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The Zachman Framework (Zachman 1987)



Analogy: Classical Architecture

Bubble charts: conceptual representation delivered by the architect

Architect's drawing: transcription of the owner's perceptual requirements –
owner's perspective

Architect's plans: translation of the owner's requirements into a product –
designer's perspective

Contractor's plans: phases of operation, architect's plans constrained by
nature and technology – *builder's perspective*

Shop plans: parts/sections/components of building details (out-of-context
specification) – *subcontractor's perspective*

The building: physical building itself

Dimension 1: Architectural Representations with analogs in Building and Information Systems

Generic	Buildings	Information Systems
Ballpark	Bubble charts	Scope/objectives
Owner's representation	Architect's drawings	Model of the business (or business description)
Designer's representation	Architect's plans	Model of the information system (or information system description)
Builder's representation	Contractor's plans	Technology model (or technology-constrained description)
Out-of-context representation	Shop plans	Detailed description
Machine language representation	—	Machine language description (or object code)
Product	Building	Information system

Dimension 1: Architectural Representations

- Each representation is different nature, in content, in semantics from the others – representing different perspectives
- Representations do not correspond to different levels of details – level of detail is an independent variable, varying within one representation

Dimension 2: Types of Descriptions

- There exist different types of descriptions oriented to different aspects

- Each aspect can be associated by question word

WHAT material description

HOW functional description

WHERE location description

WHO organisational description

WHEN temporal description

WHY motivational description

Three different types of descriptions

	Description I	Description II	Description III
Orientation	Material	Function	Location
Focus	Structure	Transform	Flow
Description	<i>WHAT</i> the thing is made of	<i>HOW</i> the thing works	<i>WHERE</i> the flows (connections) exist
Example	Bill-of-materials	Functional specifications	Drawings
Descriptive model	Part-relationship-part	Input-process-output	Site-link-site

Information systems analogs:

	Description I (material)	Description II (function)	Description III (location)
Information systems analog	Data model	Process model	Network model
I/S descriptive model	Entity-relationship-entity	Input-process-output	Node-line-node

Combination of the two ideas

For each different type of description there are different perspectives:

	What	How	Where	Who	When	Why
Planner	The content of these cells defines the scope of the enterprise, identifying what should possibly be modeled.					
Owner	These cell models comprise the Business Model - the Owner's expectations from a business perspective for the operating enterprise.					
Designer	These cell models comprise the technology neutral System Model - the Designer's plan for enabling the Business Model.					
Builder	These cell models comprise the Technology Model - the Builder's plan for applying technology to the System Model.					
Sub-contractor	These cells are listings, identifying the actual solutions that have been implemented.					
Functioning Enterprise	The functioning enterprise.					

Zachman Framework

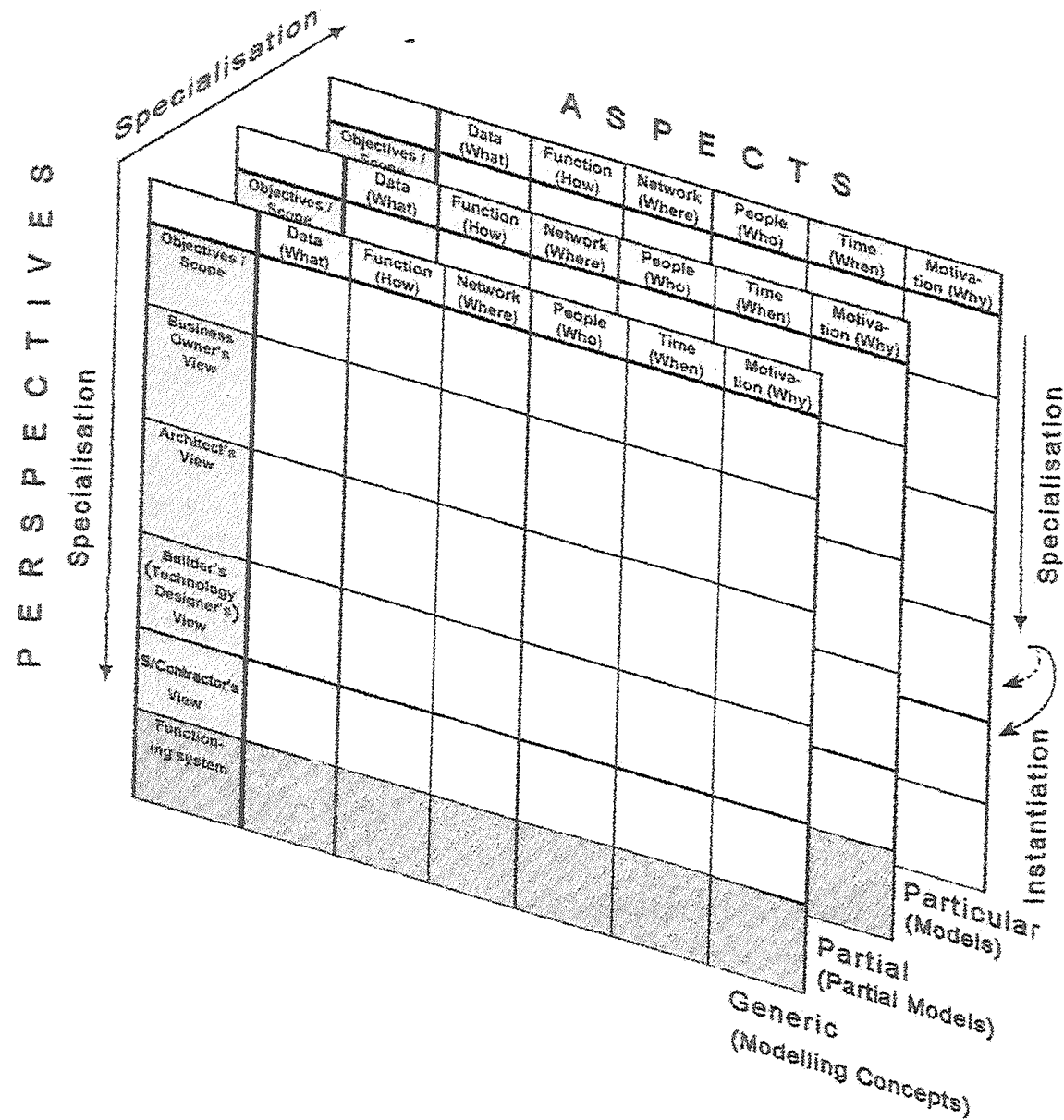
	WHAT DATA	HOW FUNCTION	WHERE NETWORK	WHO PEOPLE	WHEN TIME	WHY MOTIVATION	
SCOPE {contextual}	List of Things Important to the Business Entity = Class of Business Thing	List of Processes the Business Performs Process = Class of Business Process	List of Locations in Which the Business Operates Node = Major Business Location	List of Organizations Important to the Business People = Major Organizational Unit	List of Events/Cycles Significant to the Business Time = Major Business Event/Cycle	Lists of Business Goals/Strategies Ends/Means = Major Business Goal/Strategy	SCOPE {contextual}
Planner							Planner
BUSINESS MODEL {conceptual}	e.g., Semantic Model Entity = Business Entity Relationship = Business Relationship	e.g., Business Process Model Process = Business Process I/O = Business Resources	e.g., Business Logistics System 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	BUSINESS MODEL {conceptual}
Owner							Owner
SYSTEM MODEL {logical}	e.g., Logical Data Model Entity = Data Entity Relationship = Data Relationship	e.g., Application Architecture Process = 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							Designer
TECHNOLOGY MODEL {physical}	e.g., Physical Data Model Entity = Segment/Table/etc. Relationship = Pointer/Key/etc.	e.g., System Design Process = Computer Function I/O = Data Elements/Sets	e.g., Technology Architecture Node = Hdw/System Software Link = Line Specifications	e.g., Presentation Architecture People = User Work = Screen Formats	e.g., Control Structure Time = Execute Cycle = Component Cycle	e.g., Rule Design End = Condition Means = Action	TECHNOLOGY MODEL {physical}
Builder							Builder
DETAILED REPRESENTATIONS {out-of-context}	e.g., Data Definition Entity = Field Relationship = Address	e.g., Program Process = Language Statement I/O = Control Block	e.g., Network Architecture Node = Address Link = Protocol	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}
Subcontractor							Subcontractor
FUNCTIONING ENTERPRISE	e.g.: DATA	e.g.: FUNCTION	e.g.: NETWORK	e.g.: ORGANIZATION	e.g.: SCHEDULE	e.g.: STRATEGY	FUNCTIONING ENTERPRISE

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Model Types of the Zachman Framework

	DATA <i>What</i>	FUNCTION <i>How</i>	NETWORK <i>Where</i>	PEOPLE <i>Who</i>	TIME <i>When</i>	MOTIVATION <i>Why</i>
Objective/Scope (Contextual) → Role: Planner	List of Things important in the Business	List of Core Business Processes	List of Business Locations	List of important Organizations	List of Events	List of Business Goals/Strategies
Enterprise Model (Conceptual) → Role: Owner	Conceptual Data/ Object Model	Business Process Model	Business Logistics System	Work Flow Model	Master Schedule	Business Plan
System Model (Logical) → Role: Designer	Logical Data Model	System Architecture Model	Distributed Systems Architecture	Human Interface Architecture	Processing Structure	Business Rule Model
Technology Model (Physical) → Role: Builder	Physical Data/ Class Model	Technology Design Model	Technology Architecture	Presentation Architecture	Control Structure	Rule Design
Detailed Representations (Out of Context) → Role: Programmer	Data Definitions	Program	Network Architecture	Security Architecture	Timing Definition	Rule Specification
Functioning Enterprise → Role: User	Usable Data	Working Function	Usable Network	Functioning Organization	Implemented Schedule	Working Strategy



Task

- Consider the data aspect of the Zachman Framework
- For an enterprise a customer is an important entity. What could be a description of the data aspects from the
 - ◆ Planner's perspective – Scope
 - ◆ Owner's perspective – Business Model
 - ◆ Designer's perspective – System Model
- (you do not need to care for the representation language, you can be geared to the representation in the Zachman article)