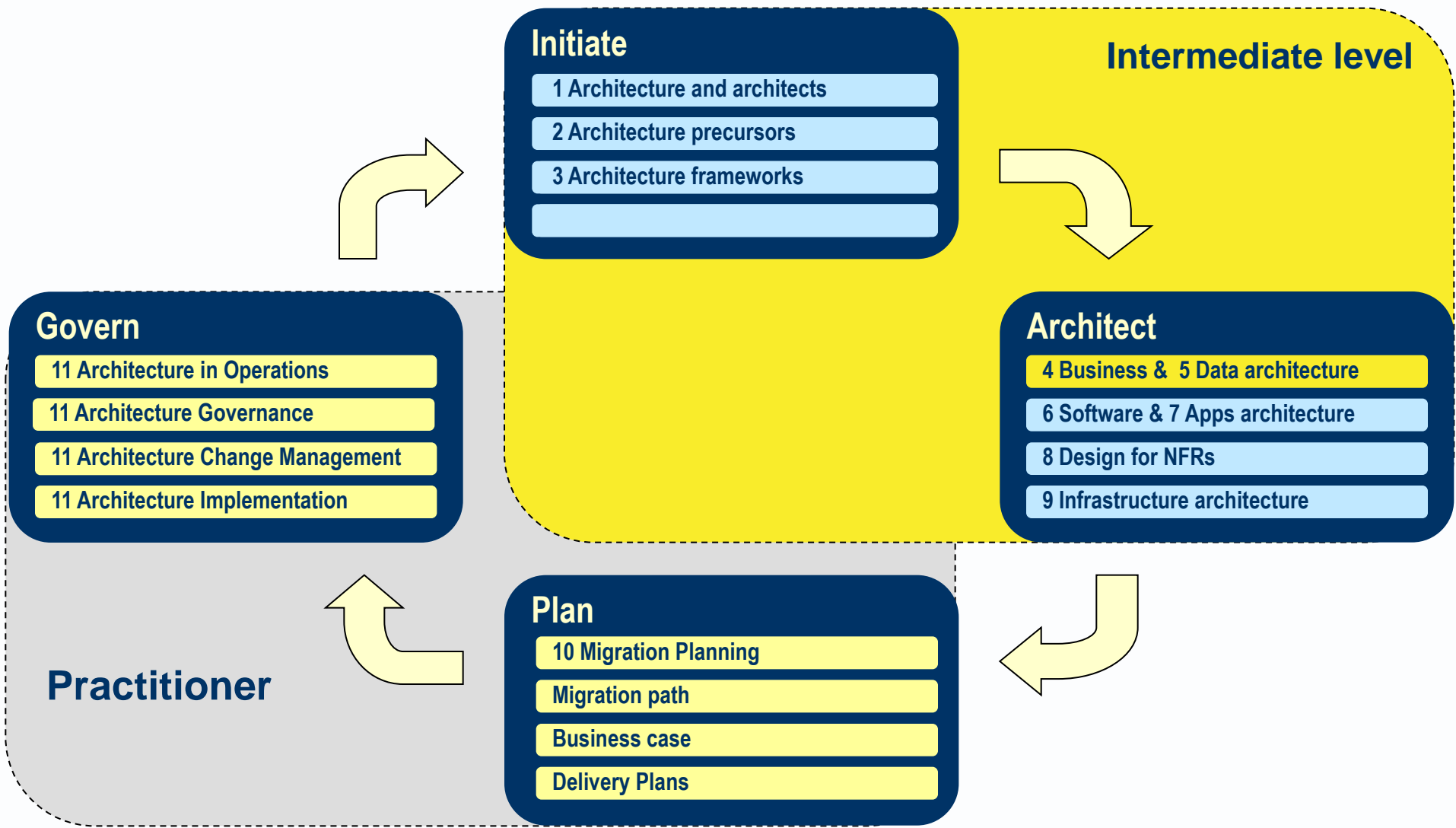


Avancier Reference Model

Business Architecture (ESA 4)

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4. Business architecture



4.1: Foundation (rarely examined)

- ▶ Fig. 4.1a Base business architecture concepts

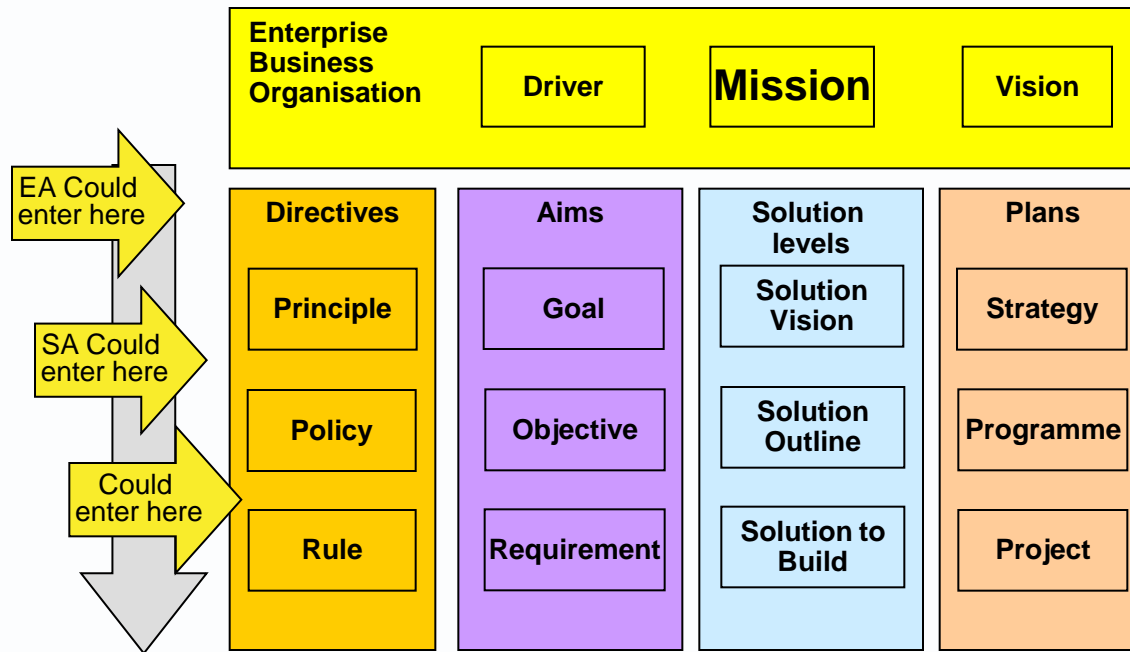
Required behaviours	Logical structures	Physical structures
Business service Business process	Business function Role	Organisation unit Actor

- ▶ The base elements in this domain are explained in later sections.
- ▶ This first section introduces some background concepts.

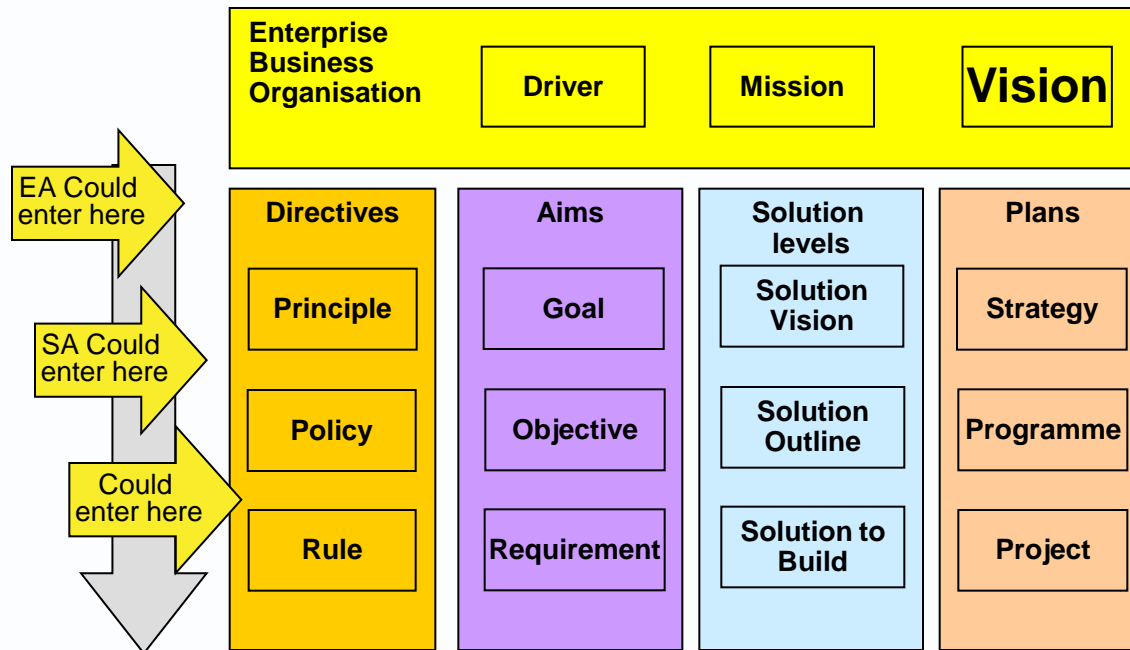
- ▶ [a system] a business or organisation, in the public or private sector, with common goals and budget.
- ▶ It is directed and controlled by a management board.
- ▶ Its players cooperate to meet agreed goals and objectives.
- ▶ It requires human and other resources (materials, energy and information).
- ▶ It is usually the highest level of an organisation.
- ▶ It usually spans several organisation units.

- ▶ classifies an enterprise or organisation unit by the services it offers or the expertise it has.
- ▶ The primary business function(s) of an enterprise or a component thereof.
 - (E.g.
 - law,
 - employment law,
 - telesales,
 - insurance,
 - airline operation,
 - airline maintenance,
 - security,
 - emergency response.)

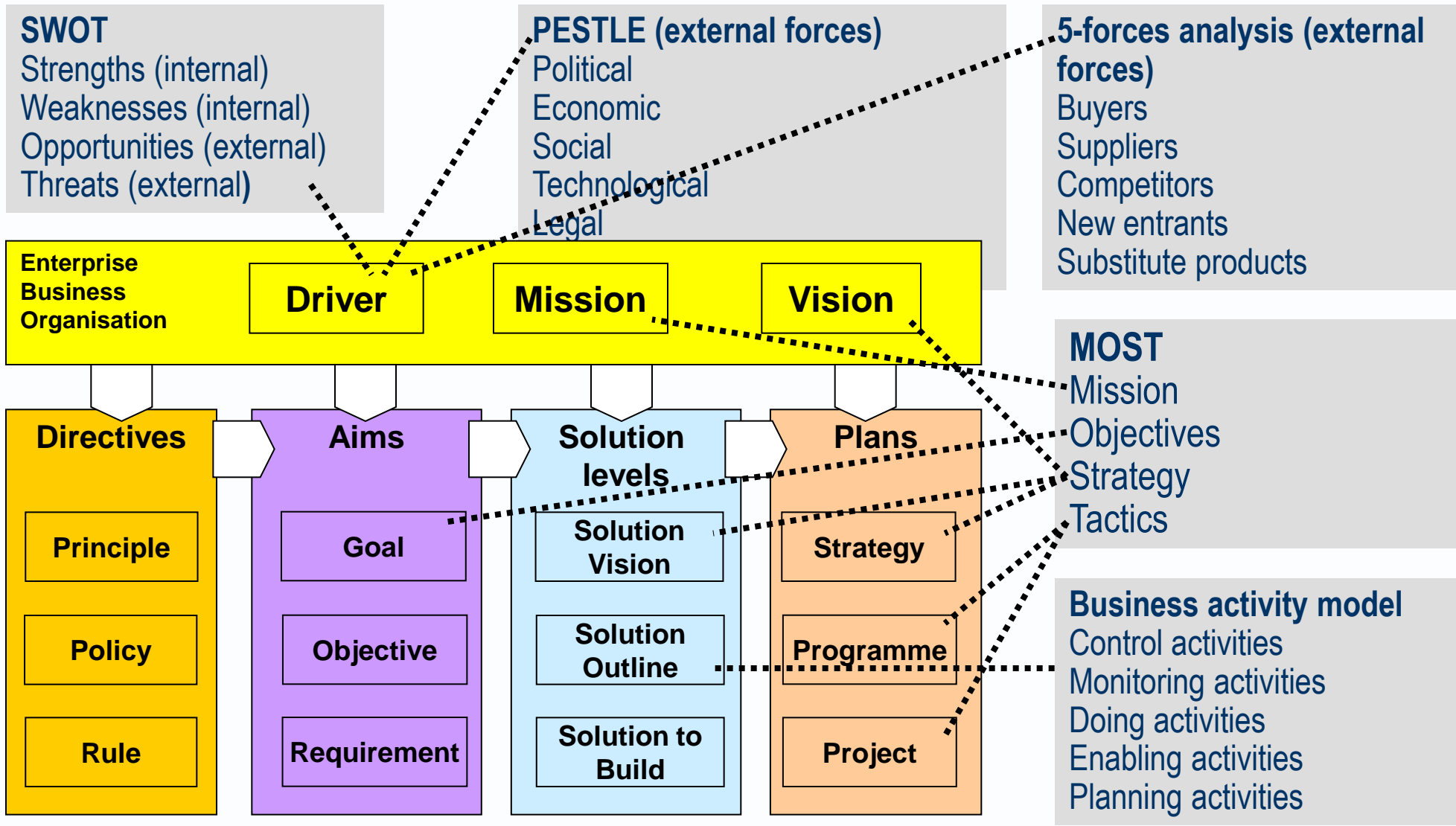
- ▶ [a driver] what an enterprise, business or organisation is about;
- ▶ its reasons for being;
- ▶ the essential products and services it offers customers.



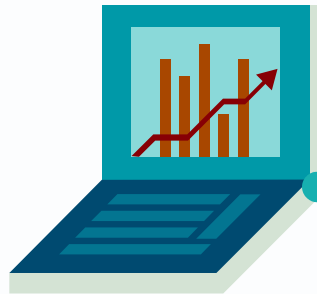
- ▶ [an aim] what an enterprise, business or organisation is about
- ▶ a high-level outline of an aspirational target state for an enterprise.
- ▶ The state may be associated with measurable aims, or only a general direction for planners to follow.



Business analysis concepts mapped to E&SA concepts



- ▶ [a description] that commonly means a top-level summary document showing how an enterprise delivers money or other value to its owners or sponsors.



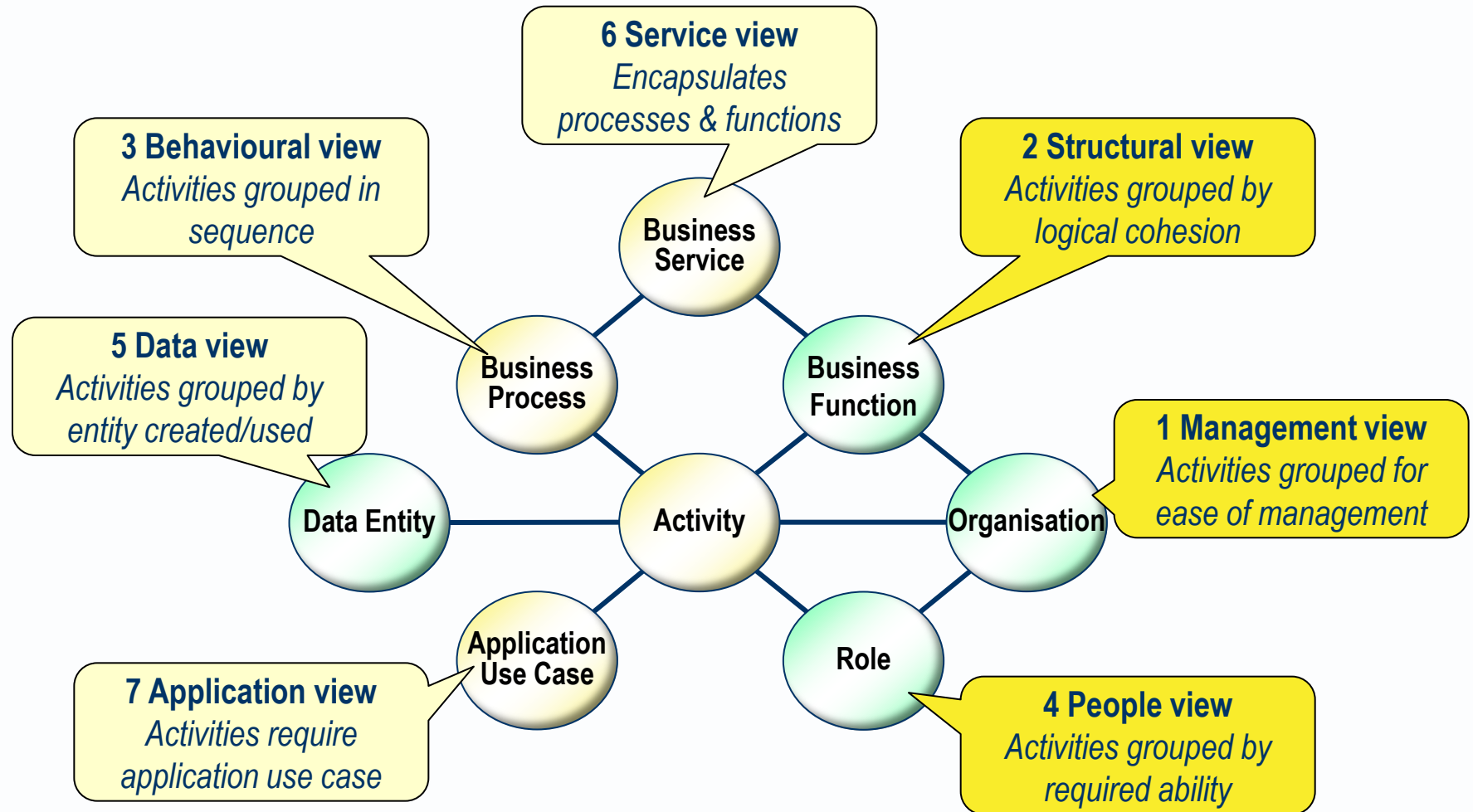
- ▶ But in EA, it usually means part or all of a business architecture description.

- ▶ [a description] that commonly means a business model.
- ▶ But in EA, it usually means a “strategic co-ordination view”, as defined in “EA as Strategy” by Ross, Weill and Robertson
- ▶
- ▶ **Strategic coordination view** [a description] that shows the degree to which an organisation aims to standardise and/or integrate business processes and business data.

High Integration	Coordinated	Unified
Low Integration	Diversified	Replicated
	Low Integration	High Standardisation

- ▶ It can be positioned in a two-by-two grid of standardisation against integration.

4.2: Business structure

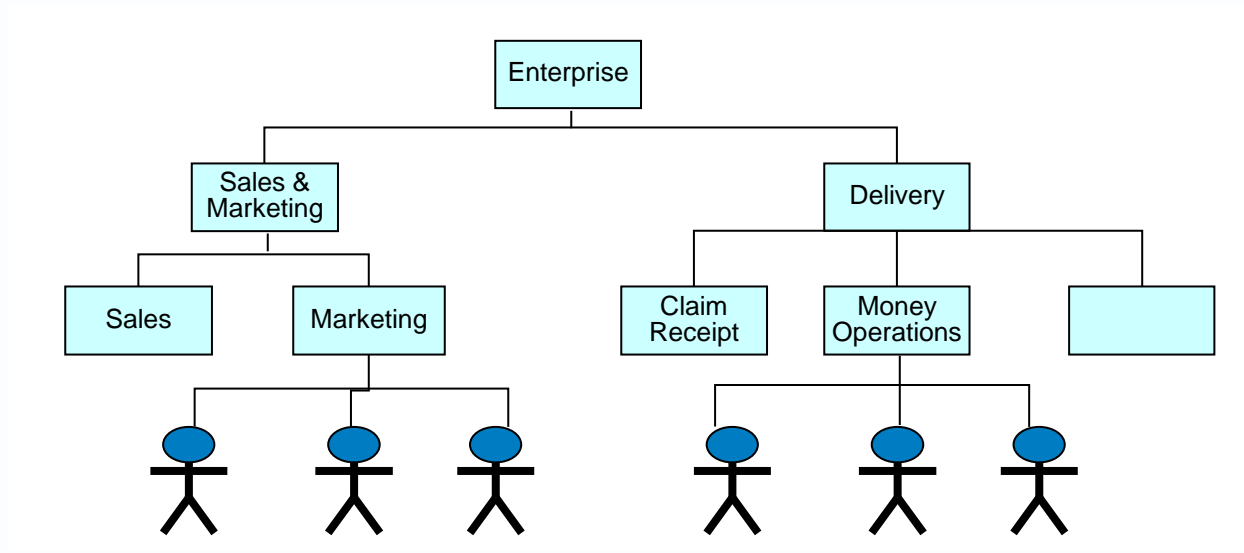


- ▶ **Actor** [a physical business component] or individual able to play one or more roles in the performance of processes.
- ▶ Some limit the term to human actors
 - (a sales executive, a customer).
- ▶ Some use the term also for organisation units and/or business applications

- ▶ **Role** [a logical business component] defined as one or more services or processes that can be realised or performed by one actor (e.g. loan applicant, expense claim approver), perhaps along with abilities required to play that role.

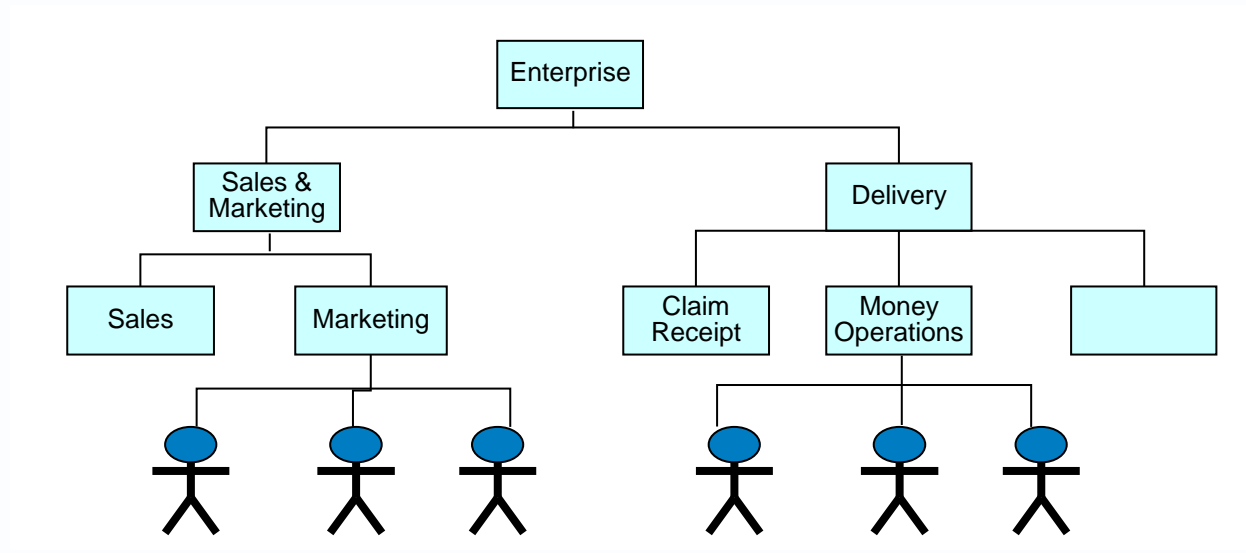
Organisation structure chart

- ▶ [an artefact] showing a structure of organisation units and/or reporting lines between managers; usually a hierarchy.



- ▶ It may also show human actors or activities assigned to each organisation unit.

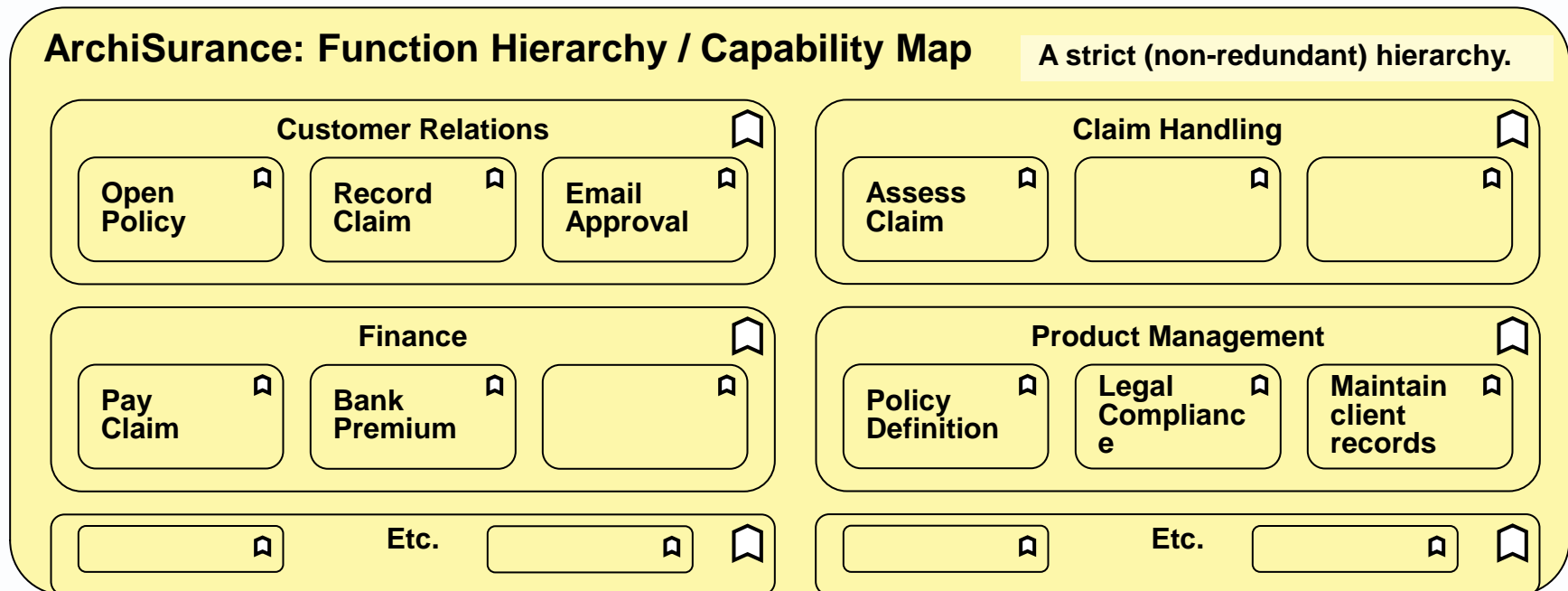
- ▶ [a physical business component] or individual node in a management structure, able to fulfil one or more functions.



- ▶ It should have goals and objectives with measures, a manager, a budget, and other resources to fulfil its functions.

Functional decomposition (aka capability map)

- ▶ [an artefact] that shows an idealised or logical organisation structure.
- ▶ Enterprise architects strive to define a stable structure that can be used as a basis for business analysis, heat mapping and classification of other architectural entities.



- ▶ [a logical business component] defined as one or more services or processes that are cohesive in some way, perhaps along with abilities required.
- ▶ It is a logical subdivision of an enterprise's overall capability.
- ▶ It is realised by one or more organisation units and actors.

Capability:

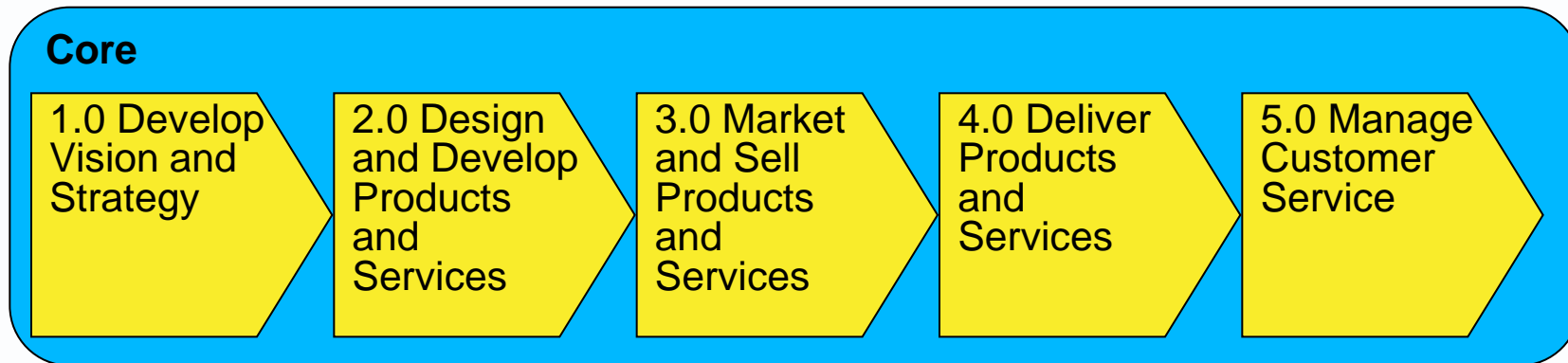
- ▶ a variously-defined concept that usually corresponds to a business function, but may embrace organisation units and actors who fulfil the function, or mean other things.

EBF: Elementary Business Function

- ▶ [a business function] a node at the bottom of a function decomposition, typically at the 3rd or 4th level of decomposition.
- ▶ If the structure is decomposed far enough, each EBF should correspond to an EBP.

Core business function

- ▶ [a business function] that is focused on the development, marketing, sales, creation and delivery of business products and services.



Support business function

- ▶ [a business function] that serves core business functions.
- ▶ Being similar in different businesses, it is a candidate to be outsourced and/or delegated to a “shared service”.
- ▶ E.g. personnel, procurement, finance or facilities management.

Support

6.0 Develop and Manage Human Capital

7.0 Manage Information Technology

8.0 Manage Financial Resources

9.0 Acquire, Construct, and Manage Property

10.0 Manage Environmental Health and Safety

11.0 Manage External Relationships

12.0 Manage Knowledge, Improvement and Change

Organisation / business function matrix

▶ [an artefact] that maps organisation units to business functions, at whatever level of granularity suits its purpose.

▶ **Functional organisation**

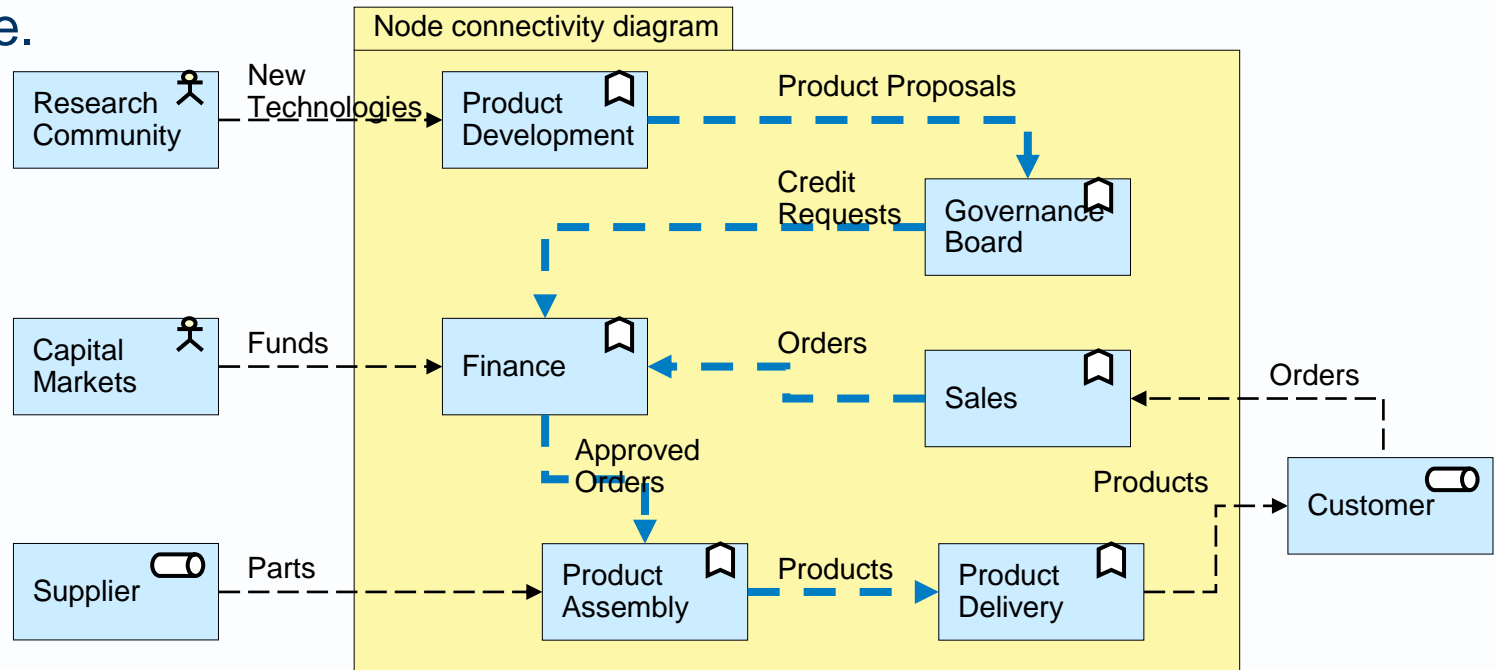
Organisation Function	Marketing	Sales	Delivery
Marketing	Activity		
Sales		Activity	
Delivery			Activity

Non-functional organisation

Organisation Function	Petrol	Paints	Plastics
Marketing	Activity	Activity	Activity
Sales	Activity	Activity	Activity
Delivery	Activity	Activity	Activity

Business network diagram

- ▶ [an artefact] that shows where business components (units, functions, roles or actors) interoperate by requesting and providing flows or services.
- ▶ Each service delivers a result, and output or product of value to the service requester or receiver.
- ▶ The components and services can be modelled at any level of abstraction you choose.

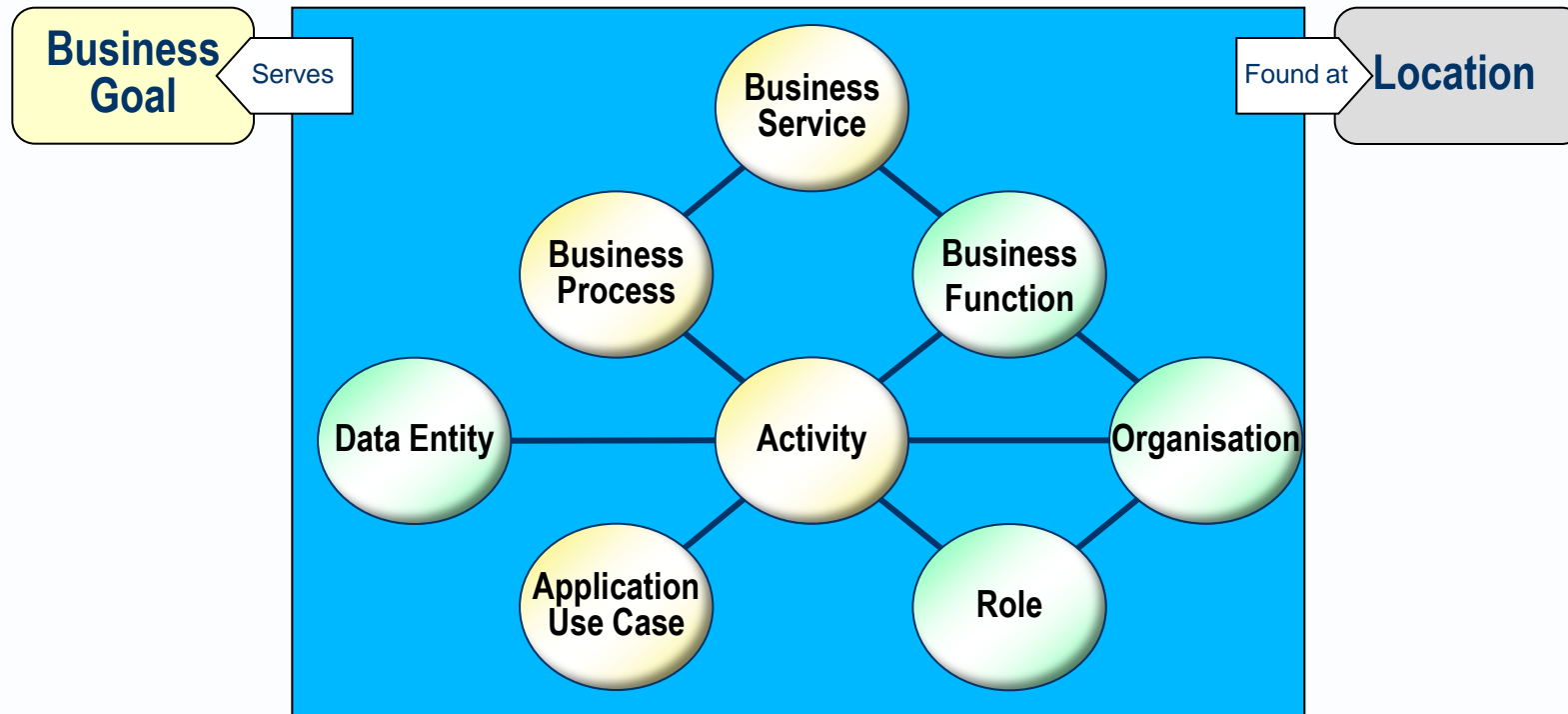


- ▶ [an interface] a collection of business services provided by a business component (function or role).
- ▶ It identifies services, may provide access to them, and hides processes and resources need to deliver the service.

- ▶ [a document] that records a business interface between a service provider and its customer(s).
- ▶ A contractual document that defines the legal context for service delivery.
- ▶ It may include a schedule of discrete services to be delivered, with agreed-to service levels.

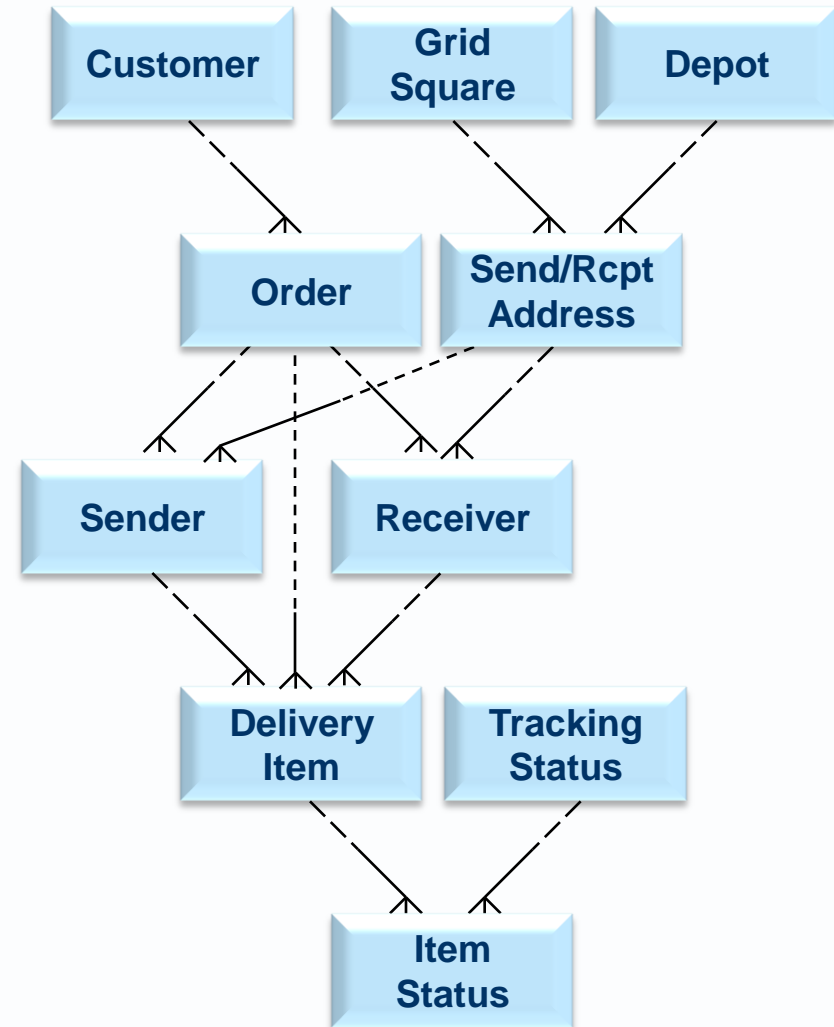
- ▶ [a technique] that discovers relationships between services requested or activities performed by identifiable actors.
- ▶ It is used by retailers to perform market basket analysis.
- ▶ This information can then be used for purposes of cross-selling and up-selling, influencing sales promotions, loyalty programs, store design, and discount plans.

- ▶ [an artefact] that lists the locations at which business activities are performed. Sometimes represented graphically.

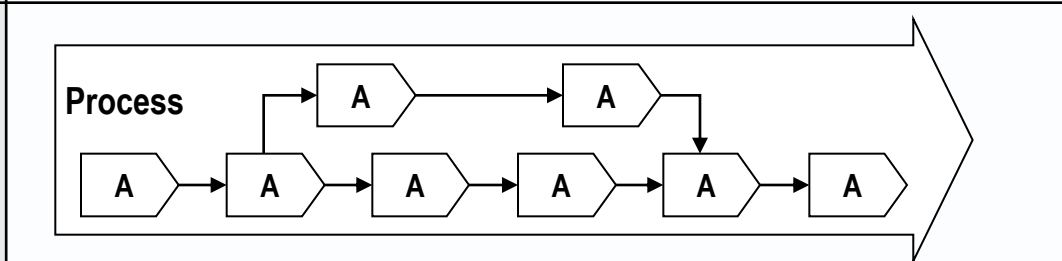
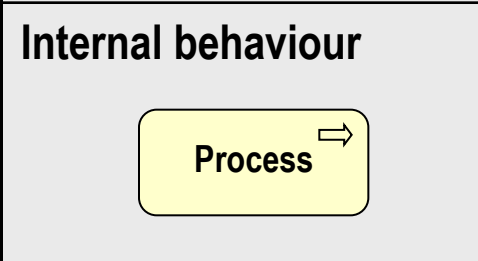
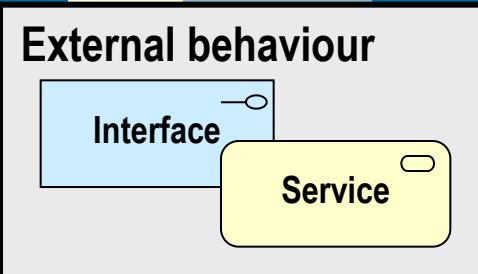


Business data model

- ▶ [an artefact].
- ▶ See the Data domain section.

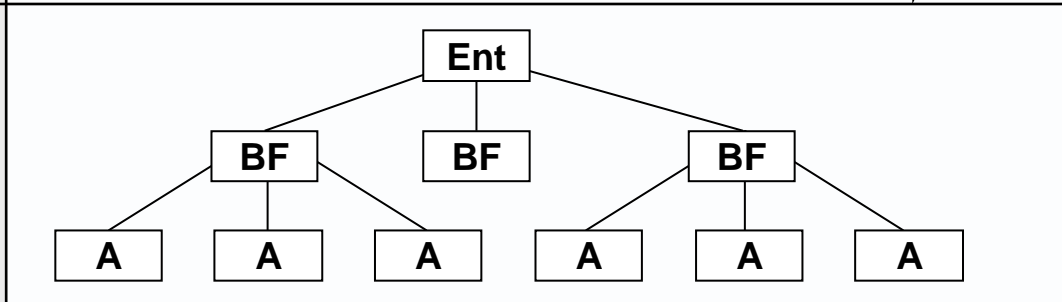
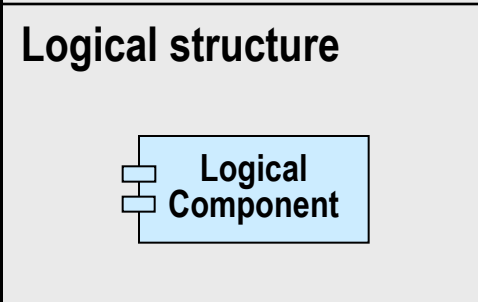


Business architecture



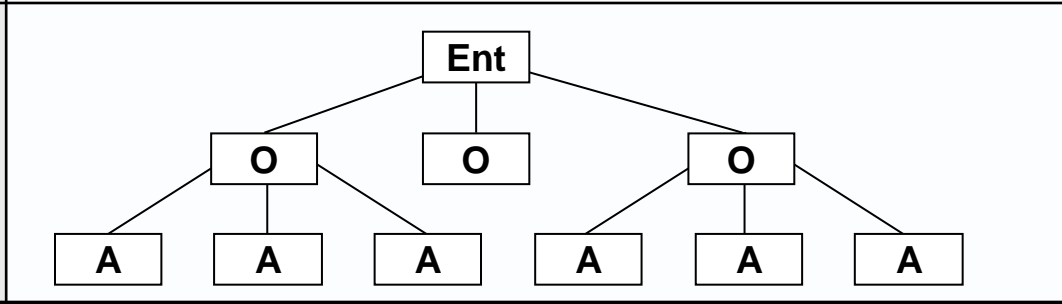
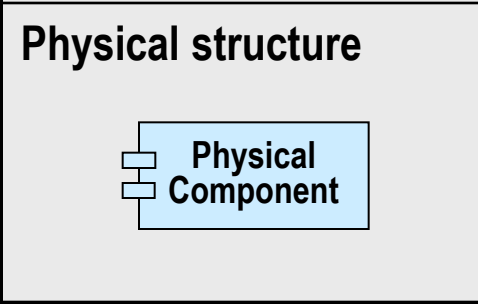
CRUD matrix

	Activity	Activity
Data entity		
Data entity		
Data entity		

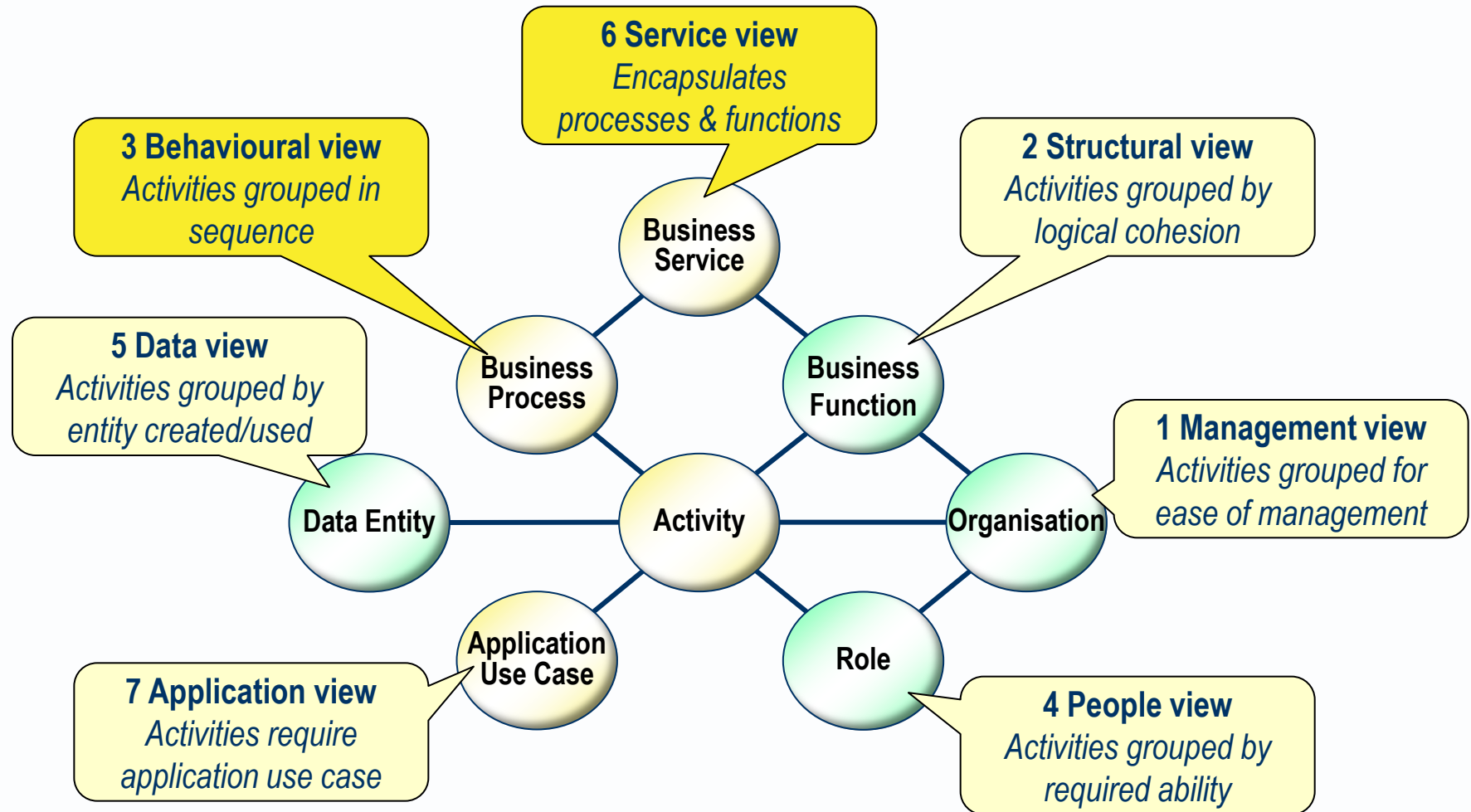


Organisation – function matrix

	Activity	Activity
Org Unit		
Org Unit		
Org Unit		



4.3: Business behaviour



Value chain diagram

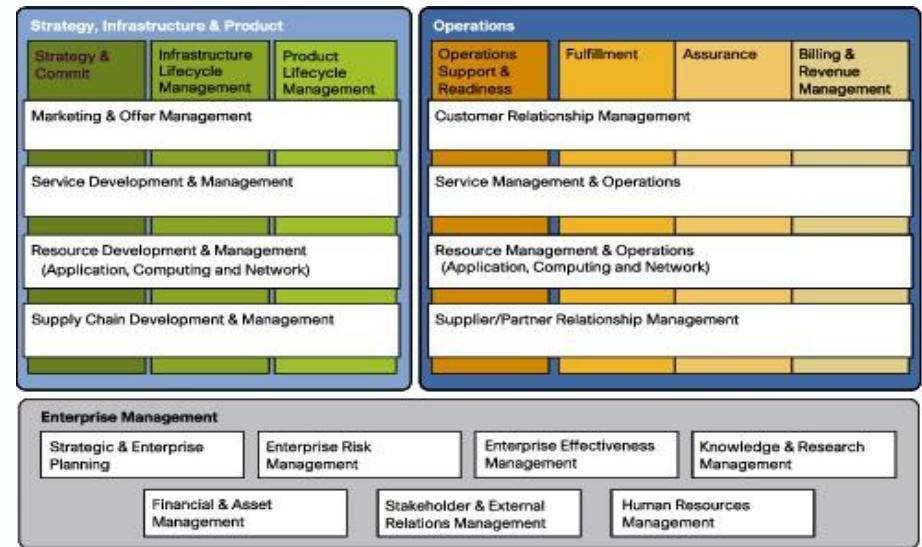
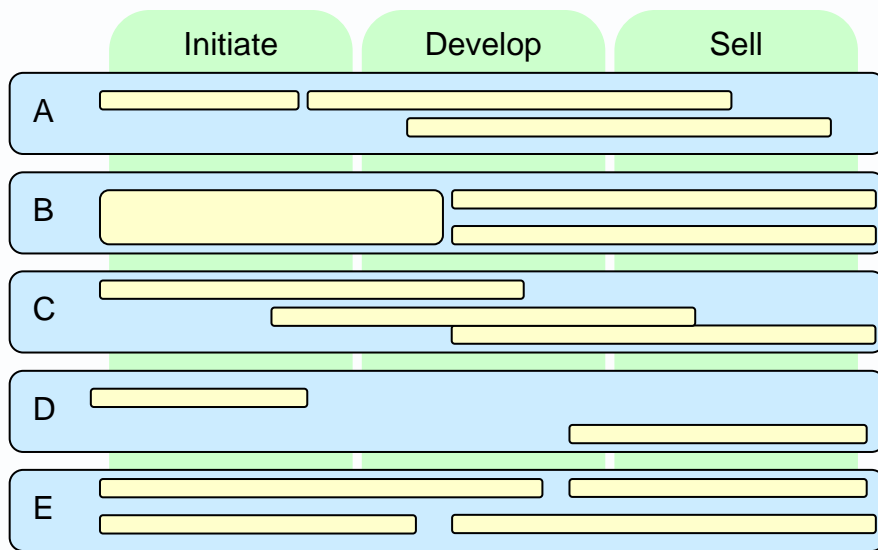
- ▶ [an artefact] that shows the top-level core and support functions of a business, and may suggest an end-to-end behavioral flow as well (usually in the arrow shape first drawn by Michael Porter in "Competitive Advantage" 1985.)



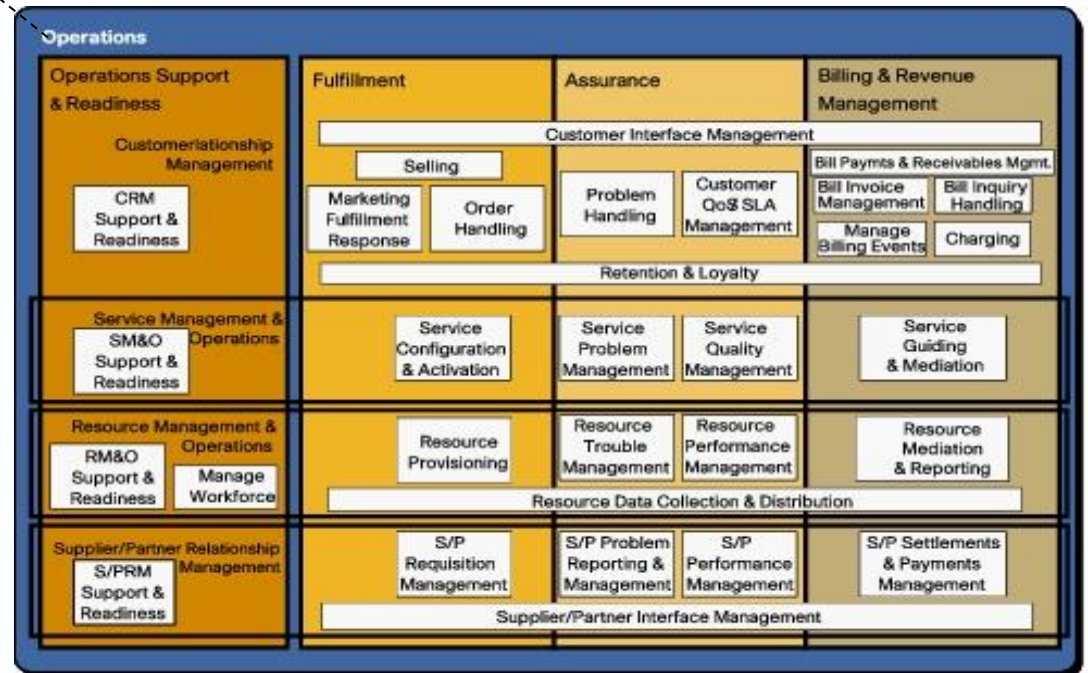
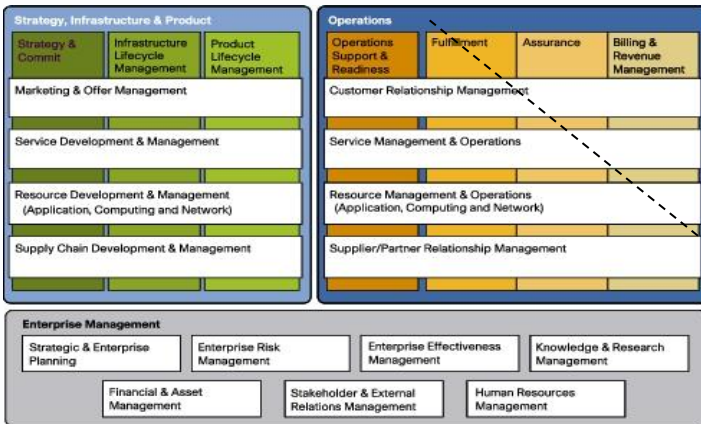
▶ [Wikipedia commons](#)

Process map

- ▶ [an artefact] that shows a top-level view of named business processes.
- ▶ Processes may not be connected or else related very informally.
- ▶ It may show coarse-grained functions (structural nodes) in vertical columns and show processes (behavioral flows) left-to-right.

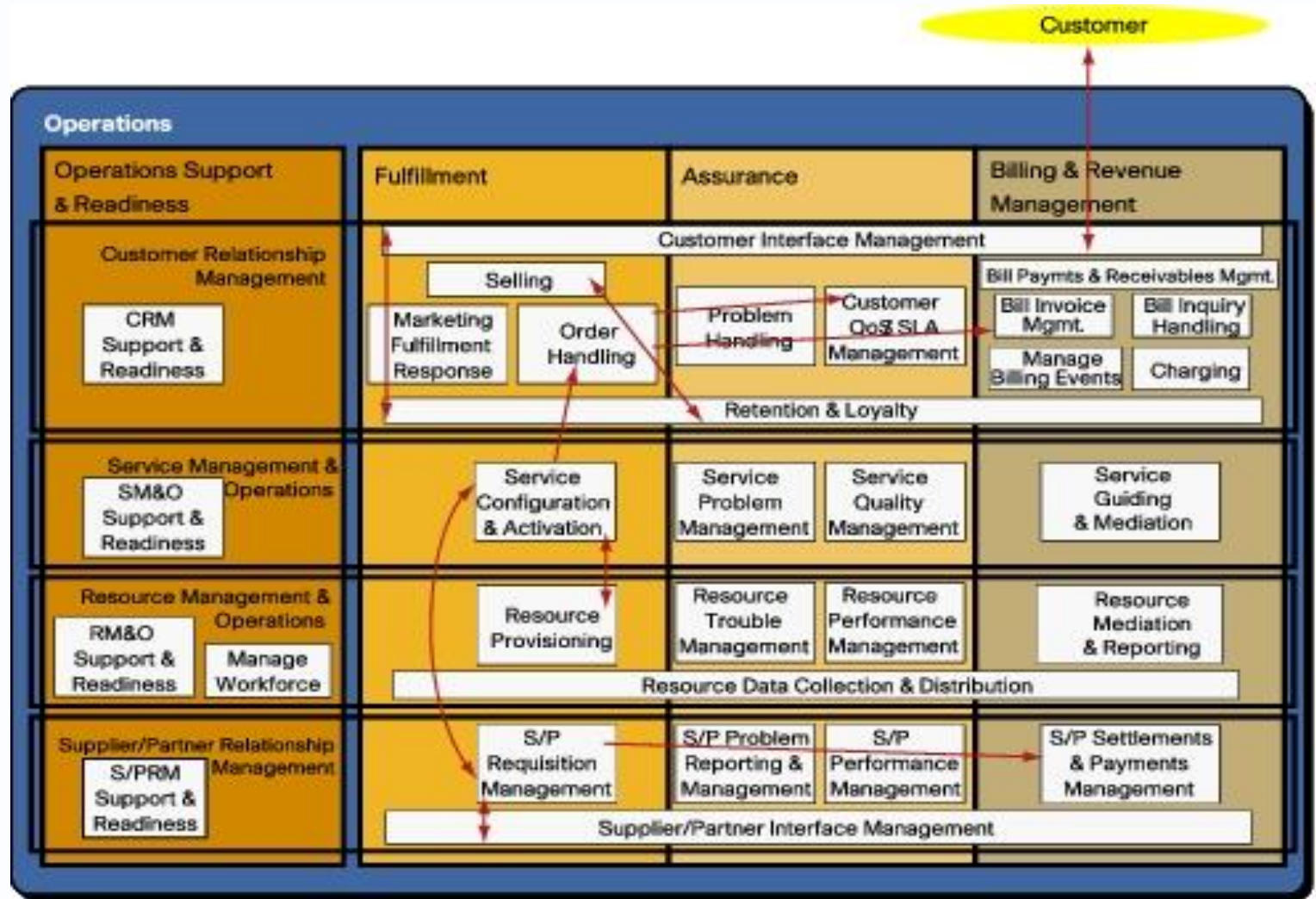


Operations Level 2 Processes (Copyright TM Forum)



Process Interaction Example (Copyright TM Forum)

► The processes are connected by dependencies rather than sequence or control flow



- ▶ [a service or process] triggered by an event that follows rules definable in the form of preconditions and post conditions.
- ▶ A repeatable activity that (if successful) ends with a result/output/product of value to the service requester or recipient.

- ▶ [a service] that can be requested of a business, or a component thereof, by its customers, suppliers or employees (e.g. order, payment, report, weighing.)

Barber Services

Hair cut – £20
Shave - £5
Manicure - £10

Logistics Services

Delivery
Express delivery
Recorded delivery

- ▶ An external view, a logical contract, that encapsulates whatever process(es) are need to deliver the desired outcome.

Business process

- ▶ [a process] that is performed by the actors in a business in the course of delivering a business service.

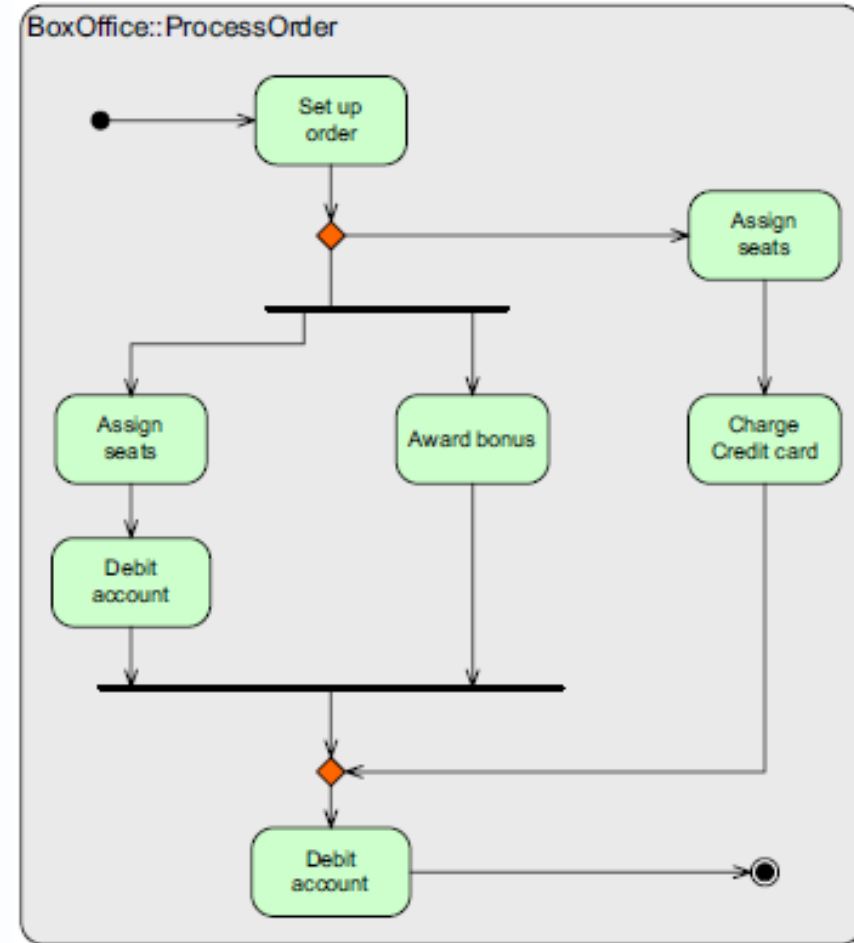
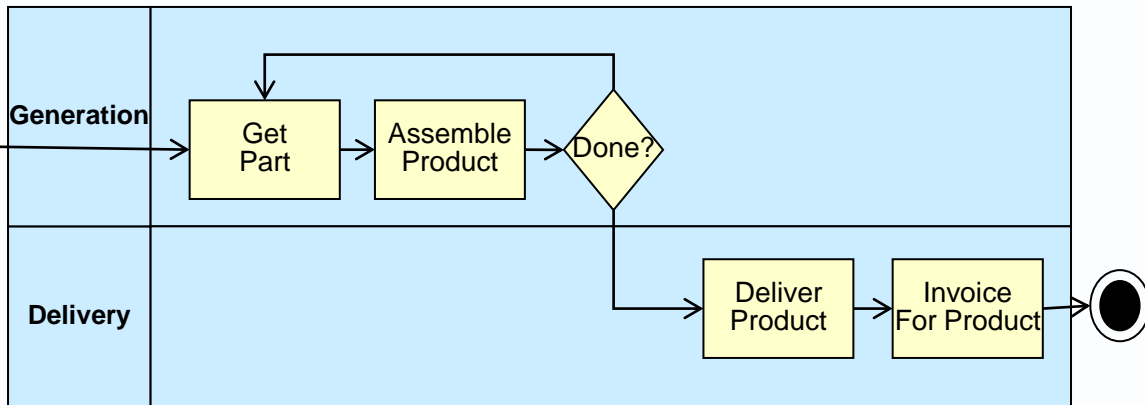
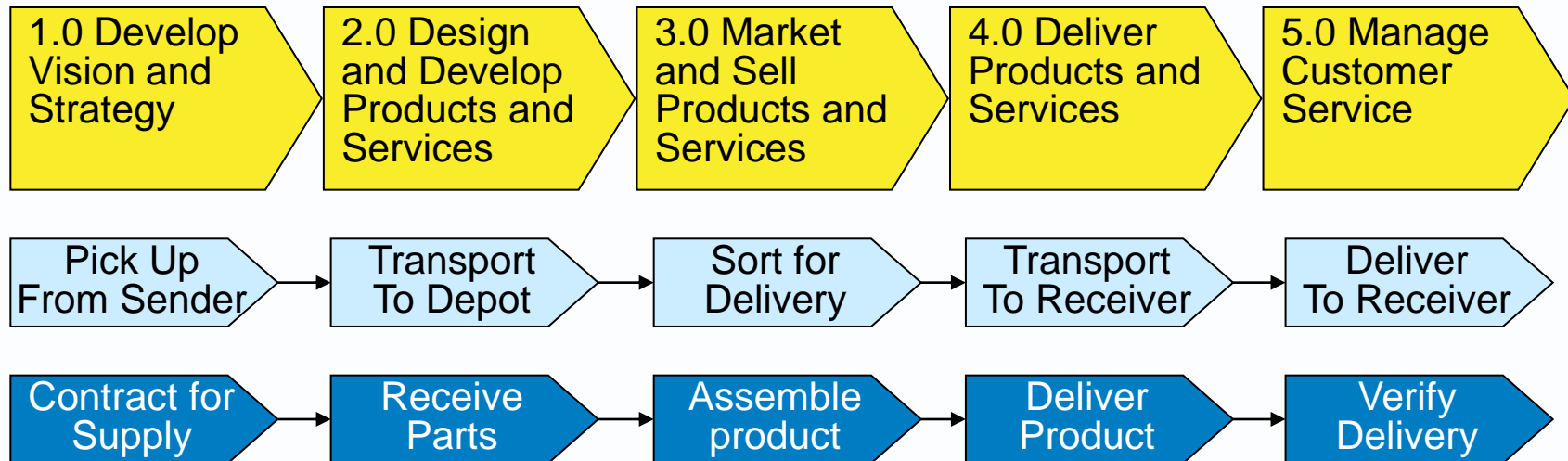


Figure 3-11, Processes (UML Activity diagram)

- ▶ [a process] “an end-to-end collection of activities that create a result for a ‘customer’ who may be the ultimate customer or an internal ‘end user’ of the value stream” Martin (1995).
- ▶ It may be drawn as a rich picture rather than a process flow chart.



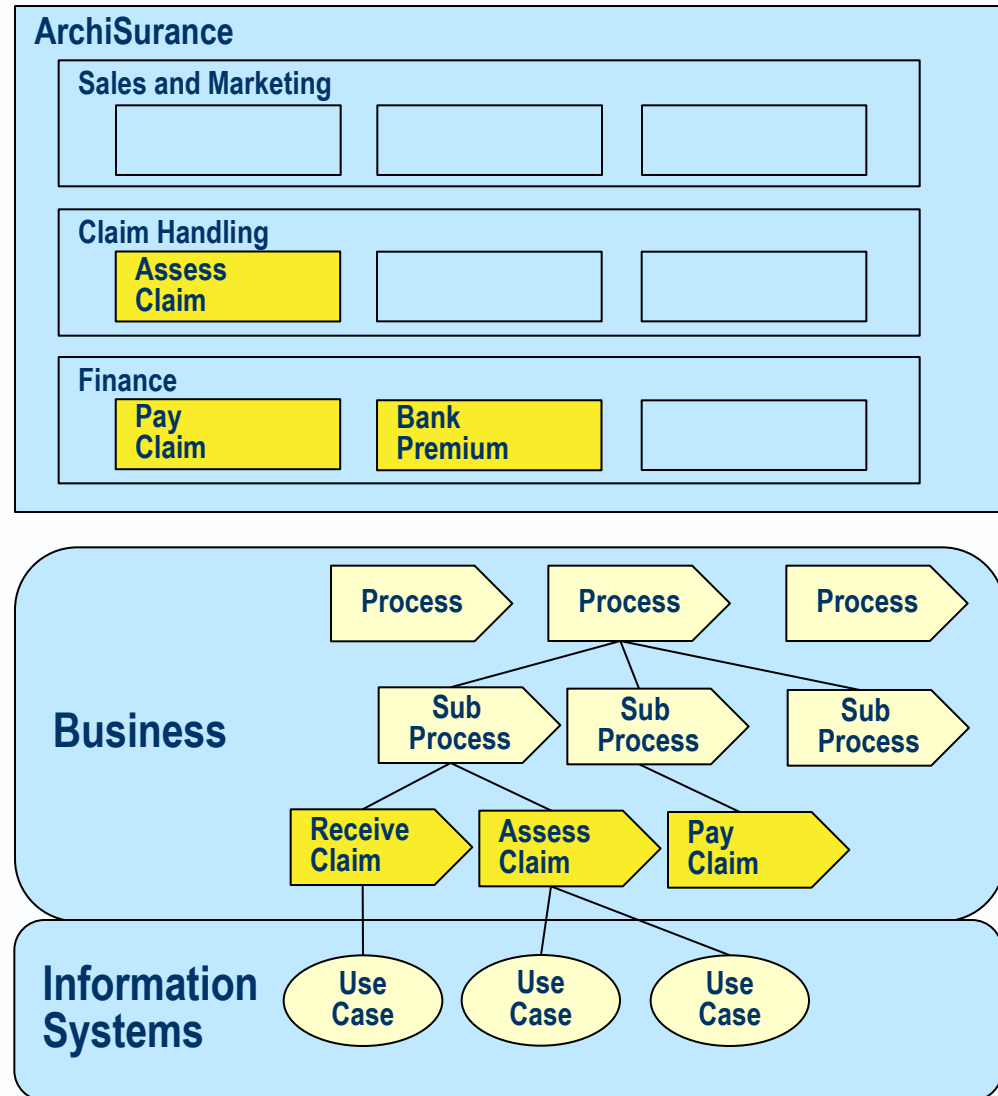
- ▶ [a technique] that involves measuring process steps, and optimising the process in the light of those measurements.
- ▶ It can help people remove wasteful activities and optimise processes in product manufacturing industries, where each activity should add more value to the end product or service than it costs.
- ▶

- ▶ [an artefact] in which each step or activity in a higher-level process is elaborated and defined as a lower-level process of several activities.

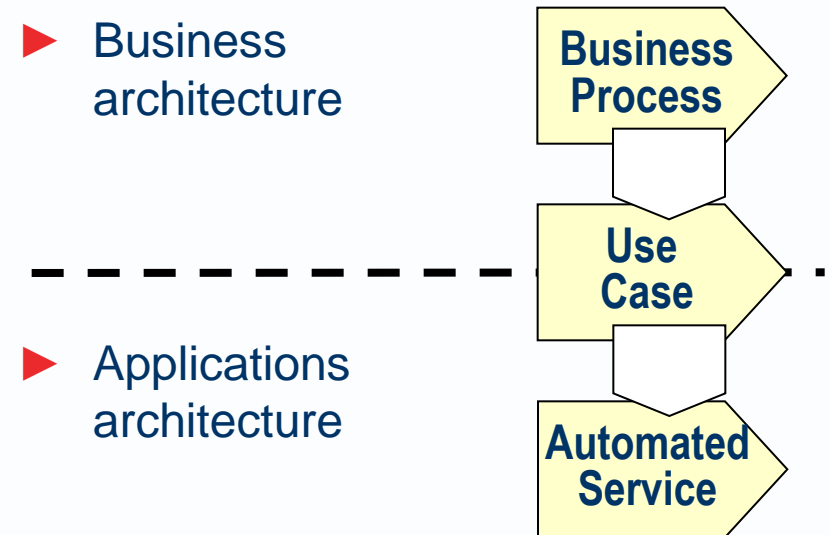
- ▶ [a process] an activity at the bottom of a business process decomposition hierarchy.
- ▶
- ▶ **OPOPOT** [a technique] one person, one place, one time; a rule of thumb used to define the bottom level of business process decomposition.

Structured analysis verification

- ▶ [a technique] to ensure a business architecture description is comprehensive and consistent.
- ▶ In theory, every EBP can be matched to an EBF.
- ▶ In practice, a structural decomposition view usually stops short of the detailed activities documented in process flows, but some cross-validation can still be useful.
- ▶



- ▶ [a technique] where by a business processes is decomposed to level where application use cases can be identified,
- ▶ which are further decomposed to a level where automated services can be identified.



- ▶ [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 (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				

- ▶ [a technique] that proceeds by defining the main elements of a process, scenario or value stream:
- ▶ The aims (outcomes or effects) and outputs (products or services)
- ▶ The main process steps
- ▶ The human actors (roles) involved in process steps.
- ▶ The computer actors (roles) involved in process steps.

There are a several business scenarios in the course

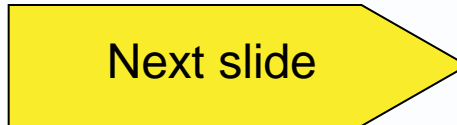
Application use case = process flow inside a service contract

Signature	Name	Withdraw cash	Service
	Input	Card details, pin number, cash amount	
	Output	Cash, receipt	
Trigger event		Enter card	
Functional rules or semantics	Preconditions	Valid pin number, sufficient cash in account	
	Post conditions	Account balance reduced by cash amount	
Process flow		<ol style="list-style-type: none"> 1 Enter card 2 Enter pin number 3 Select amount 4 Press OK 5 Withdraw card 	Process
Non-functional requirements	Response time	30 seconds	
	Throughput	100 per second	
	Availability		
	Integrity:		
	Scalability:		
	Security		
	Other non-functionals, dependencies and commercials		

Signature	
Name	Calculate Area
Input	Radius
Output	Area
Trigger event	
	Service invocation
Functional rules or semantics	
Preconditions	Radius is numeric
Post conditions	$Area = \pi * Radius^2$
Non-functional requirements	
Response time	0.1 second
Throughput	n/a
Availability	100% of time the calculator is switched on
Integrity:	100% accuracy
Scalability:	n/a
Security	n/a
Other non-functionals, dependencies and commercials	

Service

- ▶ Usually,
 - a service provided by a server-side component,
 - invoked from a user interface or data flow consuming process,
 - supports and progresses a use case,
 - applies an input message to stored business data.
- ▶ The server-side component might be code
 - on an app server or a data server under our control,
 - on a server under somebody else's control,
 - a 3rd party component of any kind – accessed via a web service perhaps
- ▶ Ideally atomic
 - So transaction management can be applied.
 - It can be rolled back if any precondition is violated.
- ▶ Typically an **ACID** transaction



ACID acronym says that database transactions should be:

- ▶ **A**tomic
 - Everything in a transaction succeeds **or the entire transaction is rolled back.**
- ▶ **C**onsistent
 - A transaction cannot leave the database in an inconsistent state.
- ▶ **I**solated
 - Transactions cannot interfere with each other.
- ▶ **D**urable
 - Completed transactions persist, even when servers restart etc.

- ▶ Transaction roll back simplifies processing because means no need for **compensating transactions**

Remember

- ▶ Business processes steps and use cases may be scoped as
 - OPOPOT: One Person, One Place, One Time

- ▶ Use cases may be supported by automated services that are
 - Ideally ACID (that is, roll-backable)