
WIT 2016 ITA Module

Lecture Group #2 - Part 3 Architecture Modeling



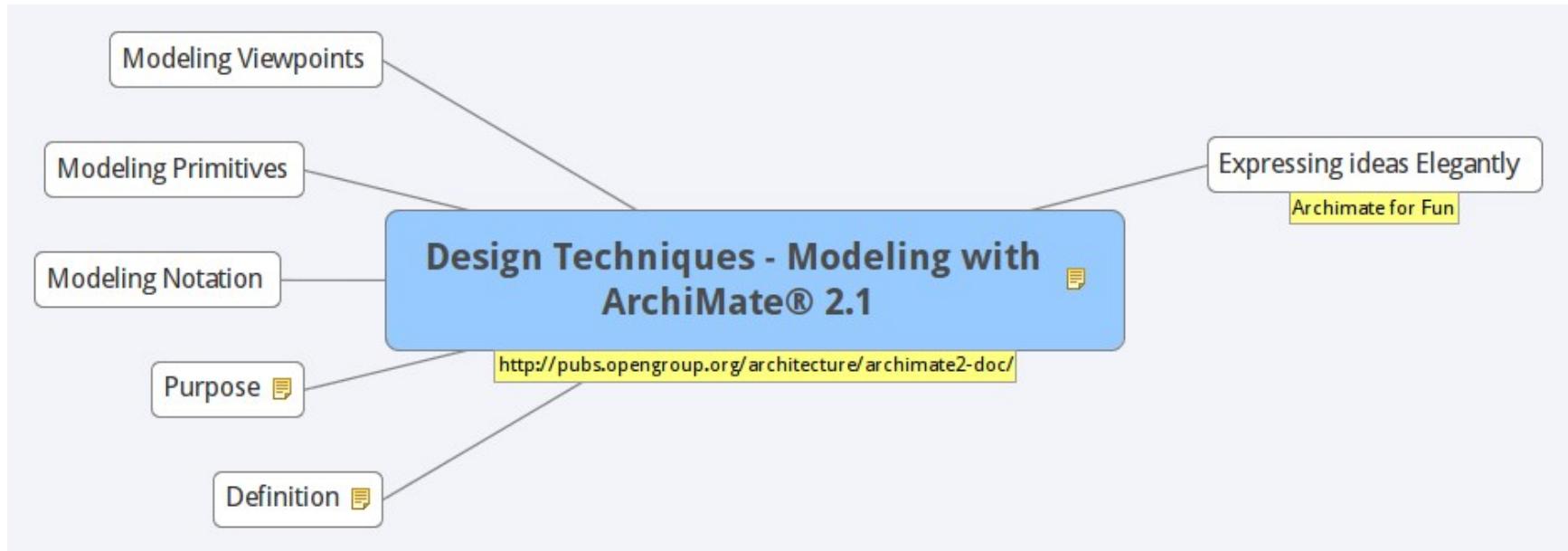
Lecture Group #2 - Part 3

Architecture Modeling

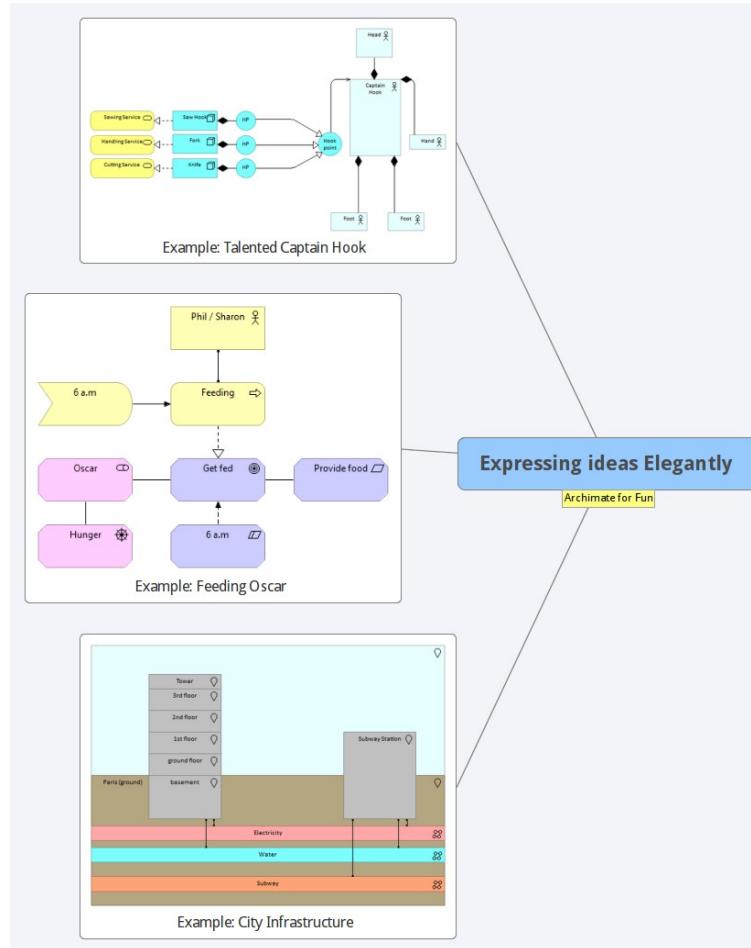


Design Techniques Modeling with ArchiMate® 2.1

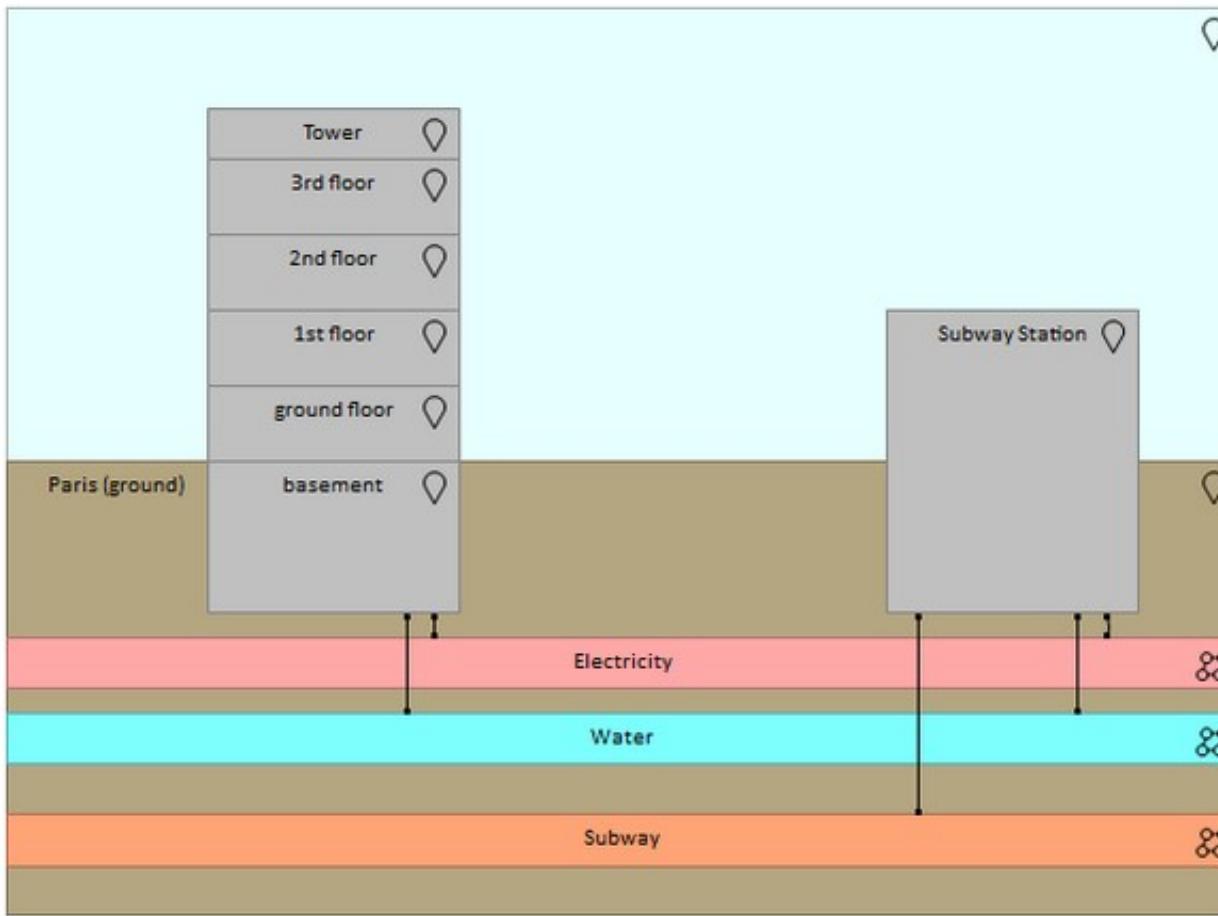
<http://pubs.opengroup.org/architecture/archimate2-doc/>



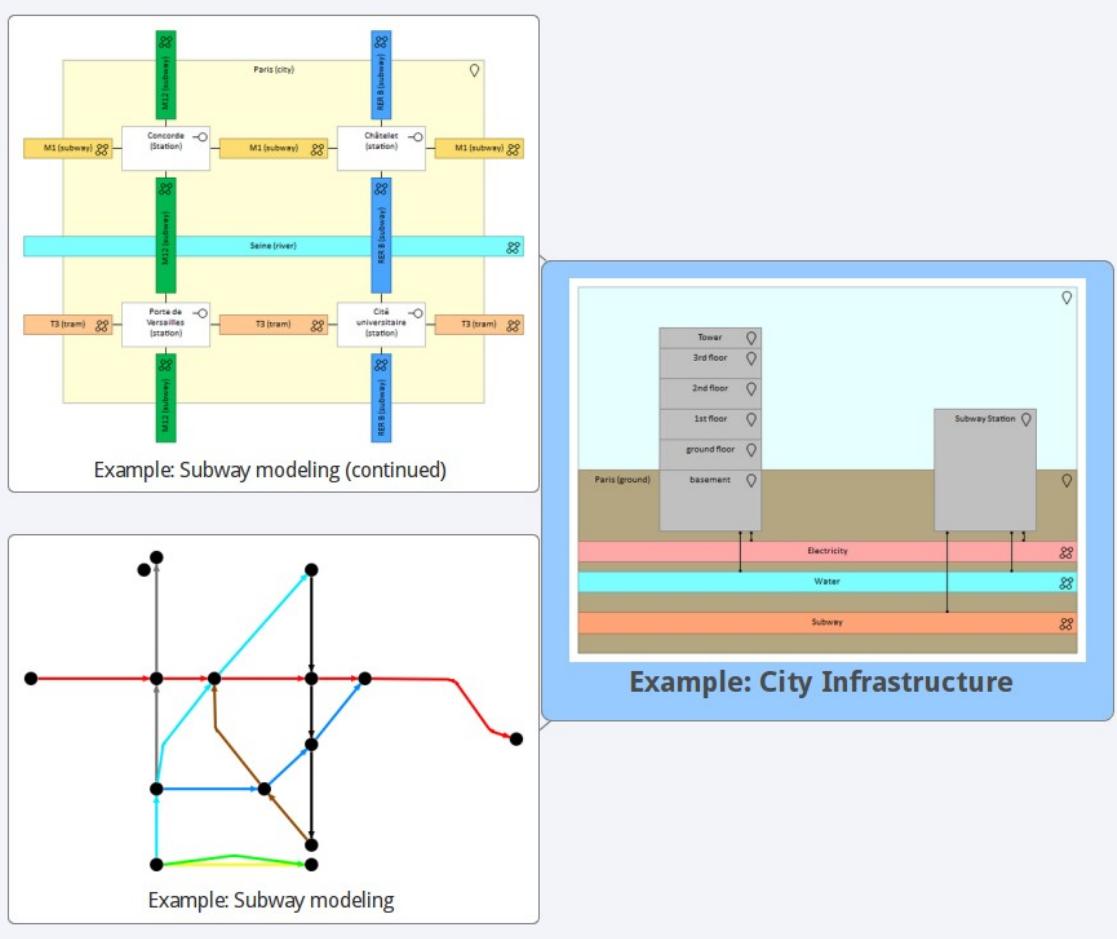
Expressing ideas Elegantly Archimate for Fun ;-)



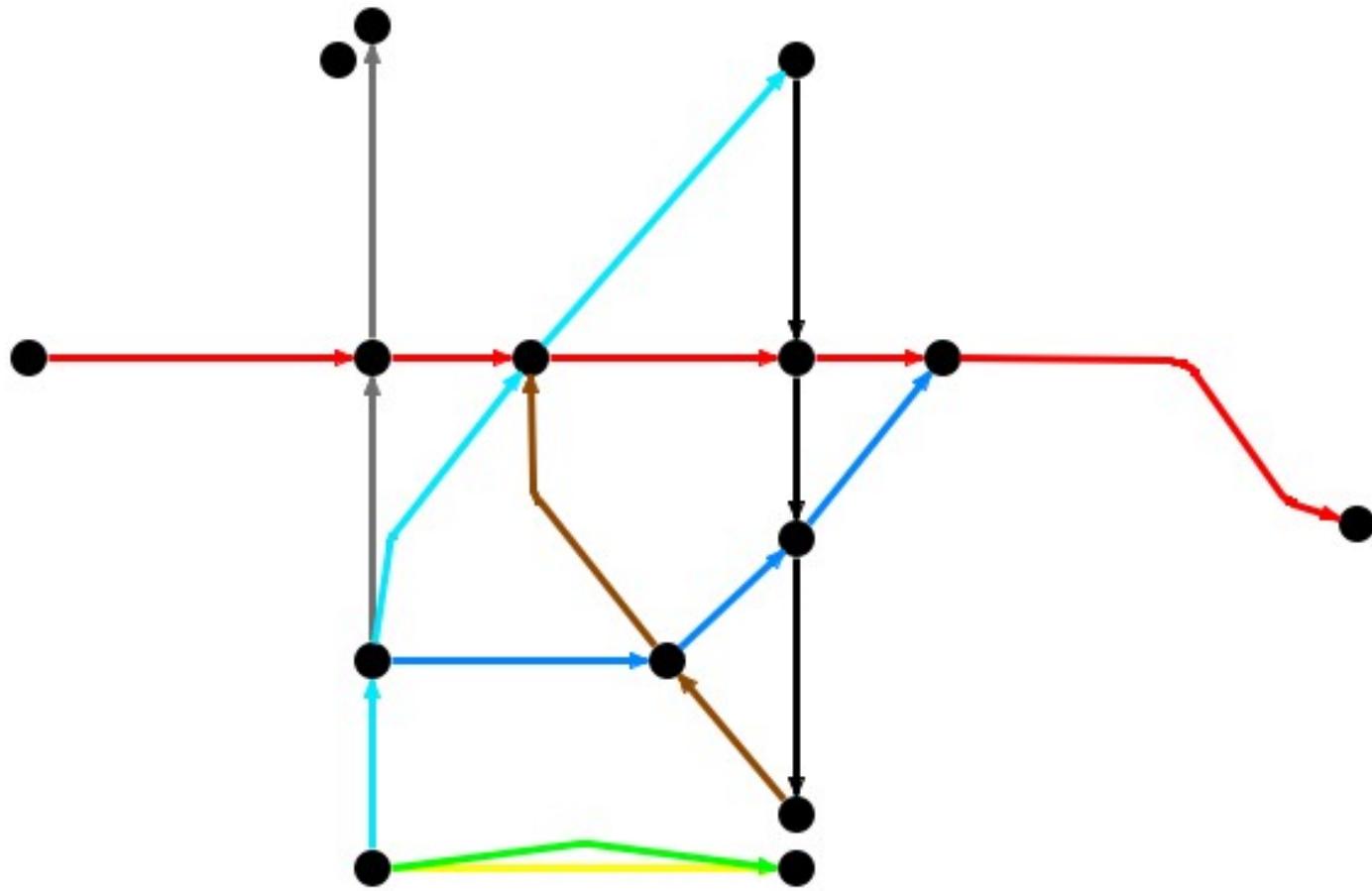
Example: City Infrastructure



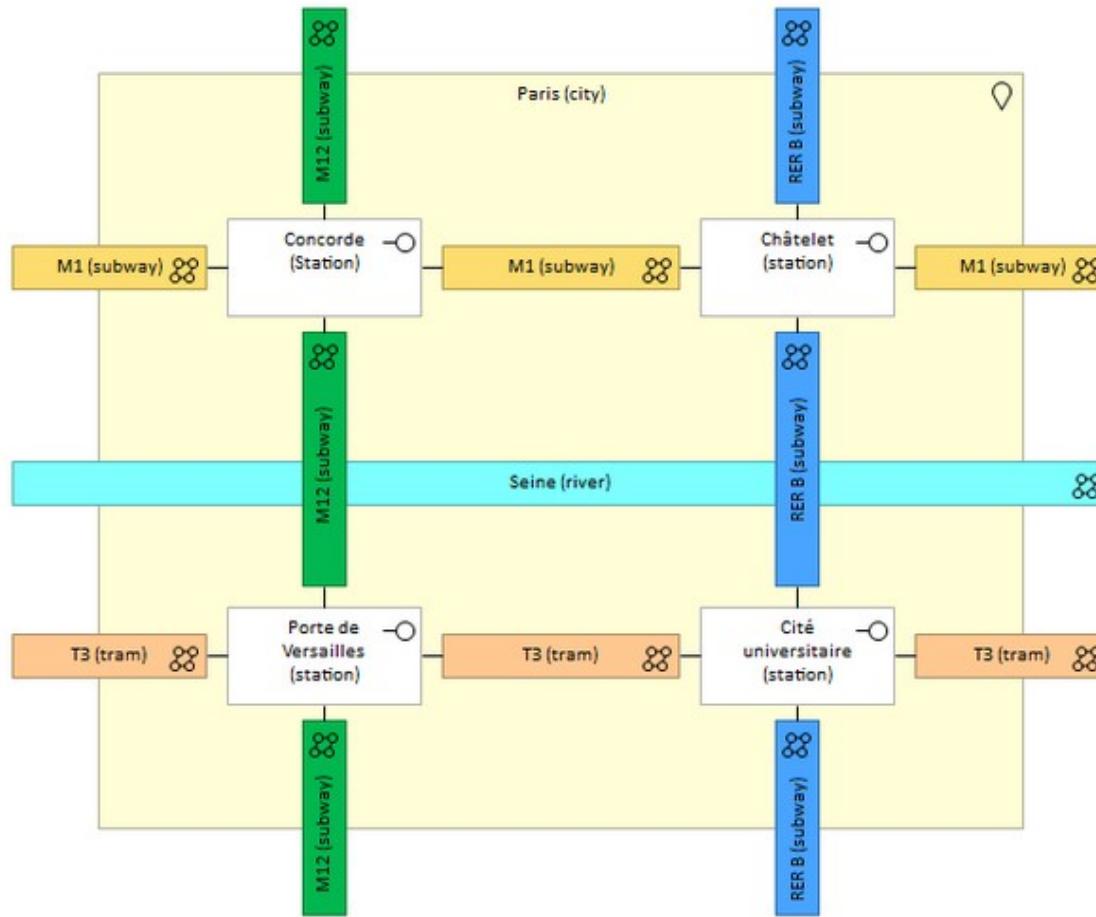
Example: City Infrastructure



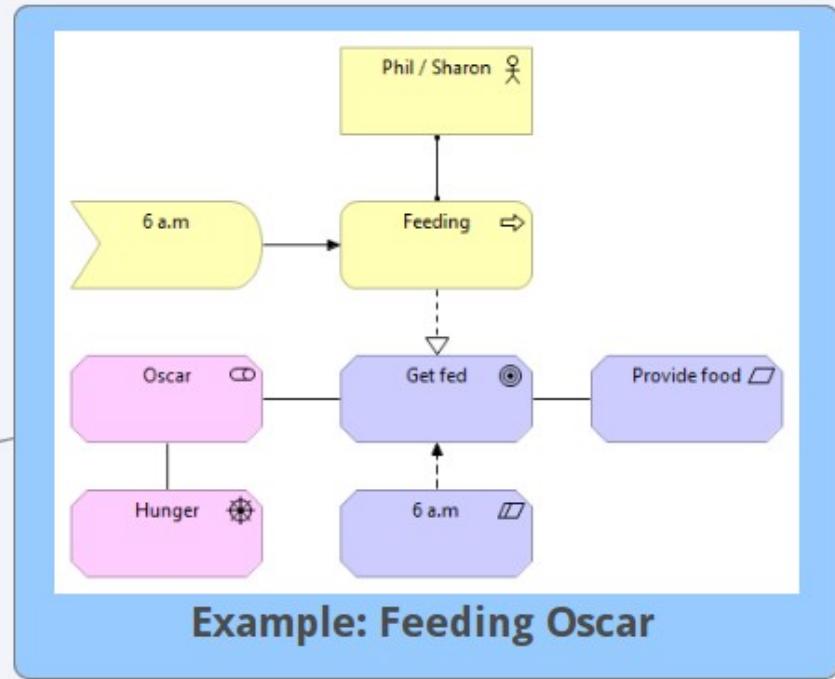
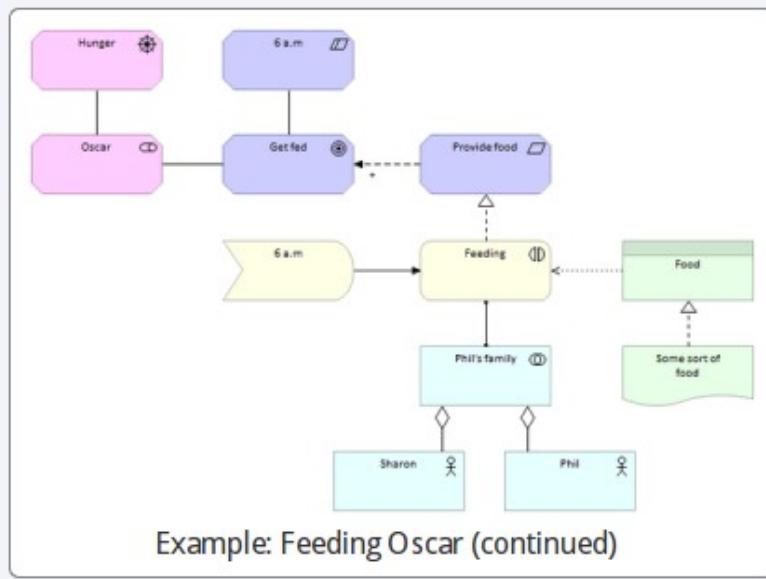
Example: Subway modeling



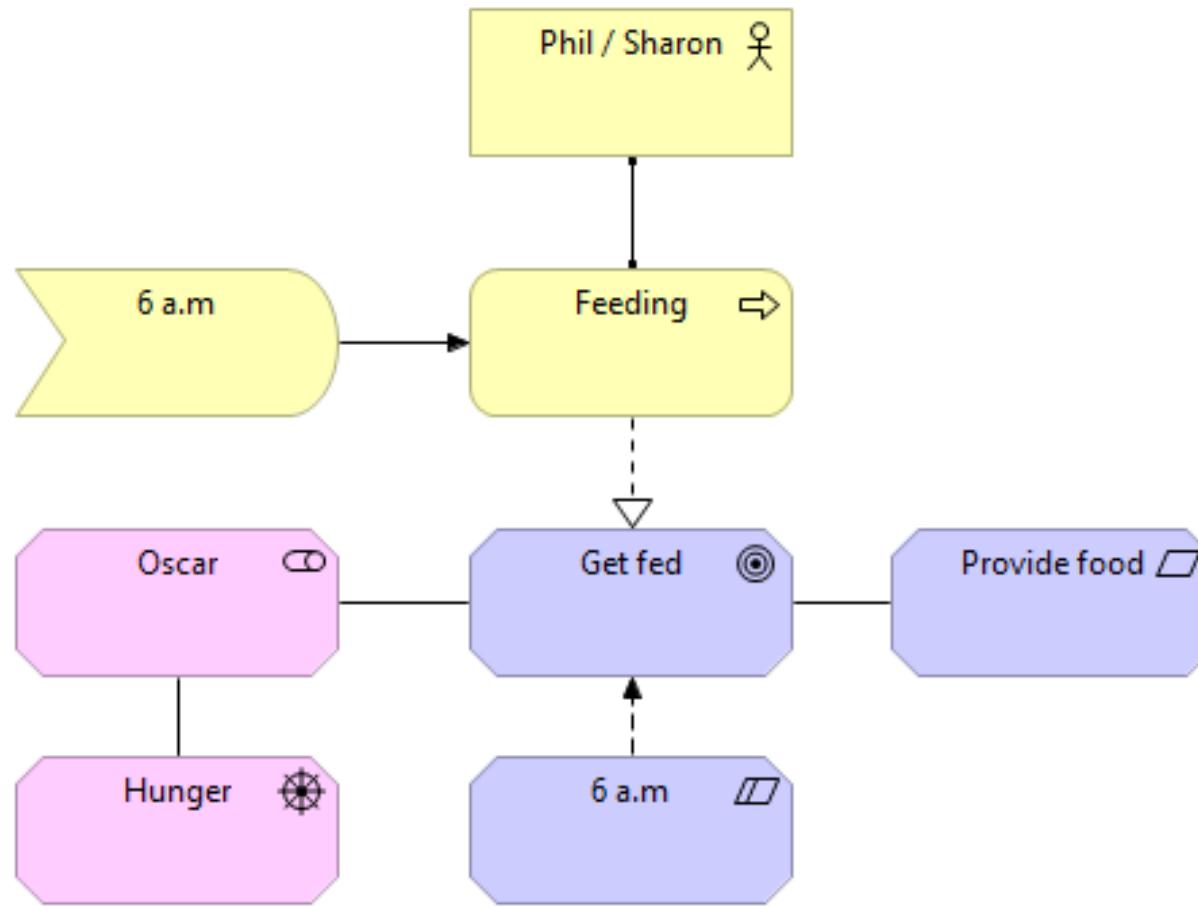
Example: Subway modeling (continued)



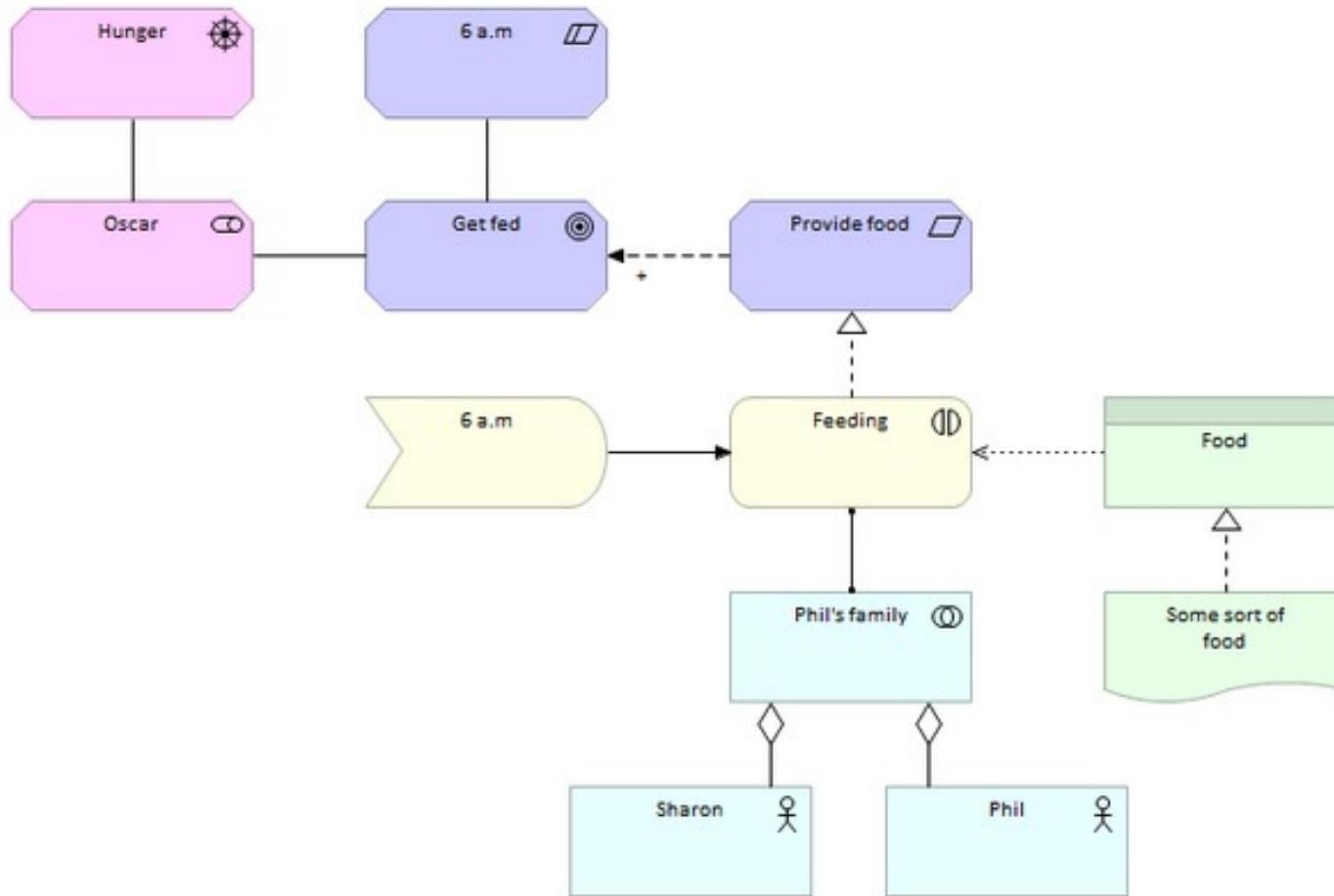
Example: Feeding Oscar



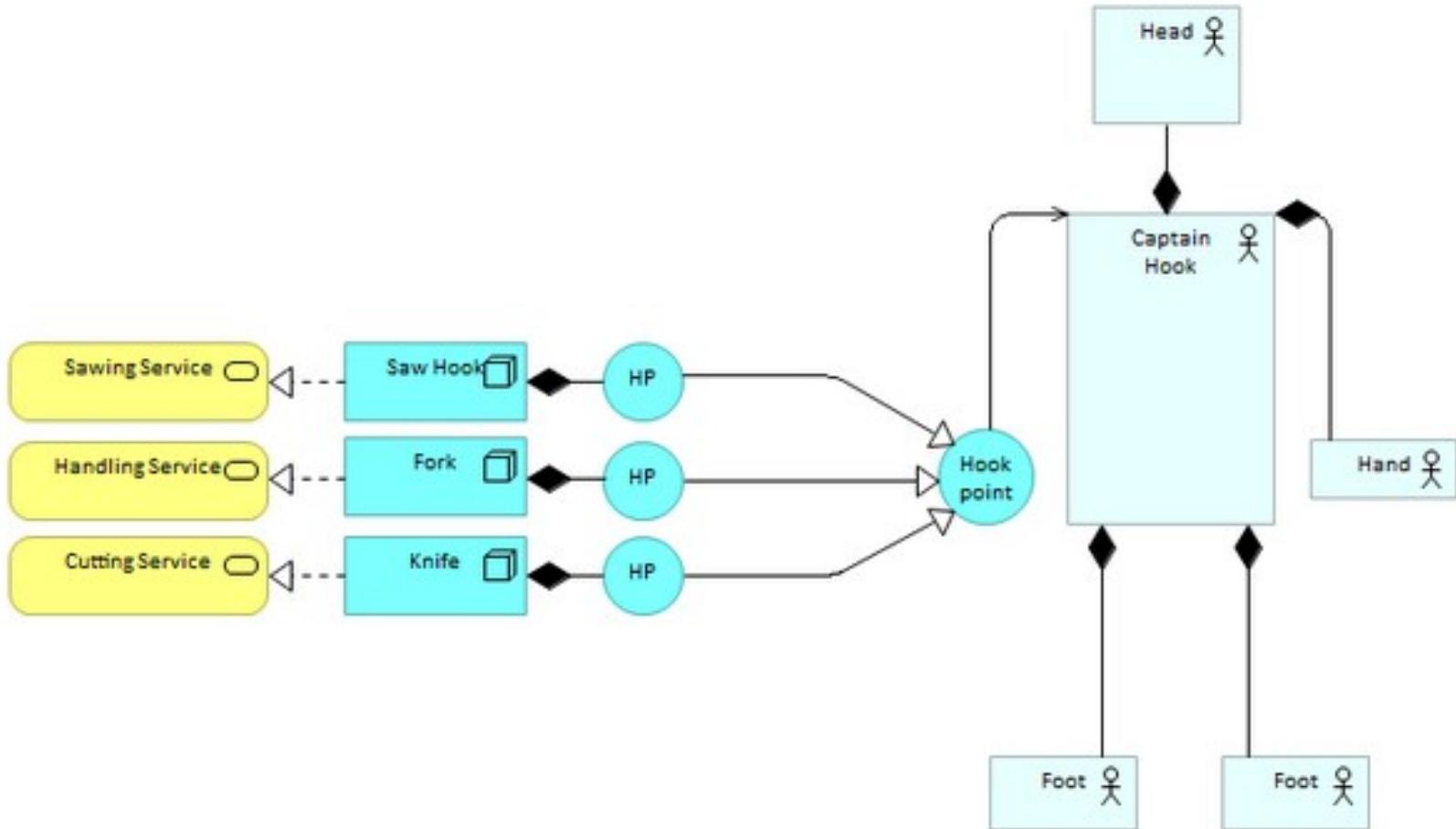
Example: Feeding Oscar



Example: Feeding Oscar (continued)



Example: Talented Captain Hook



Definition

A modeling standard published by The Open Group in 2009 (v1.0)/2012 (.2.1). A design technique for describing architectures.

Presents a clear set of concepts within architecture domains, offers a uniform structure for describing the contents of each domain.

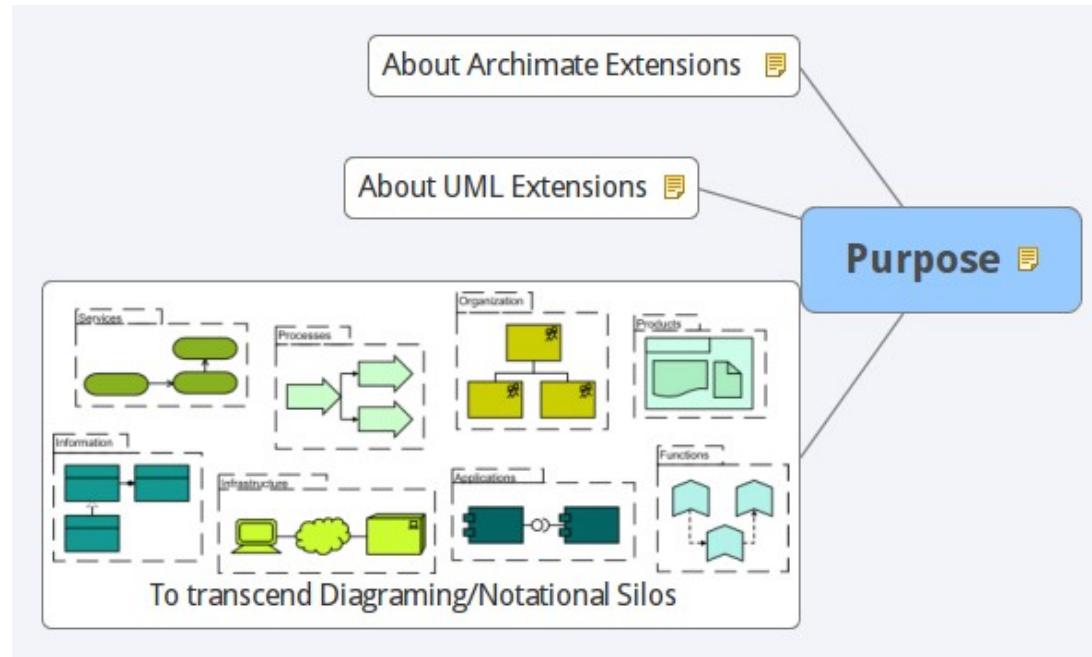
...each domain is specified by a meta-model, constraining the diagrams that can be created, and allowing consistency of notation and re-use of concept elements between Views.

Presents a clear set of concepts to establish RELATIONSHIPS (i.e. MAP) between domains.

...allows the connection of models belonging to different layers (i.e. Business/Application/Data/Technology), hence helping an Architect to document View consistency.



Purpose



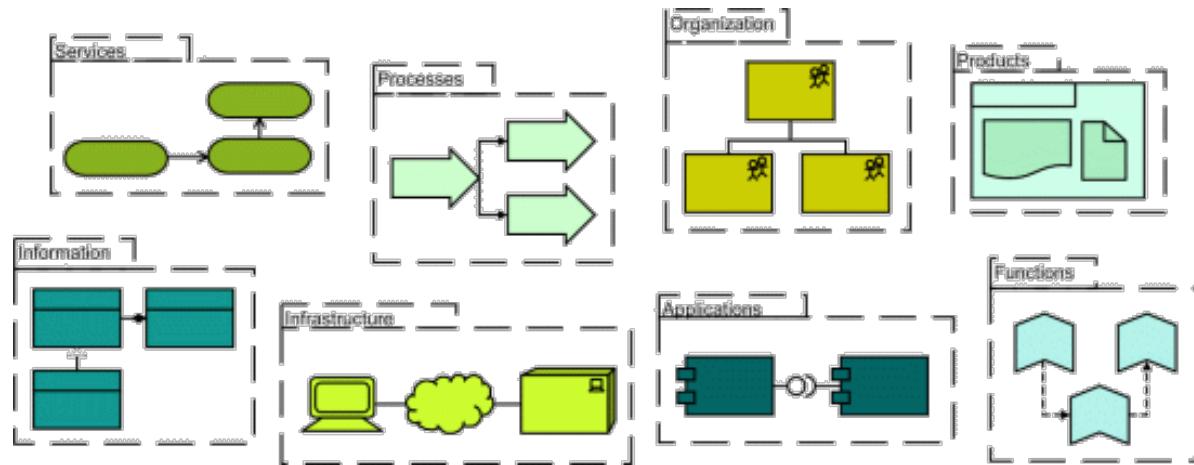
Purpose

The purpose of ArchiMate® 2.1 is to:

- be semantically precise so to help analysing and visualising relationships among problem/solution domains in an unambiguous way,
- be read by all stakeholders, and convey one same meaning,
- be intuitive to understand, with little or no training to understand the models.



To transcend Diagramming/Notational Silos



About UML Extensions

UML can be extended to support Enterprise Architecture modeling.
The EAP Profile (Enterprise Architecture Profile) proposes to combine:

- the Unified Modeling Language (UML),
- the Business Processing Langauge (BPMN),
- however does include Business Motivation Modeling (BMM).



About Archimate Extensions

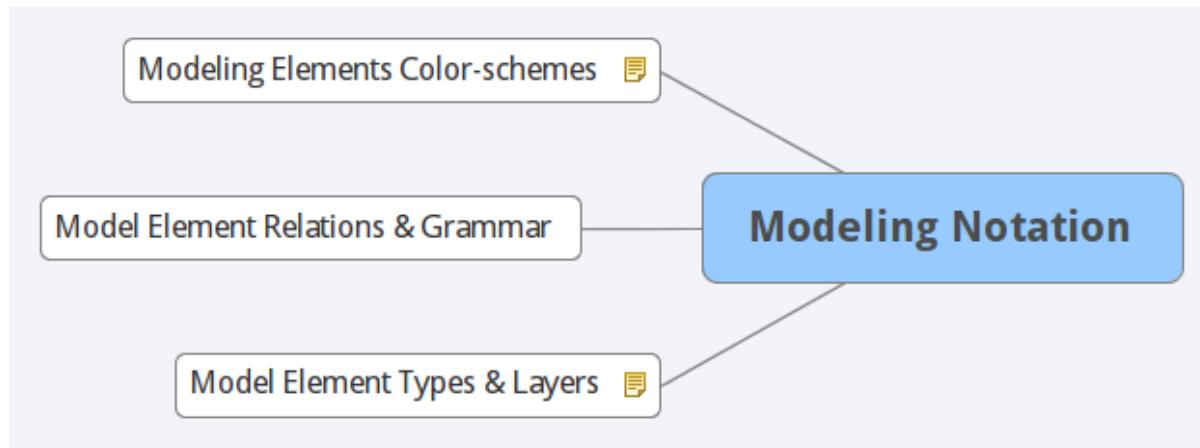
Model Extensions introduced in 2012:

- Motivation Extension (for problem space): New Model Elements and Viewpoints
- Implementation / Migration Extension (to picture current/target state increments, for program planning): New model Elements and Viewpoints

Version 3.0 being finalized in 2016.



Modeling Notation

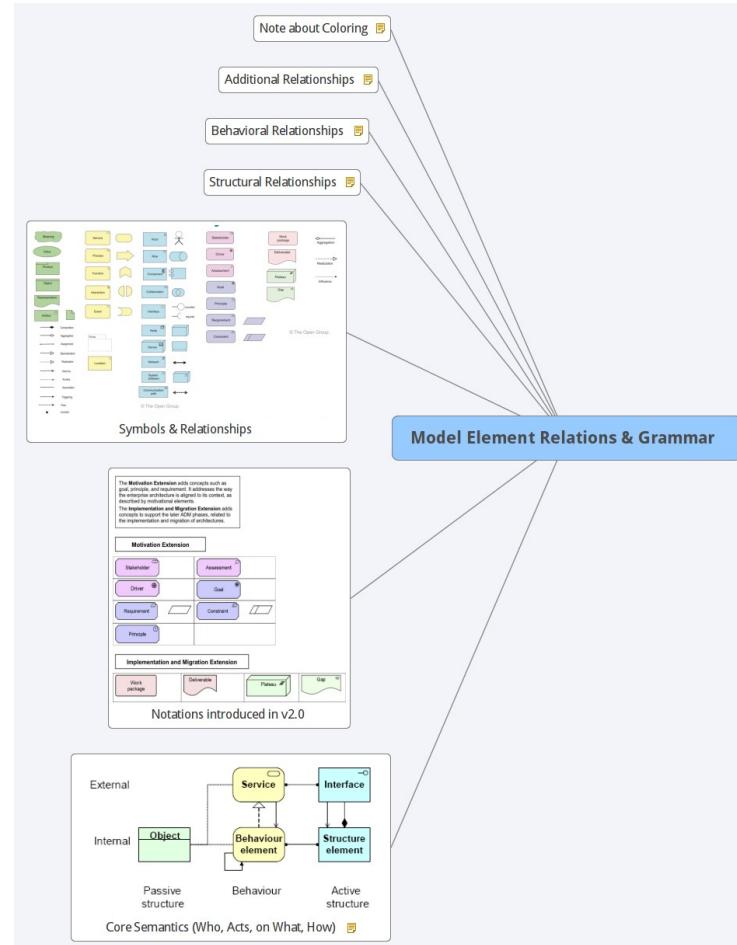


Core Elements Classification by Layer

	STRUCTURAL CONCEPTS			BEHAVIORAL CONCEPTS			INFORMATIONAL CONCEPTS	
BUSINESS	Business actor 			Business process 			Representation 	Product
	Business collaboration 			Business function 			Meaning 	Contract
	Location 			Business interaction 			Value 	
APPLICATION	Application component 			Application function 				
	Application interface 			Application service 				
TECHNOLOGY	Node 		Device 	Infrastructure function 			Artifact 	
	Network 		System software 					
	Communication path 							



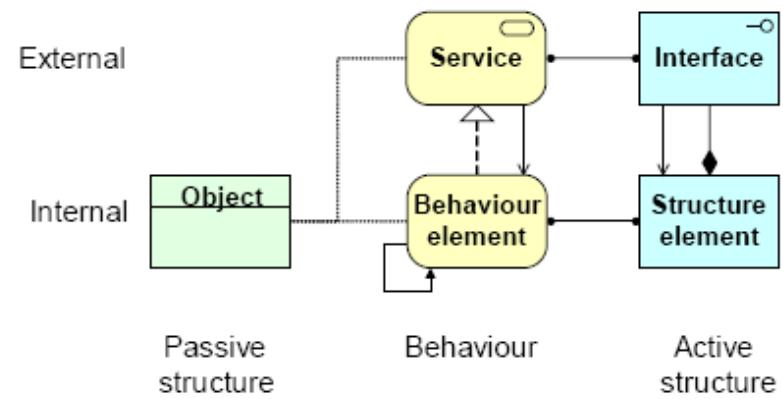
Model Element Relations & Grammar



Core Semantics (Who, Acts, on What, How)

The language consists of 3 main TYPES of core elements:

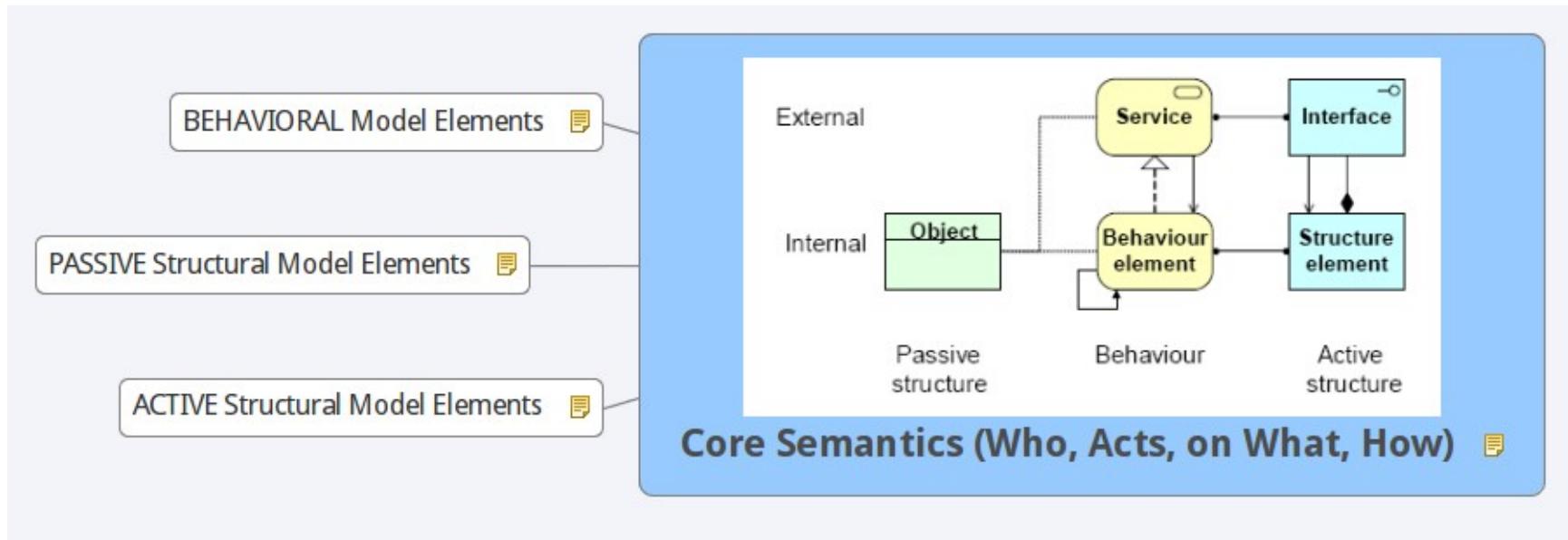
- ACTIVE structure elements are entities capable of performing behavior (business actors, application components, devices, etc.)
- BEHAVIOR elements are units of activity performed by one or several active structure elements (processes, interactions, use cases, etc.)
- PASSIVE structure elements are objects on which behavior is performed, such as data (business entities, data objects, etc.)



Note: External View model elements expose model elements from Internal View.



Core Semantics (Who, Acts, on What, How)



Model Elements

ACTIVE:

An Entity of your design capable of performing behavior (i.e. Subject).

A permanent or temporary grouping (or aggregation) of two or more structure elements, working together to perform some collective behavior (i.e. Collaboration).

BEHAVIORAL:

A unit of activity performed by one or more active structural elements (i.e. Verb).

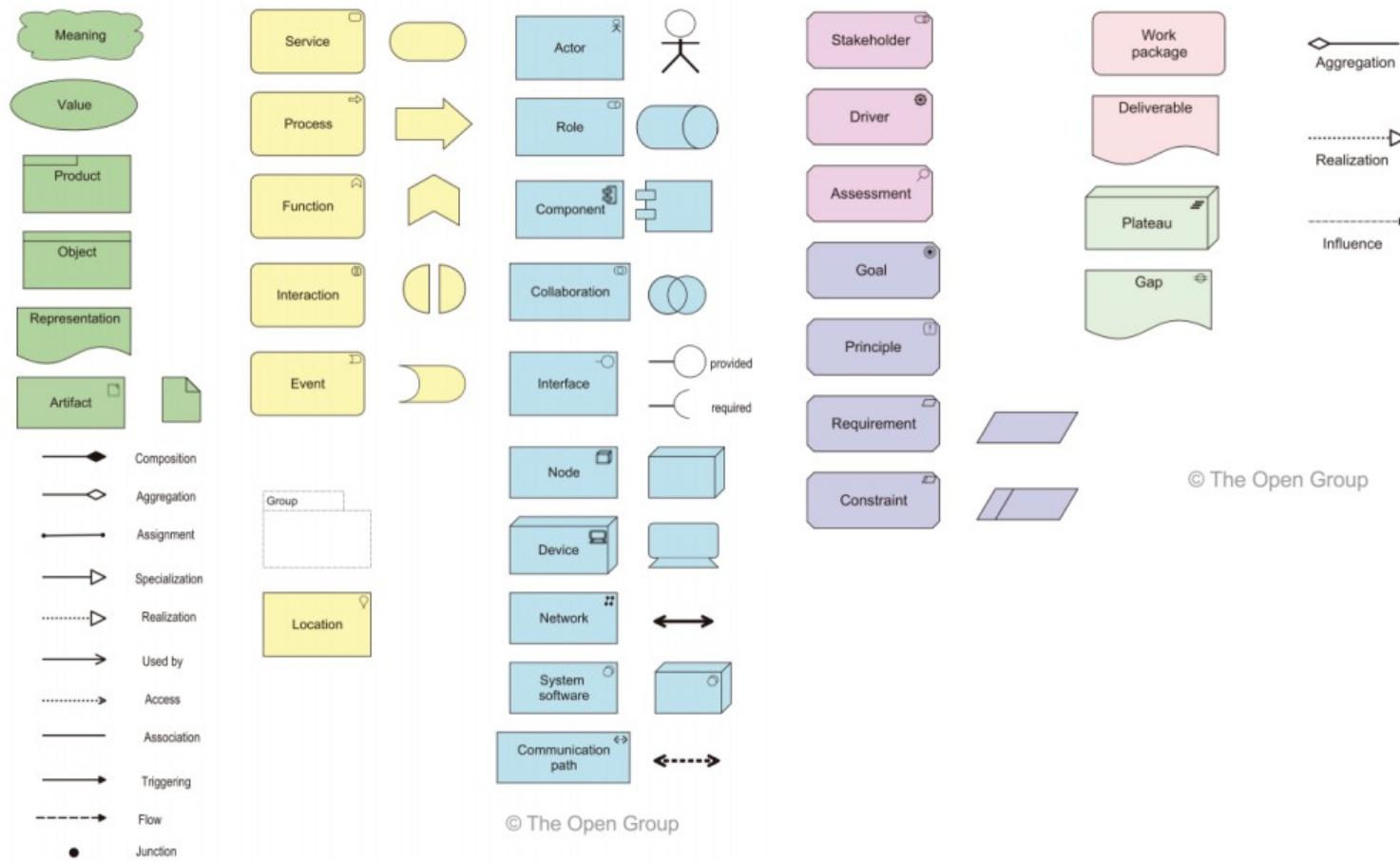
A unit of behavior performed by a collaboration of two or more structure elements (i.e. Interaction).

PASSIVE:

An object on which behavior is performed, usually information or data objects.



Symbols & Relationships



Structural Relationships

Structural relationships model the STRUCTURAL COHERENCE of concepts of same (or different) model element types.

- Composition: any object is composed of 1 or more other objects,
- Aggregation: groups a number of other objects,
- Assignment: links active elements with units of behavior that are performed by them, links business actors with business roles that're fulfilled by them,
- Realization: links logical entity with a more concrete entity that realizes it,
- Used by: models use of service by {processes | functions | interactions}, access to interfaces by {roles | components | collaborations},
- Access: models access of behavioral concepts to {business | data} objects (directional if arrowhead),
- Association: models other relationships between objects.



Behavioral Relationships

Behavioral relationships model DYNAMIC DEPENDENCIES between behavioral concepts.

Triggering:

- describes temporal or causal relationships between processes, functions, interactions and events
- no distinction between active triggering or passive causal relationship

Flow:

- describes exchange/transfer of information/value between processes, functions, interactions, events
- does not imply temporal or causal relationship



Additional Relationships

Grouping: objects belong together based on some common characteristics,

Junction: used to connect dynamic relationships of the same type,

Specialization: indicates that an object is a specialization of another object,

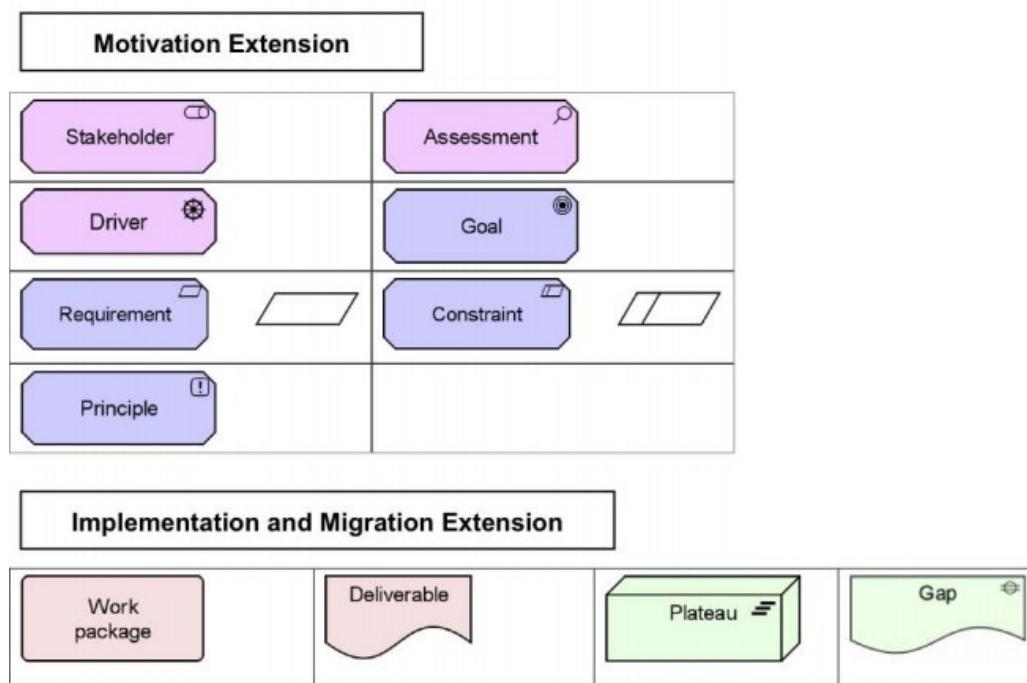
Derived relationships: two relationships that join at an intermediate element can be combined & replaced by the weaker of the two.



Notations introduced in v2.0

The **Motivation Extension** adds concepts such as goal, principle, and requirement. It addresses the way the enterprise architecture is aligned to its context, as described by motivational elements.

The **Implementation and Migration Extension** adds concepts to support the later ADM phases, related to the implementation and migration of architectures.



Modeling Elements Color-schemes

Either of two: (1.) Layered coloring, or (2.) Grammar coloring.

"Layered" color-scheme (default in modeling tools):

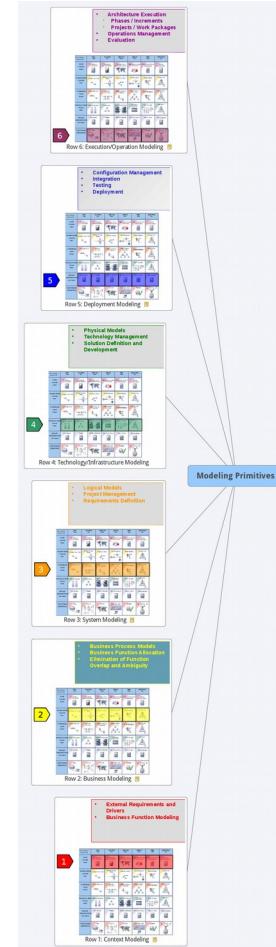
- Yellow-for-Business layer
- Blue-for-Application layer
- Green-for-Infrastructure layer

"Grammar" color-scheme (best practice of archimate modeling):

- Blue-for-actors
- Yellow-for-behavior
- Green-for-acted-upon



Modeling Primitives with Archimate



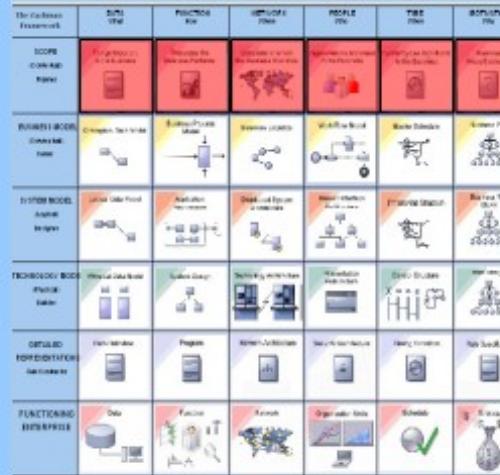
Row 1: Context Modeling

Inventory Modeling 

Motivation Modeling 

1

- **External Requirements and Drivers**
- **Business Function Modeling**



Row 1: Context Modeling 



Row 1: Context Modeling

Function/How:

List of key capabilities, functions or features.

Requirement/What:

List of drivers critical to the business.

People/Who:

List of Organisations, Stakeholders important to the business.

Network/Where:

List of locations in which the business operates.

Time/When:

List of events, constraints, significant to the business.

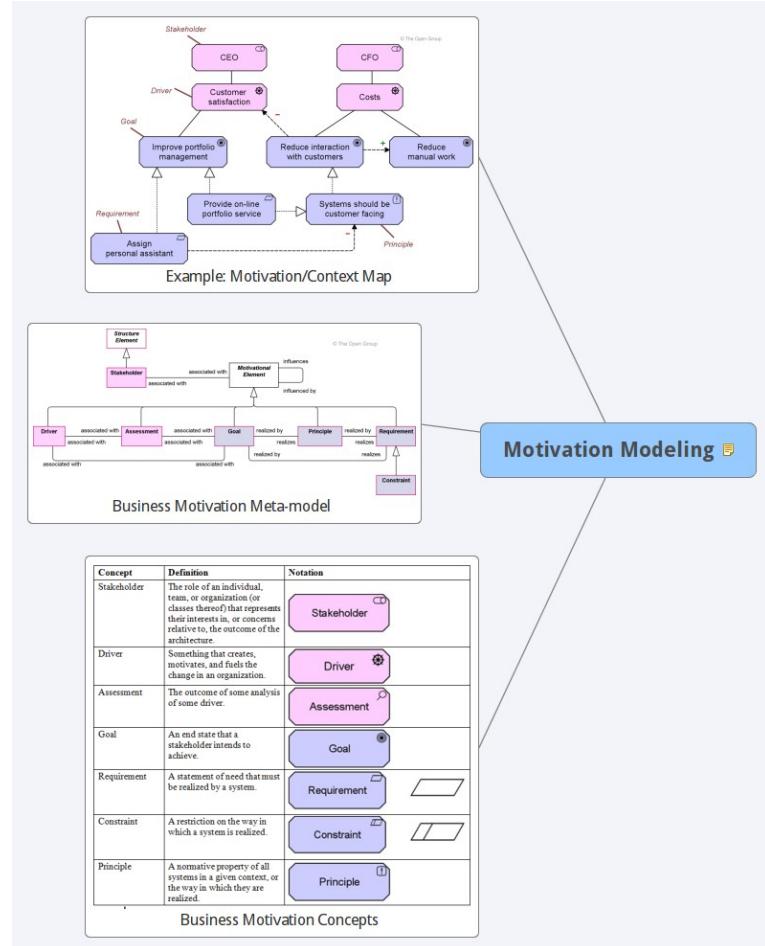
Motivation/Why:

List of goals, principles and strategies.

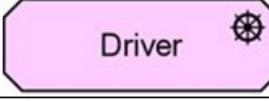
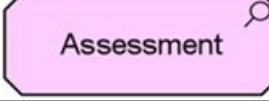


Motivation Modeling

Motivation Modeling provides the context or reason lying behind the architecture of a solution design.



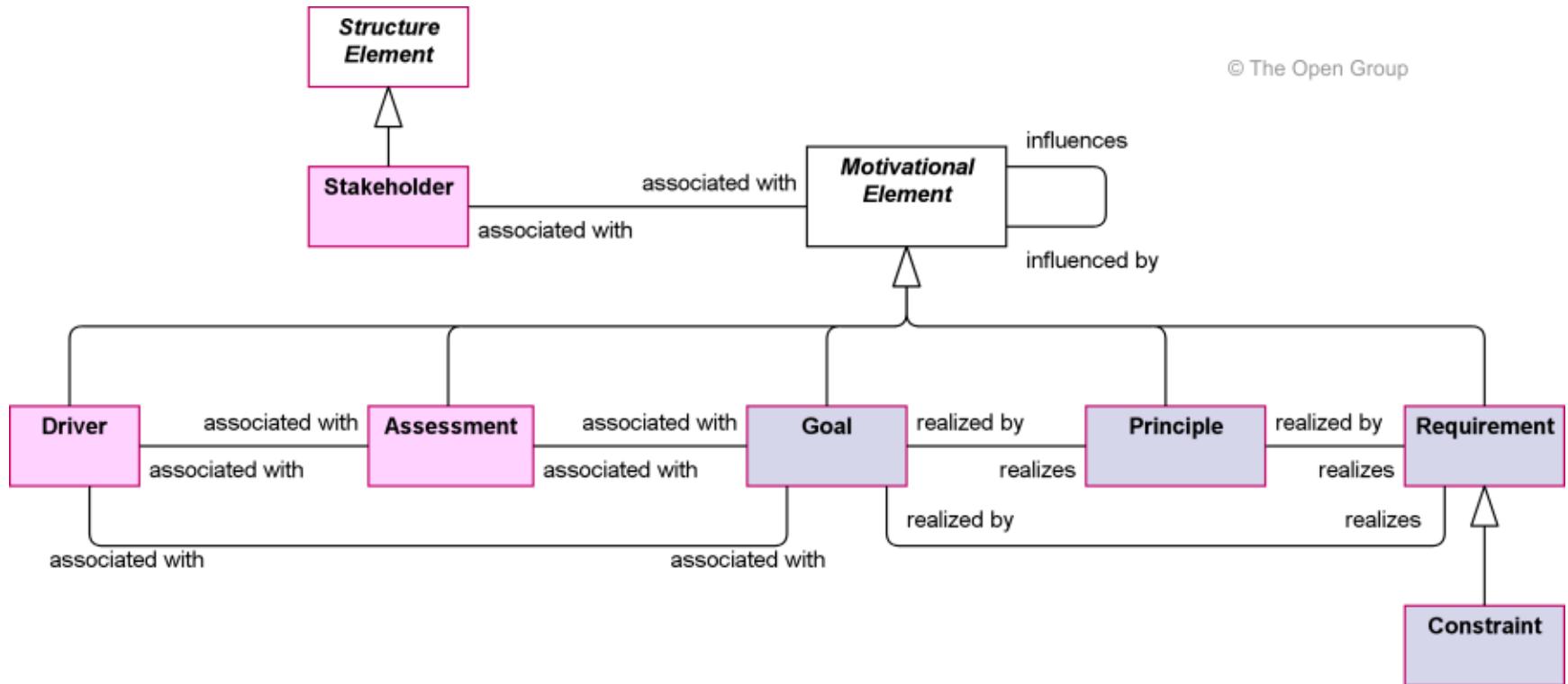
Business Motivation Concepts

Concept	Definition	Notation
Stakeholder	The role of an individual, team, or organization (or classes thereof) that represents their interests in, or concerns relative to, the outcome of the architecture.	 Stakeholder
Driver	Something that creates, motivates, and fuels the change in an organization.	 Driver
Assessment	The outcome of some analysis of some driver.	 Assessment
Goal	An end state that a stakeholder intends to achieve.	 Goal
Requirement	A statement of need that must be realized by a system.	 Requirement 
Constraint	A restriction on the way in which a system is realized.	 Constraint 
Principle	A normative property of all systems in a given context, or the way in which they are realized.	 Principle

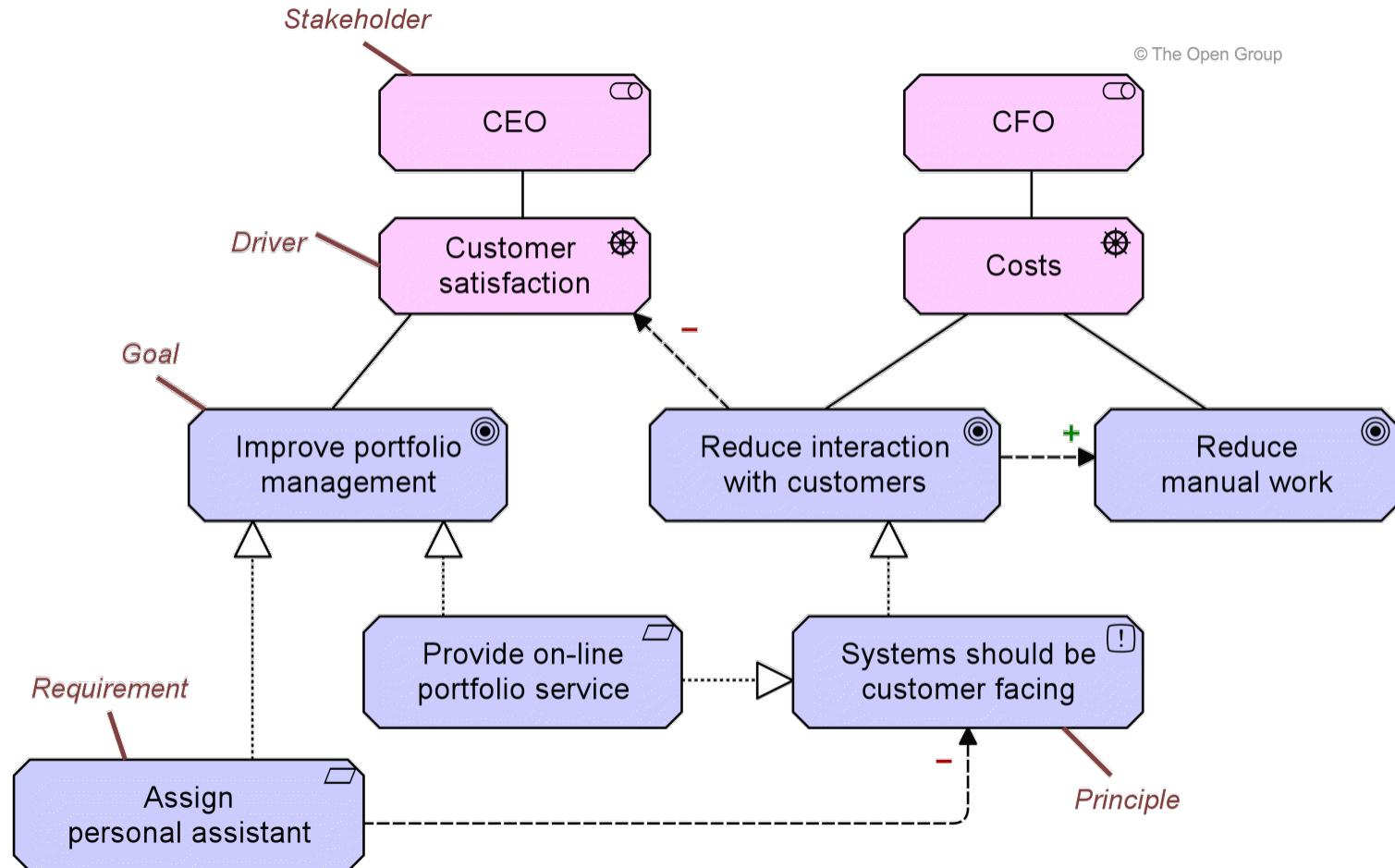


Business Motivation Meta-model

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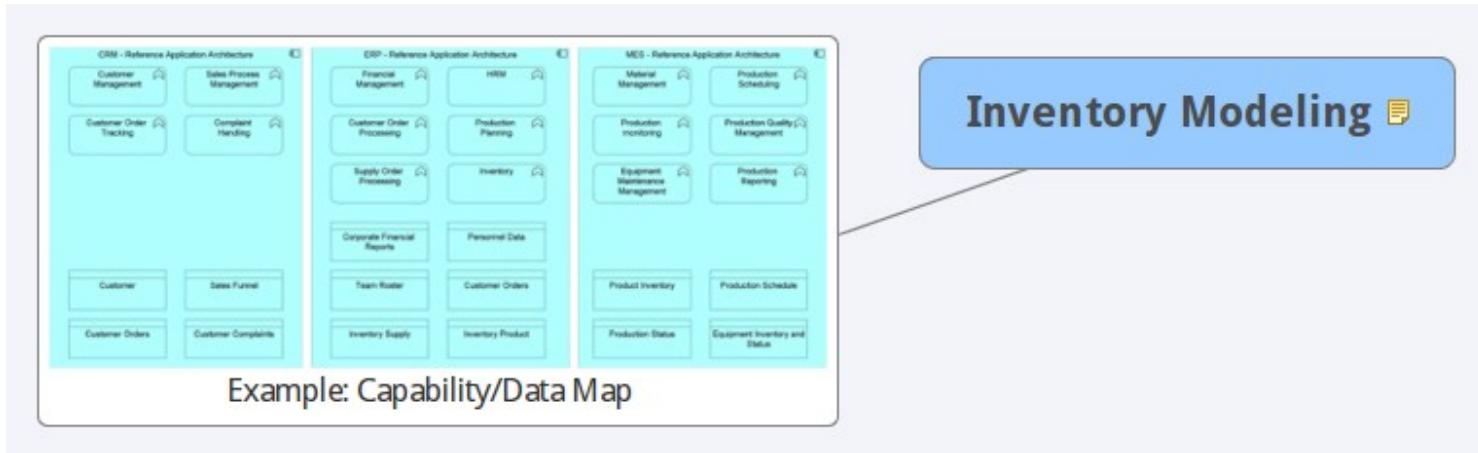


Example: Motivation/Context Map

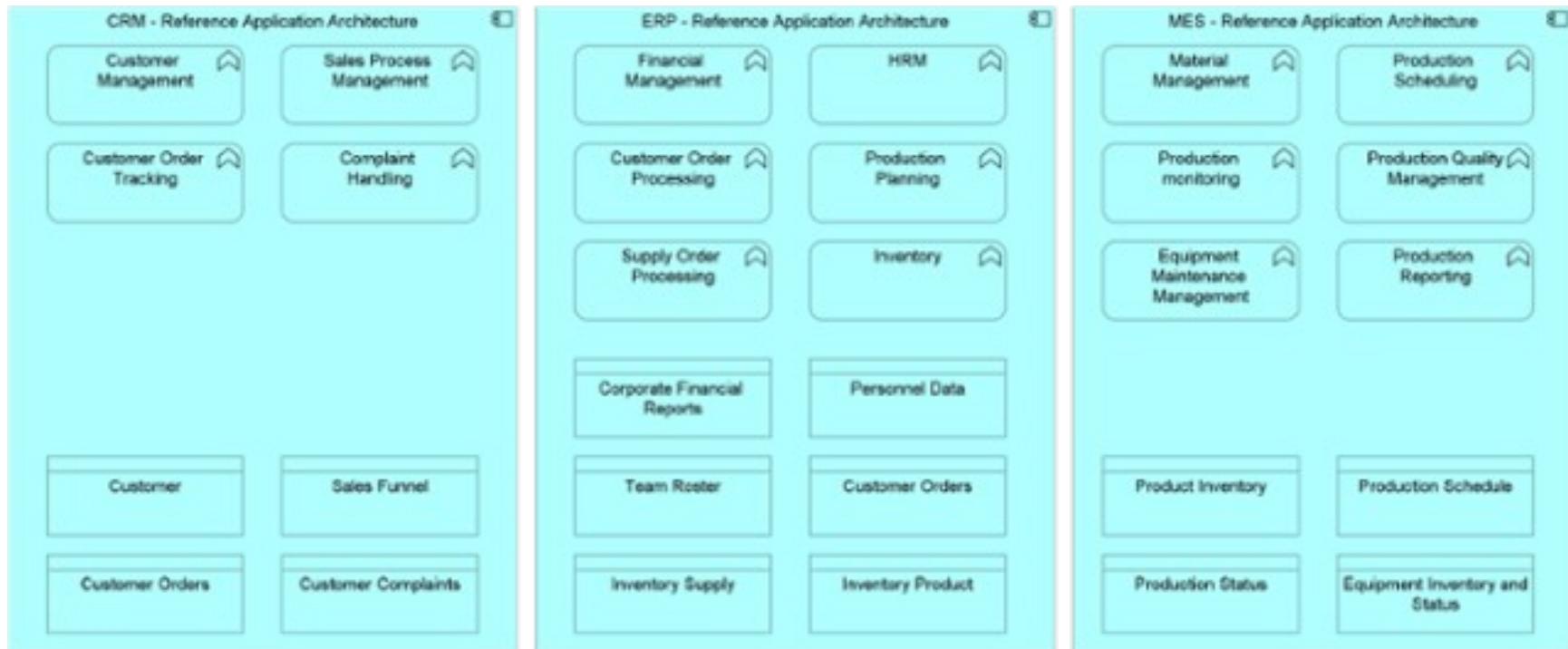


Inventory Modeling

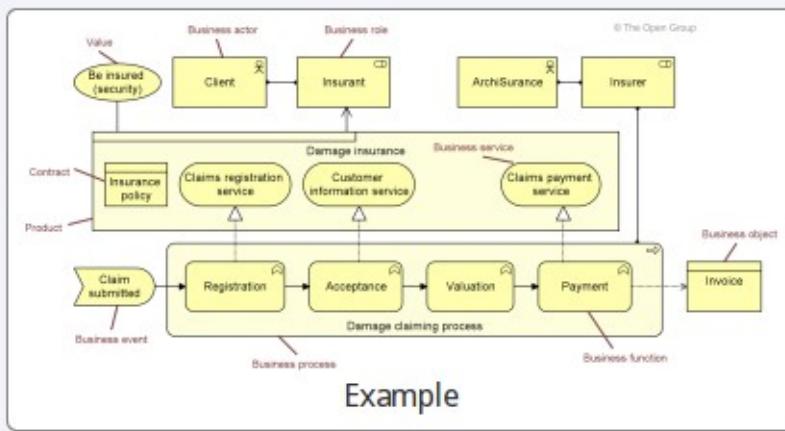
- ex. Capabilities Map
- ex. Data Map
- ex. Organization Map
- ex. Key Processes / Value Map
- (...)



Example: Capability/Data Map



Row 2: Business Modeling



- Business Process Models
- Business Function Allocation
- Elimination of Function Overlap and Ambiguity

THE ARCHIMATE FRAMEWORK	DATA	PROCESS	STRUCTURE	PEOPLE	TIME	CONTEXT
SCOPE	Requirements in the business	Process the business functions	Establish a context for the business	Participate in the business	Handle time in the business	Business model example
BUSINESS MODEL	Business Model	Business Function	Business Context	Business People	Business Time	Business Structure
INTER-BODS	Business Model	Business Function	Business Context	Business People	Business Time	Business Structure
TECHNOLOGY BODY	Physical World	System Design	Technology Architecture	Information Architecture	Data Structures	Real World
OPTIONAL FOUNDATION	Infrastructure	Program	Business Logic	Human Resources	Usage Patterns	Non-functional
FUNCTIONING ENTERPRISE	Data	Process	Context	Information Flow	Schedule	Value Proposition

Row 2: Business Modeling

Archimate Modeling of BUSINESS/INFORMATION Layer



Row 2: Business Modeling

Function/How:

Business processes

Data/What

Business data definition (i.e. information objects bounded in time)

People/Who

Roles and responsibilities in each process

Network/Where

Locations related to each process

Time/When

Events for each process and sequencing of integration and process improvements

Motivation/Why

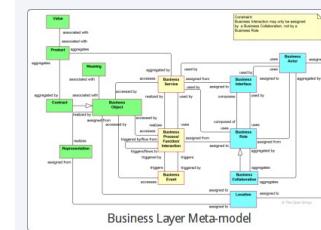
Policies, procedures and standards for each process



Archimate Modeling of BUSINESS/INFORMATION Layer

The Business layer offers products and services to external customers, which are realised in the organisation by business processes performed by business actors.

In the Business Layer, data is represented as information (i.e. data in context).



Concept	Description	Notation
Business event	Something that happens in the business world and influences behavior	
Business service	A service that fulfills a business need for a customer or partner or extend to the external environment	
Business object	A passive element that has reference from a business process	
Representation	A perceptible form of the information carried by a business object	
Meaning	The knowledge or mental picture that a person has of its representation, gives a personal interpretation	
Value	The relative worth, value, or importance of a business service or product	
Product	A coherent collection of services, accompanied by a contract, that is offered to a customer or partner or extend to the external environment	
Contract	A formalized specification of agreement that defines the rights and obligations associated with a product	

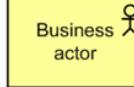
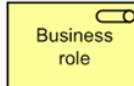
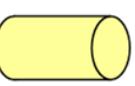
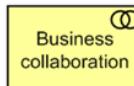
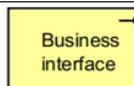
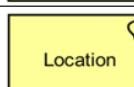
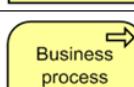
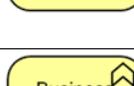
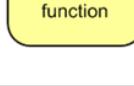
Archimate Modeling of BUSINESS/INFORMATION Layer

Concept	Description	Notation
Business actor	An organizational entity performing behavior	
Business rule	The responsibility for performing specific tasks can be assigned	
Business collaboration	An aggregate of two or more business actors that work together to perform a task	
Business interface	A point of access where a business actor can make available to the outside world a defined set of products or services	
Location	A conceptual point or extent in space	
Business process	A behavior element that defines a sequence of activities. It includes a set of resources and/or a defined set of products or services	
Business function	A behavior element that defines a set of activities within a chosen set of criteria	
Business interaction	A behavior element that defines a sequence of interactions of a business collaboration	

Business/Information Layer Concepts (1/2)

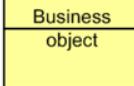
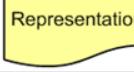
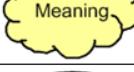
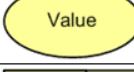
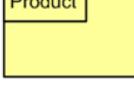
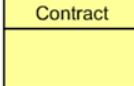


Business/Information Layer Concepts (1/2)

Concept	Description	Notation
Business actor	An organizational entity that is capable of performing behavior.	 
Business role	The responsibility for performing specific behavior, to which an actor can be assigned.	 
Business collaboration	An aggregate of two or more business roles that work together to perform collective behavior.	 
Business interface	A point of access where a business service is made available to the environment.	  
Location	A conceptual point or extent in space.	 
Business process	A behavior element that groups behavior based on an ordering of activities. It is intended to produce a defined set of products or business services.	 
Business function	A behavior element that groups behavior based on a chosen set of criteria (typically required business resources and/or competences).	 
Business interaction	A behavior element that describes the behavior of a <u>business</u> collaboration.	 

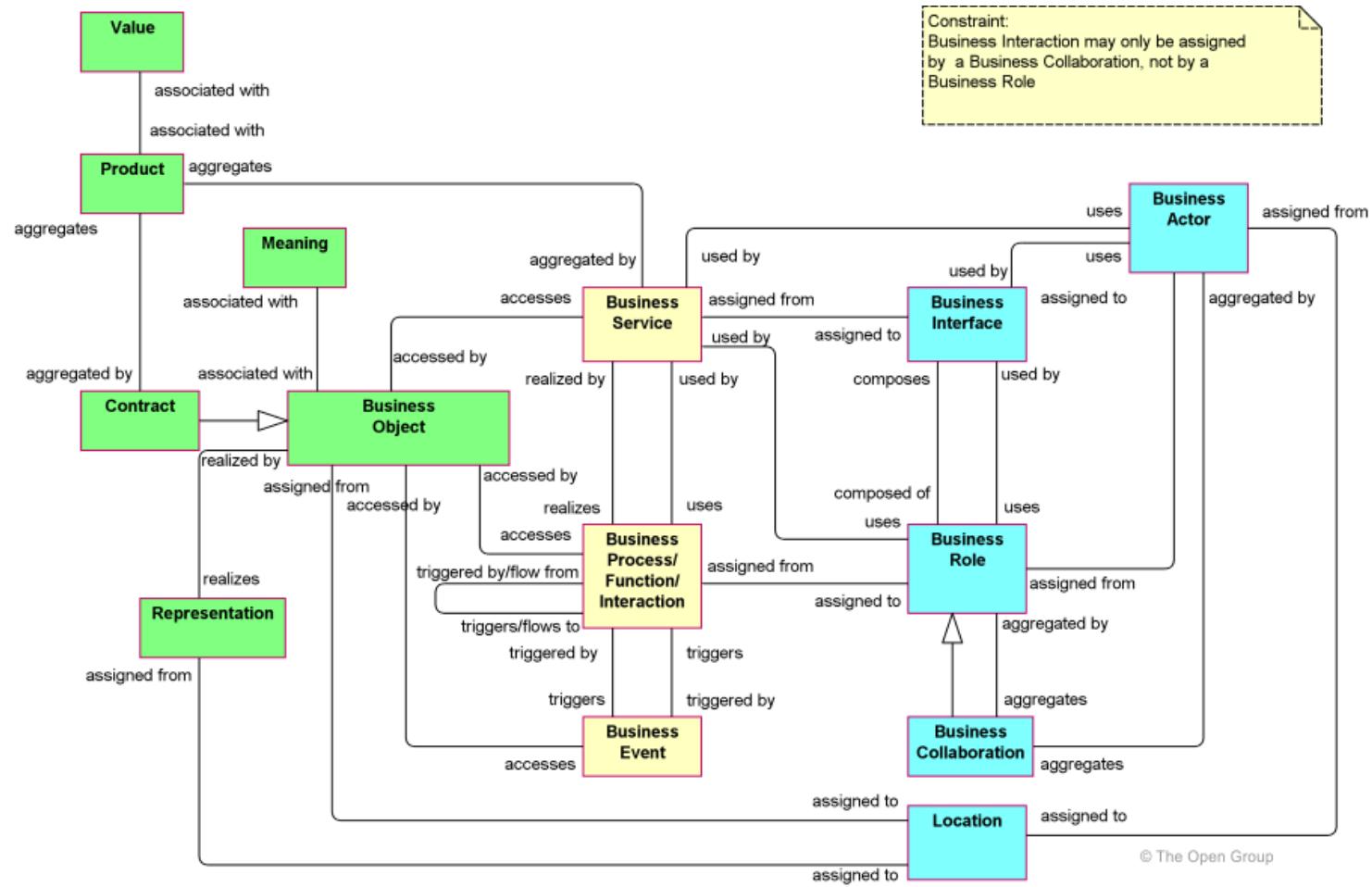


Business Layer Concepts (2/2)

Concept	Description	Notation
Business event	Something that happens (internally or externally) and influences behavior.	
Business service	A service that fulfills a business need for a customer (internal or external to the organization).	
Business object	A passive element that has relevance from a business perspective.	
Representation	A perceptible form of the information carried by a business object.	
Meaning	The knowledge or expertise present in a business object or its representation, given a particular context.	
Value	The relative worth, utility, or importance of a business service or product.	
Product	A coherent collection of services, accompanied by a contract/set of agreements, which is offered as a whole to (internal or external) customers.	
Contract	A formal or informal specification of agreement that specifies the rights and obligations associated with a product.	



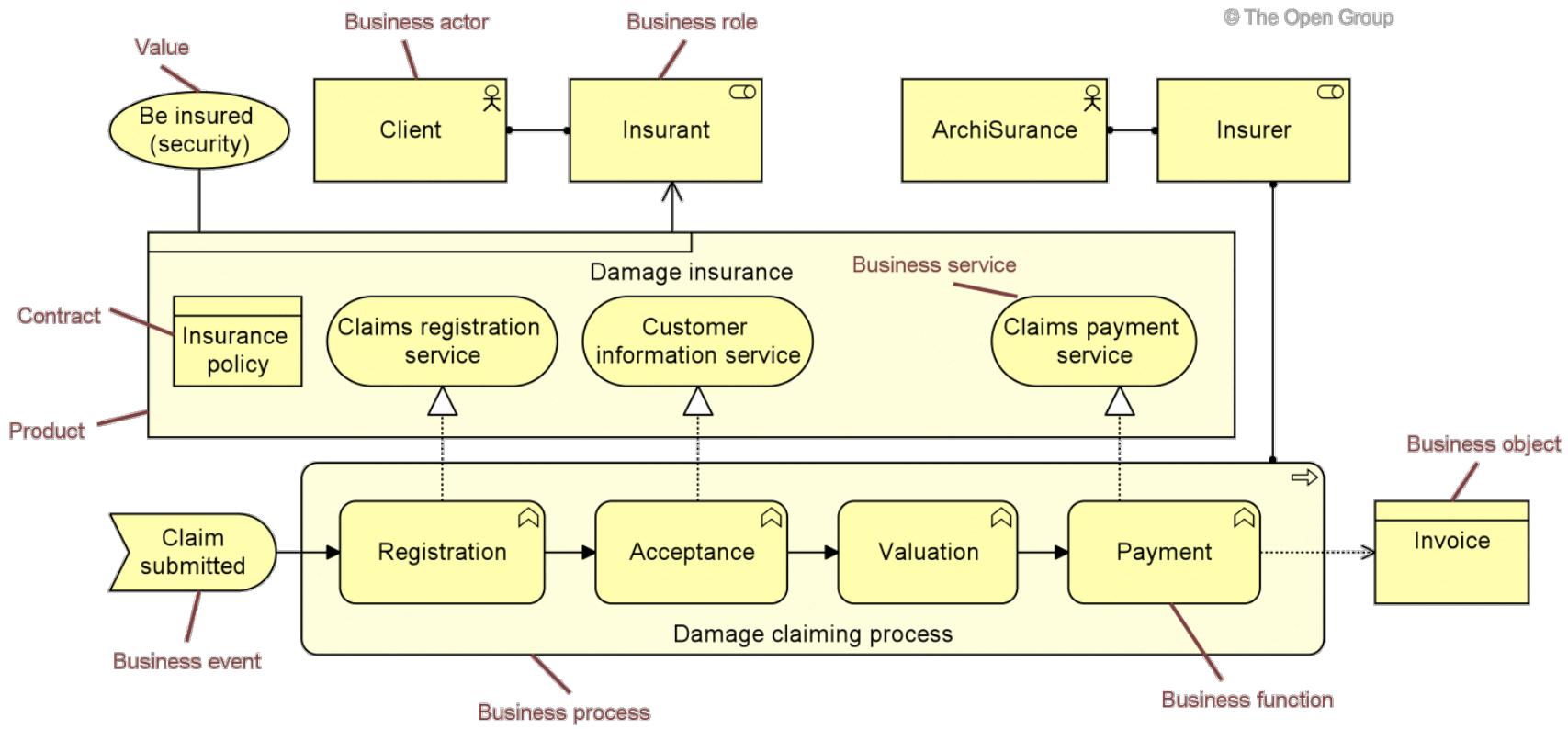
Business Layer Meta-model



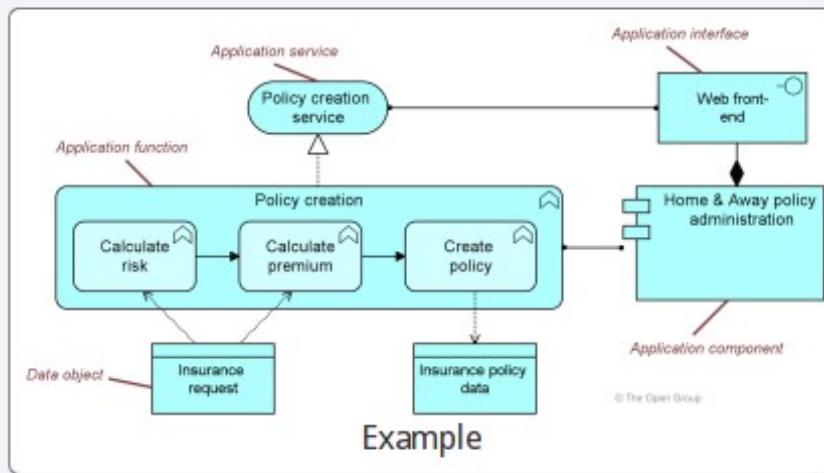
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Example



Row 3: System Modeling



Archimate MOdeling of APPLICATION/DATA Layer

- Logical Models
- Project Management
- Requirements Definition

The Guidance Framework	SCOPE	DATA	FUNCTION	STRUCTURE	PERFORMANCE	TIME	BUSINESS
SCOPE	Define the scope of the business	Data objects	Business functions	Business entities	Performance metrics	Time frames	Business objects
DATA	Design data models	Data objects	Business processes	Business entities	Performance metrics	Time frames	Business objects
FUNCTION	Design functional requirements	Functional requirements	Business processes	Business entities	Performance metrics	Time frames	Business objects
STRUCTURE	Design system architecture	Physical data models	Business objects	Technological architecture	Performance architecture	Time frames	Business objects
PERFORMANCE	Define performance	Performance	Business processes	Technological architecture	Performance metrics	Time frames	Business objects
TIME	Define time frames	Time frames	Business processes	Performance architecture	Performance metrics	Time frames	Business objects
BUSINESS	Business objects	Business objects	Business processes	Performance metrics	Time frames	Business objects	Business objects

Row 3: System Modeling



Row 3: System Modeling

Function/How:

Logical representation of information systems and their relationships.

Data/What:

Conceptual/Logical data models of data and data relationships underlying information.

People/Who:

Logical representation of access privileges constrained by roles and responsibilities.

Network/Where:

Logical representation of the distributed system architecture for locations.

Time/When:

Logical events and their triggered responses constrained by business events and their responses.

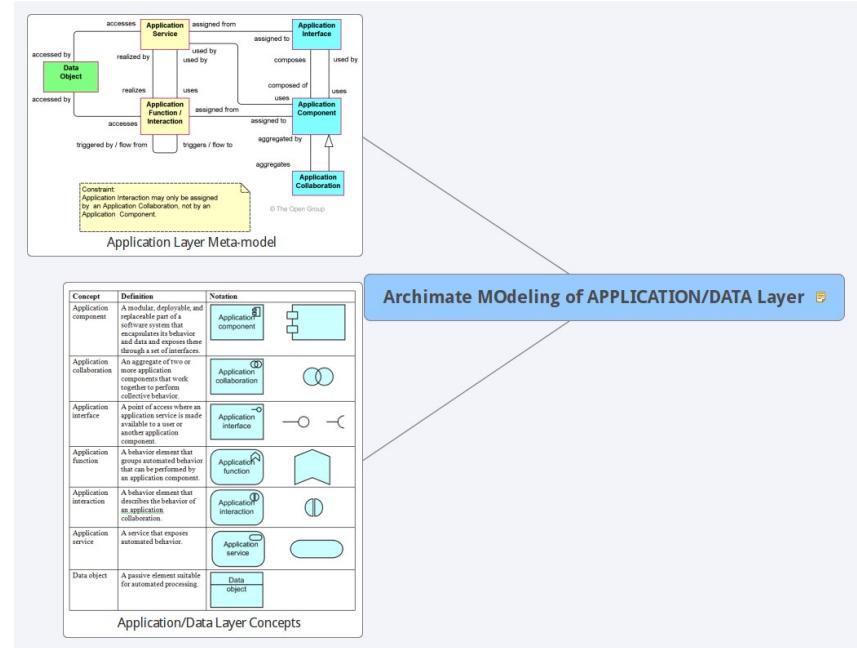
Motivation/Why:

Policies, standards and procedures associated with a business rule model.

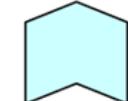
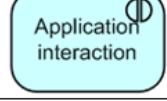
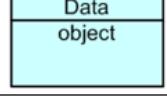


Archimate MOdeling of APPLICATION/DATA Layer

The Application layer supports the business layer with application services which are realised by (software) applications.

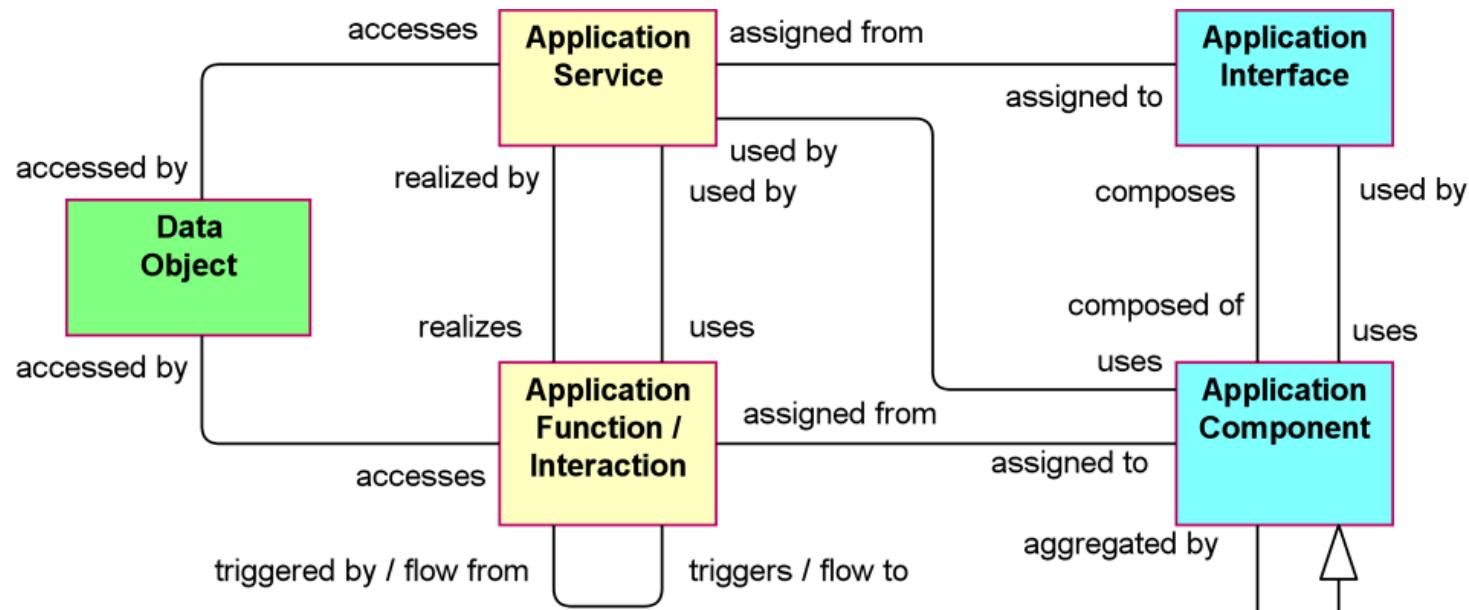


Application/Data Layer Concepts

Concept	Definition	Notation
Application component	A modular, deployable, and replaceable part of a software system that encapsulates its behavior and data and exposes these through a set of interfaces.	 
Application collaboration	An aggregate of two or more application components that work together to perform collective behavior.	 
Application interface	A point of access where an application service is made available to a user or another application component.	  
Application function	A behavior element that groups automated behavior that can be performed by an application component.	 
Application interaction	A behavior element that describes the behavior of an application collaboration.	 
Application service	A service that exposes automated behavior.	 
Data object	A passive element suitable for automated processing.	



Application Layer Meta-model

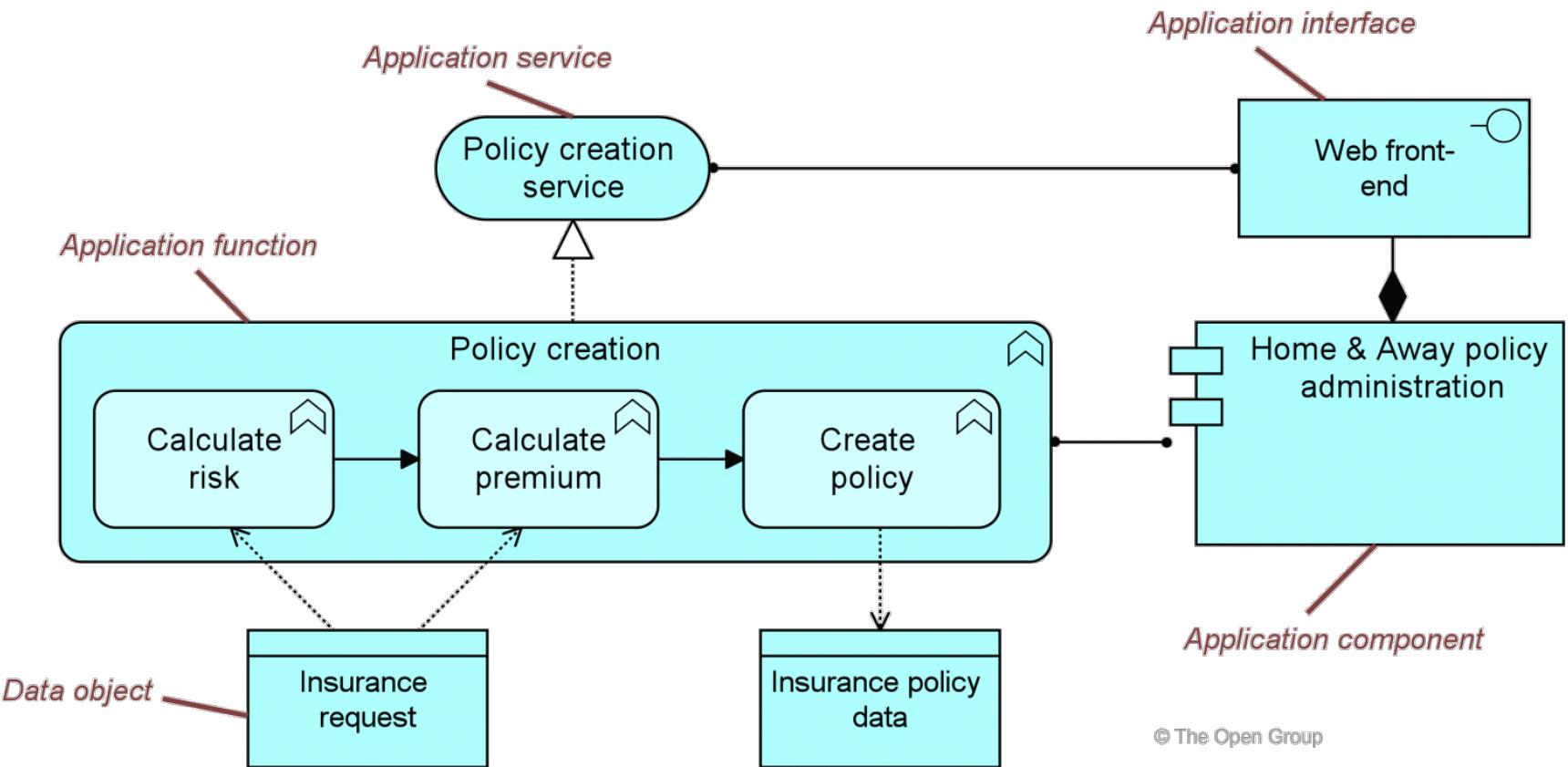


Constraint:
Application Interaction may only be assigned
by an Application Collaboration, not by an
Application Component.

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Example



Row 4: Technology/Infrastructure Modeling

The diagram illustrates the Archimate modeling of the Technology/Infrastructure Layer. It features a central node labeled 'Mainframe' containing 'CICS' and 'DBMS'. This node is connected to a 'LAN' (Local Area Network) and an 'NAS file server'. The 'NAS file server' is connected to 'Data files'. Above the Mainframe node, a 'System software' layer contains a 'Database service' and a 'File access service'. A 'Device' layer connects the Mainframe to the NAS file server. Annotations include 'Infrastructure service' pointing to the Database service, 'Node' pointing to the Mainframe, 'Network' pointing to the LAN, 'Artifact' pointing to the Data files, and 'Device' pointing to the connection between the Mainframe and the NAS file server.

Archimate Modeling of TECHNOLOGY/INFRASTRUCTURE Layer

- Physical Models
- Technology Management
- Solution Definition and Development

The Reference Framework	DATA LAYER	FUNCTIONAL LAYER	APPLICATION LAYER	BUSINESS LAYER	TECHNOLOGY LAYER	IMPLEMENTATION LAYER
SCORING	Performance	Performance	Performance	Business Object	Technology	Architecture
BUSINESS MODEL	Change	Business Model	Business Model	Business Model	Technology	Architecture
ENTERPRISE	Object	Object	Object	Data Flow Model	Market Structure	Process Flow
TECHNOLOGY	Physical Model	Physical Model	Physical Model	Object Model	Cloud Services	Code Structure
IMPLEMENTATION	Implementation	Implementation	Implementation	Process Model	Design Patterns	Code Generation
FUNCTIONING	Data	Process	Process	Market Share	Cloud Services	Deployment

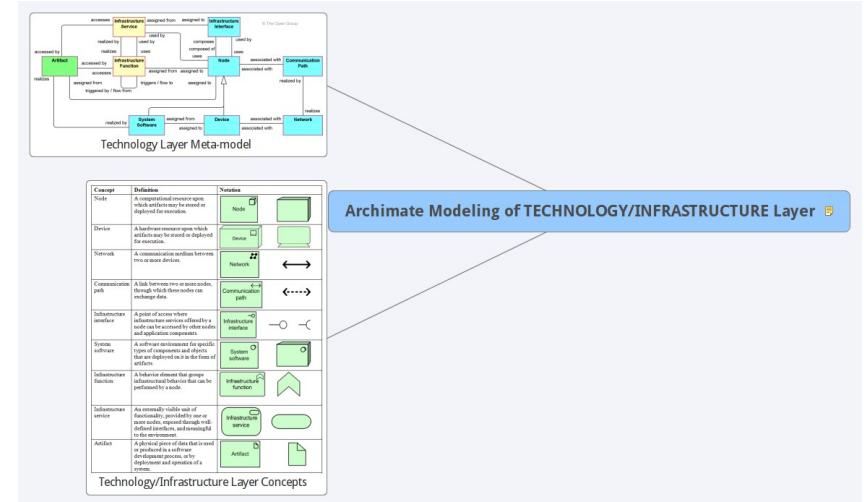
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Row 4: Technology/Infrastructure Modeling

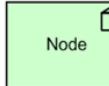
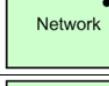
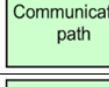
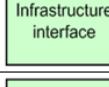
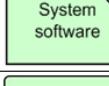
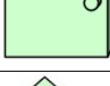
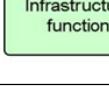


Archimate Modeling of TECHNOLOGY/INFRASTRUCTURE Layer

The Technology layer offers infrastructure services (e.g., processing, storage and communication services) needed to run applications, realised by computer and communication hardware and system software.

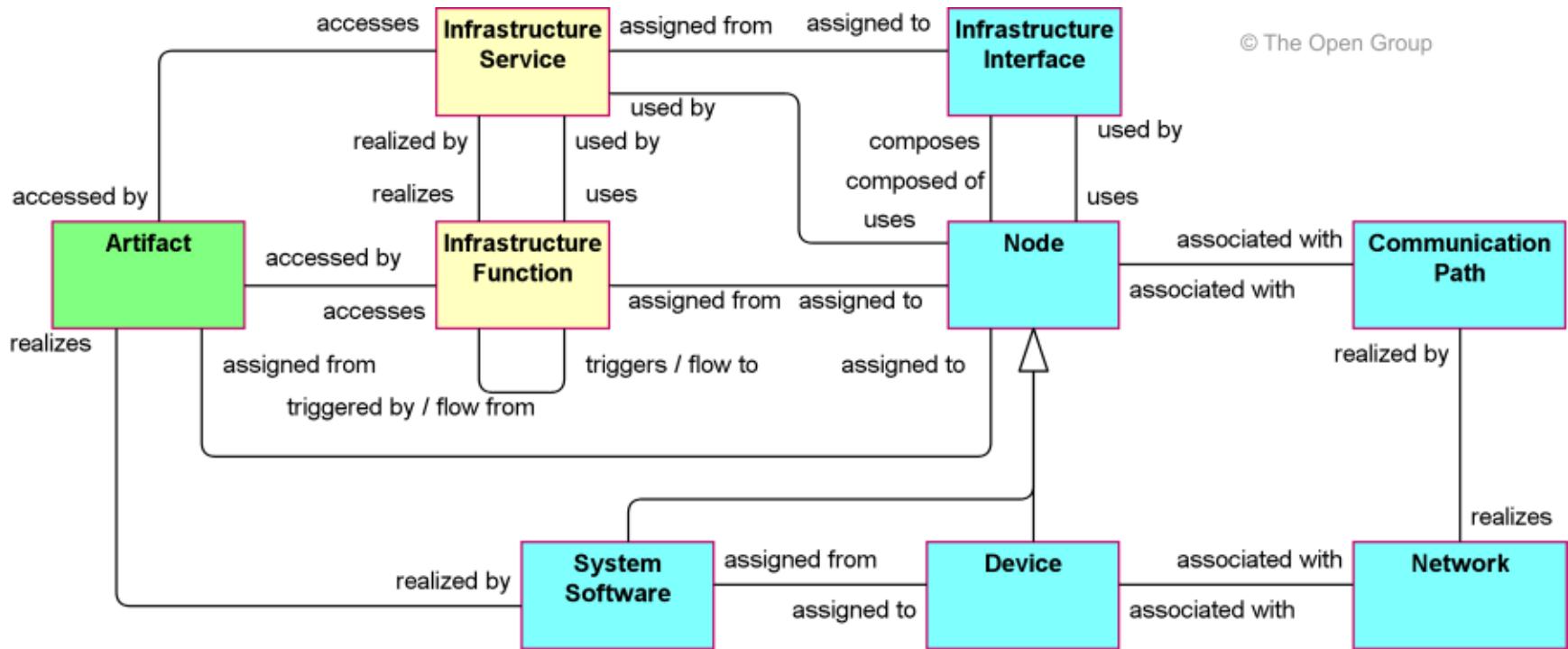


Technology/Infrastructure Layer Concepts

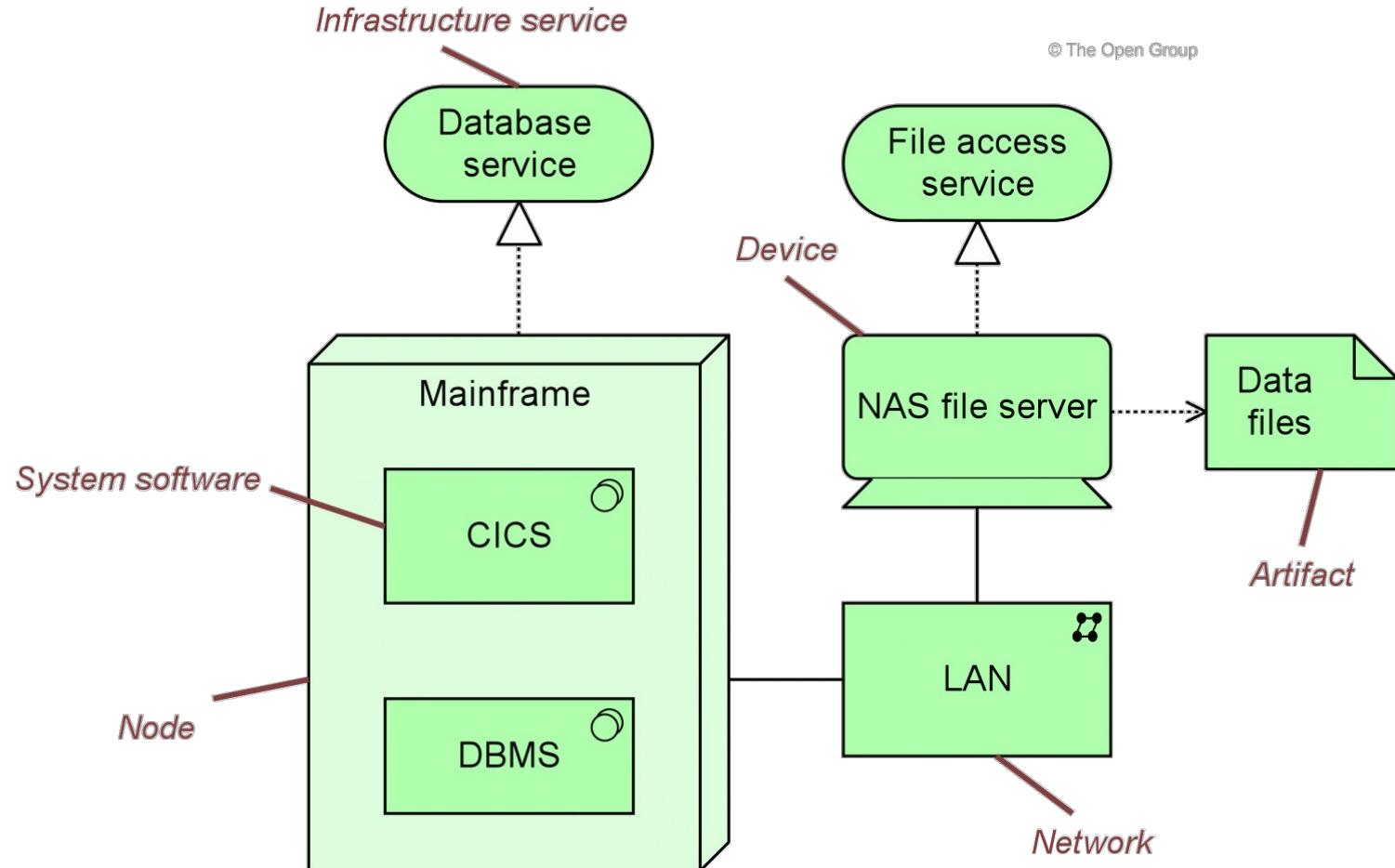
Concept	Definition	Notation
Node	A computational resource upon which artifacts may be stored or deployed for execution.	 
Device	A hardware resource upon which artifacts may be stored or deployed for execution.	 
Network	A communication medium between two or more devices.	 
Communication path	A link between two or more nodes, through which these nodes can exchange data.	 
Infrastructure interface	A point of access where infrastructure services offered by a node can be accessed by other nodes and application components.	  
System software	A software environment for specific types of components and objects that are deployed on it in the form of artifacts.	 
Infrastructure function	A behavior element that groups infrastructural behavior that can be performed by a node.	 
Infrastructure service	An externally visible unit of functionality, provided by one or more nodes, exposed through well-defined interfaces, and meaningful to the environment.	 
Artifact	A physical piece of data that is used or produced in a software development process, or by deployment and operation of a system.	 



Technology Layer Meta-model



Example



Row 5: Deployment Modeling

Archimate Modeling of Implementation/Allocation

Mapping of APPLICATION/TECHNOLOGY Layers

- Configuration Management
- Integration
- Testing
- Deployment

Implementation Environment	Data Layer	Process Layer	Business Layer	People Layer	Asset Layer	Supporting Layer
SCOPE	For architecture in the business	Business Application	Business entities	Individuals involved in the business	Business objects	Business dependencies
BUSINESS MODEL	Customer model	Business Process Model	Business entities	Individuals involved in the business	Business objects	Business dependencies
ENTERPRISE	Value chain	Business Process Model	Business entities	Individuals involved in the business	Business objects	Business dependencies
TECHNOLOGY	Physical layer	Information systems	Business entities	Individuals involved in the business	Business objects	Business dependencies
DETAILED IMPLEMENTATION	Architecture	Design	System architecture	Design artifacts	Code	Code artifacts
FUNCTIONING ENTERPRISE	Data	Process	Entity	Organizational units	Role	Resource

5

Row 5: Deployment Modeling



Row 5: Deployment Modeling

Function/How:

Required libraries, packages, components, modules, services to build and test the application.

Data/What:

Data definitions used for User Acceptance Testing.

Data used for Load Testing.

People/Who:

Access privileges coded to control access to specific platforms and technologies.

Network/Where:

Network devices configured to conform to node specifications.

Time/When:

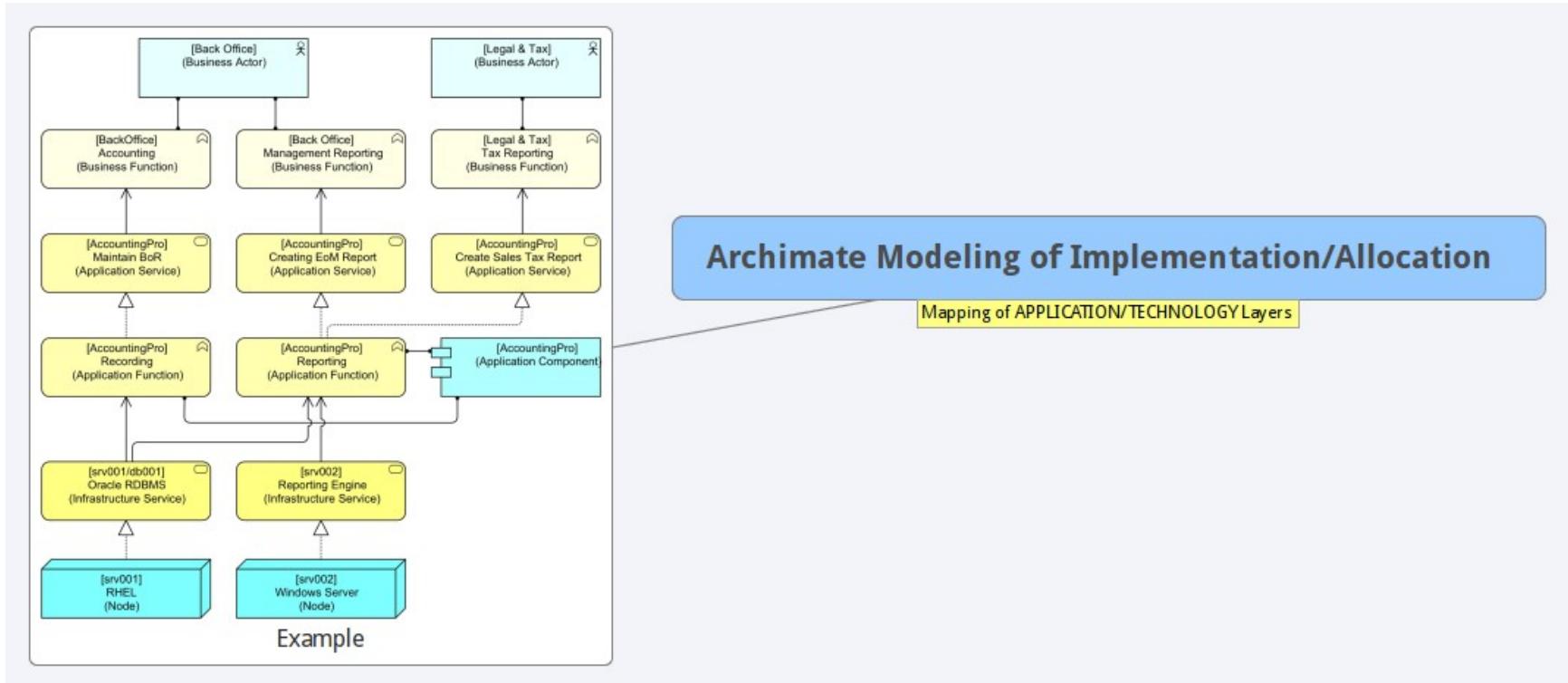
Testing, Verification, sequenced activities to perform on introduced solution.

Motivation/Why:

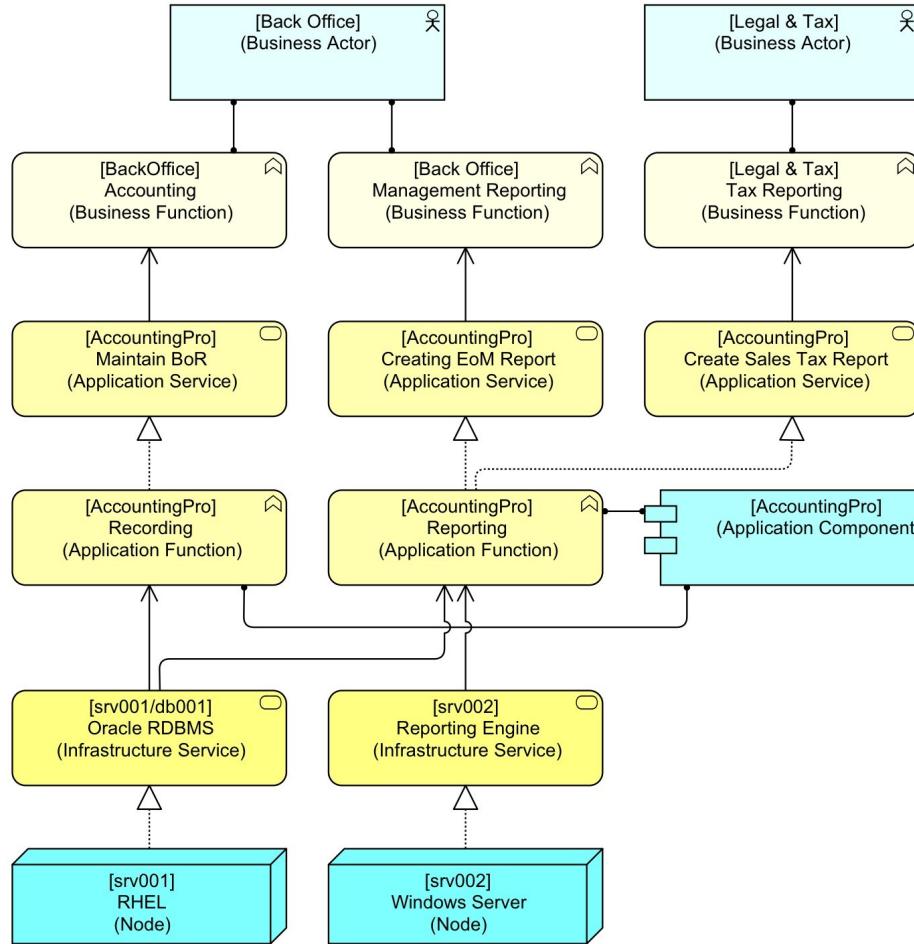
Constraints induced by specific technology standards, versions of software.



Archimate Modeling of Implementation/Allocation



Example



Row 6: Execution/Operation Modeling

Implementation / Migration Extension

- **Architecture Execution**
 - Phases / Increments
 - Projects / Work Packages
- Operations Management
- Evaluation

Execution Framework	Data View	Process View	System View	People View	Tool View	Solution View
SCOPE CONCEPT MODEL	For an Enterprise or its Business	Produce the Business Patterns	Business Process	Implementer's Role in the Business	Participate in Work in the Business	Business Model
BUSINESS MODEL EXPANSION MODEL	Complex Data Model	Business Process Model	Business Logic	Stakeholders	Master Schedules	Business Plan
DATAFLOW MODEL (Logical Design)	Logical Data Model	Relational Database	Object-Oriented Database	Business Rules	Information Model	Business Flow
TECHNOLOGY MODEL (Physical Layer)	Physical Data Model	Business Logic	Technological Architecture	Information Architecture	Cloud Computing	Multi-Cloud
DETAILED EXPRESSION (Implementation)	Architectural	Program	Business Application	Business Logic	Tool Integration	Rule Specification
FUNCTIONING ENTERPRISE	Data	Process	Network	Organizational	Symbolic	Value

6

Row 6: Execution/Operation Modeling



Row 6: Execution/Operation Modeling

Function/How:

- Replacement of existing solution.
- Migration from existing version.
- Introduction of net new solution?
- Planned Architecture/Design increments, projects/program scope definition.

Data/What:

- Conversion of existing data assets.
- Introduction of net new data assets.
- Controls and Reconciliation reports.
- Master data management considerations.

People/Who:

- Development Methodology.
- RACI charts (definition of accountability)
- Smallest unit of value delivered in phases.
- Analysts, Developers, Testers, Administrators, (...)

Network/Where:

- Sending and receiving messages.

Time/When:

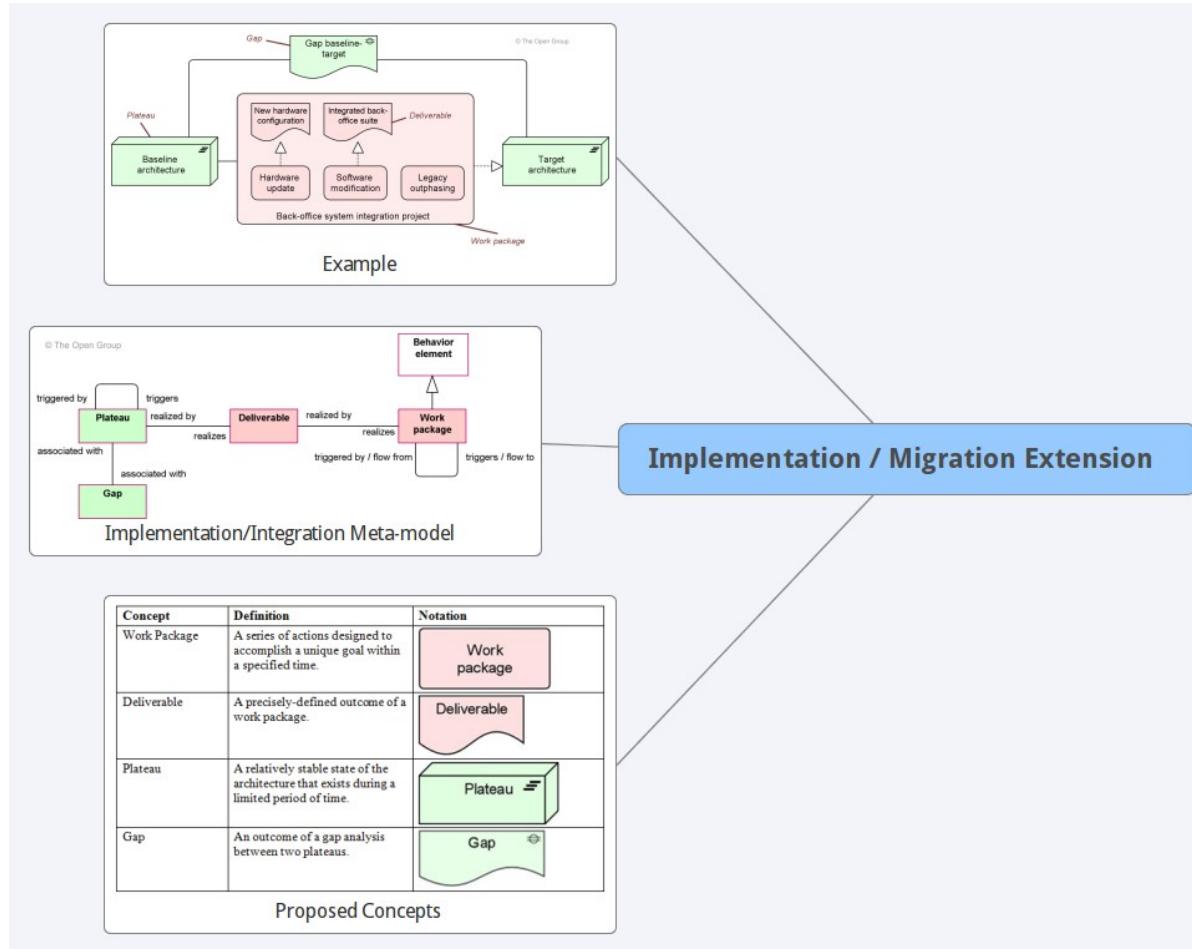
- Operating the solution,
- Failure scenarios.
- Troubleshooting strategies.

Motivation/Why:

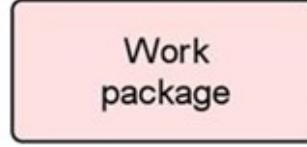
- Flexibility, Extensibility of design.
- What to watch out for if expanding the architecture.



Implementation / Migration Extension



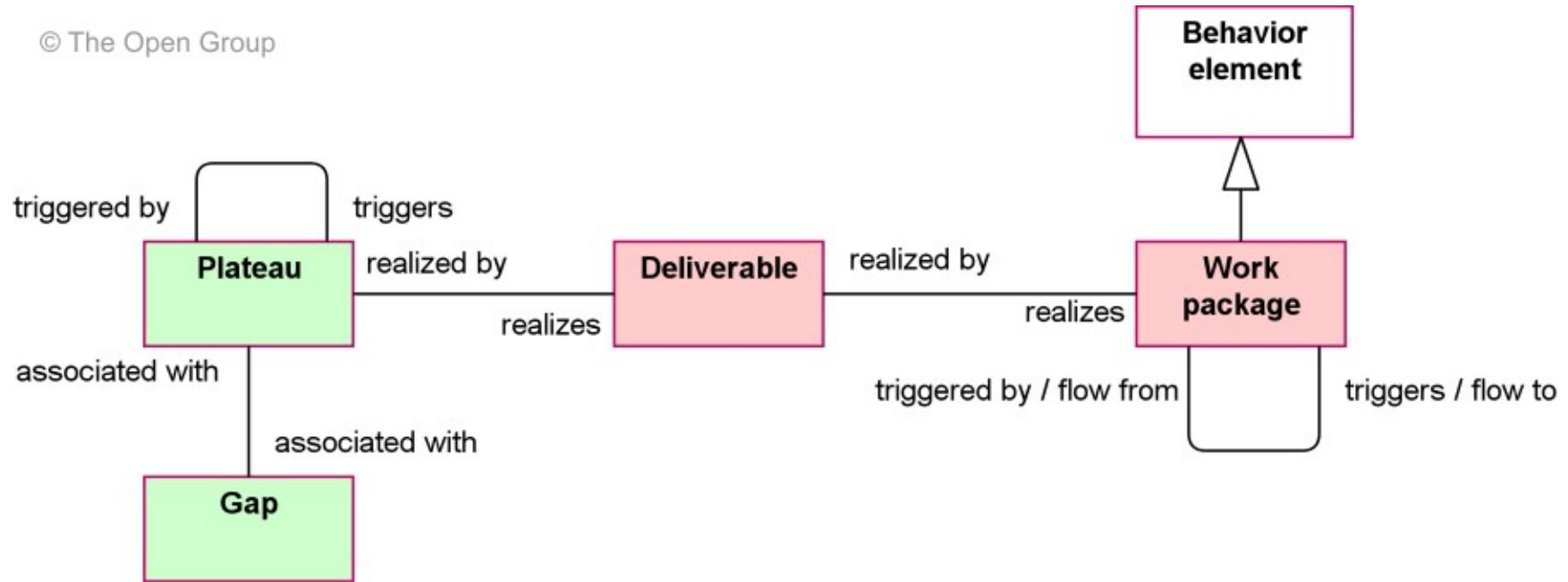
Proposed Concepts

Concept	Definition	Notation
Work Package	A series of actions designed to accomplish a unique goal within a specified time.	
Deliverable	A precisely-defined outcome of a work package.	
Plateau	A relatively stable state of the architecture that exists during a limited period of time.	
Gap	An outcome of a gap analysis between two plateaus.	

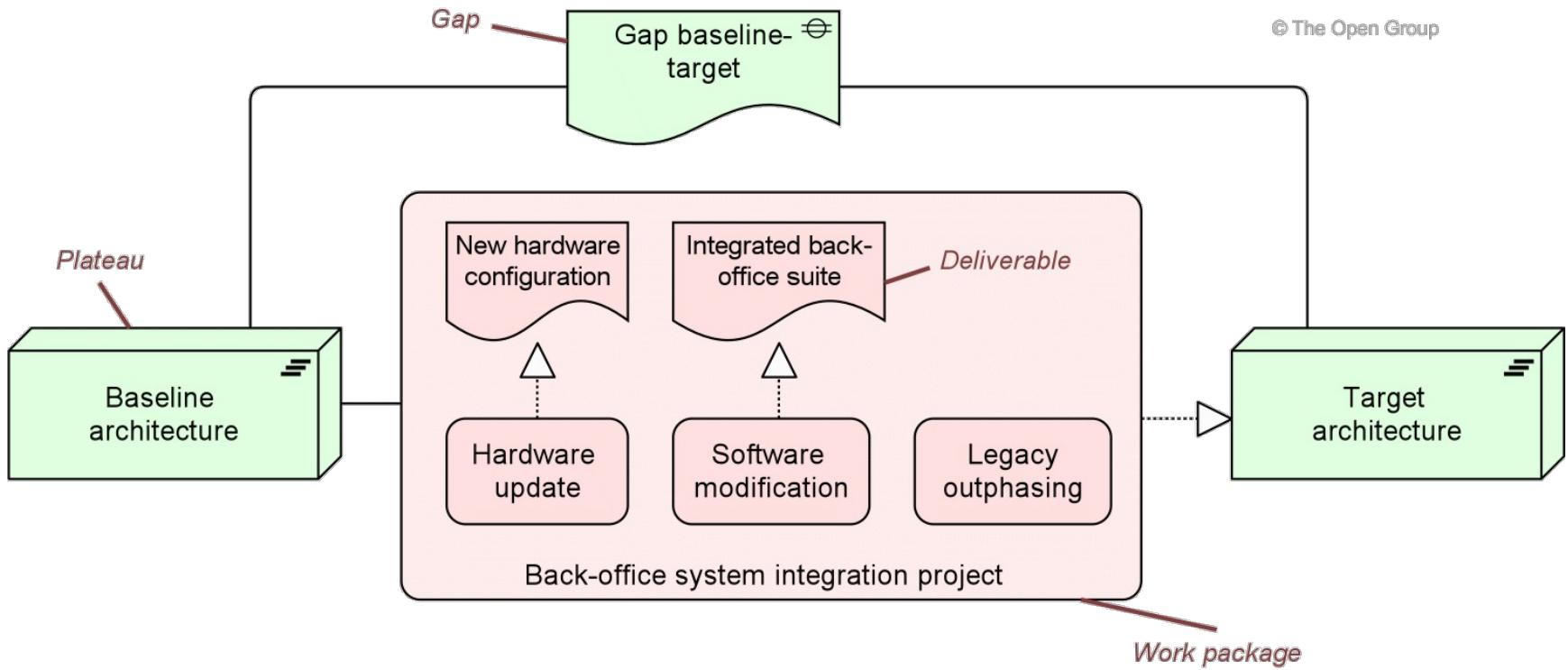


Implementation/Integration Meta-model

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Example



Modeling Viewpoints

Some Extended Viewpoints

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ArchiMate Extension Viewpoints

Viewpoint	Type	Description
Stakeholder	Motivation Extension	This viewpoint allows the analyst to model stakeholders, the internal and external drivers for change, and the assessments (in terms of strengths, weaknesses, opportunities, and threats).
Goal Realization	Motivation Extension	This viewpoint allows a designer to model the refinement of (high-level) goals into more concrete goals, and the refinement of concrete goals into requirements or constraints that describe how the system must behave.
Goal Contribution	Motivation Extension	This viewpoint allows a designer or analyst to model the influence relationship between goals and requirements.
Principles	Motivation Extension	This viewpoint allows the analyst or designer to model the principles that are relevant to the design problem at hand, including the goals that motivate these principles.
Requirements Realization	Motivation Extension	This viewpoint allows the designer to model the realization of requirements by the core elements of the architecture, such as systems, components, data stores, services, application services, application components, and infrastructure components.
Motivation	Motivation Extension	This viewpoint is used to analyze or design to model the motivation aspect, without focusing on certain elements within this aspect.
Project	Implementation & Migration Extension	This viewpoint is used to model the management of architecture change.
Migration	Implementation & Migration Extension	This viewpoint shows several concepts that describe the transition from an existing architecture to a desired architecture.
Implementation & Migration	Implementation & Migration Extension	This viewpoint is used to relate programs and projects to the parts of the architecture that they implement.

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Modeling Viewpoints

Some Core Viewpoints

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ArchiMate Standard Viewpoints

Viewpoint	Description
Introductory	This viewpoint uses a simplified notation to explain the essence of an architecture model to non-architects that require a simpler, more intuitive notation.
Organization	This viewpoint focuses on the internal organization of a company, a department, a network of companies, or another organizational entity.
Actor Co-operation	This viewpoint shows the relationships of actors with each other and their environment.
Business Function	This viewpoint shows the main business functions of an organization and their relationships in terms of the flows of information, value, or goods between them.
Business Process	This viewpoint shows the internal structure and composition of one or more business processes.
Business Process Co-operation	This viewpoint shows the relationship of one or more business processes with each other and with their environment.
Product	This viewpoint describes the value that one or more products offer to the customers or other external parties involved and shows the value of the products in terms of the consulting (business or application) services, and the associated contracts (or other agreements).
Application Behavior	This viewpoint describes the internal behavior of an application, e.g., as it realizes one or more application services.
Application Co-operation	This viewpoint shows the relationships between applications components in terms of the information flows between them, or in terms of the services they offer and use.
Application Structure	This viewpoint shows the structure of one or more applications or components.
Application Usage	This viewpoint describes how applications are used to support one or more business processes, and how they are used by other business processes.
Infrastructure	This viewpoint describes the structure of hardware infrastructure elements supporting the application layer, such as physical devices, system software, and networks.
Infrastructure Usage	This viewpoint shows how applications are supported by the software and hardware infrastructure (the infrastructure services are delivered by the devices, system software and networks are provided to the applications).
Implementation and Deployment	This viewpoint shows the structure of the information used in the enterprise or in a specific business process or application, in terms of data types (or object-oriented) class structures.
Information Structure	This viewpoint shows the structure of the information used in the enterprise or in a specific business process or application, in terms of data types (or object-oriented) class structures.
Service Realization	This viewpoint shows how one or more business services are realized by the underlying processes (and sometimes by application components).
Layered	This viewpoint shows several layers and aspects of an enterprise architecture in a single diagram.
Landscape Map	This viewpoint uses a matrix to represent a three-dimensional co-ordinate system describing spatial relationships.

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Some Core Viewpoints

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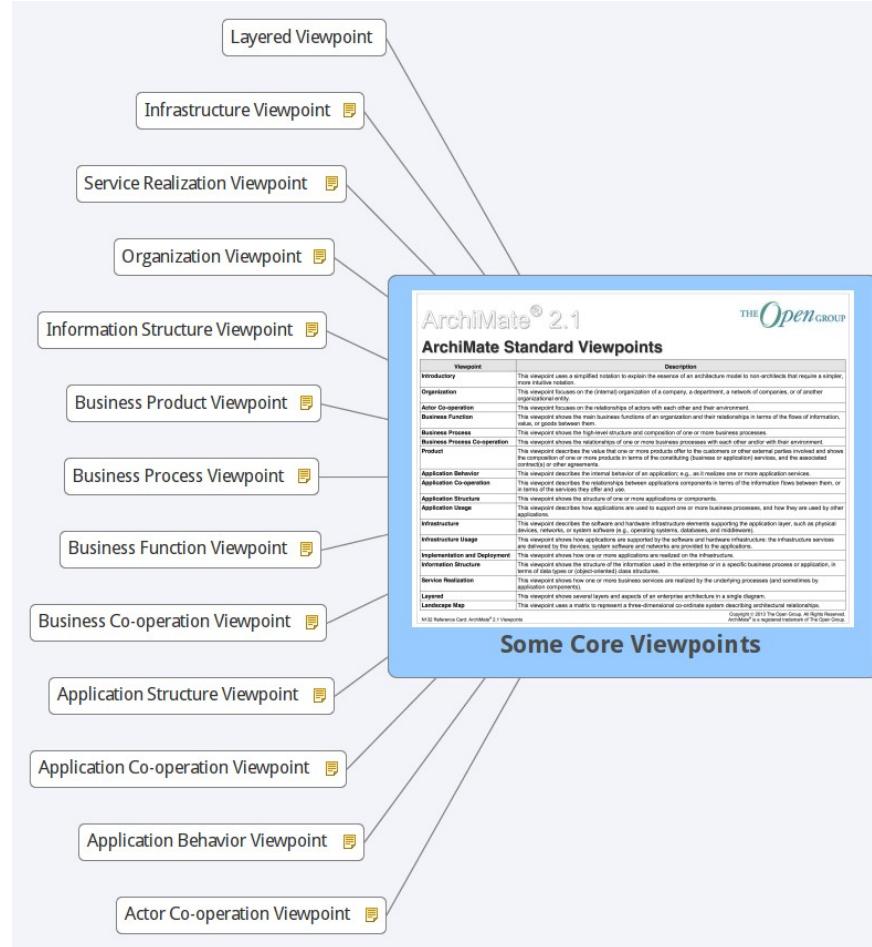
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Business Function	This viewpoint shows the main business functions of an organization and their relationships in terms of the flows of information, value, or goods between them.
Business Process	This viewpoint shows the high-level structure and composition of one or more business processes.
Business Process Co-operation	This viewpoint shows the relationships of one or more business processes with each other and/or with their environment.
Product	This viewpoint describes the value that one or more products offer to the customers or other external parties involved and shows the composition of one or more products in terms of the constituting (business or application) services, and the associated contract(s) or other agreements.
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Application Co-operation	This viewpoint describes the relationships between applications components in terms of the information flows between them, or in terms of the services they offer and use.
Application Structure	This viewpoint shows the structure of one or more applications or components.
Application Usage	This viewpoint describes how applications are used to support one or more business processes, and how they are used by other applications.
Infrastructure	This viewpoint describes the software and hardware infrastructure elements supporting the application layer, such as physical devices, networks, or system software (e.g., operating systems, databases, and middleware).
Infrastructure Usage	This viewpoint shows how applications are supported by the software and hardware infrastructure: the infrastructure services are delivered by the devices; system software and networks are provided to the applications.
Implementation and Deployment	This viewpoint shows how one or more applications are realized on the infrastructure.
Information Structure	This viewpoint shows the structure of the information used in the enterprise or in a specific business process or application, in terms of data types or (object-oriented) class structures.
Service Realization	This viewpoint shows how one or more business services are realized by the underlying processes (and sometimes by application components).
Layered	This viewpoint shows several layers and aspects of an enterprise architecture in a single diagram.
Landscape Map	This viewpoint uses a matrix to represent a three-dimensional co-ordinate system describing architectural relationships.

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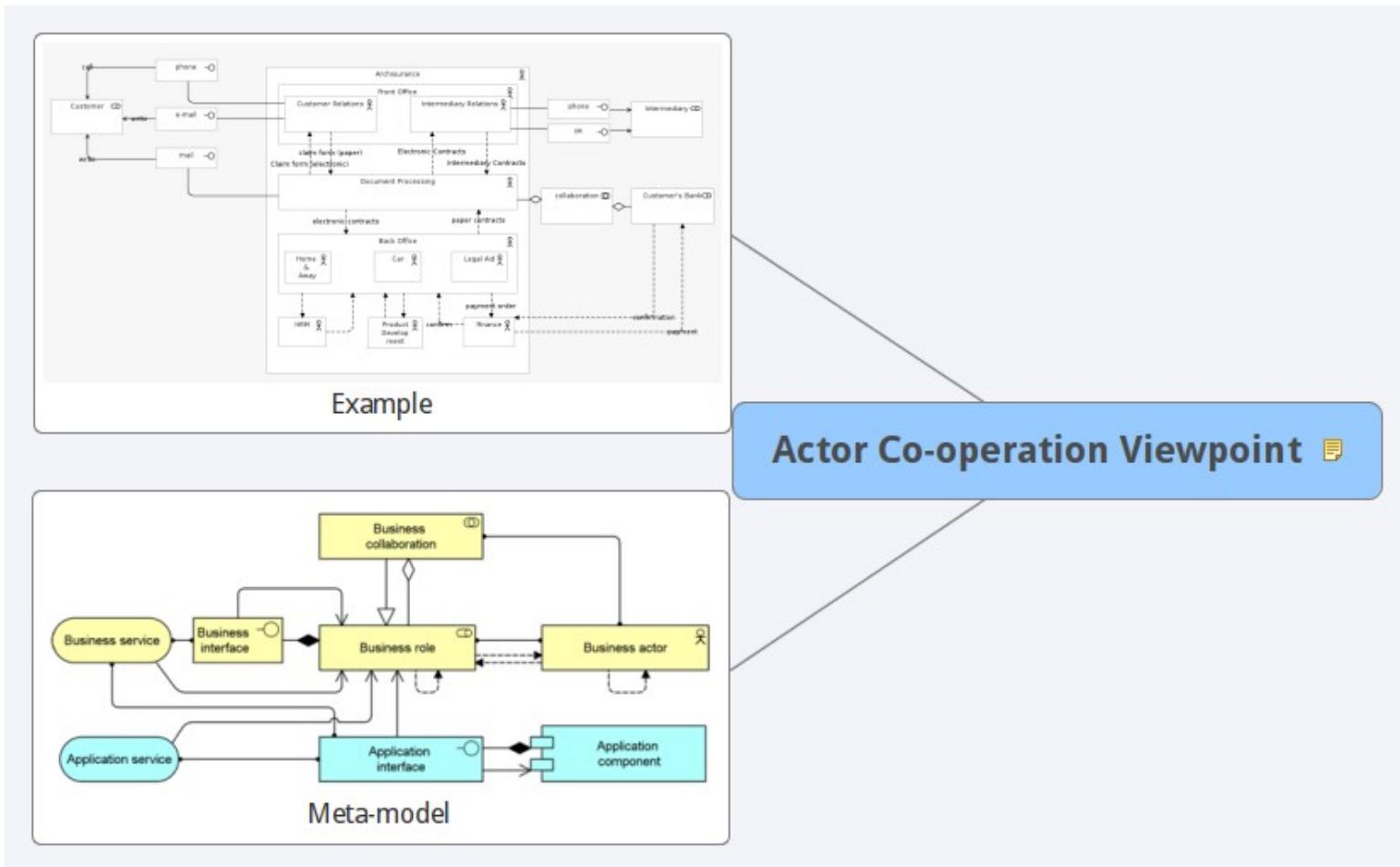
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Some Core Viewpoints



Actor Co-operation Viewpoint



Actor Co-operation Viewpoint

To determine collaborations in the value chain or network in which actors co-operates.

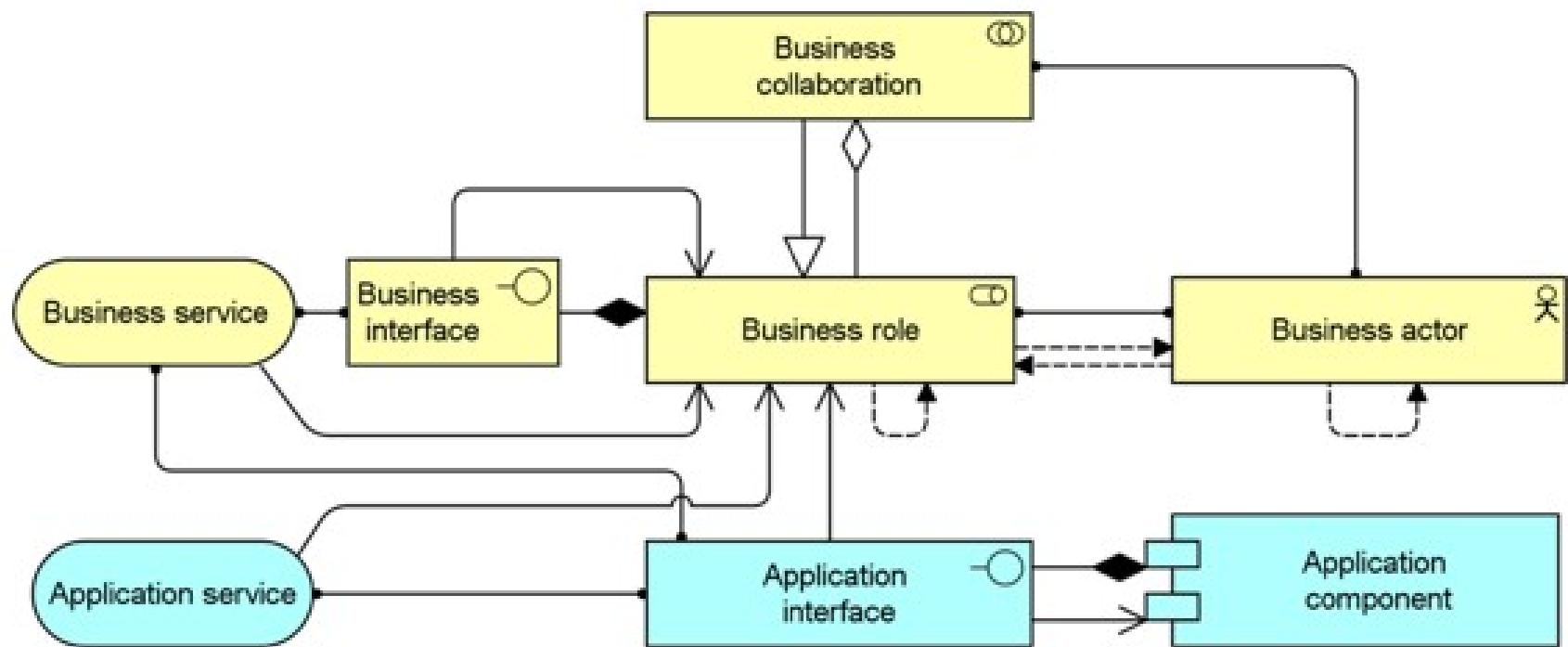
To outline relations of actors (roles, teams, departments) with each other and their environment (third-parties, customers, intermediaries).

To determine internal and external dependencies.

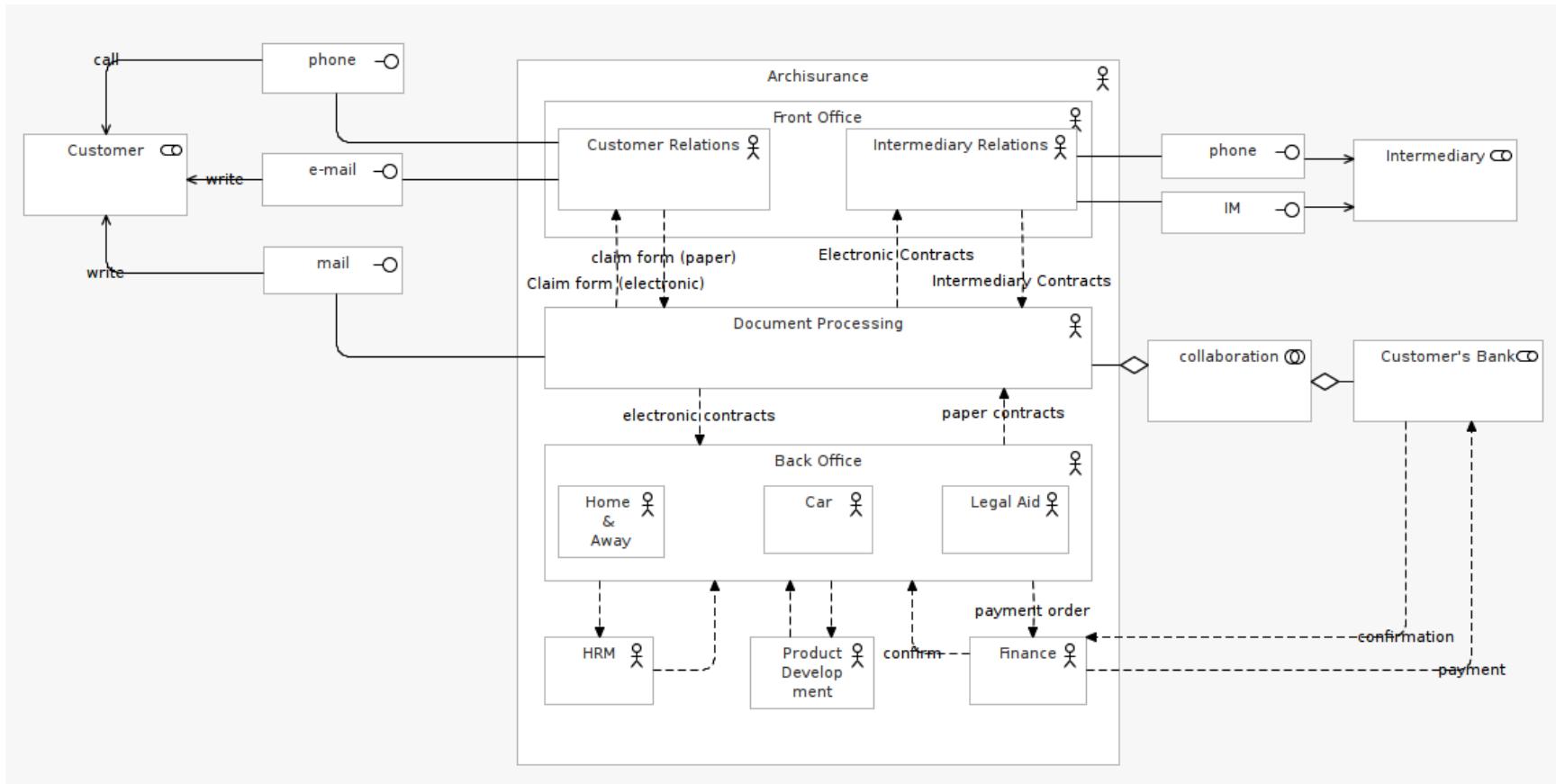
Model-type(s): Context diagrams or Value Chain diagrams.



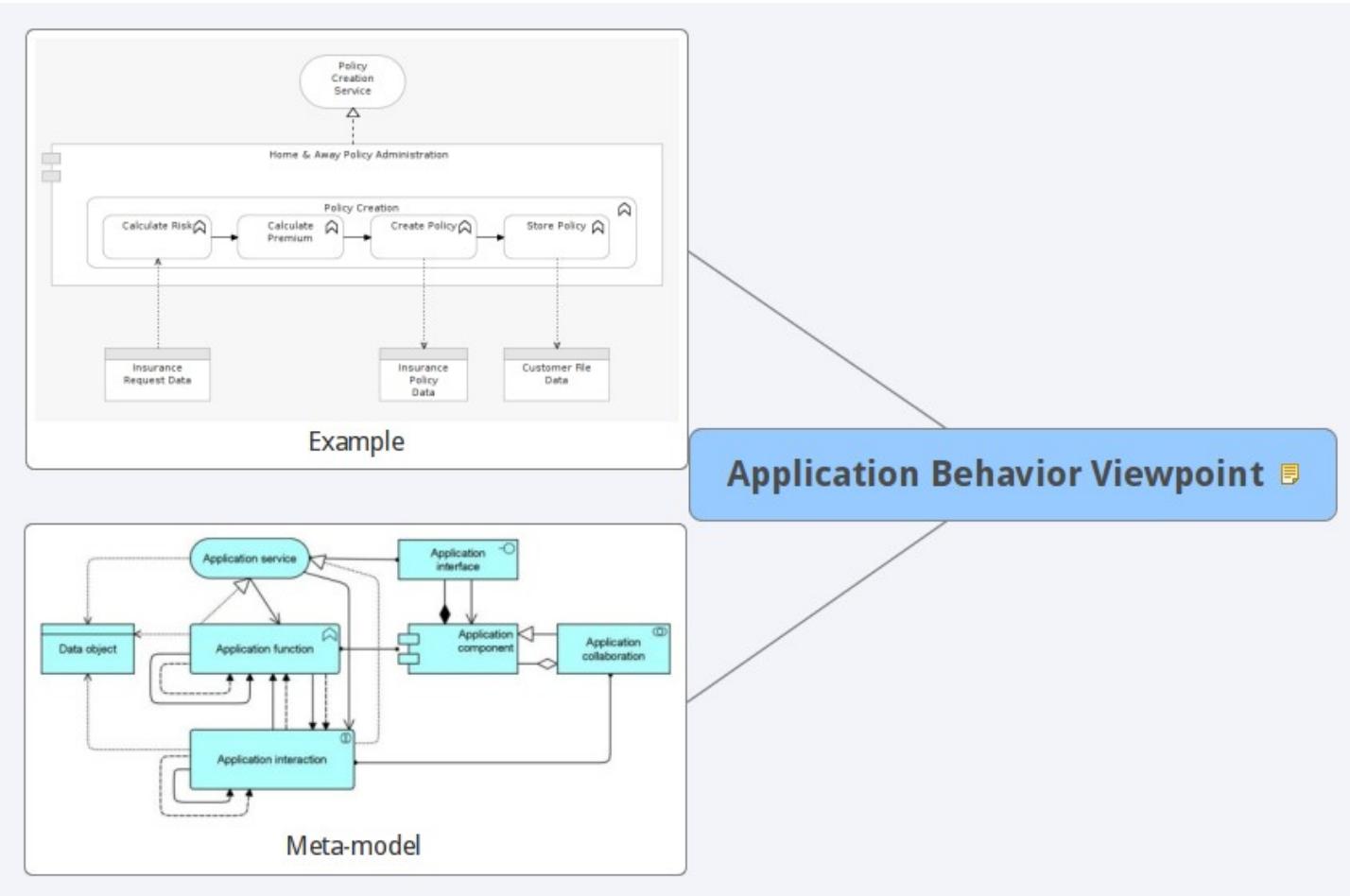
Meta-model



Example



Application Behavior Viewpoint



Application Behavior Viewpoint

To describe the internal behaviour of an application; e.g., as it realizes one or more application services.

To design the main behaviour of applications.

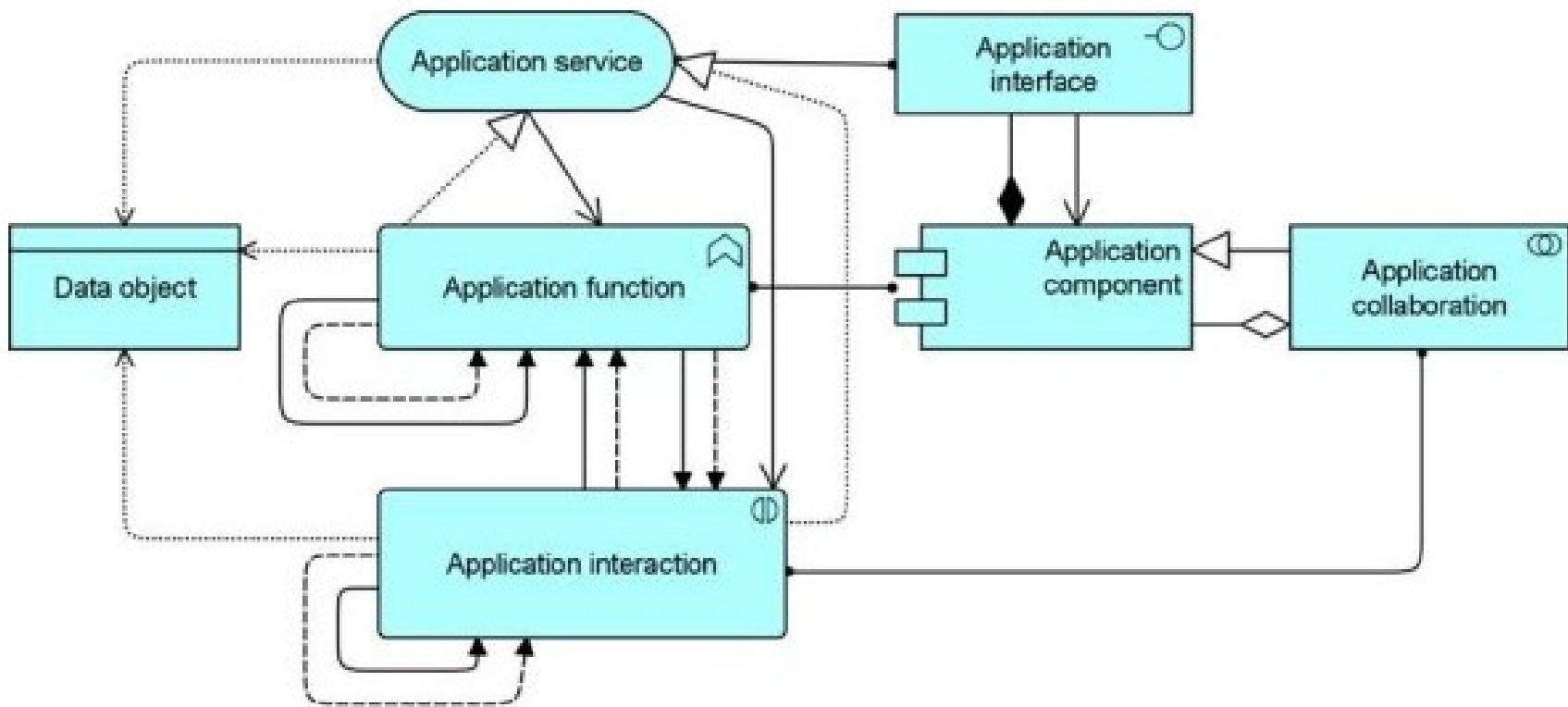
...helpful in identifying functional overlap between different applications (i.e. cross cutting concern, impact analysis)

.. or identifying functional coverage gaps within or between applications.

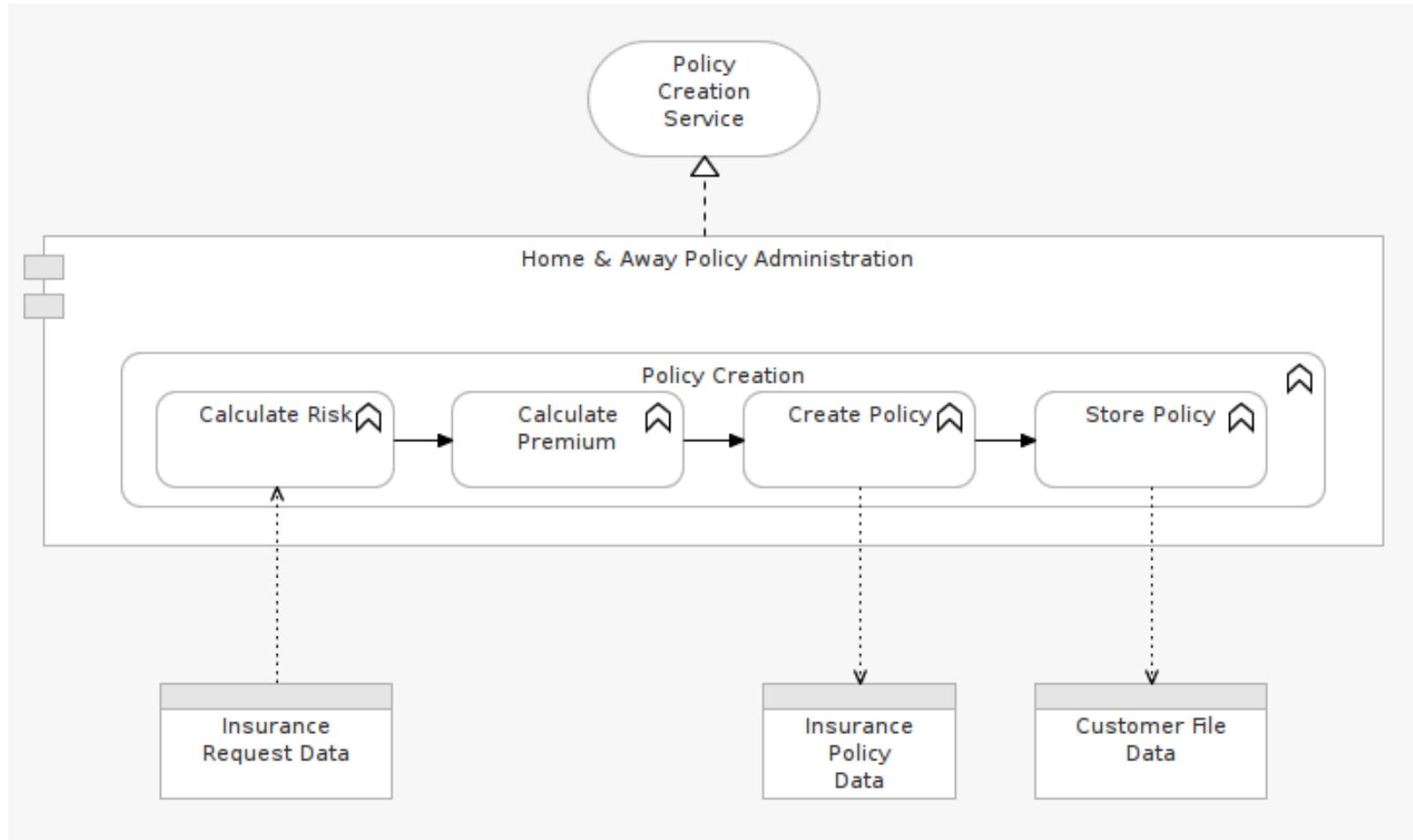
Linked Model-type(s): Behavioral, Data Flow diagram.



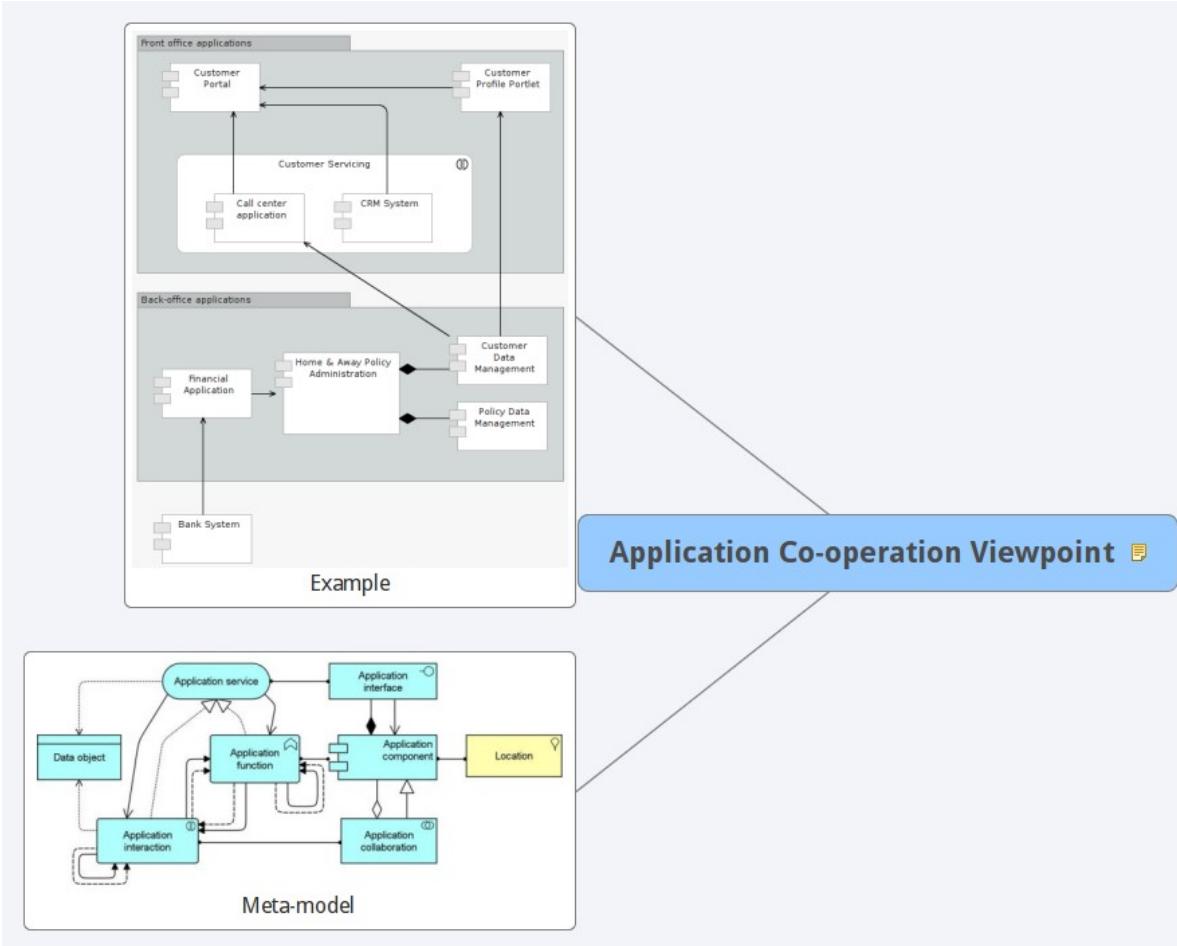
Meta-model



Example



Application Co-operation Viewpoint

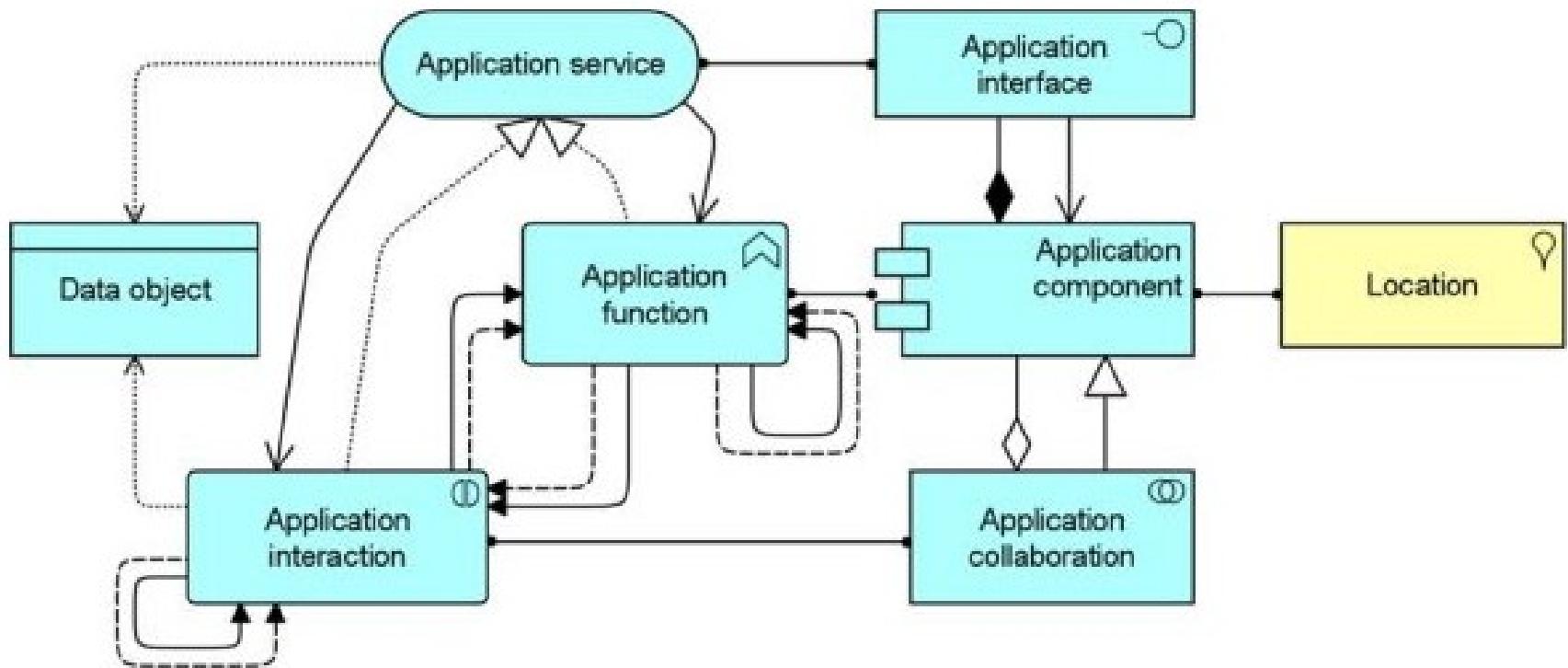


Application Co-operation Viewpoint

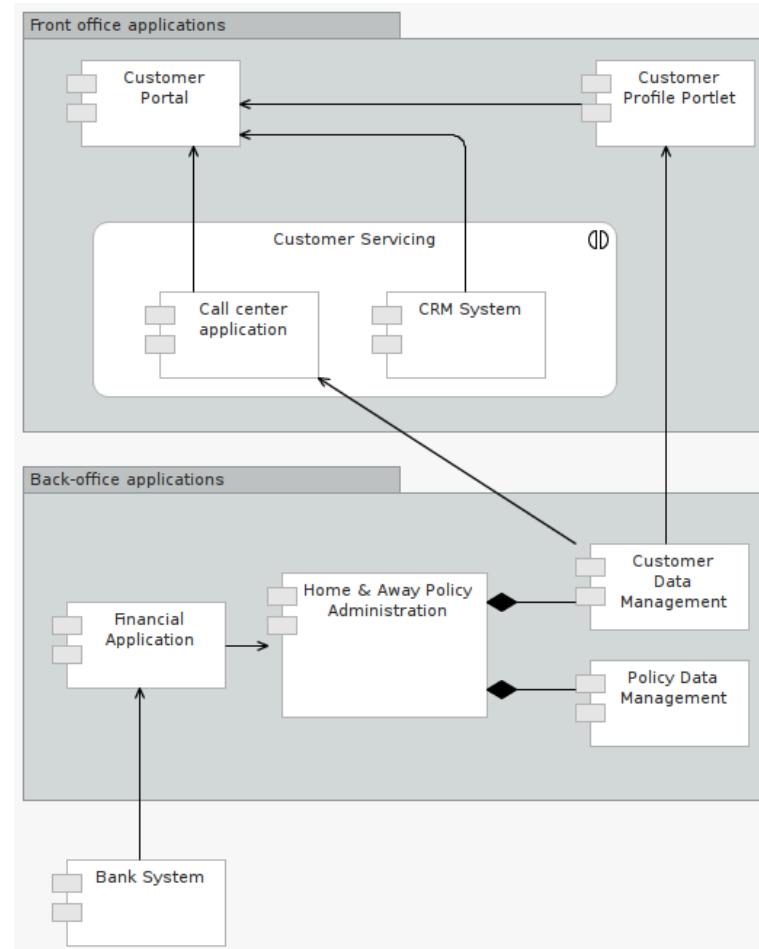
- To express the (internal) orchestration of application services that together support the execution of a business process.
 - To describe information flowing between application components.
 - To enumerate the services application components offer or/and use.
 - Can be used to create a high-level overview of the application landscape of an organization.
- Linked Model-type(s): Behavioral, Data Flow or Component collaboration diagrams.



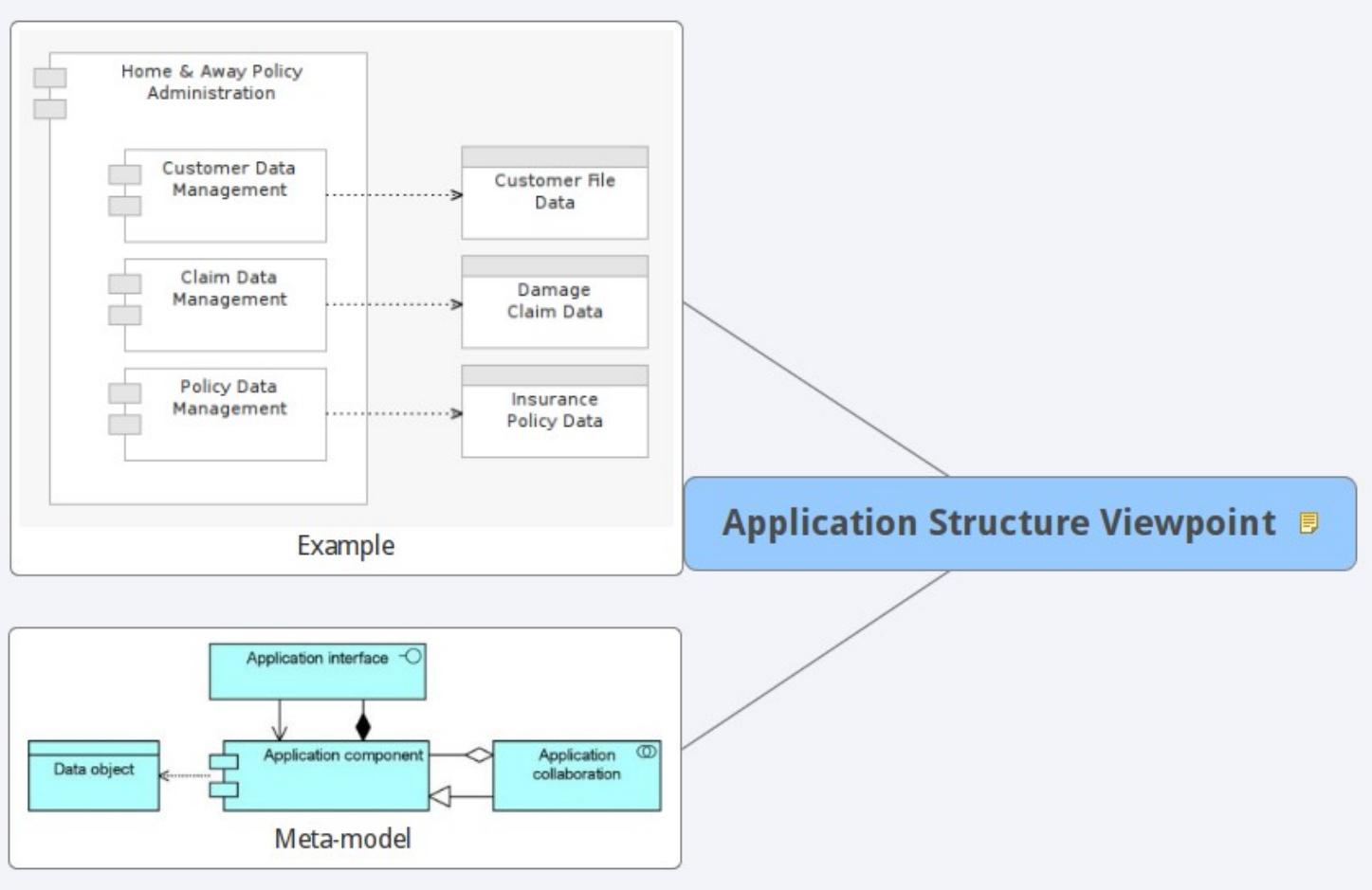
Meta-model



Example



Application Structure Viewpoint



Application Structure Viewpoint

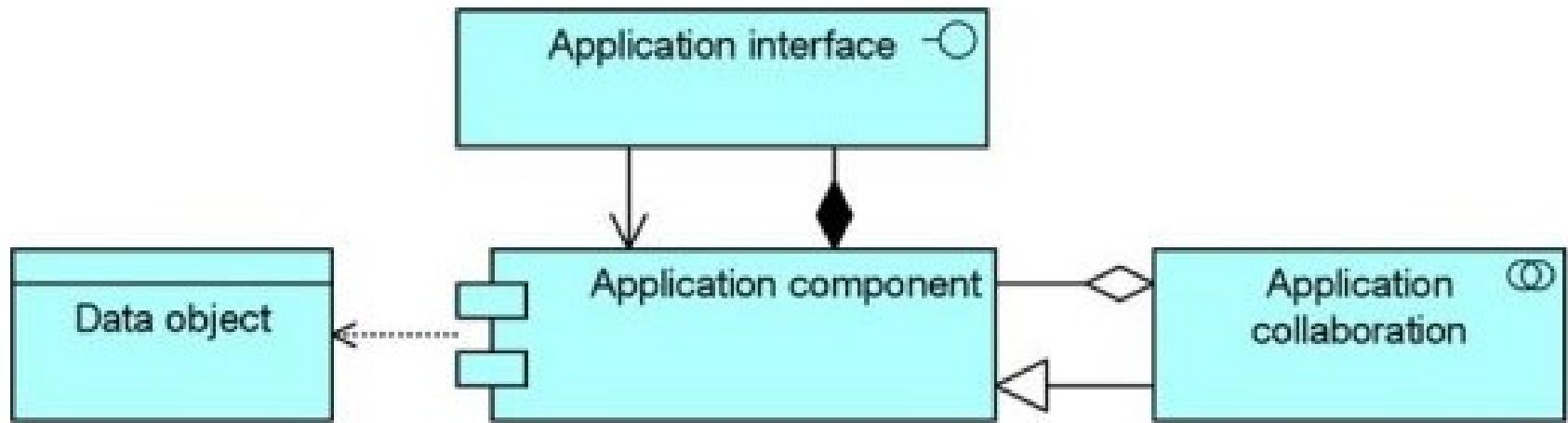
To outline the structure of one or more applications or components.

To associate components and data entities.

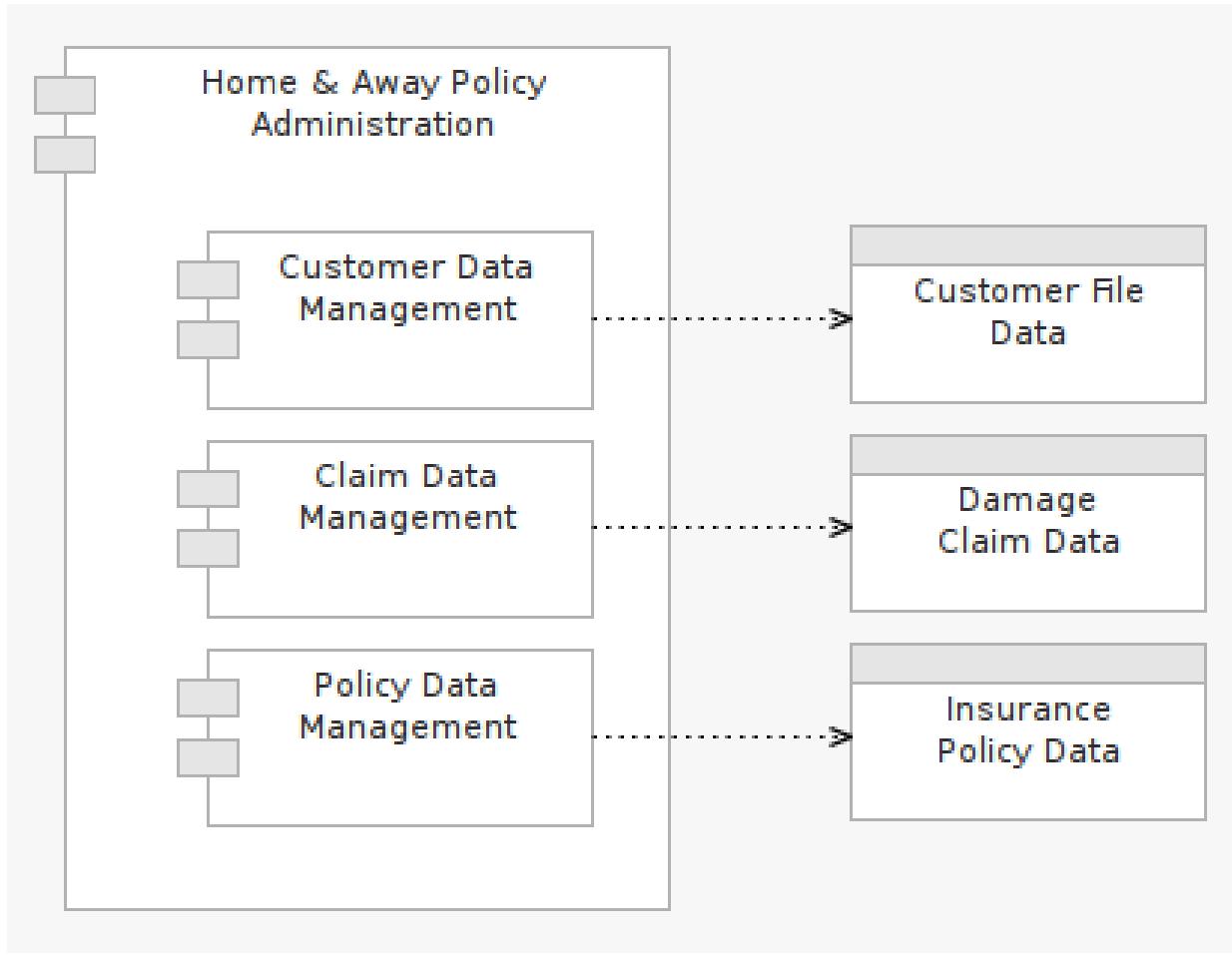
Linked Model-type(s): Functional, Component/Application diagrams.



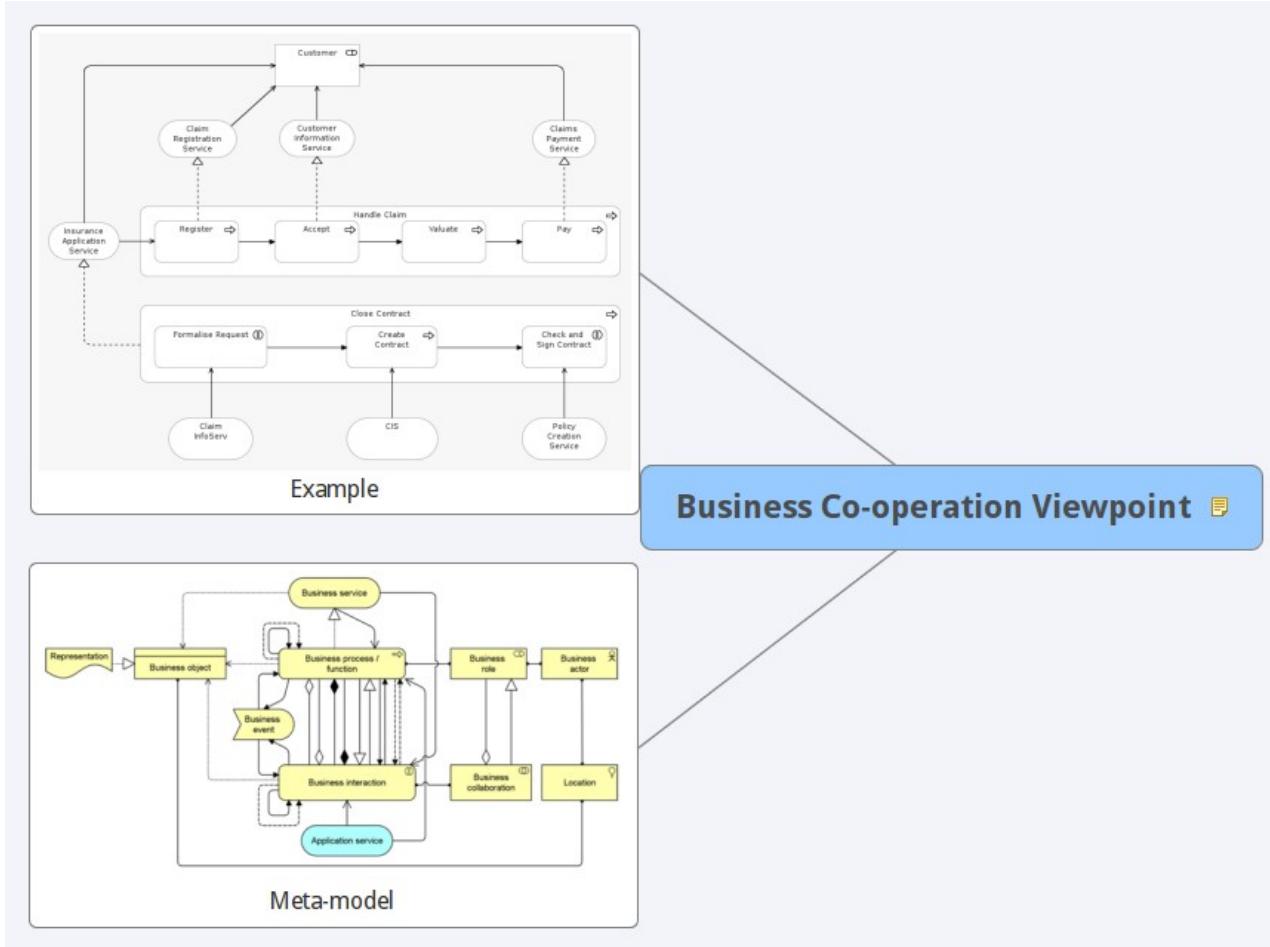
Meta-model



Example



Business Co-operation Viewpoint

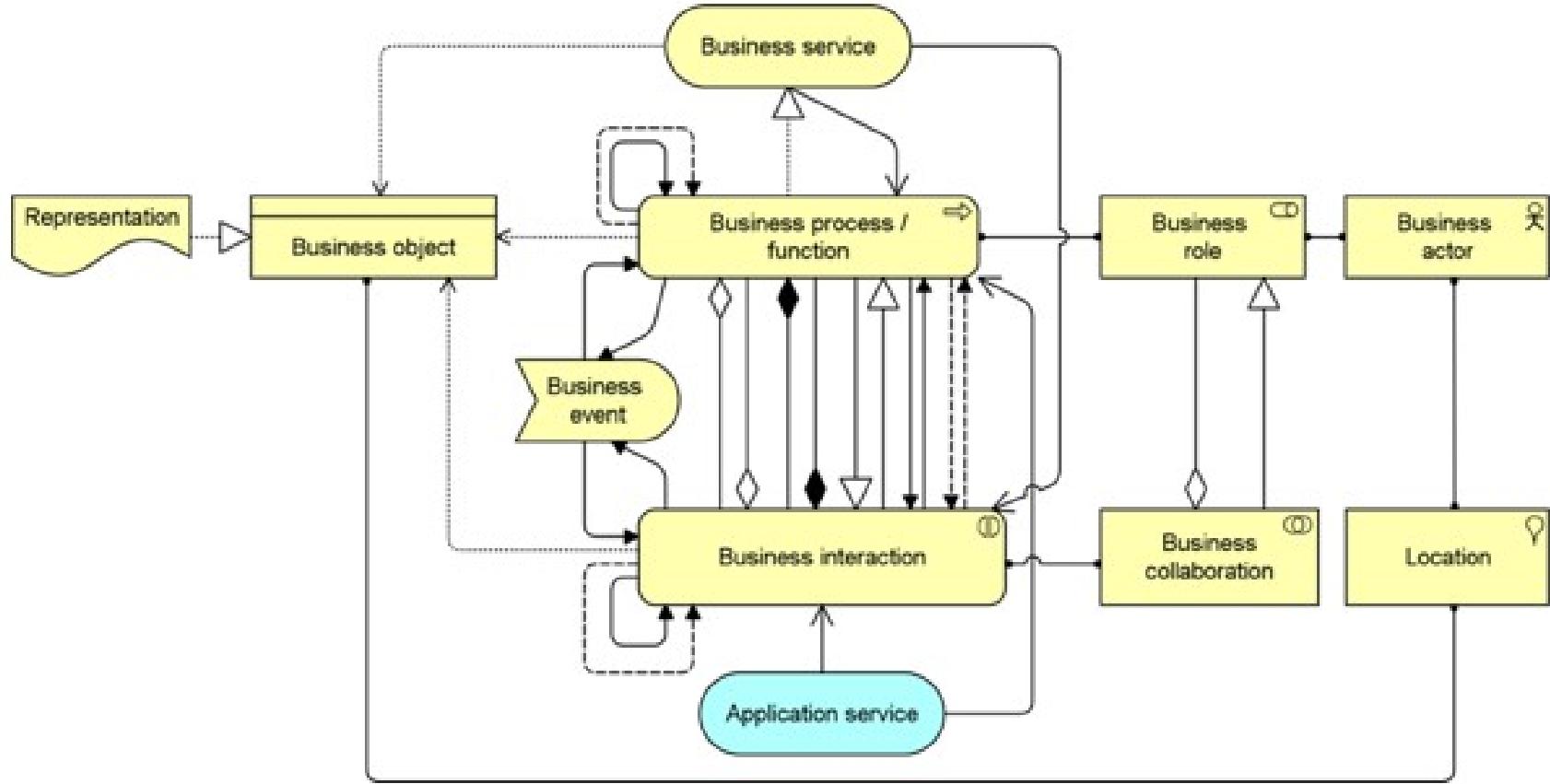


Business Co-operation Viewpoint

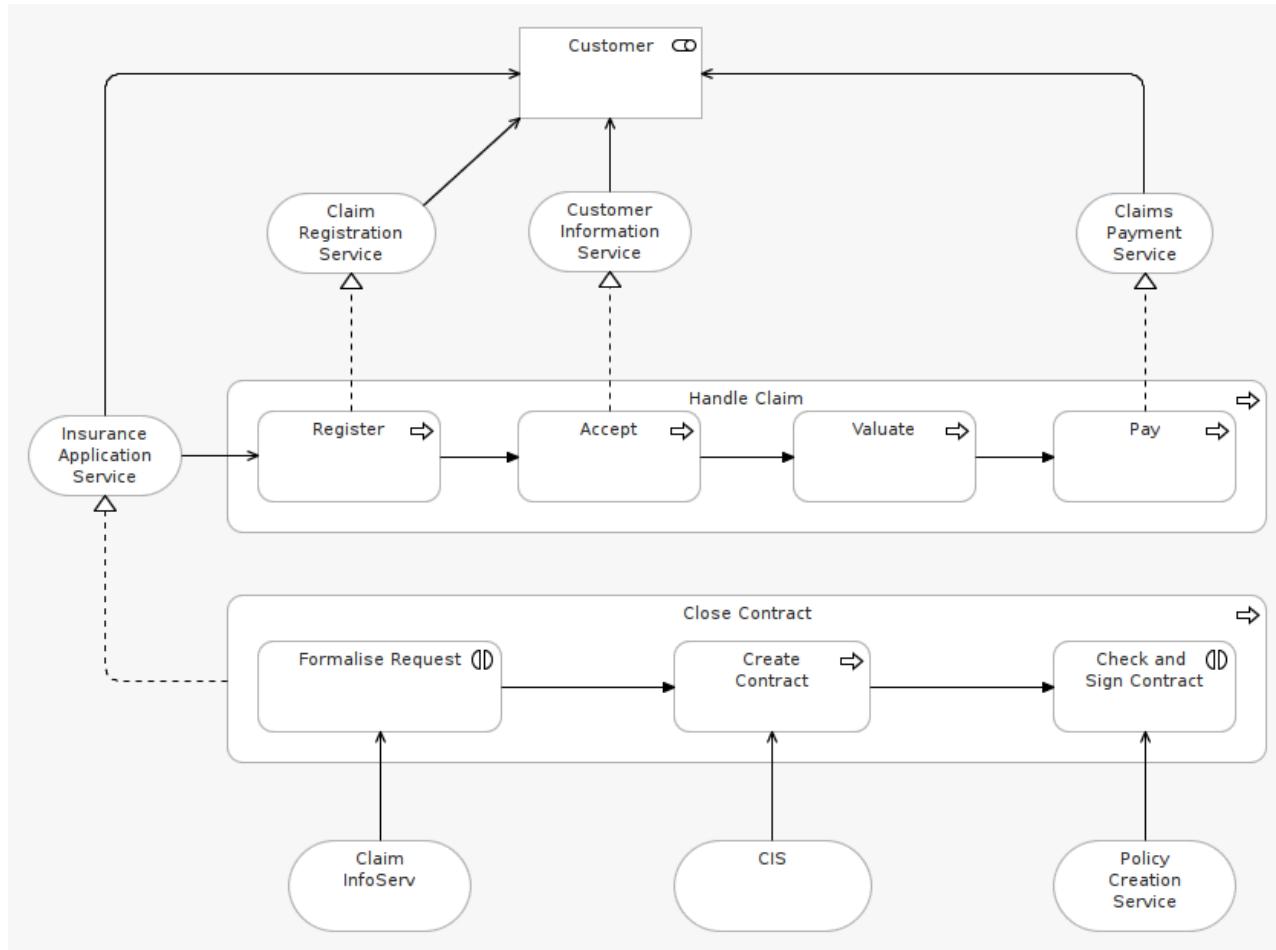
- To outline causal relations of business processes with each other and/or with their environment.
 - To outline business process dependencies within their temporal context.
 - To show how what business process realize what Business services.
 - To outline cross-cutting uses of shared data.
 - To show actors accountable for / interacting with process steps.
- Model-kind: Behavioral, Process Flow diagrams.



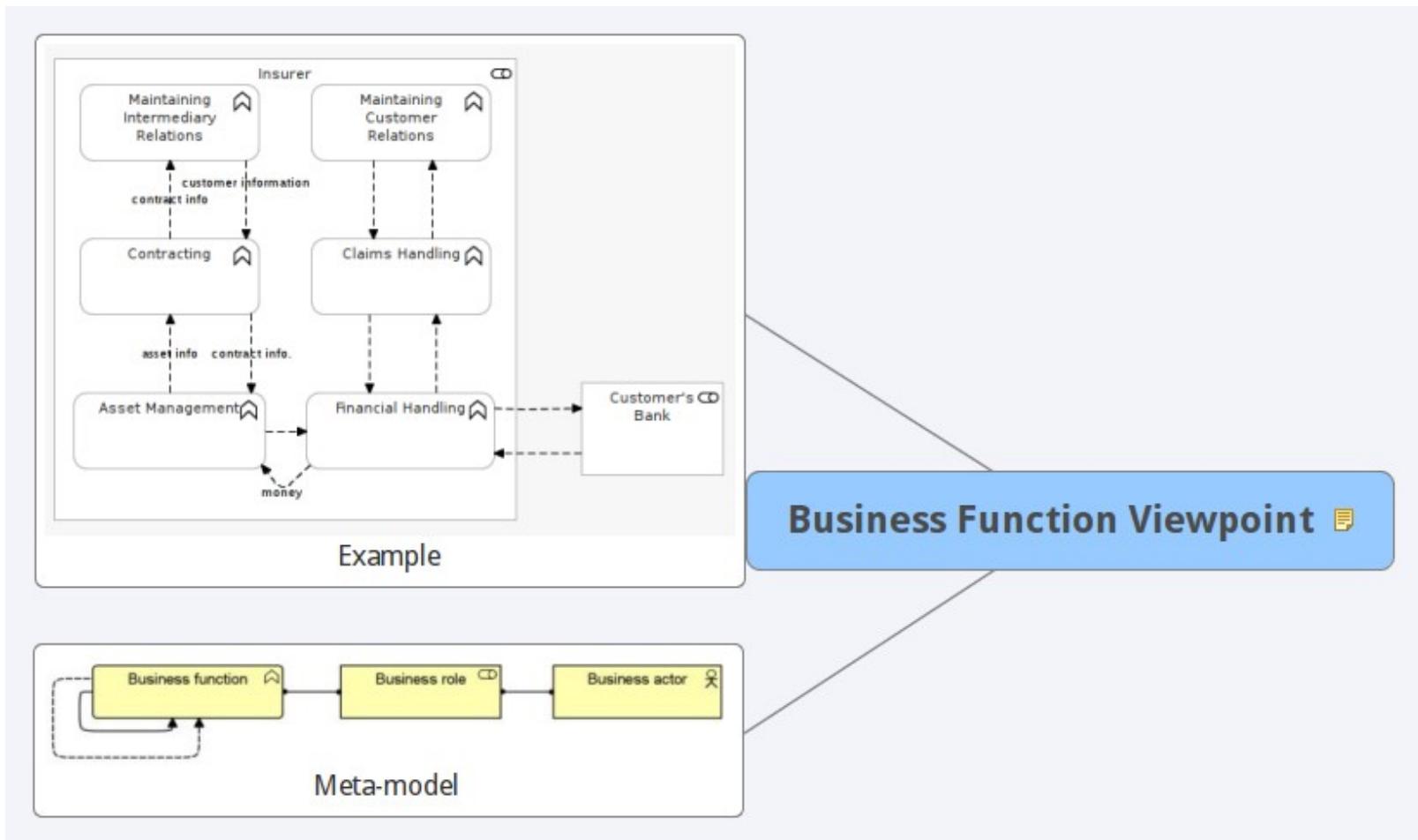
Meta-model



Example



Business Function Viewpoint



Business Function Viewpoint

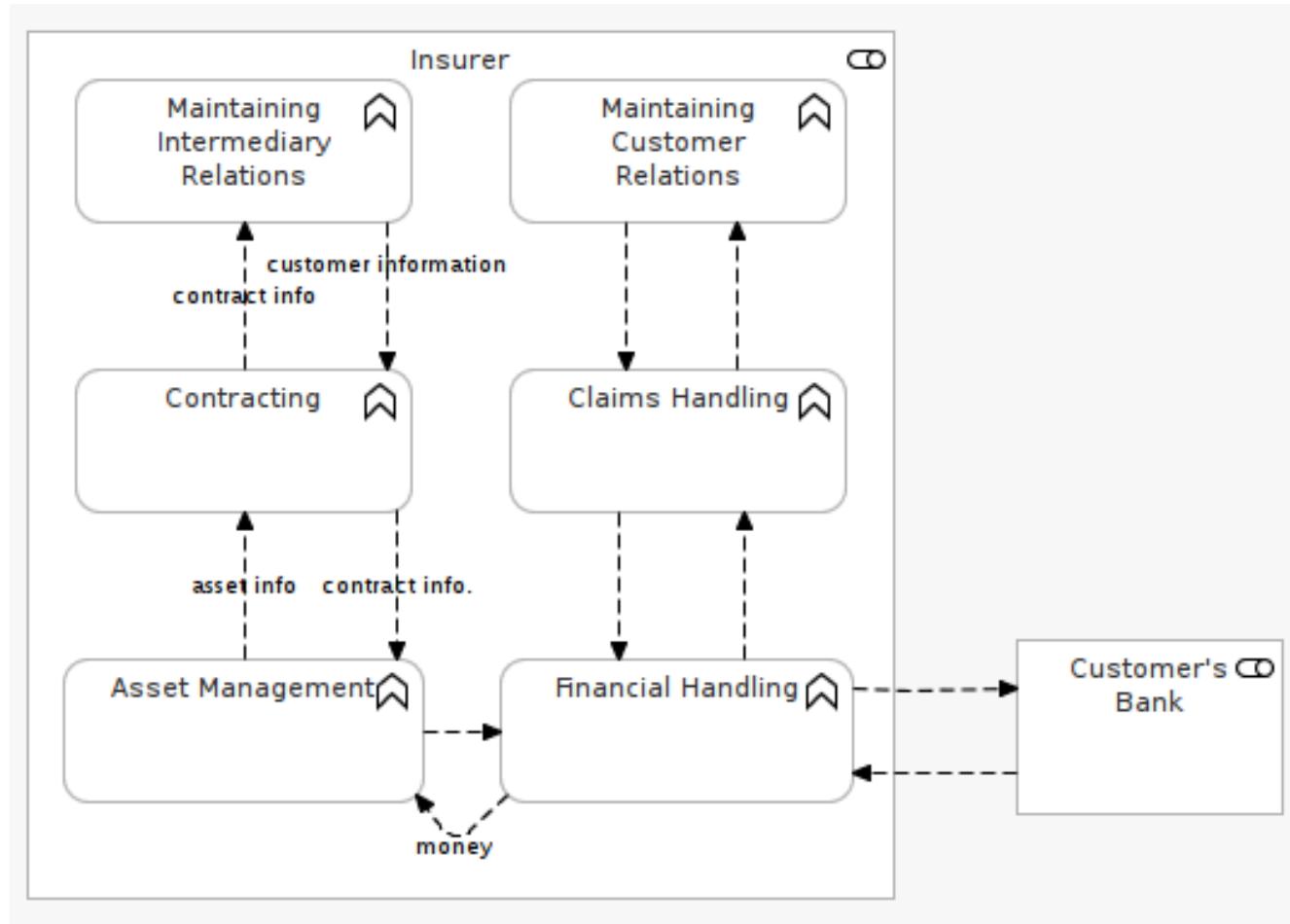
- To show domains of capabilities/functions of a solution.
 - To outline primary activities, technological features.
 - To define relation to departments/teams/roles and define accountability/ownership.
- Model-type: Capability Map diagrams, Bounded-context diagrams.



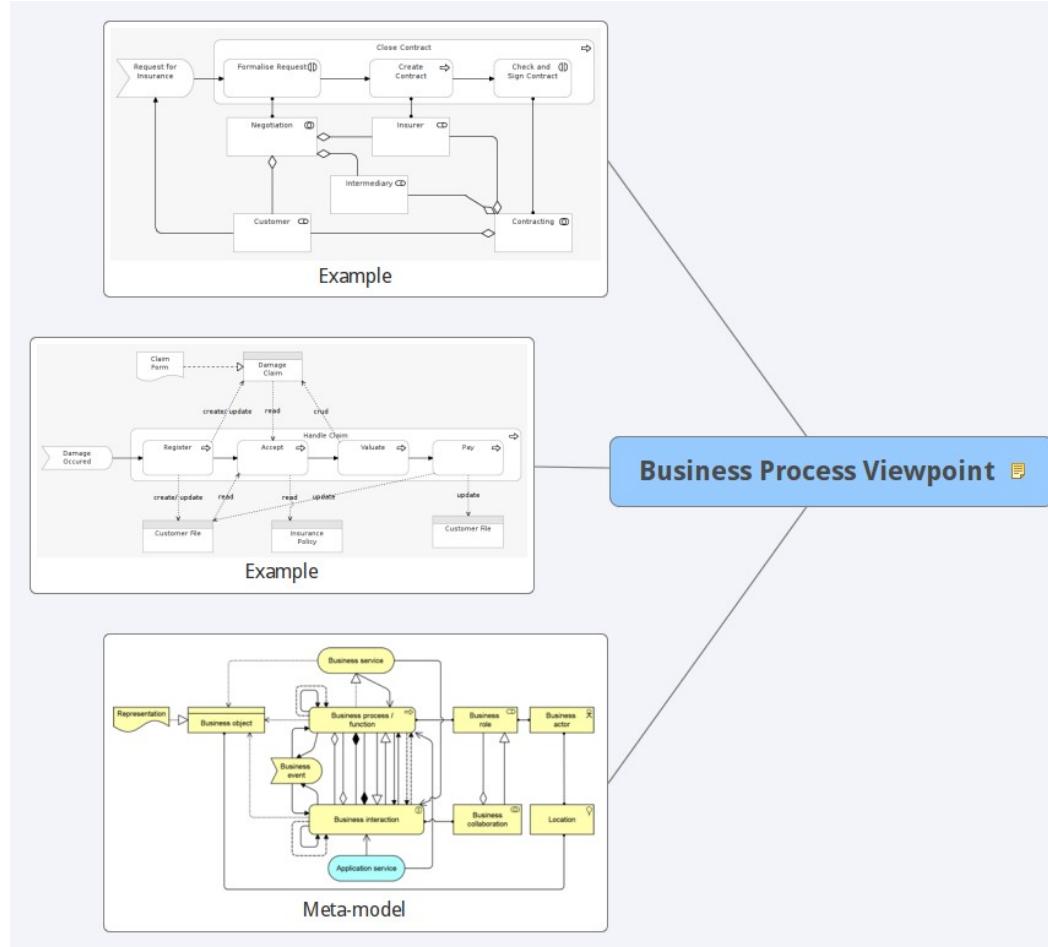
Meta-model



Example



Business Process Viewpoint

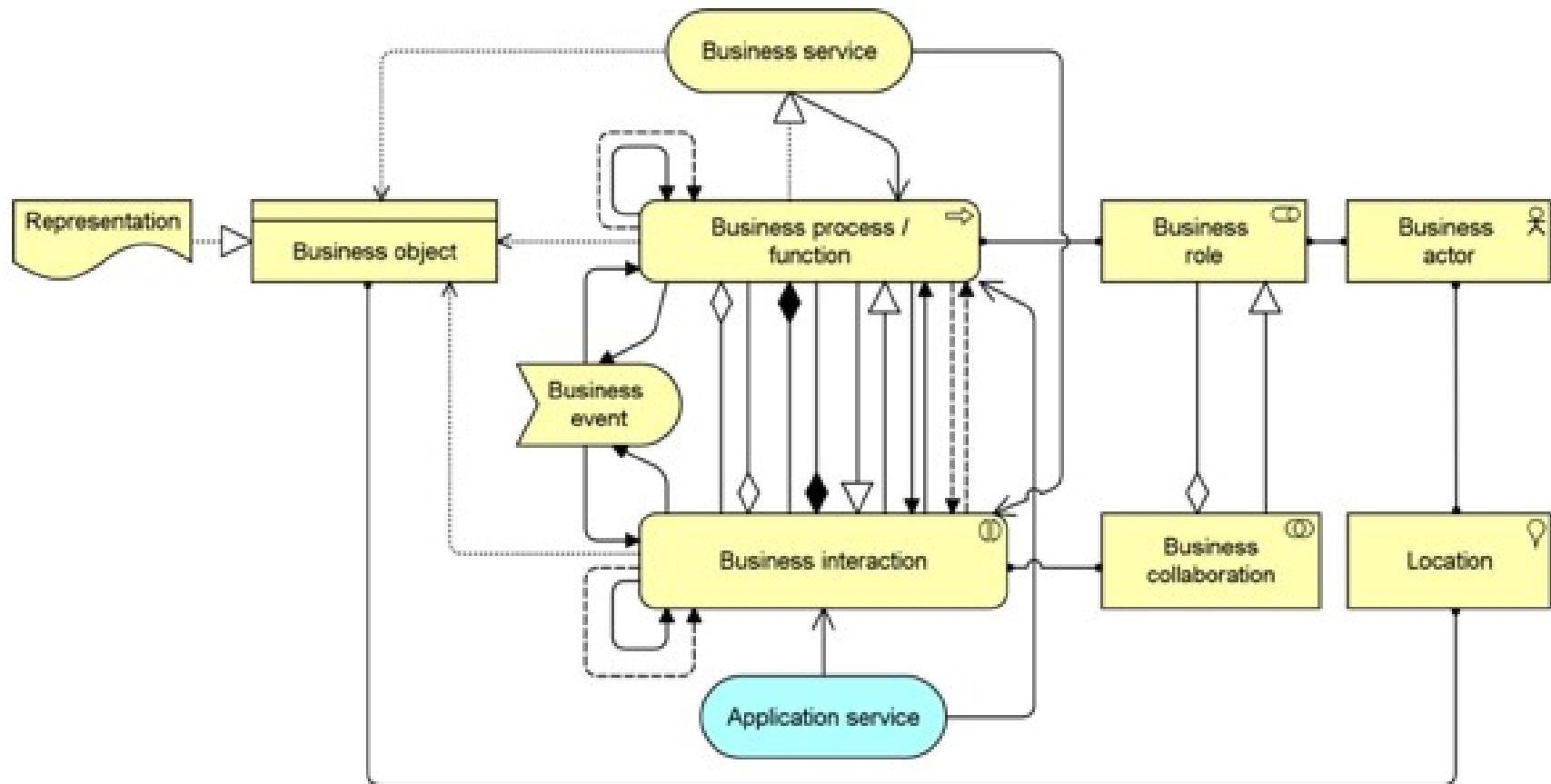


Business Process Viewpoint

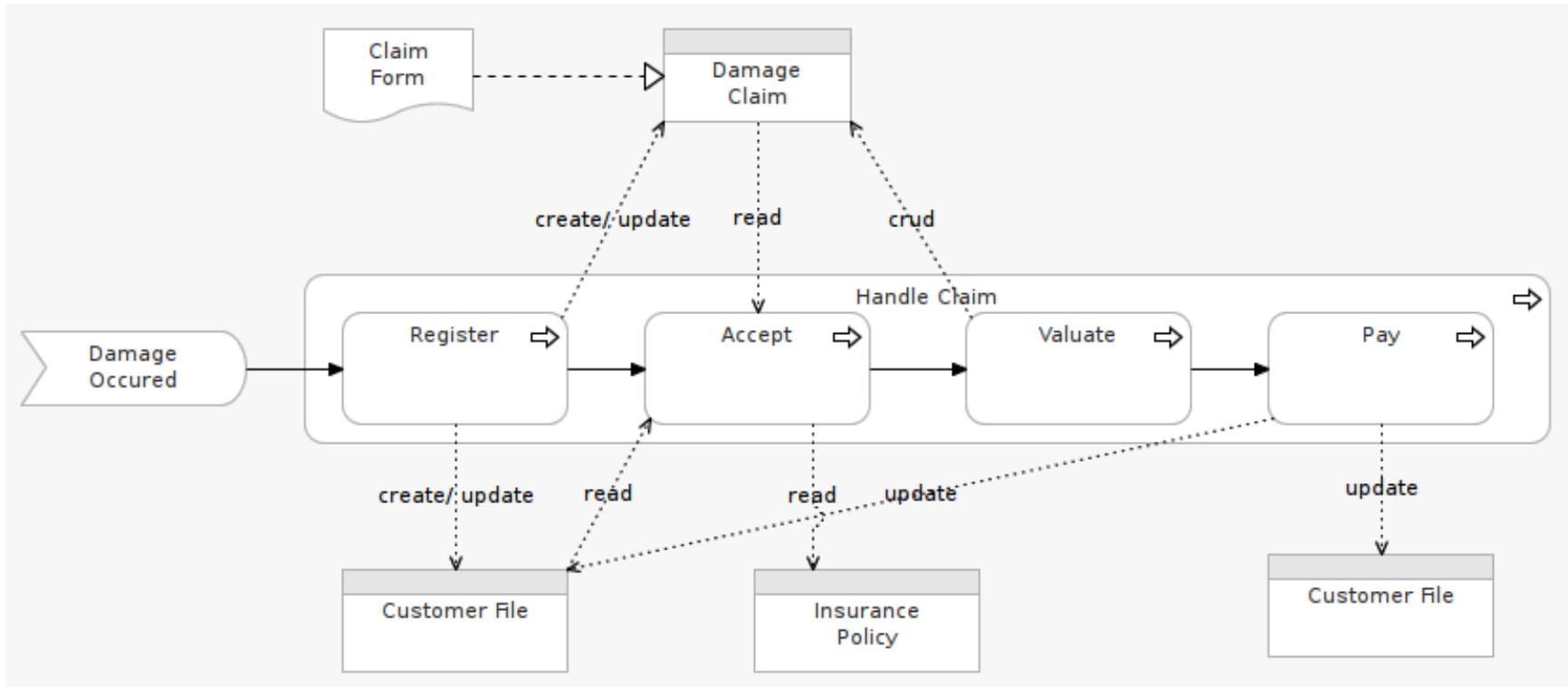
- To show the high-level structure of one or more business processes.
 - To show information types required/used for each process steps.
 - To show actors interacting with each process step and define accountability.
 - To realize service offered / exposed.
 - To compose/relate processes with other processes.
- Model-type: Behavioral



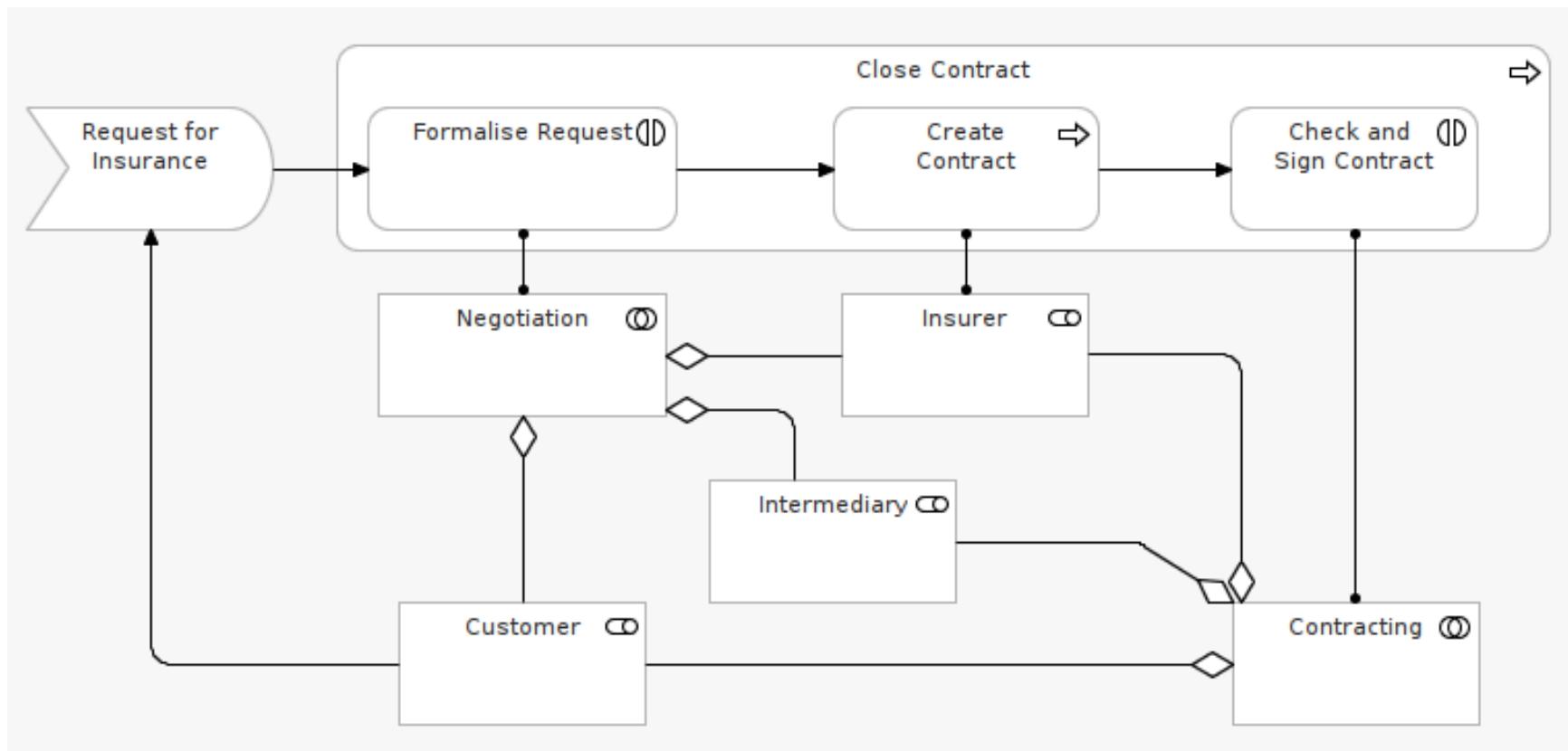
Meta-model



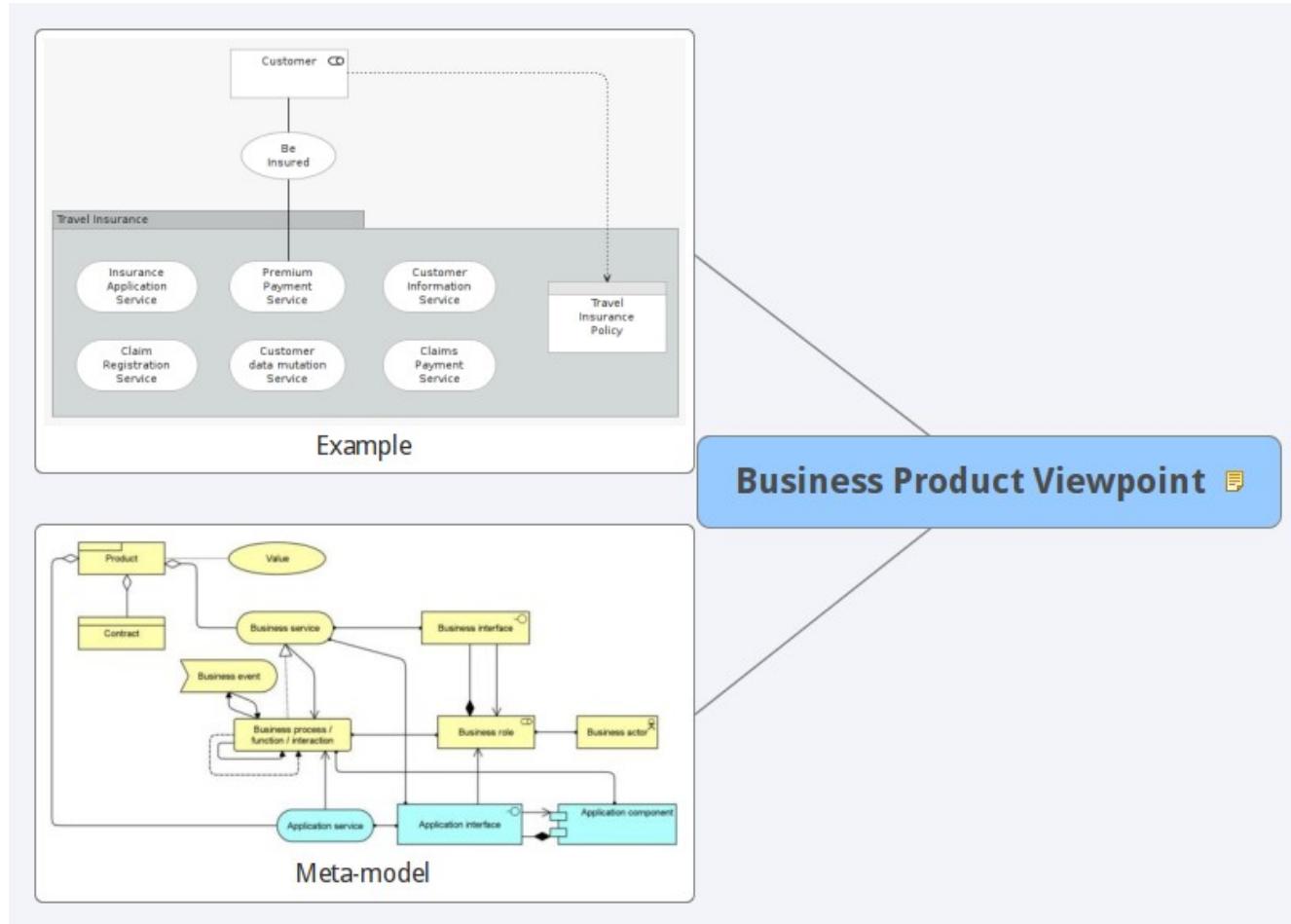
Example



Example



Business Product Viewpoint



Business Product Viewpoint

To depict the value products offer to external parties (intermediaries, customers,..)

To shows the composition of one or more products in terms of the constituting (business or application) services, and the associated contract(s) or other agreements.

To show the interfaces (channels) through which this product is offered, and the events associated with the product.

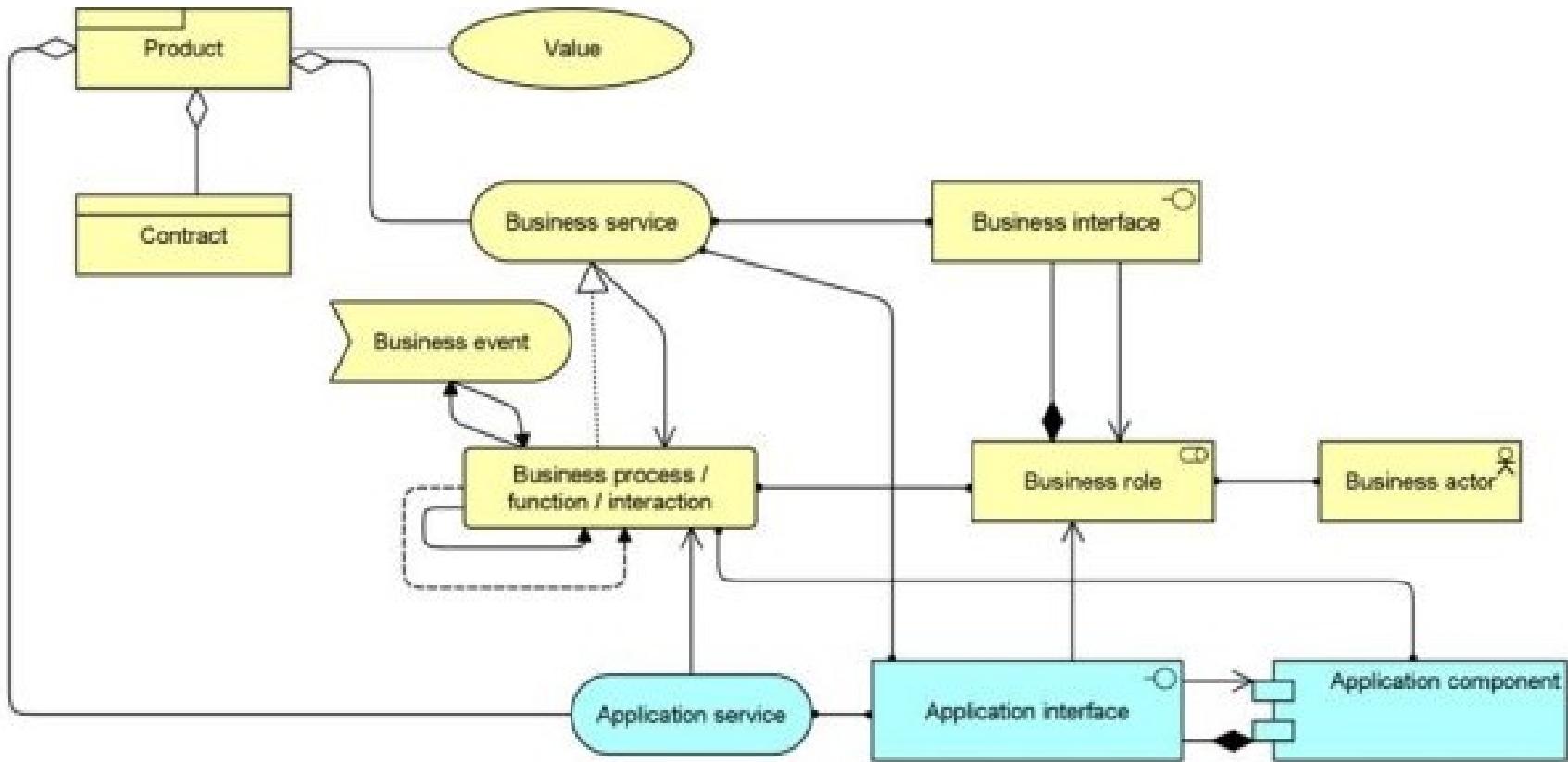
To identify which services can be re-used, or must be created for a product, given the value a customer expects from it.

Product are realized by processes.

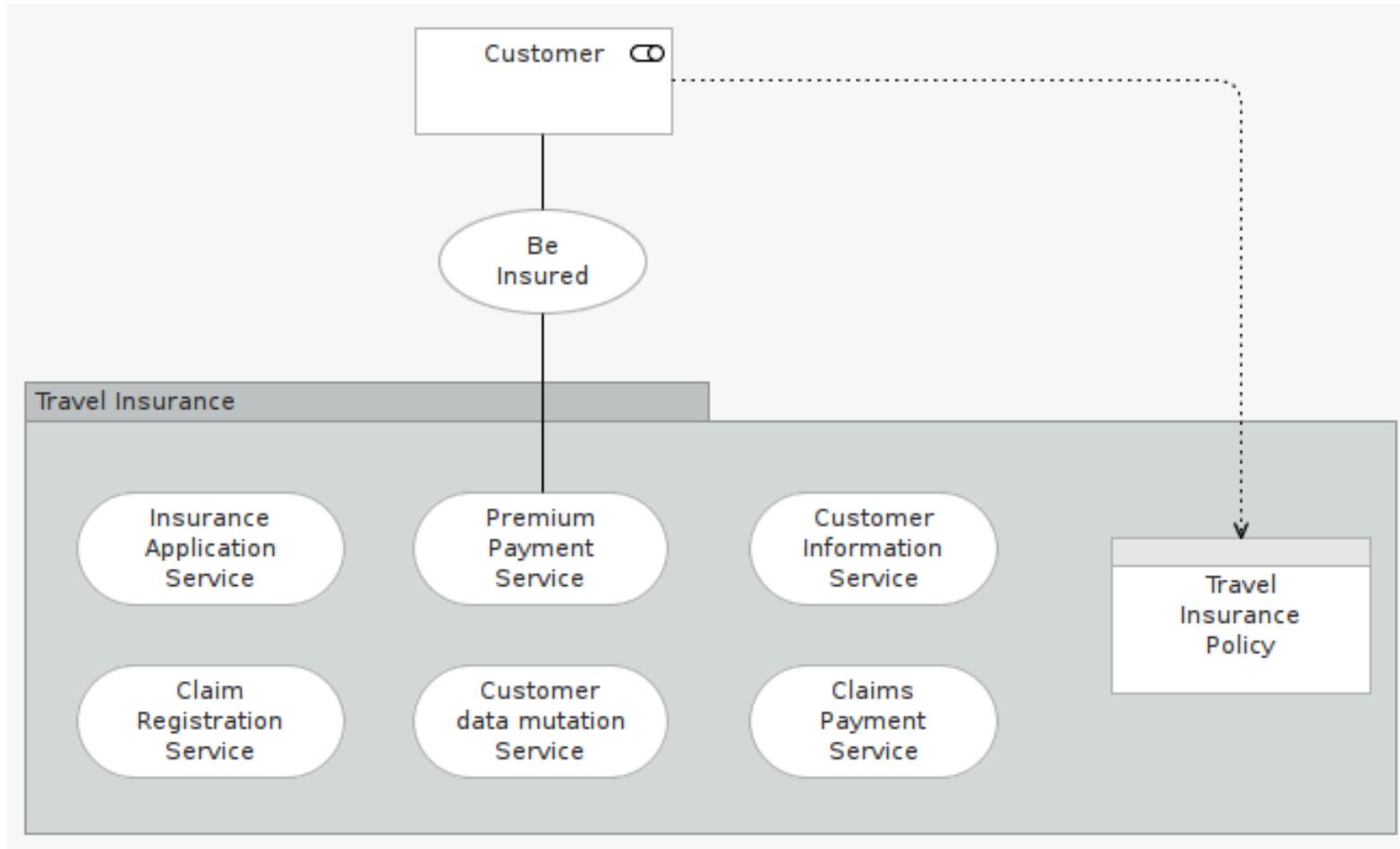
Model-type: Structural, Service Map



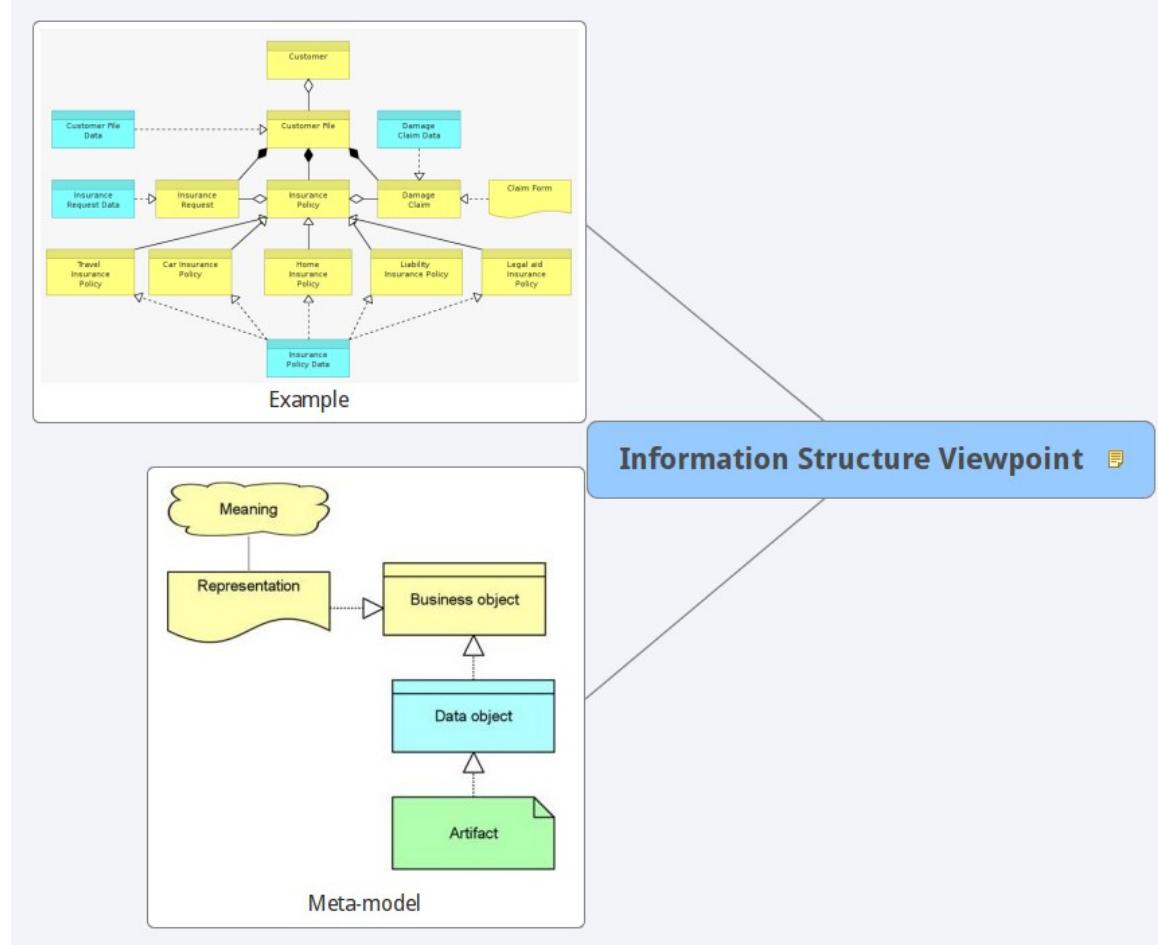
Meta-model



Example



Information Structure Viewpoint

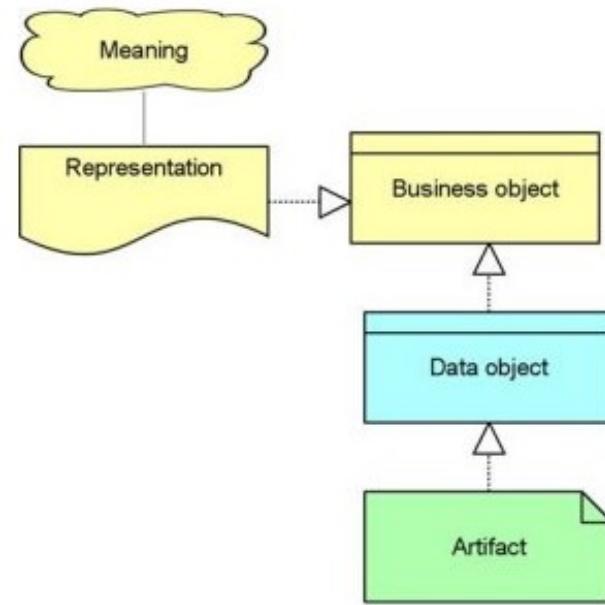


Information Structure Viewpoint

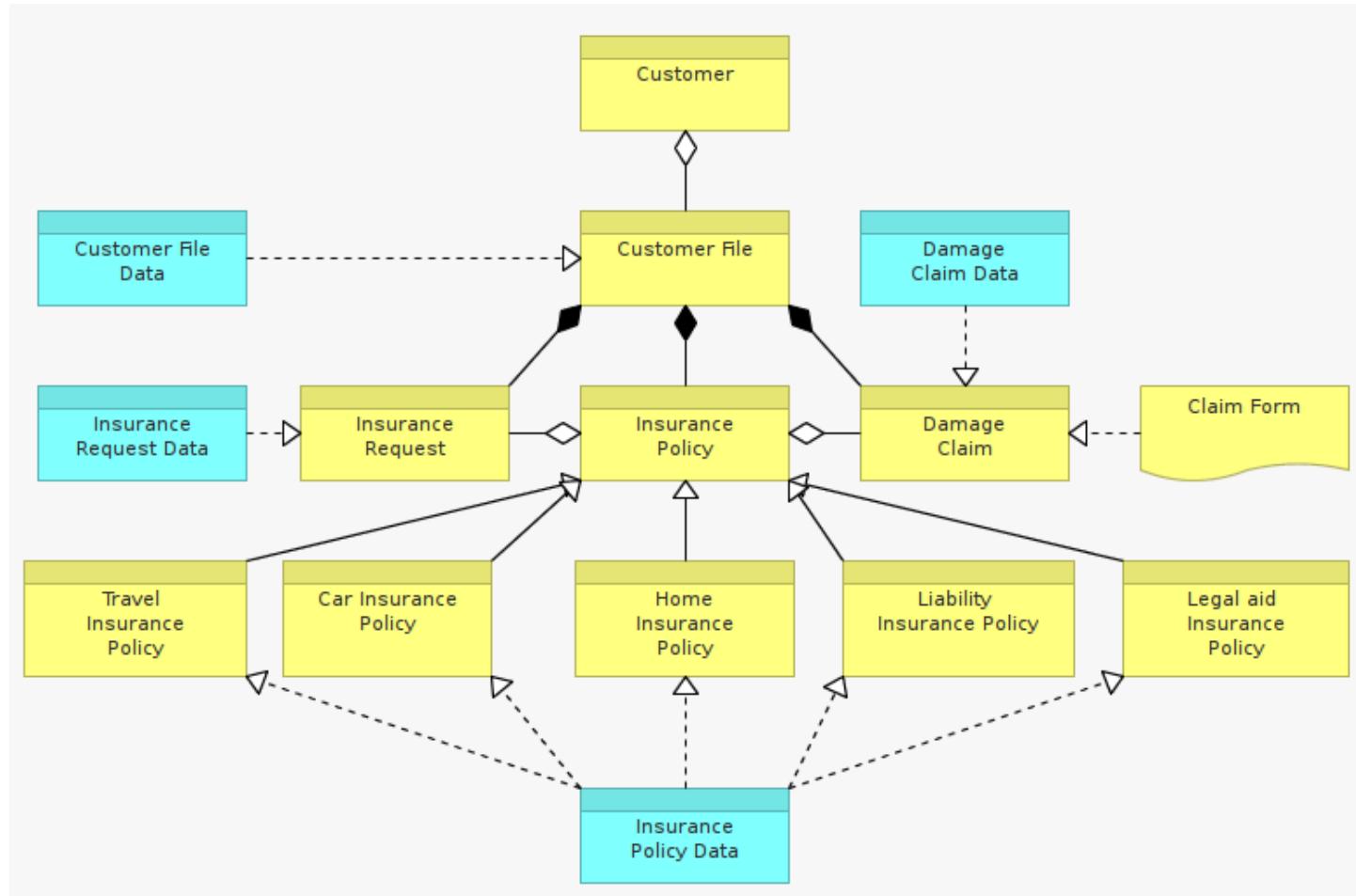
- To show the structure of the information used in the solution.
 - To map data to business processes or application function/services, in terms of data types/messages or data contract structures.
 - To realize business information concepts with data structures used.
 - To allocate data assets to underlying infrastructure; e.g., by means of a database schema.
- Model-kind: Data Structure



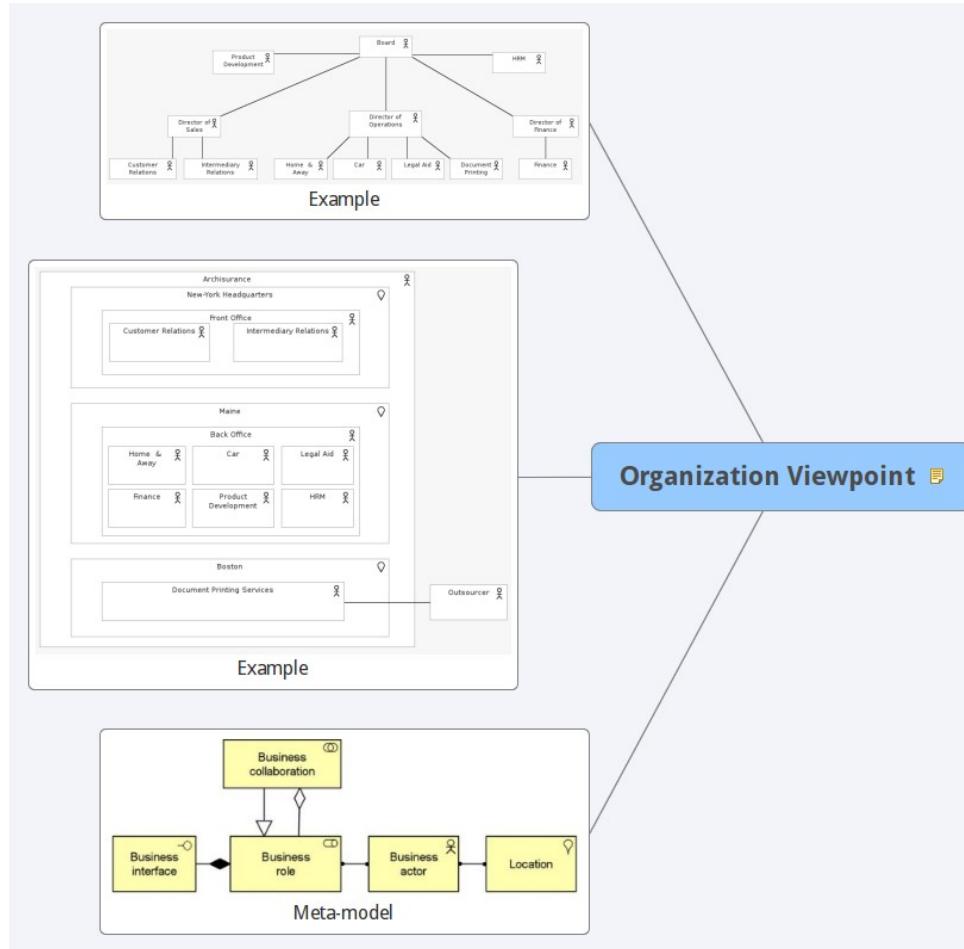
Meta-model



Example



Organization Viewpoint



Organization Viewpoint

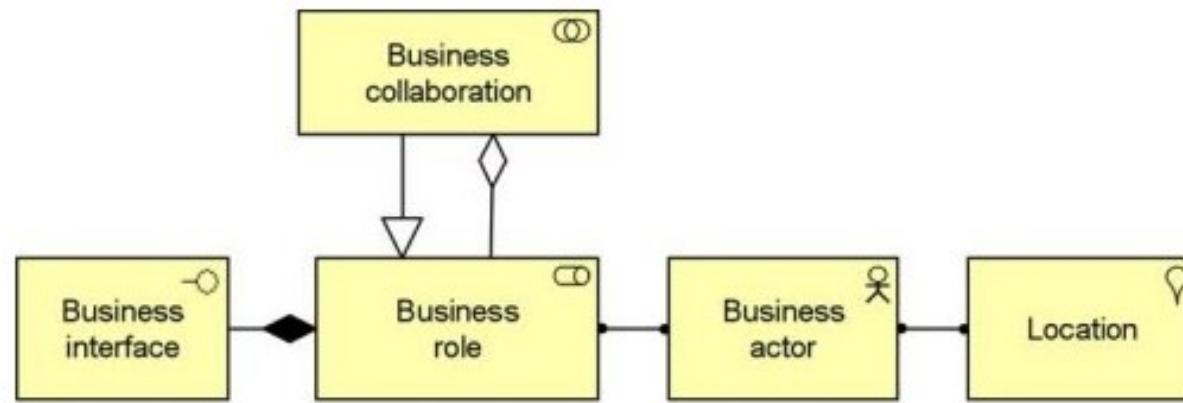
To model the (internal) organisation of a company, a department, a network of companies, or of another organisational entity.

To identifying geographies, and map competencies, activities.

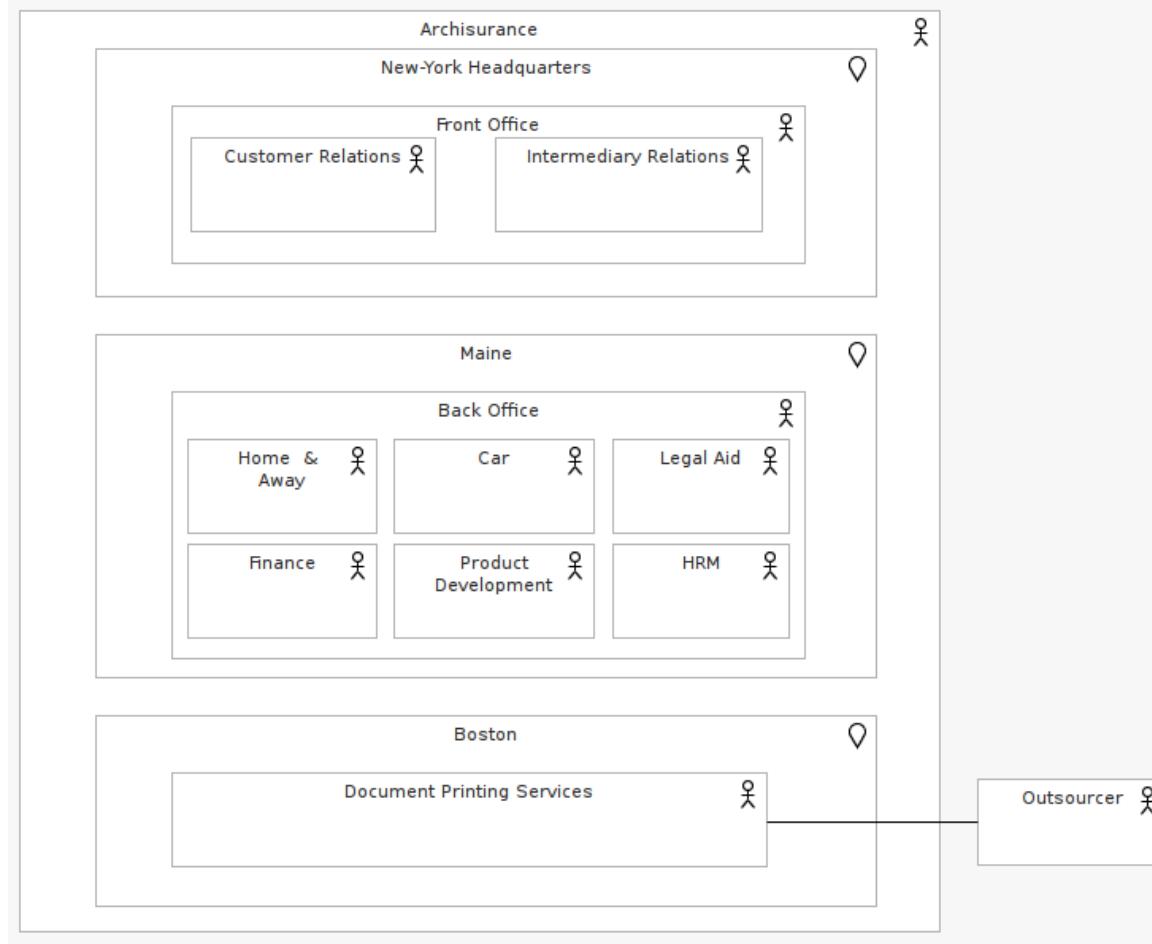
Model-kind: Organizational Chart, Nested-block diagrams.



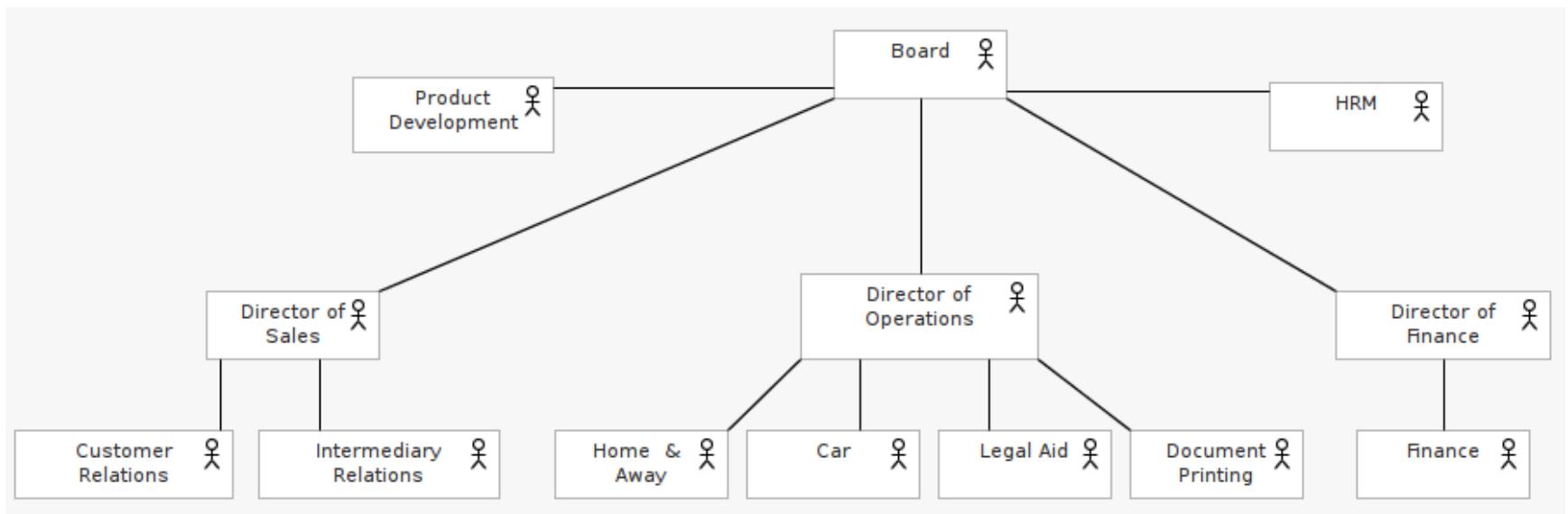
Meta-model



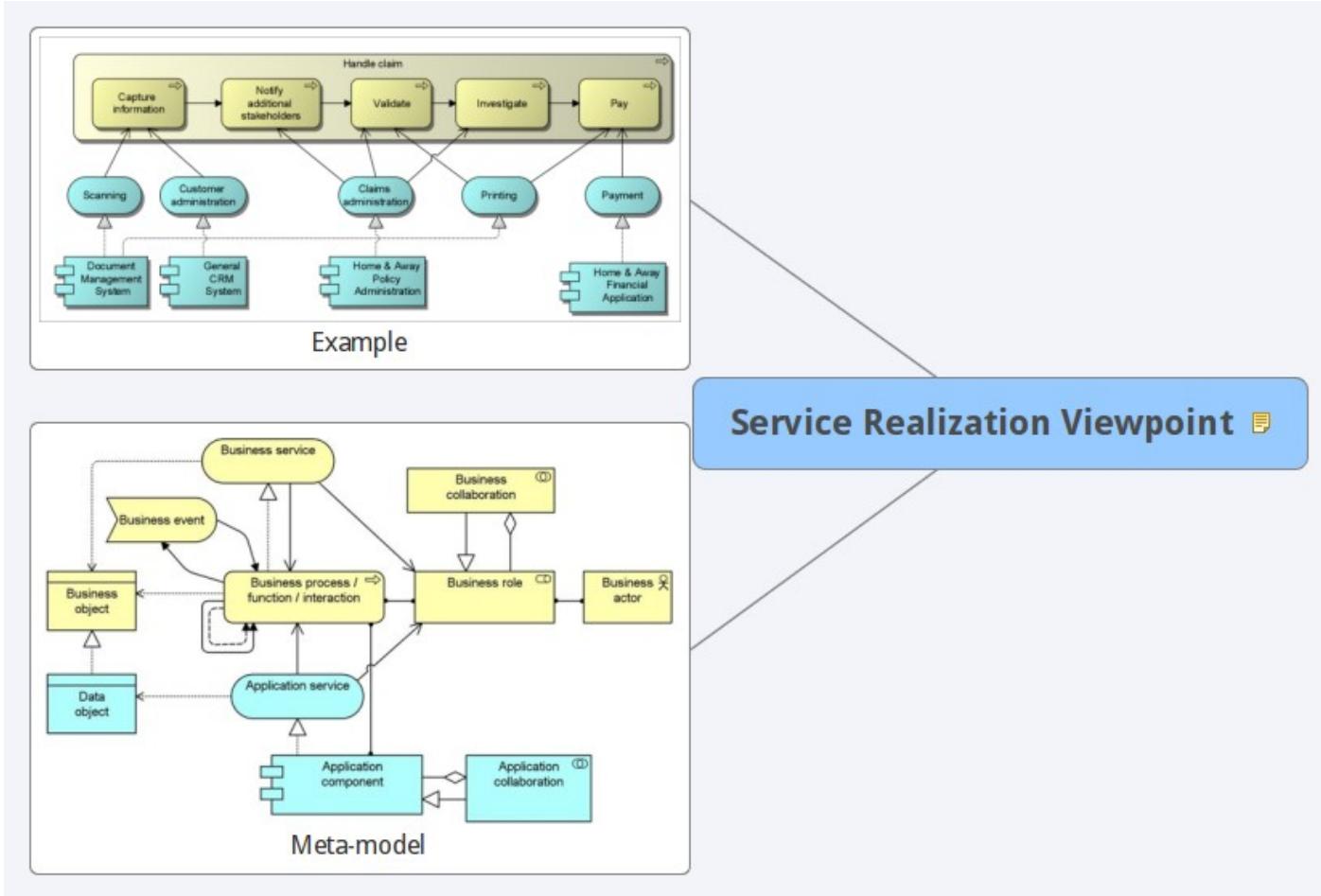
Example



Example



Service Realization Viewpoint



Service Realization Viewpoint

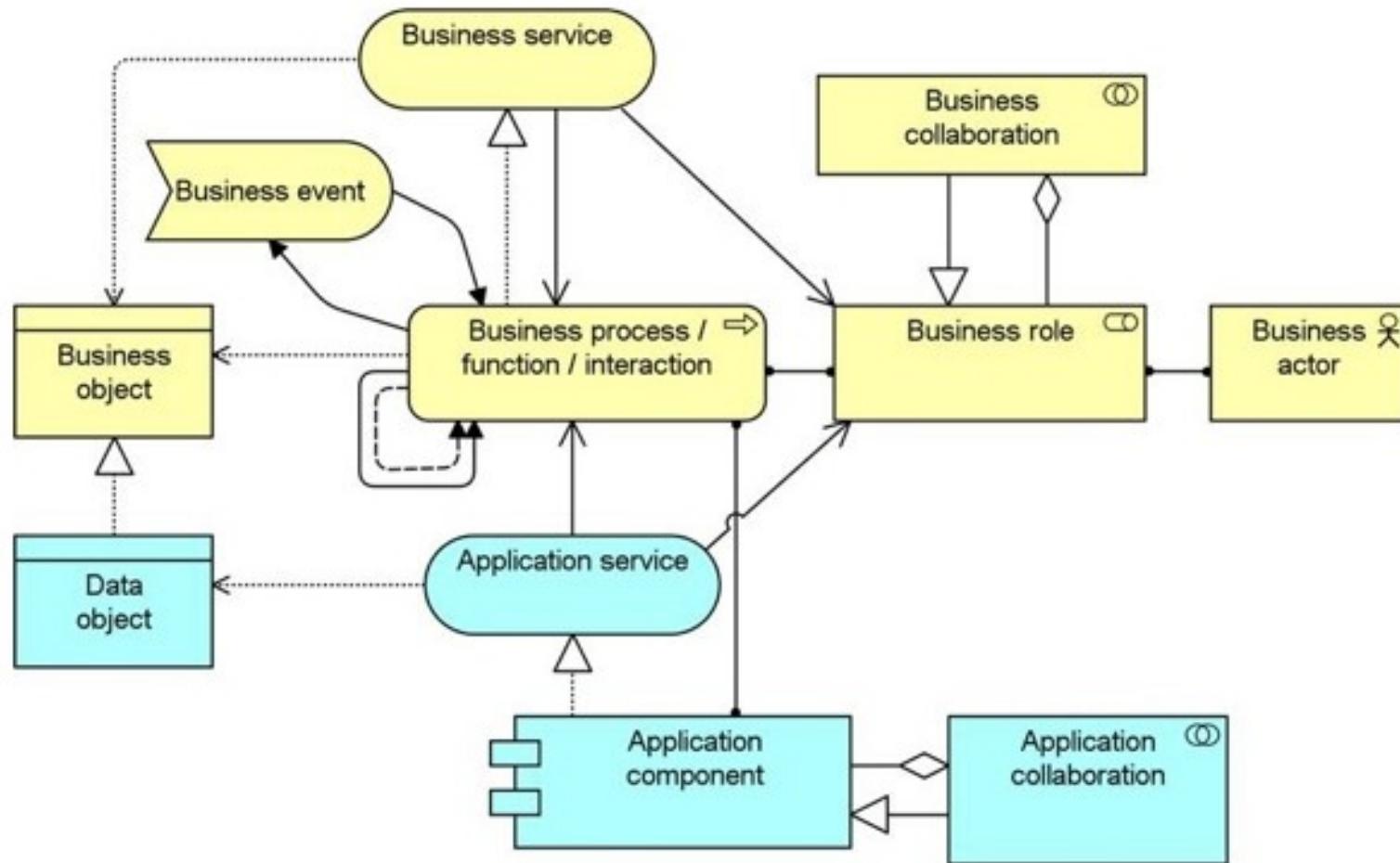
To show how one or more business services are realized by the underlying processes (and sometimes by application components).

To realize business process flows with application services.

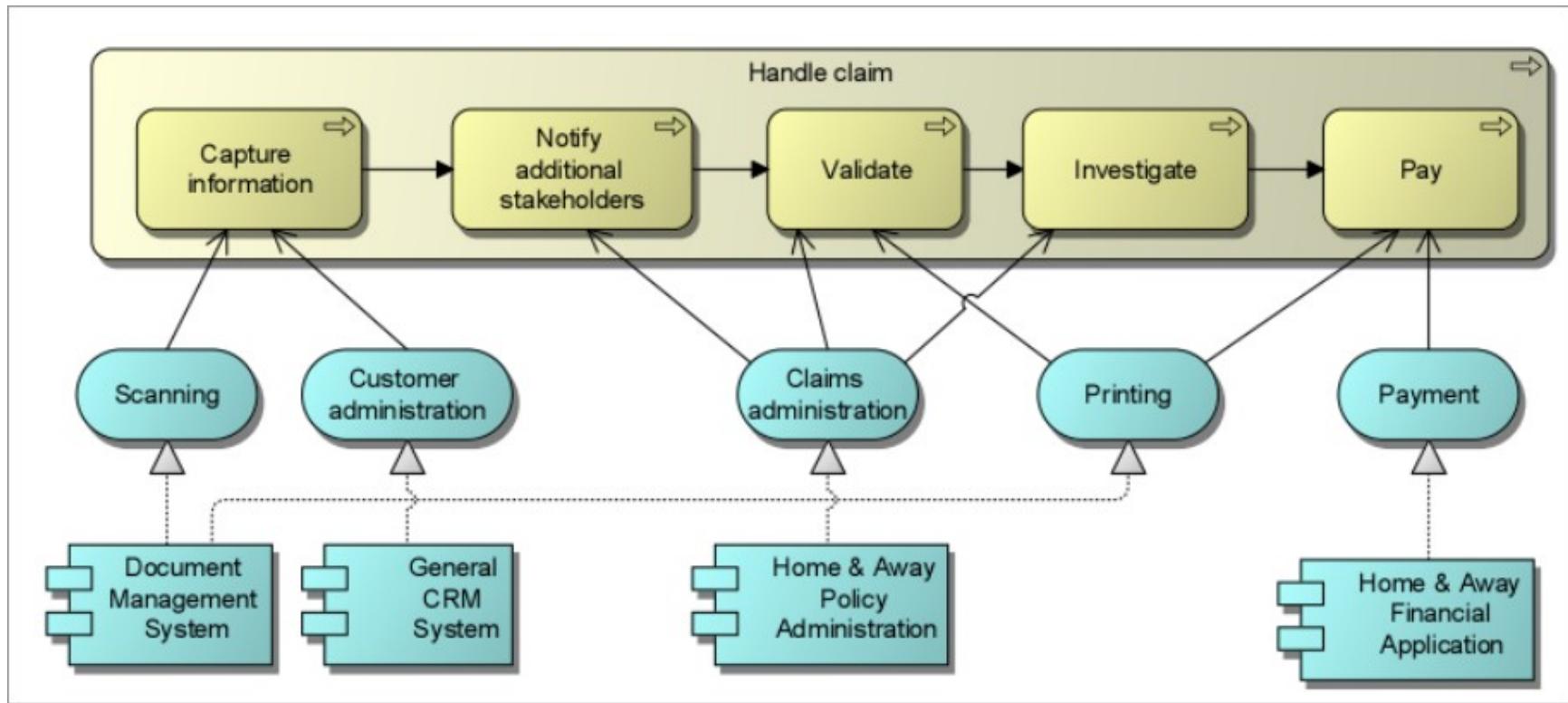
Model-kind: Function <-> Behavioral Mappings



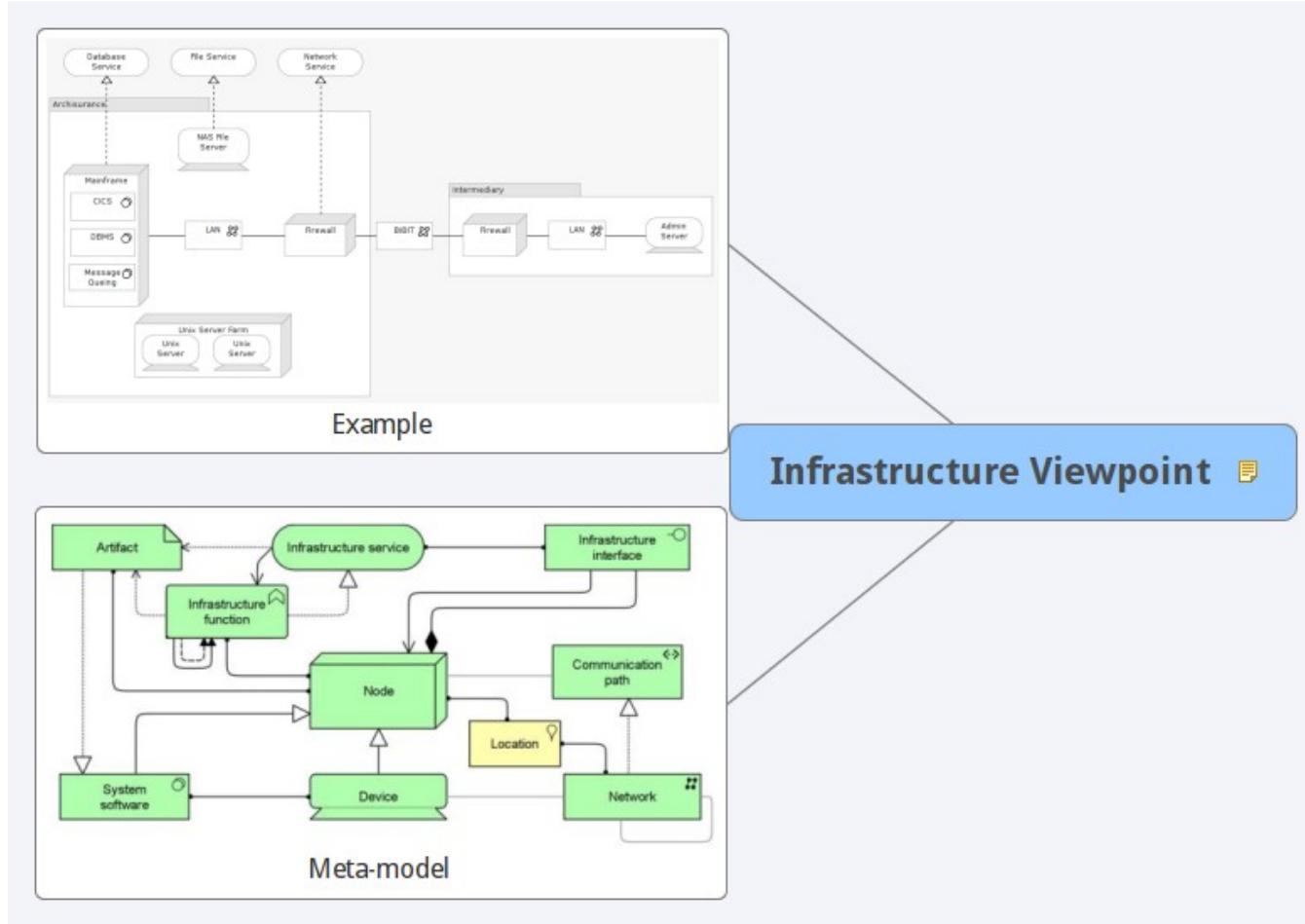
Meta-model



Example



Infrastructure Viewpoint

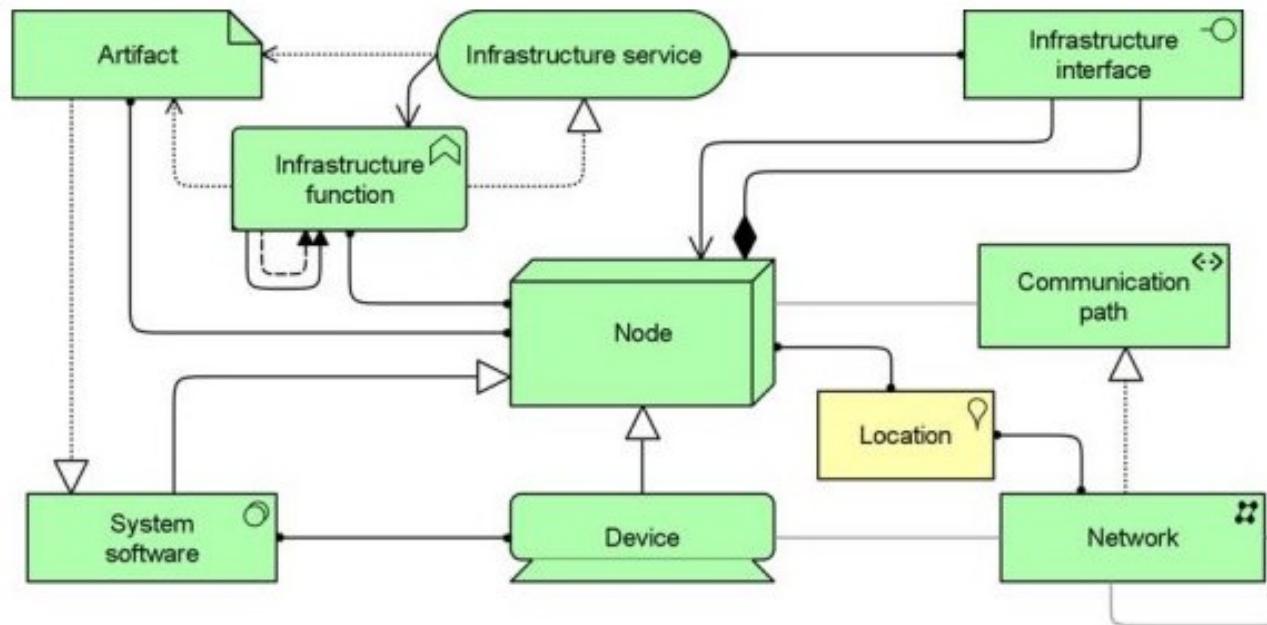


Infrastructure Viewpoint

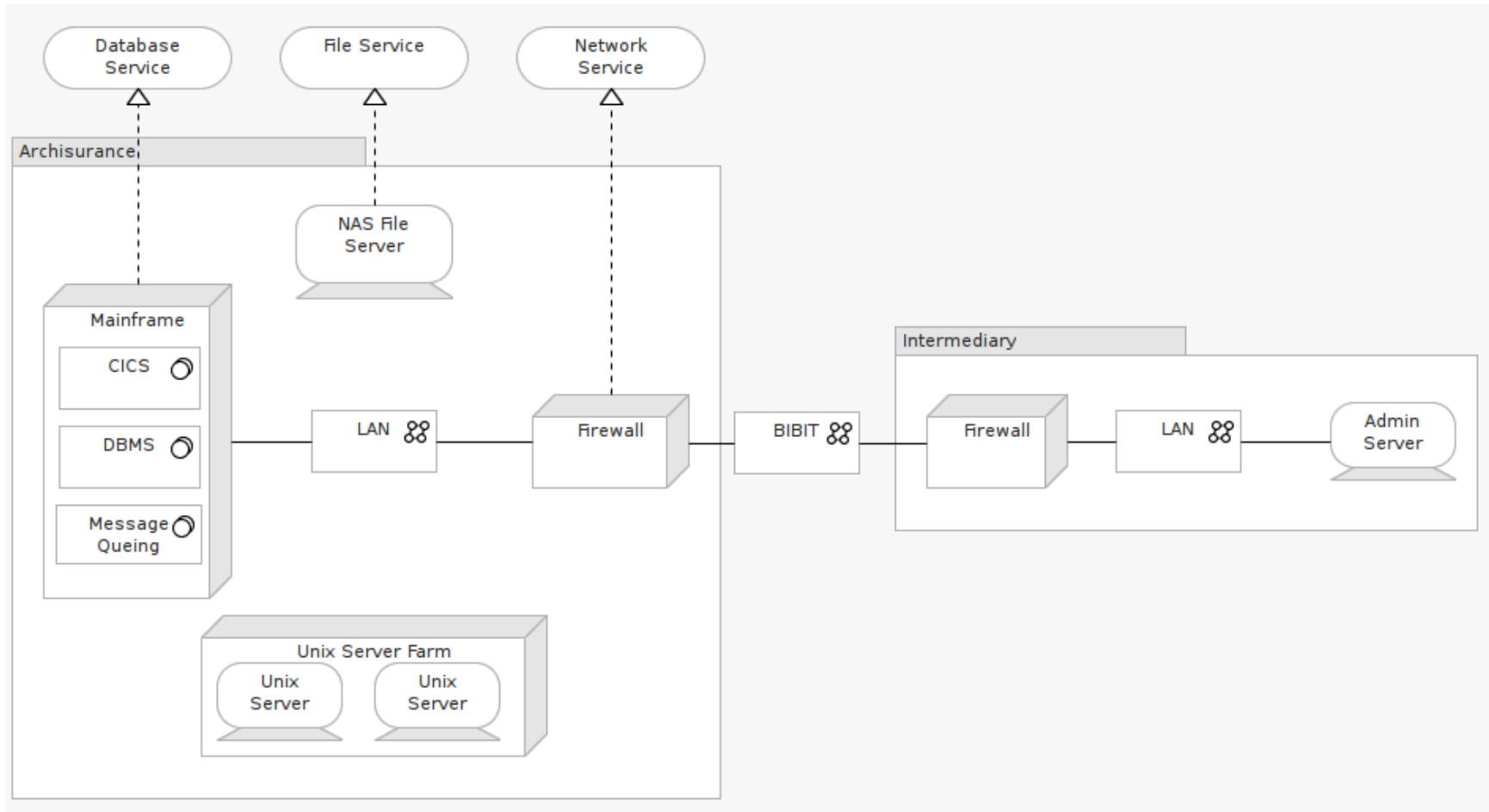
The Infrastructure viewpoint contains the software and hardware infrastructure elements supporting the application layer, such as physical devices, networks, or system software (e.g., operating systems, databases, and middleware).



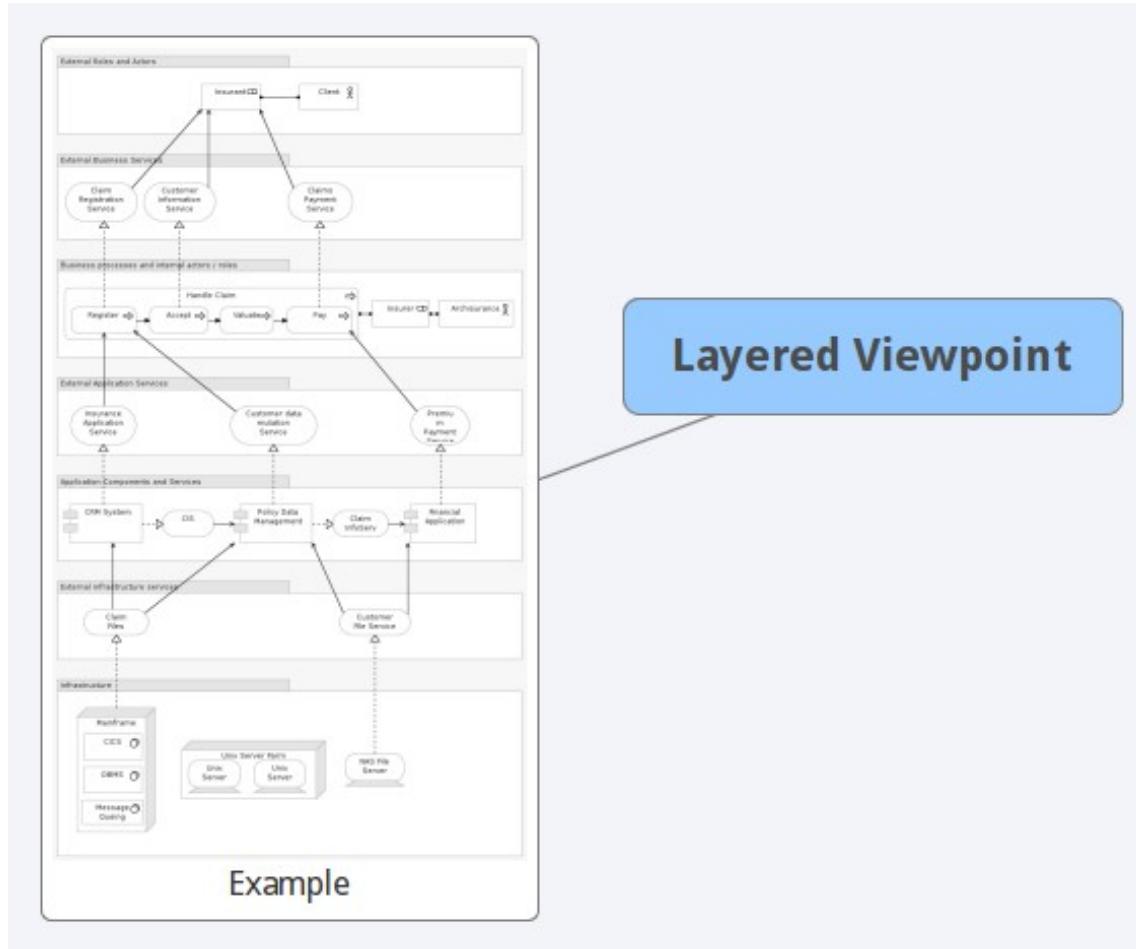
Meta-model



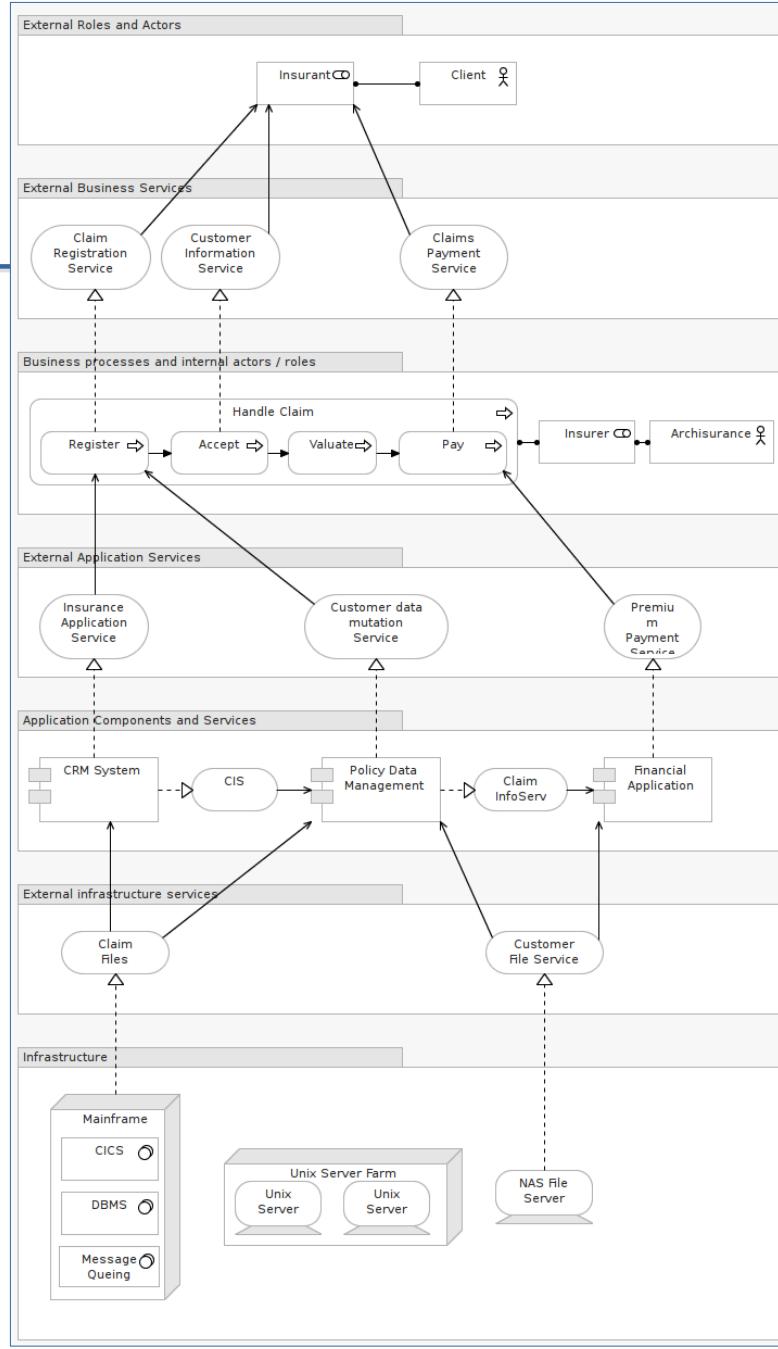
Example



Layered Viewpoint



Example



Some Extended Viewpoints

ArchiMate® 2.1

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ArchiMate Extension Viewpoints

Viewpoint	Type	Description
Stakeholder	Motivation Extension	This viewpoint allows the analyst to model the stakeholders, the internal and external drivers for change, and the assessments (in terms of strengths, weaknesses, opportunities, and threats) of these drivers.
Goal Realization	Motivation Extension	This viewpoint allows a designer to model the refinement of (high-level) goals into more concrete goals, and the refinement of concrete goals into requirements or constraints that describe the properties that are needed to realize the goals.
Goal Contribution	Motivation Extension	This viewpoint allows a designer or analyst to model the influence relationships between goals and requirements.
Principles	Motivation Extension	This viewpoint allows the analyst or designer to model the principles that are relevant to the design problem at hand, including the goals that motivate these principles.
Requirements Realization	Motivation Extension	This viewpoint allows the designer to model the realization of requirements by the core elements, such as business actors, business services, business processes, application services, application components, etc.
Motivation	Motivation Extension	This viewpoint allows the designer or analyst to model the motivation aspect, without focusing on certain elements within this aspect.
Project	Implementation & Migration Extension	This viewpoint is used to model the management of architecture change.
Migration	Implementation & Migration Extension	This viewpoint contains models and concepts that describe the transition from an existing architecture to a desired architecture.
Implementation & Migration	Implementation & Migration Extension	This viewpoint is used to relate programs and projects to the parts of the architecture that they implement.



Some Extended Viewpoints

Implementation & Deployment Viewpoint 

Motivation Viewpoint 

ArchiMate® 2.1		
ArchiMate Extension Viewpoints		
Viewpoint	Type	Description
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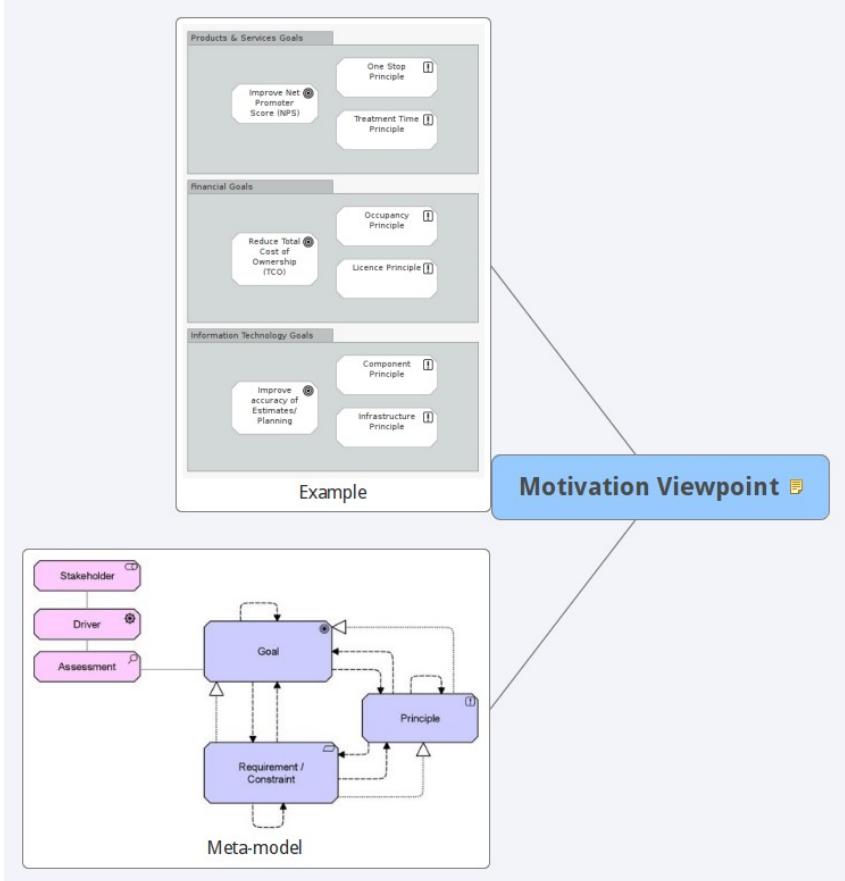
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Some Extended Viewpoints

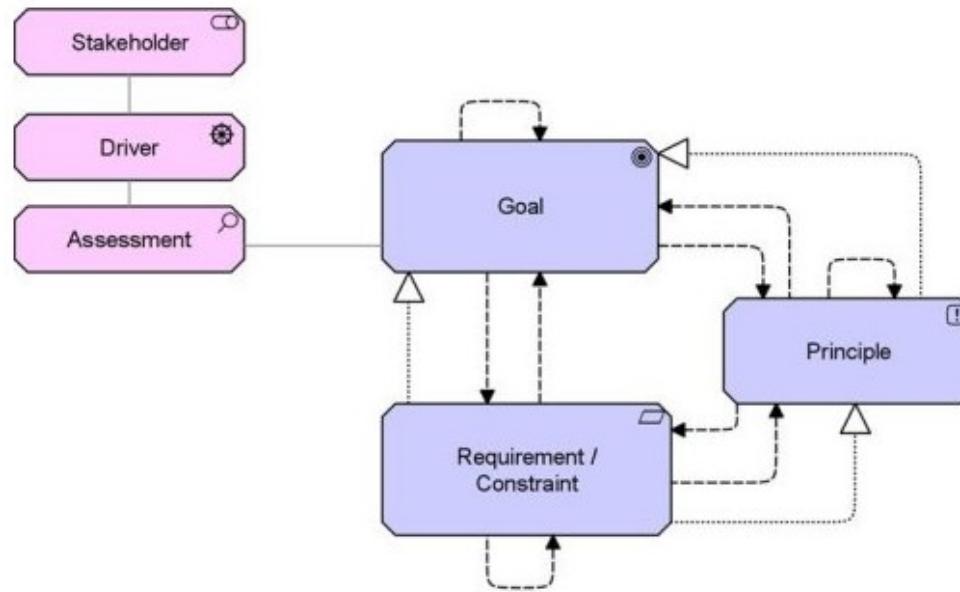


Motivation Viewpoint

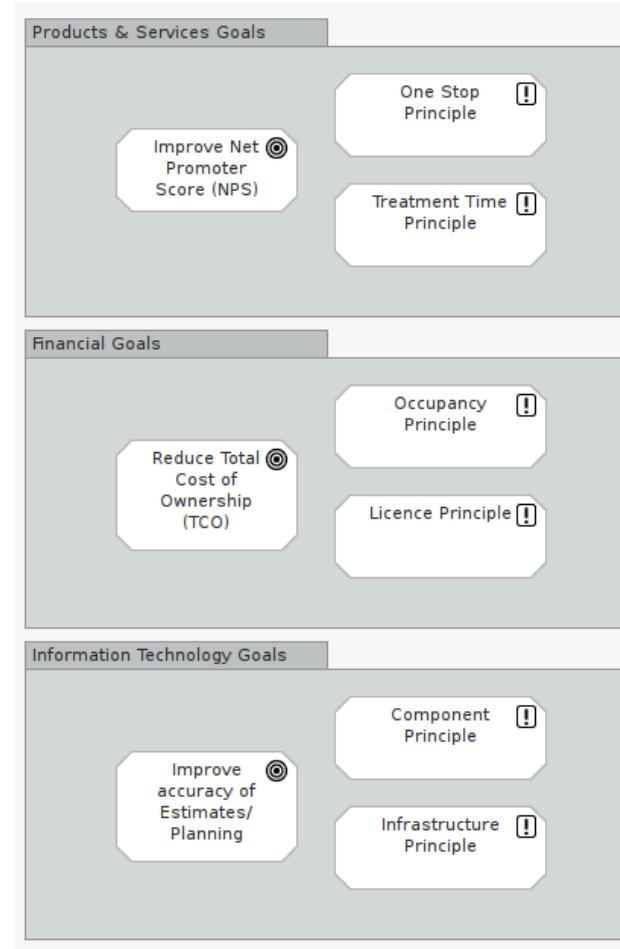
To model the motivation of the solution in terms of what to solve for.



Meta-model



Example



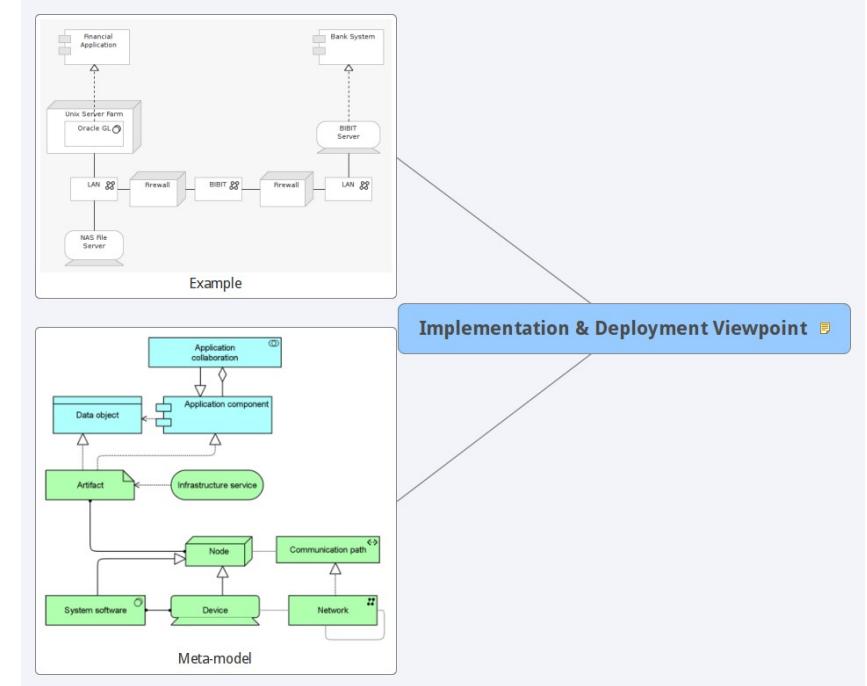
Implementation & Deployment Viewpoint

To allocate how one or more applications onto the infrastructure.

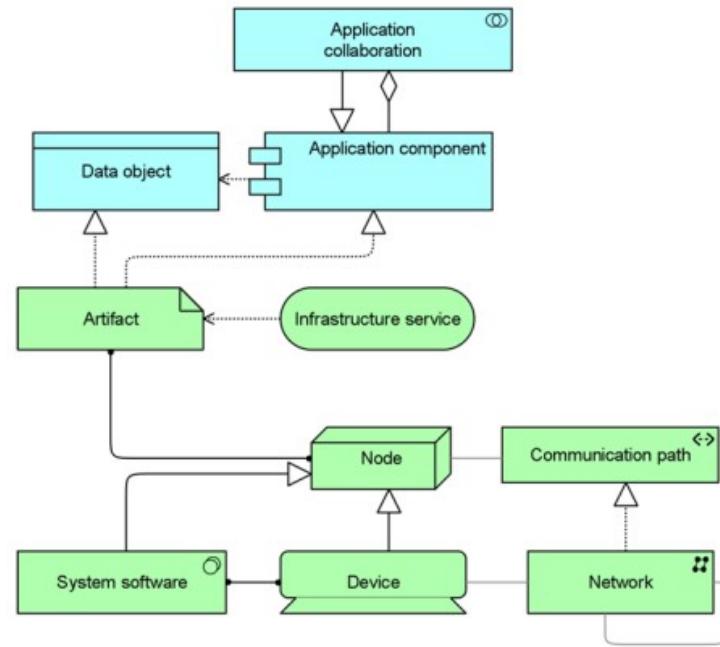
To perform (logical) mapping of applications and components onto (physical) artifacts,

To surface performance and scalability risks, since these relate the physical infrastructure to the logical world of applications.

Model-kind: Deployment diagrams



Meta-model



Example

