



Requirements Engineering and the Enterprise: The Ultimate Complex Concurrent System

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Tuesday, 26 June 2007

10:00 – 12:00 AM

(Session 4, Track 1)

Software vs. Systems Viewpoints

- Converging viewpoints
- UML / SysML is driving some convergence or at least discussion
- Driving attitudes that need to change
 - Systems – “Software is just a component”
 - Software – “Avoid the messiness of systems in the real world, such as deployment, aging, poor physical environments, and chaos”

- What is software and what is hardware in the enterprise?

Programs

- Bricks, desks, and machines?
- People, decisions, information systems?

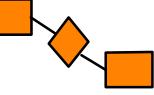
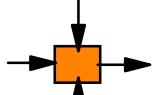
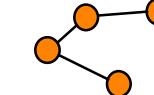
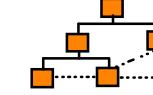
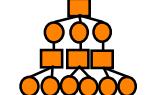
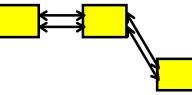
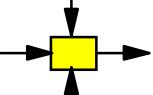
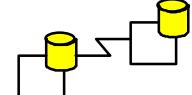
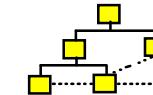
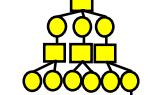
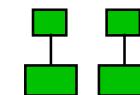
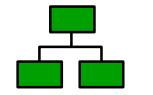
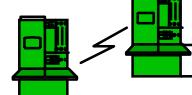
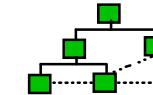
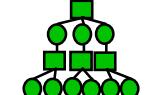
Initiatives

Infrastructure

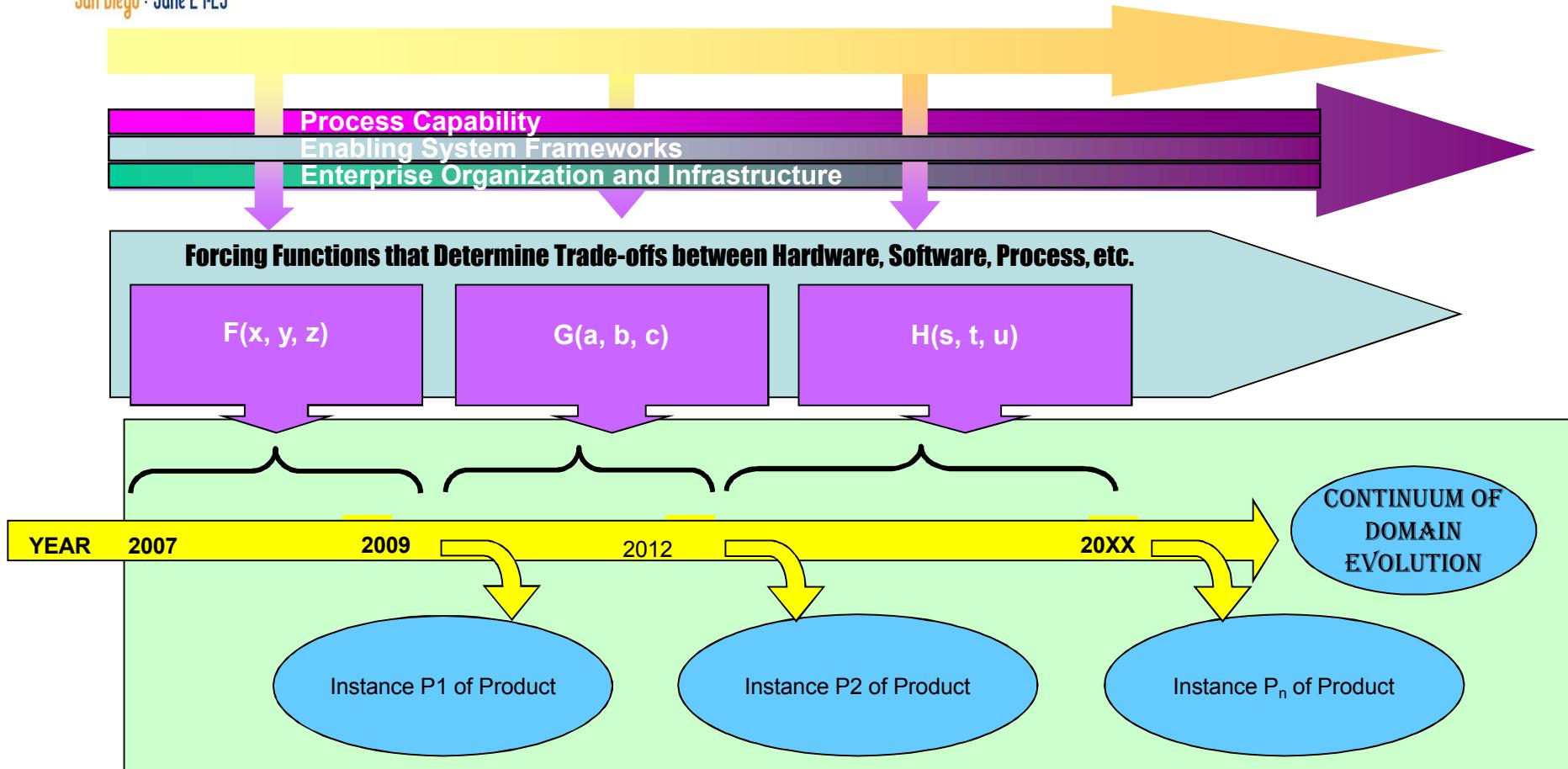
Campaigns

Applying Systems Engineering to the Enterprise May Drive Complete Convergence

ENTERPRISE ARCHITECTURE - A FRAMEWORK™

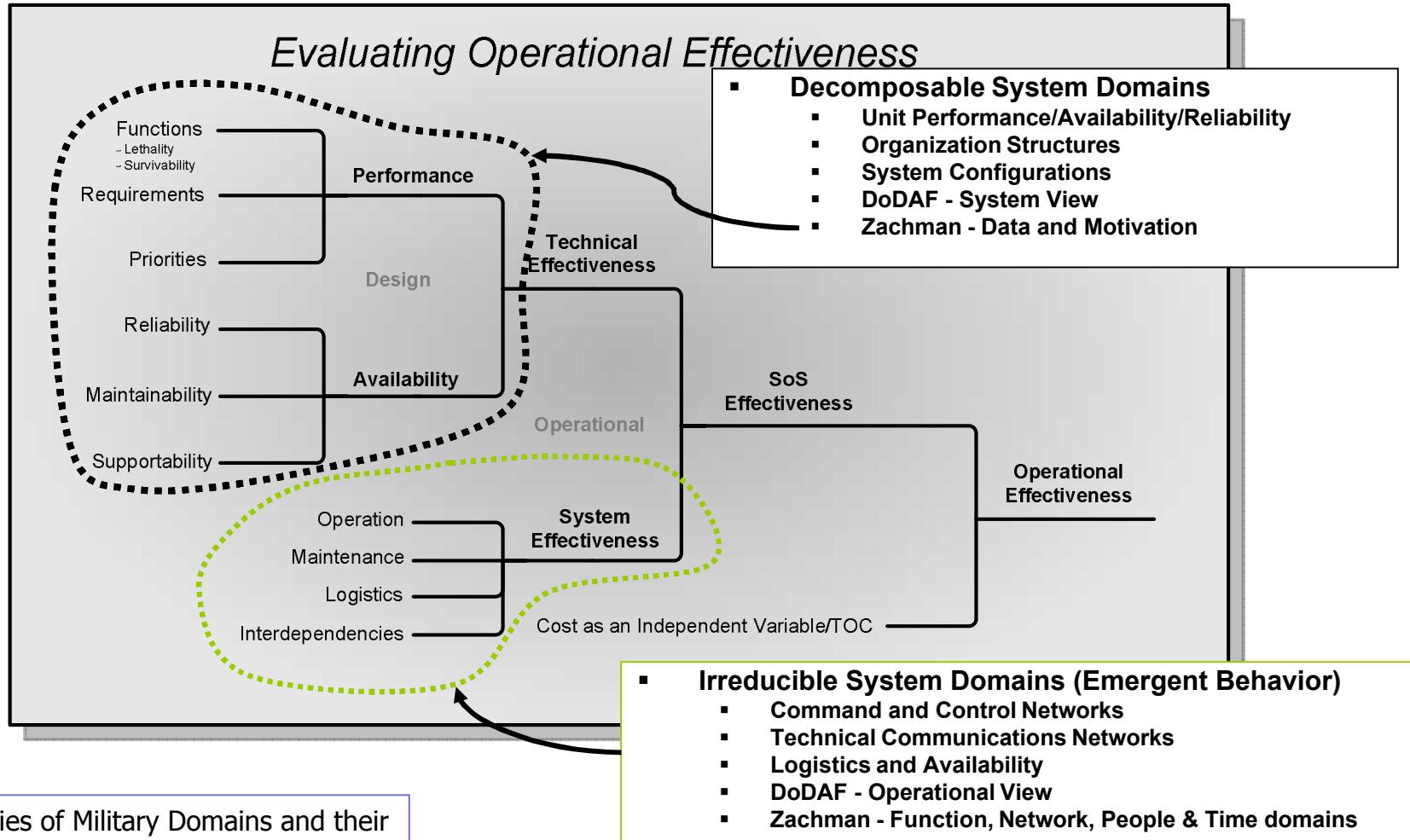
	DATA <i>What</i>	FUNCTION <i>How</i>	NETWORK <i>Where</i>	PEOPLE <i>Who</i>	TIME <i>When</i>	MOTIVATION <i>Why</i>	
SCOPE (CONTEXTUAL)	List of Things Important to the Business 	List of Processes the Business Performs 	List of Locations in which the Business Operates 	List of Organizations Important to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

Some Thoughts on Possible Model



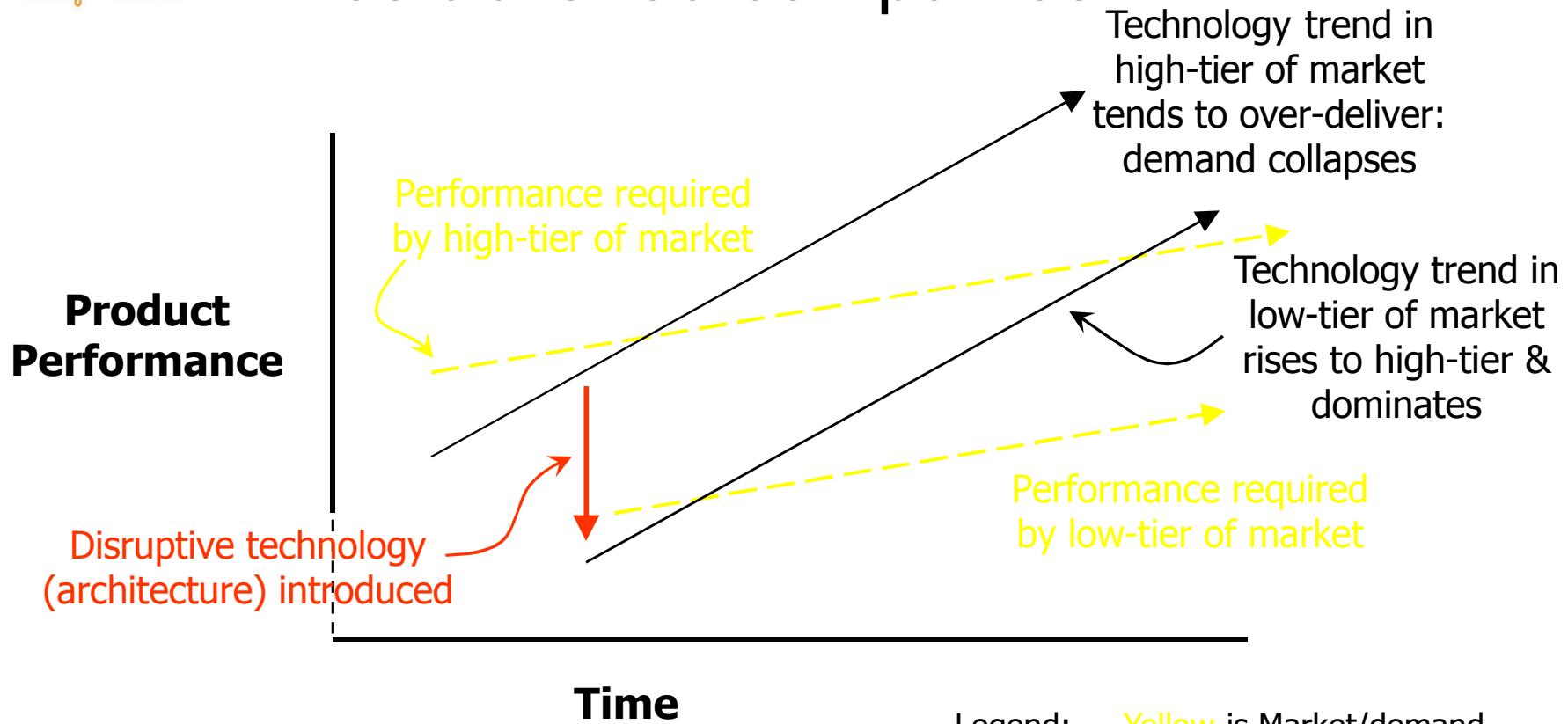
Products evolve based on various factors including technology, need for agility, enterprise constraints, etc.

Examples of Reducible and INCOSE Irreducible Domains



Categories of Military Domains and their relationship to Operational Effectiveness

Disruptive technologies (architecture) undermines established companies.



Based on Fig. I.1 of *Innovator's Dilemma*

Effects of disruptive technologies and environments are similar, but inverted.

