



Avancier Methods

Business Architecture Hierarchies

An introduction to *structural* decomposition
in Enterprise and Business Architecture

The graphics illustrate this article

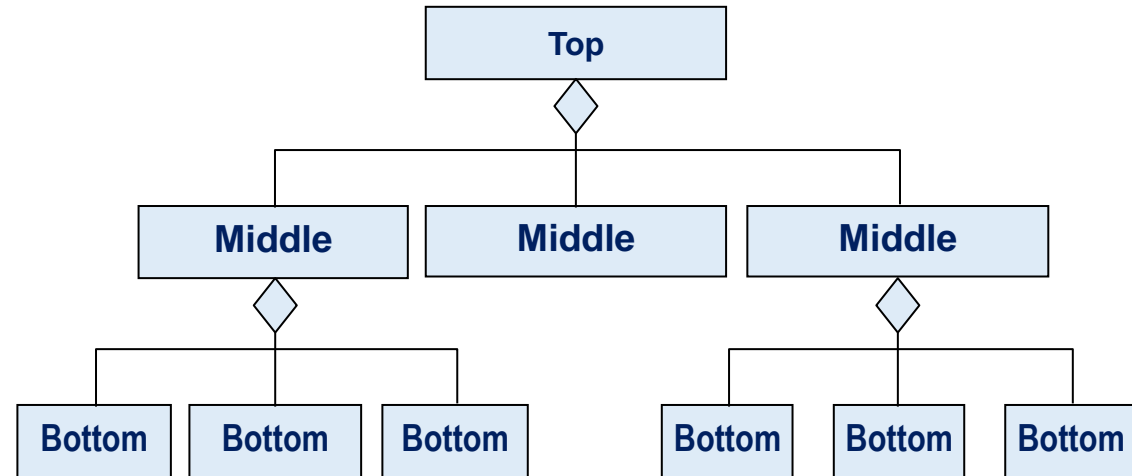
<https://www.linkedin.com/pulse/brief-eaba-history-graham-berrisford>



Bear in mind

In modeling a business you can represent
several aspects of the business
in several ways, and
at different levels of granularity

You have to decide
which aspects
which ways
at which level of granularity
and which atomic elements you include





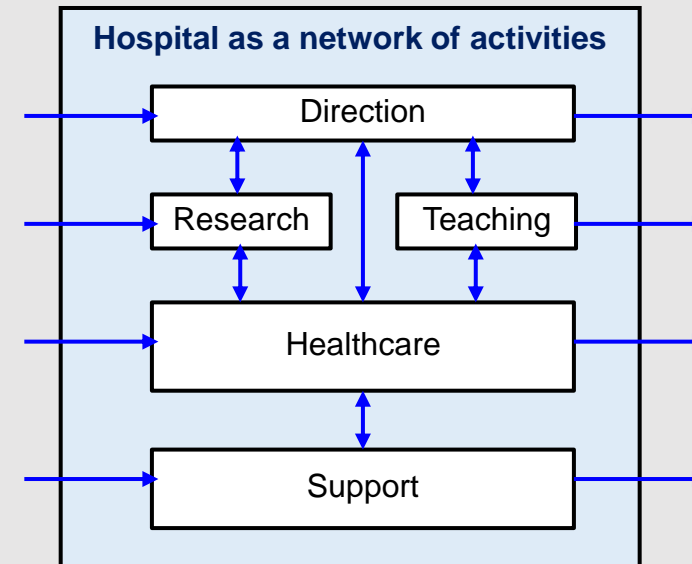
The principle behind imposing hierarchies on networks

“A system may encapsulate
a network of actors
a network of activities
a network of state variables (as in a data store)

*People often understand and manage
the networks in activity systems
by imposing hierarchies on them.”*

Systems terms and concepts

<https://lnkd.in/gqJAK3j9>



A hospital represented as hierarchy

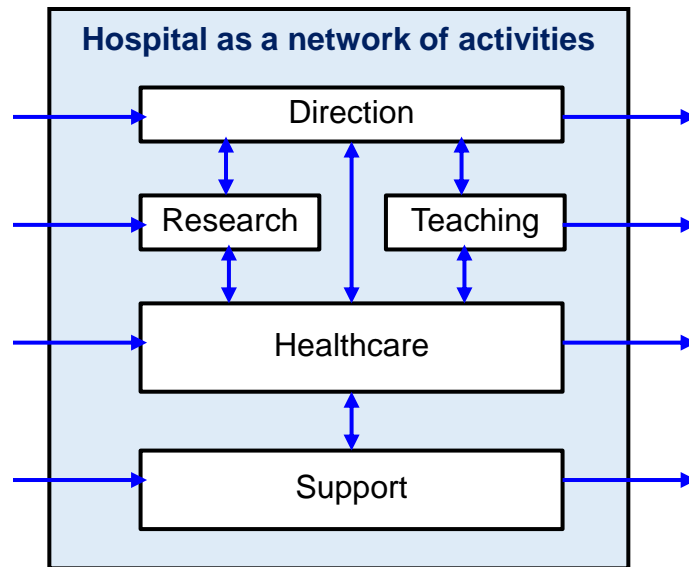
Composite

1st level decomposition

2nd level decomposition

3rd level decomposition

Few architects decompose more than 3 or 4 levels



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Hospital as a hierarchy of activities

Direction

Strategy

Planning

Governance

...

Scientific research

Research planning

Research activity

...

Healthcare

Consultation

Diagnostics

Advice

Treatment planning

Treatment...

Additional diagnostics...

Care...

Teaching

Curriculum Development

Teaching

...

Support

Property management

Human resources

Accounting

...

*Adapted from an example
published by The Open Group*

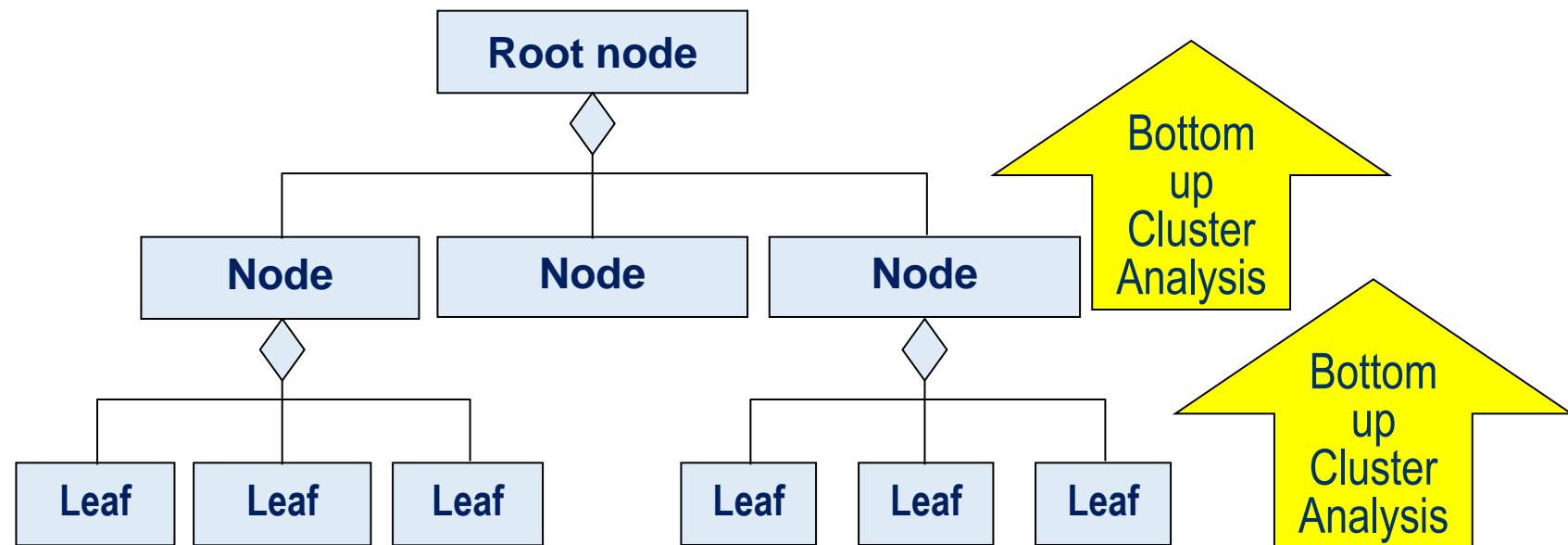


Successive cluster analysis

Given N atomic elements (leaf level nodes)

Cluster lower-level nodes under higher-level nodes

Using one or more cohesion criteria (same time, same place, same resource needed, etc.)



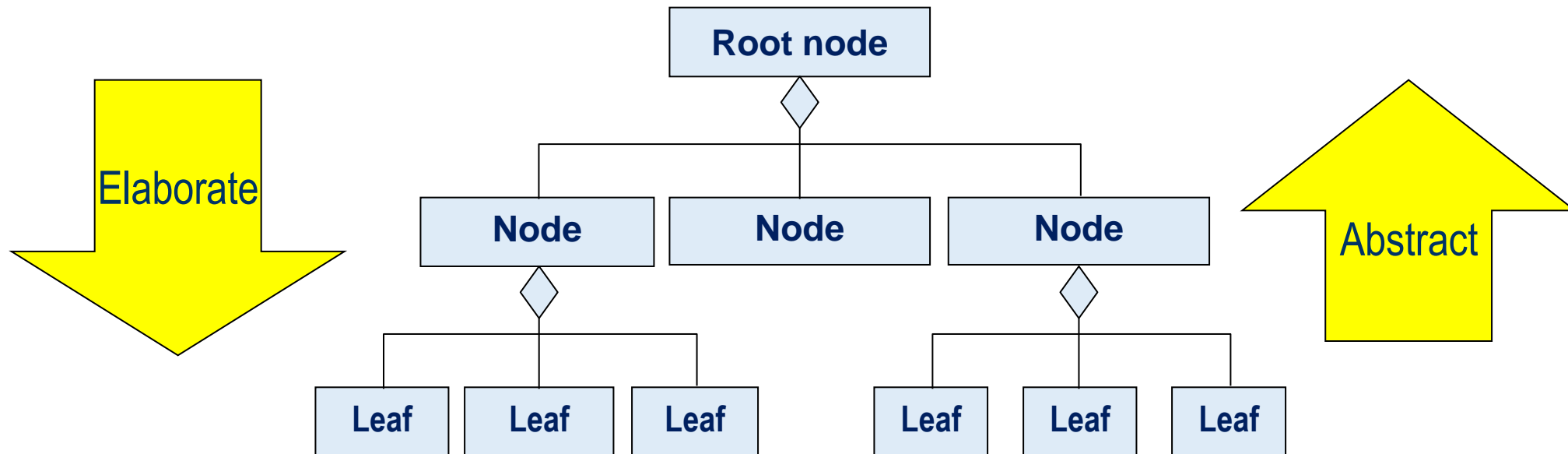


Optimising the structure

Alternately elaborate and abstract

A higher level node should be a manageable and well-named abstraction of lower nodes

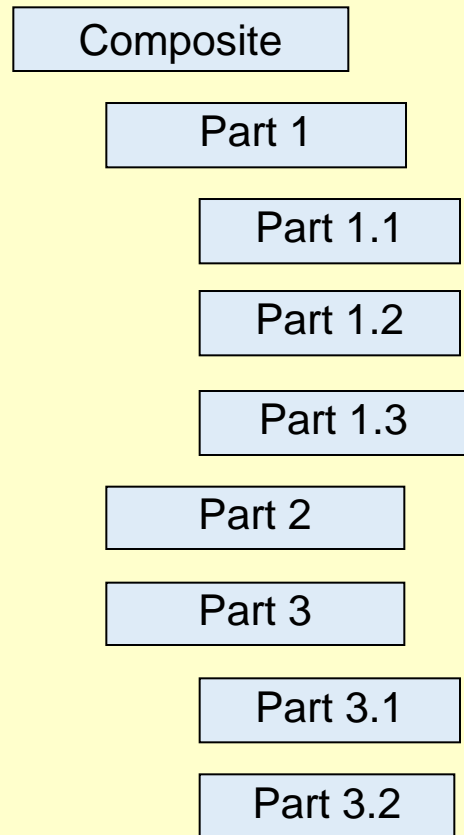
And hide detail not important to a viewer of it



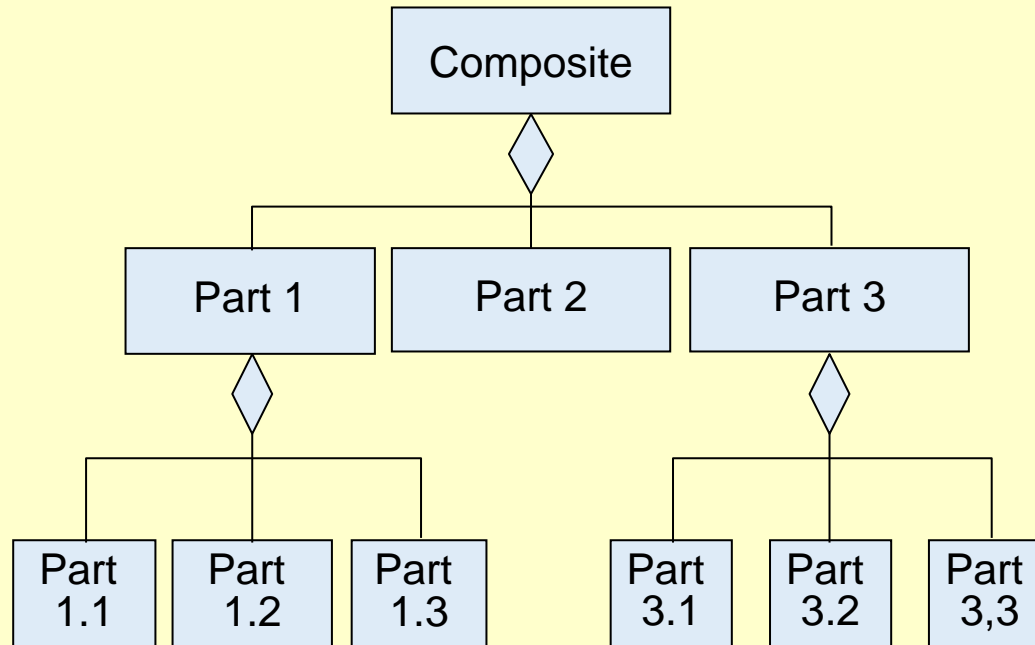


Graphical representations of a composition/decomposition hierarchy

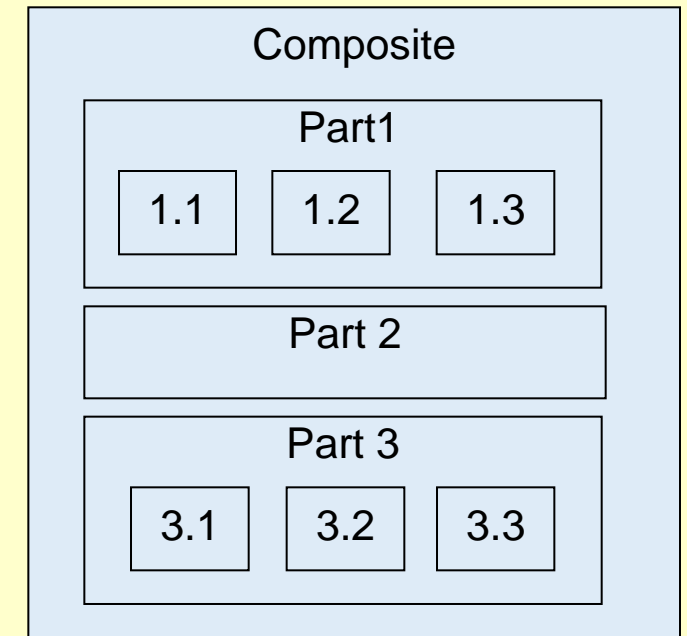
Folder structure



Tree structure (UML, ArchiMate)



Nested box structure



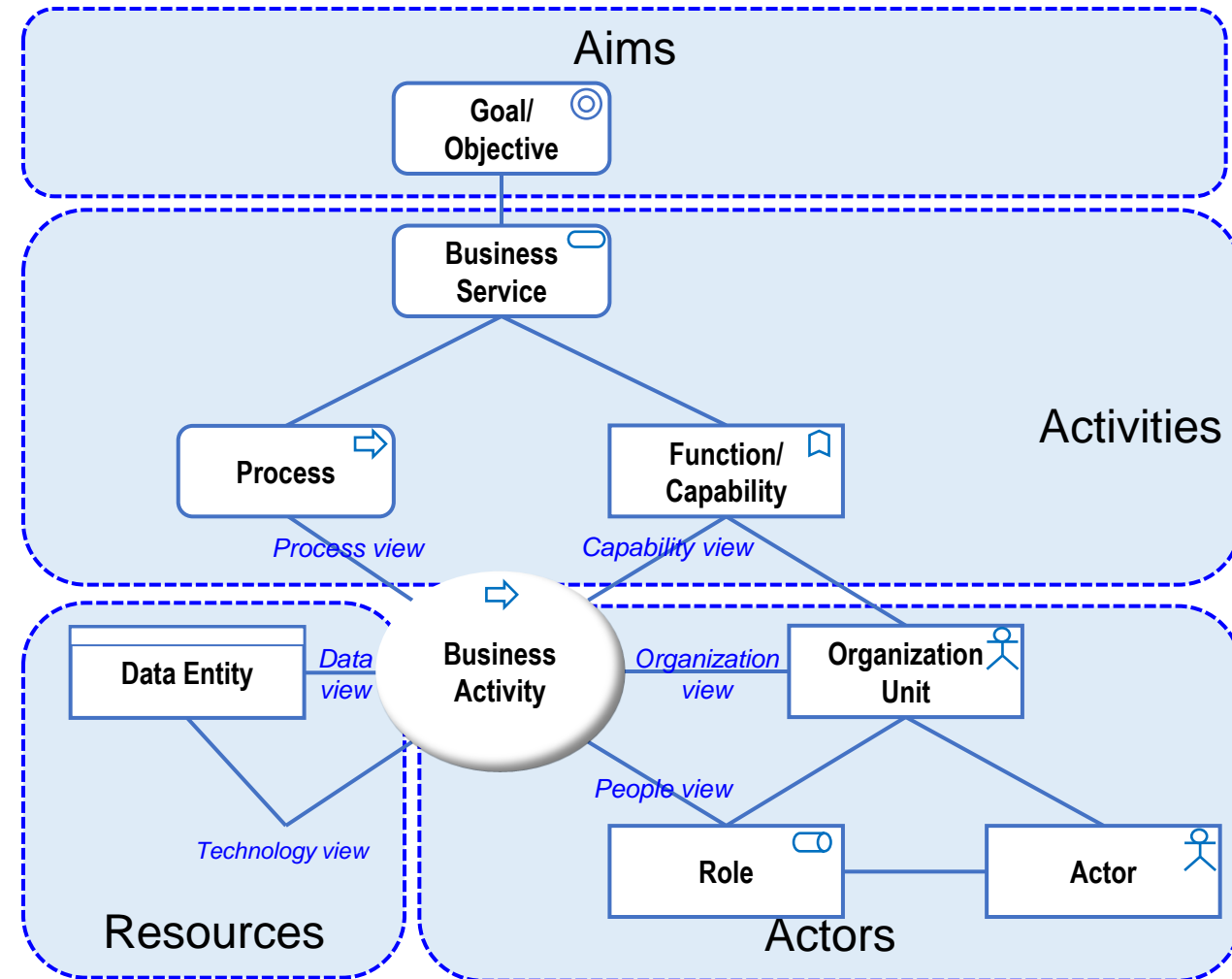
You can't call yourself an enterprise architect until you have drawn one of these.



Business architecture as in SFIA

A business is a complex network of actors interacting in activities (processes), to meet aims (goals or objectives) using resources (inc. data and apps).

SFIA implies enterprise and business architects take several views of business activities





Hierarchies people impose on business operations

To understand and manage business operations, people impose hierarchies on the

Actors employed – **organization** hierarchy (or management structure)

Activities performed – **function** hierarchy (or decomposition)

Abilities possessed – **capability** hierarchy (or map)

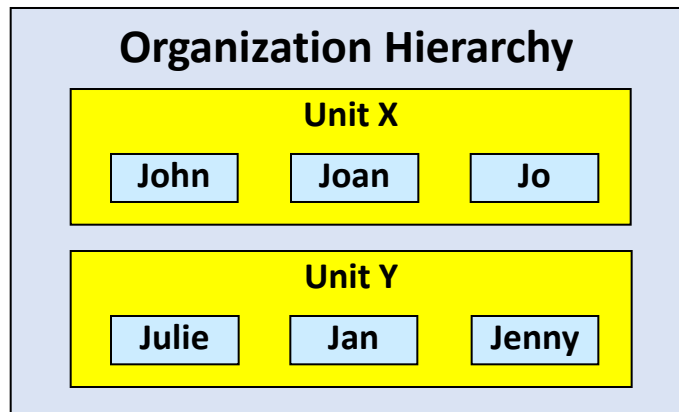
Aims to be achieved – **goal/objective** hierarchy

To follow...



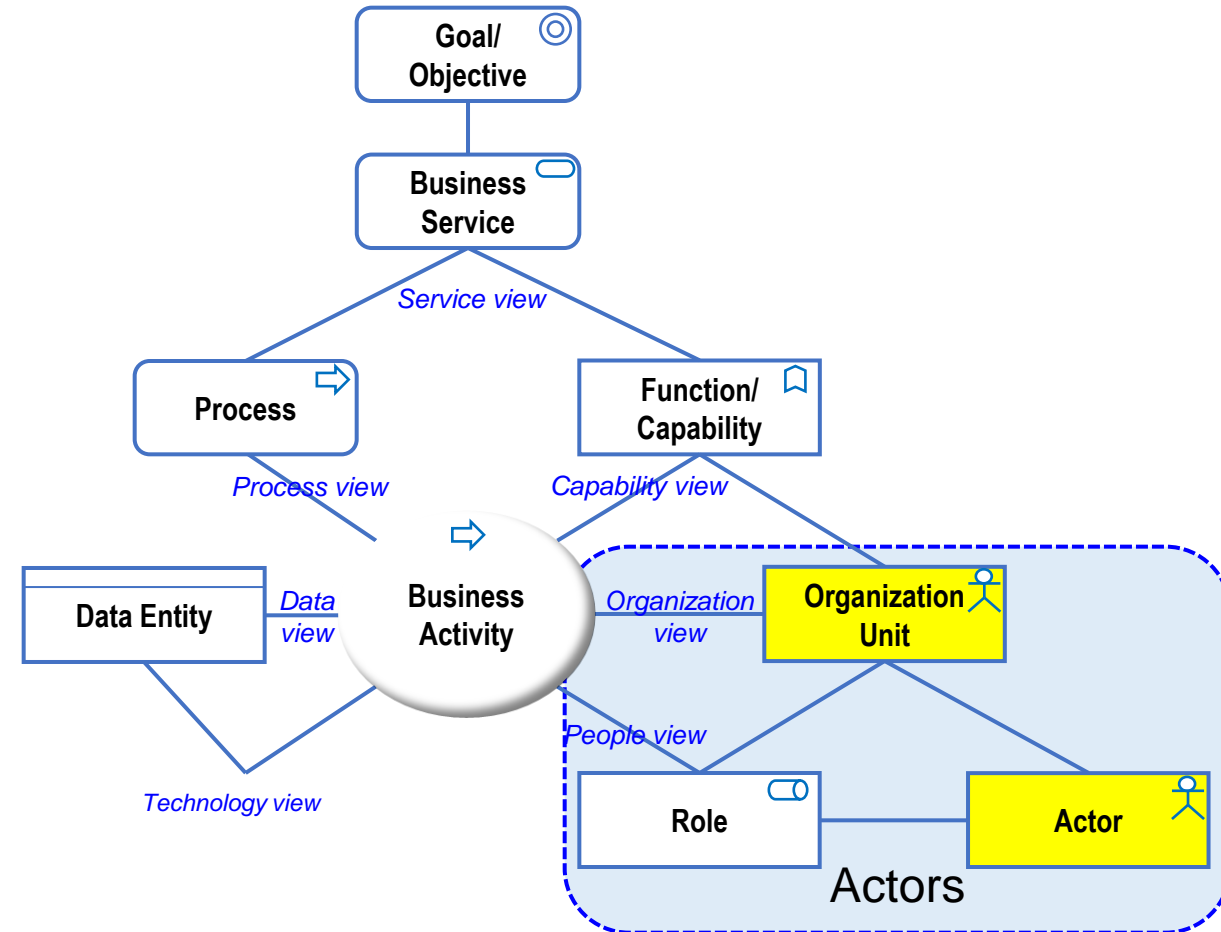
Organization hierarchy (or management structure)

Managers impose a hierarchical reporting line structure over the employees of a business



Trouble is: the management structure is often volatile/fluid

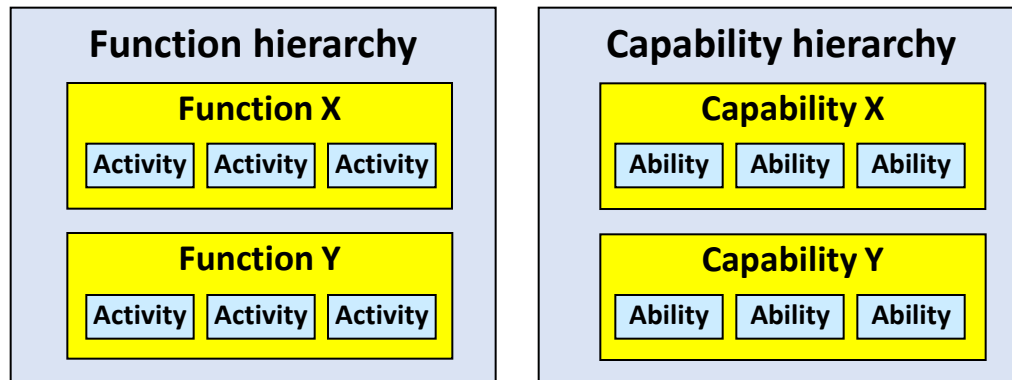
It may be restructured, say by location, customer type or product type.



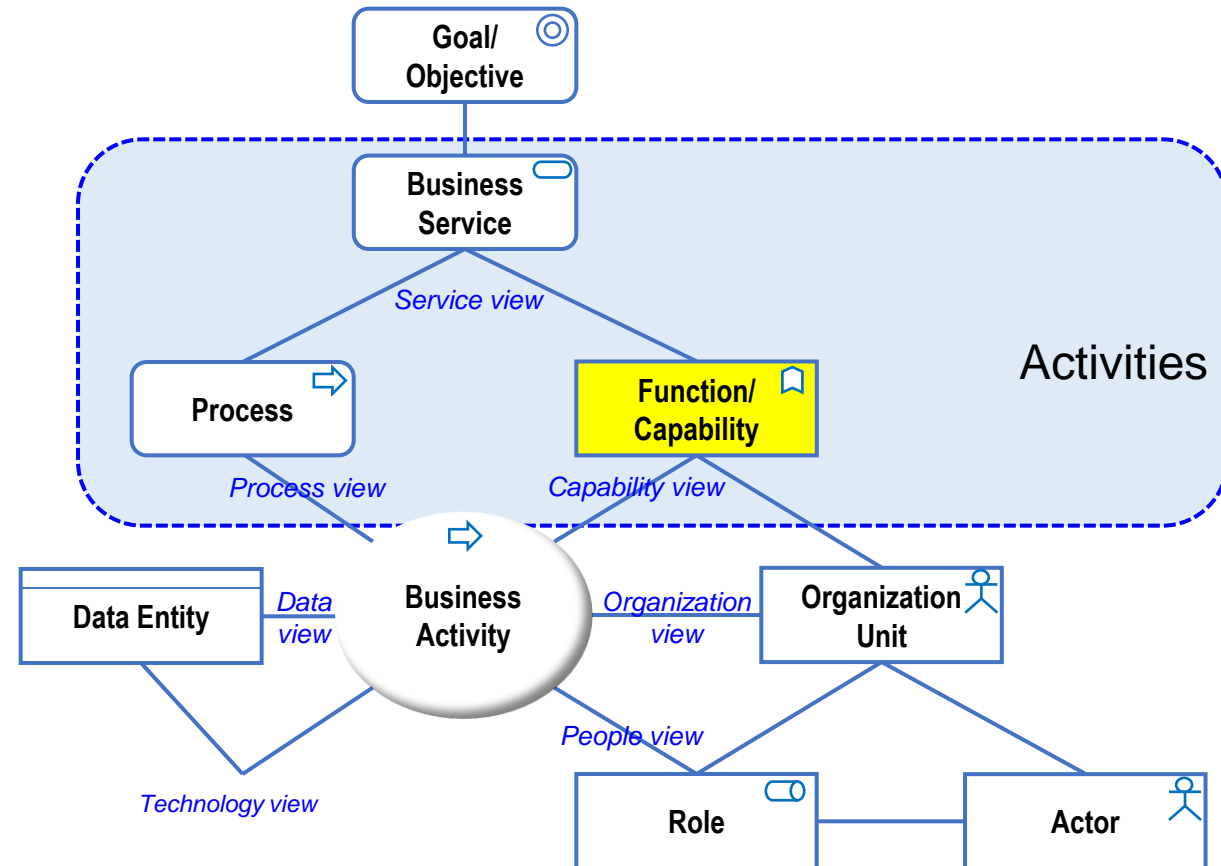


Function hierarchy (or decomposition) or Capability map

Aside from the management structure, EAs usually build a more logical and stable hierarchical overview of business operations



(When business people say “capability” or “function”, they often mean the people, processes and resources need to realize it).



Two graphics from The Open Group's Hospital Reference Architecture



Business model canvas

Hospital Reference Architecture, Part 1

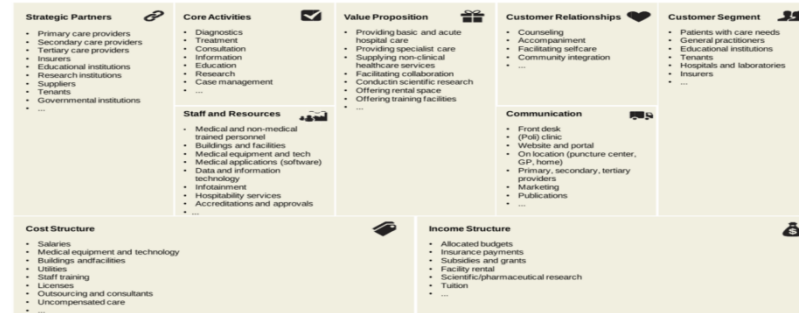


Figure 7: Business Model Canvas (BMC)

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Business function model

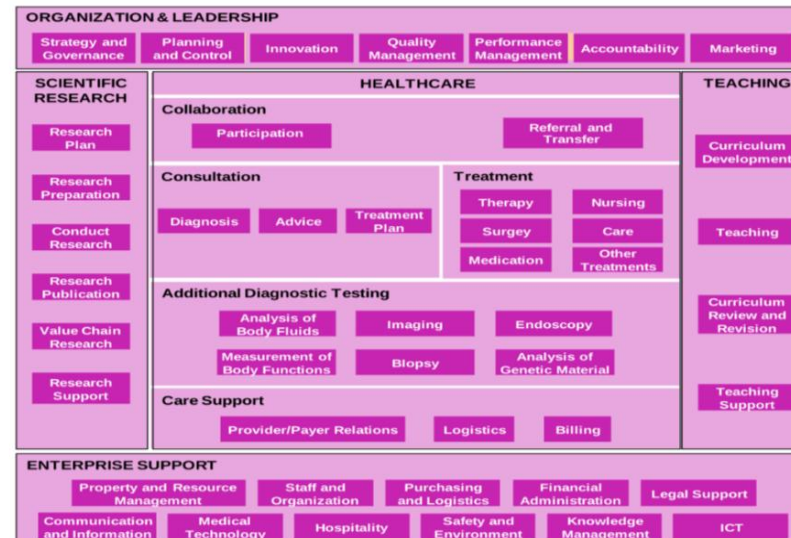
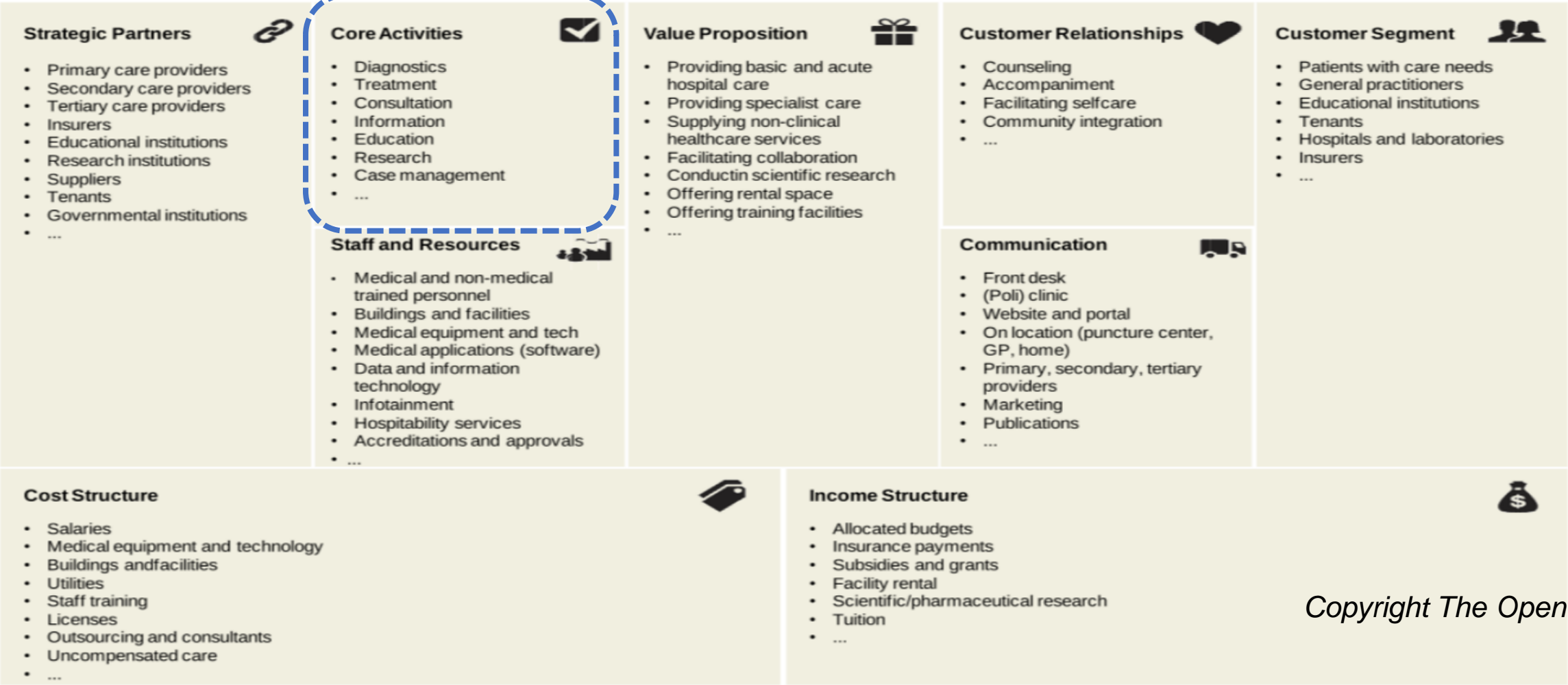


Figure 8: Business Function Model

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Hospital Reference Architecture, Part 1

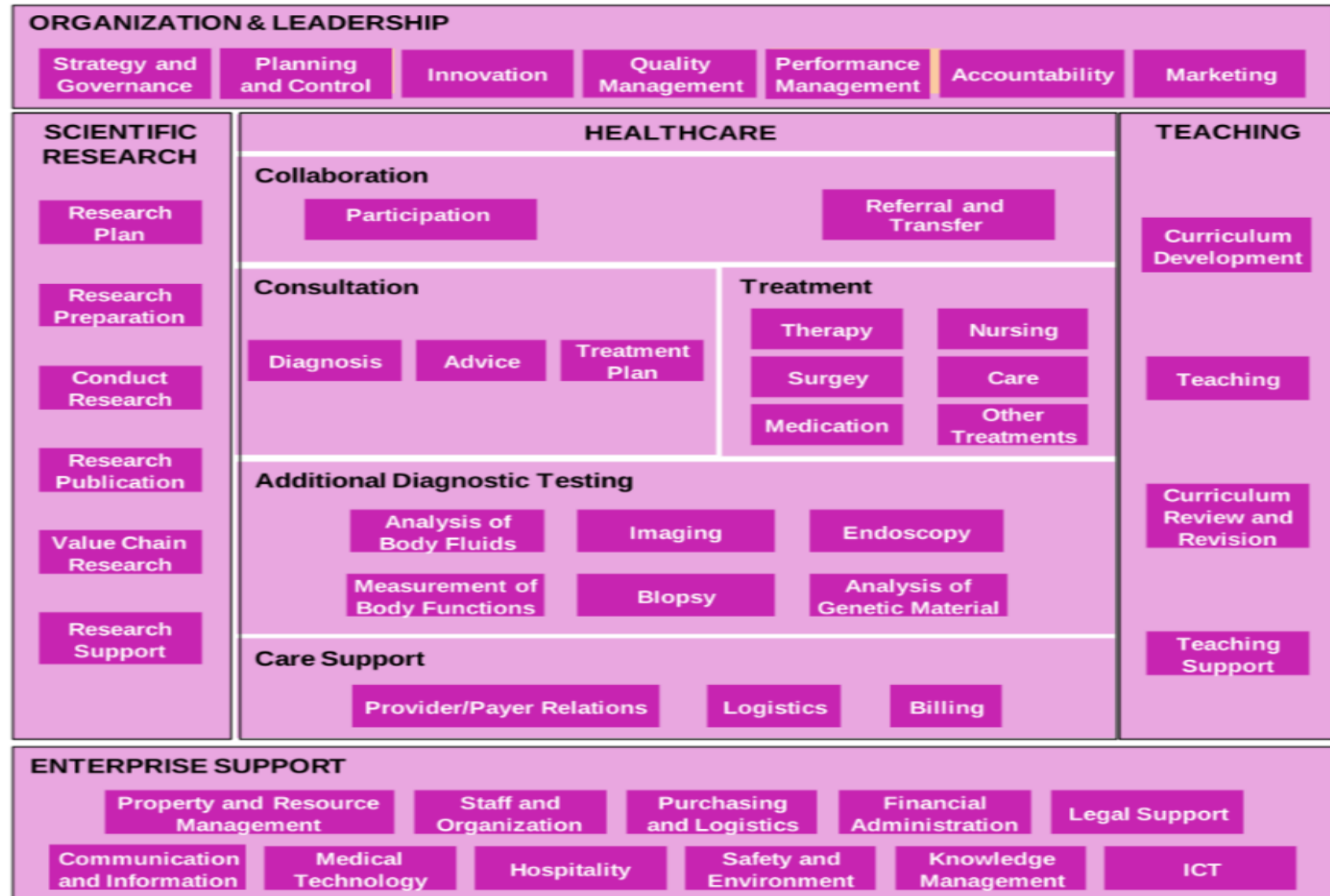


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Figure 7: Business Model Canvas (BMC)



- Hospital
 - Organisation & leadership
 - Strategy
 - Planning
 - Governance
 - ...
 - Scientific research
 - Research planning
 - Research activity
 - ...
 - Healthcare
 - Consultation
 - Diagnostics
 - Advice
 - Treatment planning
 - Treatment...
 - Additional diagnostics...
 - Care...
 - Teaching
 - Curriculum Development
 - Teaching
 - ...
 - Support
 - Property management
 - Human resources
 - Accounting
 - ...





Goal/objective hierarchy

Decomposes goals into finer-grained objectives

Increase market share

Increase marketing...

Increase capacity...

Reduce prices

Cut part costs

Reduce number of parts

Use cheaper materials

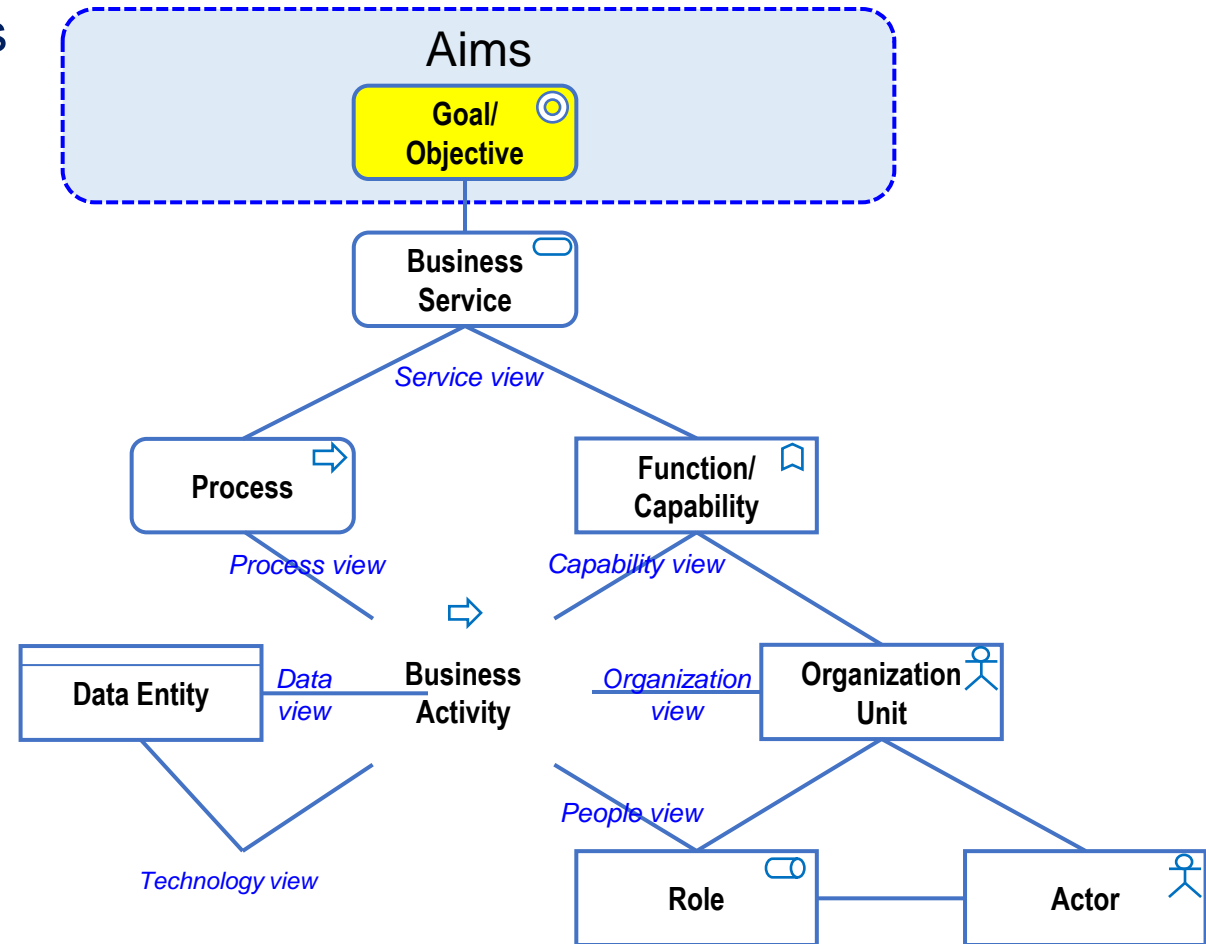
Cut assembly costs

Reduce number of parts

Simplify interfaces

Increase profit...

Improve working conditions...





Corresponding and clashing hierarchies

Might any pair of these hierarchies be the same?

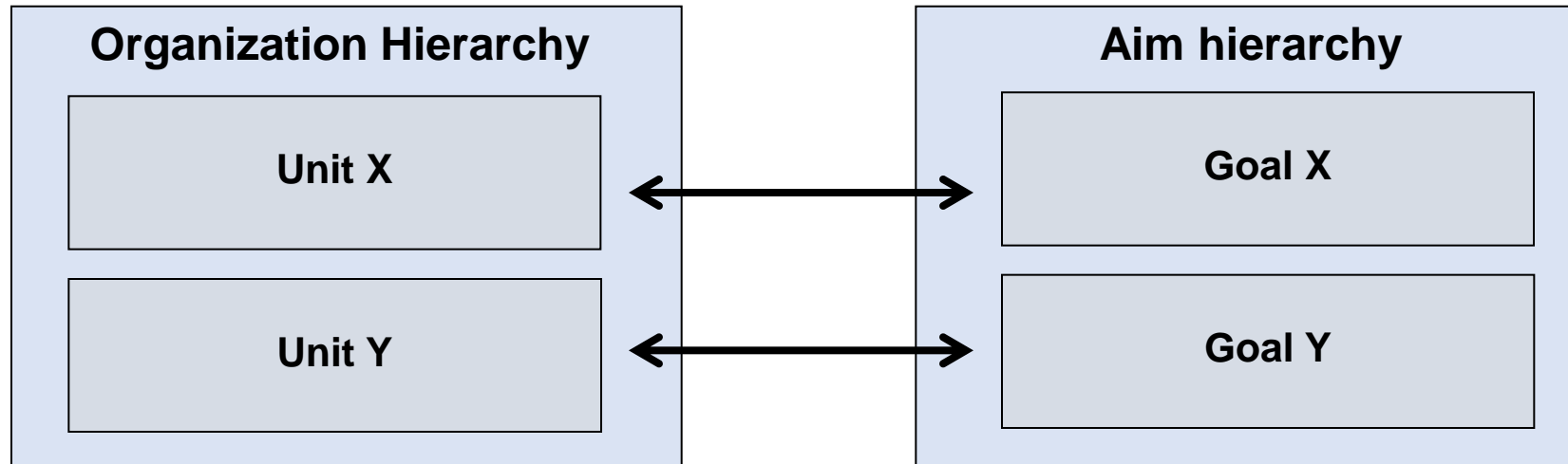
- organization hierarchy
- function hierarchy
- capability hierarchy
- goal/objective

Yes, any pair may correspond



Corresponding **aims** and **organization** hierarchies

You might align the organizational hierarchy and aim hierarchy

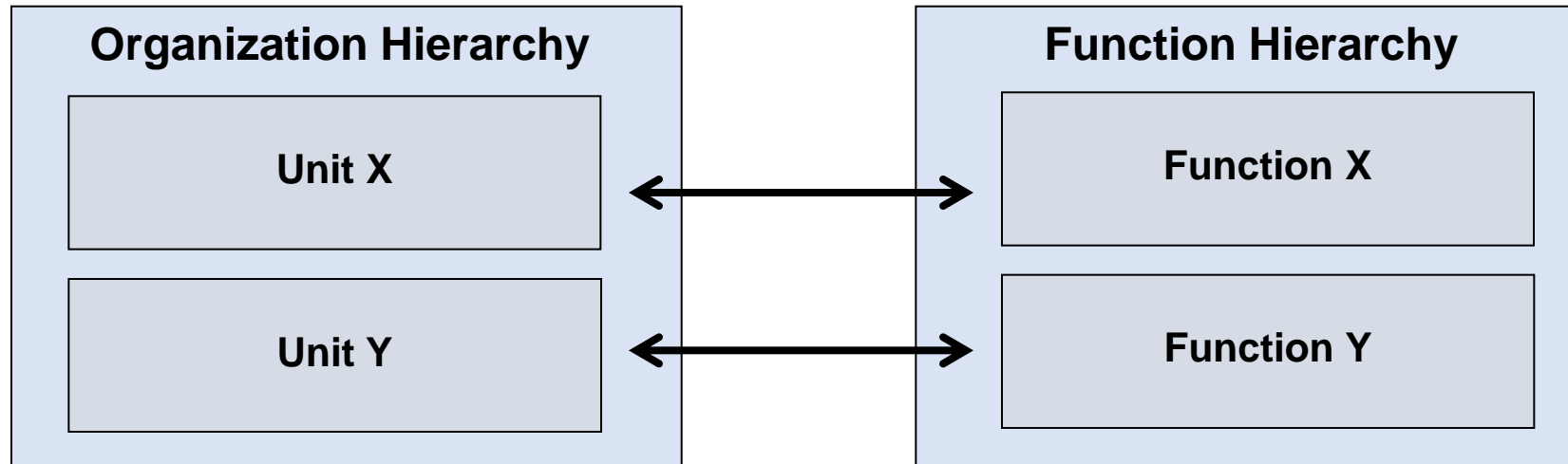


In a “balanced score card”, aims are cascaded and decomposed down the organization structure, so each managed unit has one or more goals/objectives, the achievement of which is reported to the level above.



Corresponding **organization** and **function** hierarchies

You might align the organizational hierarchy and functional hierarchy



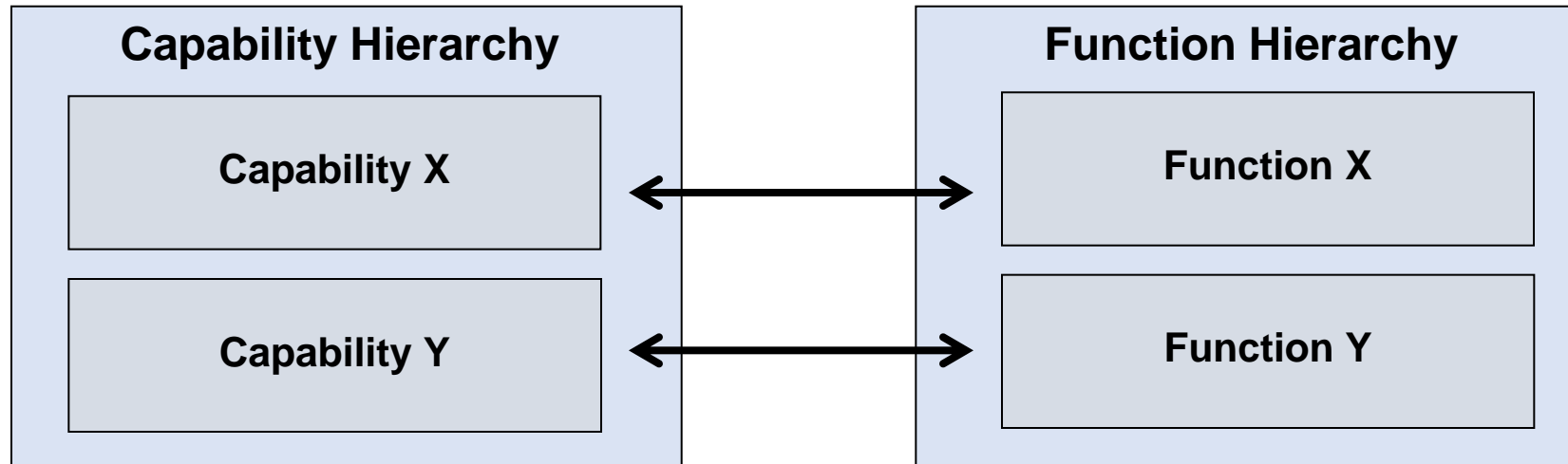
This creates what is called a “functional organization”

In which every organization unit realises a logically cohesive function.



Corresponding **capability** and **function** hierarchies

You might align the capability hierarchy and function hierarchy



You can make them different, but they naturally correspond because

To perform an activity, you need the corresponding ability

To realise a function, you need the corresponding capability.



Clashing structures

Any two hierarchical structures may clash

And even though two are currently in correspondence, one may change without the other.

E.g. you might restructure the organization's management structure by

- Location
- Customer type
- Product type
- Resource type.

without changing what the business does, as shown in a capability/function hierarchy.

That is why EA bases business architecture documentation on the more logical view

You may draw a matrix to map the elements of one hierarchy to the elements another

| Organisation Function | Petrol | Paints | Plastics |
|-----------------------|--------|--------|----------|
| Marketing | X | X | X |
| Sales | X | X | X |
| Delivery | X | X | X |



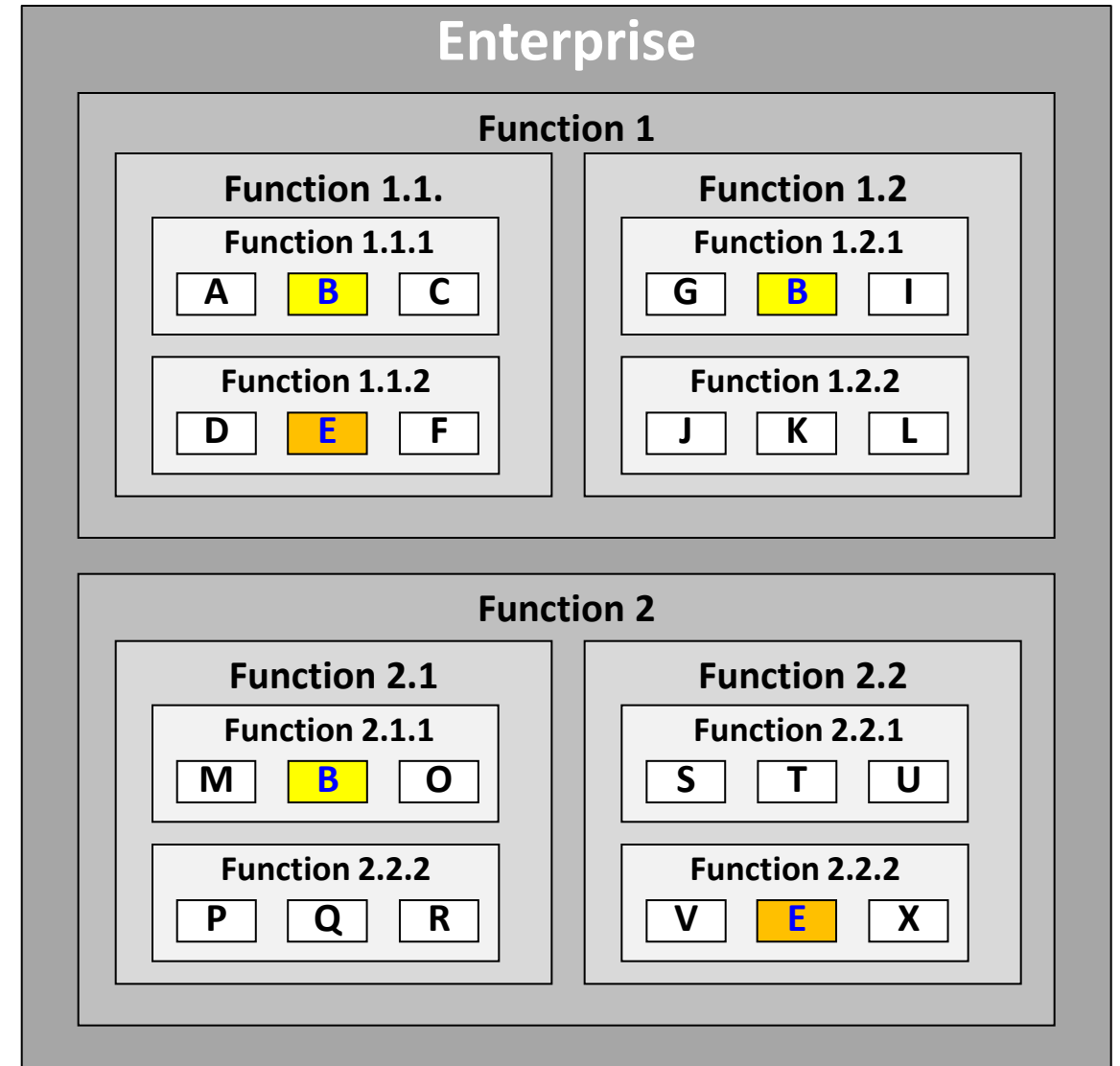
Duplicated elements?

If you decompose a business capability or function hierarchy far enough, you may well reach some elements that are

- duplicated in the diagram, and
- either duplicated or shared in reality

Rule of thumb: if you decompose to only a 3rd or 4th level, you are unlikely to find duplicated activities

You might move duplicated activities into a generic support function



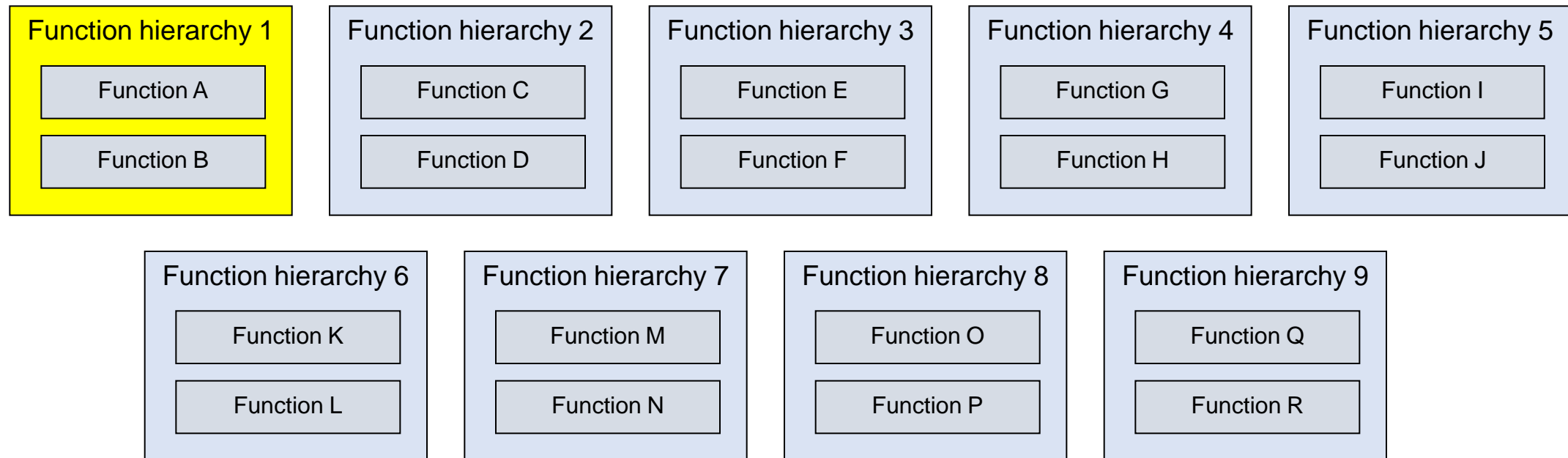


A challenge: in the forest of possible trees, which is the primary one?

Architects may impose different logical hierarchies over business operations

One enterprise architect drew 9 different functional decomposition hierarchies to reflect the interests of 9 different stakeholders

Selected one as the primary hierarchy for EA purposes





A challenge: the size of a business, the volume of documentation

Business

Applications

Data

Enterprise A

18 months to document
100s of business processes.

A central government dep't

300 apps and
500 data flows

300 databases – ave. 30 tables

9,000 tables – ave. 5 columns

45,000 atomic data types

Enterprise B

250 services
250 capabilities,
75 top-level processes
1,000 fourth level processes
1,000 organization units
3,000 roles
5,000 employees

A county council

18 months to find and list
600 applications

Enterprise C

6,000 client-side apps
1,000 server-side apps

Given a wide scope, you have to decide

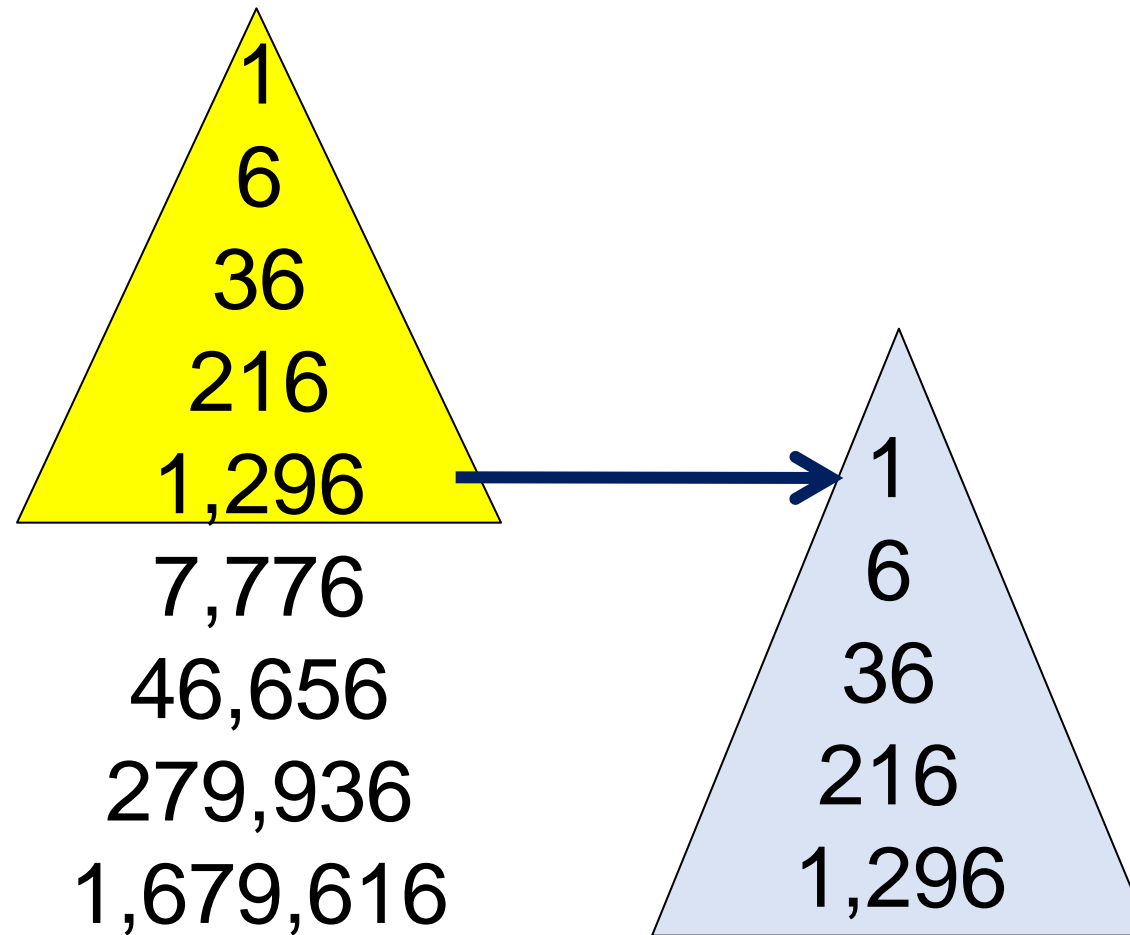
how far you decompose a hierarchical structure and which atomic elements are important enough to include



Given a large structure with any atomic elements

How many atomic elements can one person cope with?

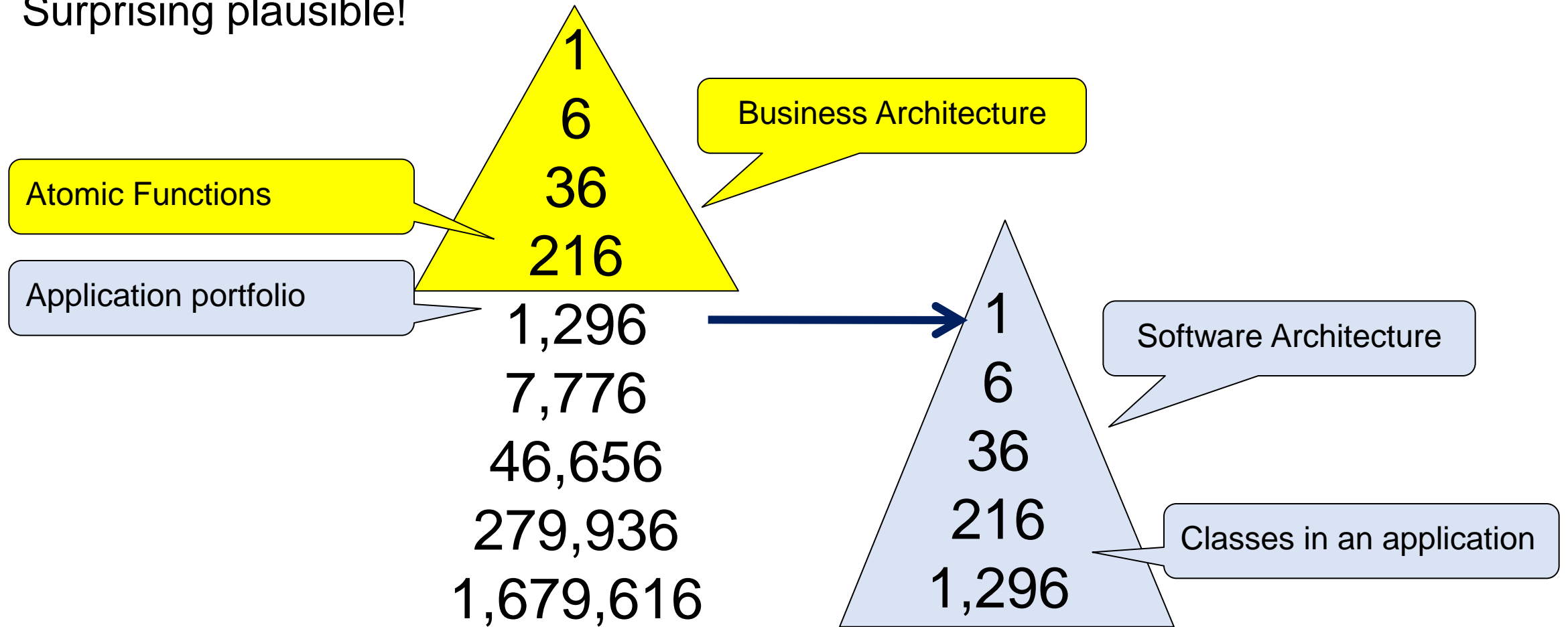
At what point do you delegate?





Mapping those numbers to a very large Enterprise

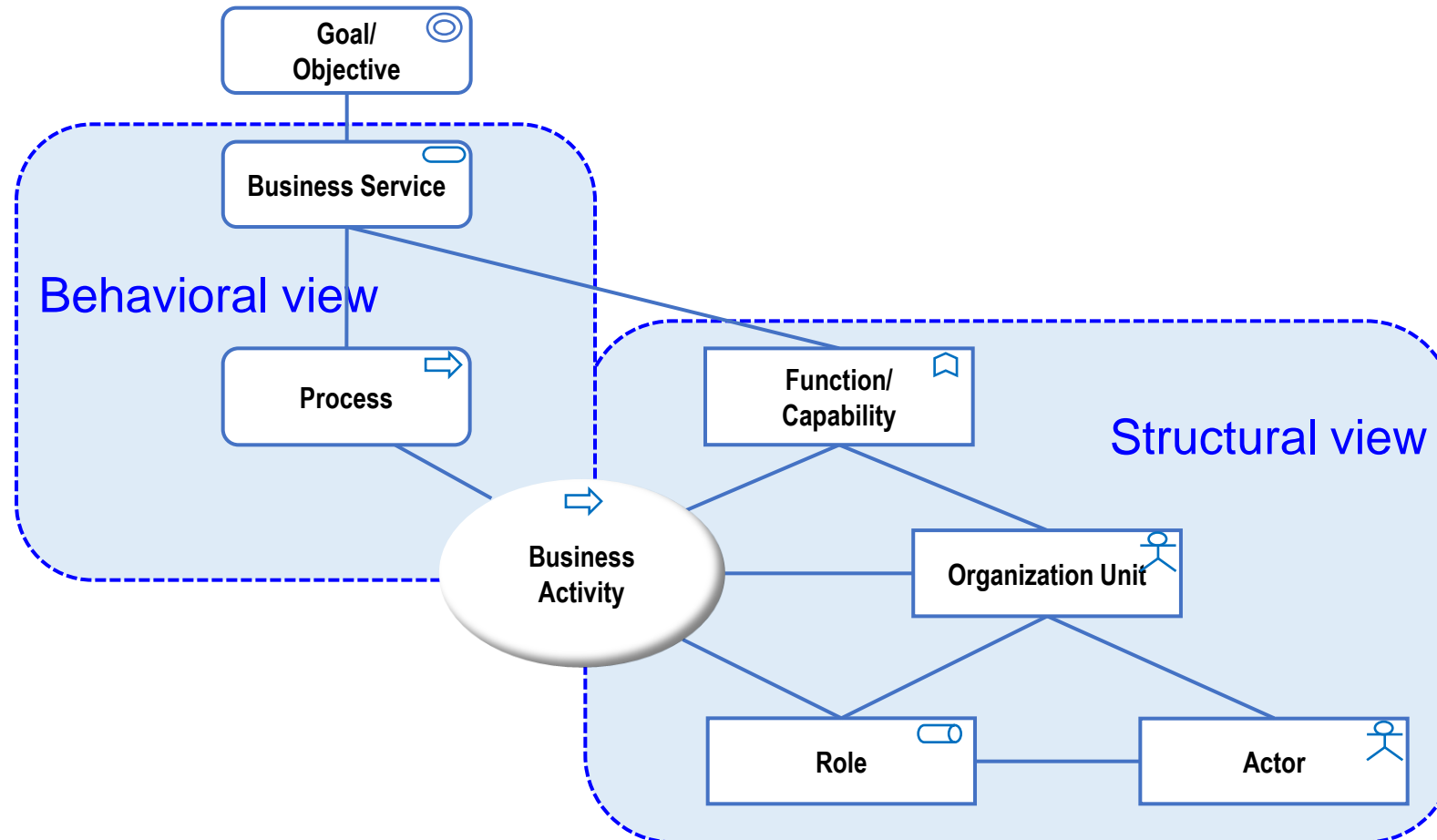
Surprising plausible!





Structural and behavioral views of activities

We've looked at the structural view; later we'll return to look at the behavioral view





You want to know more?

For training in enterprise and solution architecture

Go to <http://avancier.website>

Structures show what elements exist and how they connect

Behaviors show what happens over time

For more on both structural and behavioral decomposition,
attend the training



Avancier Methods

Business Architecture Hierarchies

An introduction to *structural* decomposition
in Enterprise and Business Architecture

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