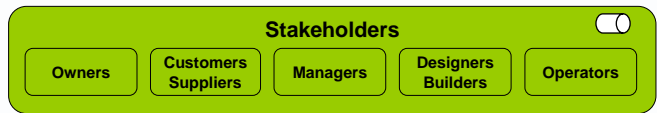


2. Architecture Context and Motivations

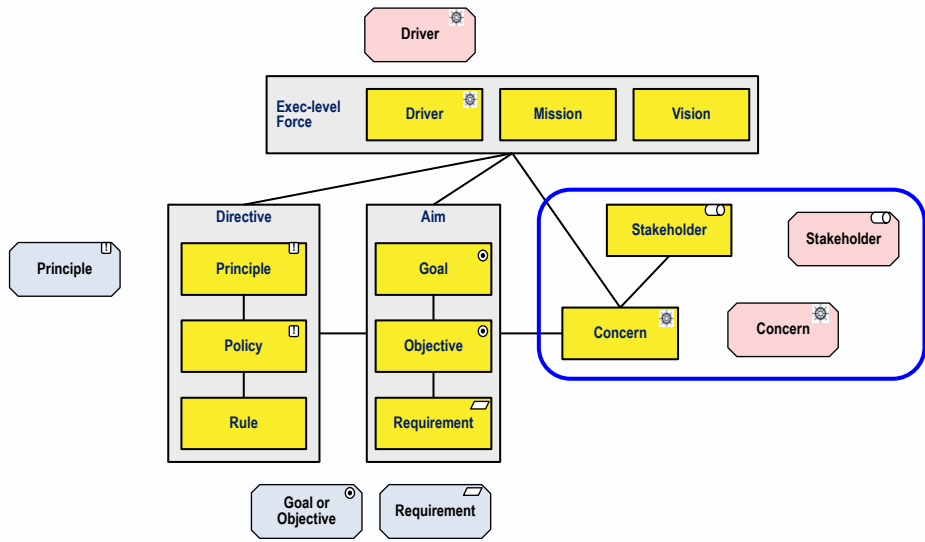


2. Architecture Context and Motivations
Stakeholders and concerns
Structured requirements & constraints
Explicit requirements
Implicit requirements
Target solution hierarchy
Scope of architecture work
Business case (before architecture)



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Motivation in AM



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Stakeholders Avancier

Stakeholder	[an actor or role] an individual, team, organization, or class thereof, having one or more concerns about or interests in a system, and/or power over the architecting of it.
Stakeholder catalogue	[an artefact] that contains a list of stakeholders. It might record concerns, interest level, power level, and/or a plan for communicating with that stakeholder
Stakeholder management	[a technique] for ensuring concerns of stakeholders are understood and addressed, with a view to ensuring that stakeholders support changes that are envisaged. A stakeholder's position in a power/interest grid helps to prioritise attention to their concerns and determine a suitable communication plan.

Stakeholders management interface with buttons: Owners, Customers Suppliers, Managers, Designers Builders, Operators.

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Enterprise and solution architecture stakeholders include: Avancier

<p>Architect stakeholder</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>Stakeholders</p> <ul style="list-style-type: none"> Owners & Customers Managers & Designers Builders & Operators </div>	<p>Enterprise and solution architecture stakeholders include:</p> <ul style="list-style-type: none"> •Owners: business and IT board members, customers. •Managers: programme/project/change managers. •Buyers: procurement/acquisition organisation. •Suppliers: service and product providers. •Designers, Builders, Testers: other project team members: •Users: representatives and domain experts. •Operators and Maintainers: IT Services Management.
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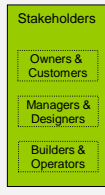
- ▶ Business sponsors and stakeholders
- ▶ IS sponsors and stakeholders
- ▶ IT sponsors and stakeholders

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Concerns



Concern	<p>An interest in a system relevant to one or more of its stakeholders.</p> <p>Any topic of interest pertaining to the system.</p> <p>A subject matter that is used to determine coverage of the architecture description, with no target or measure attached. (E.g. system behaviour, development cost, availability, disaster recovery, safety, all requirements, all standards, a particular standard, modularity.)</p>
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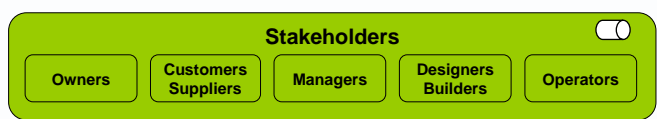
- ▶ Business sponsors and stakeholders
- ▶ IS sponsors and stakeholders
- ▶ IT sponsors and stakeholders

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Stakeholders



Sponsor	[a stakeholder] who is willing to apportion money or other resources to some work.
Request for architecture work	<p>[a document] a request from a sponsor for an architect to architect one or more systems.</p> <p>The first architecture deliverable to be recorded in an architecting process.</p>



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How to manage stakeholders?



The techniques of business and systems analysis can help

- Interviews
- Workshops
- Documentation of problems and requirements

Stakeholder management per se is something else

- 1. Identify Your Stakeholders
- 2. Prioritize Your Stakeholders:
- 3. Understand your key stakeholders
- 4. Classify by attitude
- 5. Consider how to manage blockers
- 6. Record you analysis in a stakeholder map.
- 7. Plan communication with each stakeholder

See the process in Avancier Methods

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Plan communication with each stakeholder



► Are you communicating as effectively as you should be with your stakeholders.?

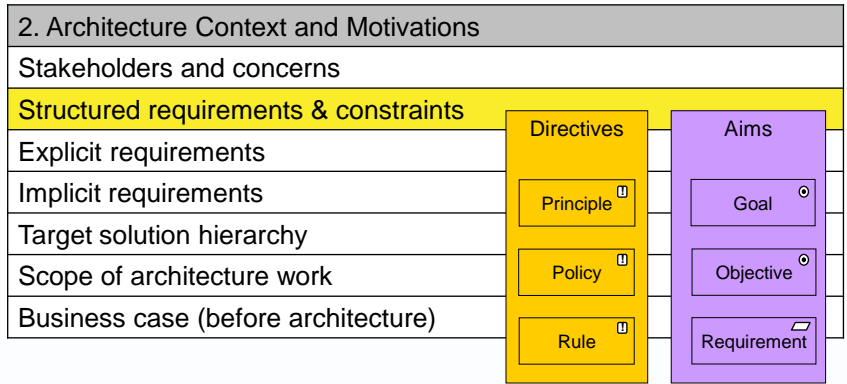


The end product

Stakeholder	Concerns	Power (H,M,L)	Interest (H,M,L)	Communication plan
1 Customer	Goal, Deadline	High	High	Involve - Manage closely
2 Manager	Reputation, Profit	High	Low	Persuade – Satisfy - Monthly status report
3 End user	Usability	Low	High	Inform – Weekly newsletter JAD workshops
4 Sales person	Customer relationship	Low	Low	Monitor

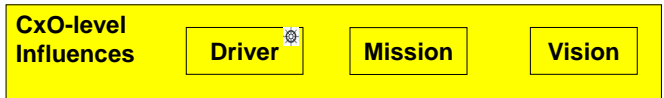
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2. Architecture Context and Motivations



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CxO level influences



Influence	a belief, fact or statement that acts as a requirement for or constraint on behaviour or choices. Examples include instances of drivers, directives, aims (defined below).
Driver	[an influence] a force, recognised by managers, that shapes the directives and aims of a business. Driver areas and types include Political, Economic, Social, Technical, Legal and Ecological (PESTLE) and Strengths, Weaknesses, Opportunities and Threats (SWOT).

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Directives



Directive

[an influence] a principle or policy, enduring and seldom amended, that steers or constrains behaviour or choices.

- Directives
- Principle
- Policy
- Rule

It may be specifiable as a data processing rule.

Directives may be arranged in a hierarchical structure in which principles are supported by lower level policies, and policies are specified as business rules.

Directives: Policies



Principle

[a directive] that is strategic and not-directly-actionable. (E.g. Waste should be minimised. Data security is paramount.)

- Principle

Policy

[a directive] that is more tactical than a principle. It may be implemented by business rules. (E.g. The public have minimal access to business data. USB ports are disabled. Messages at security level 3 are encrypted.)

- Policy

Business Rule

[a directive] that is formalised in data processing. (E.g. Access Level = Low if User Type = Public. See Process rule and Data rule for further definition.)

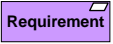
- Rule

Aims: Specific Measurable Actionable Realistic Timebound

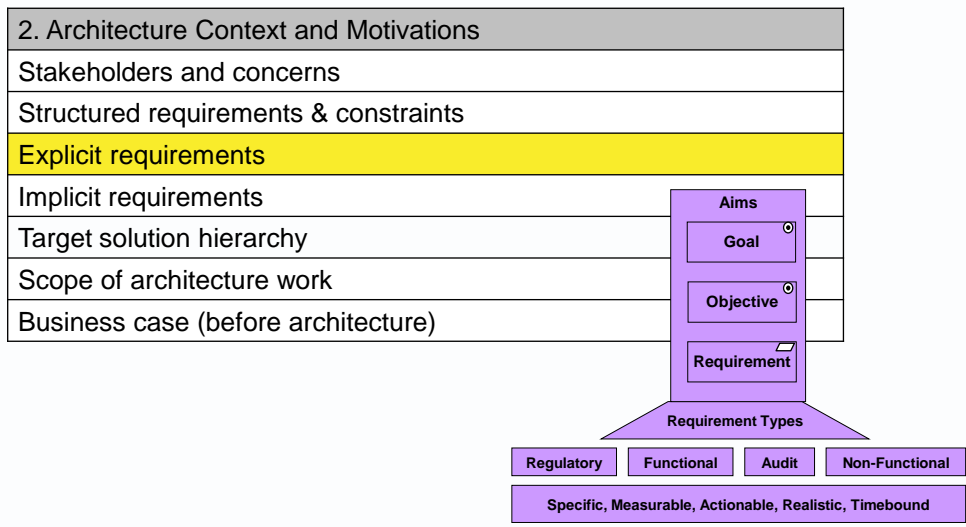


Aim	[an influence] a goal or objective that is declared or recognised by business managers, or a requirement for a particular endeavour or system. It should be SMART (Specific, Measurable, Actionable, Realistic and Time-bound.).
Goal	[an aim] that is strategic. It may be quantified using Key Goal Indicators . It may be decomposed into lower level goals or objectives.
Objective	[an aim] that is more tactical than a goal. It may support one or more higher-level goals. It should be quantified using Key Performance Indicators . It may be decomposed into lower level objectives or seen as a high-level requirement.
Requirement	[an aim] a statement of need with which compliance can be demonstrated in a specific solution or project. It should have acceptance tests and an acceptance authority. It may be captured in a requirements catalogue or in the text of a service contract or use case. It should be traceable to higher level concerns, aims, directives or strategies.

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2. Architecture Context and Motivations



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Requirement

JIRA




Requirement types

Requirement catalogue	[a document] a structured list of requirement instances in which each is recorded with properties such as reference number, description, source, owner, priority, and requirement type. (E.g. throughput = 100 tps, response time = 1 second.)
Requirement type	[a concern] a kind or group of needs that is generally applicable to system structure or behaviour. It usually correspond to a concern that is held by stakeholders or addressed in viewpoints. (E.g. throughput, response time.)
Functional requirement	[a requirement type] related to services offered by a system, including inputs and outputs, processes and business rules.
NFR: Non-functional requirement	[a requirement type] that quantifies qualities that specify how well, effectively or efficiently a system should deliver services. (See section 8 for a list of kinds.)

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Requirement



Requirements: PARRISSS

Non-functional requirement	A requirement about the ability of a system to perform its functions (whatever they are) effectively and efficiently. Usually quantitatively measurable.
Performance	Subdivides into two measures, often in opposition: <ul style="list-style-type: none"> •Throughput: number of services executed in a time period. •Response or cycle time (aka latency): time taken from request to response.
Availability	The amount or percentage of time that the services of a system are ready for use, excluding planned down time.
Recoverability	The ability of a system to be restored to live operations after a failure.
Reliability	The mean time between failures. Usually applied to the technologies in the Infrastructure, ignoring the more likely risk of application failure.
Integrity	See Data integrity and Data flow integrity.
Scalability	The ability of a system to grow to accommodate increased work loads.
Security	The ability of a system to prevent unauthorized access to its contents.
Serviceability	The ability of operations team to monitor and manage a system in operation.

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Requirement

Requirements: UMPIE



Usability	The ability of actors to use a system.
Maintainability	The ability of maintenance teams to revise or enhance a system.
Portability	The ability to move a component from one platform to another, or convert it to run on another platform. In practice, it can be difficult to set or estimate this quality metric realistically.
Interoperability	The ability for subsystems to exchange data at the technical level using shared protocols and networks.
Integratability	The ability of interoperable subsystems to understand each other, which requires either common data types or brokers to translate between data types.
Extensibility	A synonym of maintainability

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Requirement

2. Architecture Context and Motivations



2. Architecture Context and Motivations
Stakeholders and concerns
Structured requirements & constraints
Explicit requirements
Implicit requirements
Target solution hierarchy
Scope of architecture work
Business case (before architecture)

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Requirement

Explicit and implicit requirements




Explicit requirement	[a requirement type] that classifies requirements that are declared by stakeholders.
Implicit requirement	[a requirement type] that must be addressed, even if never mentioned by stakeholders. Under any “best endeavours” obligation, the architect must be aware of the possibly implicit requirements below.

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Requirement

Regulatory requirements



Regulatory requirement	<p>[a requirement type] include legislation and regulations that direct or constrain architecture work.</p> <p>IT accountability and procurement: Regulation that makes public sector, IT directors and CIOs accountable for justifying investment in IT and for fair procurement from suppliers. E.g. Information Technology Management Reform act (ITMRA) of 1996, Division E, P.L. 104-106. This “Clinger Cohen Act” was the stimulus for many early enterprise architecture initiatives.</p> <p>Data protection: Legislation that directs an enterprise to protect data from unauthorised access. E.g. UK’s data protection act. </p> <p>Data freedom: Legislation that directs an enterprise to make data available to people who request it. E.g. Freedom of Information Act 2000.</p> <p>Disability and accessibility: Legislation that directs enterprise to build systems that can be accessed by any member of the public. E.g. UK Equality act. US Americans with Disability act. W3C Web Content Accessibility Guidelines.</p> <p>Shareholder protection and audit: Legislation that directs an enterprise to maintain records showing how it has directed, monitored and controlled its business. E.g. US Sarbanes-Oxley act of 2002. Basel II.</p> <p>Intellectual property rights: International and national laws protect people and enterprises from theft of intellectual property.</p>
-------------------------------	--

Clinger Cohen Act

The IT management reform (Clinger-Cohen) act of 1996



- ▶ A USA federal government regulation
 - A response to the mess IT was in by the early 1990s
 - Clinger and Cohen heard testimony from John Zachman among others

- ▶ Defines roles and responsibilities of
 - IT director
 - CIO

- ▶ Makes CIOs responsible for
 - “developing, maintaining and facilitating the implementation of a sound and integrated IT architecture for the executive agency”.

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Office and Management and Budget (OMB) circular Q-130



- ▶ Refines the definition of EA

- ▶ Requires that EA describes
 - current architecture,
 - target architecture and
 - transition processes

The basis of TOGAF's process (ADM)

- ▶ includes
 - a TRM
 - a Standards Profile

Hence the TRM in TOGAF

Hence the SIB in TOGAF
www.opengroup.org – search “SIB”

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Requirement

Regulatory requirement references



- ▶ UK's data protection act: <http://www.opsi.gov.uk/ACTS/acts1998/19980029.htm>
- ▶ Freedom of Information act 2000: <http://www.opsi.gov.uk/ACTS/acts2000/20000036.htm>
- ▶ UK Disability Discrimination act: <http://www.opsi.gov.uk/acts/acts1995/1995050.htm>.
- ▶ W3C Web Content Accessibility Guidelines: <http://www.w3.org/TR/WAI-WEBCONTENT/>
- ▶ US Americans with Disability act.
- ▶ US Sarbanes-Oxley act of 2002.
- ▶ Basel II.

- ▶ Also
 - Solvency 2
 - PCI
 - FSA
 - VISA
 - Patriots Act
- ▶ International and national laws protect people and enterprises from theft of intellectual property.

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Standards



Standard	[a concern] a widely-accepted definition of a structure, process or rules, intended to increase uniformity and interoperability between distinct systems and processes.
Enterprise Standards Information Base	<p>[an artefact] a catalogue of standards that is recommended or used across the enterprise. (Cf. The Open Group's SIB.)</p> <p>The aim is to ensure your enterprise does not rely on the haphazard knowledge that individual architects have of which standards are relevant</p> <p>See www.opengroup.org – search "SIB"</p>

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Standards bodies



- ▶ An enterprise with a mission to set standards and assess compliance to them. E.g.
 - American National Standards Institute (ANSI).
 - British Computer Society (BCS).
 - Information Systems Examination Board (ISEB).
 - Institute of Electrical and Electronic Engineers (IEEE).
 - Information Systems Audit and Control Association (ISACA)
 - International Standards Organisation (ISO).
 - Office of Government Commerce (OGC).
 - Organisation for Advancement of Structured Information Standards (OASIS).
 - **Open Applications Group Standards (OAGIS).**
 - **The Object Management Group (OMG).** **UML**
 - **The Open Group.** **TOGAF and ArchiMate**
 - US National Institute of Standards and technology (NIST).
 - Software Engineering Institute (SEI).
 - Internet Engineering Taskforce (IETF)
- ▶ What “open” means is debatable.
- ▶ Arguably, standards are what is adopted rather than what is published by a standards body

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Industry standards in the reference model



- ▶ These standards appear (incidentally) in reference model entries:

Number	Topic	Title / subject matter
ISO/IEC 42010	Architecture Description	Recommended Practice for Architecture Description of Software-Intensive Systems.
ISO/IEC 17799	Security	Information technology: Code of practice for information security management (OLD – superseded by 27001)
ISO/IEC 24762:2008	Security	Information technology — Security techniques — Guidelines for information.
ISO/IEC 27001	Security	Information technology — Security techniques — Information
CMM-I	Quality	Capability maturity model – integrated (process quality standard)
ISO 9001	Quality	A standard in the ISO 9000 family for quality management systems.
ISO/IEC 20000	ITSM	An international standard for ITSM (based on the earlier British Standard, BS 15000).

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Other standards



- ▶ Open standards (e.g. W3C).
- ▶ Government standards (e.g. e-GIF)
- ▶ Payment card industry, data security standards (PCI DSS)
- ▶ A technical strategy that mandates (say) choice of database or mid-range servers.

Emerging	E
Standard	S
Contain	C
Retire	R
Unsupported	U
Archived	A

Tech Category	TAF Product	2010				2011				2012				2013			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
"Application Servers"		"Application Servers"															
	RedHat x.y		S														
	Tomcat		S														
	WebLogic App Server 10.x		S														
	WebLogic App Server 9.x		S						C								R
	WebLogic App Server 8.x		C						R								
"Web Servers"		"Web Servers"															
	Apache 1.x		S														
	Apache 2.0		S				C										
	Apache 2.2x		S														
Portals		Portals															
	Accident Media Management System																

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2. Architecture Context and Motivations – end of pass 1



- ▶ SHOW RELEVANT MOCK EXAM QUESTIONS

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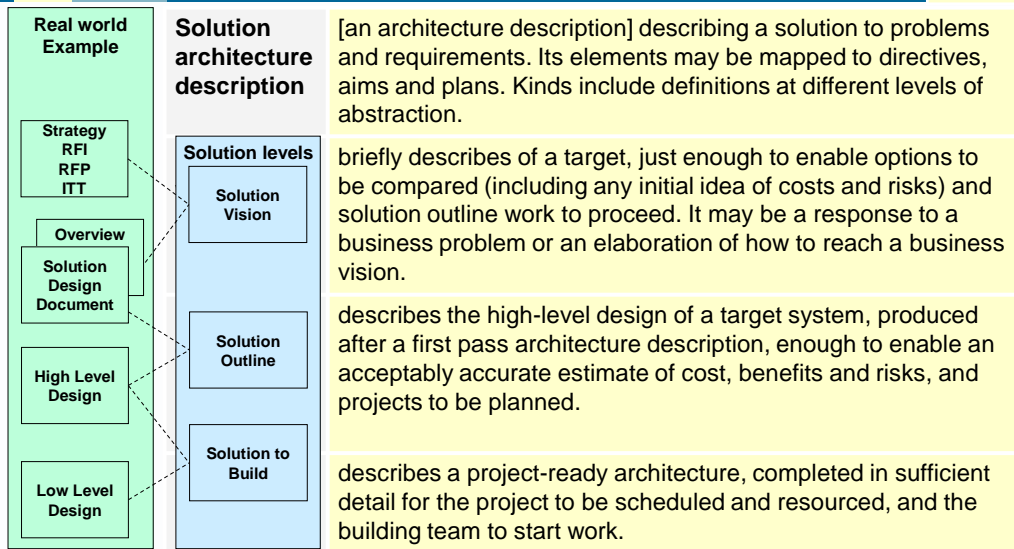
2. Architecture context and motivations



2. Architecture context and motivations	
Stakeholders and concerns	
Structured requirements & constraints	
Explicit requirements	Solution levels
Implicit requirements	
Target solution hierarchy	
Scope of architecture work	
Business case (before architecture)	Solution Vision
Business case (before architecture)	Solution Outline
Business case (before architecture)	Solution to Build

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2.5: Scoping

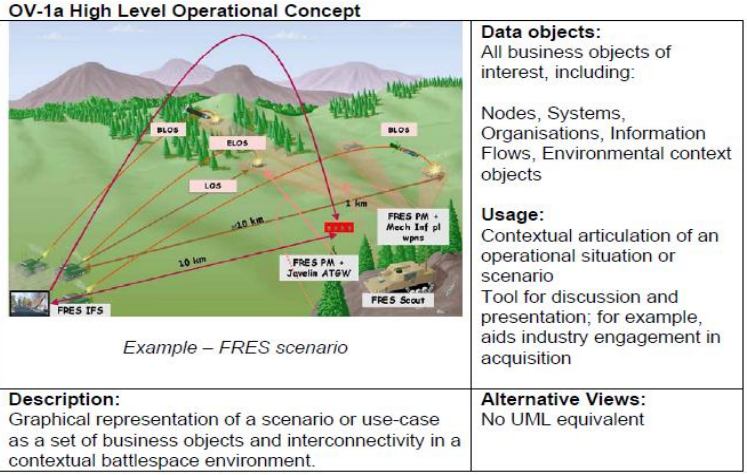


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Solution Concept/Vision diagram: MODAF style



► Based around a “rich picture” or cartoon



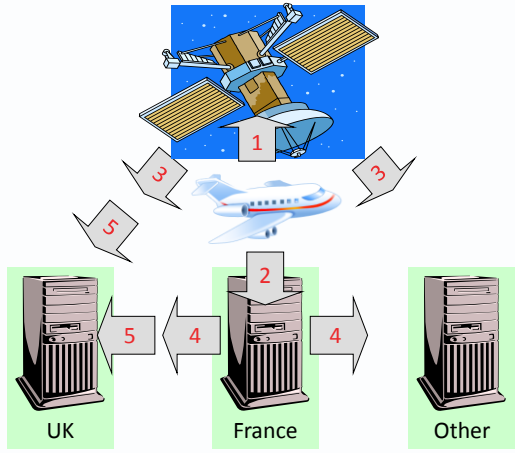
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Solution Concept/ Vision diagram: an illustration



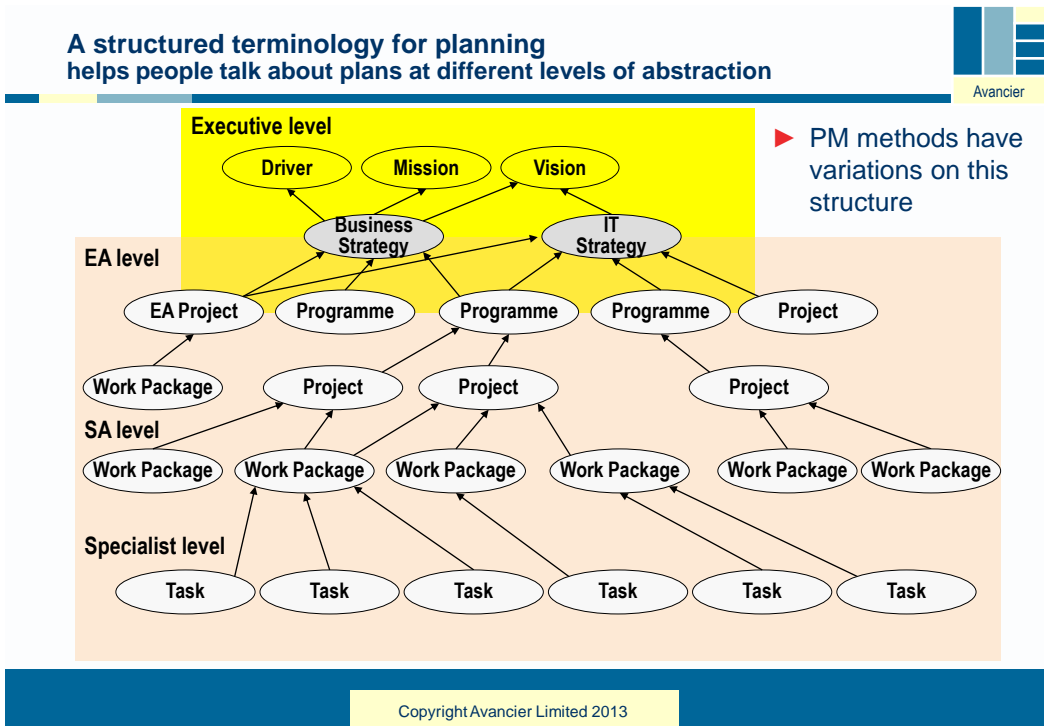
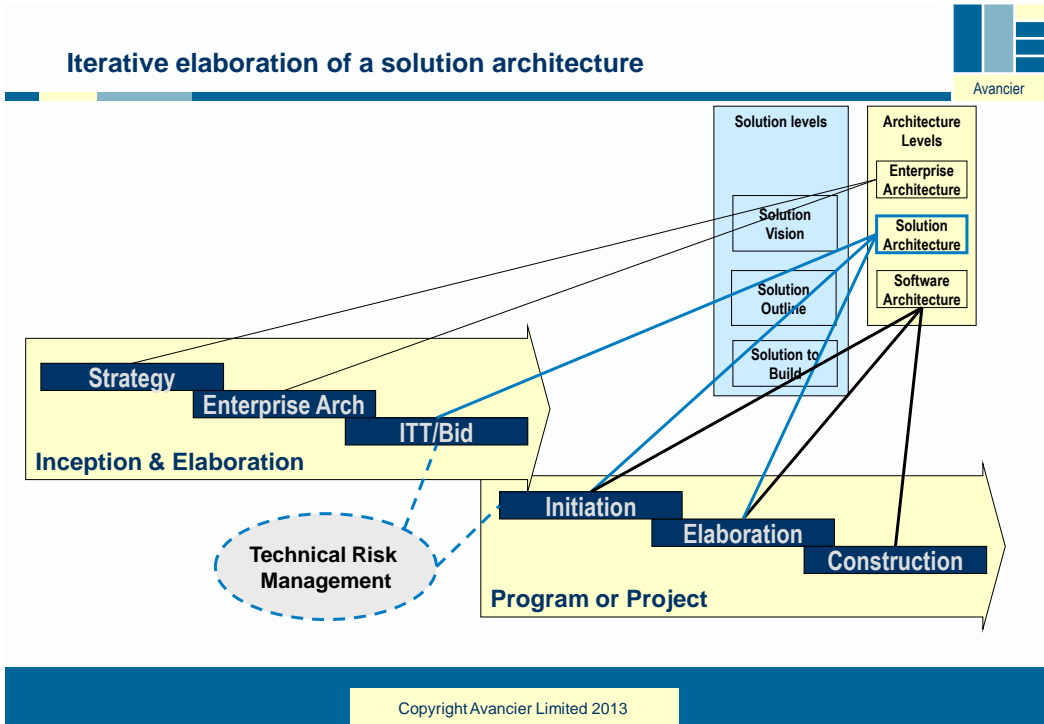
Problem: how to maintain integrity of airplane position data?

1. Airplane sends time-stamped airplane/position message to satellite
2. Airplane also sends time-stamped airplane/position message to data centre (e.g. France) of controller responsible for current air space
3. Satellite forwards the airplane/position message to UK and others
4. France forwards the airplane/position message to UK and others
5. UK receives messages
6. UK replaces airplane/position record *if time stamp of message is later than time stamp of message last processed*



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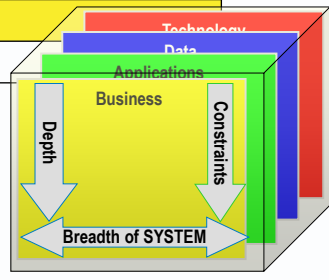
1.2 Architecture context/precursors



2. Architecture context and motivations



2. Architecture context and motivations
Stakeholders and concerns
Structured requirements & constraints
Explicit requirements
Implicit requirements
Target solution hierarchy
Scope of architecture work
Business case (before architecture)



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Three dimensions of scope



Fix any 2 dimensions, and the 3rd dimension is derivable

Three dimensions of scope		
Breadth	Constraints	Depth
Size & complexity of system or project Large / Medium / Small	Time & resources to describe the system or project Little / Moderate / Lots	Level of detail reachable in descriptions or plans
Large	Little	Vacuous
Medium	Little	Sketchy
Large	Moderate	Sketchy
Medium	Moderate	Elaborate
Small	Little	Elaborate
Large	Lots	Elaborate
Small	Moderate	Fulsome
Medium	Lots	Fulsome
Small	Lots	Complete

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The 4 dimensions in the reference model



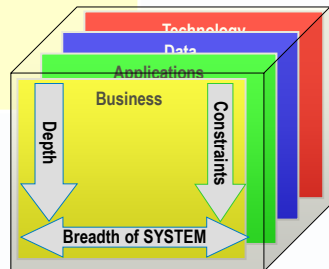
Scope view [a view] a dimension of scope.

Breadth: scope of the enterprise, system or solution.

Depth: the detail to which description or design should be completed

Constraints on work.

Domain in focus: business, application or infrastructure change.

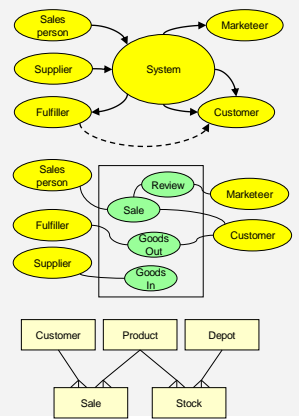


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Breadth of enterprise or system



Breadth of enterprise or system



a scope view] that may be defined in several ways.

- Aim view: goal/objective/requirement catalogue
- Service view: a service catalogue.
- System view: a top-level context diagram.
- Process view: a top-level process map or use case diagram.
- Data view: a conceptual/domain/business data model.

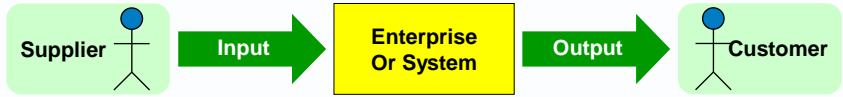
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The scope of an enterprise or system



Context Diagram [an artefact] that shows a system's scope in terms of inputs consumed, outputs produced, and the external entities (actors and/or roles) that send inputs and receive outputs.
The system is shown as a 'black box'.

- ▶ As in "SIPOC" in Six Sigma
- ▶ Supplier Input Process Output Customer



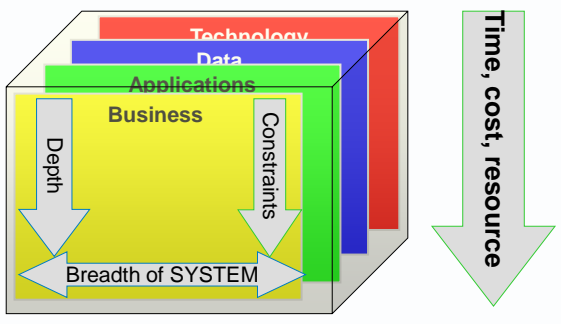
- ▶ Shows why the system exists
 - the system that is the focus of design
 - the external entities, inputs and outputs around the boundary.
- ▶ Does not show what the system is made of
 - parts or components are hidden from view

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2nd dimension: constraints



Constraint (on work) [a scope view] a factor such as time, budget and resources that limits work to be done, or potential options.



You can only do what you have time, money and resources to do

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2. Architecture context and motivations



2. Architecture context and motivations
Stakeholders and concerns
Structured requirements & constraints
Explicit requirements
Implicit requirements
Target solution hierarchy
Scope of architecture work
Business case (before architecture)

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Business planning context

▶ Planning is addressed in last two sections of the reference model



Business case (before architecture) [a document] that justifies work to build or change systems. It will be outlined at the start and updated as need be. It will be reviewed and refined several times while architecture work is done. It may be decomposed into business cases for specific options, stages or projects within the overall solution.

- [See the Migration Planning section for further definitions of supporting terms below.
- ▶ Return on Investment (ROI)
 - ▶ Cost-benefit analysis
 - ▶ Solution options
 - ▶ Risk analysis
 - ▶ Gap analysis (options)
 - ▶ Trade-off analysis.]

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► Planning is addressed in last two sections of the reference model



Business planning context

Business scenario	[an artefact] that outlines a process, along with the human and computer actors involved in the process steps. It is useful in creating and presenting an architecture description. It may be defined to support a solution vision or business case. It may be defined during business architecture description. It may be presented as an example instance of a business process.
Business scenario-driven design	[a technique] that proceeds by defining four main elements: The aims (outcomes or effects) of the process. The outputs (products or services) the process produces The steps of the process (scenario or value stream) The actors/components involved in the process.

► There are two or three business scenario exercises in the course

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Business Scenario (much adapted from a TOGAF example)



Precondition: Sales visit to customer premises has been agreed and scheduled	Human actors		Computer actors	
	Customer	Sales person	Client app use case	Data centre app
1 Initiate sales process with the customer	Accept sales person	Greet customer		
2 Discuss customer requirements	Explain problems & requirements	Listen		
3 Work with customer to create a product configuration	Select one option based on capabilities	Show product and configuration options	Get product description Assemble configuration	Product Configurator App
4 Verify that the desired configuration can be delivered		Show availability to customer	Check configuration availability	Inventory App
	Accept	Show delivery date to customer	Get delivery date	Scheduling App
5 Determine price of requested configuration	Accept	Show price to customer	Price configuration	Pricing App
6 Confirm customer desire to purchase	Accept	Show offer in full		
7 Place an order		Capture order details and print	Enter order Get fax response	Order App
8 Customer acceptance	Sign	Request signature		
Post condition: Order captured				

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