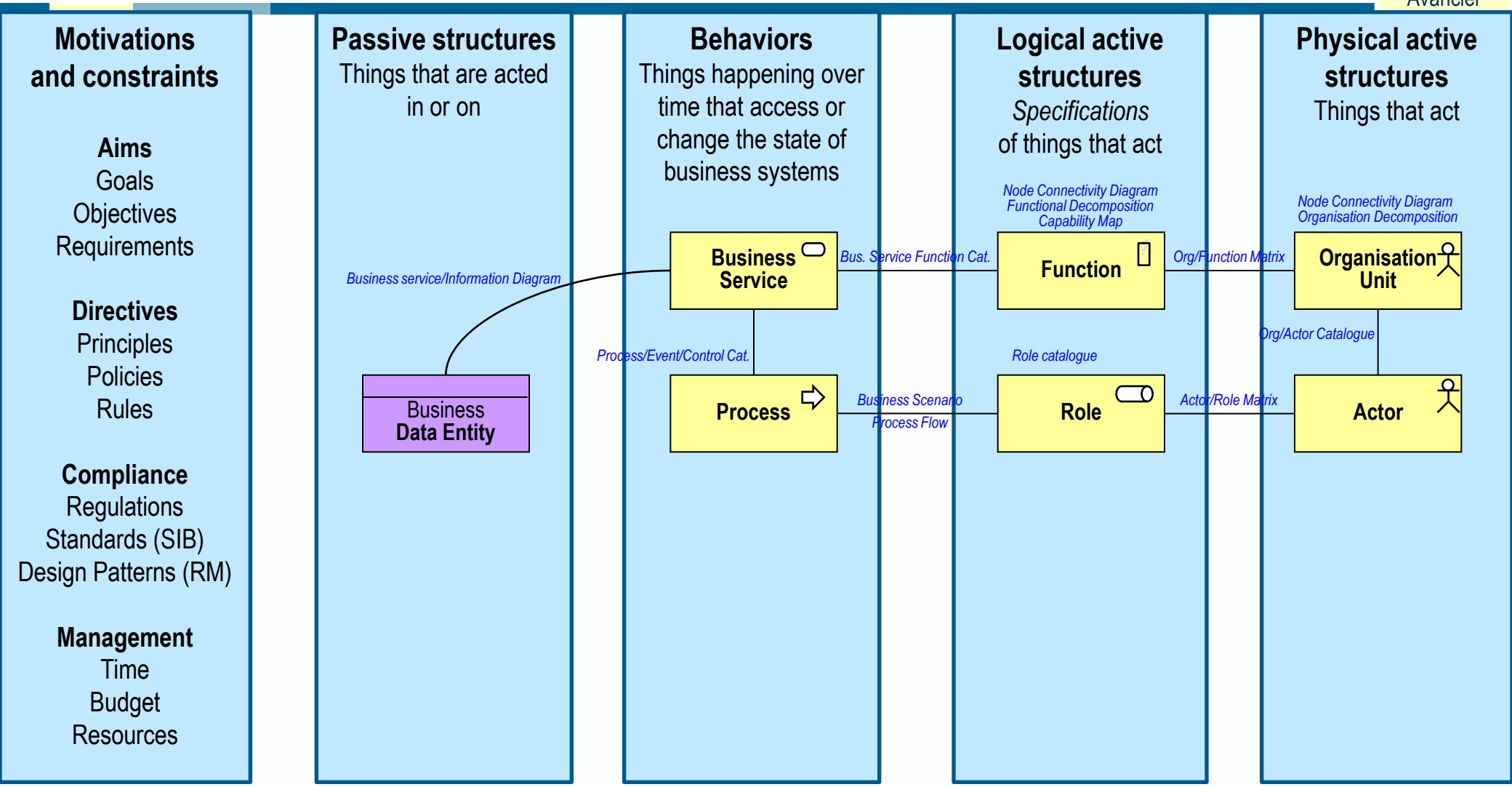
# TOGAF artifacts

## Using ArchiMate diagrams

# BUSINESS ARCHITECTURE

Avancier



# TOGAF says



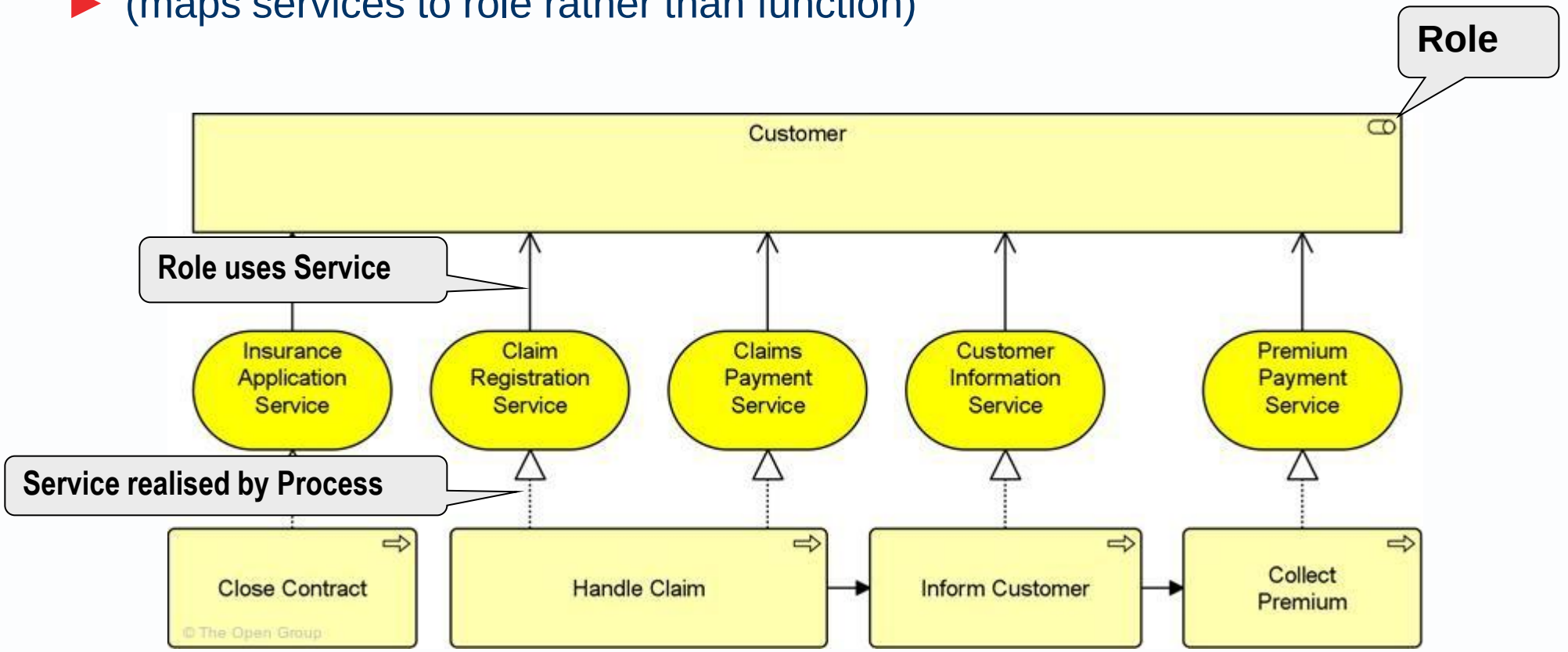
- **Business Service/Function Catalog**
- ... to provide a functional decomposition in a form that can be filtered, reported on, and queried, as a supplement to Diagrams. It can be used to
  - identify capabilities of an organization
  - understand the level that governance is applied to the functions of an organization.
  - identify new capabilities required to support business change
  - determine the scope of change initiatives, applications, or technology components.

| Function level 1 | Function level 2 | Business Service | Organisation Unit |
|---|---|---|---|
| | | | |
| | | | |

# Weak match in ArchiMate

Avancier

- **A service realisation view**
- (maps services to role rather than function)



# TOGAF says: Busines Scenario (cf. Value stream)

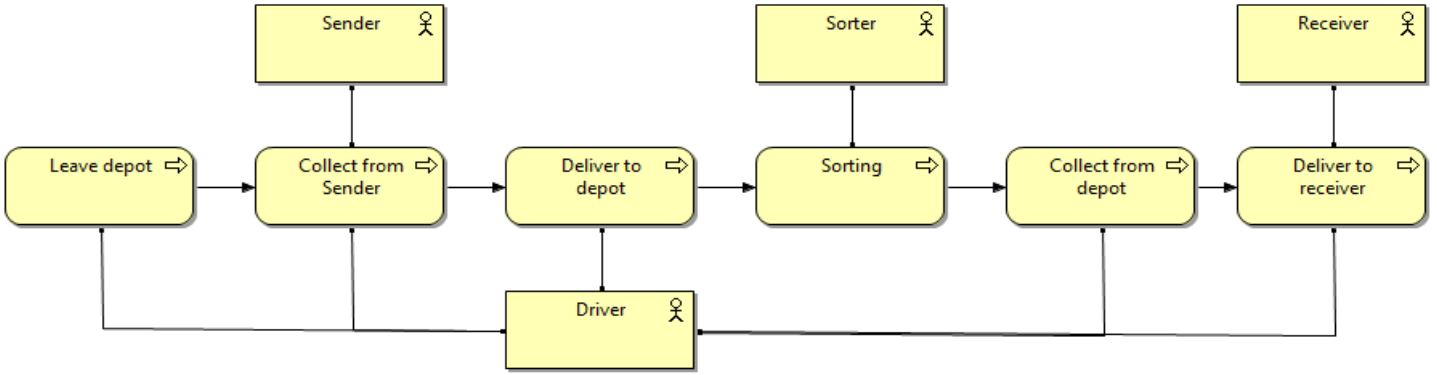


Documents the
the **roles** of
**human and computer actors** in a
**process** that leads to a
**business goal**

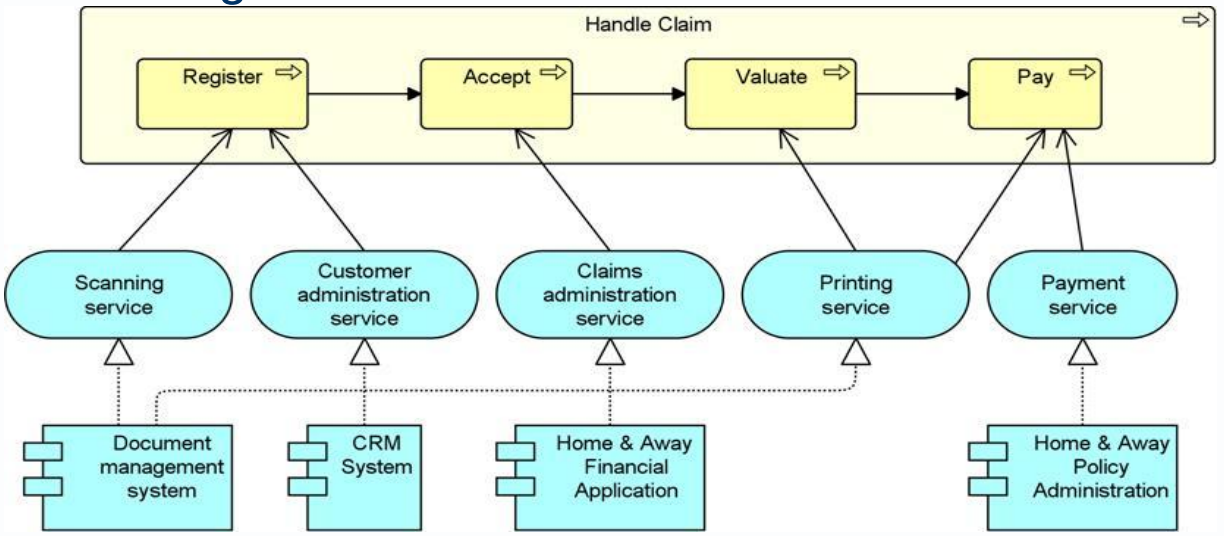
# Partial match in ArchiMate

Avancier

Imagine combining this scenario drawn by Pieter Van Ostaeyen




With this application usage view



# TOGAF says: Process Flow Diagram

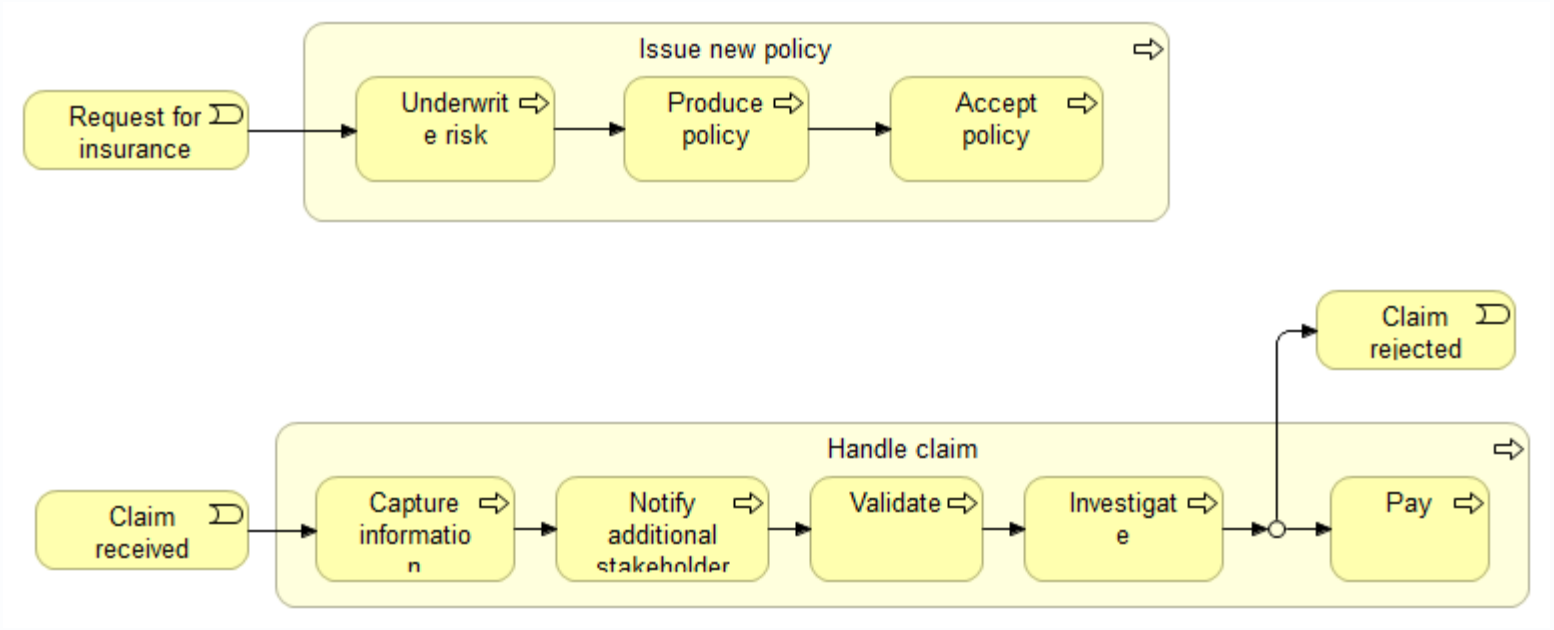


- ... to depict all models and mappings related to the process metamodel entity.
- … shows sequential flow of control between activities and may utilize swimlane techniques to represent ownership and realization of process steps.
- In addition to showing a sequence of activity, process flows can also be used to detail the controls that apply to a process, the events that trigger or result from completion of a process, and also the products that are generated from process execution.
- … useful in elaborating the architecture with subject specialists, as they allow the specialist to describe ‘‘how the job is done’’ for a particular function. .

# Partial match in ArchiMate



- Two process flow views

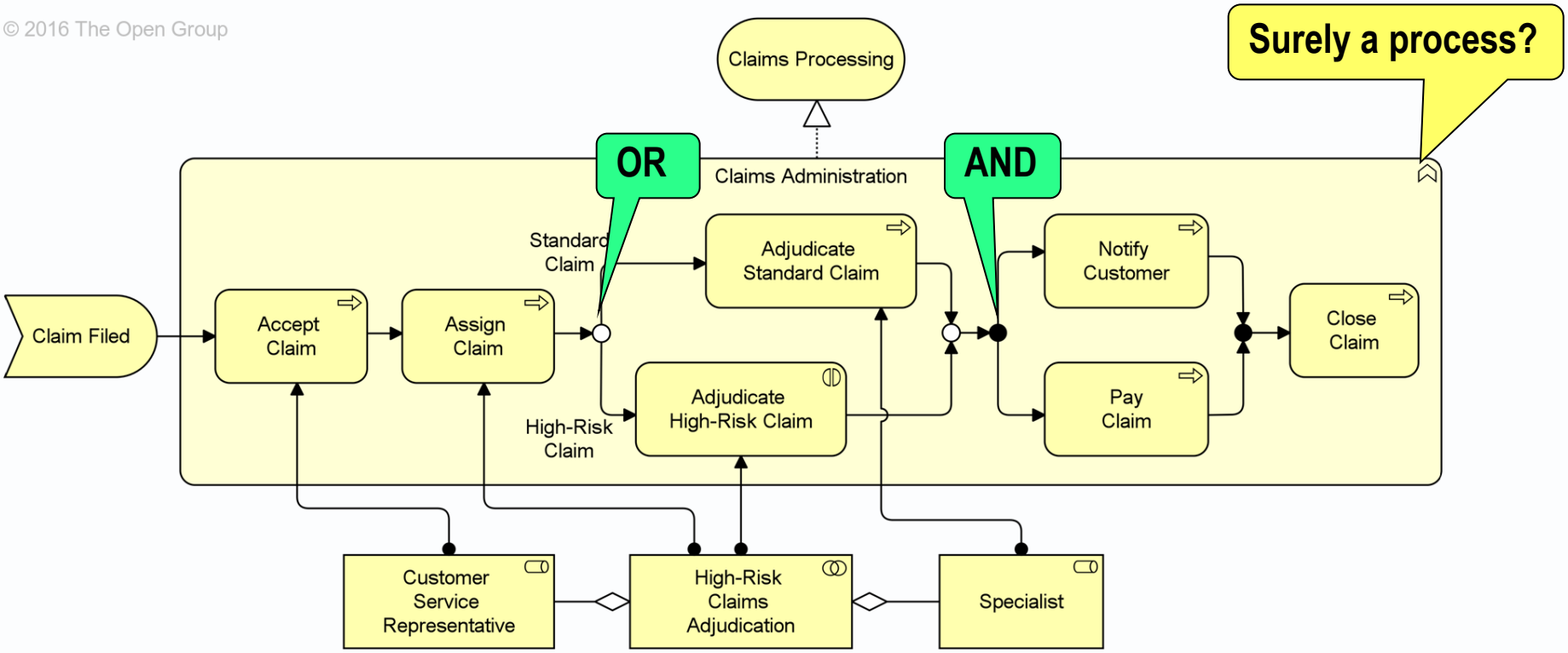


# Partial match in ArchiMate



- **A process flow view**
- (possible confusion of function with process)





# UML Activity Diagram



- The arrow means *transition* in UML, but *serves* in ArchiMate

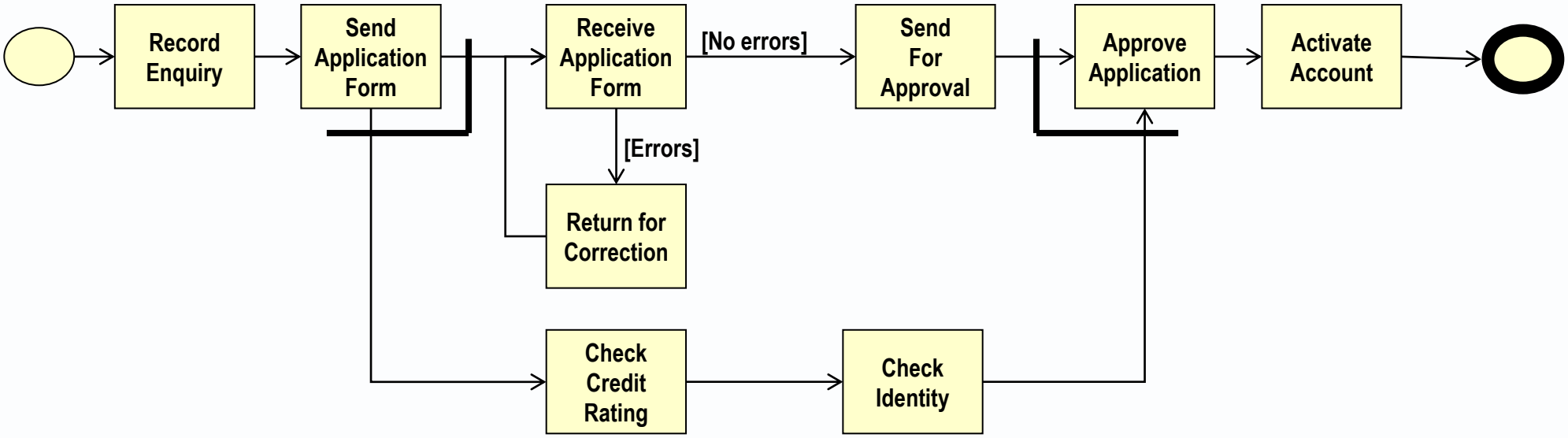
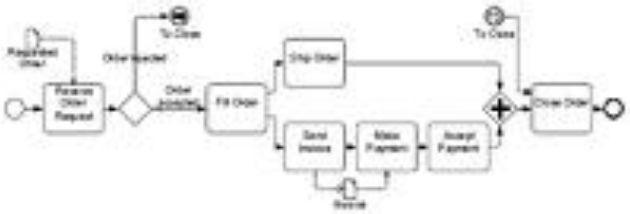


Diagram from
http://www.ariscommunity.com/users/roland-woldt/2011-01-28-learning-bpmn-2-which-models-are-available-bpmn

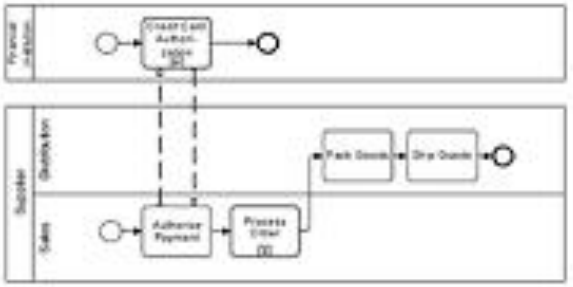
# BPMN offers 4 process model varieties

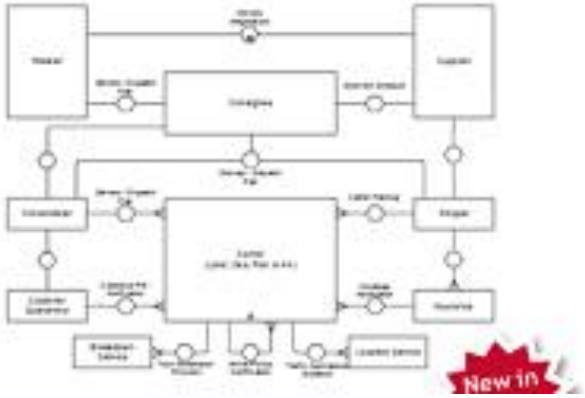
Avancier

**Process model: s**hows process elements under a logical control flow

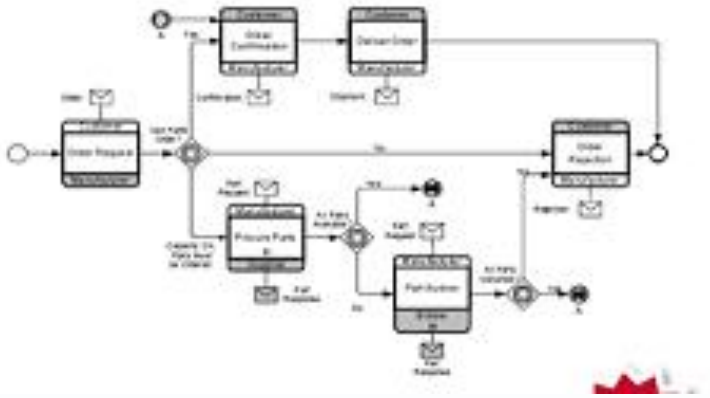


**Collaboration model:** shows inter-process interactions






**Conversation model**: shows data exchanged between “processes” (also systems, functions, roles or actors)



**Choreography model**: focus on inter-actor interactions and message flows

# TOGAF says: Process/Event/Control/Product Catalog



- … provides a hierarchy of processes, events that trigger processes, outputs from processes, and controls applied to the execution of processes.
- … provides a supplement to any Process Flow Diagrams and allows an enterprise to filter, report, and query across organizations and processes to identify scope, commonality, or impact.
- For example, an enterprise can see relationships of processes to sub-processes in order to identify the full chain of impacts resulting from changing a high-level process.

| Process | Process | Process | Input event | Output product | Control |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

# ArchiMate???

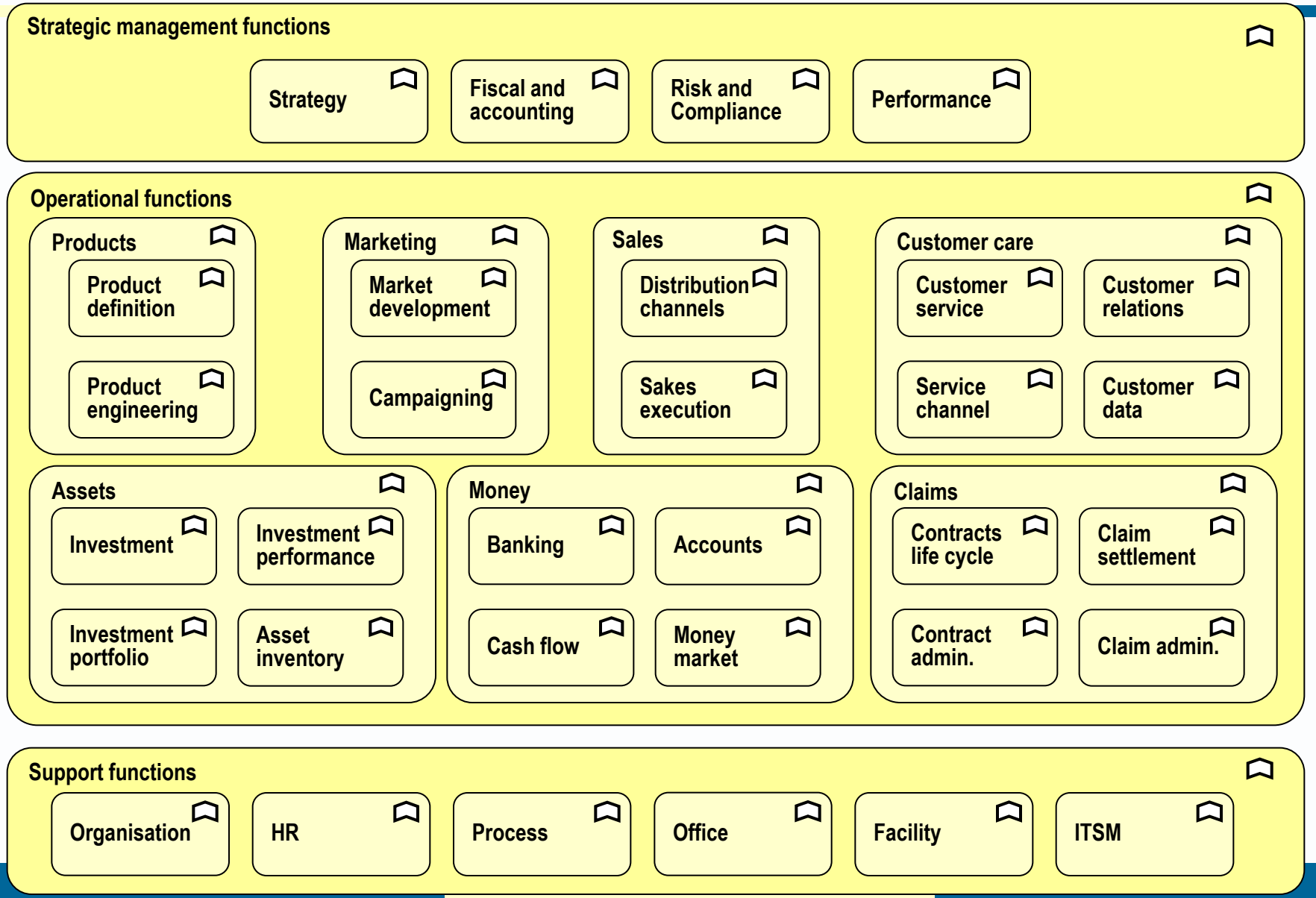
# TOGAF says: Functional Decomposition Diagram



- ... to show on a single page the capabilities of an organization that are relevant to the consideration of an architecture.
- By examining the capabilities of an organization from a functional perspective, it is possible to quickly develop models of what the organization does without being dragged into extended debate on how the organization does it.
- Once a basic Diagram has been developed, it becomes possible to layer **heat-maps** on top of this Diagram to show scope and decisions. For example, the capabilities to be implemented in different phases of a change program.

# Good match in ArchiMate

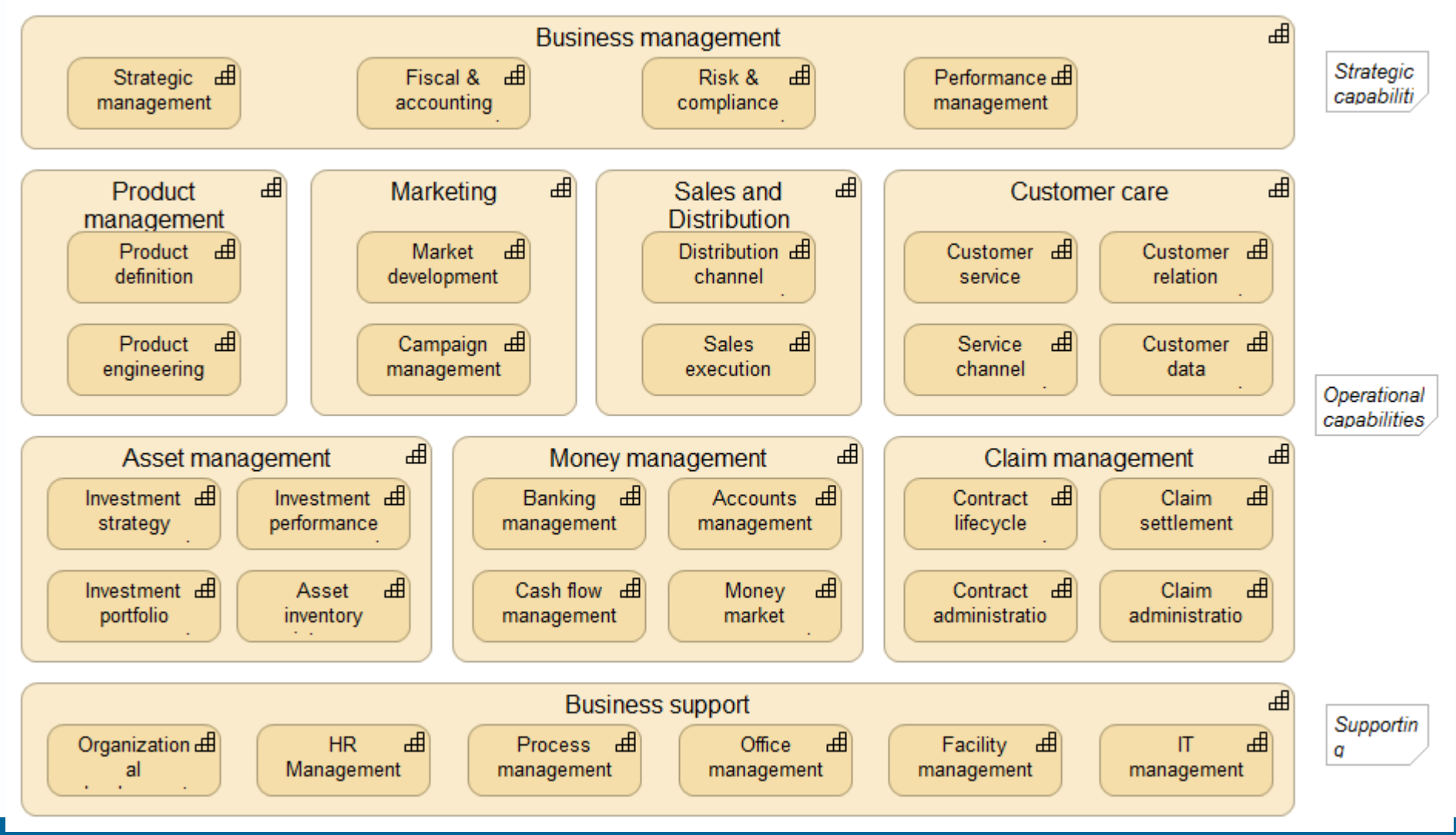
A strict (non-redundant) hierarchy.



# More fashionable (aargh!) match in ArchiMate

Avancier

- Capability map



# Note that Functions group activities in Processes

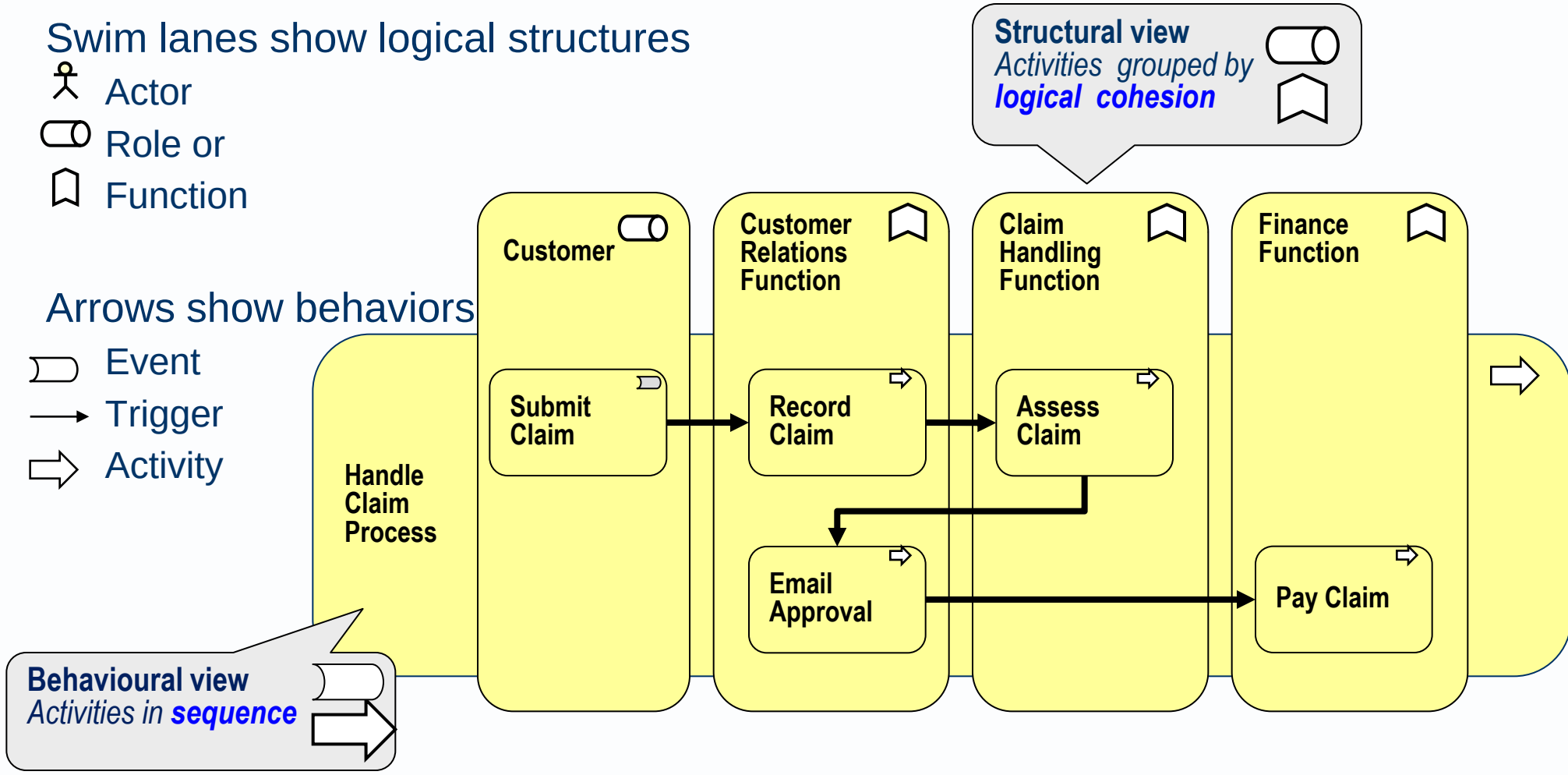
Avancier

Swim lanes show logical structures

- Actor
- Role or
- Function

Arrows show behaviors

- Event
- Trigger
- Activity



# TOGAF says: Structured Analysis:

Avancier

- "Identifies the key business functions within the scope of the architecture, and maps those functions onto the organizational units within the business."

| Organisation Function | Marketing | Sales | Delivery |
|---|---|---|---|
| Marketing | Activity | | |
| Sales | | Activity | |
| Delivery | | | Activity |

- Might reveal a
- "Functional organisation"

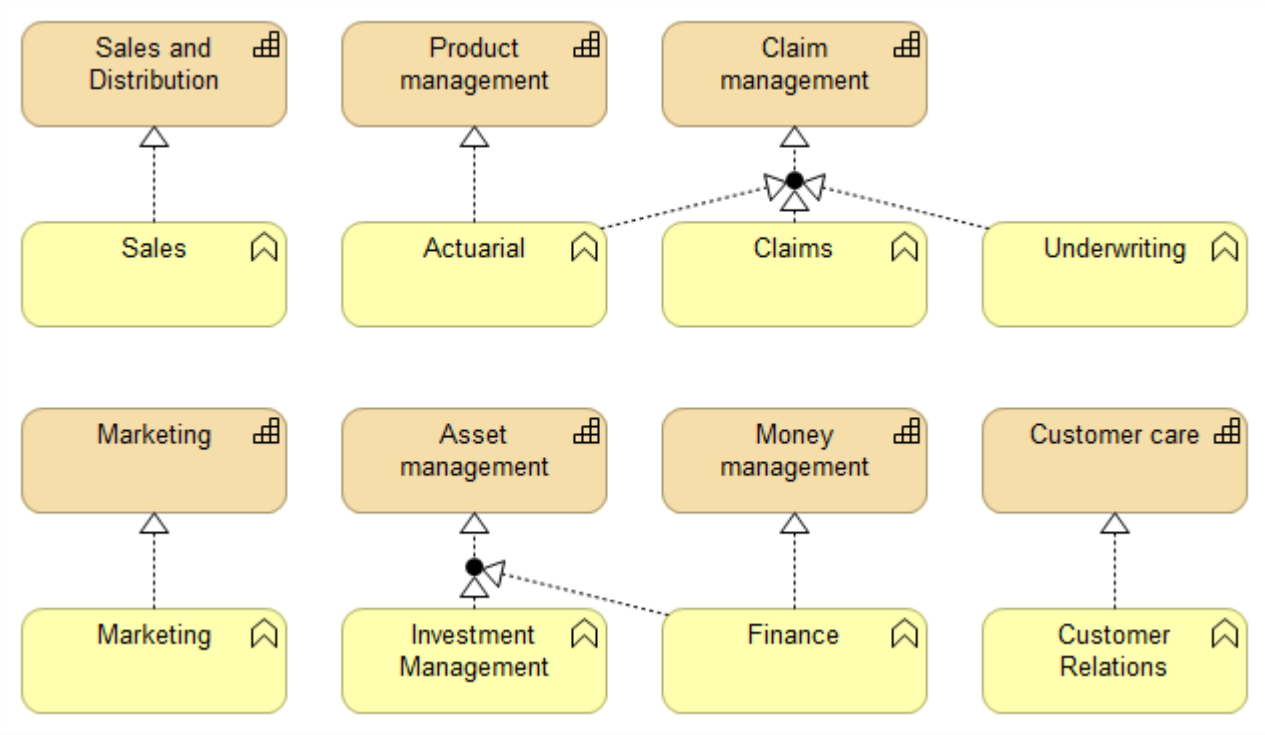
- Or else a different (say
- product-oriented) organisation

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

# Weak match in ArchiMate



- A Capability realization  view
- (In TOGAF organisation units realise functions/capabilities)



# TOGAF says: Organization Decomposition Diagram

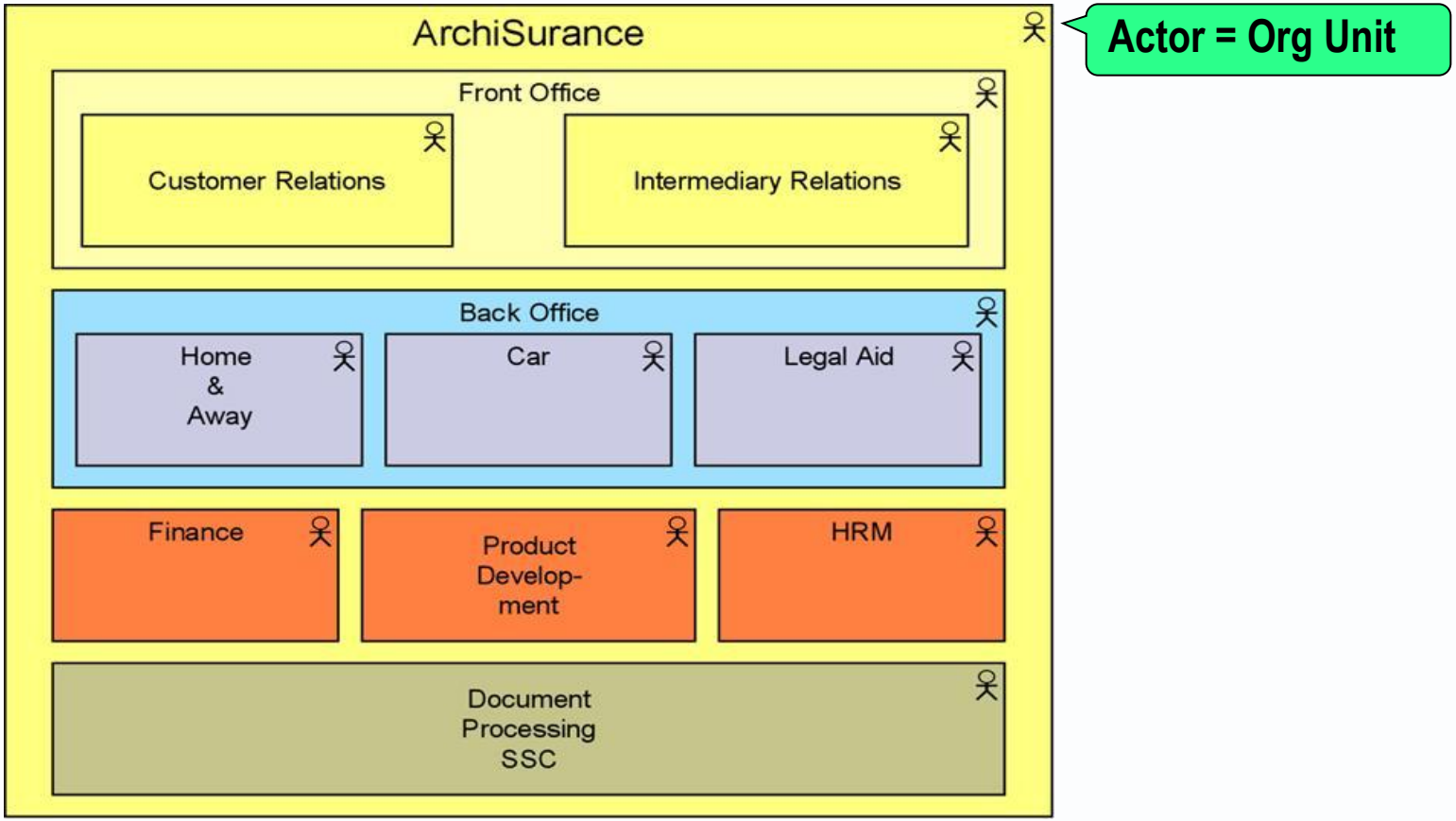


- … describes the links between actor, roles, and location within an organization tree.
- An organization map should provide a chain of command of owners and decision-makers in the organization.
- Although it is not the intent to link goal to organization, it should be possible to intuitively link the goals to the stakeholders from the diagram.

# Reasonable match in ArchiMate



- An organisation view



# TOGAF says: Organization/Actor Catalog



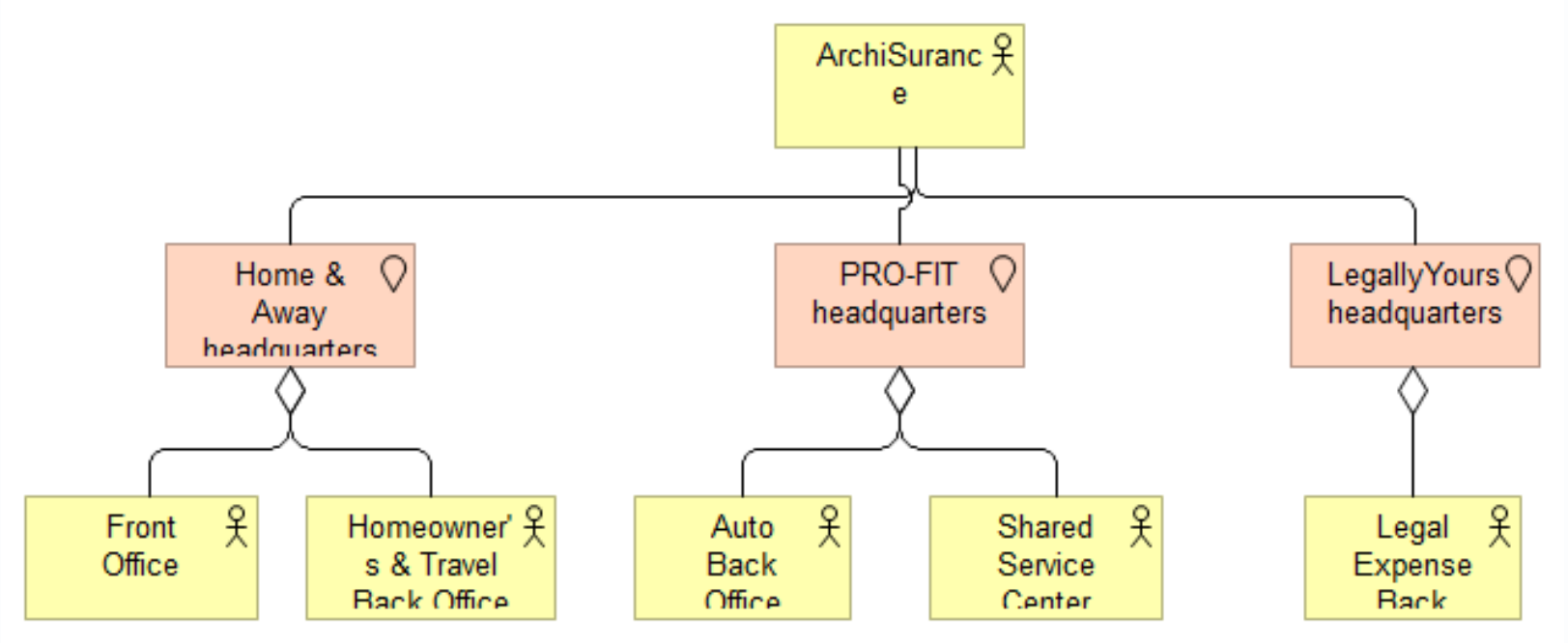
- ... to capture a definitive listing of all participants that interact with IT, including users and owners of IT systems.
- The catalog can be referenced when developing requirements in order to test for completeness.
- For example, requirements for an application that services customers can be tested for completeness by verifying exactly which customer types need to be supported and whether there are any particular requirements or restrictions for user types.

| Org level 1 | Org level 2 | Org level 3 | Location | Actor |
|---|---|---|---|---|
| | | | | |
| | | | | |

# Reasonable match in ArchiMate



- Though there may be some conflation of, or confusion between, organisation unit and location



# TOGAF says: The Node Connectivity Diagram

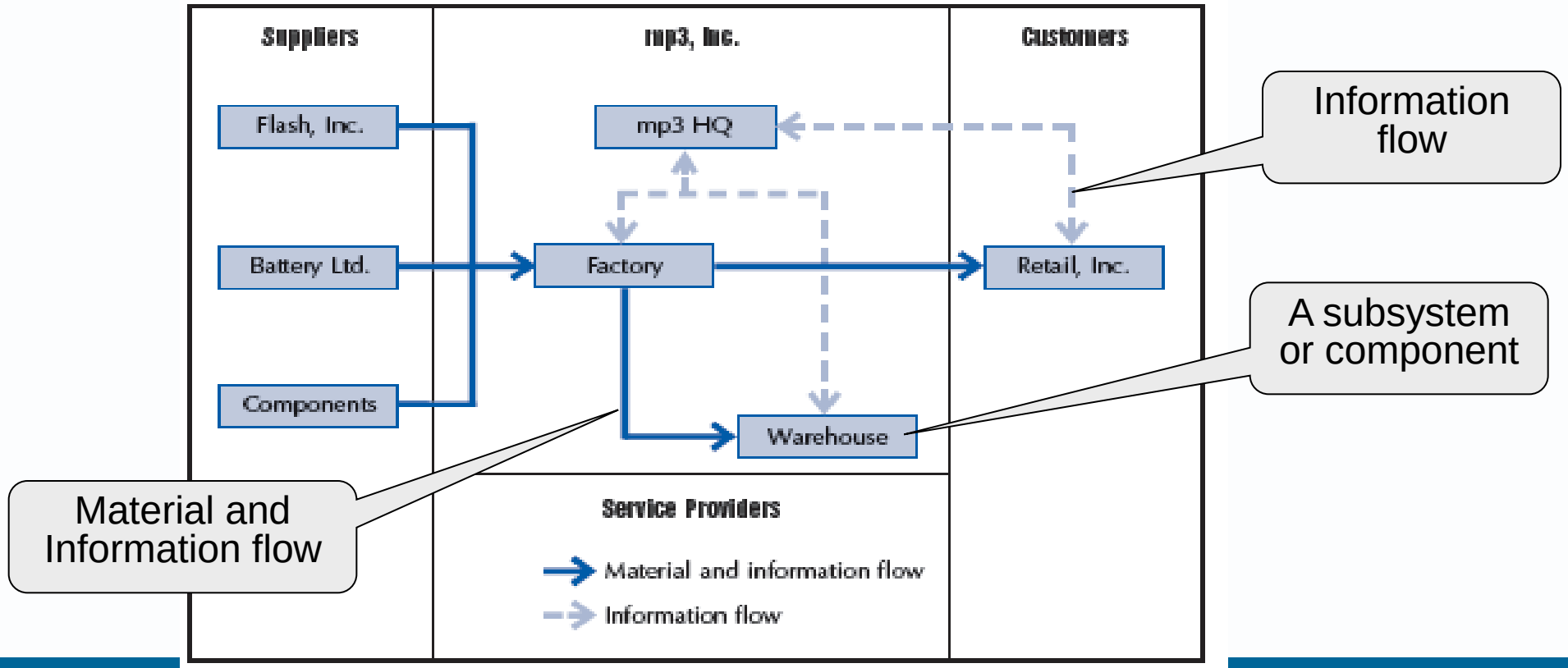


- describes the business locations (nodes), the ‘‘needlines’’ between them, and the characteristics of the information exchanged.
- can be described at three levels: conceptual, logical, and physical.
- Each needline indicates the need for some kind of information transfer between the two connected nodes.
- A node can represent a role (e.g., a CIO), an organizational unit, a business location or facility, and so on.
- An arrow indicating the direction of information flow is annotated to describe the characteristics of the data or information — for example, its content, media, security or classification level, timeliness, and requirements for information system interoperability.

# Node connectivity Diagram: SCOR technique

Avancier

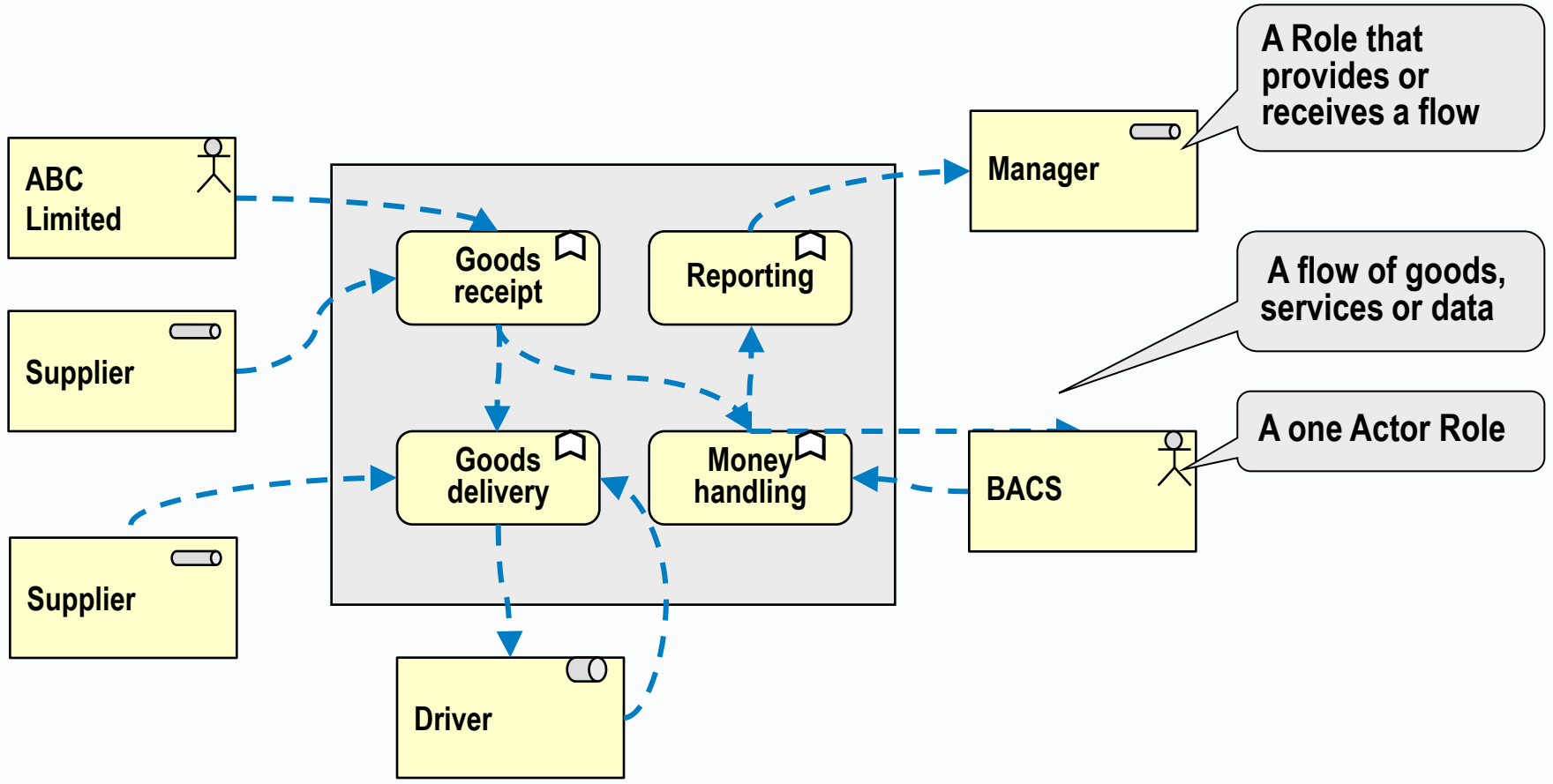
1. Identify your customers
2. Identify your suppliers
3. Identify the key nodes (logical or physical entities in the supply chain)
4. Link nodes - differentiating material and information flows.



# Node Connectivity Diagram drawn using ArchiMate notation

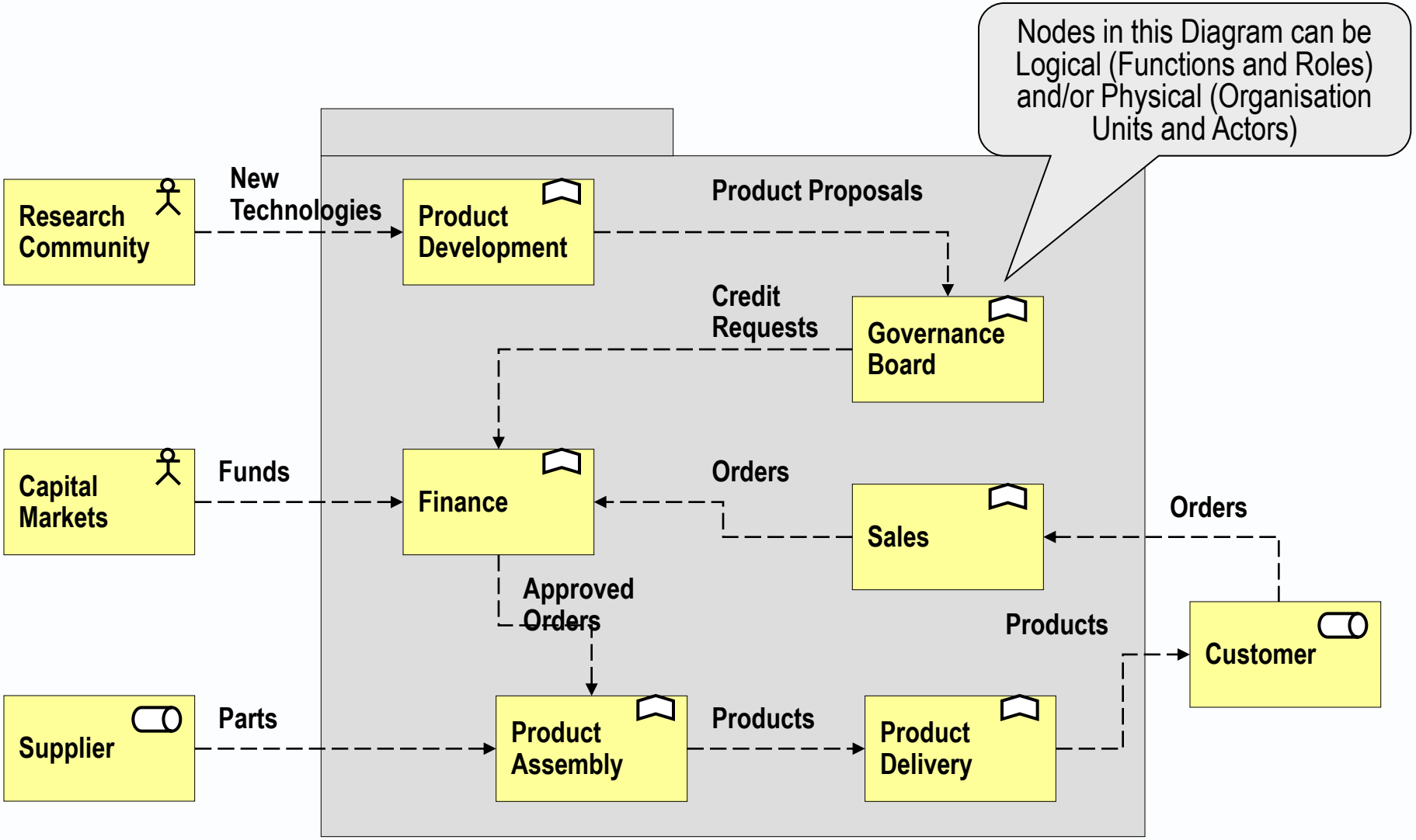


- Shows services offered by components to external entities and to each other



# Node Connectivity Diagram drawn using ArchiMate notation

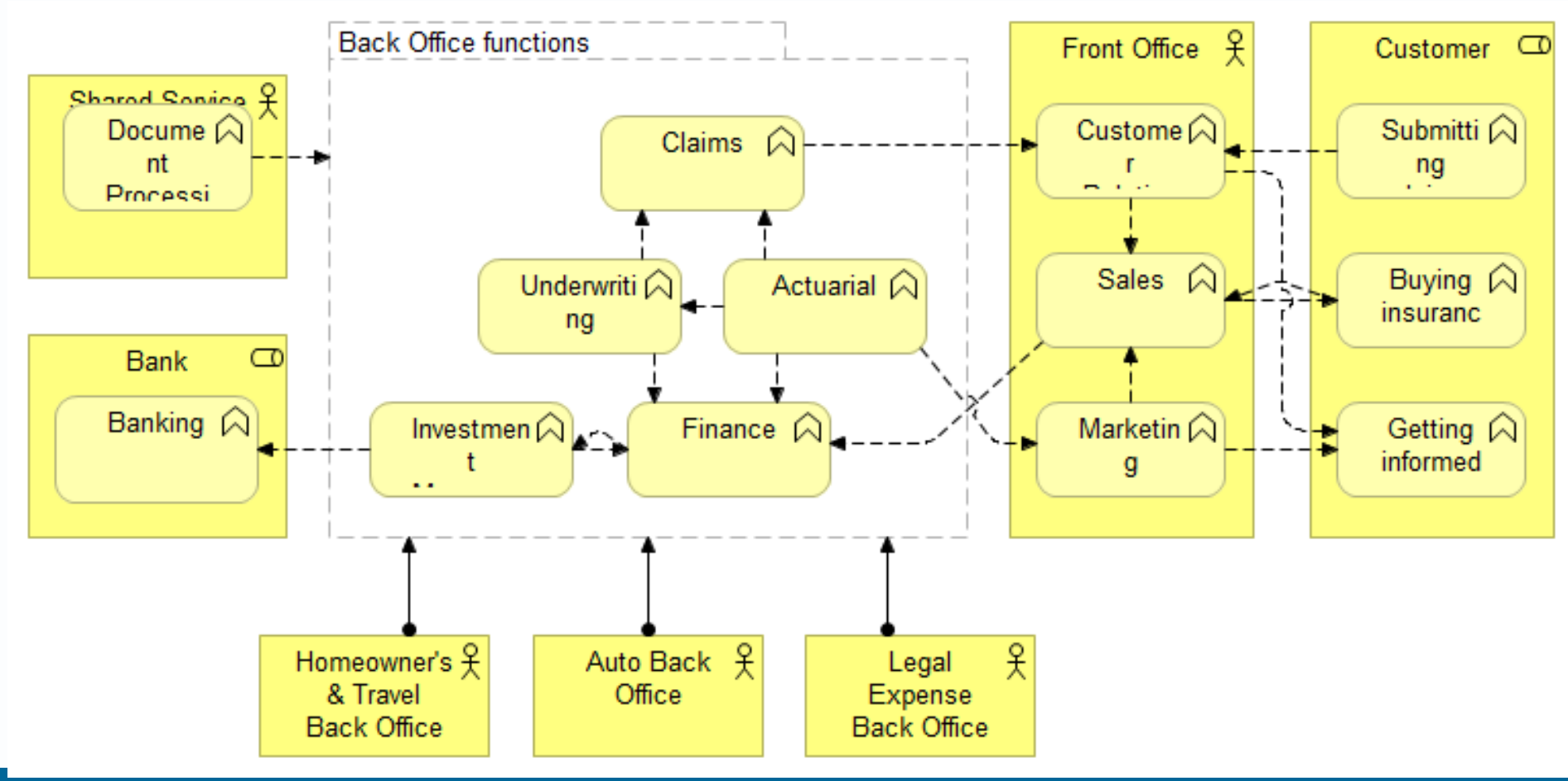
Avancier



# Reasonable match in ArchiMate

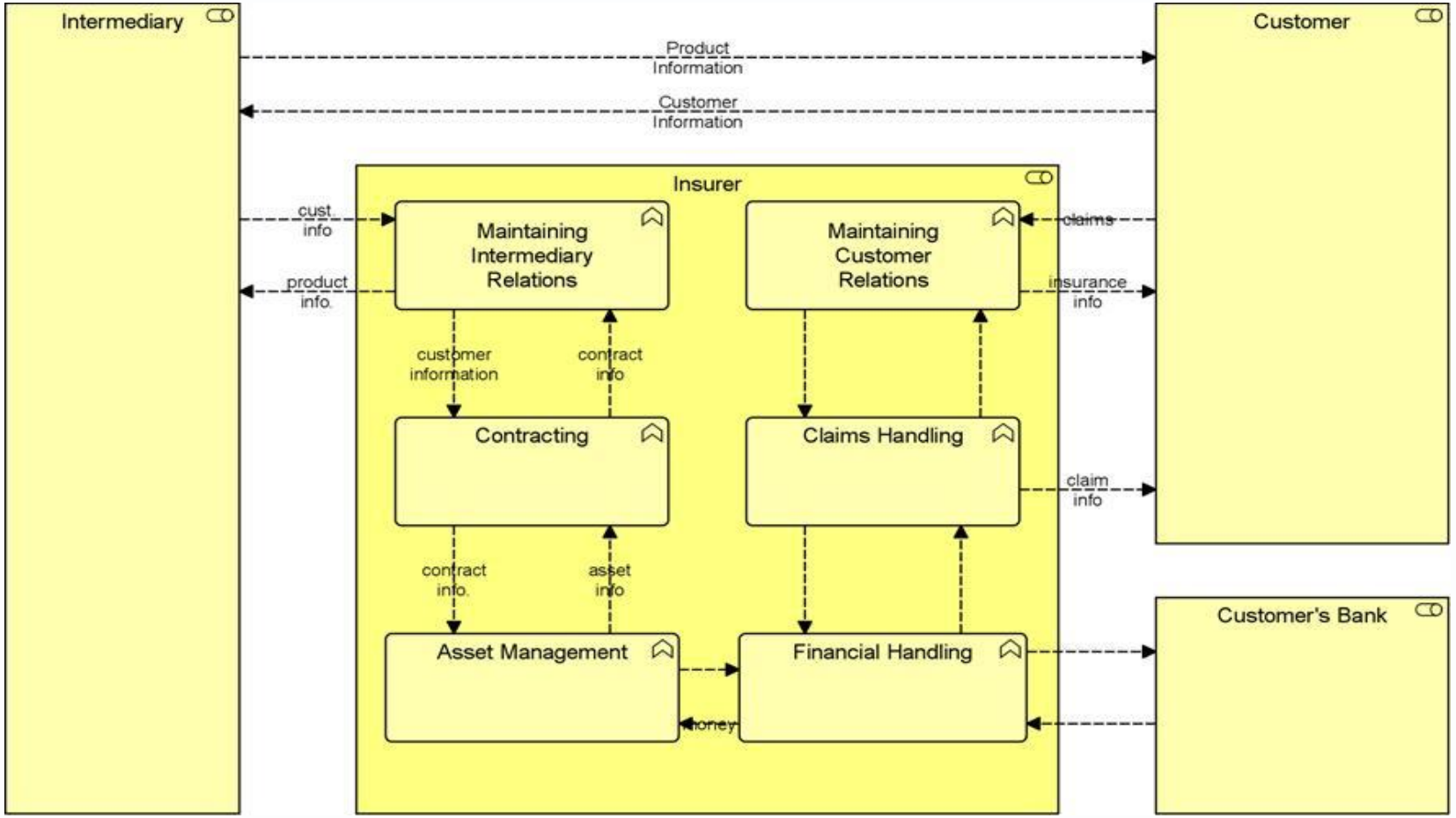
Avancier

- Nodes are logical Functions



# Reasonable match in ArchiMate

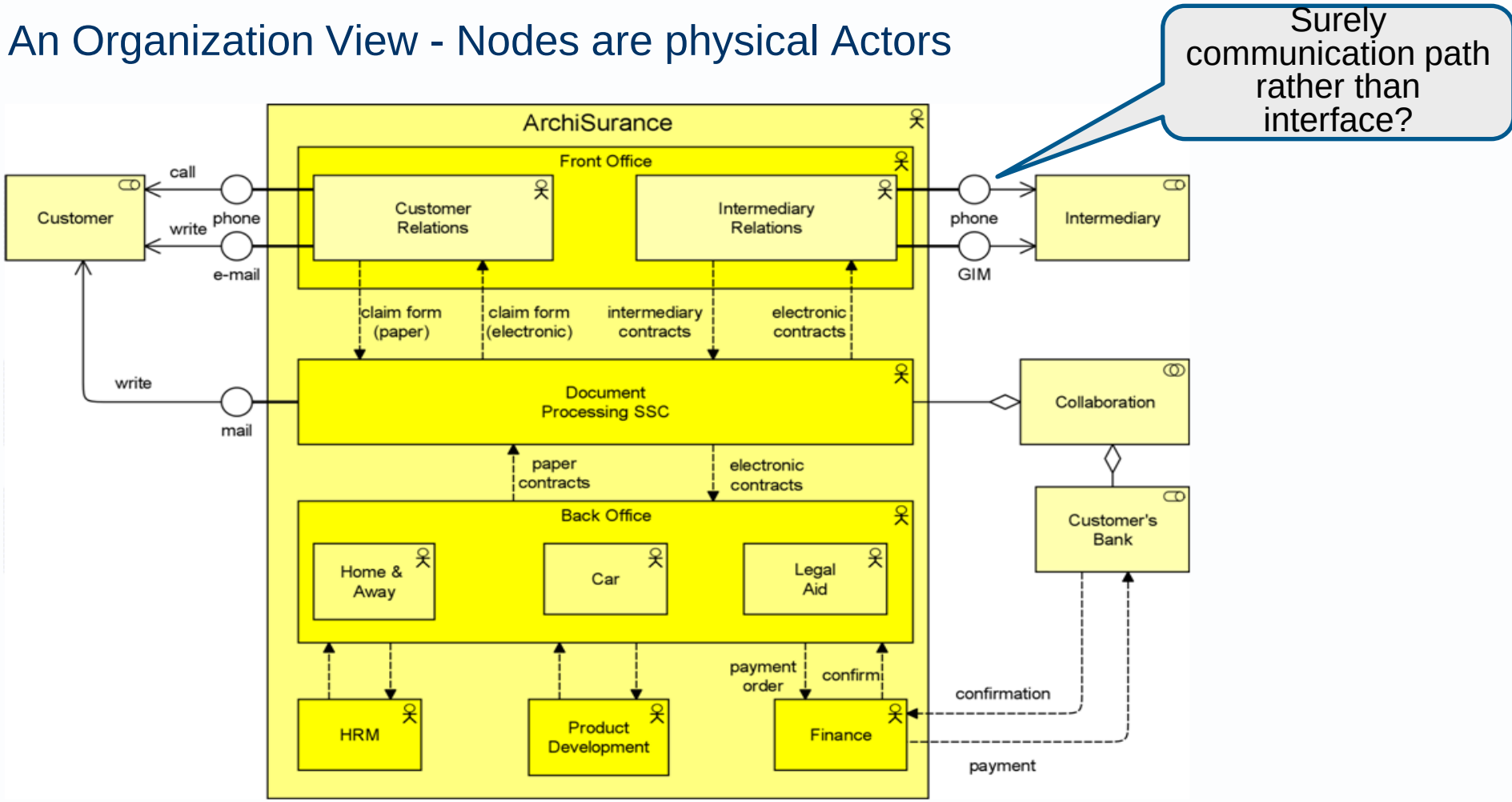
Avancier



# Reasonable match in ArchiMate

Avancier

- An Organization View - Nodes are physical Actors



# TOGAF says: Actor/Role Matrix



- … to show which actors perform which roles, supporting definition of security and skills requirements.
- Understanding Actor-to-Role relationships is a key supporting tool in definition of training needs, user security settings, and organizational change management.

| Role / Actor | A | B | C |
|---|---|---|---|
| P | Performs | Performs | |
| Q | | Performs | Performs |

# Reasonable match in ArchiMate

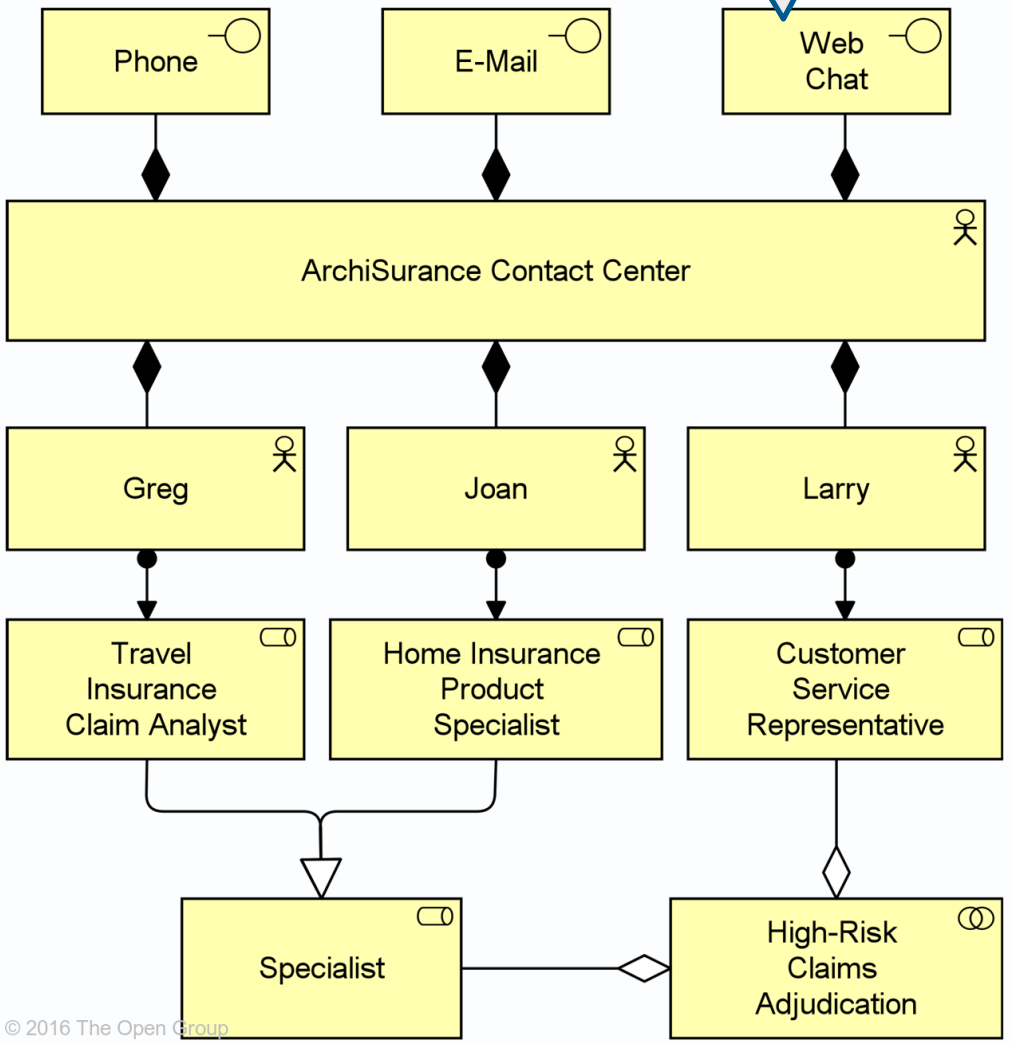
Avancier

Surely communication path rather than interface?

Organization unit

Actor

Role



# TOGAF says: Business Service/Information Diagram

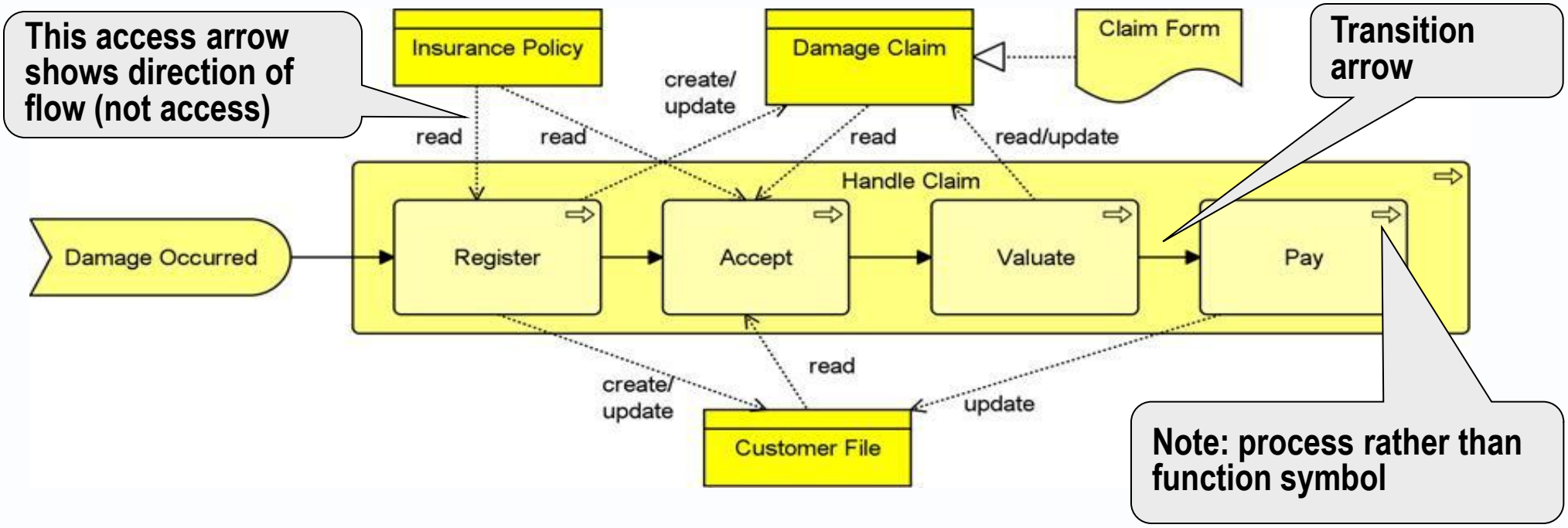


- … shows the information needed to support one or more business services.
- … shows what data is consumed by or produced by a business service and may also show the source of information.
- … shows an initial representation of the information present within the architecture and therefore forms a basis for elaboration and refinement within Phase C (Data Architecture).

| Information needed | Customer account | Sender address | Receiver address | Depot address | Package description | Package status | Journey route |
|---|---|---|---|---|---|---|---|
| **Business services** | | | | | | | |
| Order delivery | Use | Create | Create | Use | Create | Initialise | |
| Collect from sender | | Use | Use | Use | Use | Update | Use |
| Deliver to depot | | | | | Use | Update | |
| Sort in depot | | | Use | | | Update | |
| Collect from depot | | | | | | Update | Use |
| Deliver to receiver | | | | | | Update | |

# Partial match in ArchiMate

- **A Business Process View**
- Maps to the process that delivers a service, rather than the service



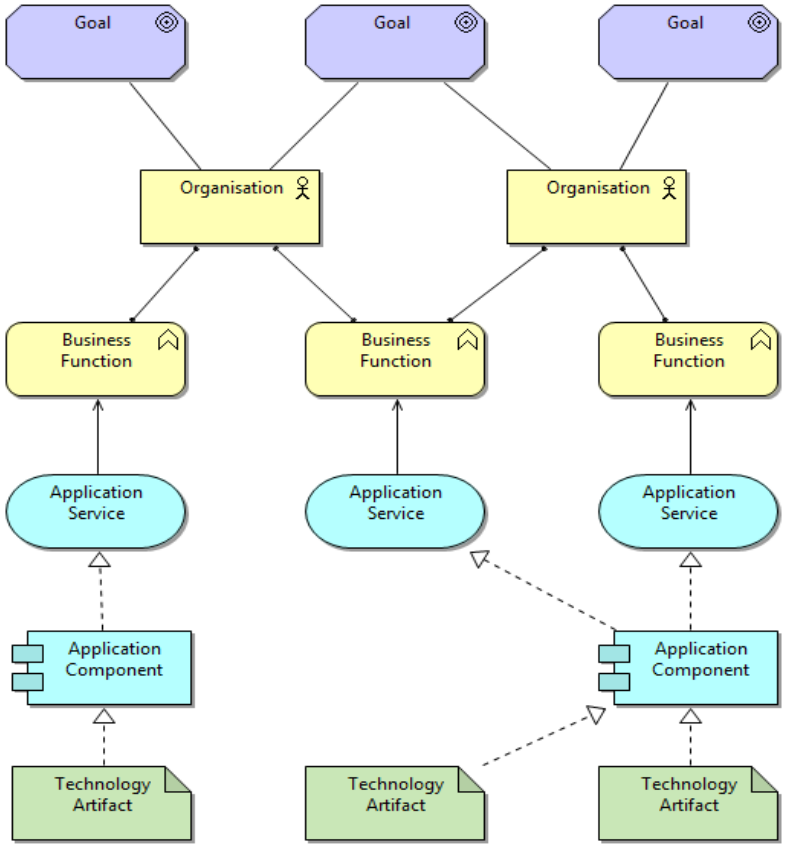
# TOGAF says: Business Footprint Diagram

Avancier

- describes the links between business goals, organizational units, business functions, and services,
- maps these functions to the technical components delivering the required capability.

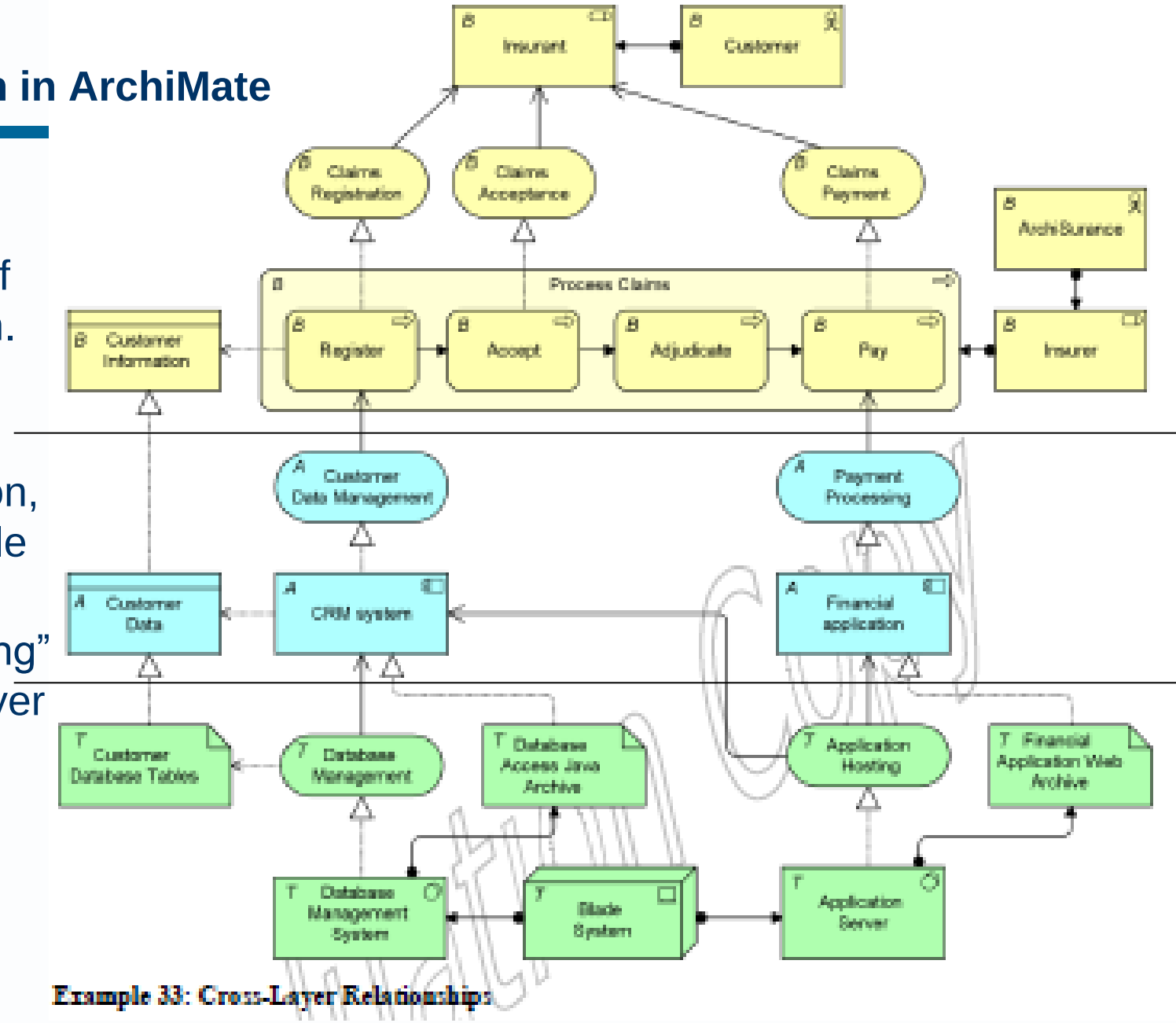
- provides a clear traceability between a technical component and the business goal that it satisfies
- demonstrates ownership of the services identified.

- demonstrates only the key facts linking organization unit functions to delivery services and is utilized as a communication platform for senior-level (CxO) stakeholders.



# Reasonable match in ArchiMate

- **Layered viewpoint**
- Layers and aspects of an EA in one diagram.
- Dedicated layers: technology, application, process, and actor/role layers
- Service layers: “serving” the next dedicated layer
- This example is not intended to be prescriptive.




Example 33: Cross-Layer Relationships

# Functional Decomposition diagram in BPMN style



- Top-level functions shown as “groups”
- Sub-functions shown as collapsed processes “pools”

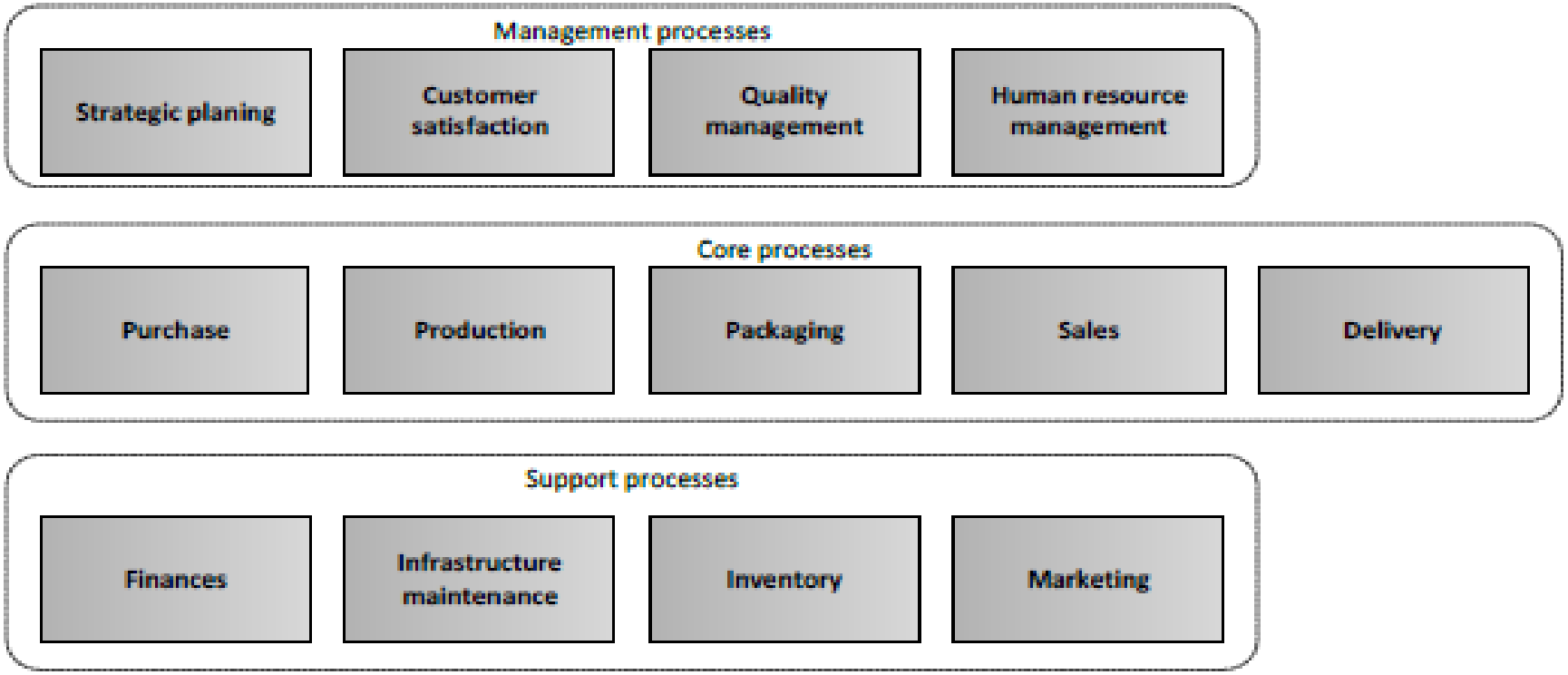



*Figure 4: BPMN based “process landscape”*

# TOGAF says: Business Use-Case diagram

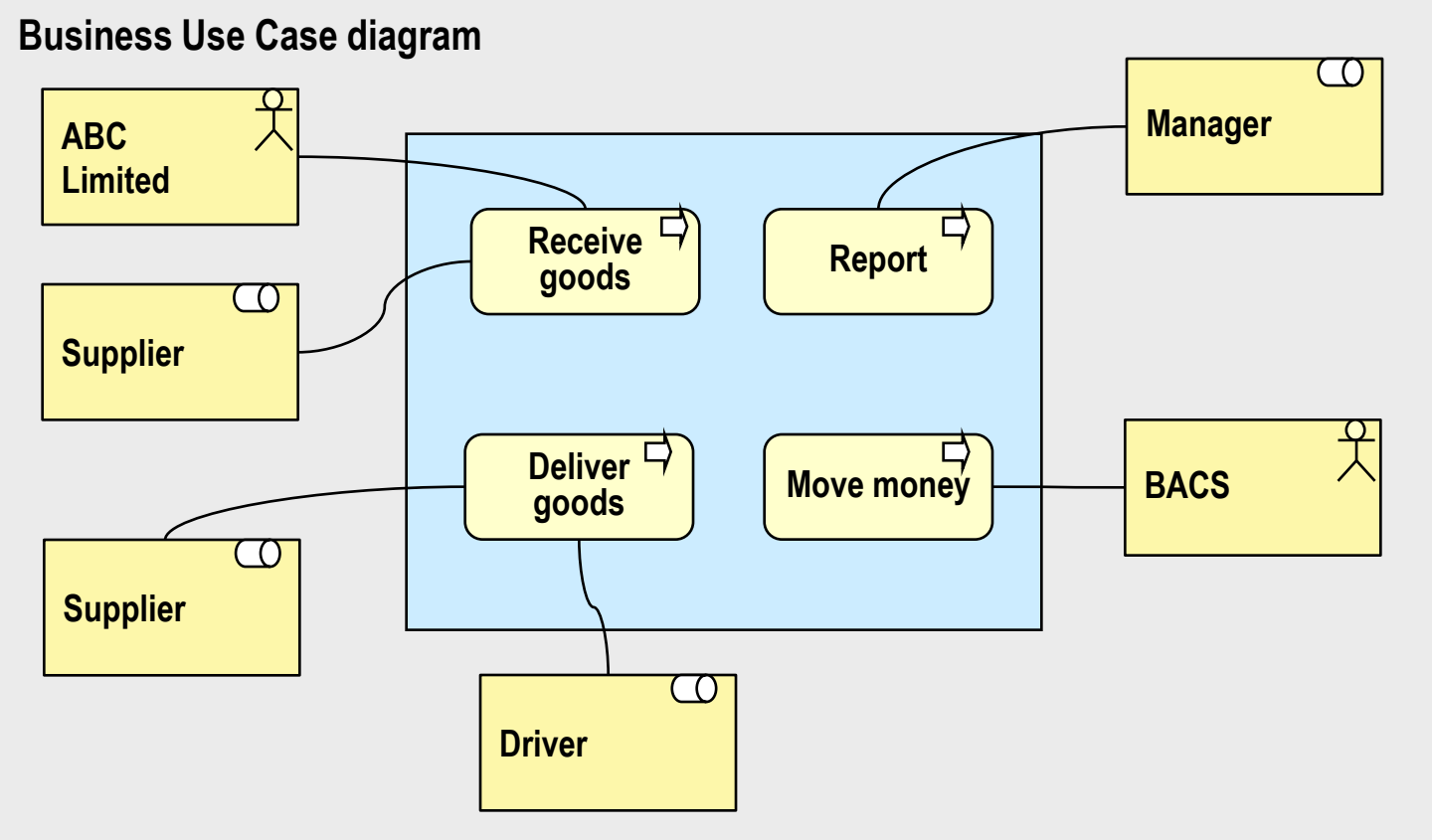
Avancier

- displays the relationships between consumers and providers of business services.
- Business services are consumed by actors or other business services
- The diagram provides added richness in describing business capability by illustrating how and when that capability is used.
- to help to describe and validate the interaction between actors and their roles to processes and functions.
- As architecture progresses, use-cases can evolve from the business level to include data, application, and technology details.
- Architectural business use-cases can also be re-used in systems design work.

# Business Use Case diagram: illustration



- What uses do external entities make of a business?
- What processes are executed in the scope of a business?



# TOGAF says: Events Diagram

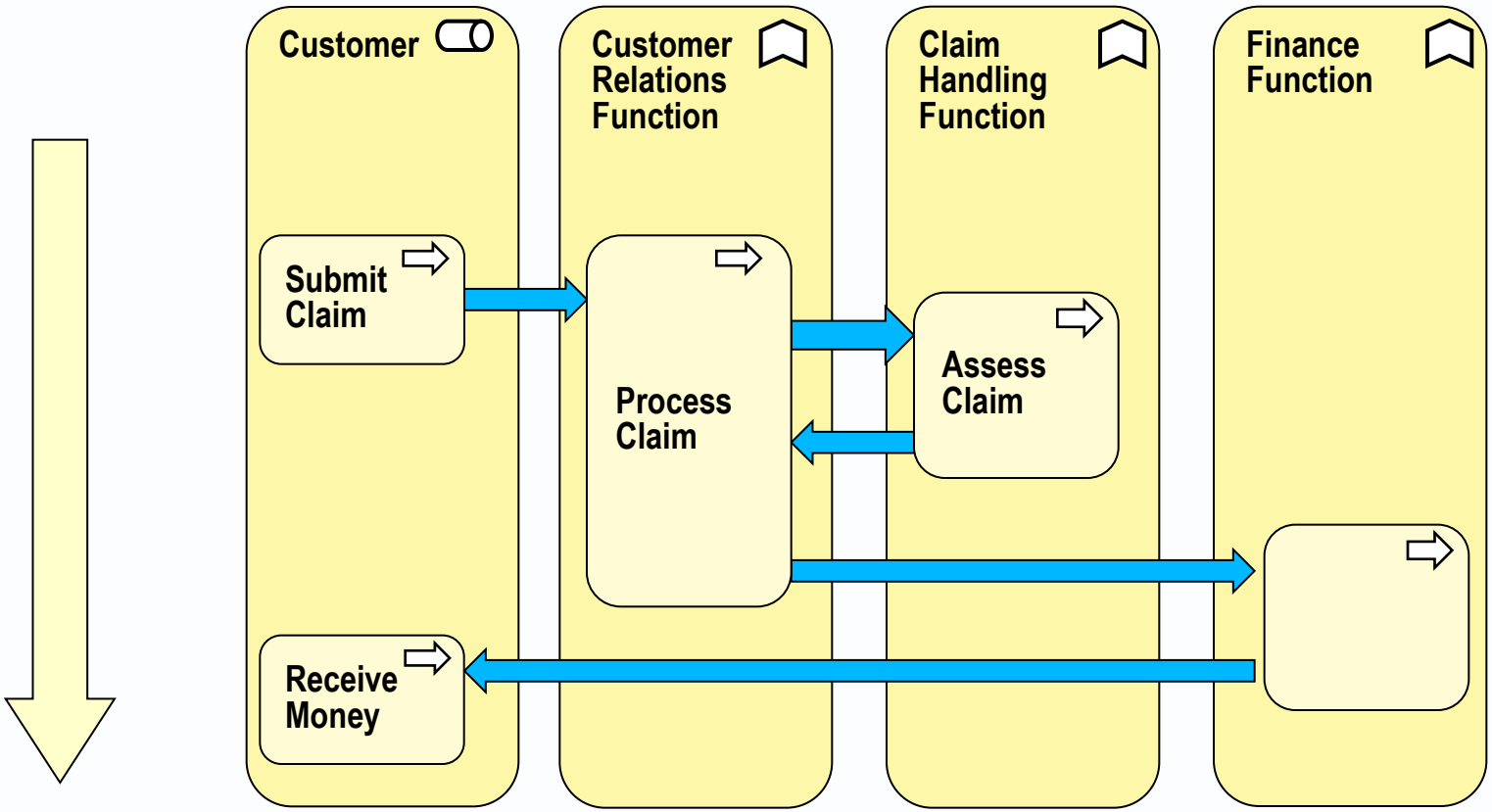


- To depict the relationship between events and process.
- Events [represent]
  - Arrival [capture] of information
    - (e.g., customer submits sales order)
  - Points in time
    - (e.g., end of fiscal quarter)
- Events cause work and actions need to be under taken within the business.
- Events are considered as triggers for a process.
- It is important to note that the event has to trigger a process and generate a business response or result.

# Event diagram dawn as sequence diagram



- Shows how each role of function may trigger a process carried out by another



# TOGAF says: Role catalog



- can list both roles and the activities expected of each role.
- A role is a group of *activities* that is performable by one or more actors, by virtue of the *abilities* required.

# On the Actor v Role confusion



- UML, Actor = Roles
- TOGAF, Actor is an entity (an individual) that plays a Role
  - (though this is obscured in the text and the meta model).
- As you may realise
  - *a* Client is an individual, whereas “Client” is a type;
  - *an* Insurant is a Client
  - the “Insurant” role is a subtype of the “Client” role.
- ArchiMate appears to align with TOGAF, but some example ArchiMate diagrams suggest Actor is *a subtype* of Role. E.g.
  - "Client" is an Actor
  - "Insurant" is a Role.

# A Data entity / Business function matrix

- The North West corner method sorts the rows and columns of a matrix
- by clustering them on a shared cell entry, such as “create”.

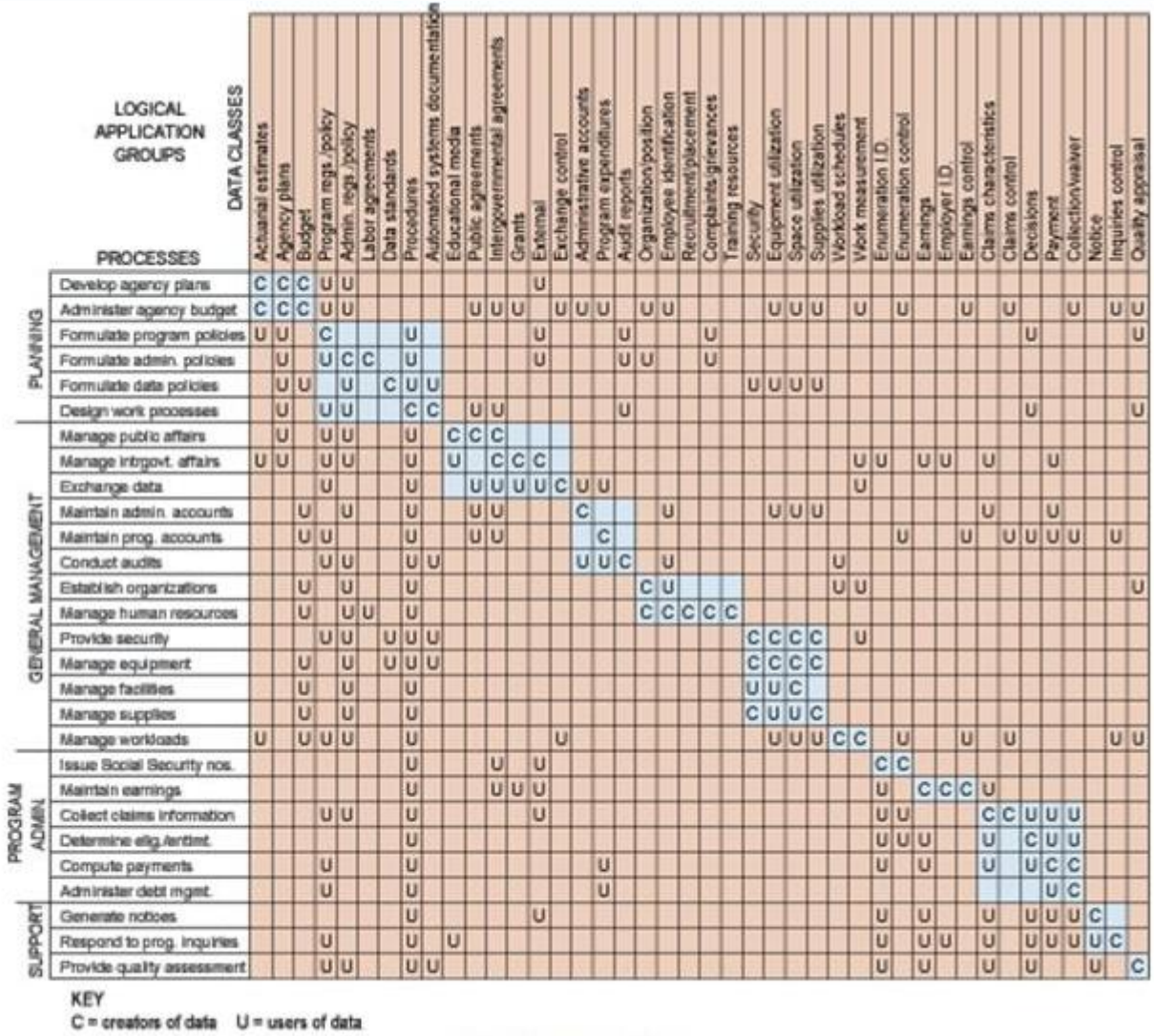


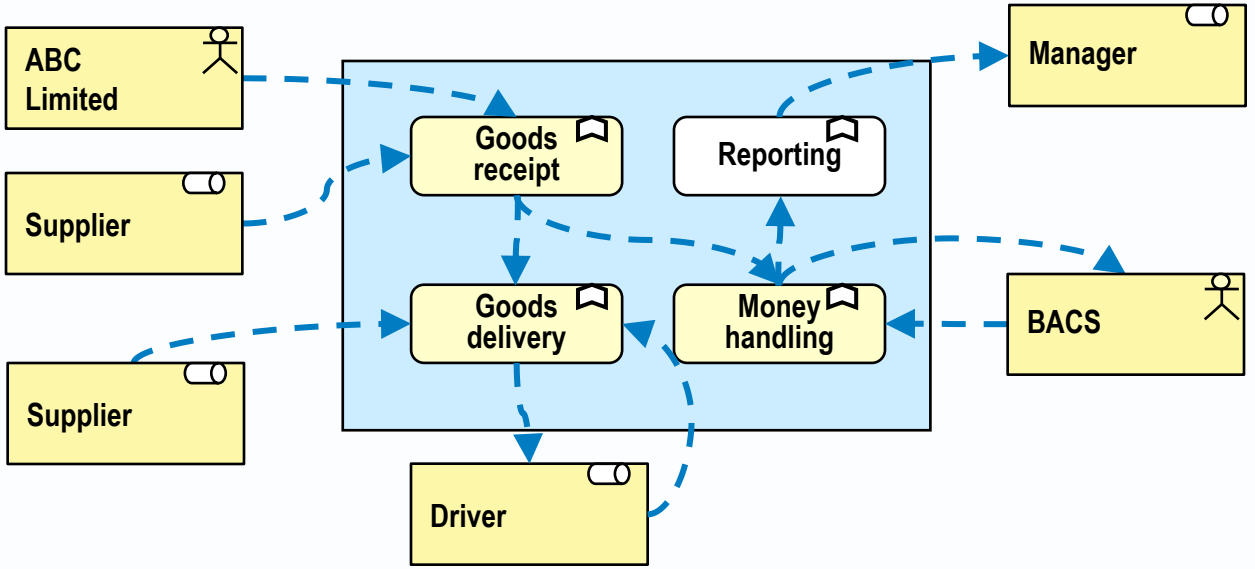



Figure 12-1

# TOGAF says: Information Exchange matrix



- identifies who exchanges what information with whom, why the information is necessary, and in what manner.
- It documents the information exchange requirements between three basic entities (activities, business nodes and their elements, and information flow).
- It focus on characteristics of the information exchange, such as performance and security.



# TOGAF says: Product Lifecycle Diagram

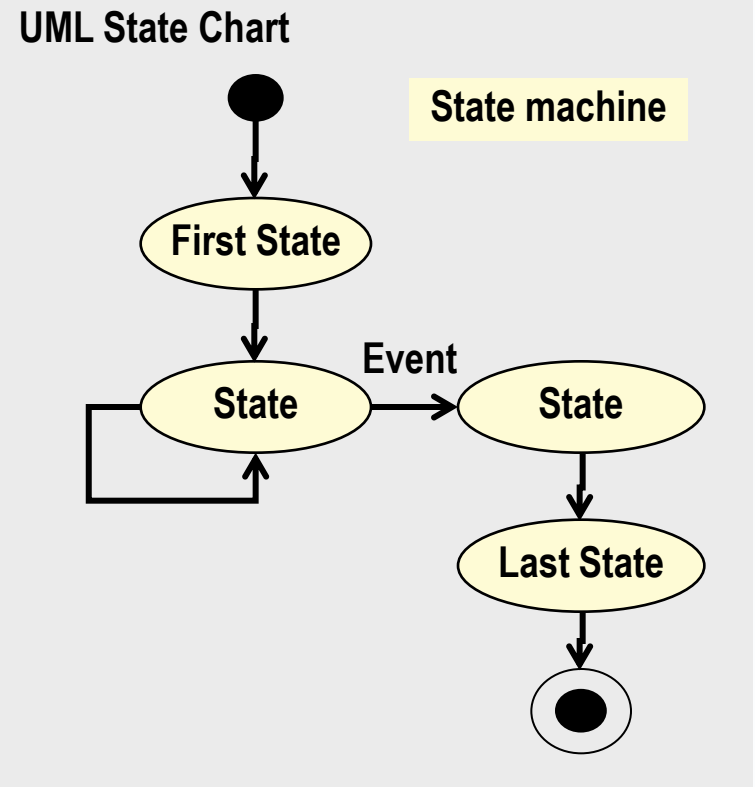


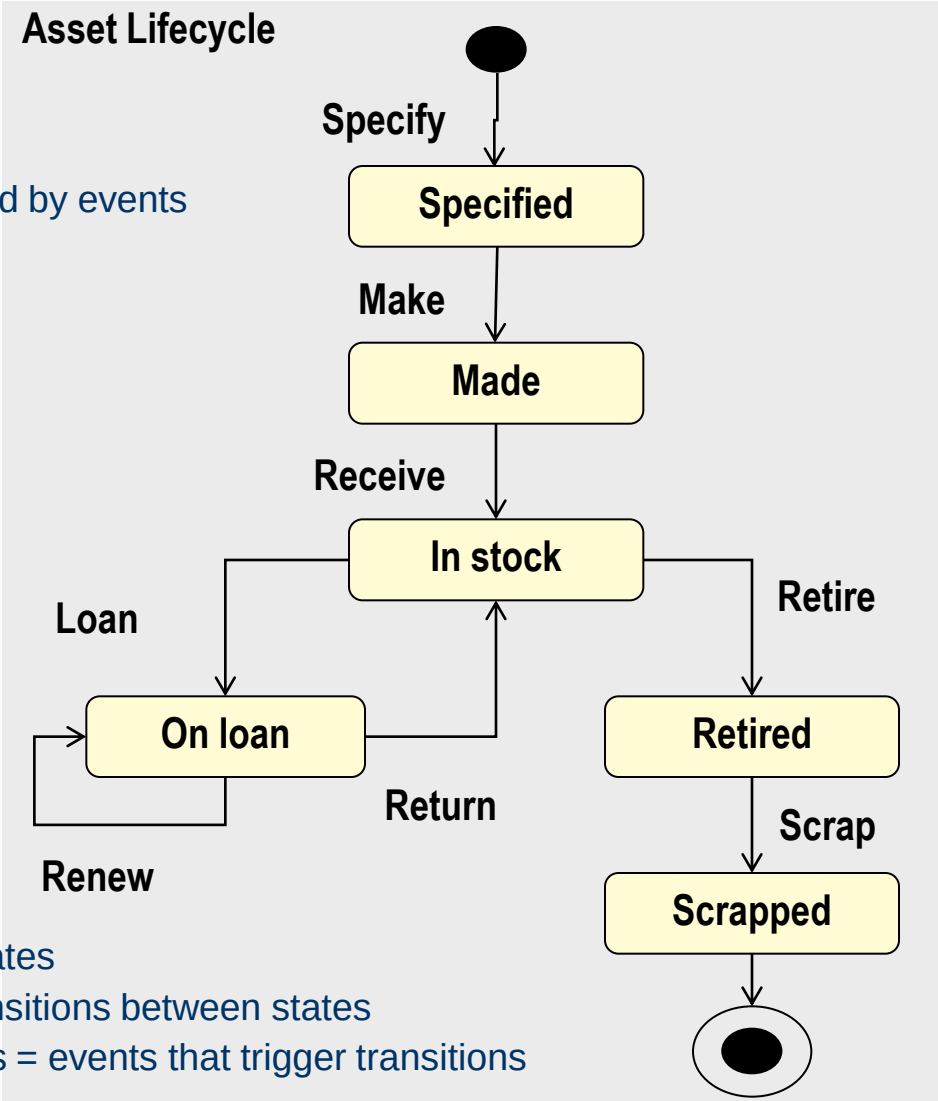
- to assist in understanding the lifecycles of key entities within the enterprise.
- Understanding product lifecycles is becoming increasingly important with respect to environmental concerns, legislation, and regulation where products must be tracked from manufacture to disposal.
- Equally, organizations that create products that involve personal or sensitive information must have a detailed understanding of the product lifecycle in order to ensure rigor in design of controls, processes, and procedures.
- **Examples include credit cards, debit cards, store/loyalty cards, smart cards, user identity credentials (identity cards, passports, etc.).**

# Product Lifecycle diagram: illustration



- What states does a product move through?
- What events trigger each state transition?
- Useful in product lifecycle management.
- A lifecycle views an entity as a long-term process, updated by events




Boxes = states
Lines = transitions between states
Annotations = events that trigger transitions

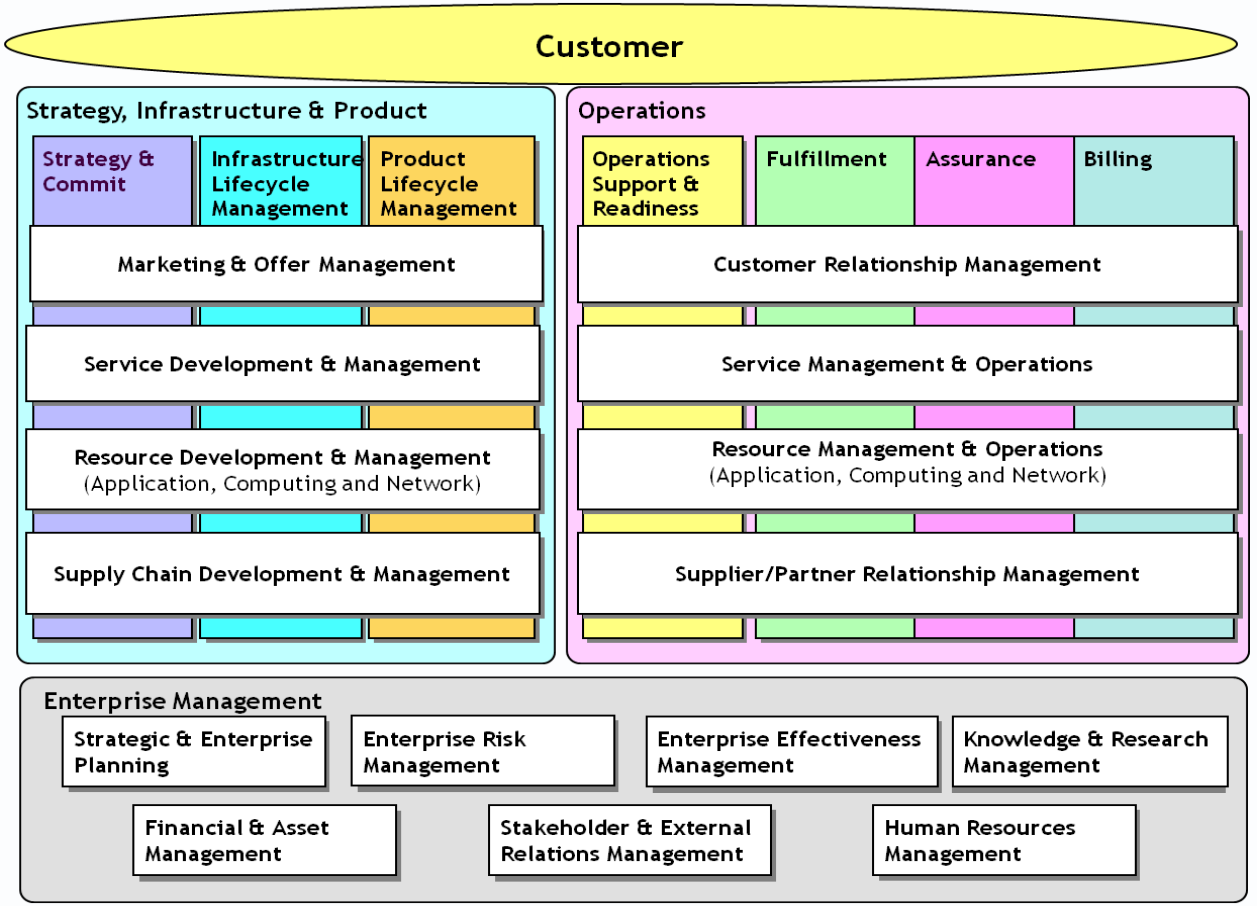
# MORE…

# Business process map diagram



- What processes are carried out in an enterprise or system?
- A summary and ideally engaging graphical representation.

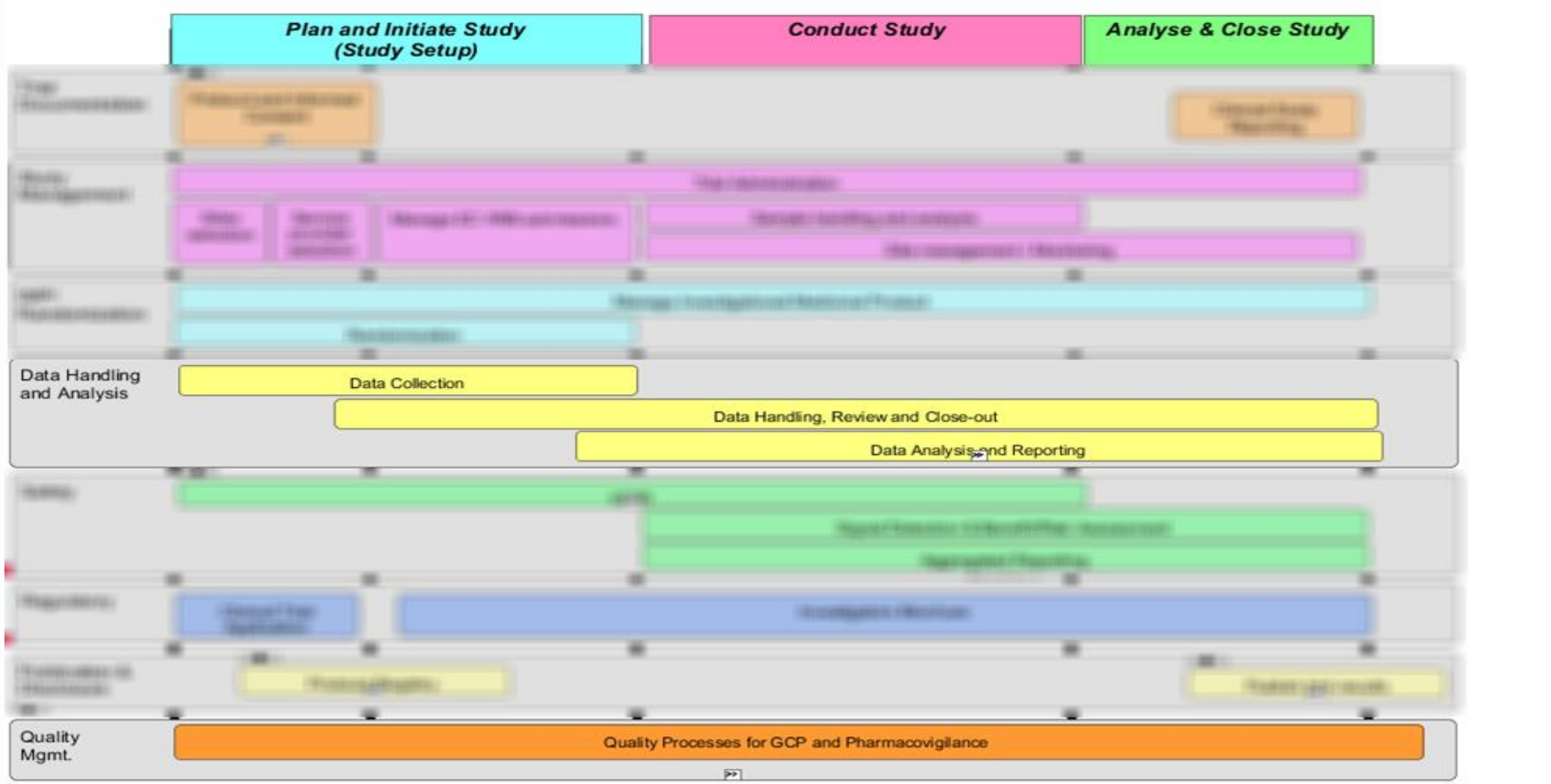
TMF: eTOM



# Business process map diagram

Avancier

- What processes are carried out in an enterprise or system?
- A summary and ideally engaging graphical representation.

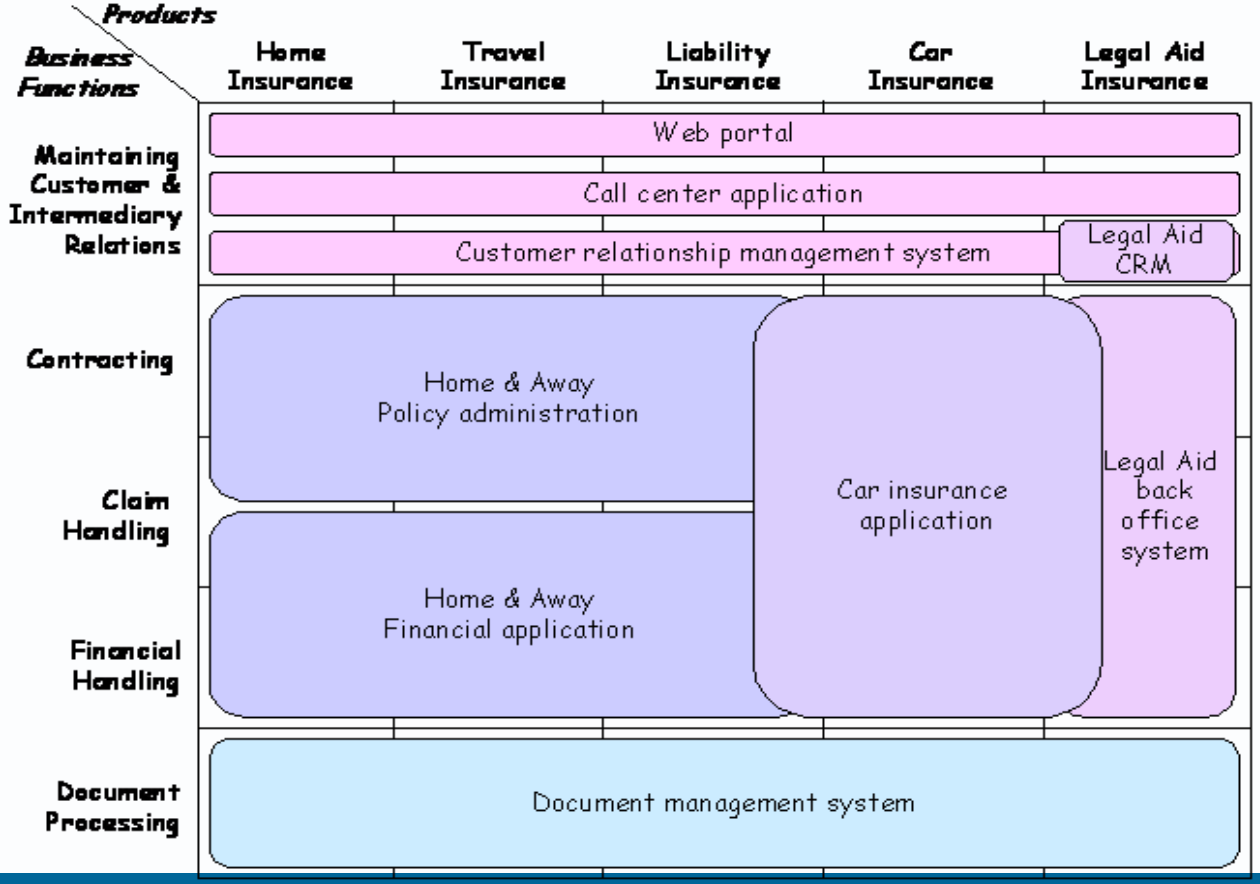


# ArchiMate 2.1: Landscape Map Viewpoint

**Cf. Business process map**

Avancier

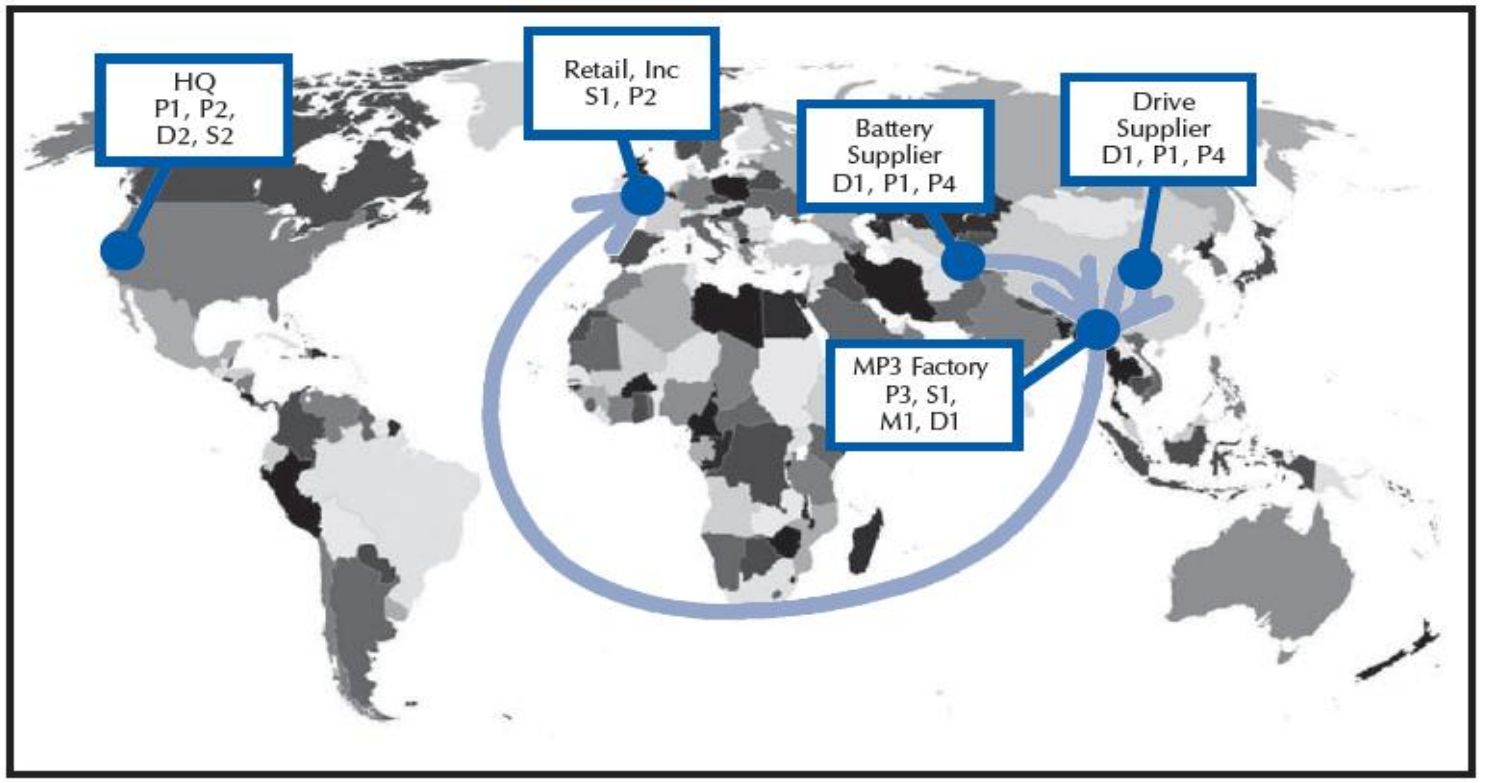
- Stakeholders: Enterprise architects, top managers: CEO, CIO
- Concerns: Readability, management and reduction of complexity, comparison of alternatives



# Location map diagram



- Where are business activities carried out?
- Where are business resources to be found?

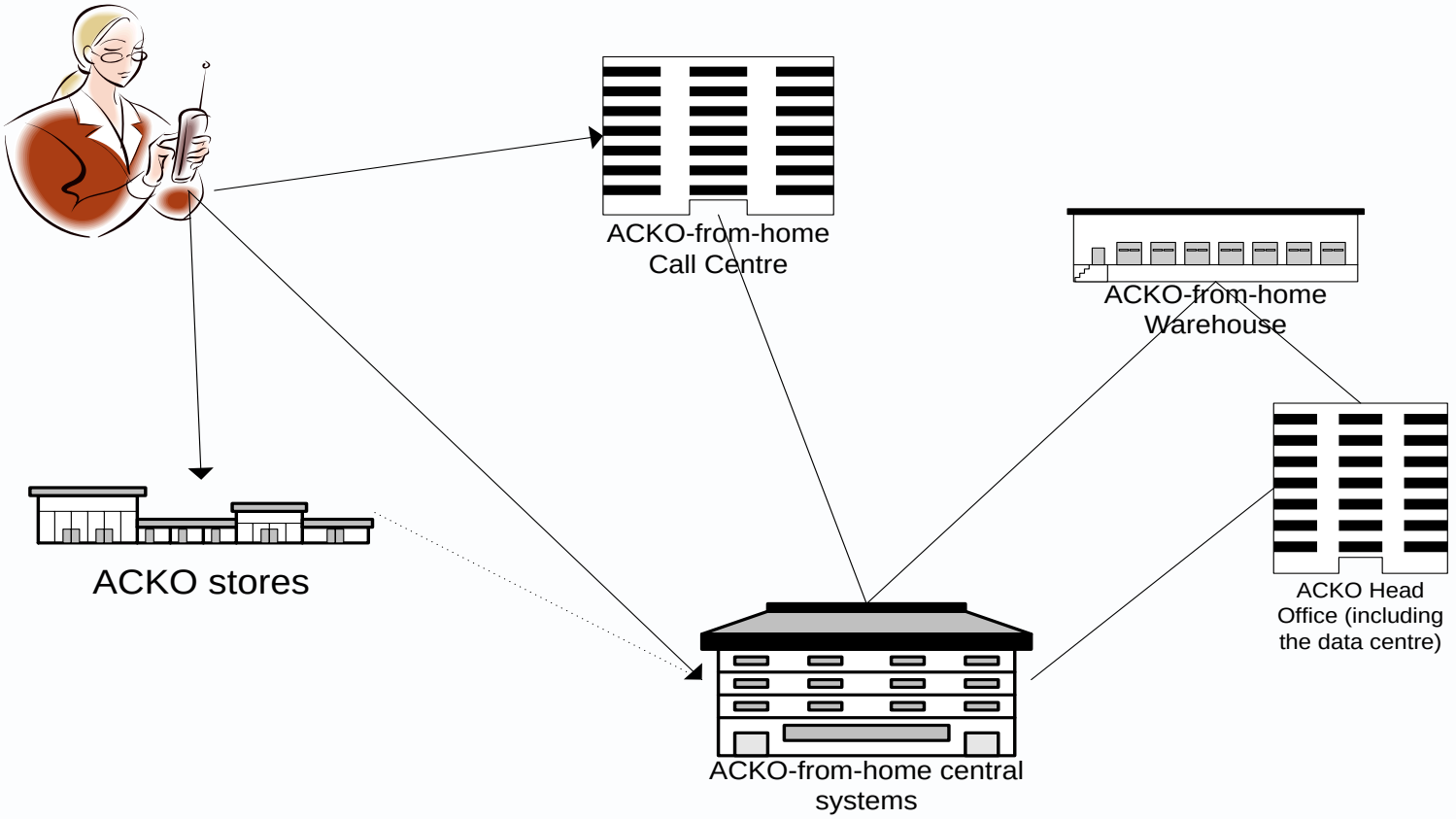



- From Supply Chain Council web site

# Location communication path diagram: an illustration



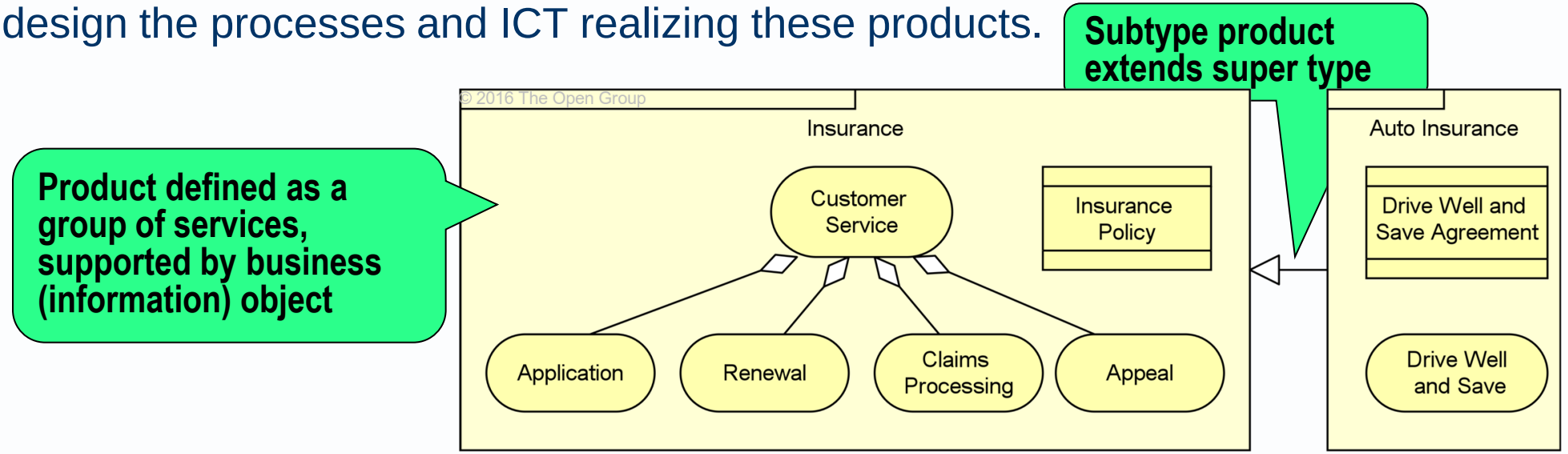
- What are the routes via which nodes can be connected and communicate?
  - solid lines - how locations may inter-connect
  - solid arrows - the different ways a customer might use the service
  - a dotted line – a possible future communication path



# ArchiMate 3.0 Product Viewpoint

Avancier

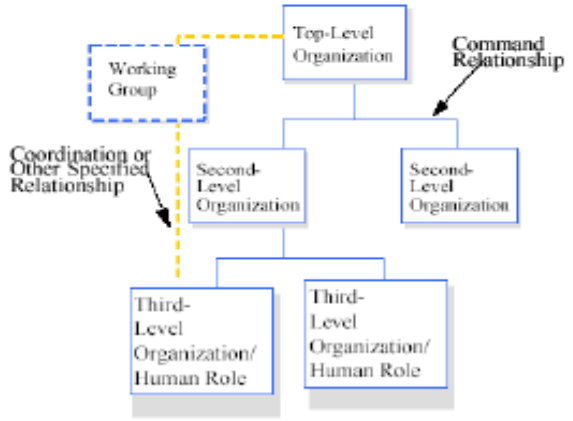
- depicts the value products offer to the customers or other external parties and shows the composition of one or more products in terms of the constituting services, and the associated contract(s) or other agreements.
- may also be used to show the interfaces (channels) through which this product is offered, and the events associated with the product.
- typically used to design a product by composing existing services or by identifying which new services have to be created for this product,
- may then serve as input for business process architects and others that need to design the processes and ICT realizing these products.



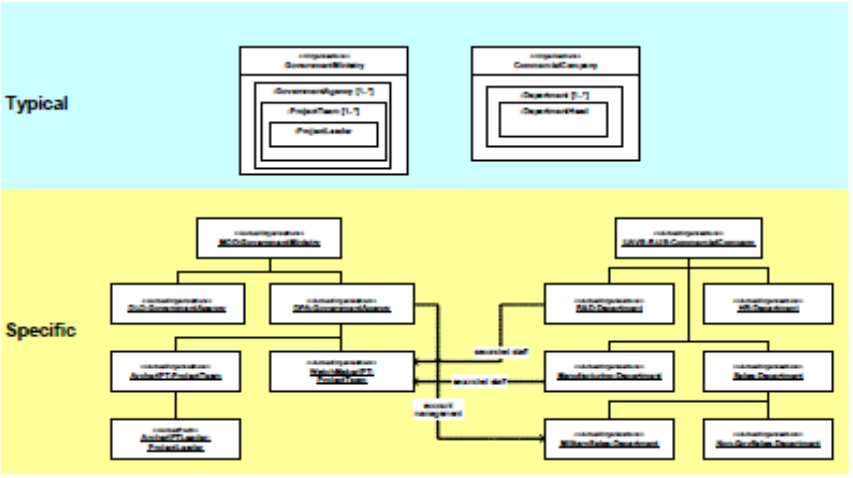
# Organisational relationships chart: MODAF style

Avancier

## OV-4 Organisational Relationships Chart




*Example – Generic Organisational Template*




*Example – UML version of OV-4*

**Data objects:**
Organisations
Resources

**Usage:**
Operational analysis
Organisation optimisation

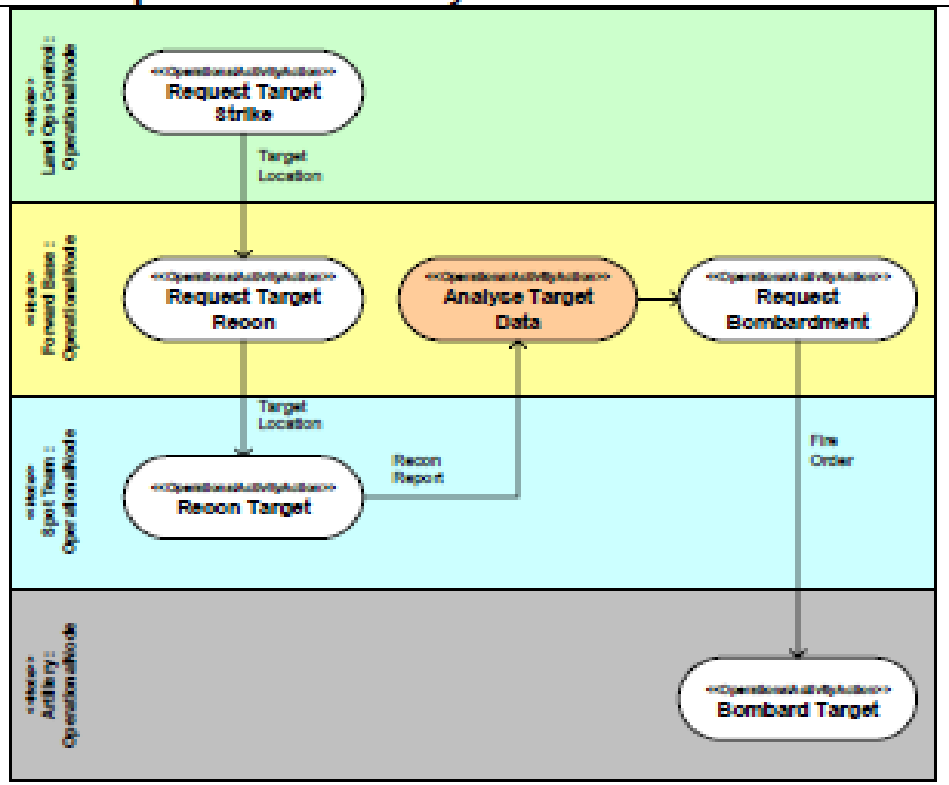
**Description:**
Illustrates the command structure / relationships -as opposed to relationships with respect to a business process flow

**Alternative Views:**
UML Class Diagram with Actor Icon

# MODAF-style Activity Model

Avancier

## OV-5 Operational Activity Model




*Example – Hypothetical Land Operational Tasks*

**Data objects:**
Nodes
Operational activities
Activity flow
Activity hierarchy
Information need lines
Information need line mapping to activity flows

**Usage:**
Operational analysis
Operational process optimisation
Specification of user operational activity requirements in URD

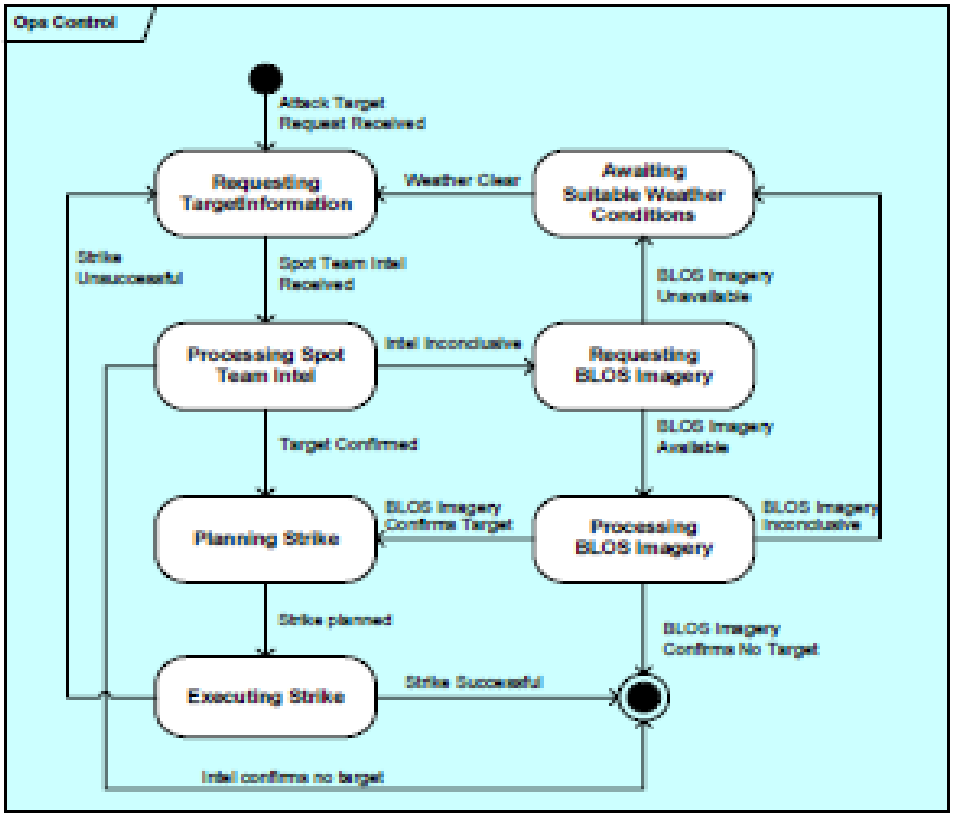
**Description:**
Describes the flow of, or hierarchy of activities required to conduct the operations within a scenario or use case

**Alternative Views:**
UML Use Case Diagram
UML Activity Diagram

# MODAF-style State Transition diagram

Avancier

## OV-6b Operational State Transition Diagram




*Example – UML Version of OV-6b*

**Data objects:**
Operational states
Events
Operational state transitions

**Usage:**
Operational analysis

**Description:**
Graphical method of describing how an operational node or activity responds to various events by changing its state

**Alternative Views:**
UML Statechart Diagram

# Avancier Methods

- **Avancier Methods** can be used on their own and/or to supplement any architecture framework that shares similar domains and entities

- http://avancier.website