Knut Hinkelmann, Source: ArchiMate 3 – Chapters 14 and 15

View, Viewpoints and Customization in ArchiMate

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Architecture Views and Viewpoints

- Not everyone is interested in everything.
- Views and Viewpoints are a means to specify which part of an Architecture Description is of relevance
  - *View*: Part of an architecture description that
    - addresses a set of related *Concerns*
    - and is tailored for specific *Stakeholders*
  - *Viewpoint* specifies a view
    - prescribes the concepts, models, analysis techniques, and visualizations that are provided by the view
    - a characterisation of stakeholders and their concerns

A *view* is what you see and
a *viewpoint* is where you are looking from

ArchiMate 3, section 14.3

Stakeholder and Concerns

- *Stakeholders* are individuals, groups or organizations holding concerns for the System, i.e.
  - **Examples of Stakeholders**: business analyst, CEO, CIO, CxO, business architect, information architect, application architect, enterprise architect, process manager, product manager, auditor, …
- A *Concern* is any interest in the system, i.e. the objective for which a model is used
  - **Examples of Concerns**: optimisation, efficiency, quality of service, automation, agility, behavior, customer experience, flexibility, maintainability, regulatory compliance, security.

Views and Viewpoints in ArchiMate

- In ArchiMate, architects and other stakeholders can define their own views on the enterprise architecture
- A viewpoint in ArchiMate is a selection of
  - a relevant subset of the ArchiMate concepts and their relationships
  - For each viewpoint one model kind exists
- A view is (a set of) models
  - representing a part of an architecture
  - using the concepts and relationships of the corresponding viewpoint

Comparison to Databases

- The concept of views is well-known from databases
  - A view is a subset of a database
  - A view can be characterized by a query
- Thus
  - a *query* corresponds to a *viewpoint*: it characterizes what should be in a view
  - an *answer* to a query corresponds to a *view*: it is a table, which represents the part of the databases specified by the query

Two-Dimensional Classification of Enterprise Architecture Viewpoints

Purpose Dimension

Content Dimension

	Designing	Deciding	Informing
Details			
Coherence			
Overview			
	architect, software developer, business process designer	product manager, CIO, CEO	customer, employee, others

Two-Dimensional Classification of Enterprise Architecture Viewpoints

Purpose dimension:

***Designing*:** support architects and designers in the design process from initial sketch to detailed design. Typically, design viewpoints consist of diagrams, e.g. those used in UML.

***Deciding*:** assist managers in the process of decision-making by offering insight into cross-domain architecture relationships. Typical examples: cross-reference tables, landscape maps, lists, and reports.

***Informing*:** help to inform any stakeholder about the Enterprise Architecture, in order to achieve understanding, obtain commitment, and convince adversaries. Typical examples are illustrations, animations, cartoons, flyers, etc.

Content dimension:

select relevant aspects and layers from the ArchiMate Core Framework.

Details: one layer and one aspect. Typical stakeholders: a software engineer or a process owner responsible for one application/process.

***Coherence*:** multiple layers or multiple aspects. Enables to focus on architecture relationships like process-uses-system (multiple layer) or application-uses-object (multiple aspects). Typical stakeholders are operational managers responsible for a collection of IT services or business processes.

Overview: multiple layers and multiple aspects. Addressed to Enterprise Architects and decision-makers, such as CEOs and CIOs.

Creating an ArchiMate Viewpoint

- Creating an ArchiMate viewpoint consists of two steps:

1. Selecting a *subset of relevant concepts* (elements and relationships) from the ArchiMate metamodel that is needed to address the stakeholder's concerns.

2. Defining a *representation* to depict these concepts in a way that is understood by the stakeholders.

   This can be a diagram that uses standard or customized ArchiMate notation, a catalog of elements, a matrix showing the relationships between two groups of elements, or an entirely different visualization.

Customization in Archimate

- The ArchiMate language contains only the elements and relationships that are necessary for general architecture modeling.
- It can be customized for for specific usage like model-based performance or cost calculations, or to attach supplementary information (textual, numerical, etc.)
- Two ways to customize
  - Profiling
  - Specialization of eElements and relationship

Specialization of Elements and Relationships

- Specialization is a simple and powerful way to define new elements or relationships based on the existing ones.
- Specialized elements inherit the properties of their generalized elements
- New graphical notation could be introduced for a specialized concept, e.g., by adding or changing the icon.
- Specialization of elements and relationships allows organizations or individual users to customize the language to their own preferences and needs, while the underlying definition of the concepts is preserved

Examples of Specializations

Specializsation can be made for elements and relations on all layers

- A **Business Actor** could be
  - Individual
  - Organization Unit
- **Product** could be
  - Physical Product
  - Digital Product
- **Application Interface** coud be
  - Application-to-Application Interface
  - User Interface
- **Network** could be
  - WiFi Network
  - Wide Area Network
- **Equipment** could be
  - Vehicle
  - Train
- A **Goal** coud be
  - A Business Objective
  - A Control Object (for a risk)

Examples of Views and Viewpoints in ArchiMate

Source: ArchiMate 3, Appendix C

Basic Viewpoints (1)

Category: Composition		
Name	**Perspective**	**Scope**
Organization	Structure of the enterprise in terms of roles, departments, etc.	Single layer/ Single aspect
Application Platform	Shows structure of a typical application platform and how it relates to supporting technology.	Multiple layer/ Multiple aspect
Information Structure	Shows the structure of the information used in the enterprise.	Multiple layer/ Single aspect
Technology	Infrastructure and platforms underlying the enterprise's information systems in terms of networks, devices, and system software.	Single layer/ Multiple aspect
Layered	Provides overview of architecture(s).	Multiple layer/ Multiple aspect
Physical	Physical environment and how this relates to IT infrastructure.	Multiple layer/ Multiple aspect

Basic Viewpoints (2)

Category: Support		
Name	**Perspective**	**Scope**
Product	Shows the contents of products.	Multiple layer/ Multiple aspect
Application Usage	Relates applications to their use in, for example, business processes.	Multiple layer/ Multiple aspect
Technology Usage	Shows how technology is used by applications.	Multiple layer/ Multiple aspect
Category: Cooperation		
Business Process Cooperation	Shows the relationships between various business processes.	Multiple layer/ Multiple aspect
Application Cooperation	Shows application components and their mutual relationships.	Multiple layer/ Multiple aspect
Category: Realization		
Service Realization	Shows how services are realized by the requisite behavior.	Multiple layer/ Multiple aspect
Implementation and Deployment	Shows how applications are mapped onto the underlying technology.	Multiple layer/ Multiple aspect

Motivation Viewpoints

- The ***stakeholder viewpoint*** focuses on modeling the stakeholders, drivers, the assessments of these drivers, and the initial goals to address these drivers and assessments.
- The ***goal realization viewpoint*** focuses on refining the initial, high-level goals into more concrete (sub-)goals using the aggregation relationship, and finally into requirements and constraints using the realization relationship.
- The ***goal contribution viewpoint*** focuses on modeling and analyzing the influence relationships between goals (and requirements).
- The ***principles viewpoint*** focuses on modeling the relevant principles and the goals that motivate these principles.
- The ***requirements realization viewpoint*** focuses on modeling the realization of requirements and constraints by means of core elements, such as actors, services, processes, application components, etc.
- The ***motivation viewpoint*** covers the entire motivational aspect and allows use of all motivational elements.
- The ***capability map viewpoint*** provides an overview of the capabilities of the enterprise.

Strategy Viewpoints

- The ***capability map viewpoint*** provides an overview of the capabilities of the enterprise.
- The ***outcome realization viewpoint*** describes how high-level, business-oriented results are produced by the capabilities and resources of the enterprise.
- The ***resource map viewpoint*** provides a structured overview of the resources of the enterprise.

Implementation and Migration Viewpoints

- The ***project viewpoint*** is primarily used to model the management of architecture change.
- The ***migration viewpoint*** is used to model the transition from an existing architecture to a target architecture.
- The ***implementation and migration viewpoint*** is used to model the relationships between the programs and projects and the parts of the architecture that they implement.

Layered Viewpoint

The Layered viewpoint pictures several layers and aspects of an enterprise architecture in one diagram.

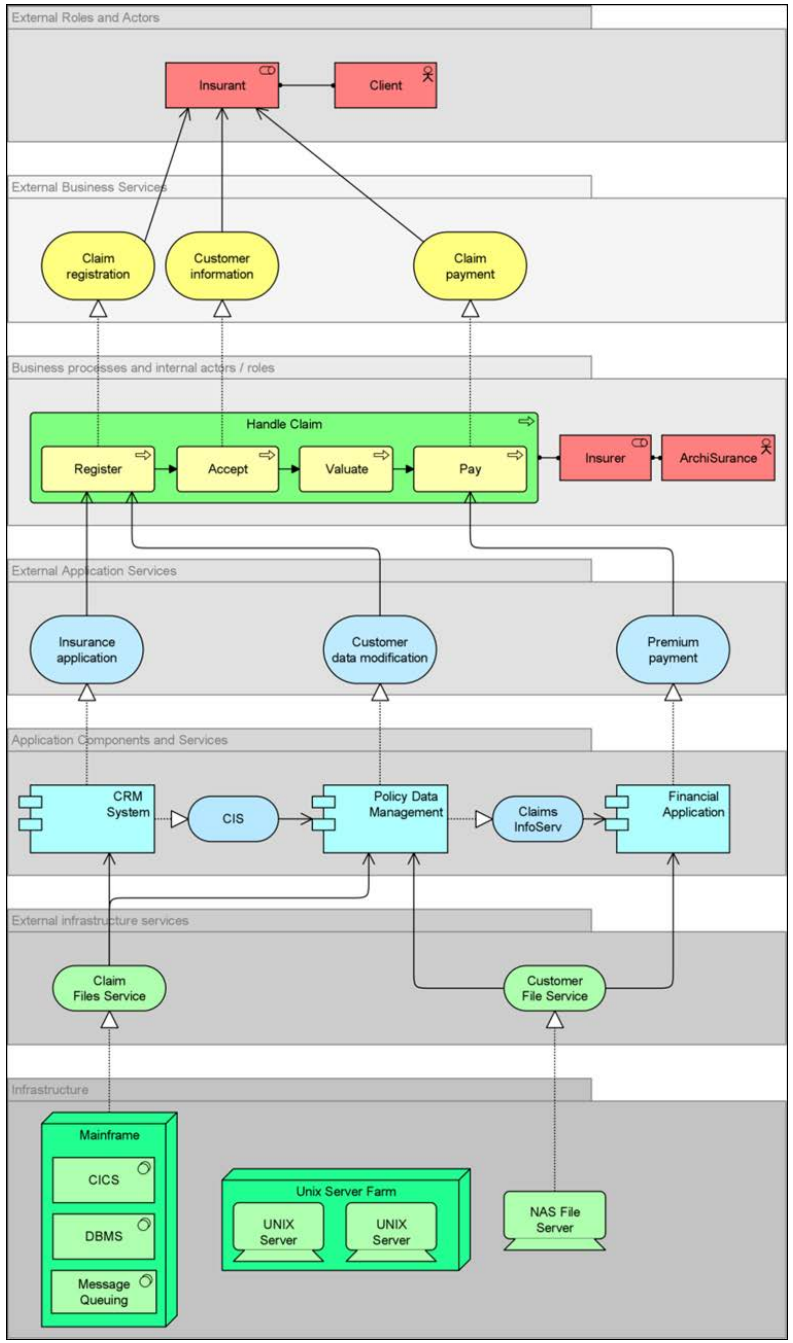
The layers are the result of the use of the “grouping” relation for a natural partitioning of the entire set of objects and relations that belong to a model.

Each dedicated layer exposes, by means of the “realization” relation a layer of services, which are further on “used by” the next dedicated layer.

Layered Viewpoint	
Stakeholders	Enterprise, process, application, infrastructure, and domain architects
Concerns	Consistency, reduction of complexity, impact of change, flexibility
Purpose	Designing, deciding, informing
Scope	Multiple layer/Multiple aspect

Concepts and Relationships: **all core elements**

Example of a Model from the Layered Viewpoint

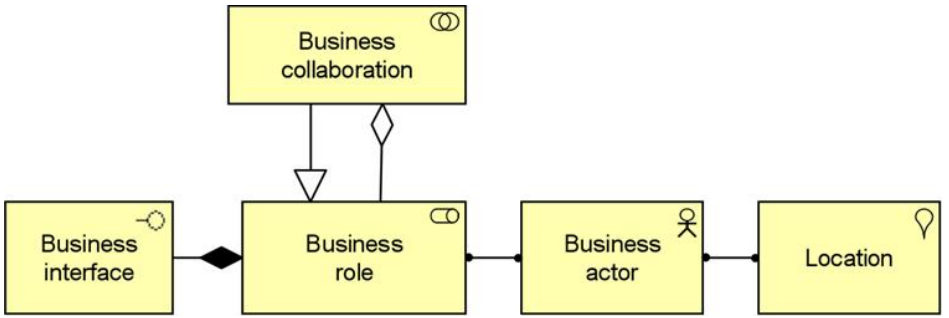


Organization Viewpoint

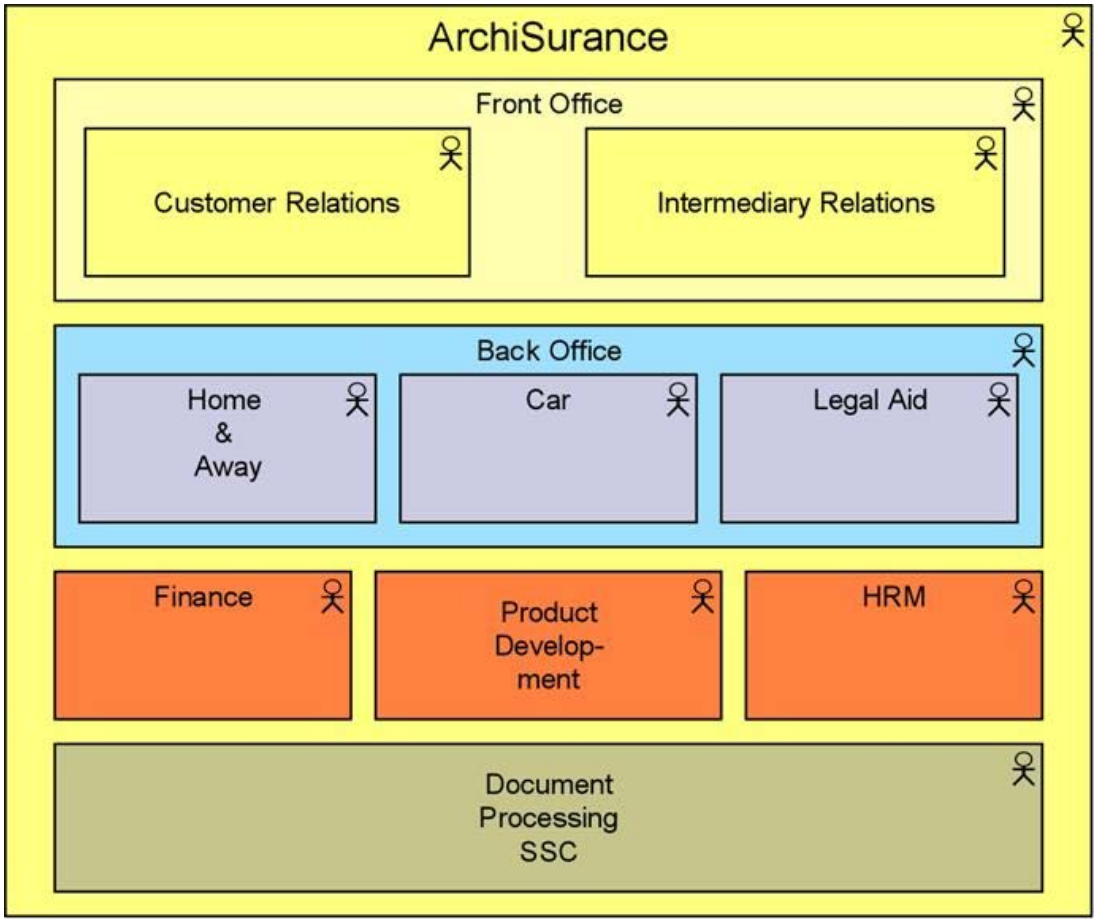
- (Internal) organization of a company, a department, a network of companies. Could be modeled as nested diagrams or as organizational charts.
- Useful in identifying competencies, authority, and repsonsibilities

Organization Viewpoint	
Stakeholders	Enterprise, process and domain architects, managers, employees, shareholders
Concerns	Identification of competencies, authority, and responsibilities
Purpose	Designing, deciding, informing
Scope	Single layer/Single aspect

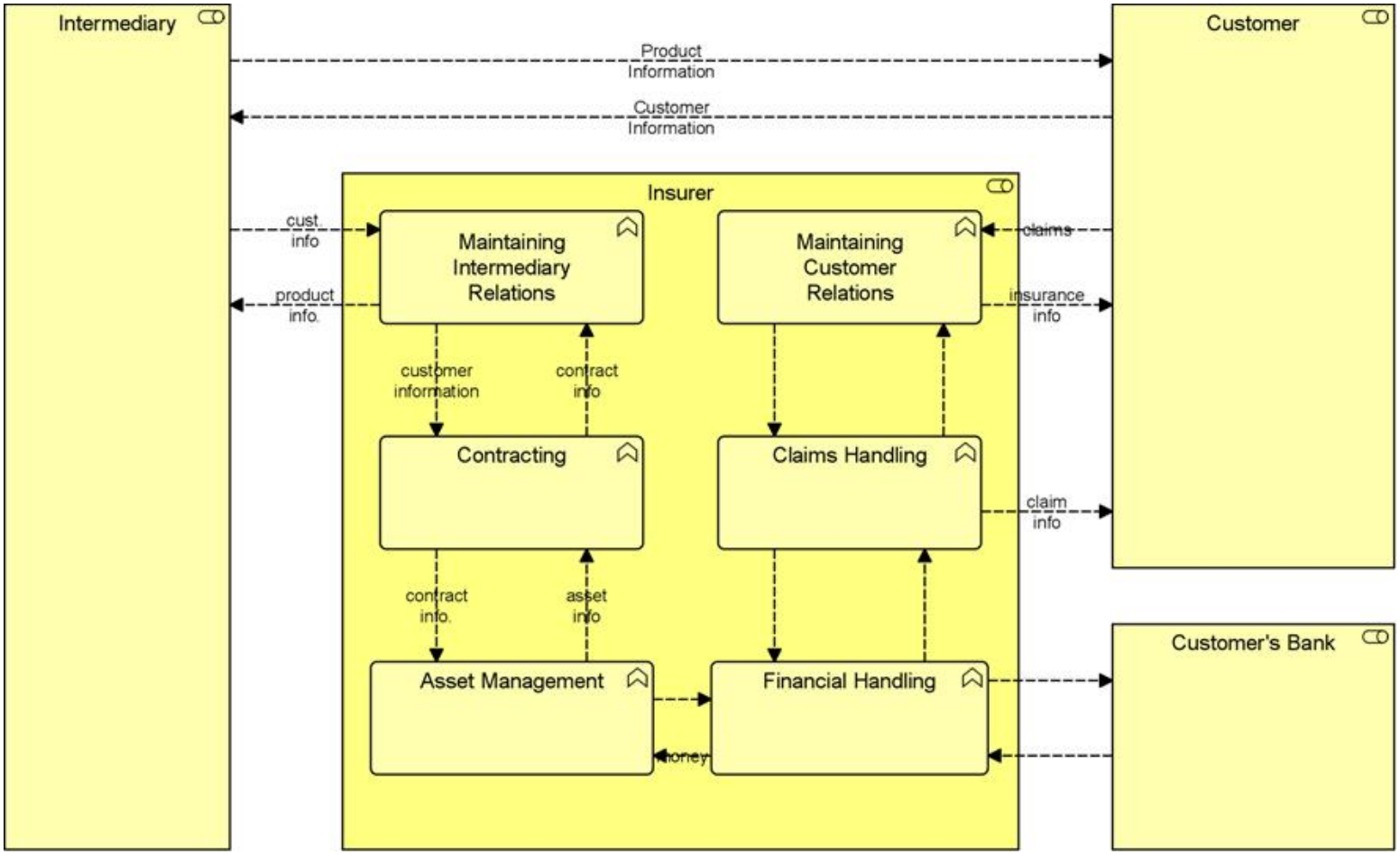
Concepts and Relations:



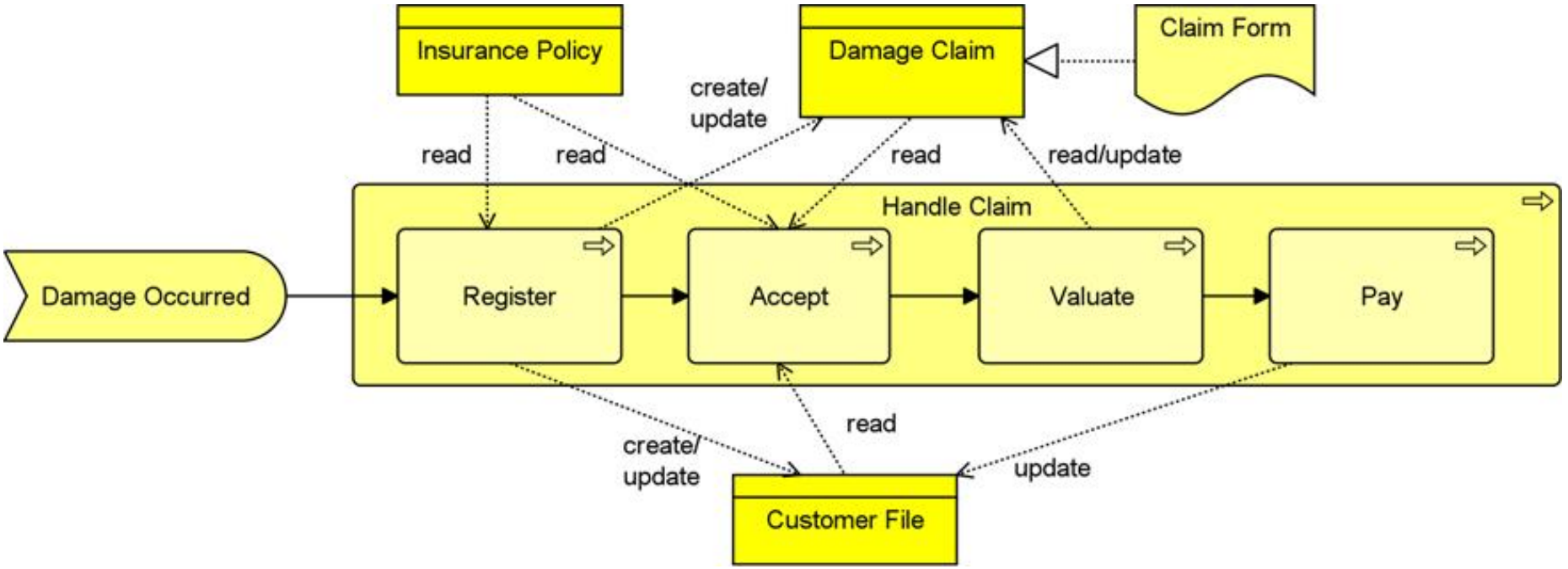
Example of a Model from the Organization Viewpoint



Example of a Model from the Business Function Viewpoint



Example of a Model from the Business Process Viewpoint

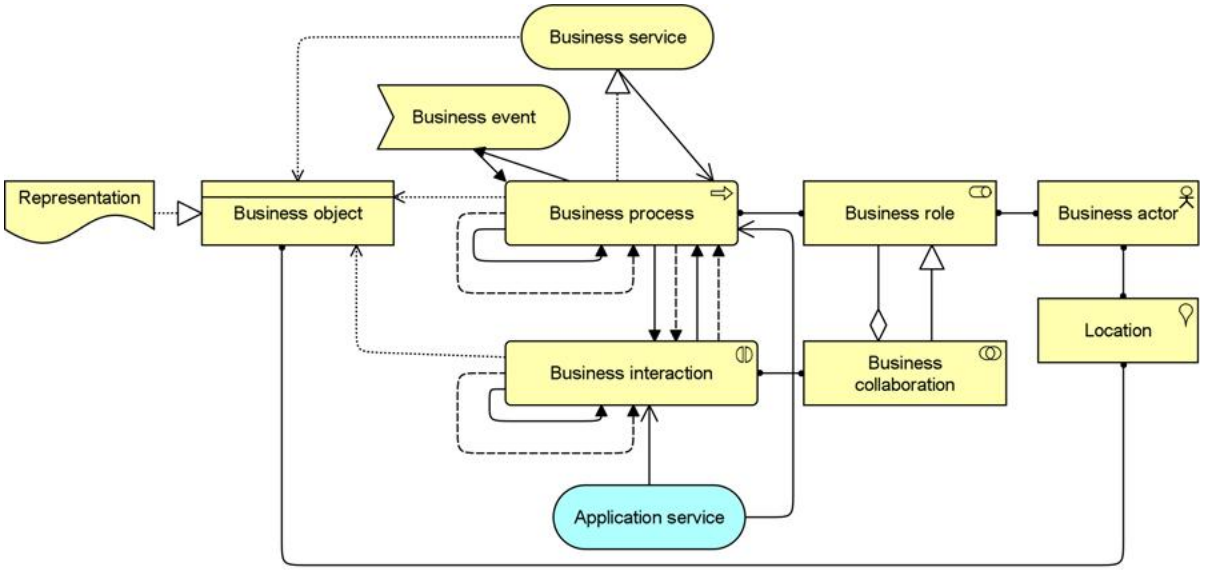


Business Process Co-operation Viewpoint

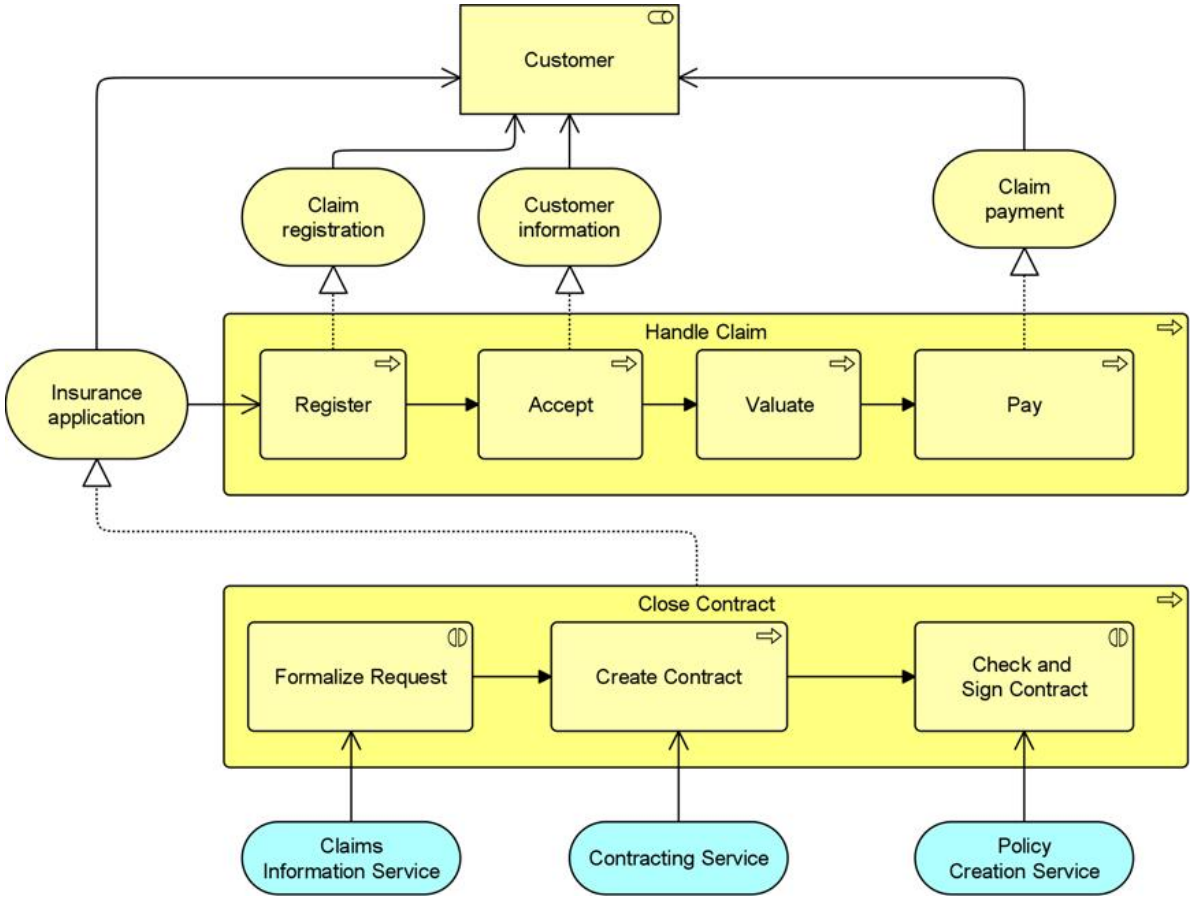
Relations of one or more business processes with each other and/or the environment.

Business Process Cooperation Viewpoint	
Stakeholders	Process and domain architects, operational managers
Concerns	Dependencies between business processes, consistency and completeness, responsibilities
Purpose	Designing, deciding
Scope	Multiple layer/Multiple aspect

Concepts and Relationships:



Example of a Model from the Business Process Co-operation Viewpoint

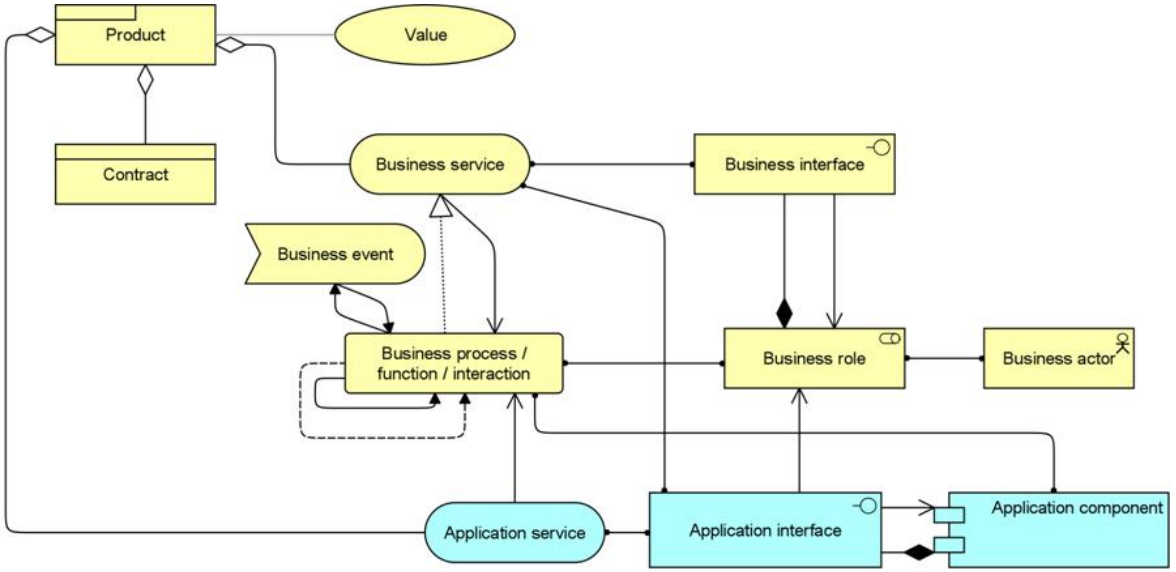


Product Viewpoint

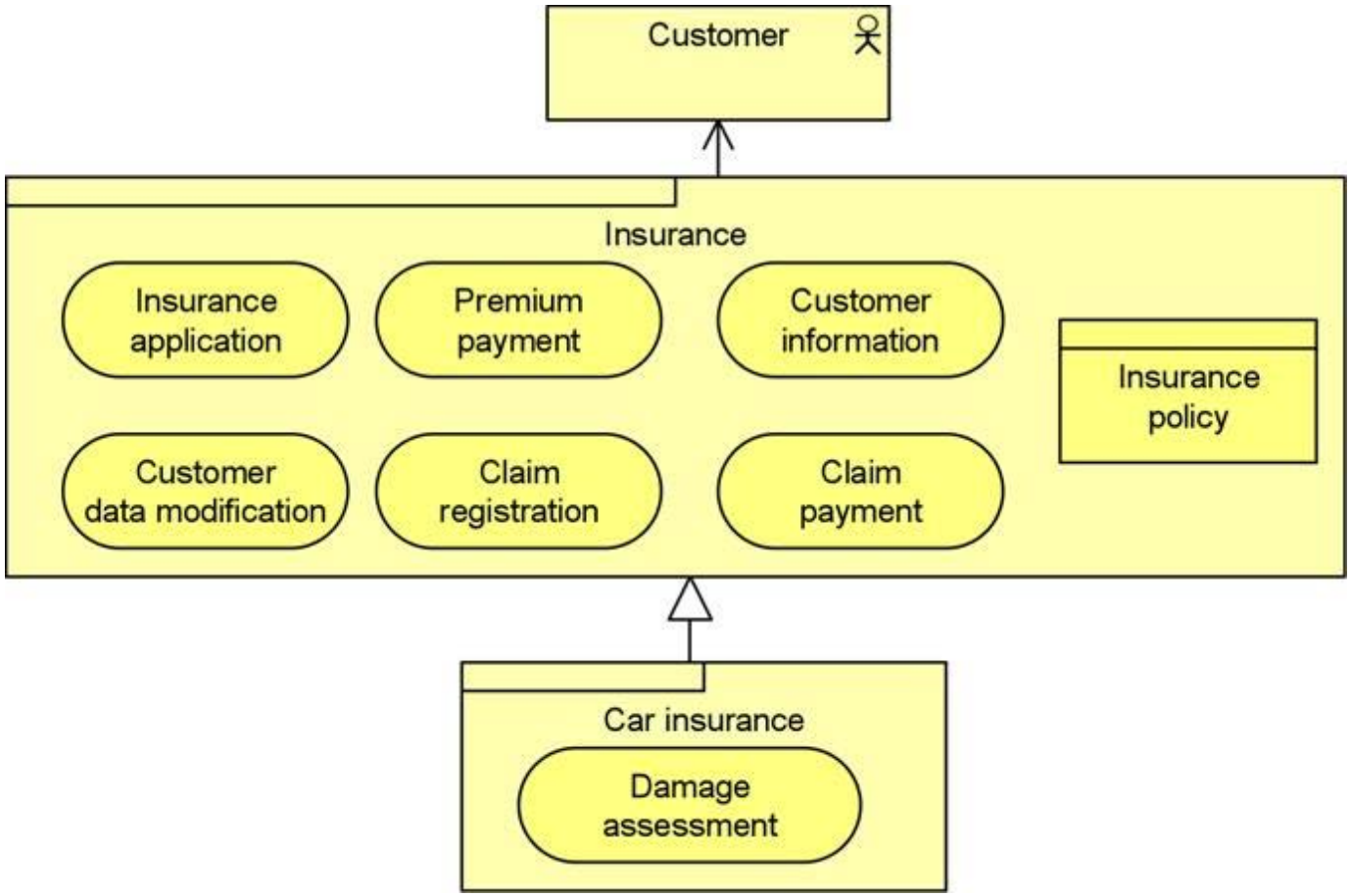
Composition of products, the associated contract(s) or agreements, and the products' value to customers and other external parties..

Product Viewpoint	
Stakeholders	Product developers, product managers, process and domain architects
Concerns	Product development, value offered by the products of the enterprise
Purpose	Designing, deciding
Scope	Multiple layer/Multiple aspect

Concepts and Relationships:



Example of a Model from the Product Viewpoint

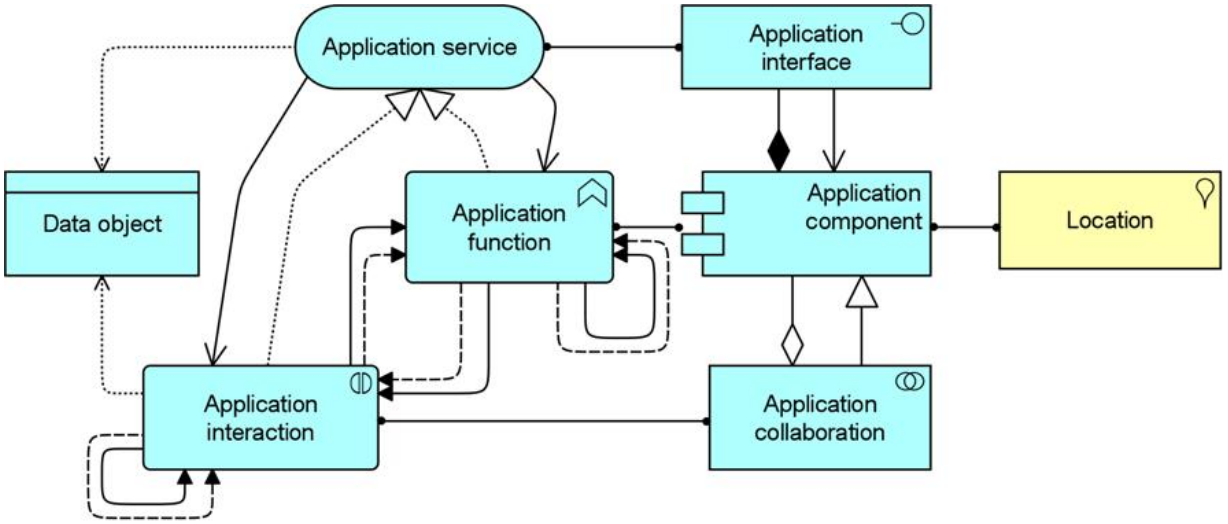


Application Cooperation Viewpoint

Relations between applications components in terms of the information flows between them, or in terms of the services they offer and use.

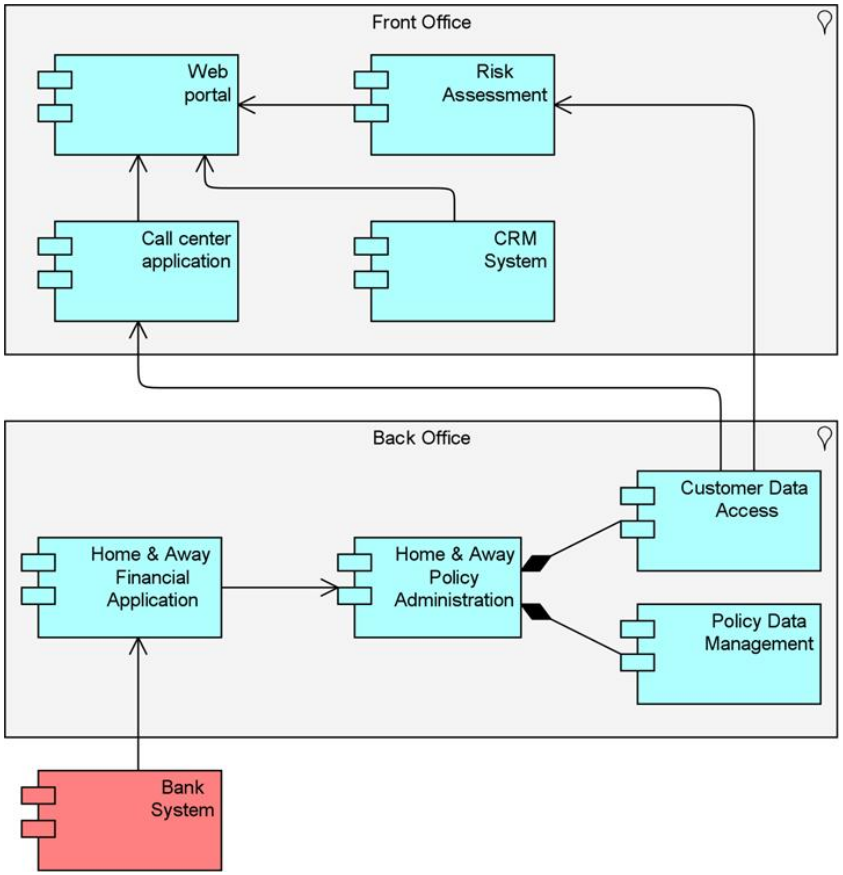
Application Cooperation Viewpoint	
Stakeholders	Enterprise, process, application, and domain architects
Concerns	Relationships and dependencies between applications, orchestration/choreography of services, consistency and completeness, reduction of complexity
Purpose	Designing
Scope	Multiple layer/Multiple aspect

Concepts and Relationships:



Example of a Model from the Application Co-operation Viewpoint

Relations between applications components in terms of the information flows between them, or in terms of the services they offer and use.

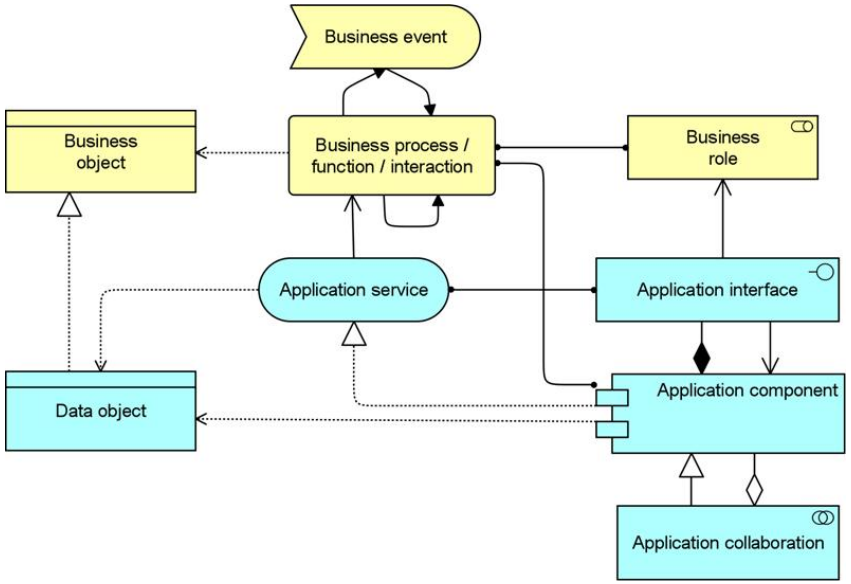


Application Usage Viewpoint

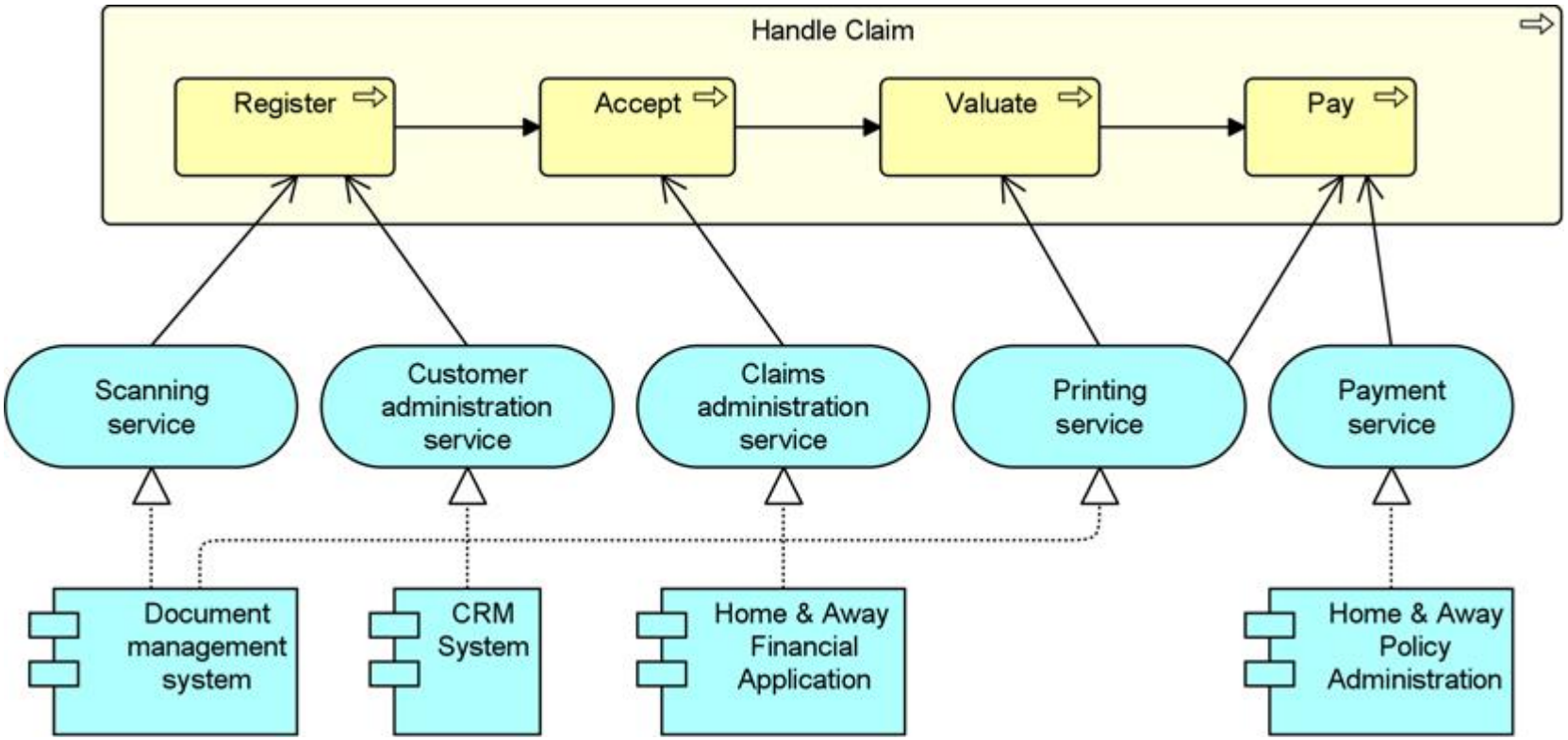
Describes how applications are used to support one or more business processes, and how they are used by other applications

Application Usage Viewpoint	
Stakeholders	Enterprise, process, and application architects, operational managers
Concerns	Consistency and completeness, reduction of complexity
Purpose	Designing, deciding
Scope	Multiple layer/Multiple aspect

Concepts and Relationships:



Example of a Model from the Application Usage Viewpoint

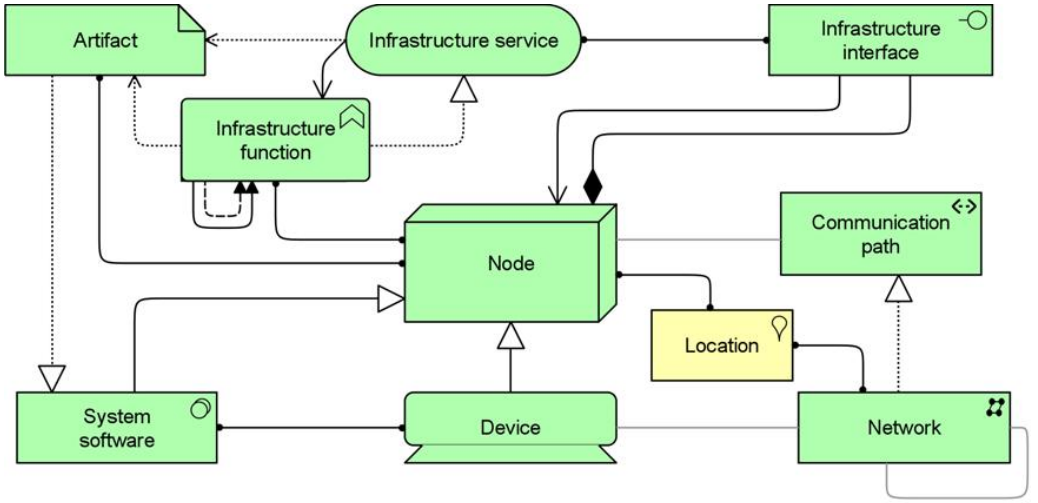


Technology Viewpoint

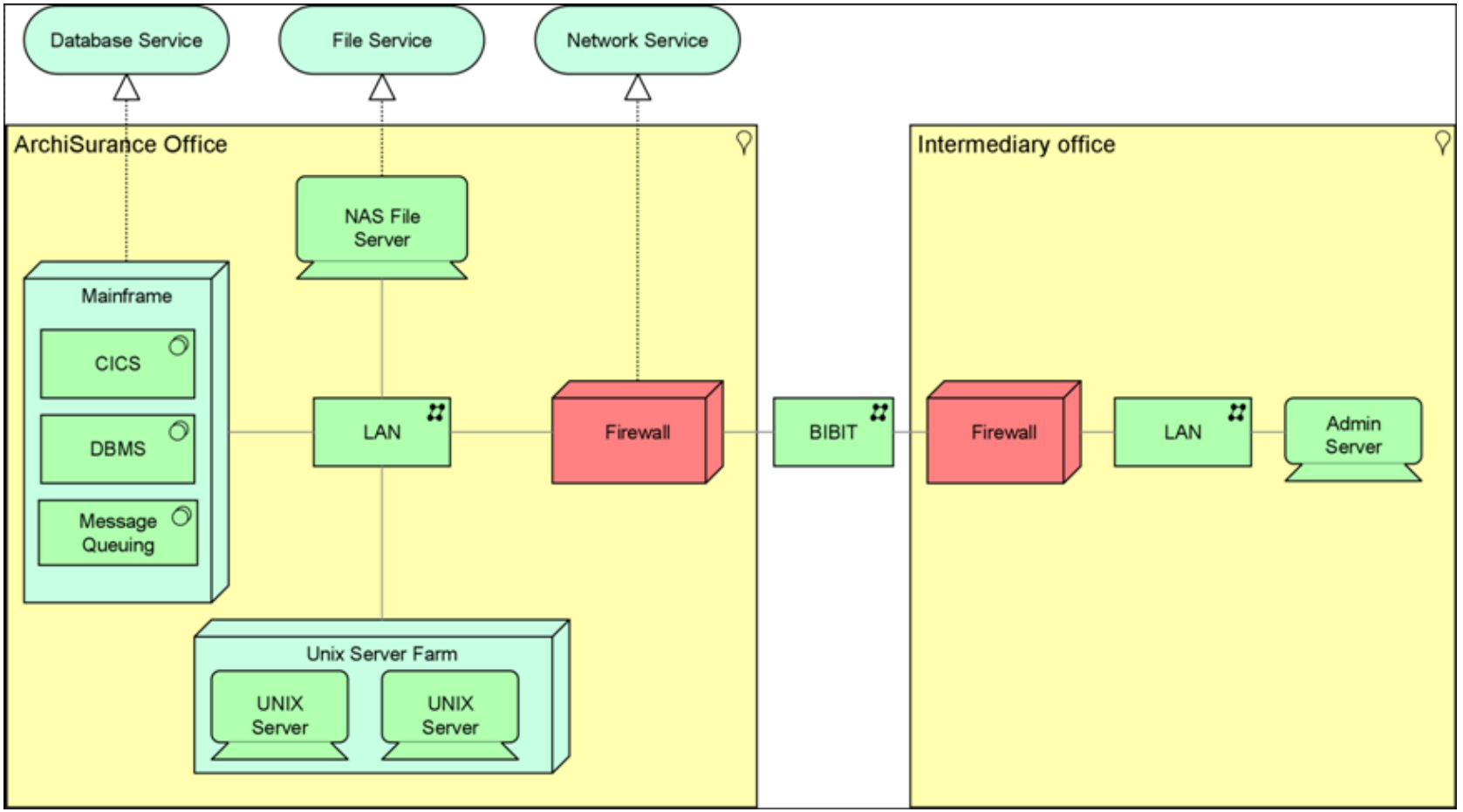
Software and hardware infrastructure elements supporting the application layer, such as physical devices, networks, or system software (e.g., operating systems, databases, and middleware).

Technology Viewpoint	
Stakeholders	Infrastructure architects, operational managers
Concerns	Stability, security, dependencies, costs of the infrastructure
Purpose	Designing
Scope	Single layer/Multiple aspect

Concepts and Relationships:



Example of a Model from the Technology Viewpoint

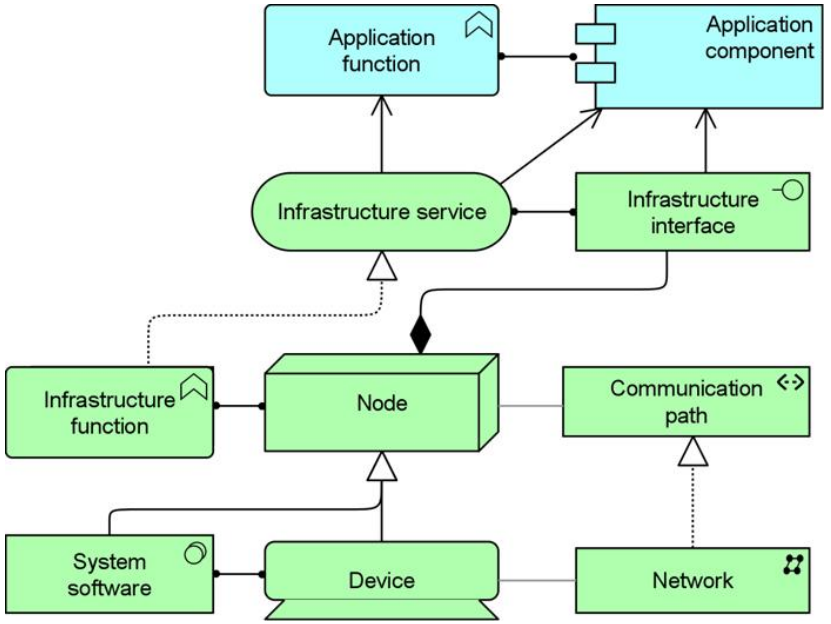


Technology Usage Viewpoint

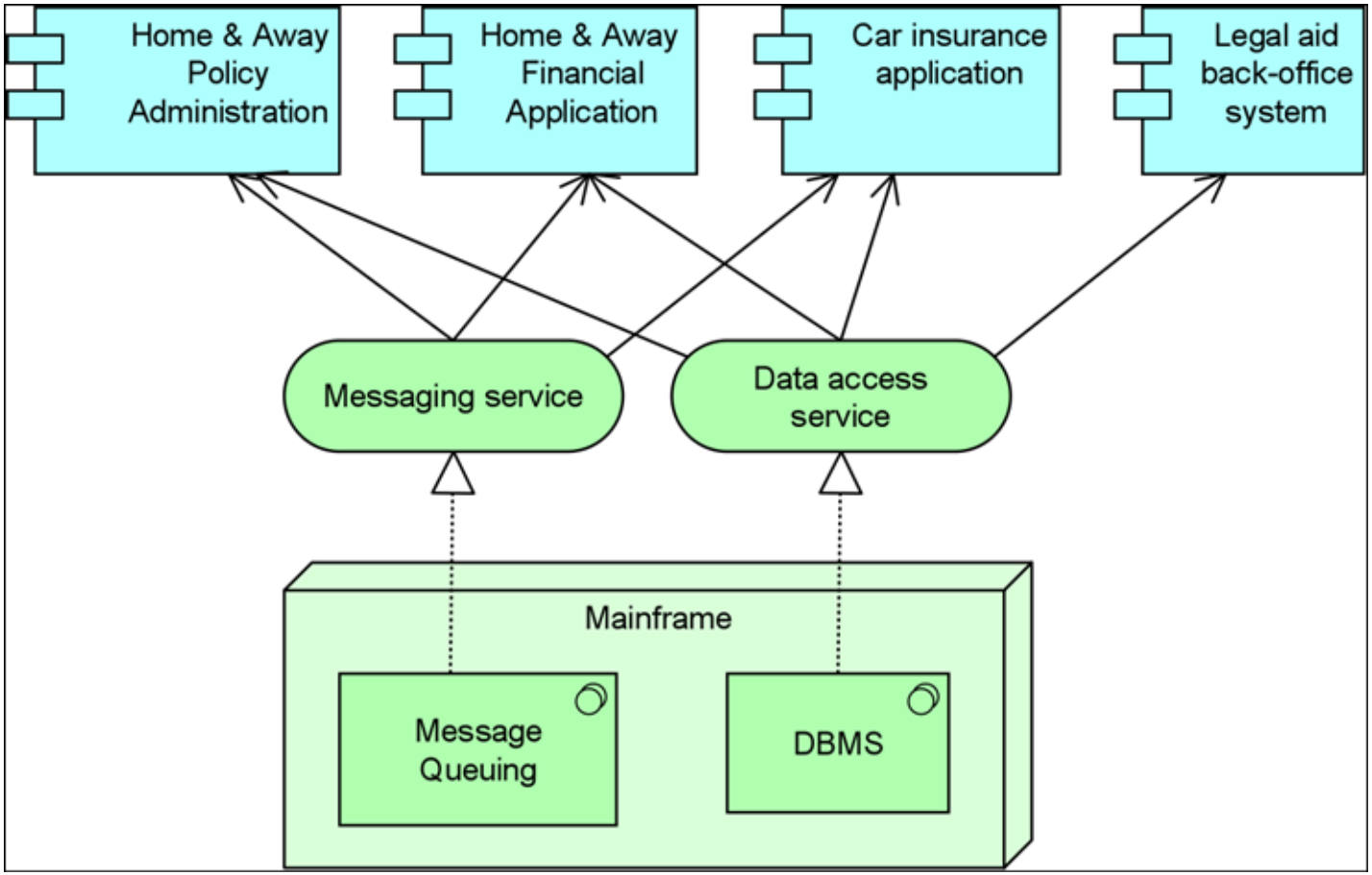
How applications are supported by the software and hardware infrastructure: the infrastructure services are delivered by the devices; system software and networks are provided to the applications

Technology Usage Viewpoint	
Stakeholders	Application, infrastructure architects, operational managers
Concerns	Dependencies, performance, scalability
Purpose	Designing
Scope	Multiple layer/Multiple aspect

Concepts and Relationships:



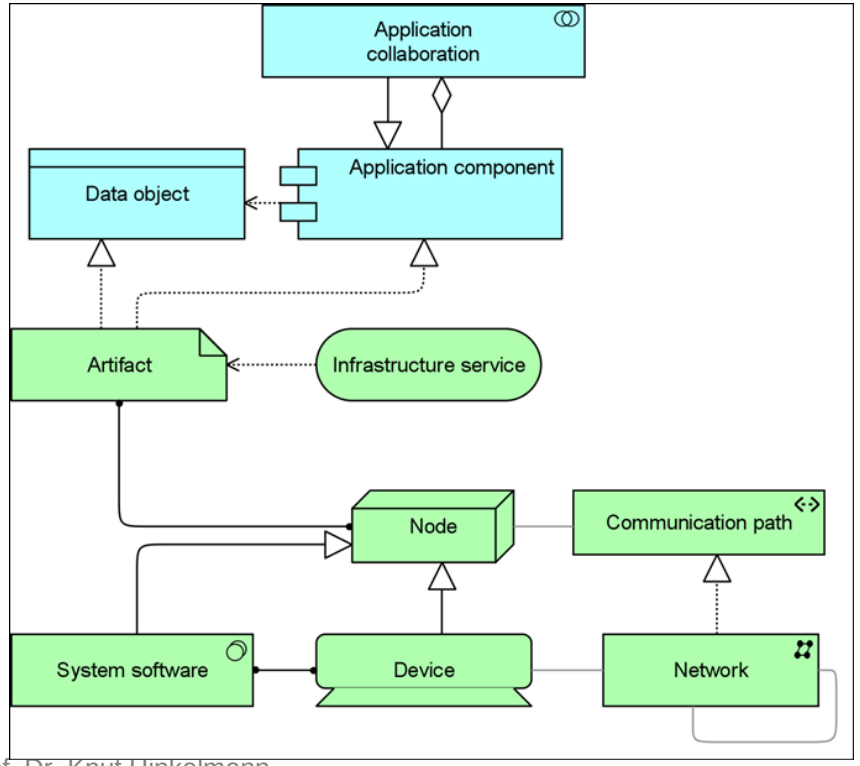
Example of a Model from the Technology Usage Viewpoint



Implementation and Deployment Viewpoint

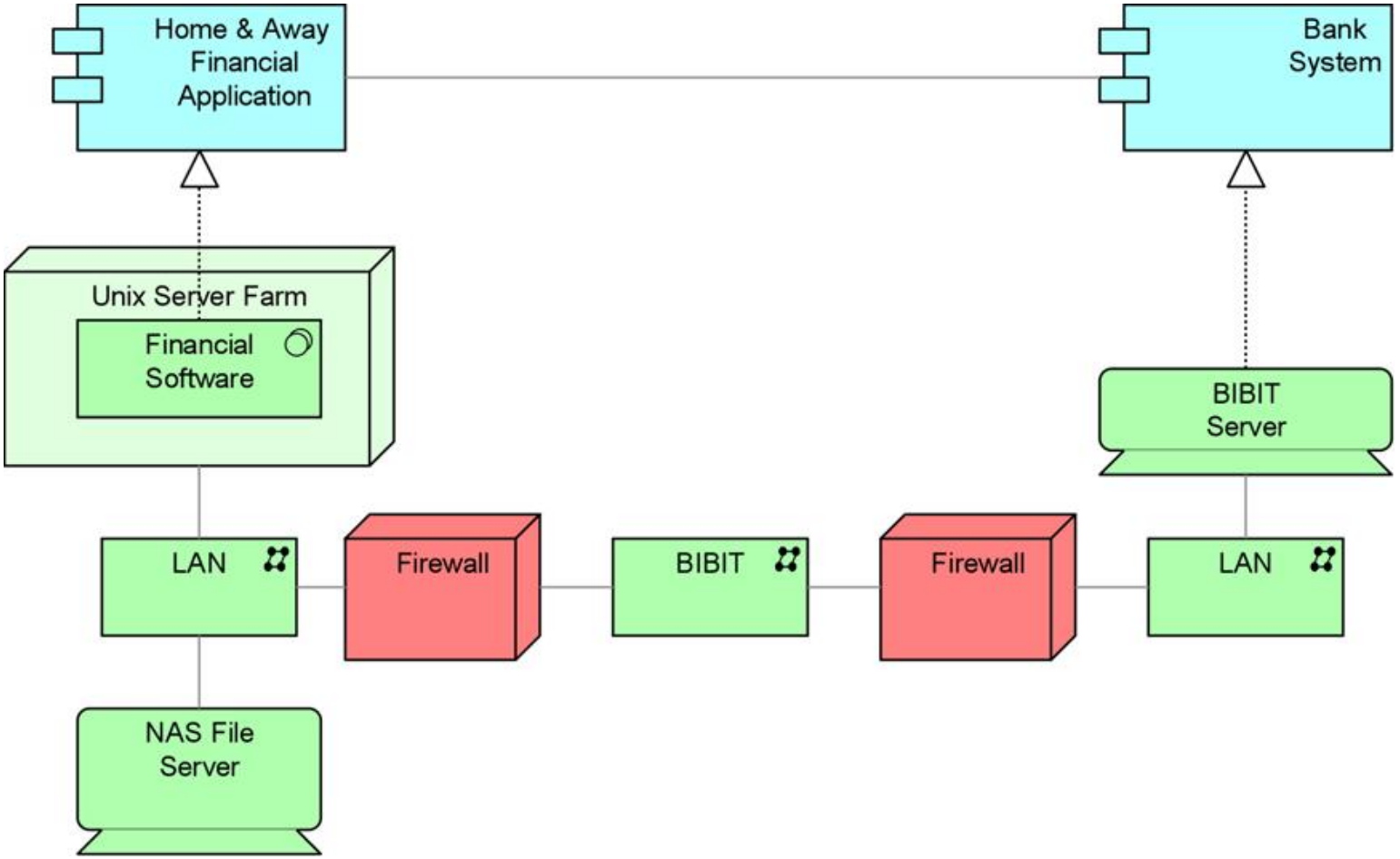
How one or more applications are realized on the infrastructure. This comprises the mapping of (logical) applications onto (physical) artifacts, such as Enterprise Java Beans, and the mapping of the information used by these applications onto the underlying storage infrastructure; e.g., database tables or other files.

Concepts and Relationships:



Implementation and Deployment Platform Viewpoint	
Stakeholders	Application and domain architects
Concerns	Structure of application platforms and how they relate to supporting technology
Purpose	Designing, deciding
Scope	Multiple layer/Multiple aspect

Example of a Model from the Implementation and Deployment Viewpoint

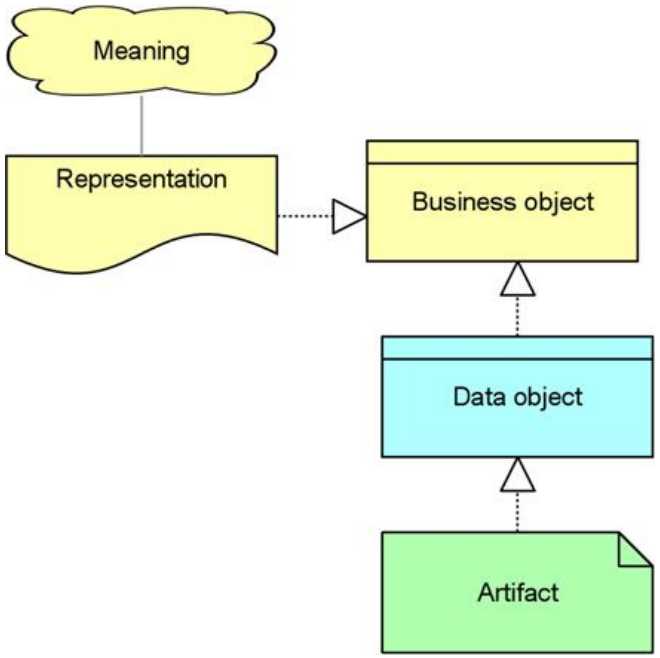


Information Structure Viewpoint

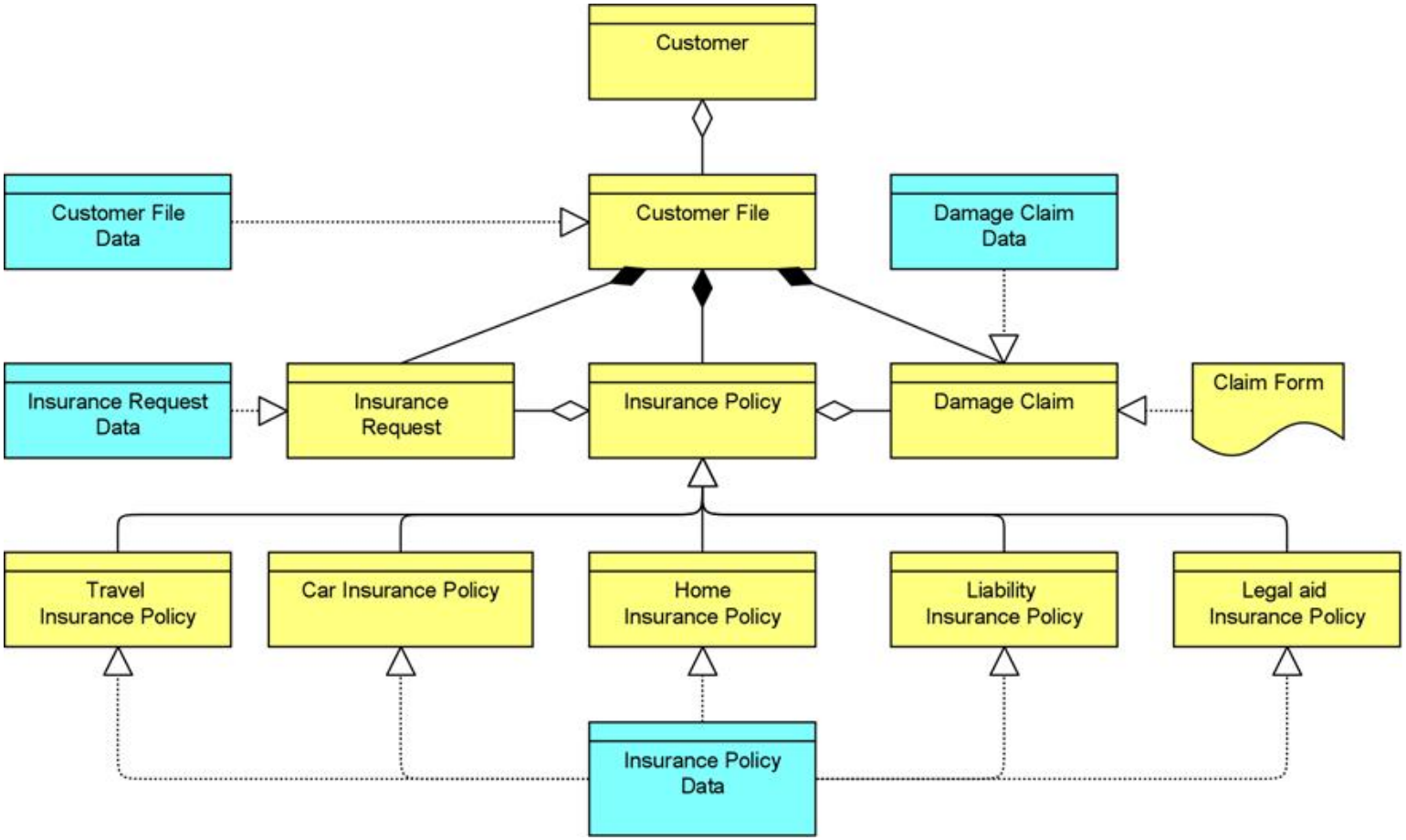
It shows the structure of the information used in the enterprise or in a specific business process or application, in terms of data types or (object-oriented) class structures. It is comparable to the traditional information models created in the development of almost any information system.

Information Structure Viewpoint	
Stakeholders	Domain and information architects
Concerns	Structure and dependencies of the used data and information, consistency and completeness
Purpose	Designing
Scope	Multiple layer/Single aspect

Concepts and Relationships:



Example of a Model from the Information Structure Viewpoint

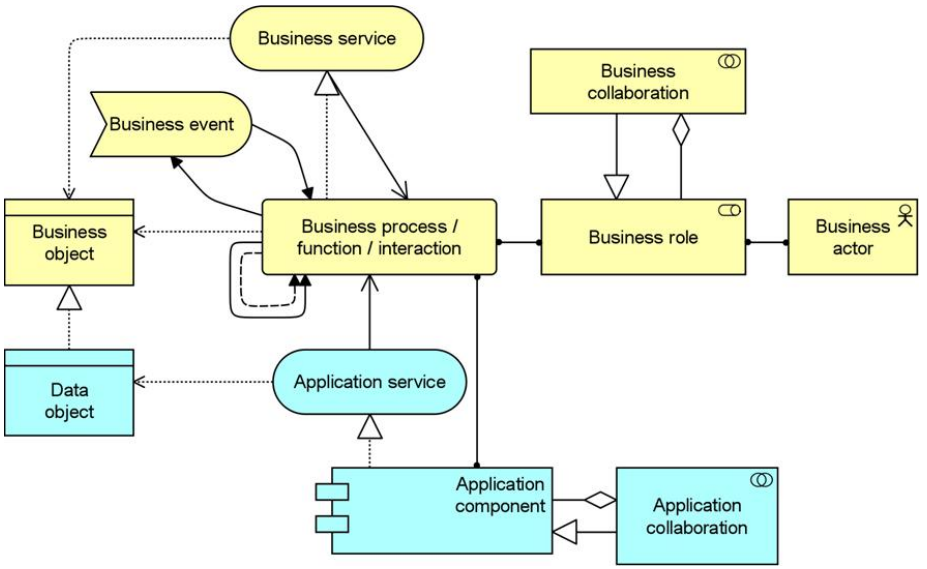


Service Realization Viewpoint

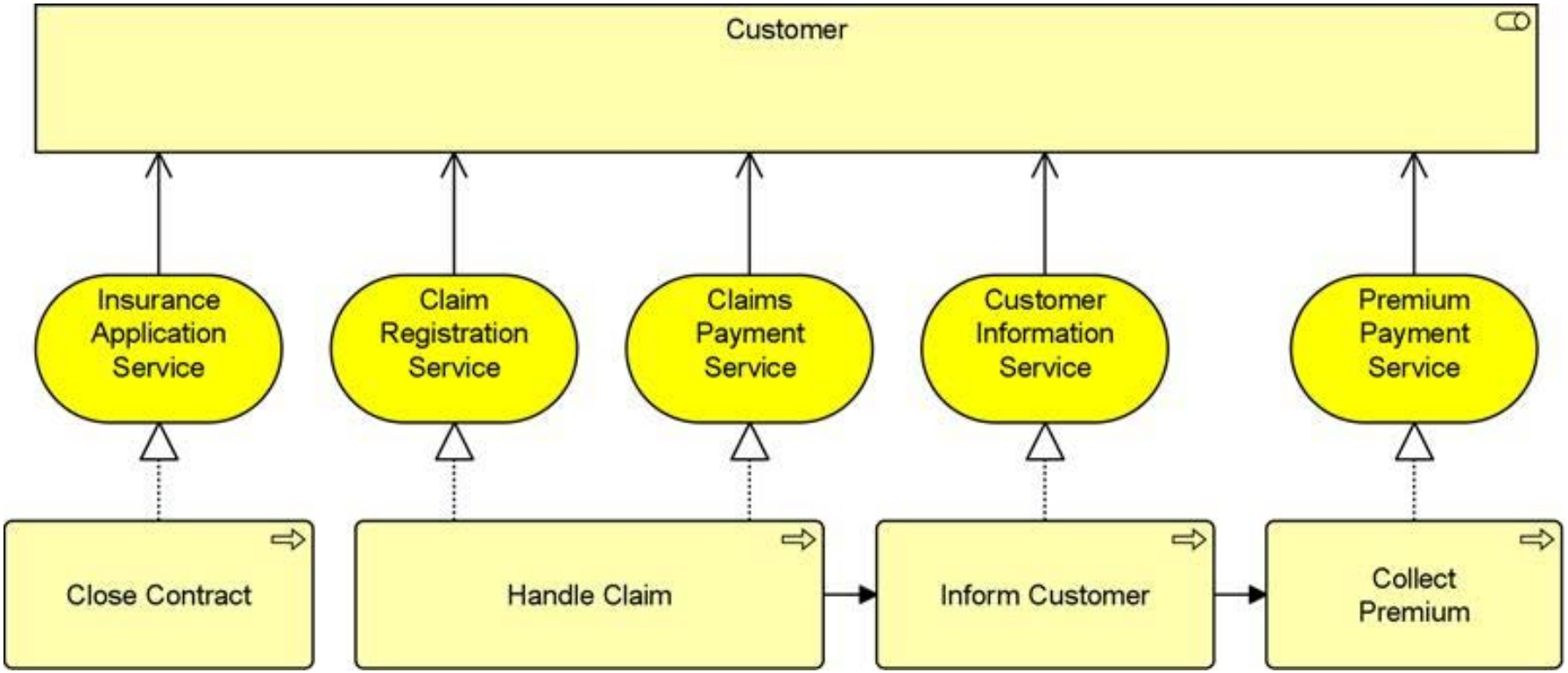
How one or more business services are realized by the underlying processes (and sometimes by application components). Thus, it forms the bridge between the business products viewpoint and the business process view.

Service Realization Viewpoint	
Stakeholders	Process and domain architects, product and operational managers
Concerns	Added-value of business processes, consistency and completeness, responsibilities
Purpose	Designing, deciding
Scope	Multiple layer/Multiple aspect

Concepts and Relationships:



Example of a Model from the Service Realization Viewpoint



Physical Viewpoint

The physical viewpoint contains equipment (one or more physical machines, tools, or instruments) that can create, use, store, move, or transform materials, how the equipment is connected via the distribution network, and what other active elements are assigned to the equipment.

Physical Viewpoint	
Stakeholders	Infrastructure architects, operational managers
Concerns	Relationships and dependencies of the physical environment and how this relates to IT infrastructure
Purpose	Designing
Scope	Multiple layer/Multiple aspect

Concepts and Relationships: