

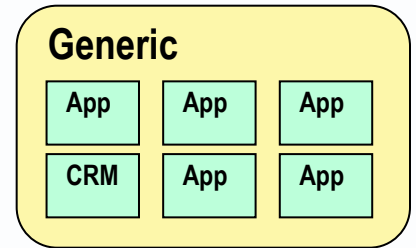
# Avancier Methods (AM)

## Applications architecture diagrams

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but you can share a link to it.

- ▶ If you work at the application portfolio management level, you might find data flow diagrams suffice.
  - For an EA context, go to the “Enterprise Architecture roles and realities” page.
  
- ▶ If you work on an application’s internal structure, you may consider UML more appropriate.
  - For a software architecture context, go to the “Software Architecture principles and patterns” page.

- ▶ [an artefact] listing business applications and recording their properties. Usually structured so as to reflect the business function hierarchy.



## Core business functions

### Marketing



### Sales



### Delivery

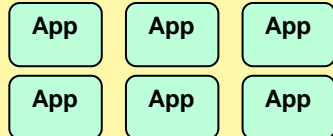


### Customer Service

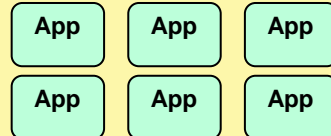


## Support business functions

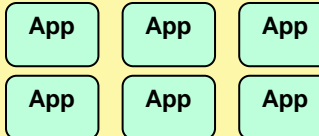
### HR



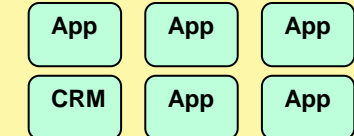
### IT



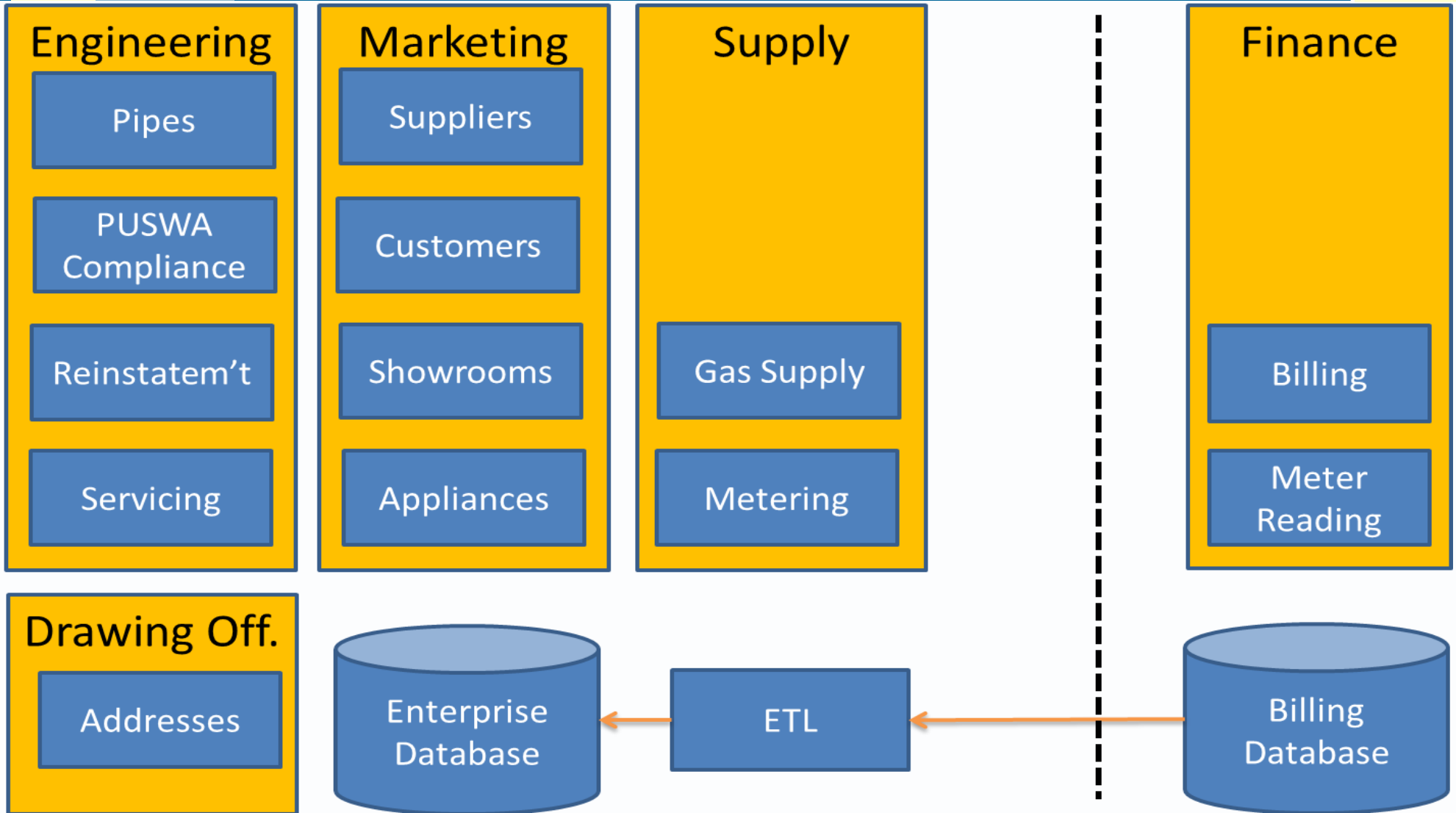
### Accounts



### Legal



# Application Portfolio Map - Gas Utility Company (c1985)



Market / Sales

Campaign Management

Channel Sales Management

Corporate Sales Management

# The TAM R2.0 Overview

Product Management

Product / Service Catalog Management

Product Lifecycle Management

Product Performance Management

Product Strategy / Proposition Management

Customer Management

Customer SelfManagement

Order Management

Customer Information Management

Customer Contact, Retention & Loyalty

Quotation Engine

Customer QOS/SLA Management

Customer Service / Account Problem Resolution

Fraud Management

Customer Billing Management

Bill Formatting

Invoicing

Collections Management

Receivables Management

Service Management

Service Design / Assign

Service Inventory Management

Service Specification Management

Service Configuration Management

Service Problem Management

Service Quality Monitoring & Impact Analysis

Service Performance Management

Service Level Agreement Management

Service Rating / Discounting Management

Revenue Assurance Management

Resource Management

Workforce Management

Resource Planning / Optimization

Resource Inventory Management

Resource Specification Management

Resource Performance Monitoring / Management

Resource Testing Management

Correlation & Root Cause Analysis

Resource Design / Assign

Resource Provisioning / Configuration

Resource Activation

Resource Logistics

Resource Problem Management

Resource Status Monitoring

Resource Data Mediation

Arbitrage Management

Billing Data Mediation

Voucher Management

Real-time Billing Mediation

Resource Domain Management (IT Computing, IT Applications, Network)

Supplier / Partner Management

Partner Management

Supply Chain Management

Wholesale / Interconnect Billing

Enterprise Management

HR Management

Financial Management

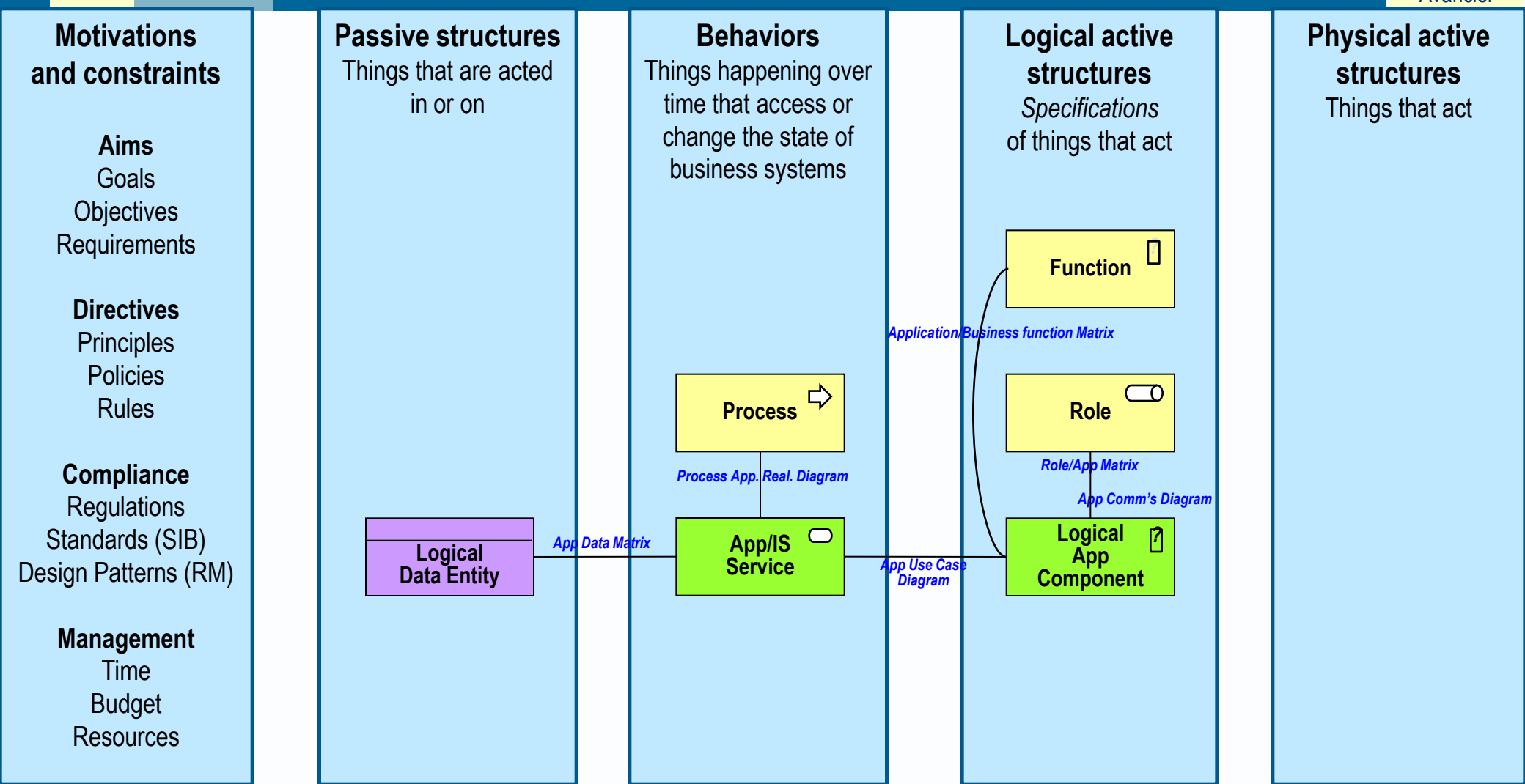
Asset Management

Security Management

Knowledge Management

Integration infrastructure: bus technology / middleware / business process management

# APPLICATIONS ARCHITECTURE



# TOGAF says: Application/Data Matrix

- ▶ ... to depict the relationship between applications (i.e., application components) and the data entities that are accessed and updated by them.
- ▶ Applications will create, read, update, and delete specific data entities that are associated with them.
- ▶ The data entities in a package/package services environment can be classified as master data, reference data, transactional data, content data, and historical data.
- ▶ Applications that operate on the data entities include transactional applications, information management applications, and business warehouse applications.
- ▶ The mapping of the Application Component-Data Entity relationship is an important step as it enables the following to take place:
  - Assign access of data to specific applications in the organization
  - Understand the degree of data duplication within different applications, and the scale of the data lifecycle
  - Understand where the same data is updated by different applications
  - Support the gap analysis and determine whether any of the applications are missing and as a result need to be created

Application	CRM	ERP	Billing	Data warehouse
Data entity				
Customer	CRUD	RUD	RUD	RD
Order	CRUD	RUD	CRUD	RD
Invoice			CRUD	RD

# ArchiMate???



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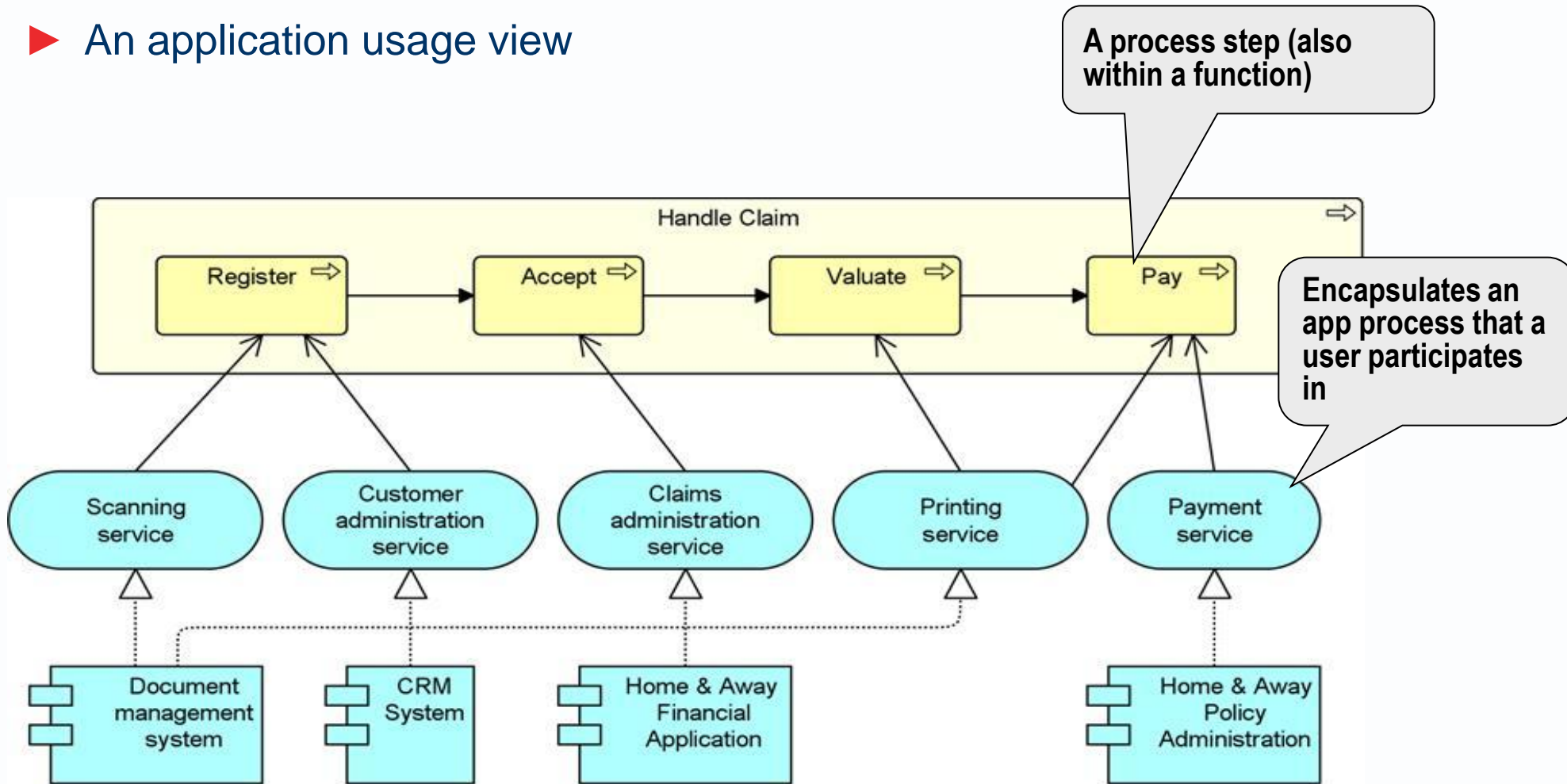
# TOGAF says: Application/Function Matrix

- ▶ ... to depict the relationship between applications and business functions within the enterprise.
- ▶ Business functions are performed by organizational units.
- ▶ Some of the business functions and services will be supported by applications.
- ▶ The mapping of the Application Component-Function relationship is an important step as it enables the following to take place:
  - Assign usage of applications to the business functions that are supported by them
  - Understand the application support requirements of the business services and processes carried out
  - Support the gap analysis and determine whether any of the applications are missing and as a result need to be created
  - Define the application set used by a particular business function

<b>Application Function</b>	<b>CRM</b>	<b>ERP</b>	<b>Billing</b>	<b>Data warehouse</b>
<b>Sales</b>	Place order Register customer			
<b>Invoicing</b>			Post invoice	

# Partial match in ArchiMate

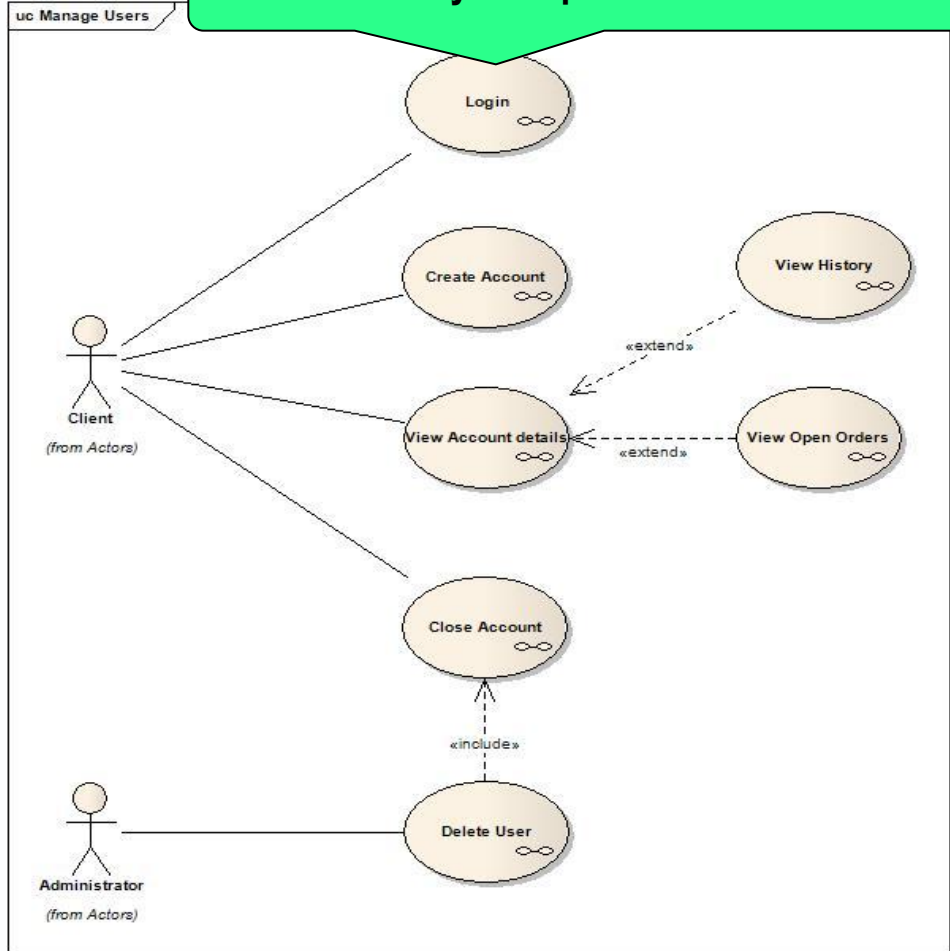
► An application usage view



- ▶ This displays the relationships between consumers and providers of application services.
- ▶ Application services are consumed by actors or other application services and the diagram provides added richness in describing application functionality by illustrating how and when that functionality is used.
- ▶ The purpose is to help to describe and validate the interaction between actors and their roles with applications.
- ▶ As the architecture progresses, the use-case can evolve from functional information to include technical realization detail.

# Application Use-Case diagram

Use case = a system process that an actor engages with

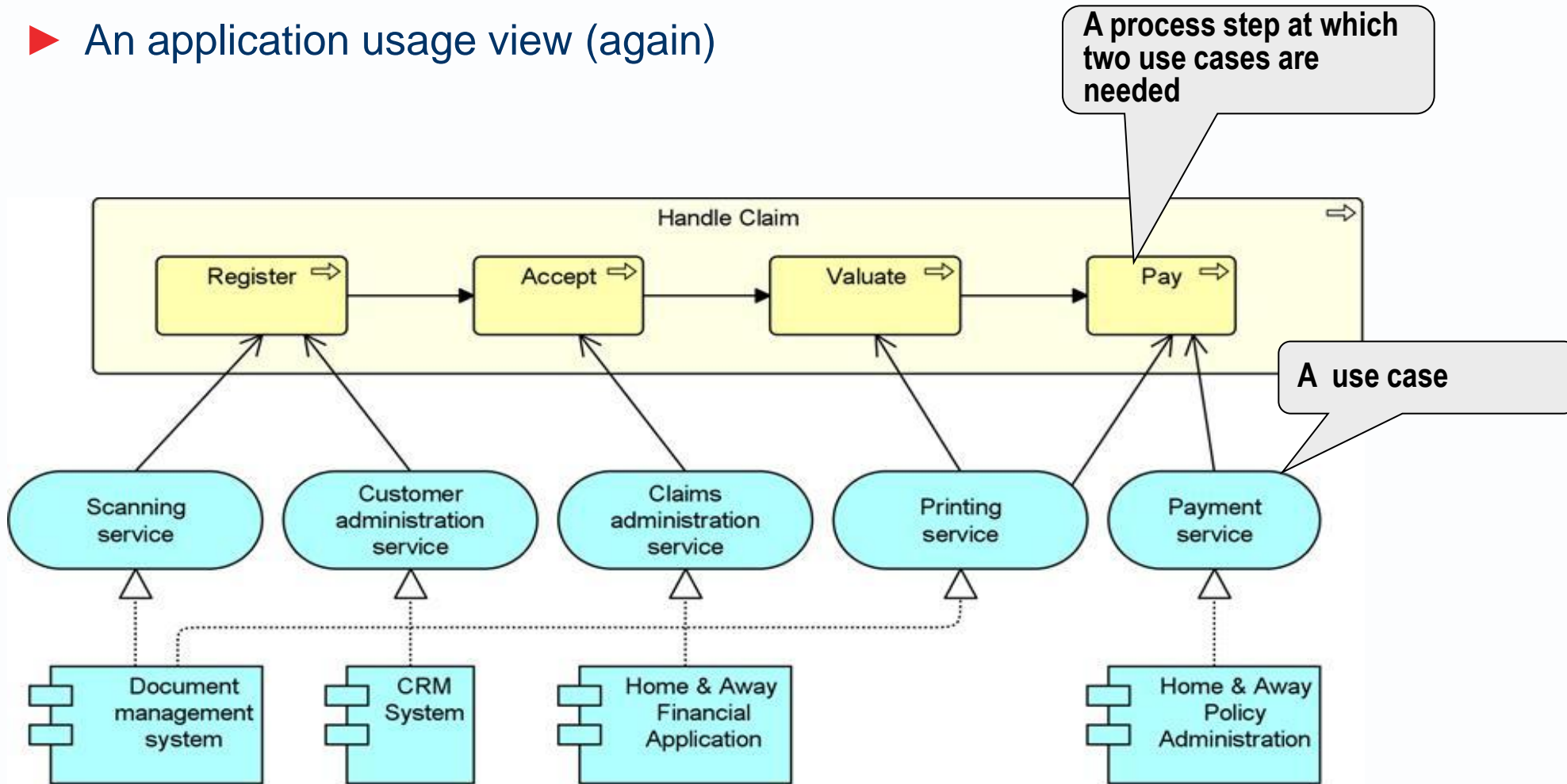


- ▶ One use can
  - *extend* another use case
  - *be included* in one or more other use cases

<http://www.modernanalyst.com/Resources/Articles/tabid/115/articleType/ArticleView/articleId/353/Enterprise-Architect-for-Business-Analysts.aspx>

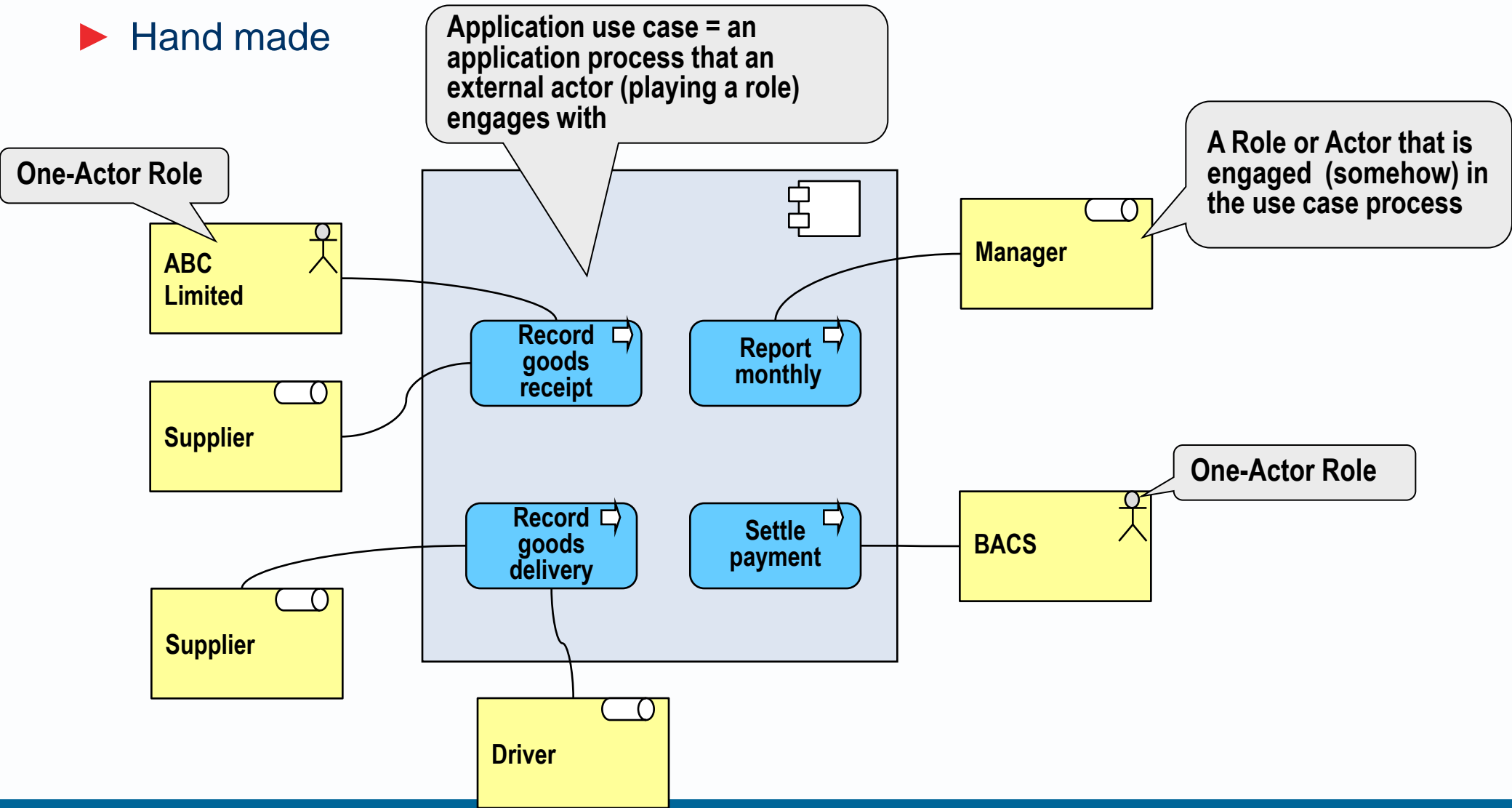
# Partial match in ArchiMate

► An application usage view (again)



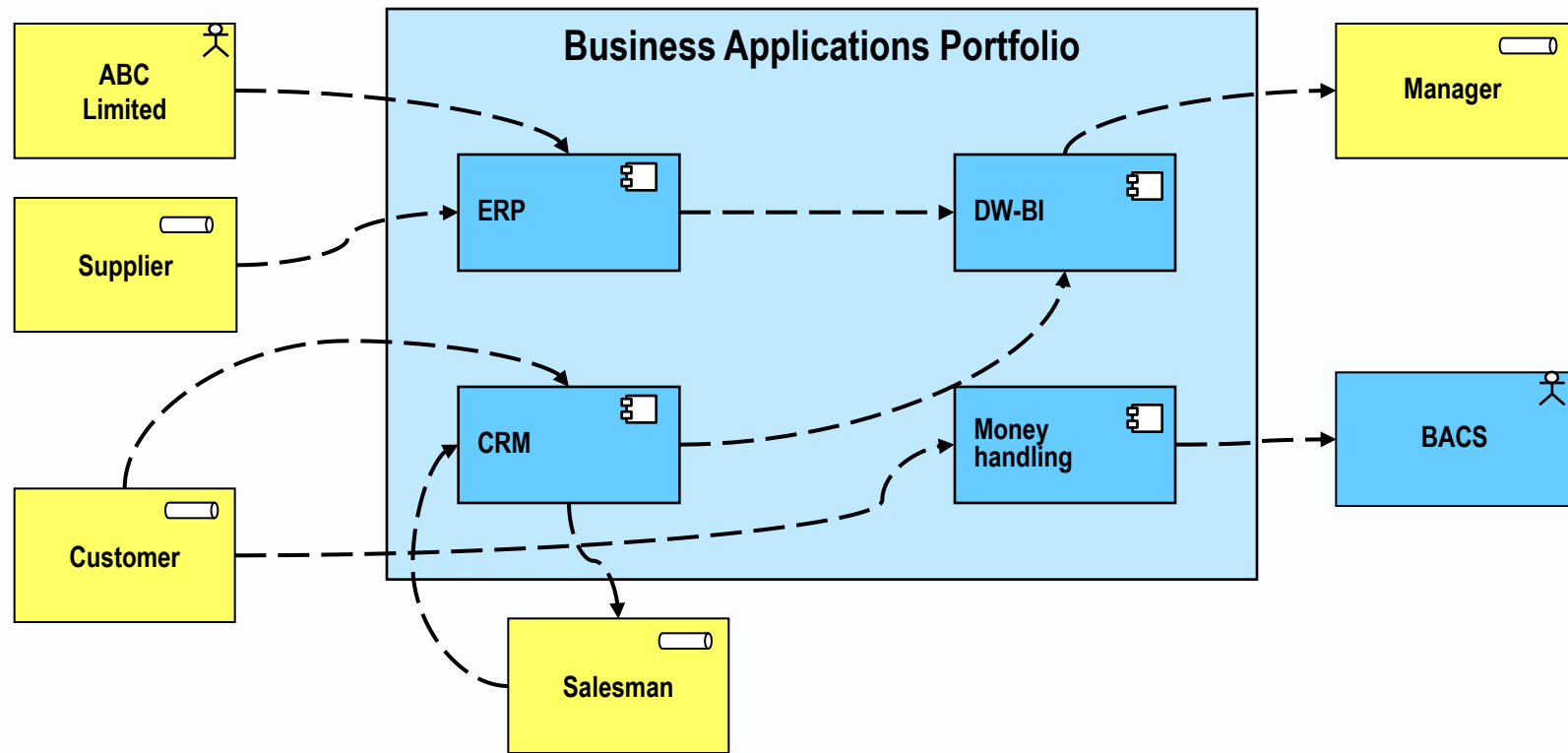
# Reasonable match in ArchiMate

► Hand made



- ▶ ... to depict all models and mappings related to communication between applications in the metamodel entity.
- ▶ It shows application components and interfaces between components.
- ▶ Interfaces may be associated with data entities where appropriate.
- ▶ Applications may be associated with business services where appropriate.
- ▶ Communication should be logical and should only show intermediary technology where it is architecturally relevant.

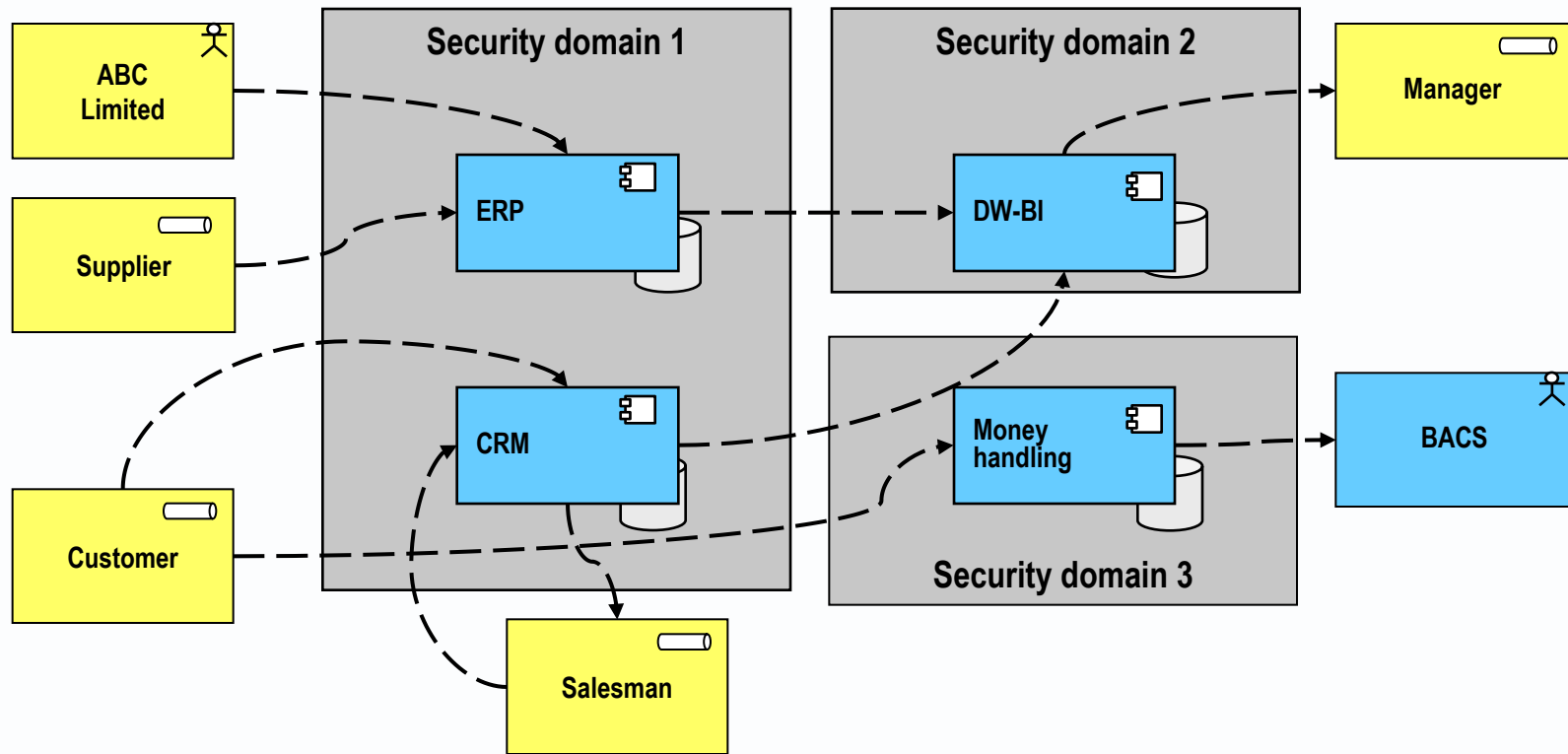
# Reasonable match in ArchiMate



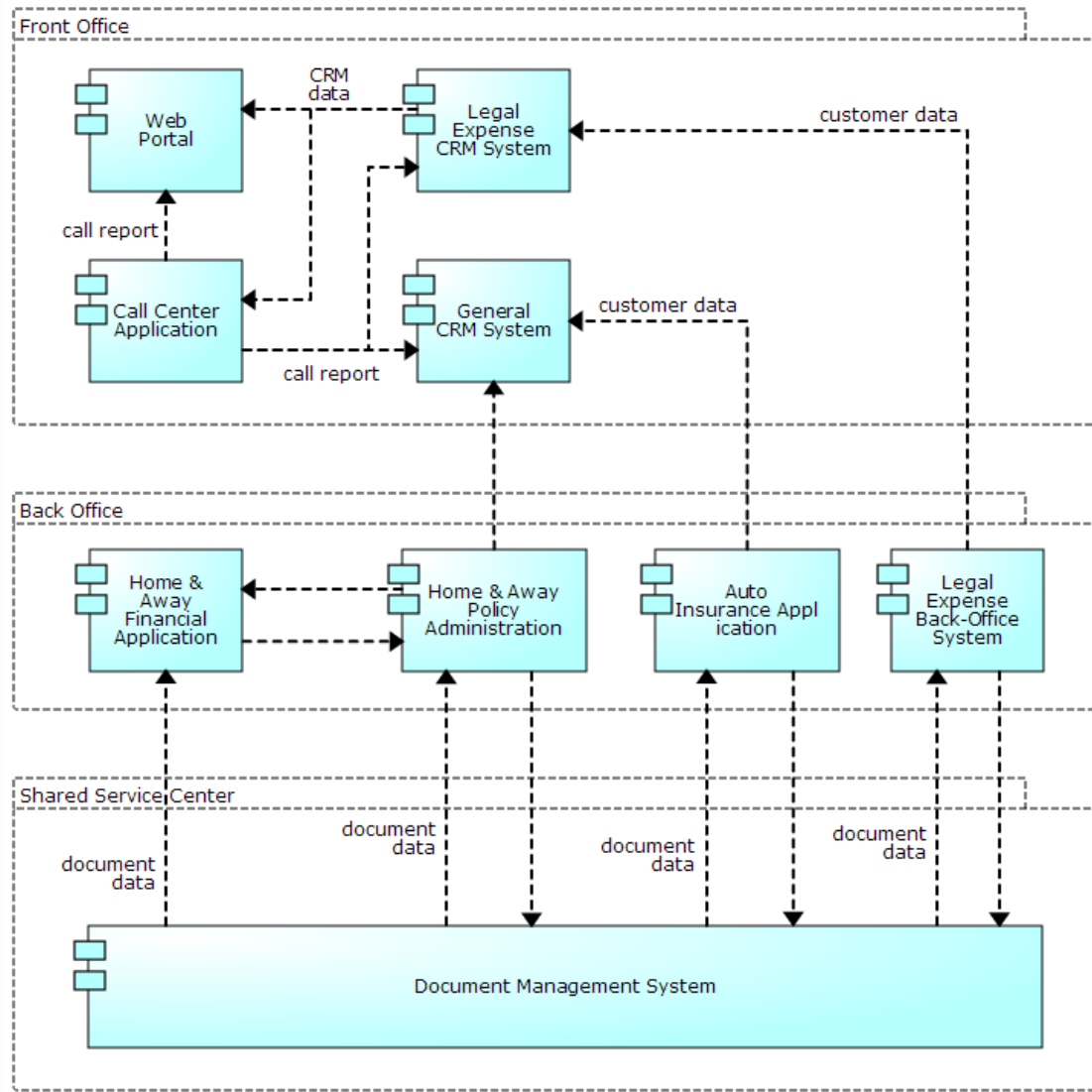


# OVERLAY: Application Communication & Security diagram

- ▶ Which applications and/or data stores are in which security domain?
- ▶ Which data flows pass between security domains?
- ▶ A variation of Application Communication diagram with security domains

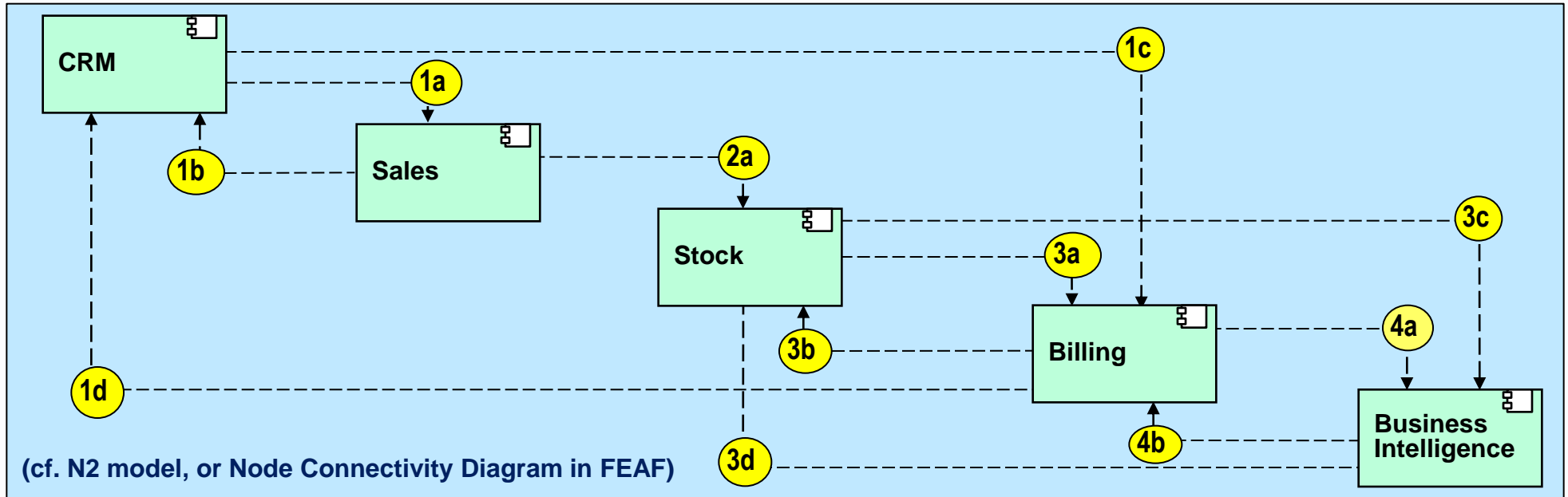


# Reasonable match in ArchiMate



# TOGAF supports the diagram with an “interface” catalogue

## Application Communication Diagram



## Interface (Aargh! Data Flow) Catalogue

Data Flow id	Source App	Destination App	Data content	Trigger event
1a	CRM	Sales	Sales order request	New sales order
1b	Sales	CRM	Sales order confirmation	Order created in the Sales system
2a	Sales	Stock	Requisition	Subscribe/Publish timer

# TOGAF says: Role/Application Matrix

- ▶ ... to depict the relationship between applications and the business roles that use them within the enterprise.
- ▶ People in an organization interact with applications.
- ▶ During this interaction, these people assume a specific role to perform a task; for example, product buyer.
- ▶ The mapping of the Application Component-Role relationship is an important step as it enables the following to take place:
  - Assign usage of applications to the specific roles in the organization
  - Understand the application security requirements of the business services and processes supporting the function, and check these are in line with current policy
  - Support the gap analysis and determine whether any of the applications are missing and as a result need to be created
  - Define the application set used by a particular business role; essential in any move to role-based computing

# ArchiMate???

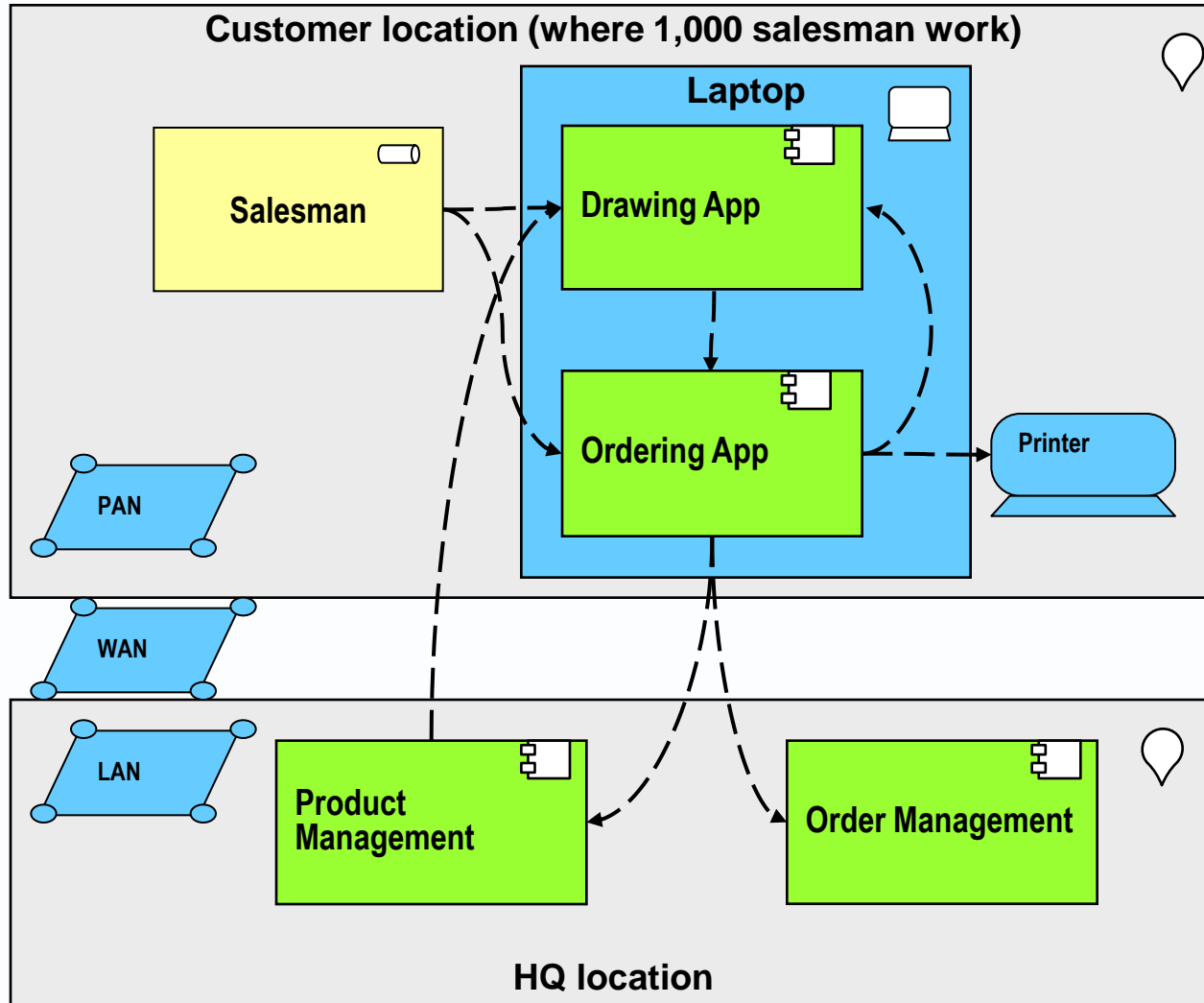


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- ▶ ...shows the geographical distribution of applications.
- ▶ It can be used to show where applications are used by the end user; the distribution of where the host application is executed and/or delivered in thin client scenarios; the distribution of where applications are developed, tested, and released; etc.
- ▶ Analysis can reveal opportunities for rationalization, as well as duplication and/or gaps.
- ▶ The purpose is to clearly depict the business locations from which business users typically interact with the applications, but also the hosting location of the application infrastructure.

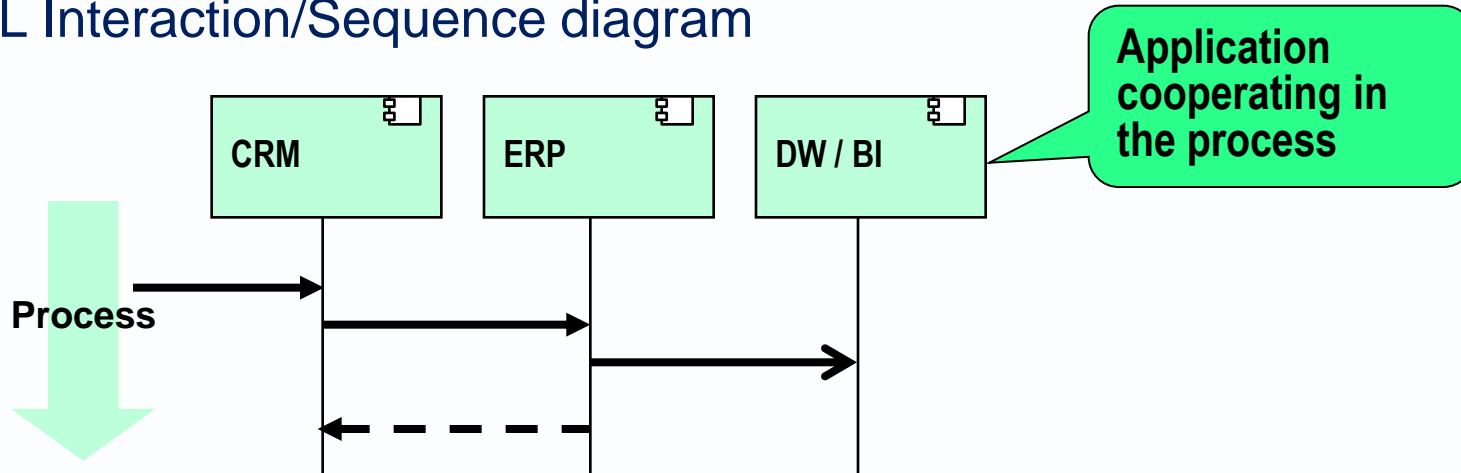
# Reasonable match in ArchiMate



- ▶ ...to clearly depict the sequence of events when multiple applications are involved in executing a business process.
- ▶ It enhances the Application Communication Diagram by augmenting it with any sequencing constraints, and hand-off points between batch and real-time processing.
- ▶ It would identify complex sequences that could be simplified, and identify possible rationalization points in the architecture in order to provide more timely information to business users.
- ▶ It may also identify process efficiency improvements that may reduce interaction traffic between applications.

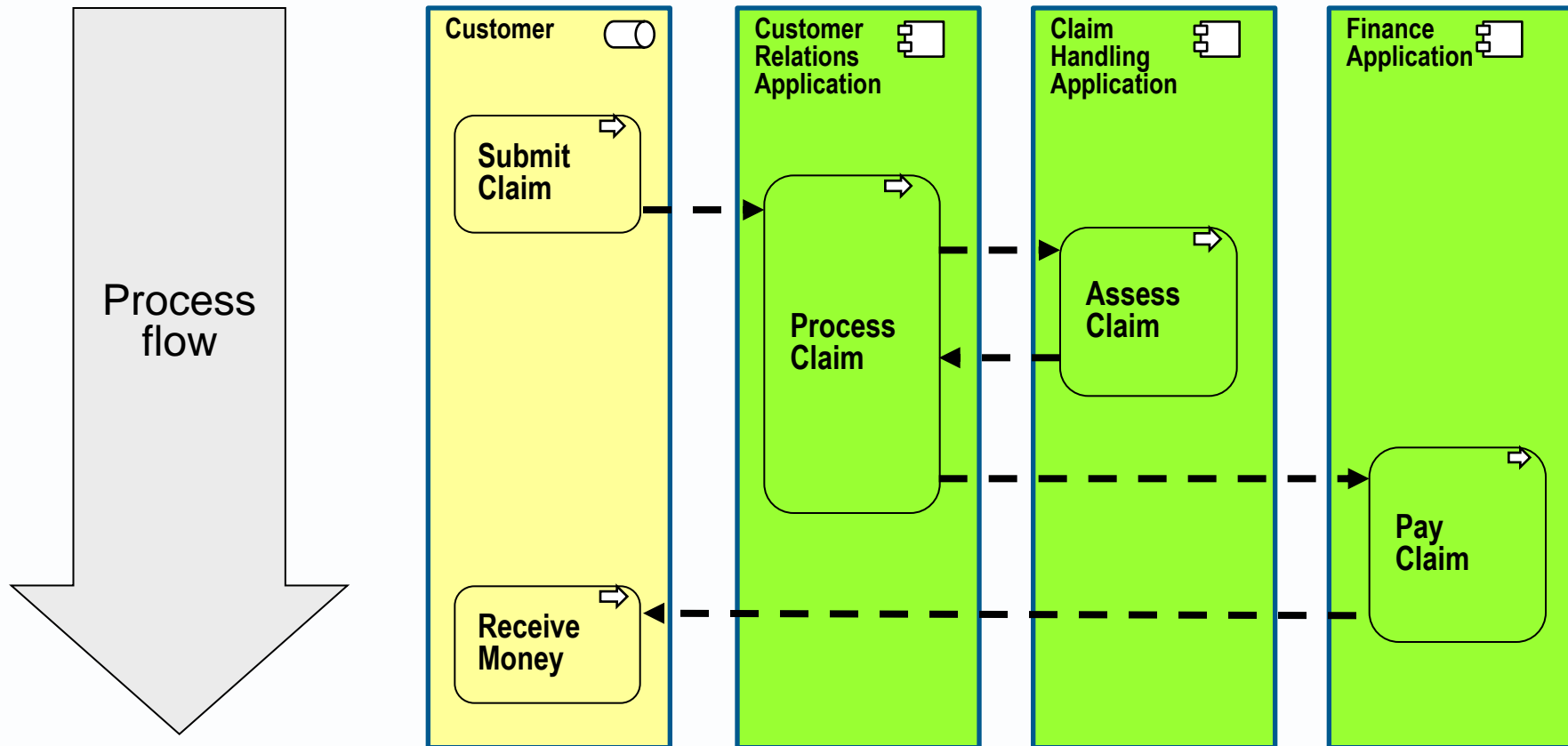


## ▶ UML Interaction/Sequence diagram



- ▶ What applications cooperate in the execution of a process?
- ▶ How and when are applications triggered by invocations?
- ▶ What data flows or messages are passed along with an invocation?
- ▶ Useful in analysing the efficiency of a process
- ▶ Shows the overall sequence of a process
- ▶ Limited representation of logic (loops, options & quits)

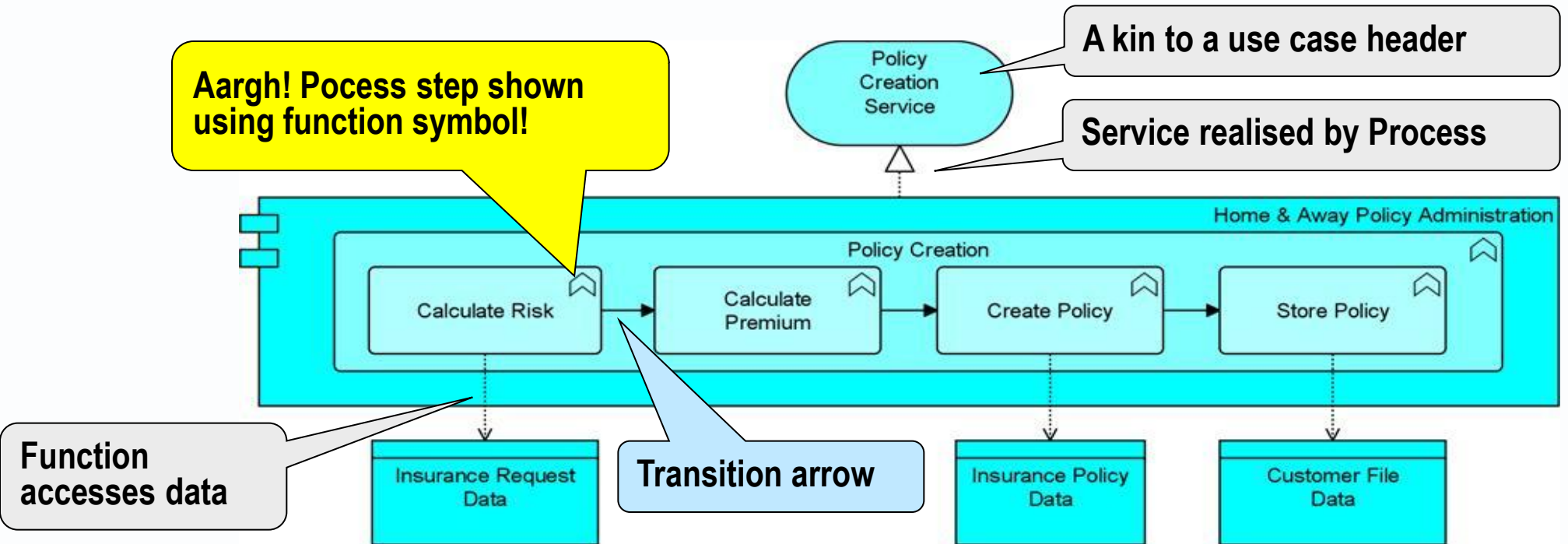
## ► Simulation in ArchiMate of a UML Sequence Diagram



- ▶ ... breaks applications into packages, modules, services, and operations from a development perspective.
- ▶ It enables more detailed impact analysis when planning migration stages, and analyzing opportunities and solutions.
- ▶ It is ideal for application development teams and application management teams when managing complex development environments.

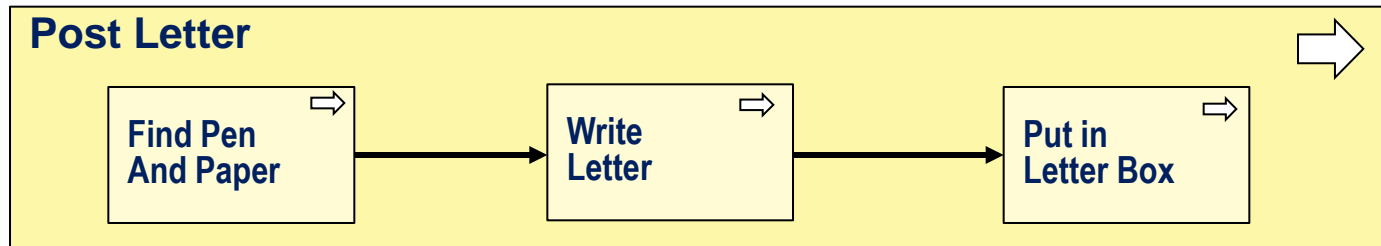
# Possible match in ArchiMate?

► An Application Behavior view?



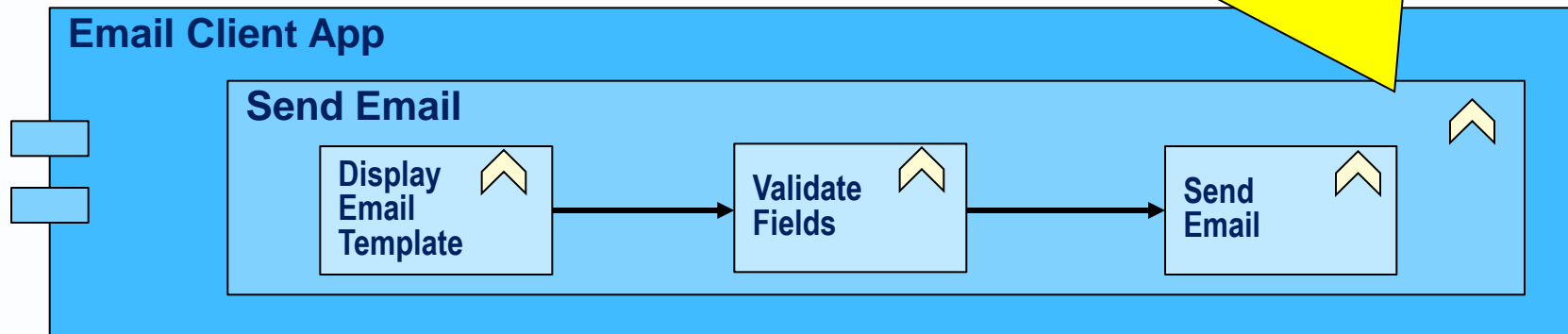
## Note the function / process confusion

- ▶ ArchiMate standard diagrams use different symbols for processes in the business layer



- ▶ And in the application layer

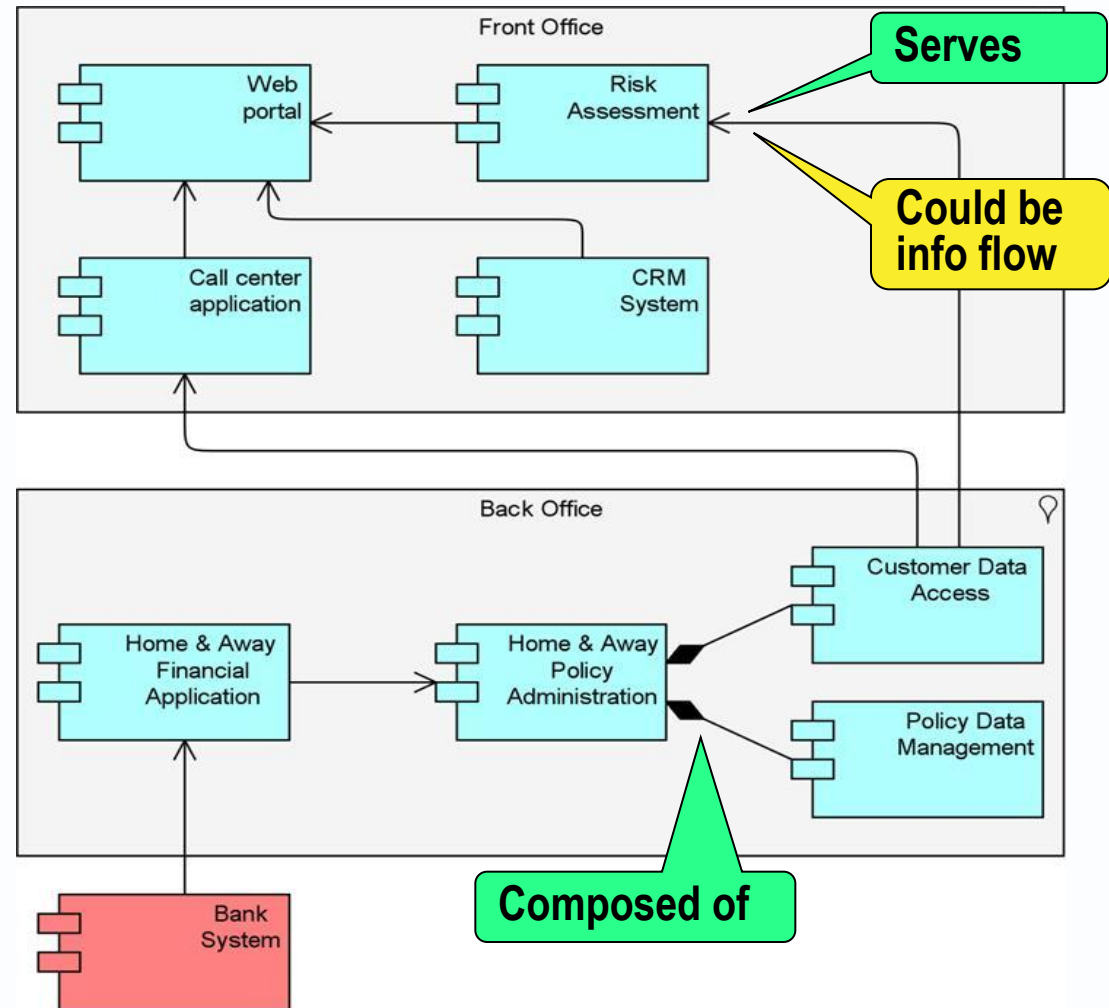
What show a process using function symbol?



- ▶ ... shows how application software is structured and distributed across the estate.
- ▶ ... useful in systems upgrade or application consolidation projects.
- ▶ ... shows how physical applications are distributed across physical technology and the location of that technology.
- ▶ This enables a clear view of how the software is hosted, but also enables managed operations staff to understand how that application software is maintained once installed.

# Application Co-operation 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.
- ▶ typically used to create an overview of the application landscape of an organization.
- ▶ also used to express the (internal) cooperation or orchestration of services that together support the execution of a business process.



## TOGAF says: One more applications architecture diagram type

### ▶ Application/Migration Diagram

- Identifies application migration from baseline to target application components.
- enables a more accurate estimation of migration costs
- used to identify temporary applications, staging areas, and the infrastructure required to support migration



# Beware the duplication between TOGAF diagrams

- ▶ Application and User Location Diagram
  - “shows the geographical distribution of applications, where applications are used by the end user; where the host application is executed and/or delivered in thin client scenarios;
  - where applications are developed, tested, and released; etc.”

- ▶ Application/Technology Matrix
  - “documents the mapping of business systems [i.e applications] to technology platform.”

- ▶ Processing Diagram
  - “focuses on deployable units of code/configuration and
  - how these are deployed onto the technology platform.”

- ▶ Software Distribution Diagram
  - “shows how application software is structured and distributed across the estate...”
  - shows how physical applications are distributed across physical technology and the location of that technology...
  - enables a clear view of how the software is hosted”

- ▶ Environments and Locations Diagram
  - “depicts which locations host which applications...”
  - what technologies and/or applications are at which locations”

- ▶ Networked Computing/Hardware Diagram
  - “to document the mapping between logical applications and the technology components (e.g., server) that supports the application both in the development and production environments...”
  - “to show the “as deployed” logical view of logical application components in a distributed network computing environment...”
  - “Enable understanding of which application is deployed where in the distributed network computing environment.”

**MORE...**

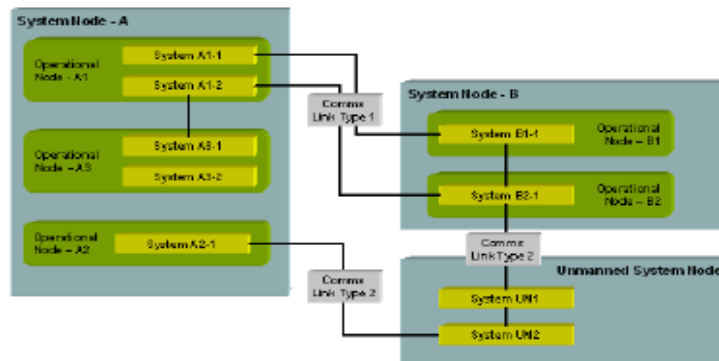


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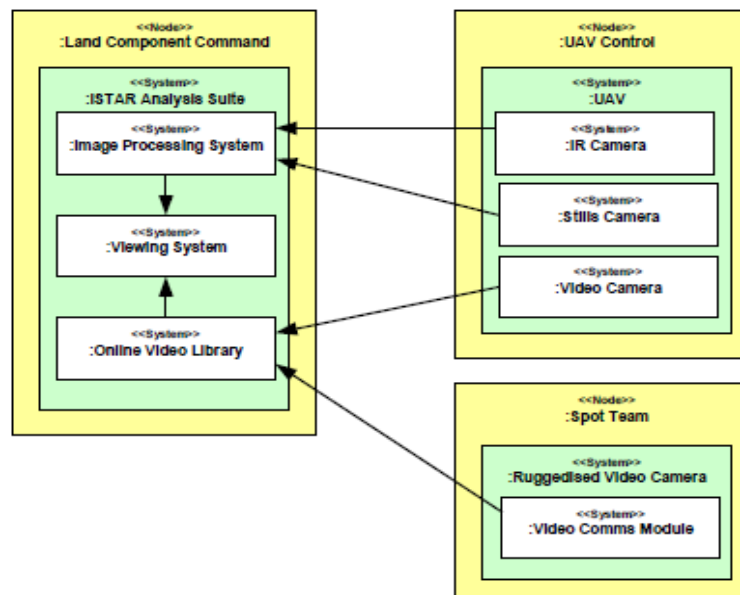


# Application Communication diagram: MODAF style

## SV-1 System Interface Description



Example –Generic SV-1



Example – UML Version of Generic SV-1

### Data objects:

Nodes (can be operational or system by taxonomy)  
Organisations  
Resources, specifically including systems  
System connections

### Usage:

Operational analysis  
Interoperability analysis  
Specification of system-node associations as requirements in SRD

### Description:

Depicts systems and identifies the interfaces between those systems. Also shows the system nodes at which those systems are located, and overlays operational nodes that are deployed at system nodes.

### Alternative Views:

UML Class Diagram

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

