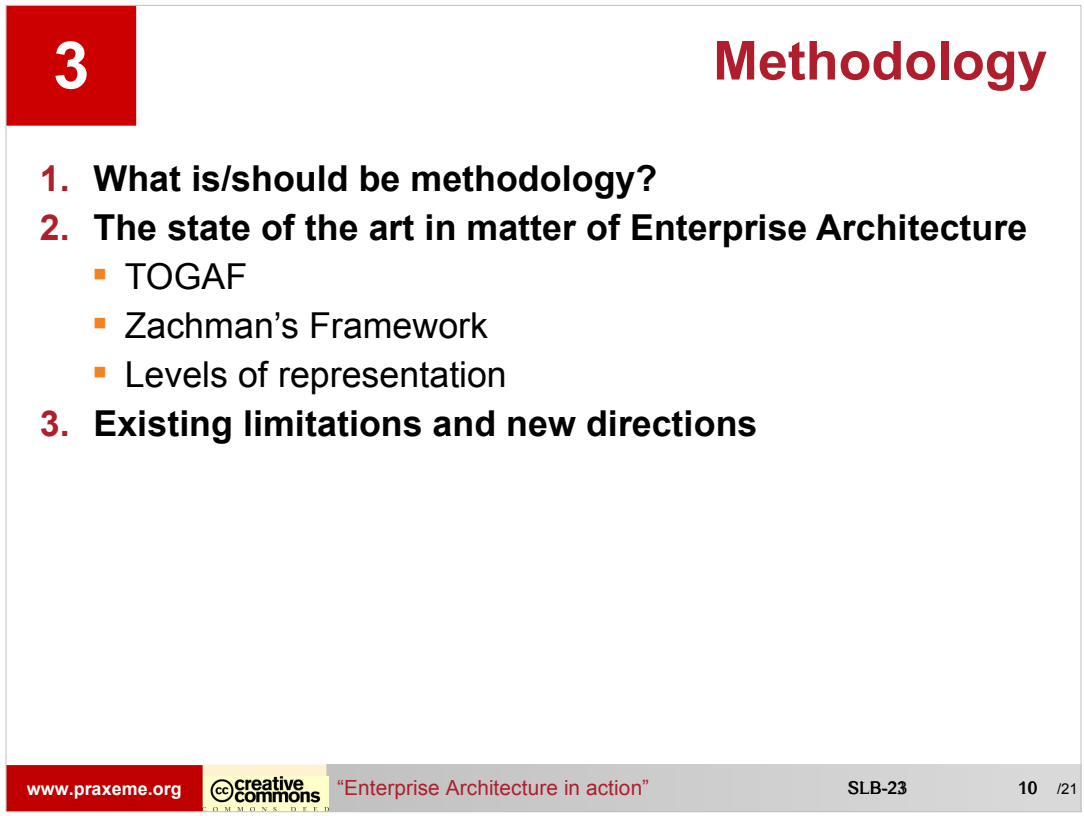
•Since the subject is the enterprise as a whole, it implies many professional populations, each with its own target, interest, vocabulary, culture… So, most of the time, the main challenges we experienced result from communication issues. The traditional chasm between business and IT doesn't seem to have been resolved, in today practices. It could not be unless we decide to seriously cope with the question.

•In matter of architecture, we have to recognize that there are several types of architectures, each of which requires a specific approach and a specialized discipline. If we lack an overall frame to correlate these disciplines we will not be able to define responsibilities accurately enough. Particularly, the balance between logical architecture and technical architecture absolutely need to be addressed.

•Too often, we find ourselves in the situation of making a decision about the system, sometimes about important investment, only on the basis of vague information and an informal draft. We absolutely need to restore our ability to model: the only way to deal with complexity.

•Among the disciplines and know-how we must reckon with, the technical expertise enjoys an overvalued legitimacy. It leads to a misrepresentation of the other points of view and jeopardizes the multidisciplinary approach. [the techies in the room will not like it – soften the blow somehow]

•Our project culture also impedes the Enterprise Architecture effort. "Because IT applications have been designed historically to map to this business pattern, the applications we run are siloed, the notion of resource-sharing is alien to this culture." cit. *SOA Governance. Applying Governance to Ensure the Long-term benefits of SOA*. Butler Group, p. 150.



In the face of these difficulties, we propose:

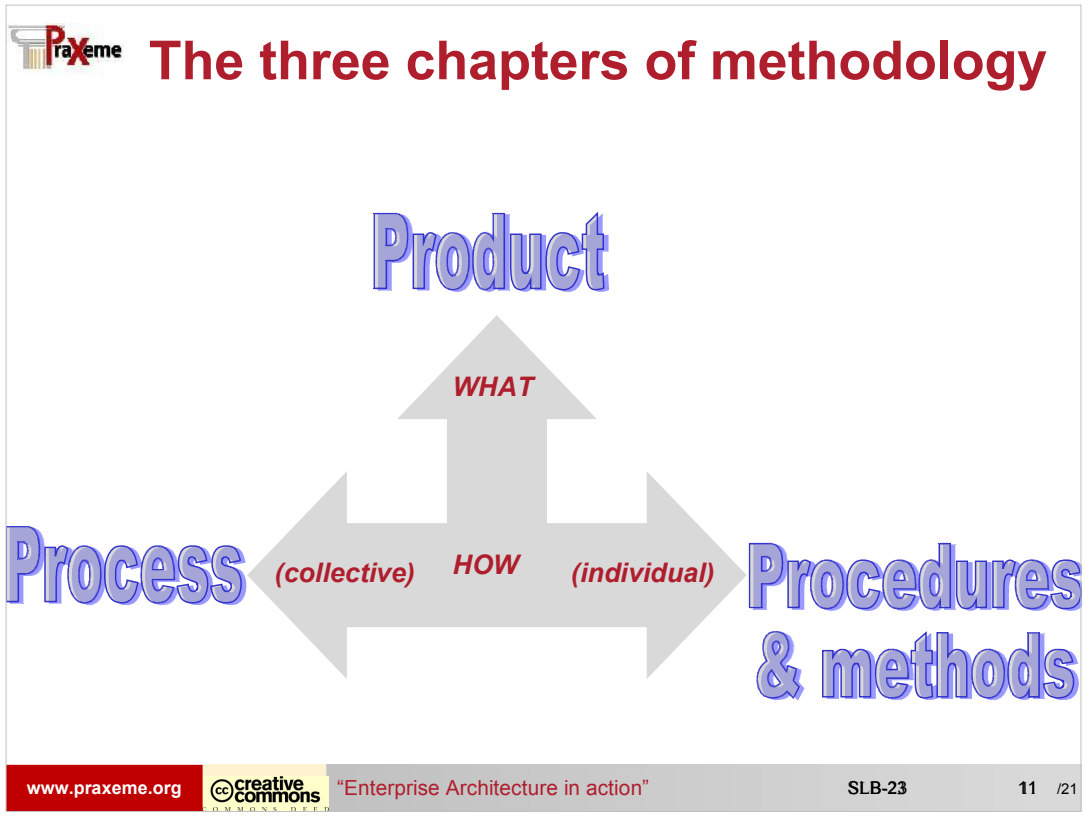
•to adopt a comprehensive methodology which encompasses all the aspects of the enterprise, from its strategy till the deployment;

•to restore modeling skills by defining detailed modeling techniques and by investing in a stringent training;

•to cautiously articulate the different types of models we need in order to cover all the activity chain;

•to take advantage of today technology offer and set up the agility chain (MDM, BRMS, BPM).

New considerations spur the work on methodology. As we are about to move toward a new approach, it is the appropriate time for taking these considerations into account and pour them in the foundations of the new methodological repository.



In the field of methodology, we distinguish three dimensions or chapters:

2."Product": the "What" the object we want to build or change. (enterprise, organization, IT system, software component, people, values…).

3."Process": the "How" at a collective level (how should we work together?).

4."Procedures and methods": "How" at an individual level (how should I produce what it is required? How to draw a good model? How to design an appropriate solution?).

"Product": the enterprise itself and all the systems inside (information system, production system, software…). What is to be represented?

We want to model the "Enterprise System" before acting on it.

Which models do we need?

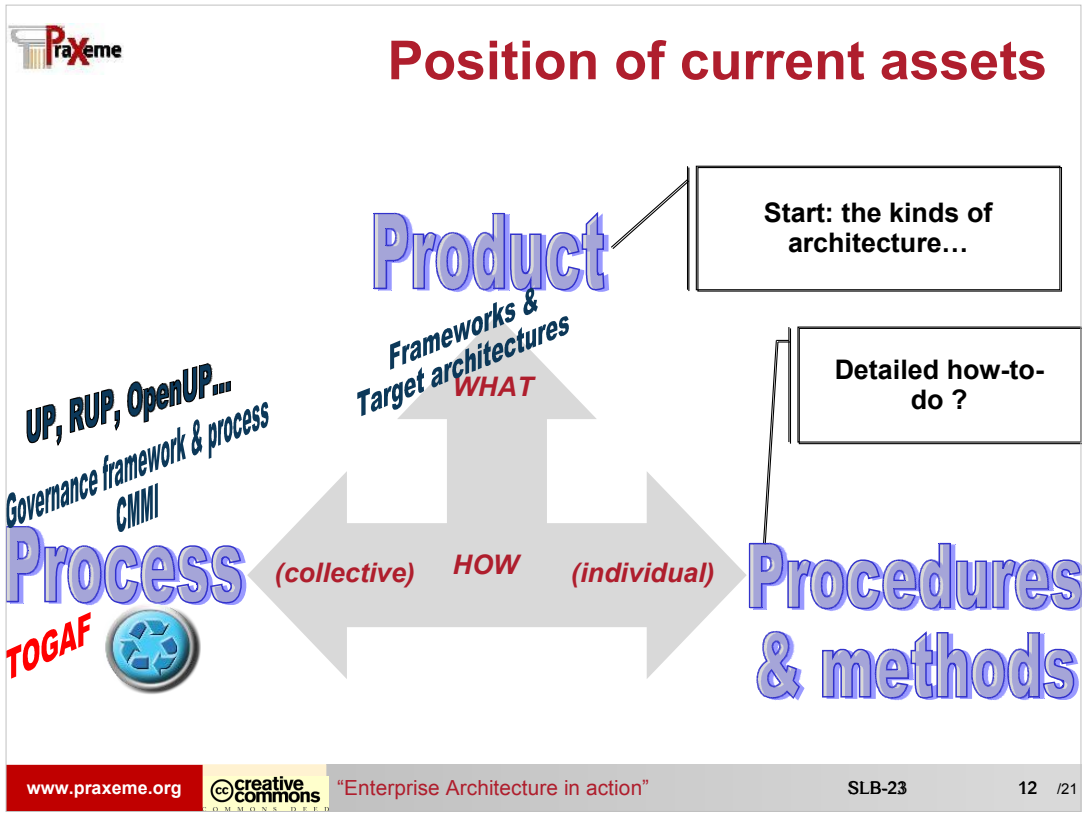
How can we ensure a comprehensive description of this complex system?

How to build a check-list of information to seek for and decision to make?

These are primary questions in order to lay the groundwork.

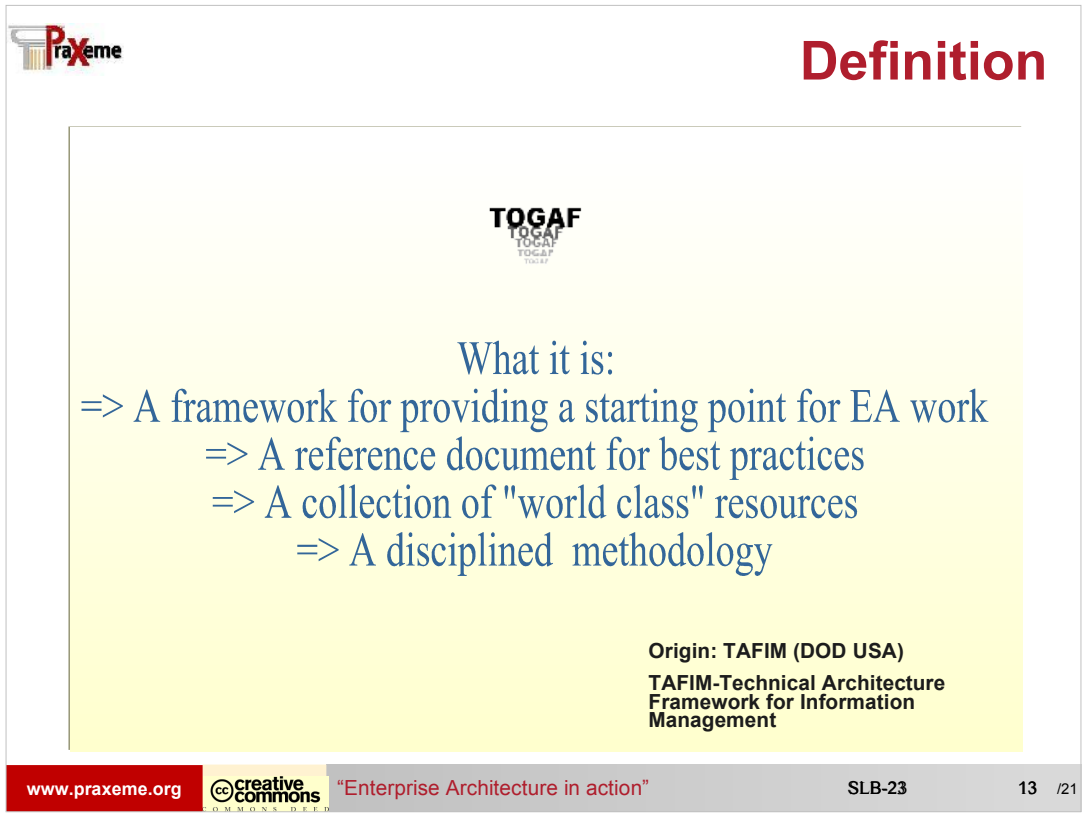
Also: how to correlate link, trace and so forth all the artifacts?

Nowadays, most of the methodological offer is focused on the processes (enterprise transformation, software development…) and answers the question: "How do we work as a group of actors?" The responses in terms of "Product" and detailed procedures are set apart and often omitted.



Prior to answering the question "How should we work?", the question of the Product raises. What is the thing – enterprise, system, application… - we act on? What is to be said of it? How should we describe it?

At its highest level, this question is addressed in the shape of a methodological framework. The role of such a framework is to provide an underlying theory of what we have to consider in our activities.



In the case of TOGAF, "methodology" is an inappropriate term. TOGAF is not a discourse about the method. It is more of a "best practices" repository, obtained by consensus in an architects community.

It provides us with:

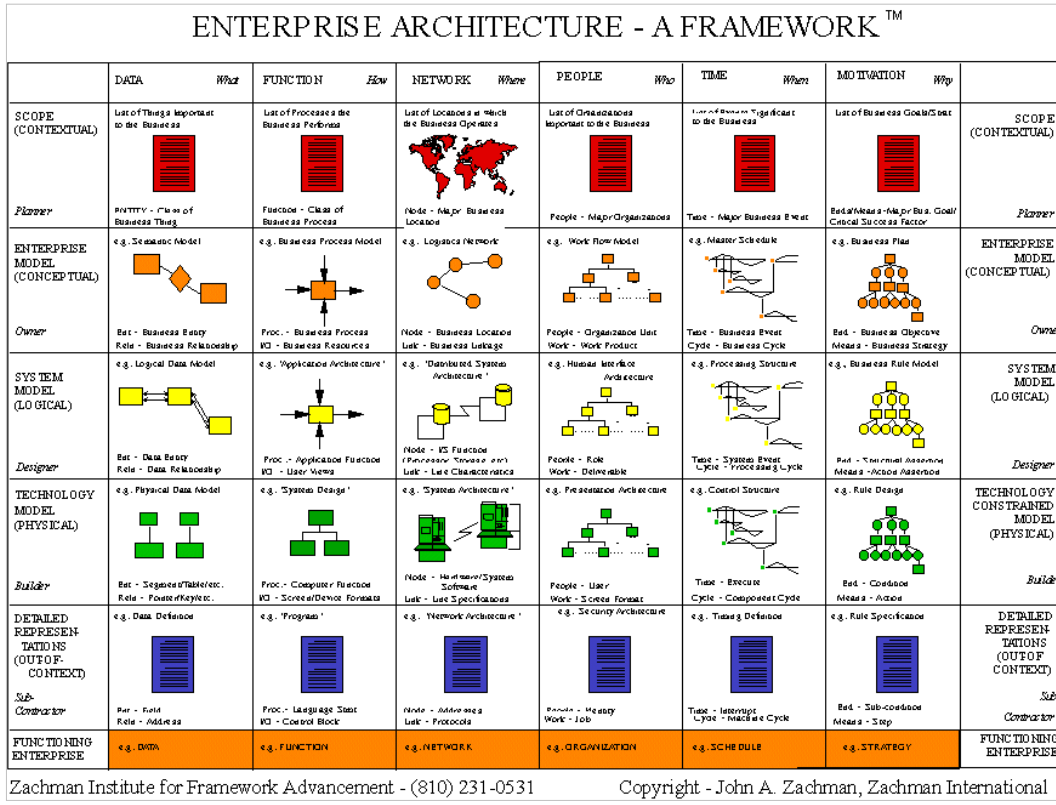
•a process (ADM);

•an overall frame stating 4 kinds of architectures;

•a knowledge database about many topics.

Many organizations – specially multinational ones – have chosen TOGAF for its widespread support and the access to an open community.

There exist other repositories (e.g. DoDAF used by the U.S. Department of Defense).



Zachman's framework is a well-known methodological frame, establishing the kinds of information we have to deal with when transforming the enterprise.

Nevertheless, it reflects a software orientation which limits its accuracy. Indeed, Zachman answers the "What?" and "How?" questions in terms of data and functions. These answers make sense in a certain state of information technology.

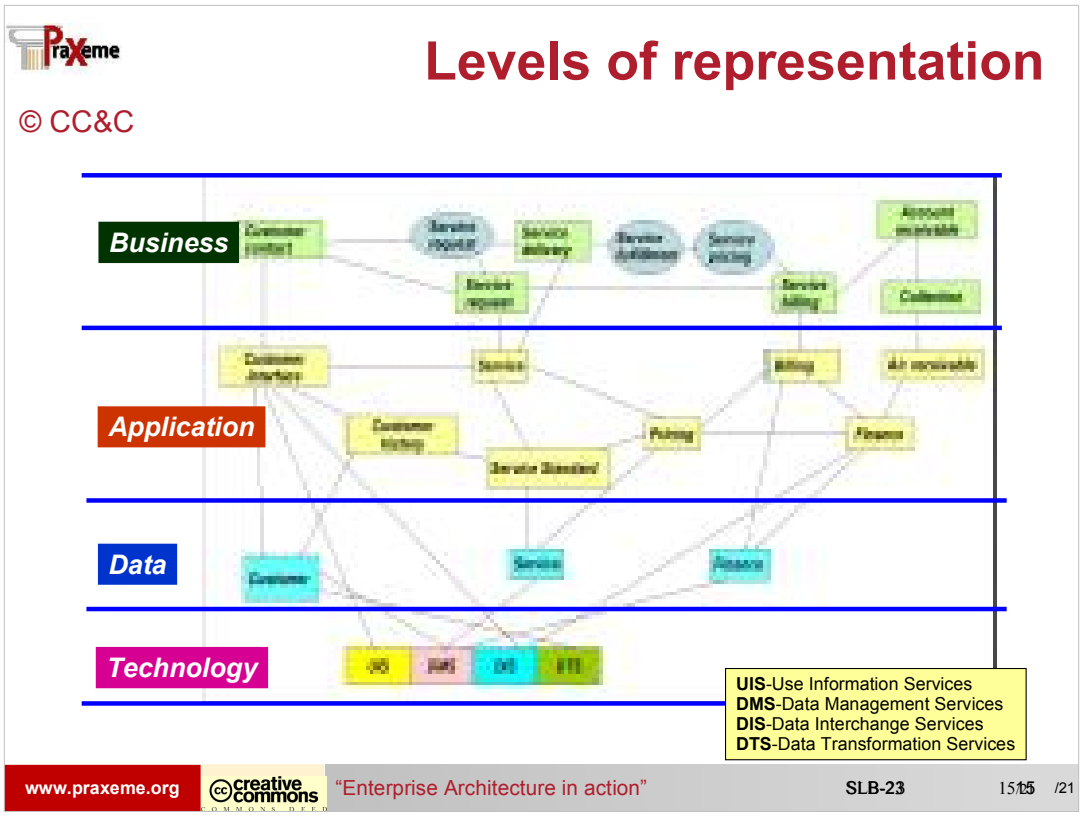
Some drawbacks:

•The framework defines too many models. In fact, we never saw a project strictly applying the framework. Even the methods (as TOGAF) didn't use directly this framework (see next slide).

•The categories for representation are given *a priori*, without any justification.

•Zachman says nothing about how to articulate the categories across the models.

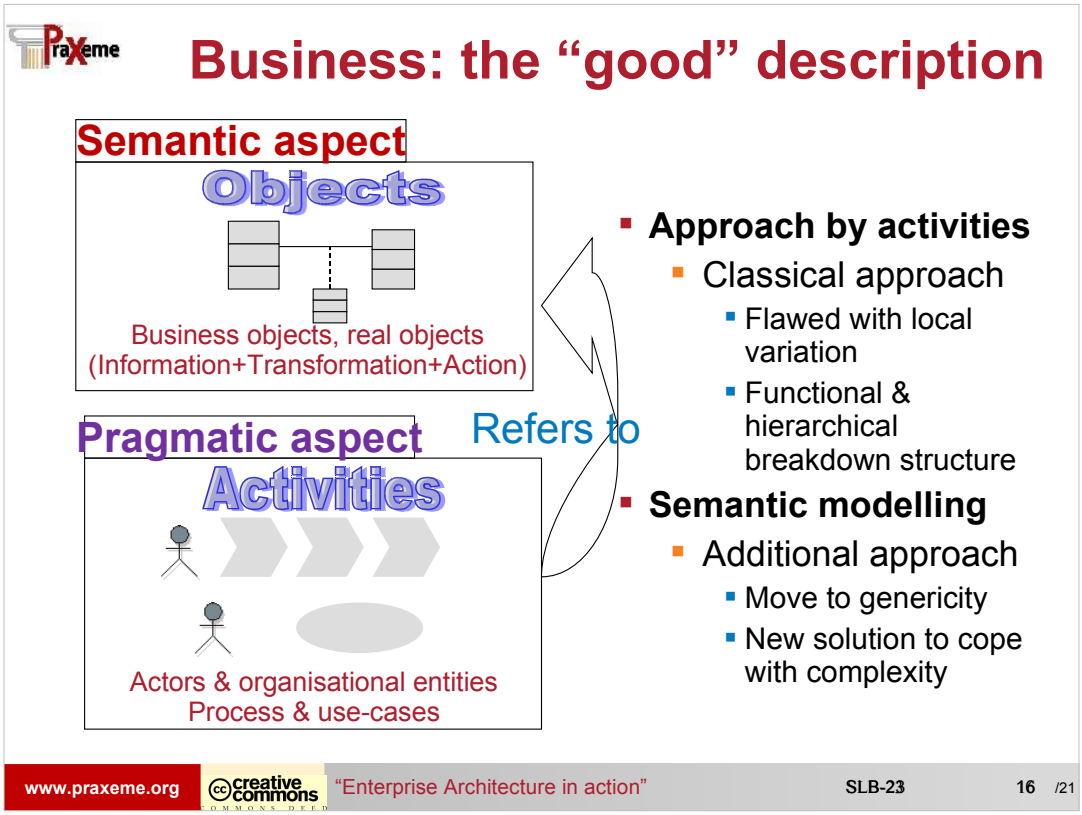
Despite these defects, we reckon Zachman's framework among our heritage. It is still useful and inspiring.



In most cases, the EA initiatives apply a four layers frame instead of Zachman's framework or other theory.

The business perspective – one of four – is known in TOGAF as Business Architecture and expressed in terms of processes.

So, the more abstract level regarding the enterprise is the organizational one. Compared to the traditional methodologies, we have lost at least one level: the conceptual level of abstraction. Hence, the separation of concerns has been dramatically altered.



This spontaneous approach of business reality ranks among the functionalist approaches.

It entails a difficulty: we are considering the enterprise in its organisational aspect.

Yet, what we see in this aspect are actors, activities, processes, use-cases... All this stuff conveys organisational choices.

Therefore, representations of this aspect can hardly be shared and generalized.

When the purpose is convergence, simplification, agility... we need a more generic representation. We need to isolate the core business knowledge, using abstraction and expelling variability.

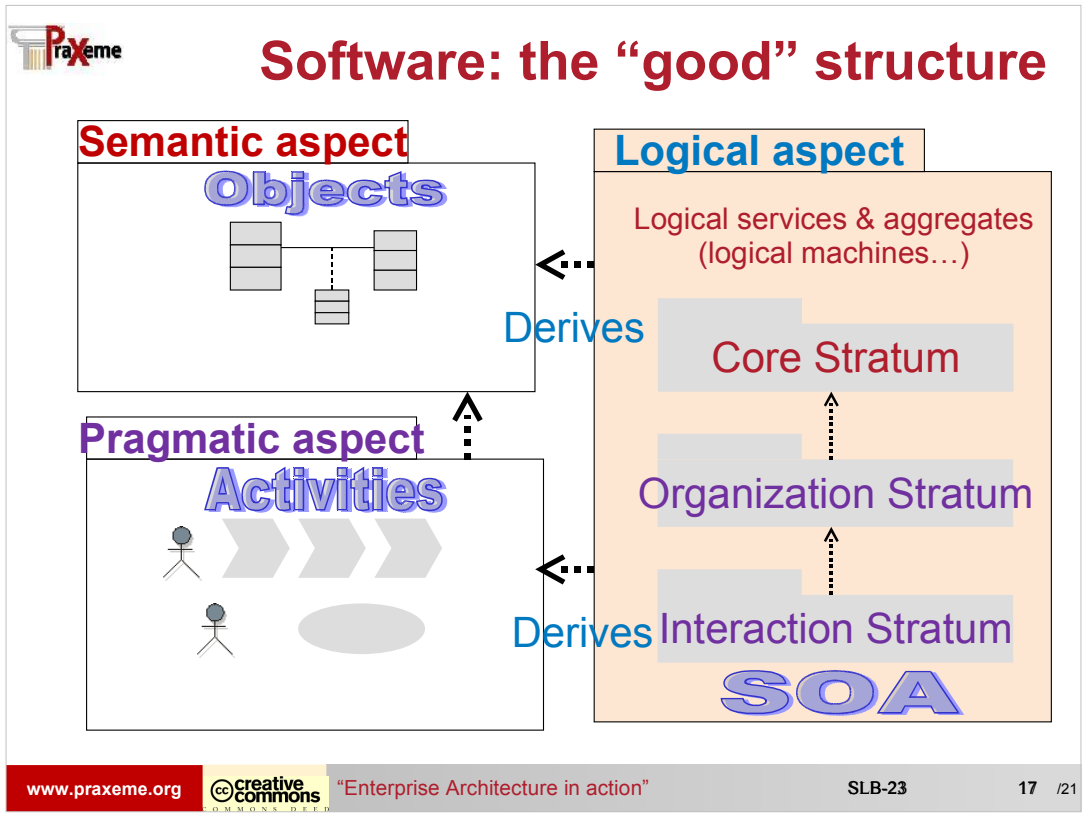
We must recognise above this “pragmatic” (organizational) aspect a more abstract one, made of business objects, regardless of organisational habits and, of course, independent of technical choices. This aspect, we name it semantic. The semantic model is not only a sort of conceptual data model; it intends to express the business knowledge. We can use here an object oriented approach, which provides us with all the tools we need:

•class diagram to structure the concepts,

•state machines to catch the transformations and objects life cycles,

•Etc.

Object oriented approach is connoted software but it lies upon philosophical works. That explains its ability to efficiently structure representations. It can really empower the formal expression of business knowledge. For an example see: http://www.mdmalliancegroup.com/ .



When equipped with the two business models – semantic and pragmatic – we can search for a better structure for the software solution.

If we conceive this structure directly in terms of technology and technical choices, we will get a representation which will be subjected to technical change. Also, there will be a risk of entering in excruciating details. Such a representation will make it impossible to drive the IS transformation on the long term.

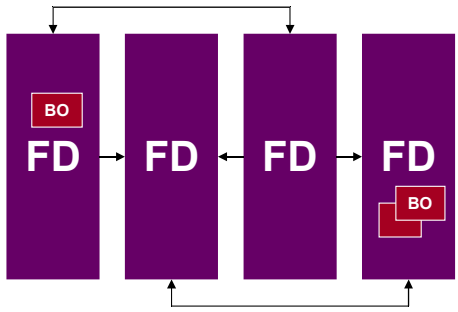
For all these reasons, our frame introduces an intermediate aspect, between business and IT: the logical aspect. It is the ground where will be made the structural decisions regarding the software system.

For instance, SOA is a style for a logical architecture.

The logical aspect is linked with the previous aspects. The methodology states the derivation rules which help discovering the logical services.

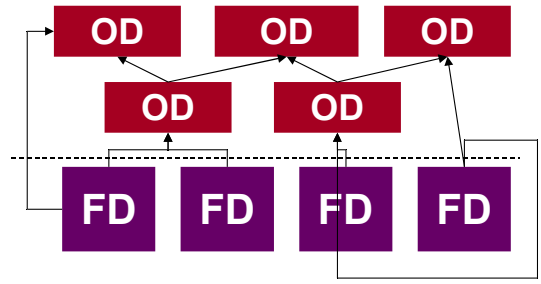
Logical architecture: a new approach

Caricature of an architecture based upon functional approach



Logical blocks take in charge functional domains
Which structure the pragmatic model
It stems from that important dependencies or redundancies since same business objects are used inside many functional domains

Outlined logical architecture according to Praxeme method



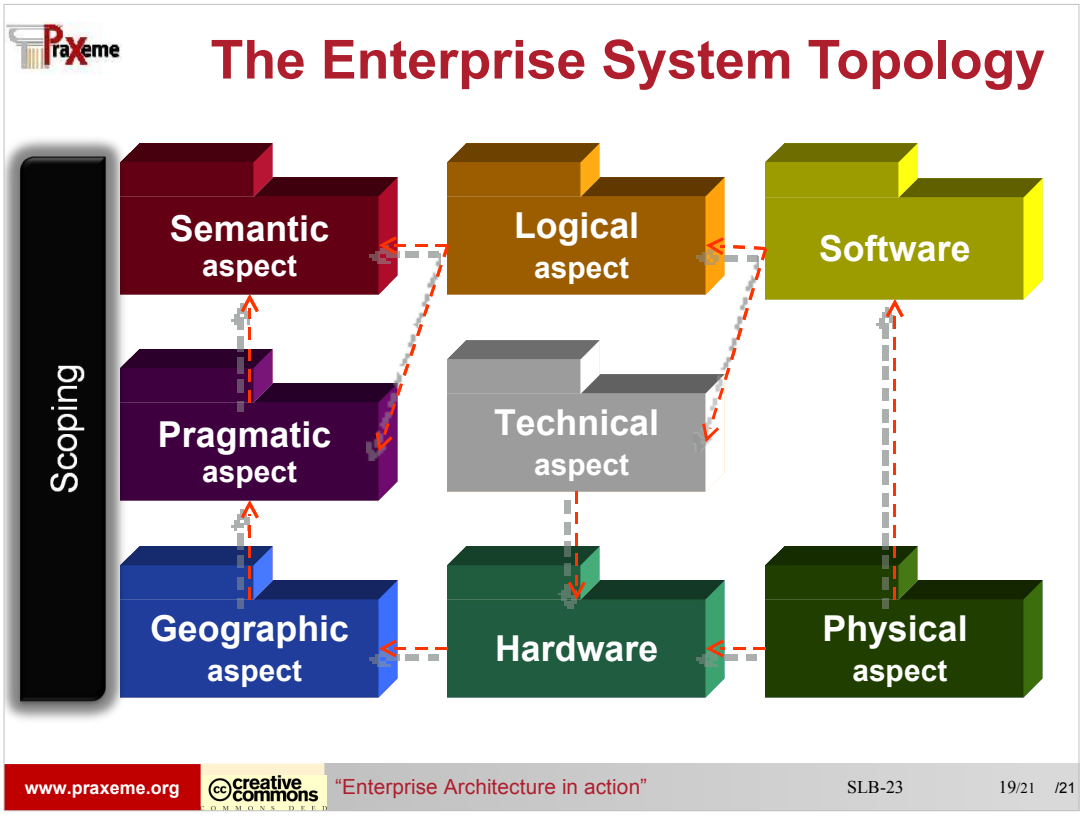
Several logical blocks match with the objects domains from semantic model.
Dependencies obey topological constraints
•Between strata (“Business Core”, “Organization”, “Interaction”)
•Coupling reducing,
•No dependency between FD, unless special cases,
•etc.

FD: functional domain
BO: business object
OD: objects domain

By applying this approach, we change deeply the structure of the system.

Indeed, the logical architect receives from the semantic model a list of objects domains. Objects domains are an alternative way for structuring a model, opposed to functional domains.

For more details, see the “Guide to logical aspect”.



We previously introduced semantic, pragmatic and logical aspects. These are three among eight aspects which the comprehensive framework identifies and articulate. The all picture is the scheme of the Enterprise System Topology. We can formally model each of these aspects, in order to master information and decision making regarding the enterprise. In addition to the eight aspects, there are elements of knowledge and management that cannot be given a formal expression by means of models: objectives, requirements, vocabularies, rules when expressed in natural language. The "scoping" box gathers these scoping elements. They are then linked to model elements dispatched in the aspects, depending on their nature.

Some points related to the framework and the shift of paradigm it embodies:

What must change in our mindset?
How should we perceive things in order to facilitate our work?

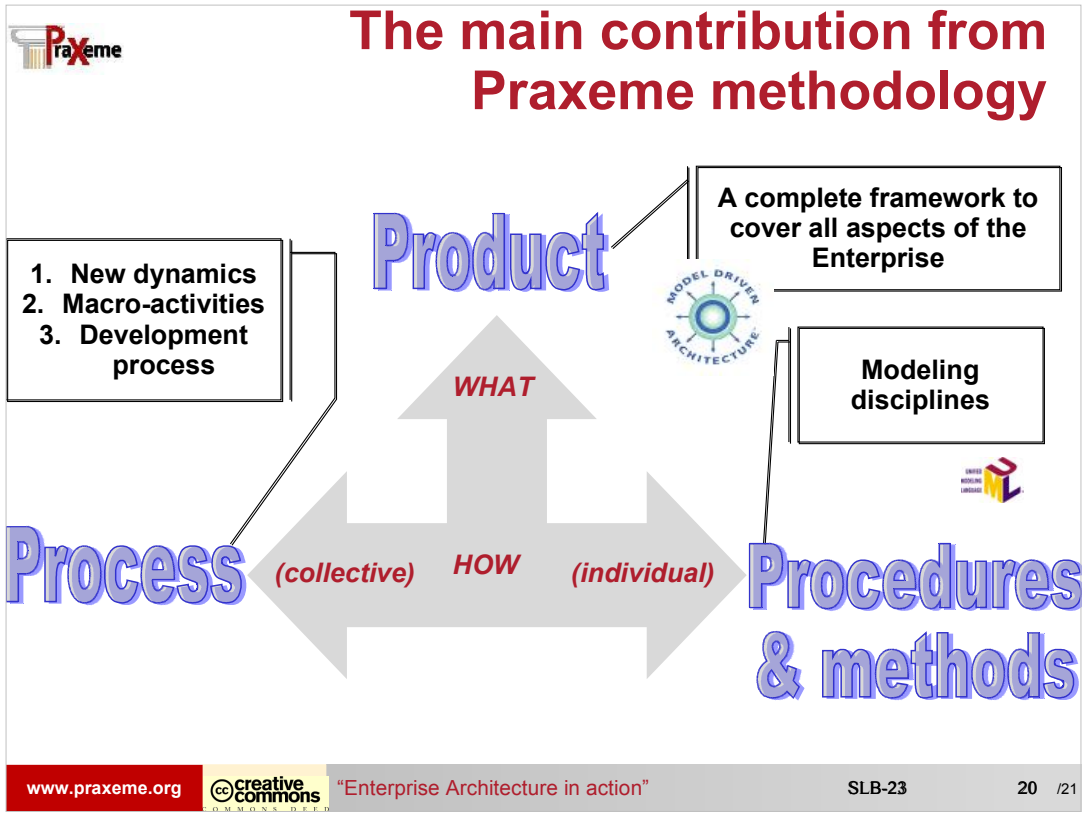
Separation of concerns as an inescapable principle

•*An upper level of abstraction*: Semantic modeling, to express the core business knowledge in a formal way.

•*An intermediate level*: Logical architecture, to design the optimal structure of the software system, regardless of technical choices.

New categories are used to perceive the real and design the solutions

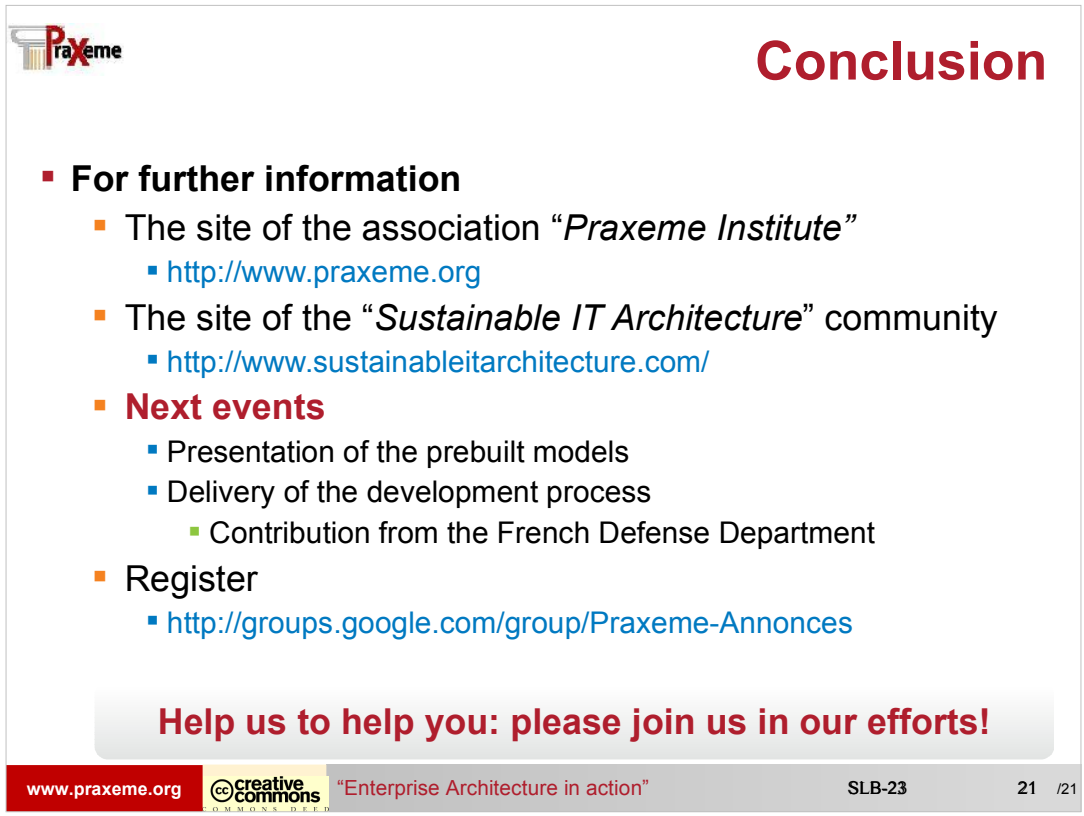
- •Object oriented approach, ontologies, agents… can be used for semantic modeling.
- •SOA, a style of logical architecture, is a good direction – today – for structuring and designing the system.
- •Praxeme proposes an innovative method for designing the business processes.



In a nutshell, what Praxeme brings to Enterprise Architecture as a contribution:

•Firstly, a more complete framework which is based upon a theory of representation and which is detailed in a metamodel (the "Enterprise System Topology" provides the ground and frames the metamodel).

•Secondly, modeling techniques for each of the eight aspects (these modeling techniques are – generally but not always – tooled by the UML standard so as to facilitate deployment and conform to the MDA approach).



The Praxeme Institute is a not-for-profit association whose goal is to develop and promote the open source method.

Many contributors from private and public sectors back the initiative.

The Praxeme Institute publishes on its site:

•The methodological guides that constitute the methodology.

•Complementary papers.

•Prebuilt models.

•Training material.

The list "Praxeme-Annonces" (see the slide) provides information to follow the activities around the method (no more than one or two messages per month).