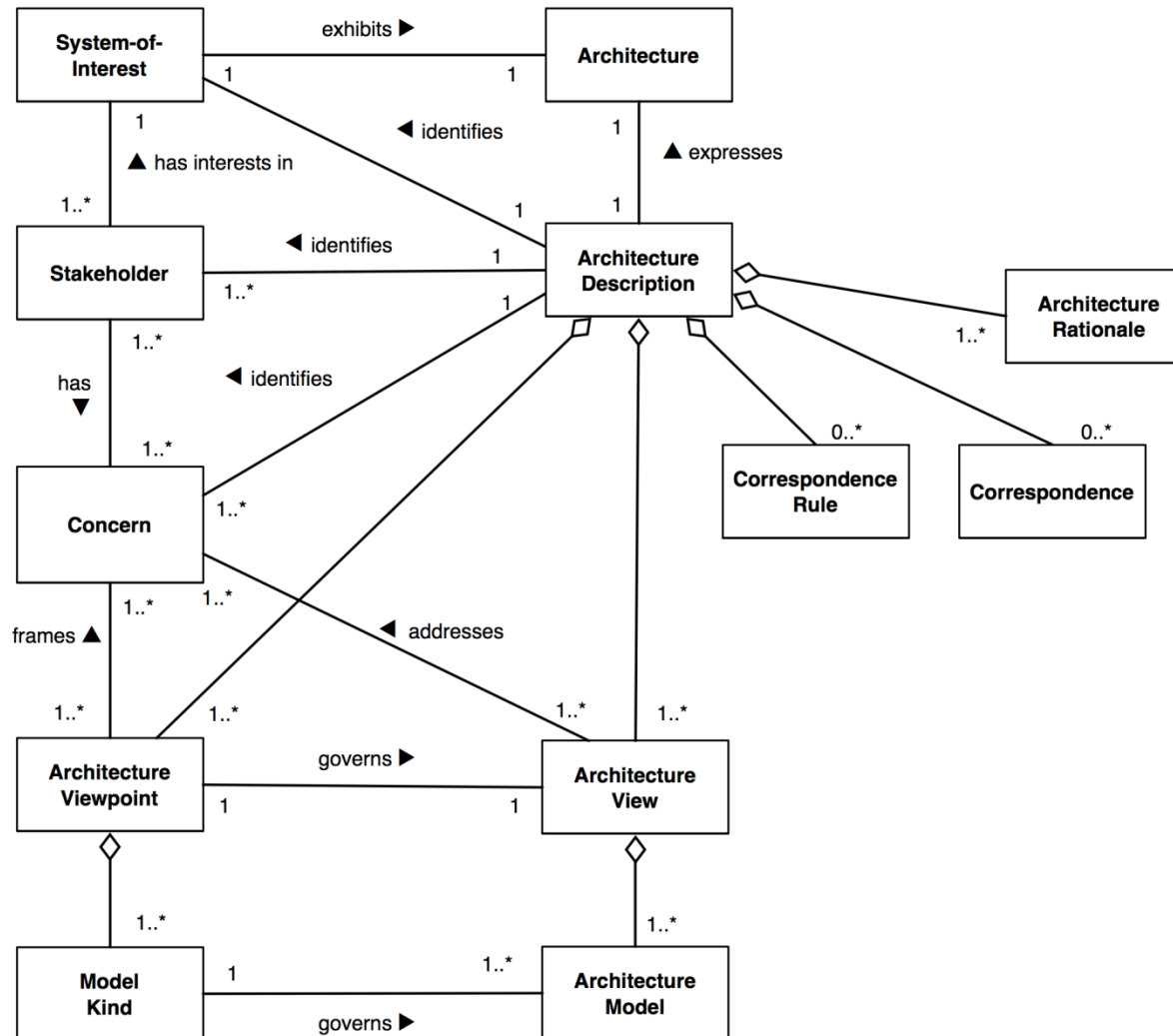


# Enterprise Architecture Views and Viewpoints in ArchiMate

*ArchiMate 3 – Chapter 14*

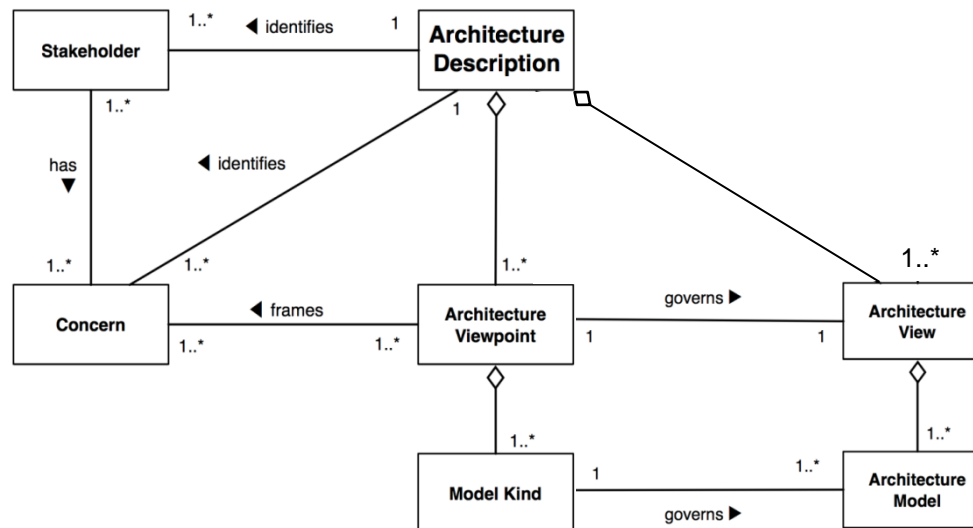


# The Core of Architecture Description



# Architecture Description

- An *Architecture Description* includes one or more views.
- A view is a subset of an architecture description
- An architecture view addresses one or more of the concerns held by a stakeholder of the system
- A concern can be framed by more than one viewpoint.



<http://www.iso-architecture.org/ieee-1471/cm/>

# Stakeholder and Concerns

- **Stakeholders** are individuals, groups or organizations holding concerns for the System, i.e.
  - ◆ **Examples of Stakeholders:** client, owner, user, operator, maintainer, developers, suppliers, regulator, auditor, architect.
- 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, business goals, customer experience, flexibility, maintainability, regulatory compliance, security.

# Examples of Stakeholders and Concerns

The following examples of stakeholders and concerns are mentioned in the ArchiMate specification as a basis for the specification of viewpoints:

## End Users

- ◆ What are the consequences for his workplace?

## Architect

- ◆ What is the consequence for the maintainability of a system?

## Upper-level Management

- ◆ How can we ensure that our policies are followed in the development and operation of processes and systems?

## Operational Manager – responsible for exploitation or maintenance

- ◆ Is there a need to adapt maintenance processes?

## Project Manager – responsible for development of new applications

- ◆ What is the dependence of business processes on the applications to be built?

## Developer

- ◆ What are the required modification with respect to the current situation?

# 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*

# 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



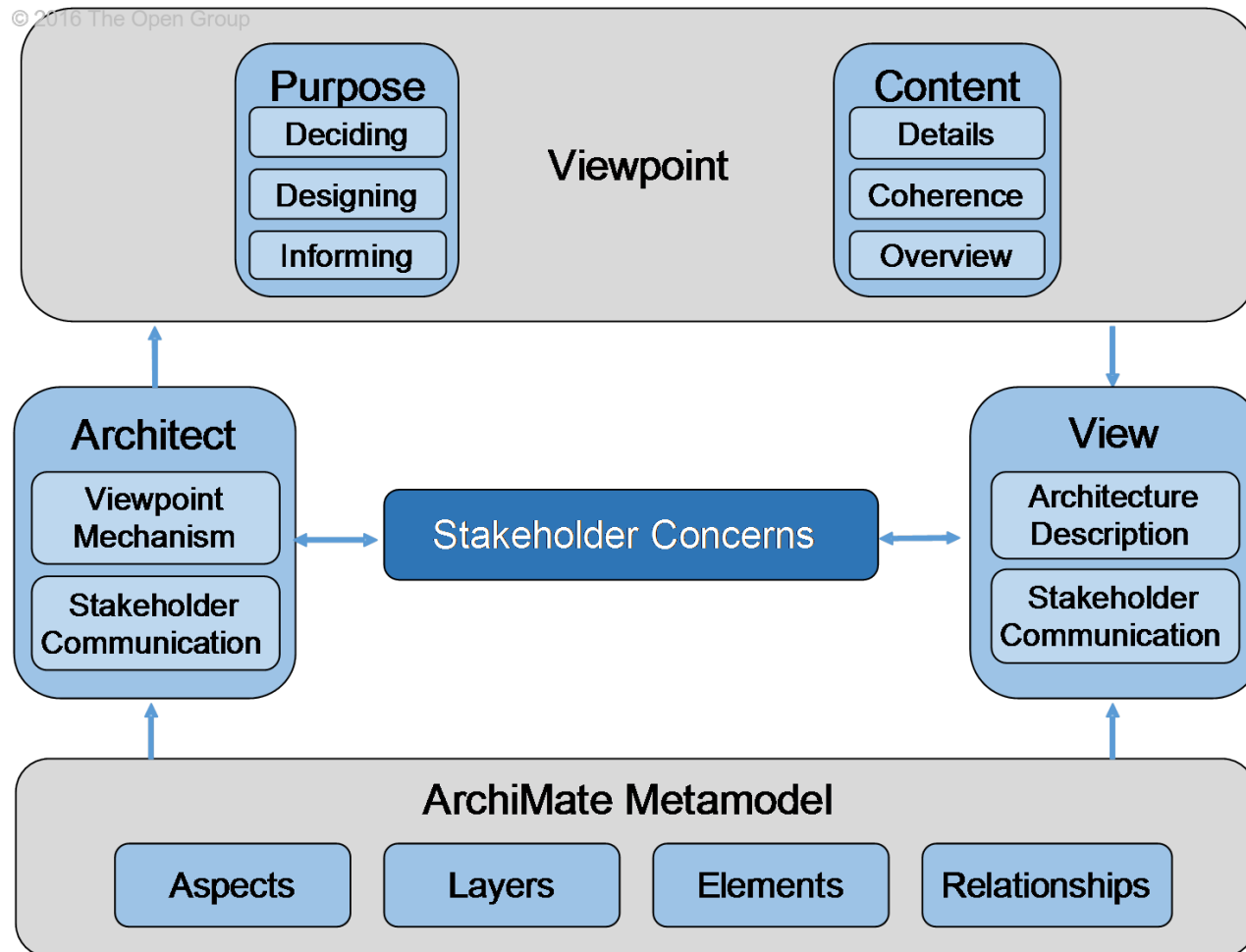
# Comparison to Databases

- 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

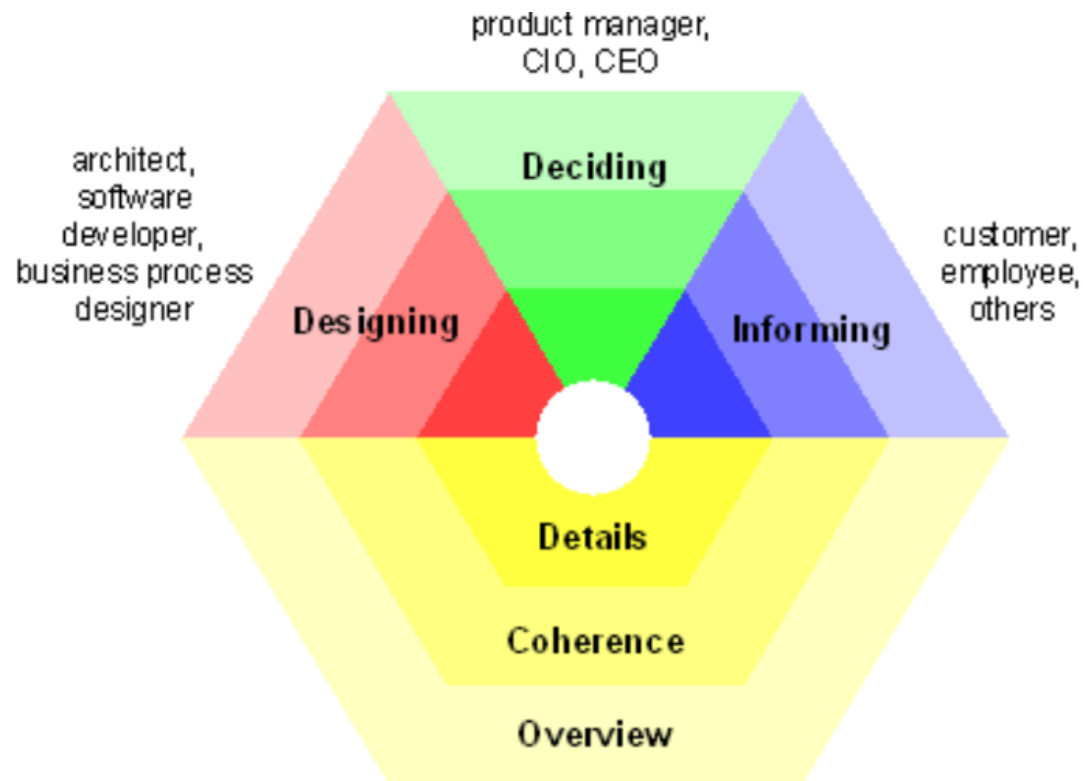




# Framing Stakeholder Concerns using the Viewpoint Mechanism



# Two-Dimensional Classification of Enterprise Architecture Viewpoints



# 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.



# Basic Viewpoints (1)

<b>Category: Composition</b>		
<b>Name</b>	<b>Perspective</b>	<b>Scope</b>
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)

<b>Category: Support</b>		
<b>Name</b>	<b>Perspective</b>	<b>Scope</b>
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
<b>Category: Cooperation</b>		
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
<b>Category: Realization</b>		
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

# 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.

# Examples of View and Viewpoints in ArchiMate

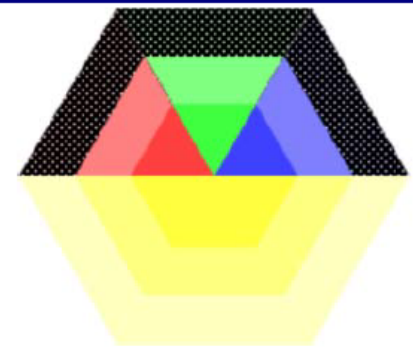
# Layered Viewpoint

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.

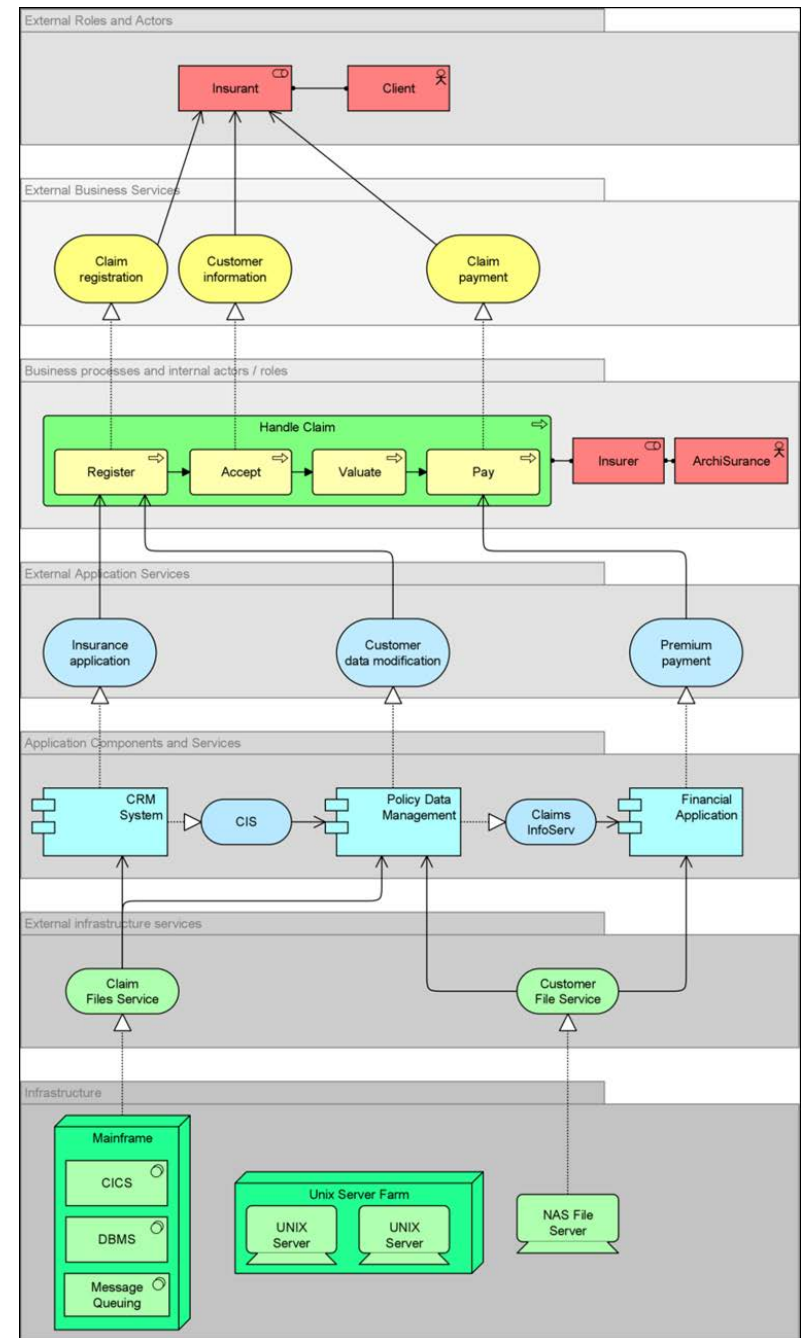
Layered Viewpoint	
Stakeholders	Enterprise, process, application, infrastructure, and domain architects
Concerns	Consistency, reduction of complexity, impact of change, flexibility
Purpose	Designing, deciding, informing
Abstraction Level	Overview
Layer	Business layer, application layer, technology layer (see also Figure 4)
Aspects	Information, behavior, structure (see also Figure 4)



Concepts and Relationships: **all**

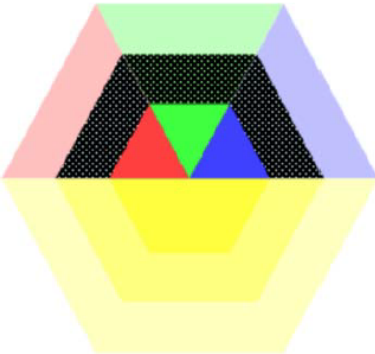


# Example of a Model from the Layered Viewpoint

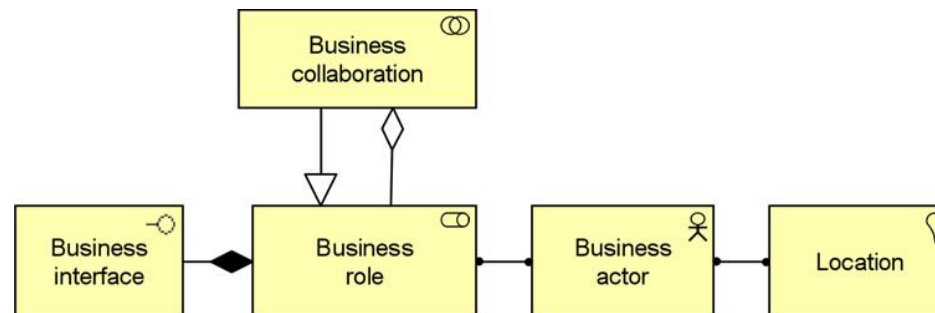


# Organization Viewpoint

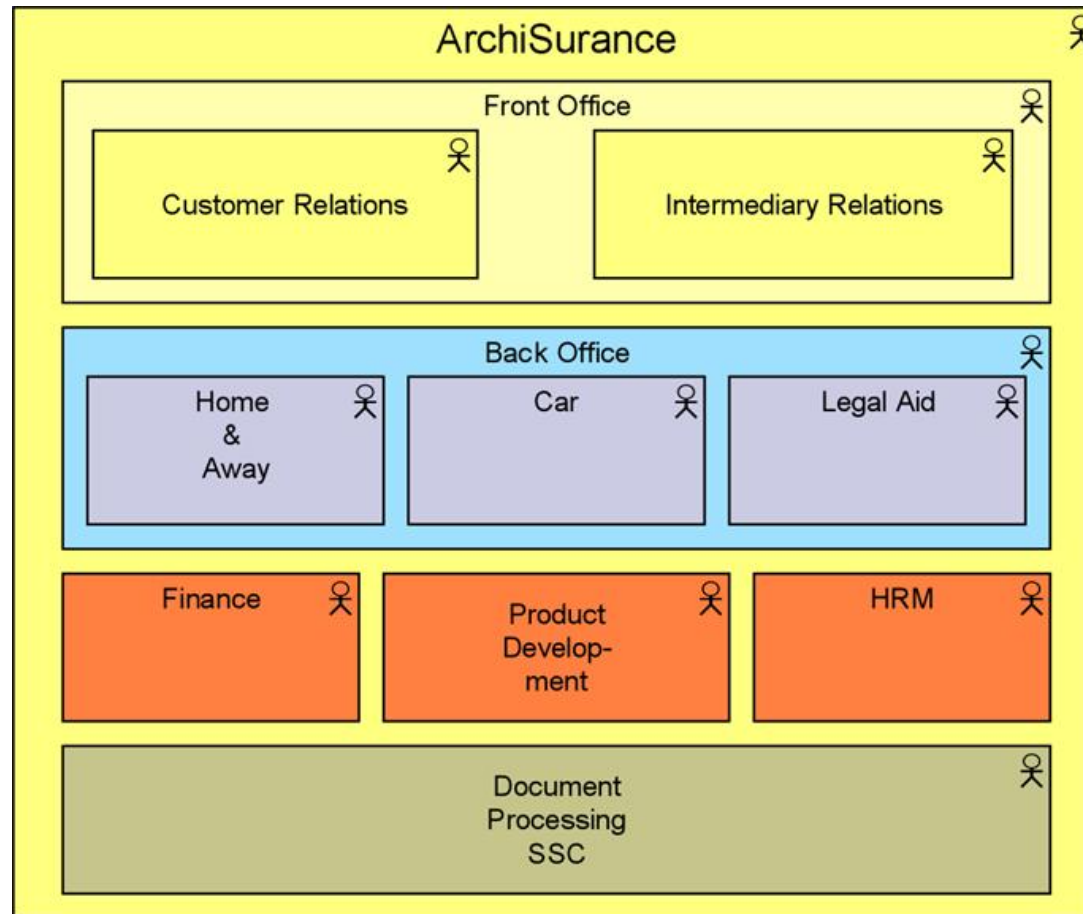
- (Internal) organization of a company, a department, a network of companies. Could be modeled as nested diagrams or as organizational charts.
- Useful in identifying competencies, authority, and responsibilities

Organization Viewpoint		
Stakeholders	Enterprise, process and domain architects, managers, employees, shareholders	
Concerns	Identification of competencies, authority, and responsibilities	
Purpose	Designing, deciding, informing	
Abstraction Level	Coherence	
Layer	Business layer (see also Figure 4)	
Aspects	Structure (see also Figure 4)	

Concepts and Relations:



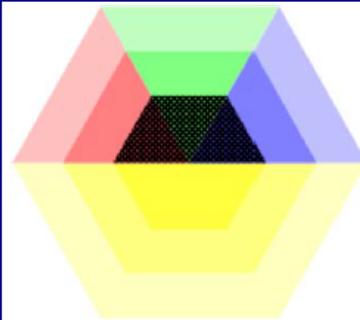
# Example of a Model from the Organization Viewpoint



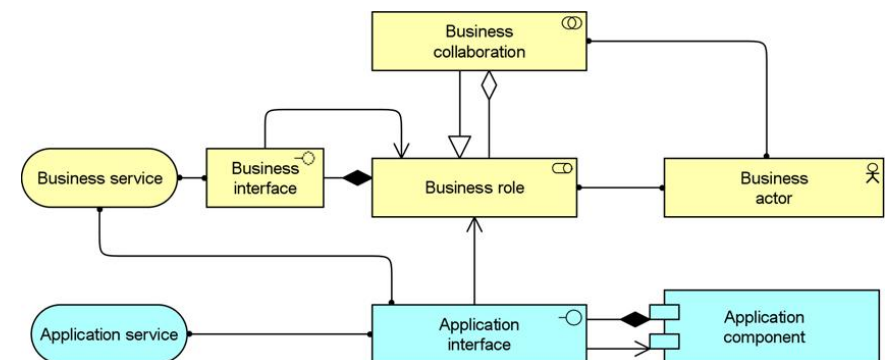
# Actor Co-operation Viewpoint

- Extending the Organization Viewpoint with a focus on the relations of actors with each other and their environment
- Useful in determining external dependencies and collaborations; shows the value chain or network in which the actor operates.
- Can show how a number of co-operating business actors and/or application components together realize a business process

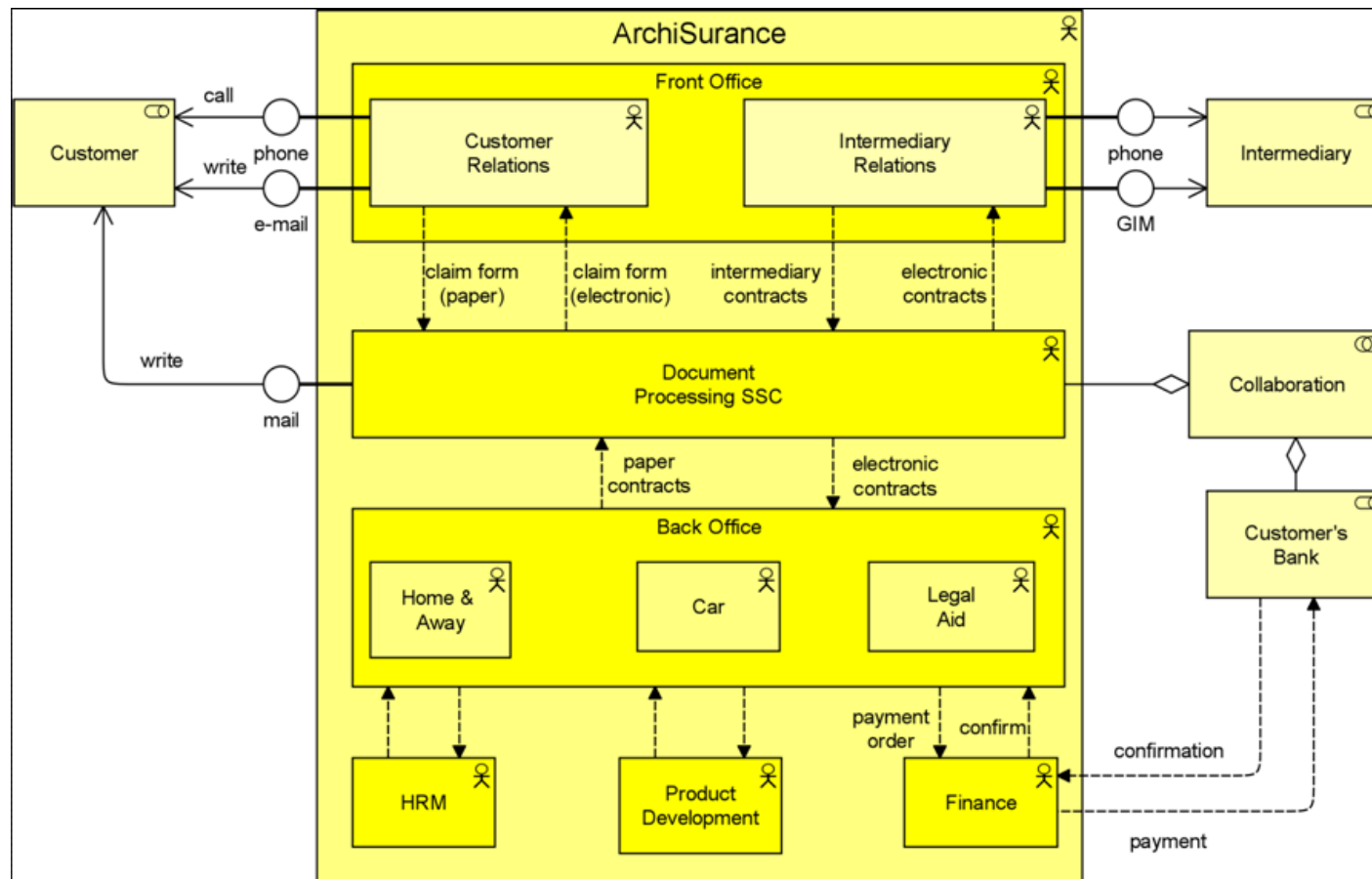
Actor Co-operation Viewpoint	
Stakeholders	Enterprise, process, and domain architects
Concerns	Relationships of actors with their environment
Purpose	Designing, deciding, informing
Abstraction Level	Detail
Layer	Business layer (application layer) (see also Figure 4)
Aspects	Structure, behavior (see also Figure 4)



## Concepts and Relationships:



# Example of a Model from the Actor Co-operation Viewpoint

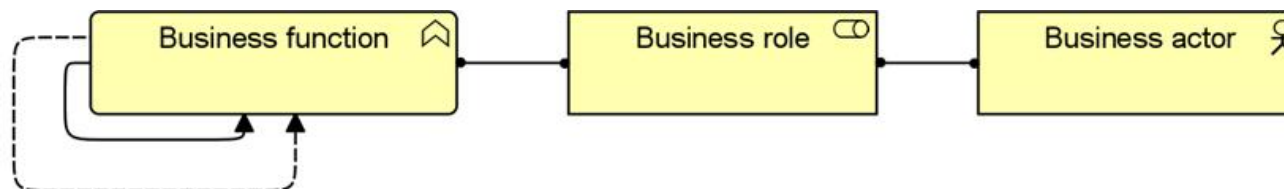


# Business Function Viewpoint

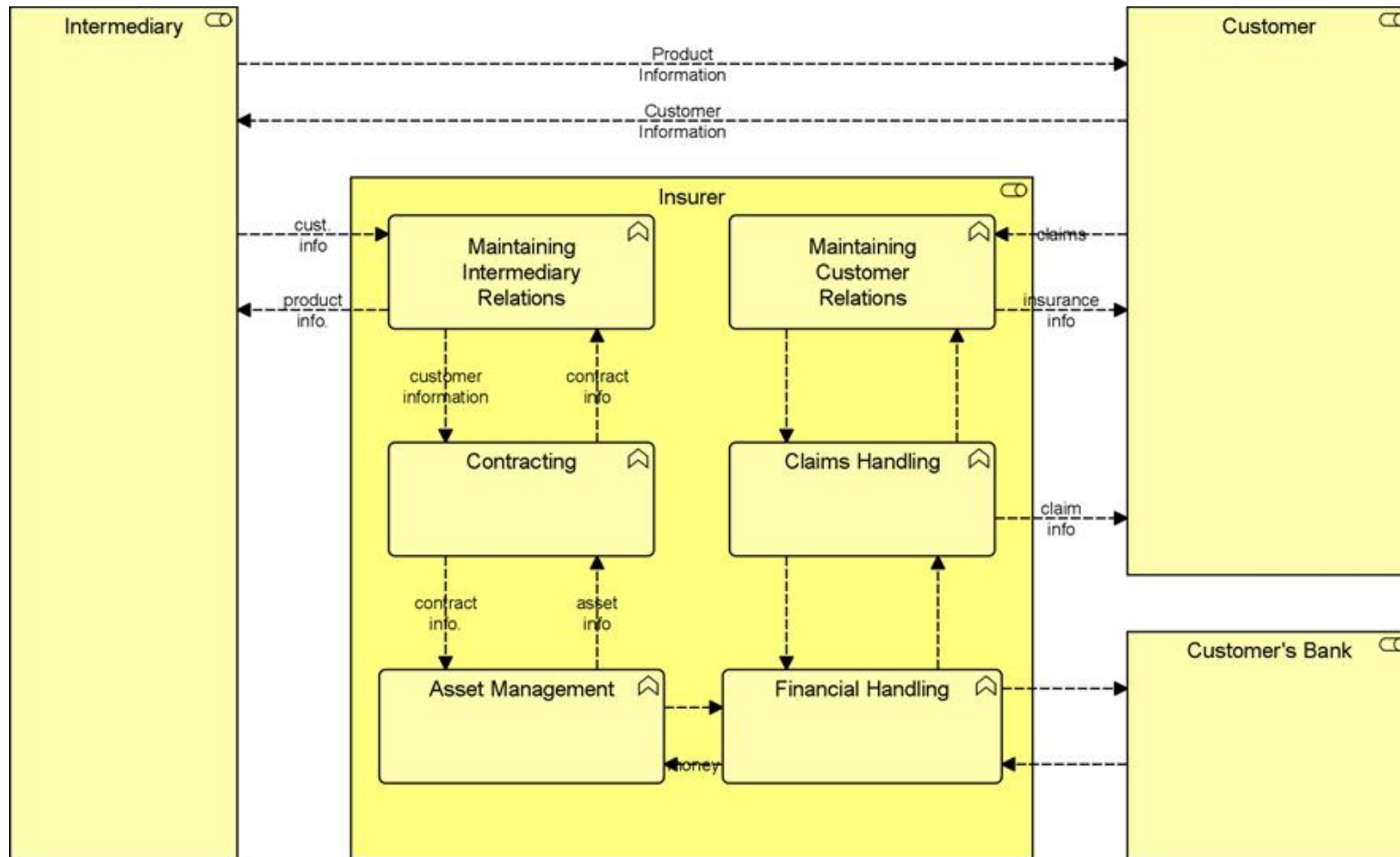
- Shows the main business functions of an organisation and their relations in terms of flow of information, value or goods between them.

Business Function Viewpoint		
Stakeholders	Enterprise, process, and domain architects	
Concerns	Identification of competencies, identification of main activities, reduction of complexity	
Purpose	Designing	
Abstraction Level	Coherence	
Layer	Business layer (see also Figure 4)	
Aspects	Behavior, structure (see also Figure 4)	

## Concepts and Relationships:



# Example of a Model from the Business Function Viewpoint

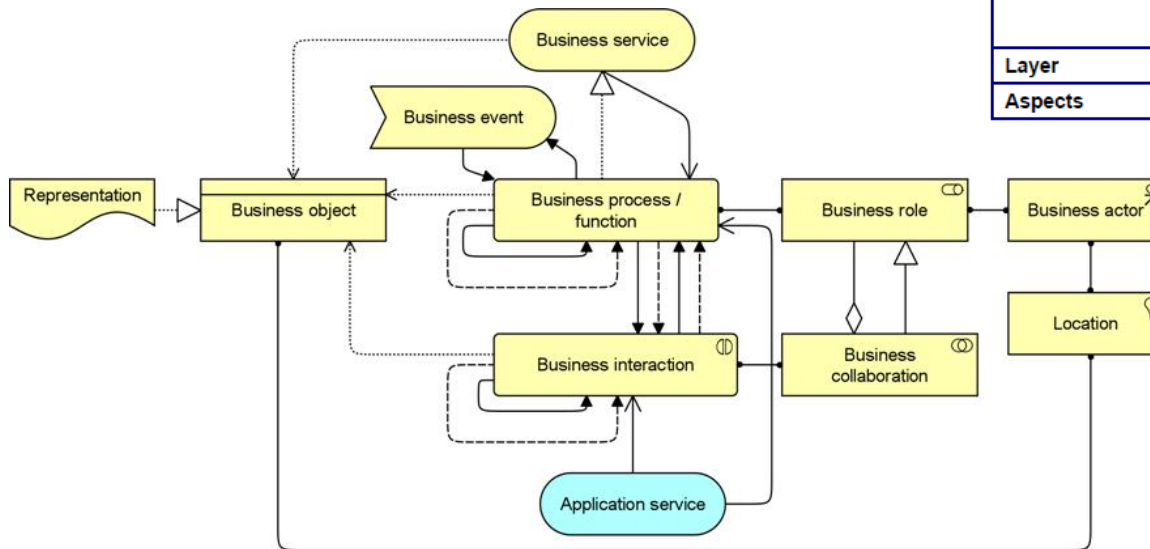


# Business Process Viewpoint

Structure and composition of one or more business processes and directly related concepts like products, roles, and information

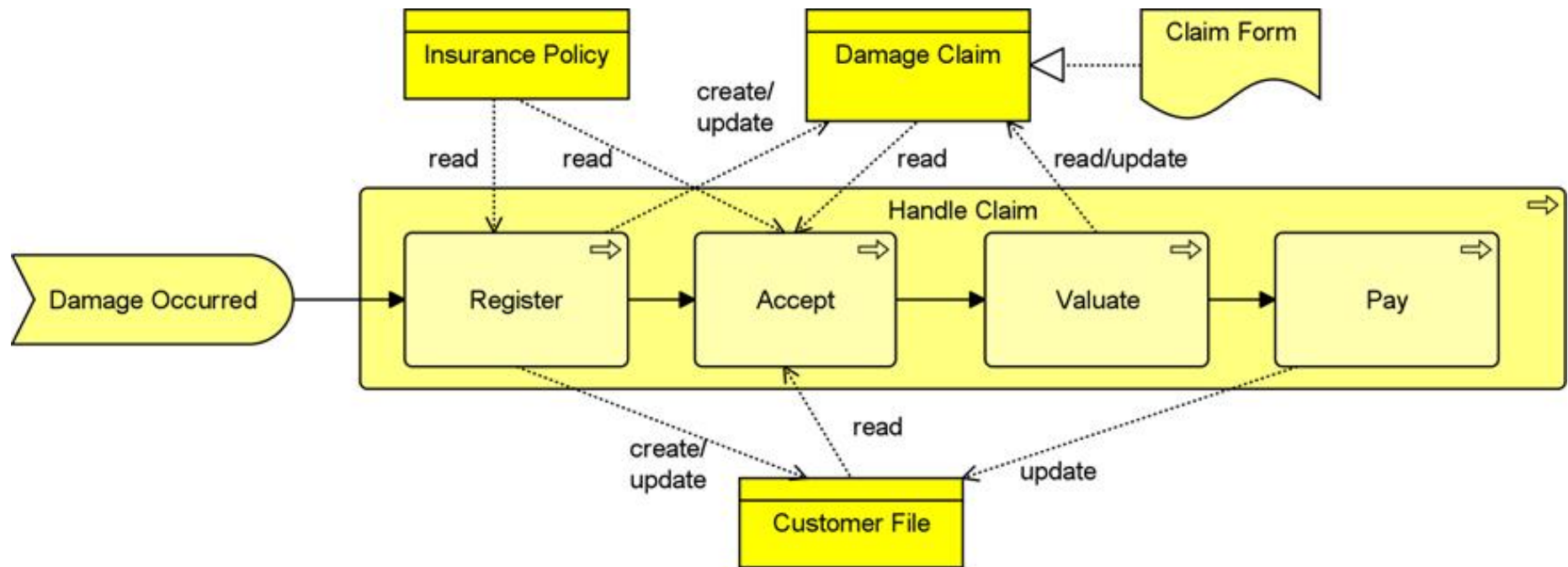
Business Process Viewpoint		
<b>Stakeholders</b>	Process and domain architects, operational managers	
<b>Concerns</b>	Structure of business processes, consistency and completeness, responsibilities	
<b>Purpose</b>	Designing	
<b>Abstraction Level</b>	Detail	
<b>Layer</b>	Business layer (see also Figure 4)	
<b>Aspects</b>	Behavior (see also Figure 4)	

Concepts and Relationships:



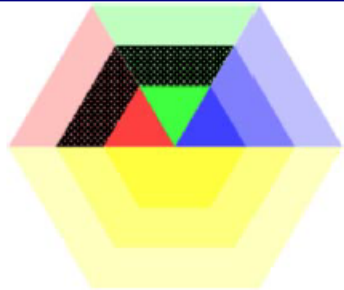


# Example of a Model from the Business Process Viewpoint

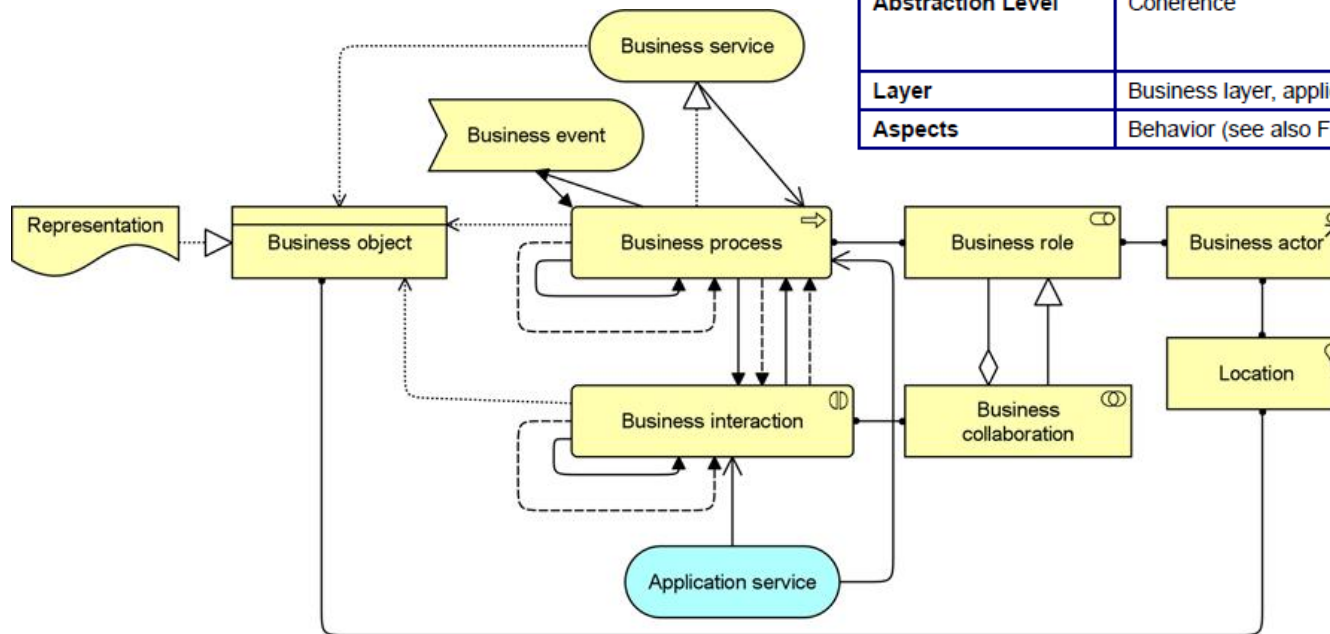


# Business Process Co-operation Viewpoint

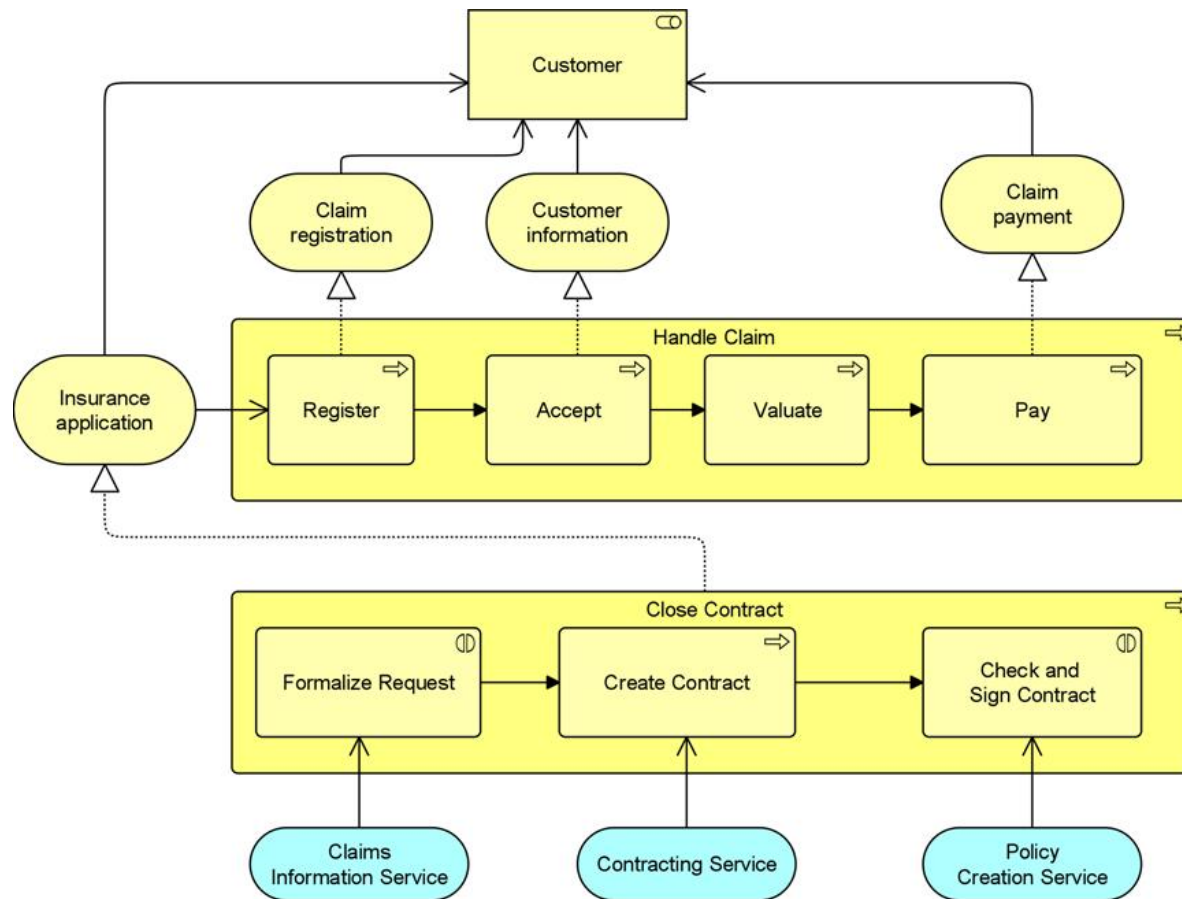
Relations of one or more business processes with each other and/or the environment.

Business Process Co-operation Viewpoint		
<b>Stakeholders</b>	Process and domain architects, operational managers	
<b>Concerns</b>	Dependencies between business processes, consistency and completeness, responsibilities	
<b>Purpose</b>	Designing, deciding	
<b>Abstraction Level</b>	Coherence	
<b>Layer</b>	Business layer, application layer (see also Figure 4)	
<b>Aspects</b>	Behavior (see also Figure 4)	

Concepts and Relationships:



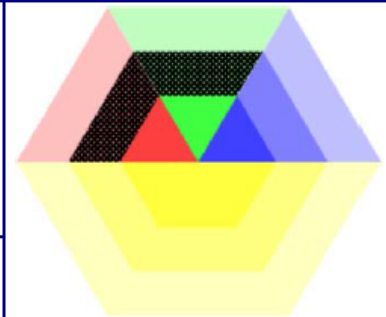
# Example of a Model from the Business Process Co-operation Viewpoint



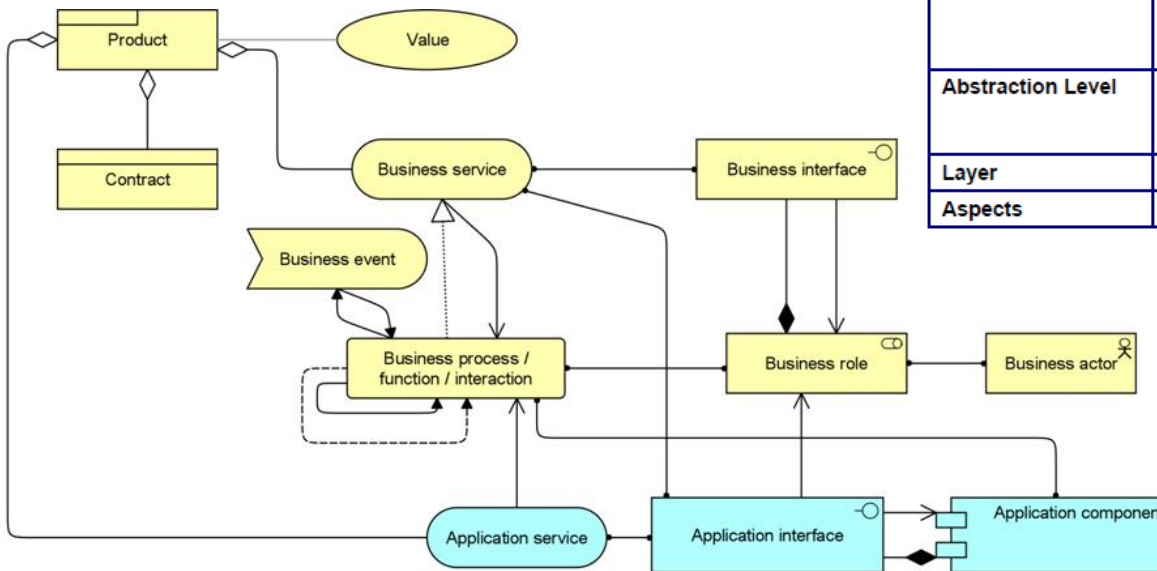
# Product Viewpoint

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

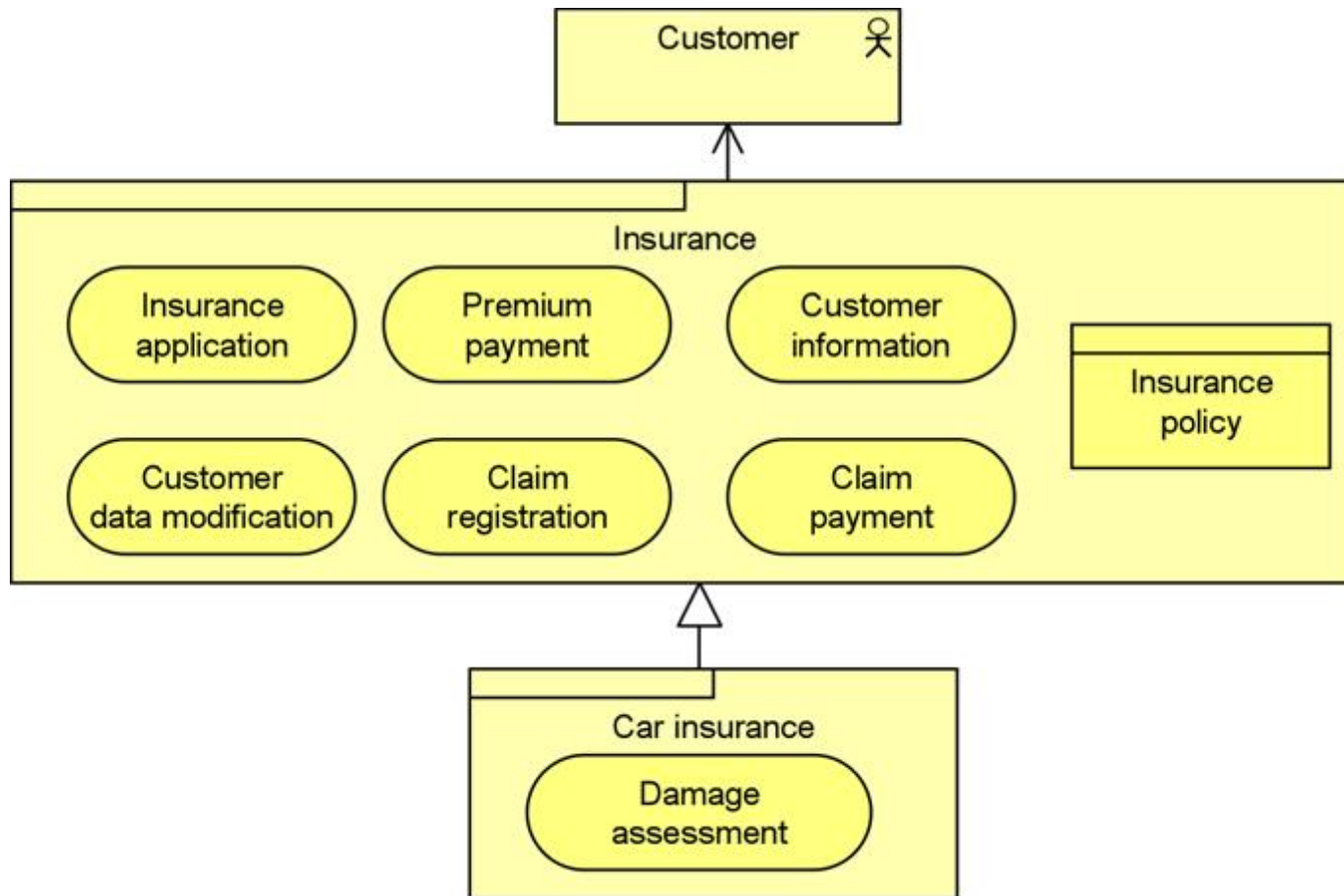
Product Viewpoint	
<b>Stakeholders</b>	Product developers, product managers, process and domain architects
<b>Concerns</b>	Product development, value offered by the products of the enterprise
<b>Purpose</b>	Designing, deciding
<b>Abstraction Level</b>	Coherence
<b>Layer</b>	Business layer, application layer (see also Figure 4)
<b>Aspects</b>	Behavior, information (see also Figure 4)



Concepts and Relationships:




# Example of a Model from the Product Viewpoint

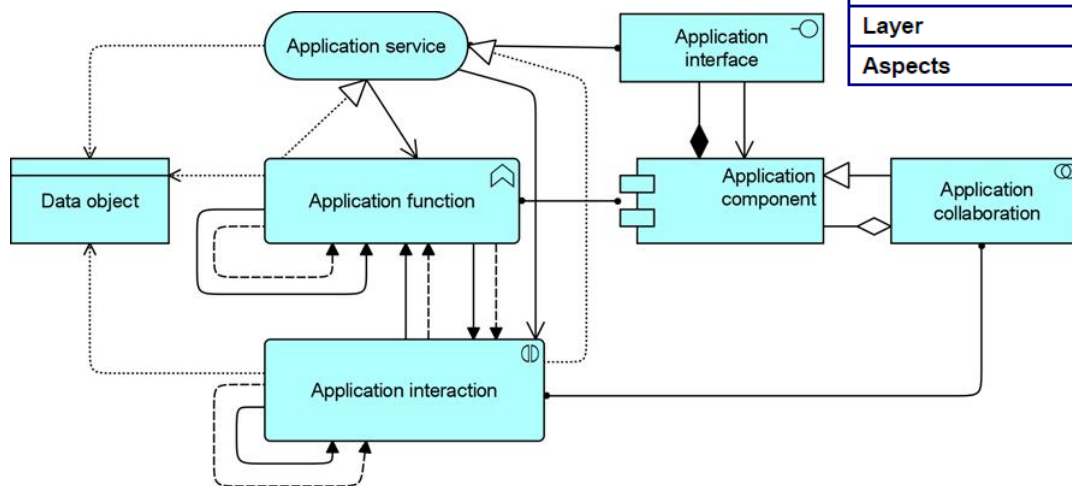


# Application Behavior Viewpoint

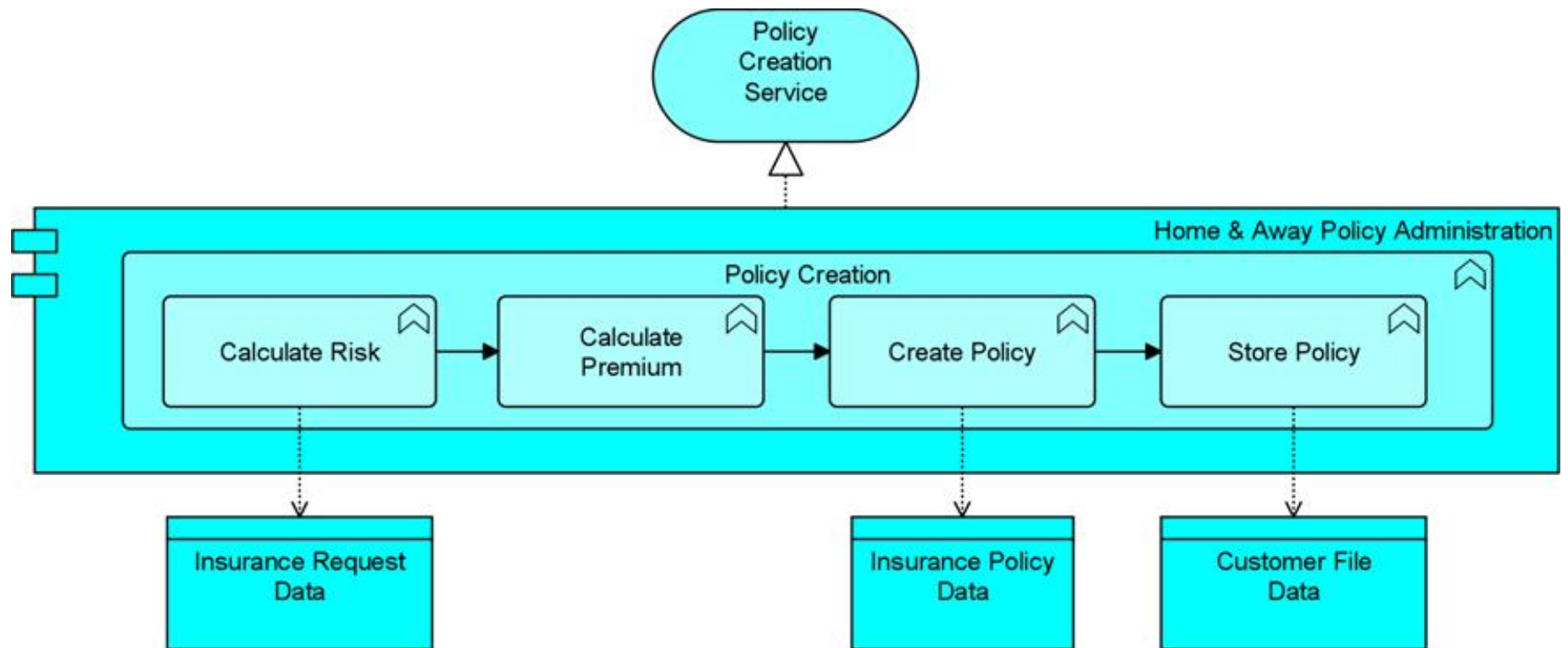
Internal behavior of an application, e.g. as it realizes one or more services

Application Behavior Viewpoint		
<b>Stakeholders</b>	Enterprise, process, application, and domain architects	
<b>Concerns</b>	Structure, relationships and dependencies between applications, consistency and completeness, reduction of complexity	
<b>Purpose</b>	Designing	
<b>Abstraction Level</b>	Coherence, details	
<b>Layer</b>	Application layer (see also Figure 4)	
<b>Aspects</b>	Information, behavior, structure (see also Figure 4)	

Concepts and Relationships:



# Example of a Model from the Application Behavior Viewpoint

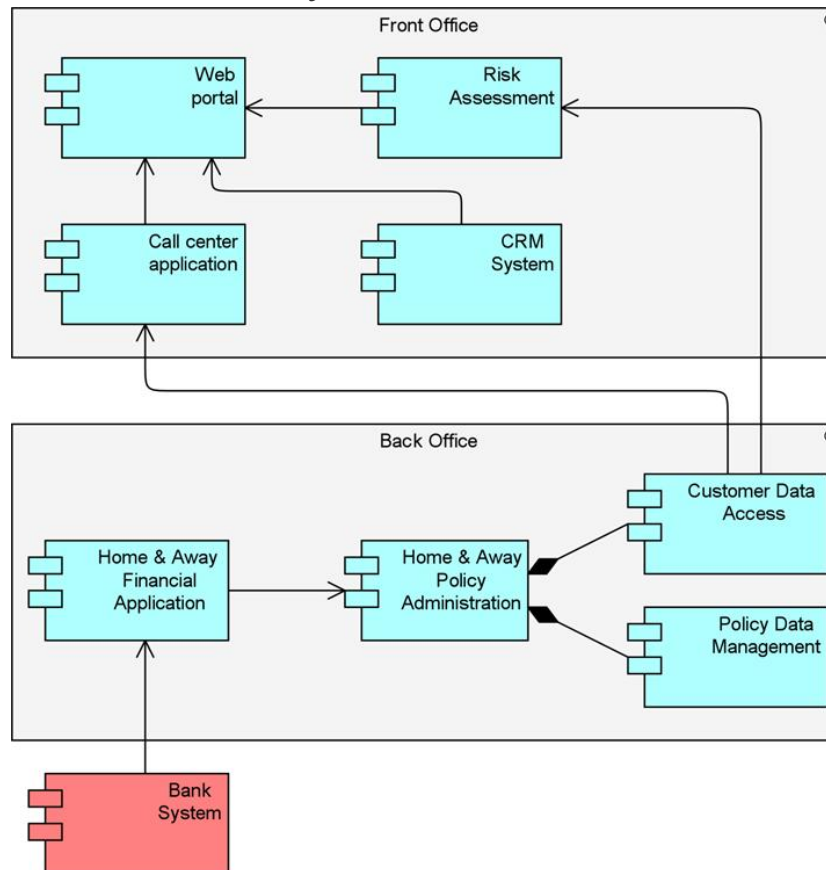






# Example of a Model from the Application Co-operation Viewpoint

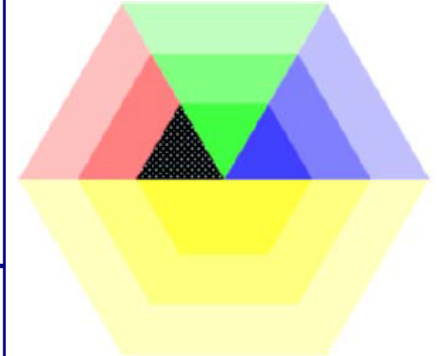
Relations between applications components in terms of the information flows between them, or in terms of the services they offer and use.



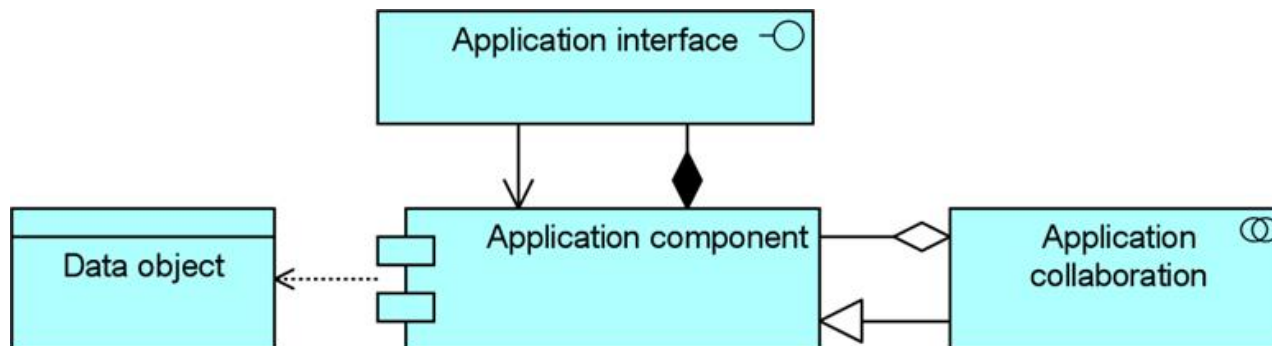
# Application Structure Viewpoint

Structure of one or more applications or components. This viewpoint is useful in designing or understanding the main structure of applications or components and the associated data

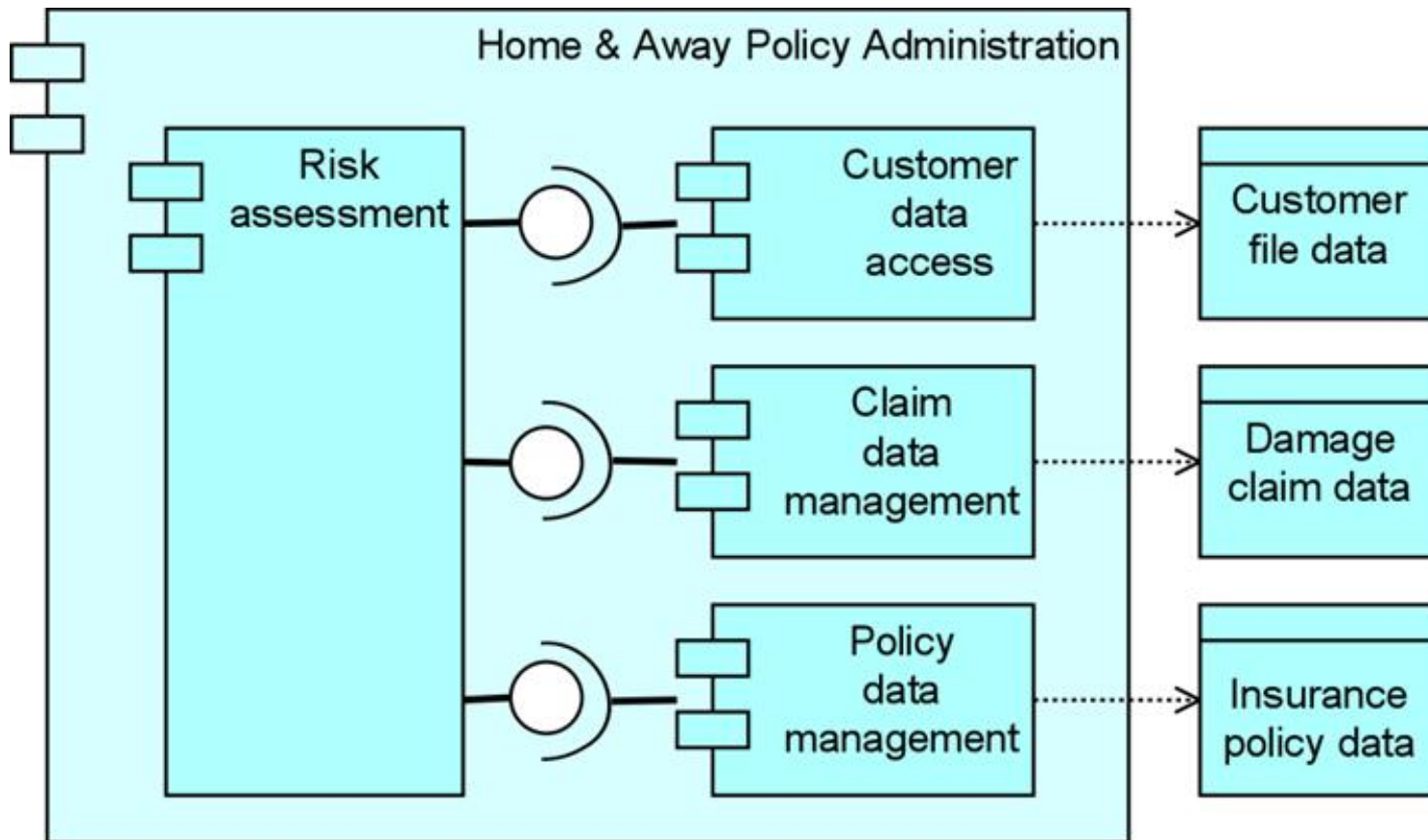
Application Structure Viewpoint	
<b>Stakeholders</b>	Enterprise, process, application, and domain architects
<b>Concerns</b>	Application structure, consistency and completeness, reduction of complexity
<b>Purpose</b>	Designing
<b>Abstraction Level</b>	Details
<b>Layer</b>	Application layer (see also Figure 4)
<b>Aspects</b>	Structure, information (see also Figure 4)



Concepts and Relationships:



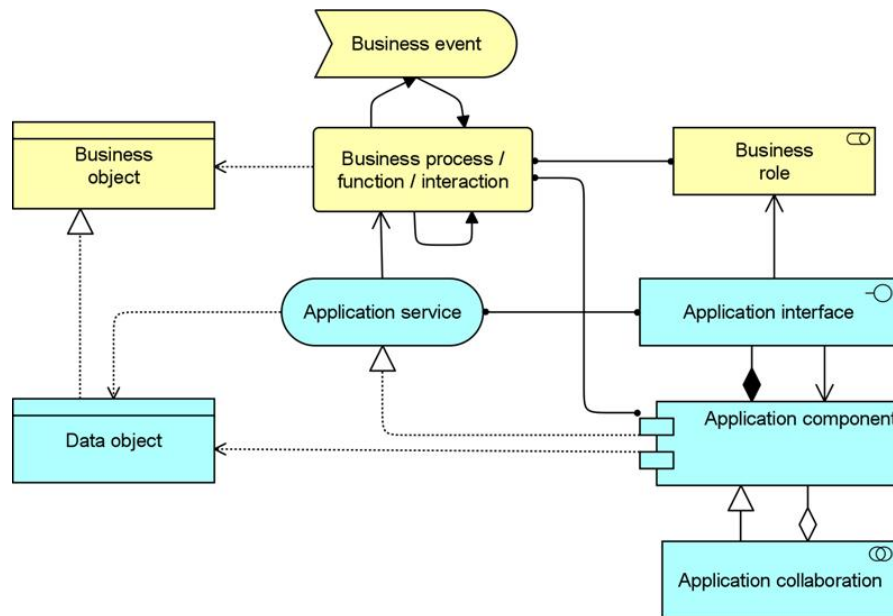
# Example of a Model from the Application Structure Viewpoint



# Application Usage Viewpoint

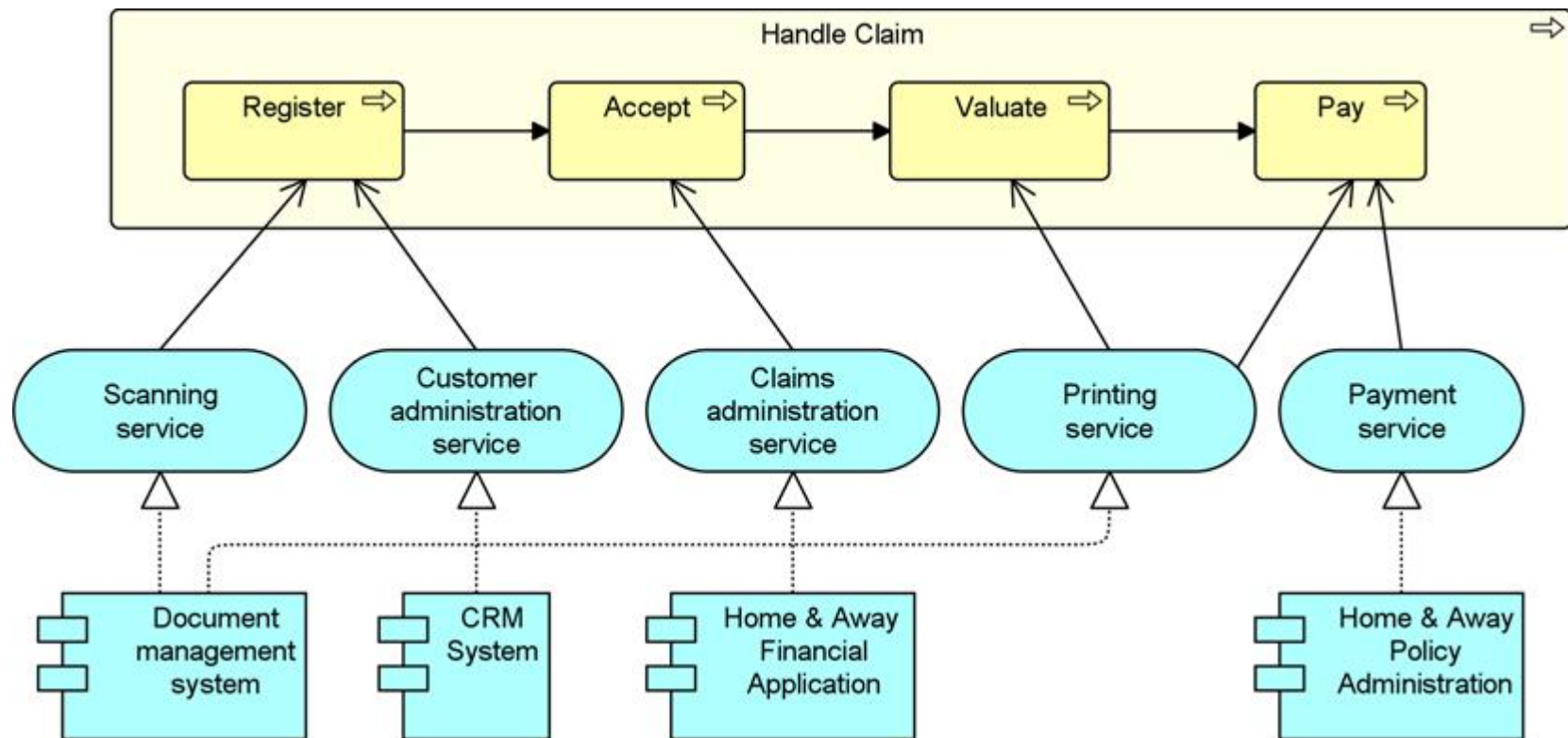
Describes how applications are used to support one or more business processes, and how they are used by other applications

Concepts and Relationships:



Application Usage Viewpoint		
<b>Stakeholders</b>	Enterprise, process, and application architects, operational managers	
<b>Concerns</b>	Consistency and completeness, reduction of complexity	
<b>Purpose</b>	Designing, deciding	
<b>Abstraction Level</b>	Coherence	
<b>Layer</b>	Business and application layers (see also Figure 4)	
<b>Aspects</b>	Behavior, structure (see also Figure 4)	

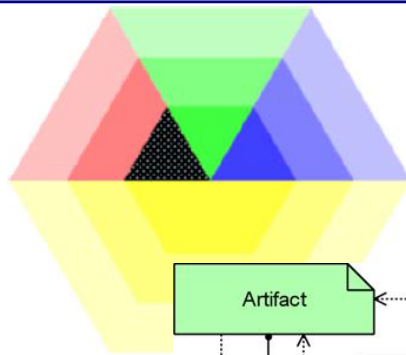
# Example of a Model from the Application Usage Viewpoint



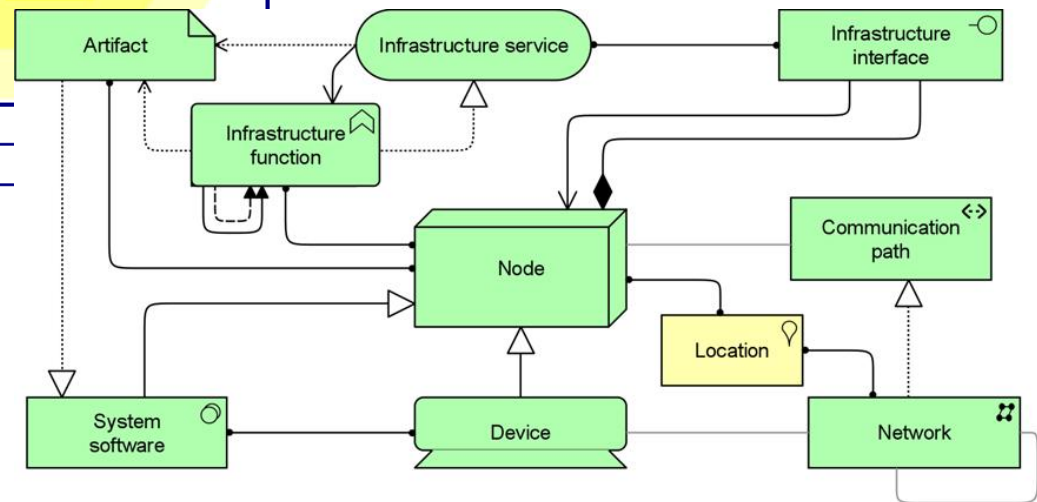
# Infrastructure Viewpoint

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

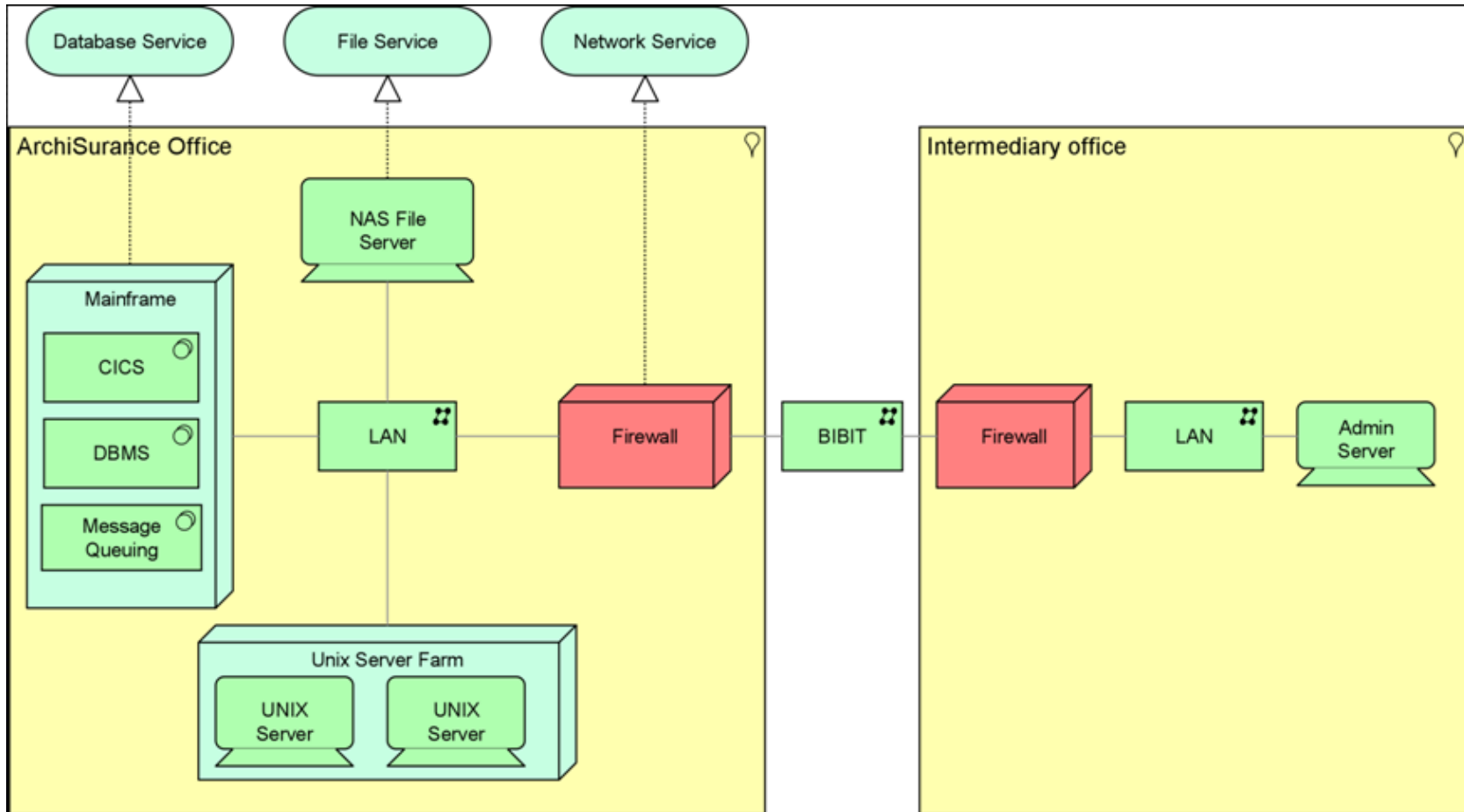
Infrastructure Viewpoint	
<b>Stakeholders</b>	Infrastructure architects, operational managers
<b>Concerns</b>	Stability, security, dependencies, costs of the infrastructure
<b>Purpose</b>	Designing
<b>Abstraction Level</b>	Details
<b>Layer</b>	Technology layer (see also Figure 4)
<b>Aspects</b>	Behavior, structure (see also Figure 4)



## Concepts and Relationships:



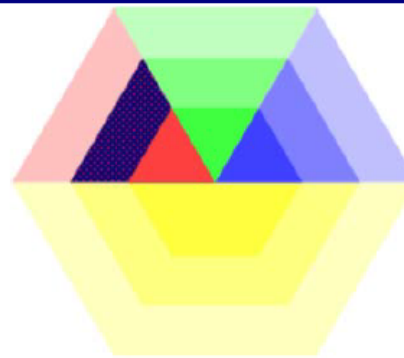
# Example of a Model from the Infrastructure Viewpoint



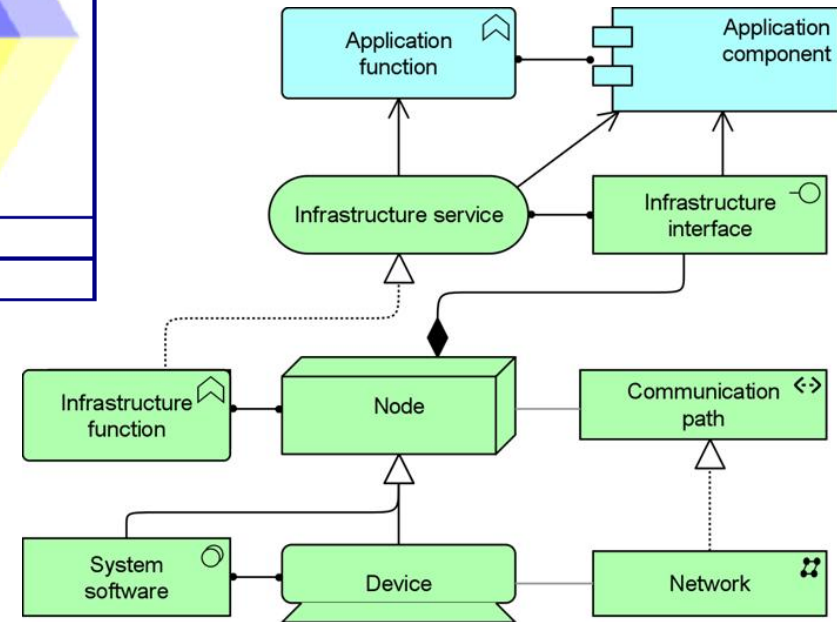
# Infrastructure Usage Viewpoint

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

Infrastructure Usage Viewpoint	
<b>Stakeholders</b>	Application, infrastructure architects, operational managers
<b>Concerns</b>	Dependencies, performance, scalability
<b>Purpose</b>	Designing
<b>Abstraction Level</b>	Coherence
<b>Layer</b>	Application and technology layers (see also Figure 4)
<b>Aspects</b>	Behavior, structure (see also Figure 4)

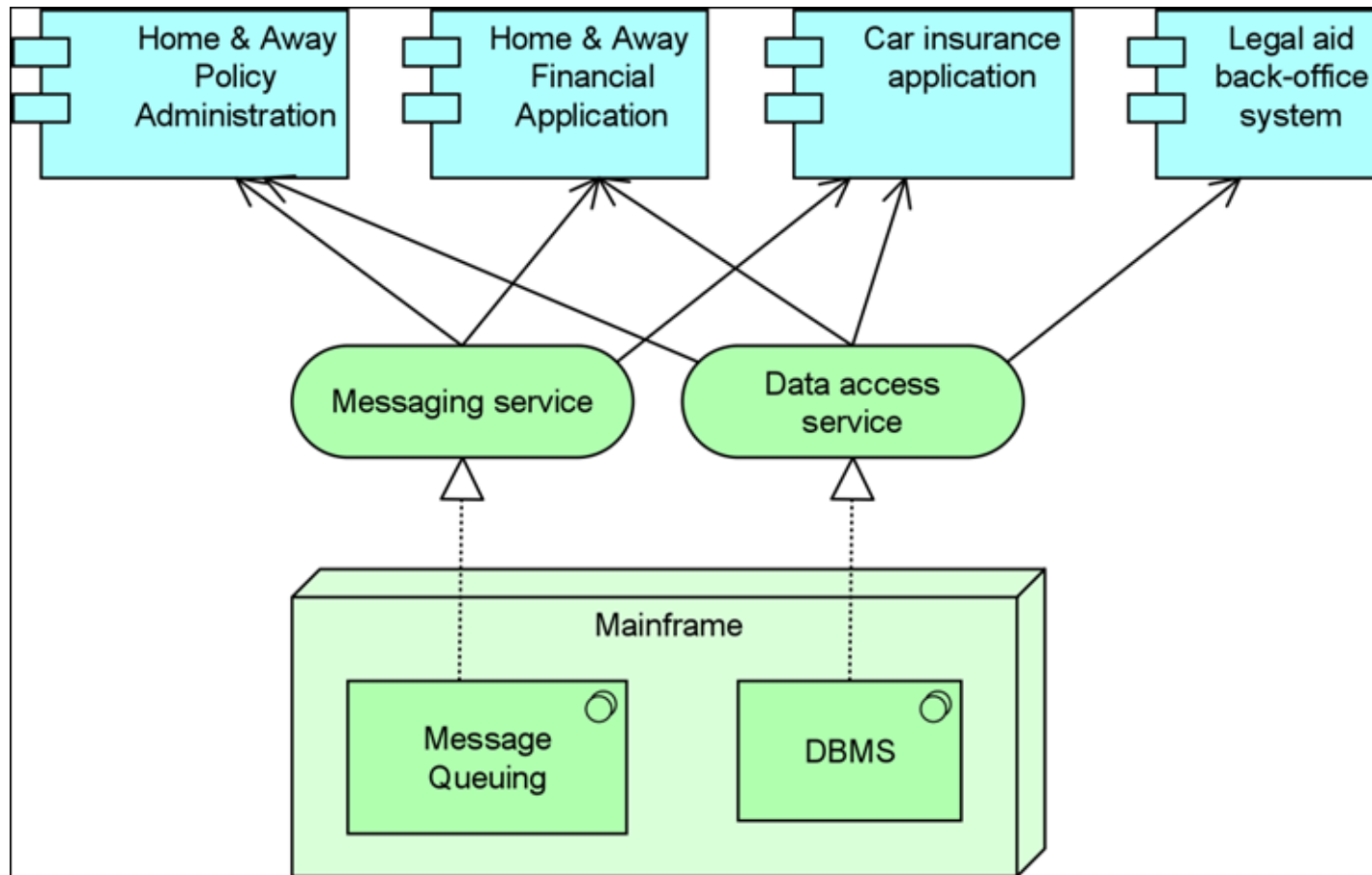


Concepts and Relationships:





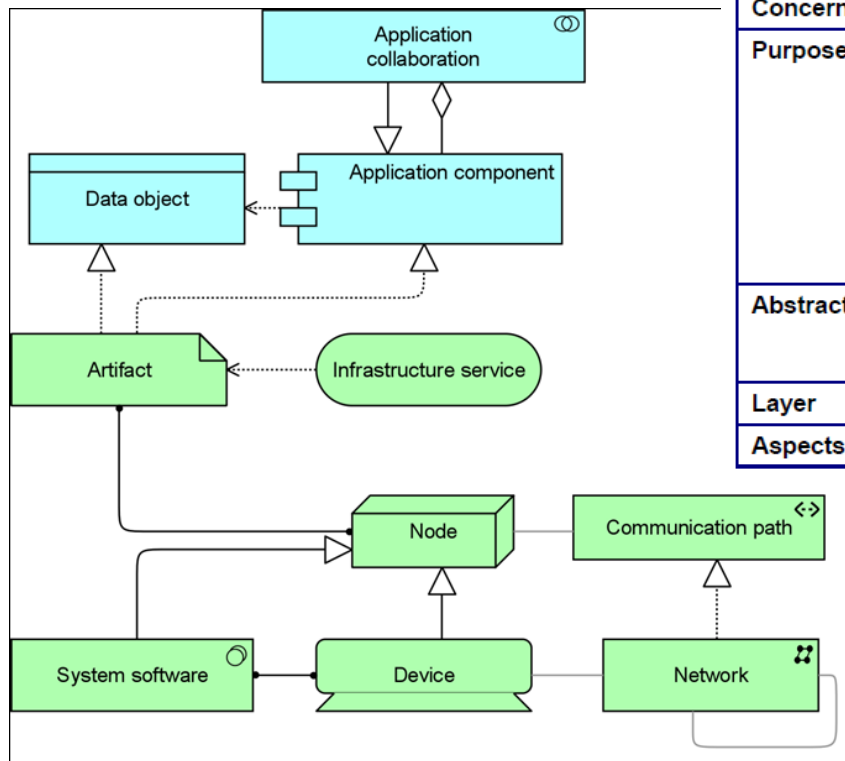
# Example of a Model from the Infrastructure Usage Viewpoint



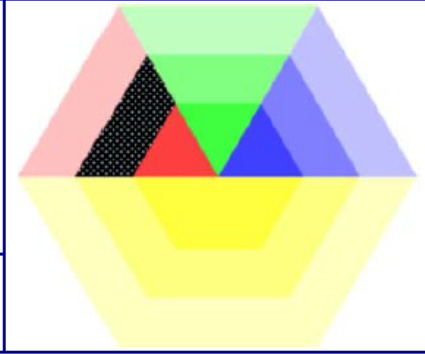
# Implementation and Deployment Viewpoint

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.

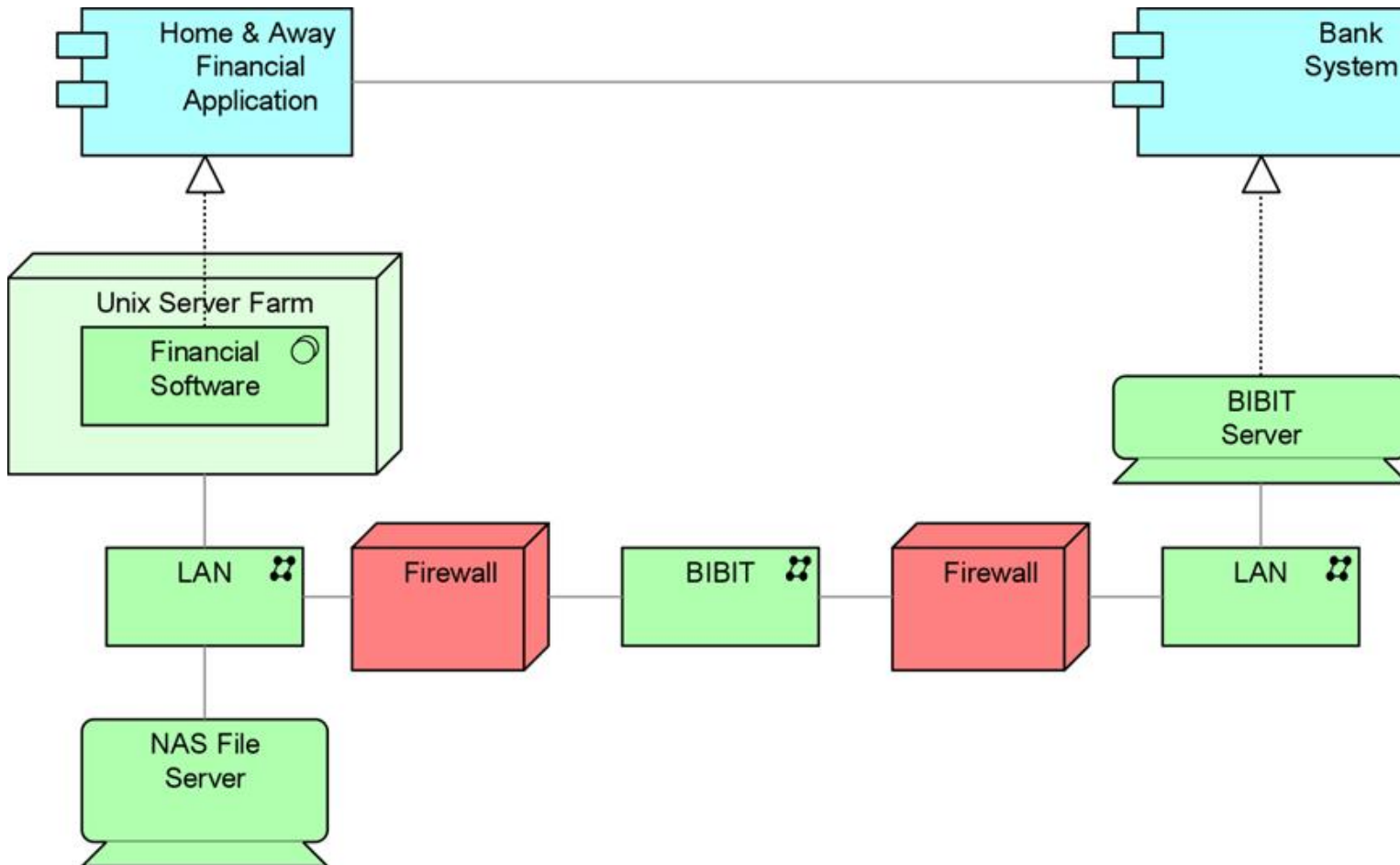
## Concepts and Relationships:



Implementation and Deployment Viewpoint	
<b>Stakeholders</b>	Application and infrastructure architects, operational managers
<b>Concerns</b>	Dependencies, security, risks
<b>Purpose</b>	Designing
<b>Abstraction Level</b>	Coherence
<b>Layer</b>	Application layer, technology layer (see also Figure 4)
<b>Aspects</b>	Information, behavior, structure (see also Figure 4)



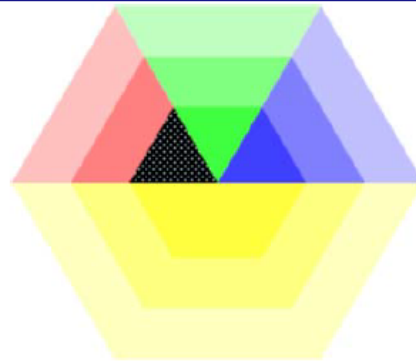
# Example of a Model from the Implementation and Deployment Viewpoint



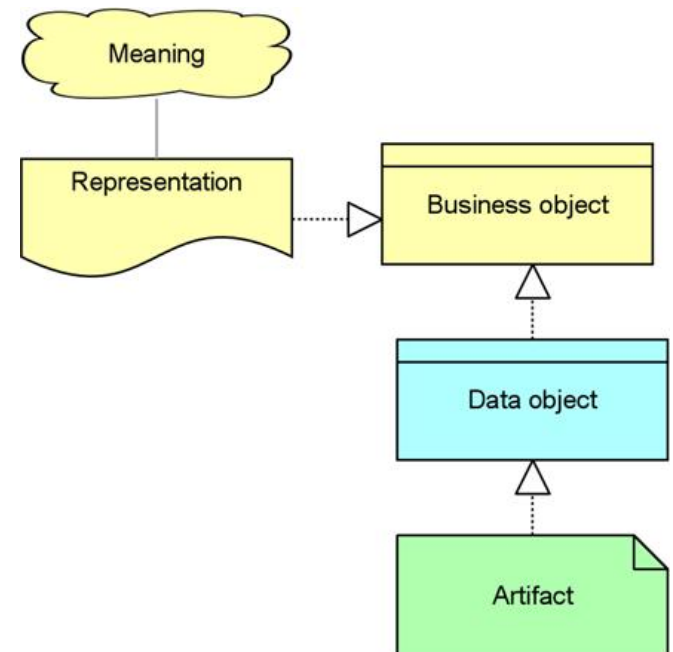
# Information Structure Viewpoint

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.

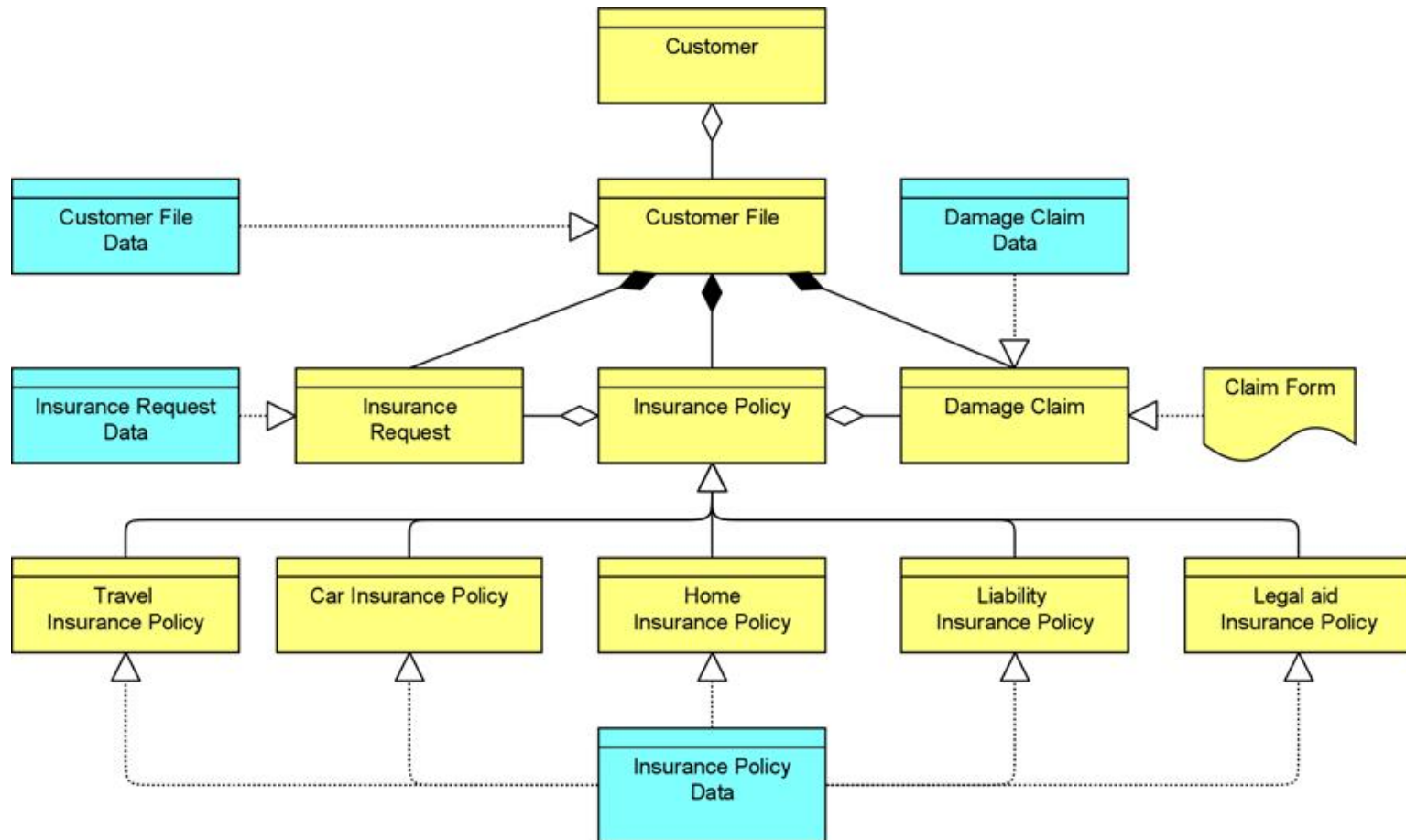
Information Structure Viewpoint	
<b>Stakeholders</b>	Domain and information architects
<b>Concerns</b>	Structure and dependencies of the used data and information, consistency and completeness
<b>Purpose</b>	Designing
<b>Abstraction Level</b>	Details
<b>Layer</b>	Business layer, application layer, technology layer (see also Figure 4)
<b>Aspects</b>	Information (see also Figure 4)



## Concepts and Relationships:



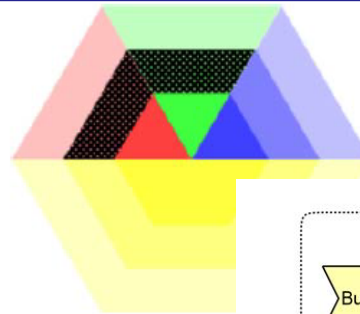
# Example of a Model from the Information Structure Viewpoint



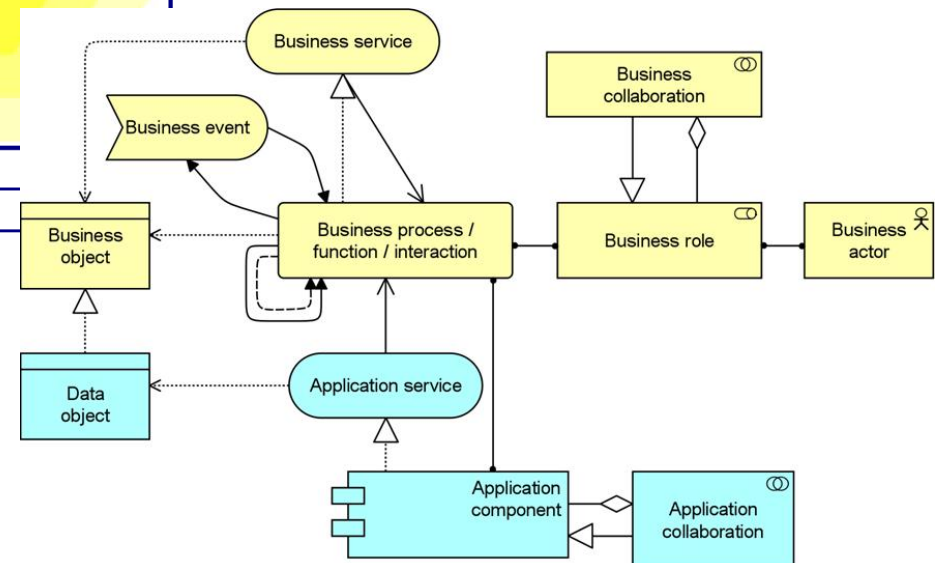
# Service Realization Viewpoint

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	
<b>Stakeholders</b>	Process and domain architects, product and operational managers
<b>Concerns</b>	Added-value of business processes, consistency and completeness, responsibilities
<b>Purpose</b>	Designing, deciding
<b>Abstraction Level</b>	Coherence
<b>Layer</b>	Business layer (application layer) (see also Figure 4)
<b>Aspects</b>	Behavior, structure, information (see also Figure 4)



Concepts and Relationships:



# Example of a Model from the Service Realization Viewpoint

