Enterprise Architecture as an Automated Instrument to support Enterprise Transformation – Approach and Practice

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GERIMOS CONHECIMENTO, CONSIGO

INTRODUCTION

- Enterprise Transformation requires up-to-date **Architectural Blueprints (or models)** as an instrument to monitor and govern changes in organization's artefacts.

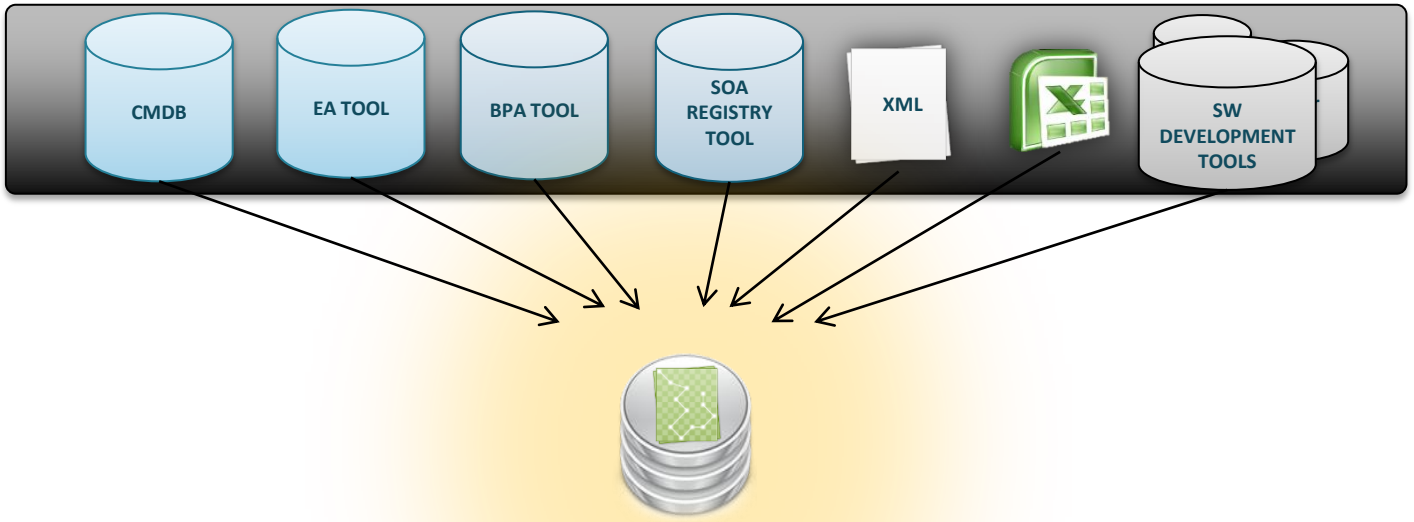
- We distinguish two major types of **Architectural Blueprints** :
  - Those that result form creative reasoning, as in designing a new thing, where drawing is a auxiliary of thinking.
  - Those that aim at describe a given cartographic aspects of modelling, where one only needs to represent existing (and planned) things.

- This talk is mostly about how to build and maintain the overall architectural cartography of an organization (business and IT) from the composition of individual artefacts blueprints.

INTRODUCTION

We will see:

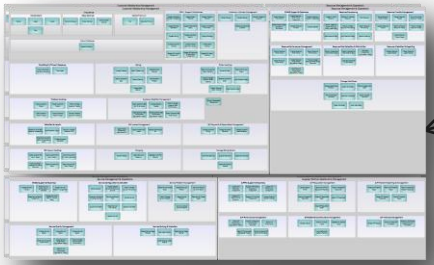
- The approach used to capture information, across the organization, regarding planned and effective changes from heterogeneous sources to build an consolidated view of the Organization Architecture

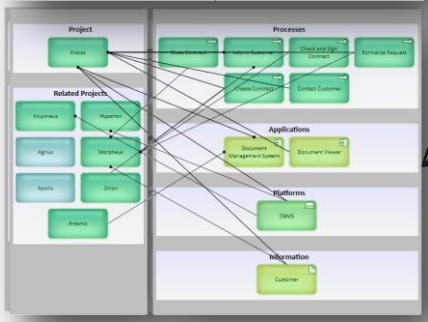


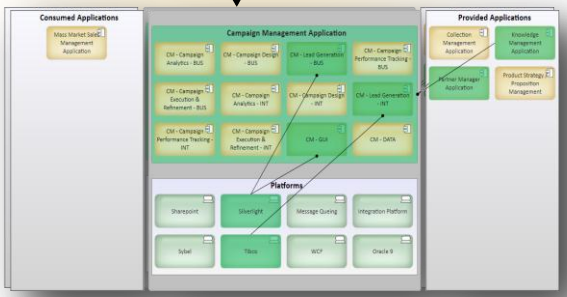
INTRODUCTION (3)

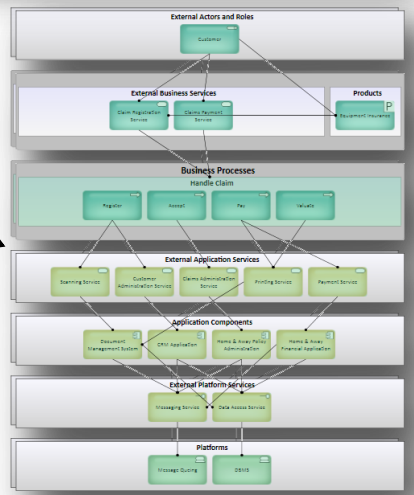
We will see:

- How to generate and maintain automatically all the architectural representations of the organization, covering both IT and Business









INTRODUCTION

We will see:

- How to generate a dynamic time-based visualization of the architectural artifacts and representations, providing the capacity to visualize the past, the present and the planned future

THE VISION

- Most organizations have operational catalogues (Process Catalogue, Application Catalogue, CMDB, Services Catalogue, Products Catalogue, Human Resource, etc.) with valuable information for enterprise wide Blueprints. Such information is mostly about the AS-IS state of the Organization.

- Consider that organizations changes as result of projects. During the projects' early stages, architects produce models and views of the artifacts that the project promises to build/change. These views are partial views of the TO-BE state of the Organization.

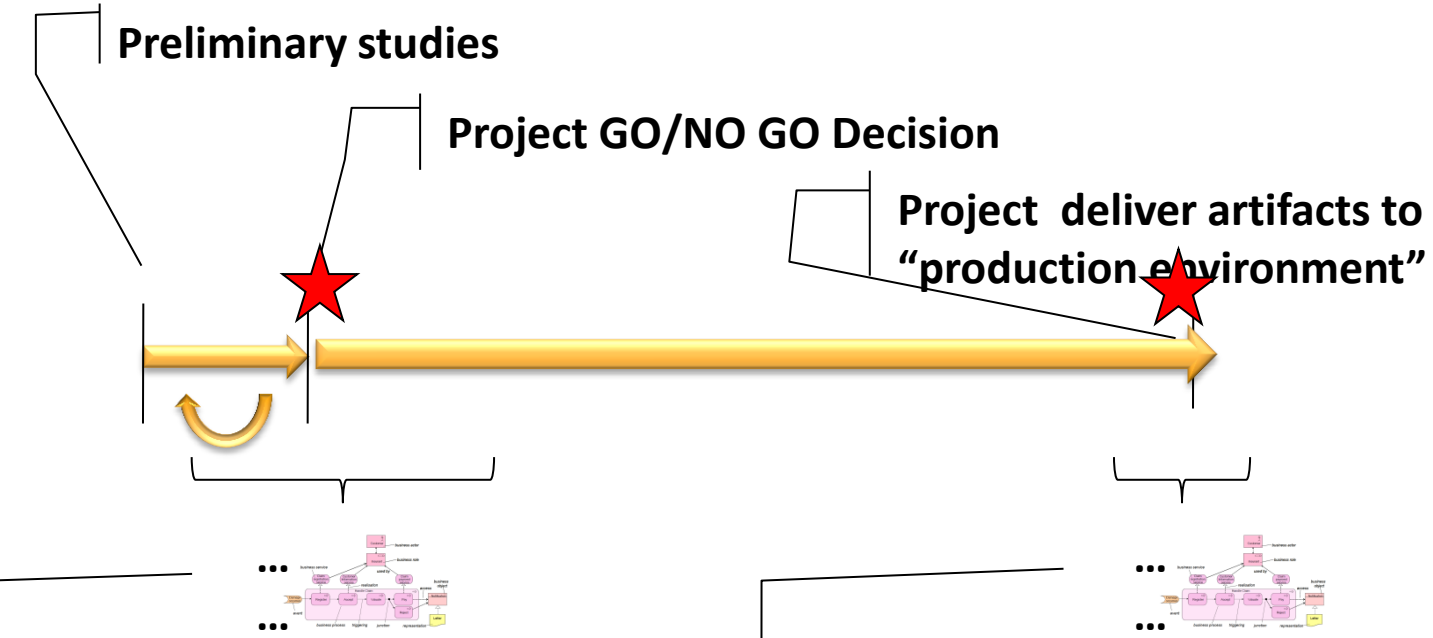
- The key issue is how to generate and maintain enterprise-wide architectural models from the aggregation of partial models and other information sources, with little effort.

INFORMATION SOURCES

- Business Processes < Business Process Modelling tools;
- IT Solutions Catalogue < Enterprise Architecture Modelling Tools;
- IT infra-structure < CMDB;
- Services < SOA Service Registry & Repository;
- Business Rules < Business Rules Engine;
- Organic Units < Human Resource Management System;
- Application Functions < Requirements Management Tools;
- Organization Changes < Project Management Tools;
- Etc.

All these information sources have valuable data about the Organization's artifacts, typically represented in Architectural Models/Blueprints.

BUT ORGANIZATIONS CHANGE!!!
PROJECTS AS UNITS OF PLANNED CHANGES TO ORGANIZATION



Initial data:
What the project promise to do;
A partial vision of the TO-BE state of the organization.

Final data:
What the project actually did!
A factual view of the AS-IS of the organization.

THE FUNDAMENTAL ISSUES!

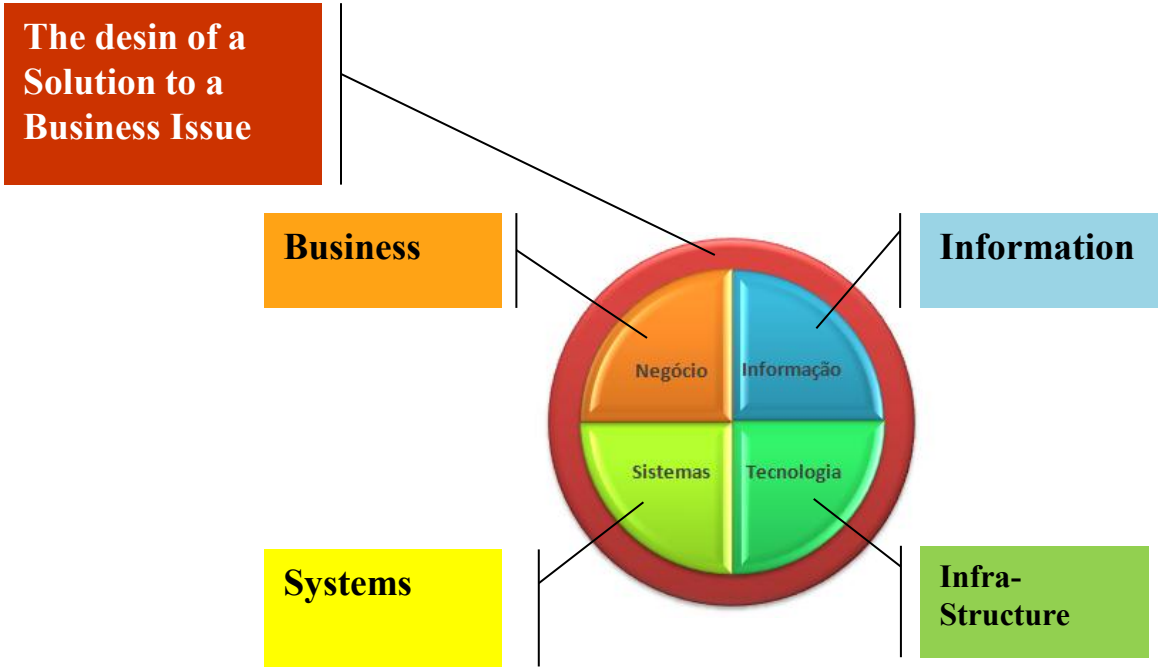
- How to gather information from disparate sources of information about Organization Artifacts :
  - Partial views of future artifacts (project models)
  - Partial views of actual artifacts (operational catalogues)

- Build enterprise-wise Models/Blueprints of the organization :
  - Aggregate **Partial Views** into **Global Views**
  - Aggregate **Past**, **Present** and **Future** views in a continuous of the organization.
  - Avoid blueprints versioning each time something changes.

THE FUNDAMENTAL ISSUES!

Building the cartography of the whole based on the design of the parts!

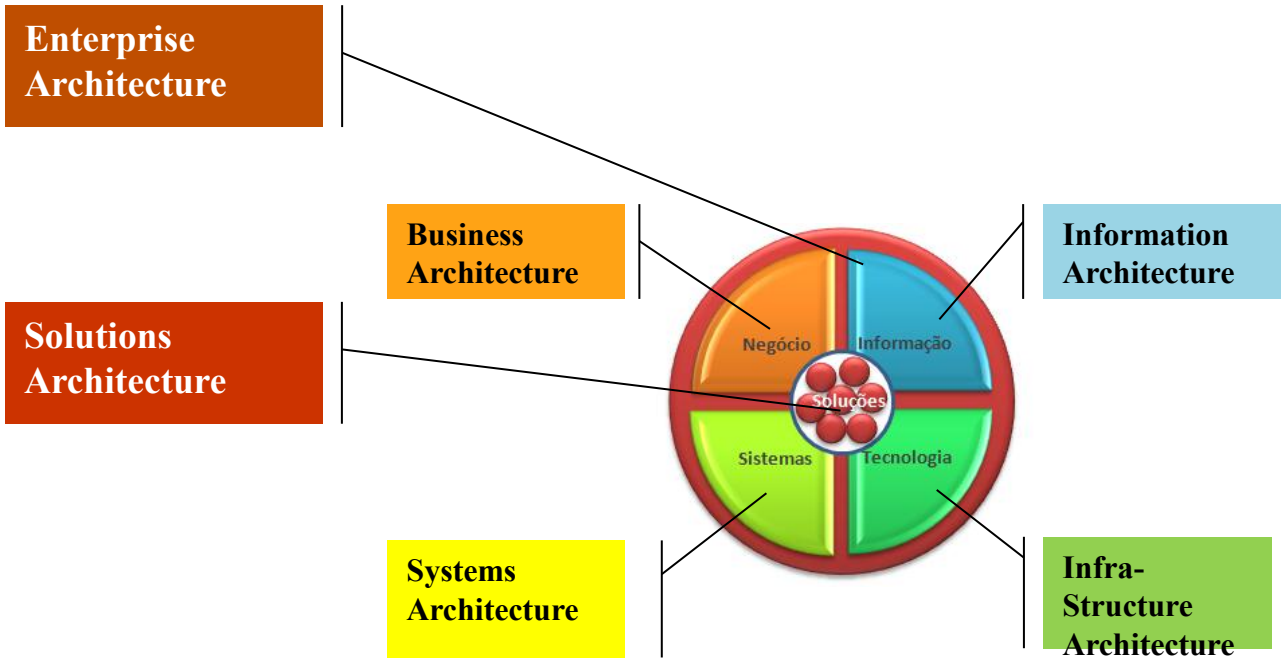
An example of a description a PART:



THE FUNDAMENTAL ISSUES!

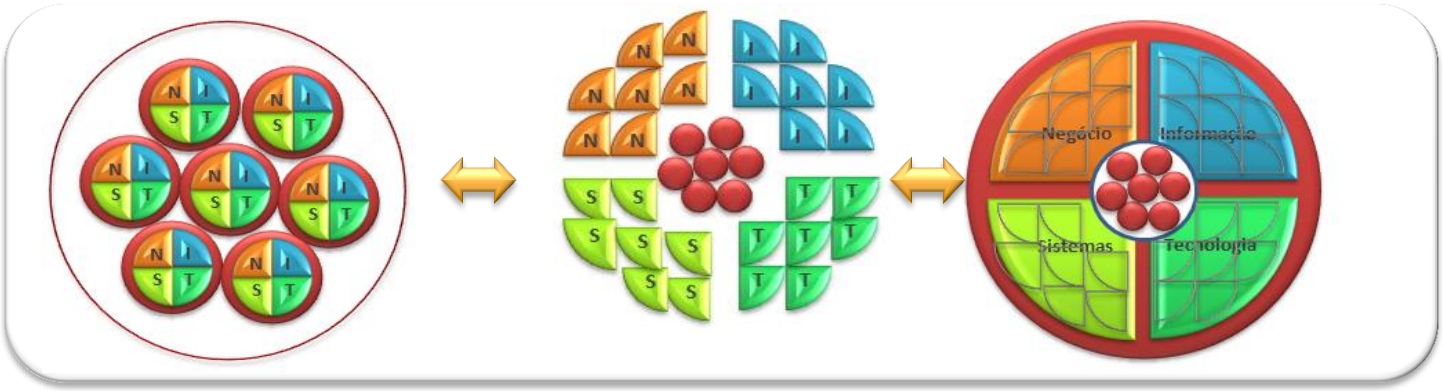
Building the cartography of the whole based on the design of the parts!

An example of a description the WHOLE:

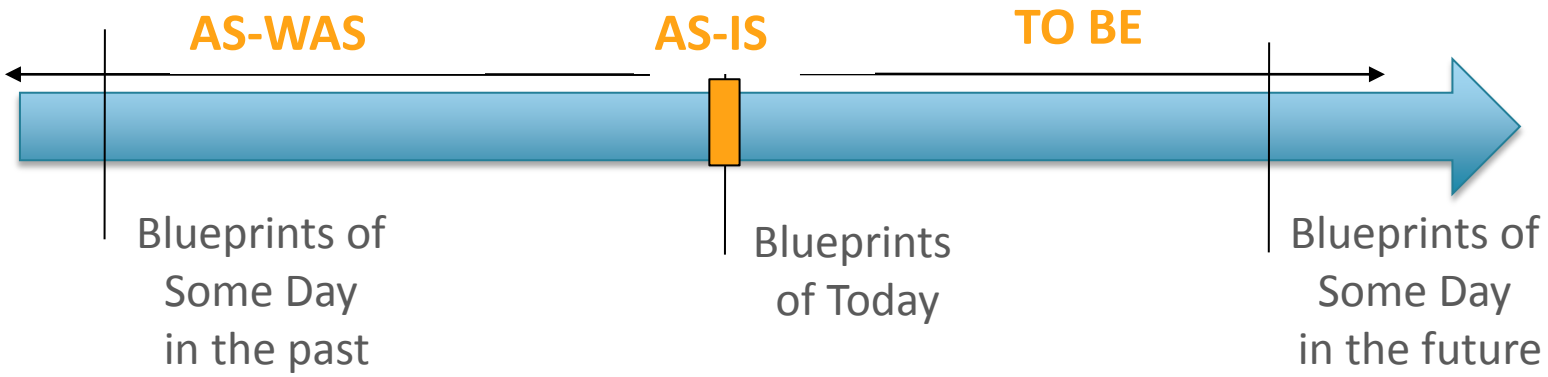


THE FUNDAMENTAL ISSUES!

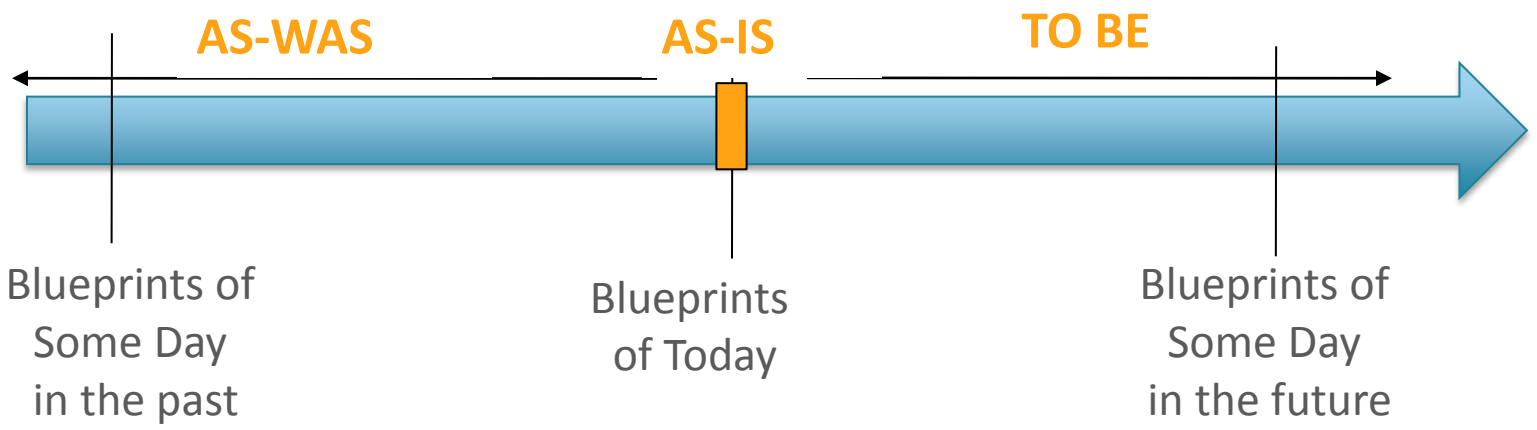
Navegate between the PARTS and the WHOLE



Navegate between the PAST and the Forrseen FUTURE



THE TIME CONTINUOUS FROM PAST TO FUTURE STATES



- The best guess one has about the Blueprints of the organization in "some day in the future" will those of today changed buy whatever "on-going" and "to be" projects promise to change up to that day

- Versioning occurs implicitly by moving the time button into the past

THE VISION: AUTOMATIC CARTOGRAPHY OF THE ORGANIZATION

Projects that change the Organization's Artifacts

Project Plans:
what the project promises to do
(TO-BE)

Project Results:
what projects actualy did
(AS-IS)

Operational Catalogs

Lists of artifacts and relatioins of current perception of AS-IS

Blueprint Generation Repository & Engine

Enterprise Wide Blueprints

Validate and Correct operational catalogs

THE VISION EMBODIES TWO MAJOR ISSUES

- Information Gathering!
- Graphical Blueprints Generation!

THE VISION EMBODIES TWO MAJOR ISSUES

- **Information Gathering!**
- Graphical Blueprints Generation!

INFORMATION GATHERING

- Identify the information required, by identify entities evolved in the top problems to be solved. (Architectural vs Engineering information)

- Find most valuable source of that information
  - Existing catalogues
  - Project documentation
  - Interchanged Documents between teams

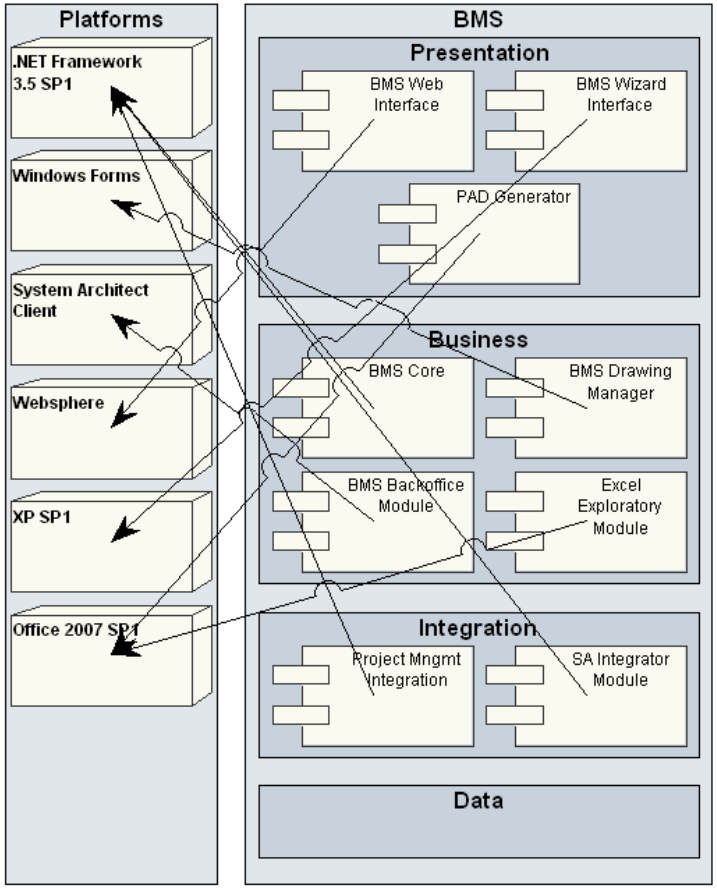
- Normalize that information source up to the point that can be automatically processed into textual lists of artifacts and their relations.

- Feed the repository accordingly.

INFORMATION GATHERING

An example of normalized information: A project that promises to deliver an application (BMS) with those components each running on the indicated platform

	A	B	C
1	Components	Application Layer	Platforms
2	BMS Web Interface	Presentation	Websphere
3	BMS Wizard Interface	Presentation	XP SP1
4	PAD Generator	Presentation	Office 2007 SP1
5	BMS Core	Business	.NET Framework 3.5 SP1
6	BMS Drawing Manager	Business	Windows Forms
7	BMS Backoffice Modul	Business	System Architect Client
8	Excel Exploratory Mod	Business	Office 2007 SP1
9	Project Mngmt Integra	Integration	.NET Framework 3.5 SP1
10	SA Integrator Module	Integration	.NET Framework 3.5 SP1
11			
12			
13			



THE VISION EMBODIES TWO MAJOR ISSUES

- Information Gathering?
- **Graphical Blueprints Generation?**

GRAPHICAL BLUEPRINTS GENERATION

- The challenge was to generate blueprints for each and every type of system:
  - An Enterprise
  - A Department with staff
  - A process with resources and actors
  - An IT System
  - A Service interface with an implementation
  - And so on…

THE GENERAL NOTION OF A SYSTEM

- We adapt the general notion of a System, based on its Composition, Environment and Structure:

Following the description presented in [16], a system σ is defined by its *Composition*, *Environment* and *Structure*:

- The *Composition* C of a system σ is the set of artifacts that:

$$C(\sigma) = \{x : x \; IsA \; Component \wedge \; x \; \prec \sigma\}$$

- The Environment E of a system σ is the set of artifacts that:

$$E(\sigma) = \{x : x \notin C(\sigma) \wedge \exists y : y \in C(\sigma) \wedge (x \rightarrow y \vee y \rightarrow x)\}$$

- The Structure S of a system σ is the set of related artifacts defined as:

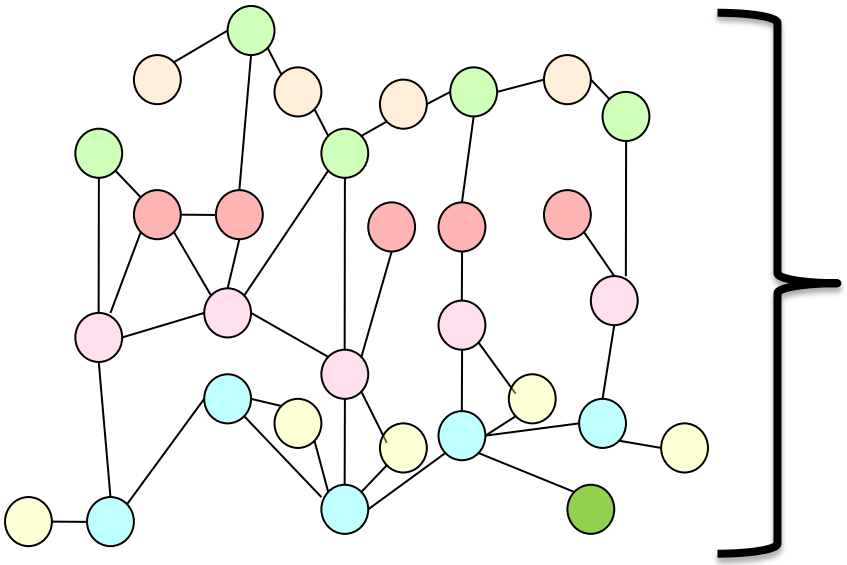
$$S(\sigma) = \{< x, y > \mid (x \rightarrow y \vee y \rightarrow x) \wedge (x, y \in C(\sigma) \vee (x \in C(\sigma) \wedge y \in E(\sigma)))\}$$

Notice that, in spite that the above expressions are time invariant, the set of artifacts that belong to $C(\sigma), E(\sigma)$ and $S(\sigma)$ do change over time, since the

ENTERPRISE ARCHITECTURE ARTIFACTS GRAPH

- Consider an instantiation of a given Enterprise Architecture model/ framework, as a graph or artifacts (instances) and their relationships.

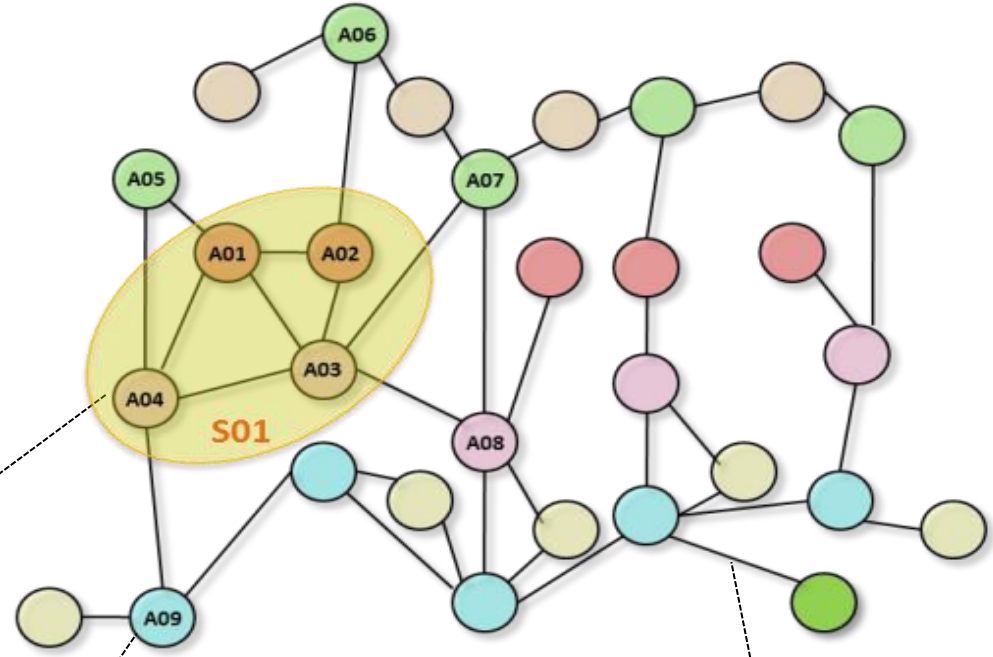
EA Artifacts (instances) graph in production environment



Example of Artifact Types

- Organization
- Vision/Mission
- Strategy
- Business
- Units/Stakeholders
- Business Entities
- Regulations
- Business Rules
- Goals/Outcomes
- Products
- Services
- Risk
- Events
- Control
- Business Processes
- Business Functions
- Services
- Informational Entity/Attribute
- Repository
- Data Flow
- Domain/Solution/Application
- Application/Component
- IS Function/Service
- Platform
- Node
- Technology

THE GENERAL NOTION OF A SYSTEM



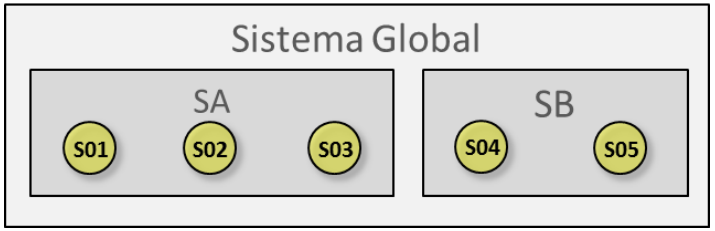
A System as a set of artifacts

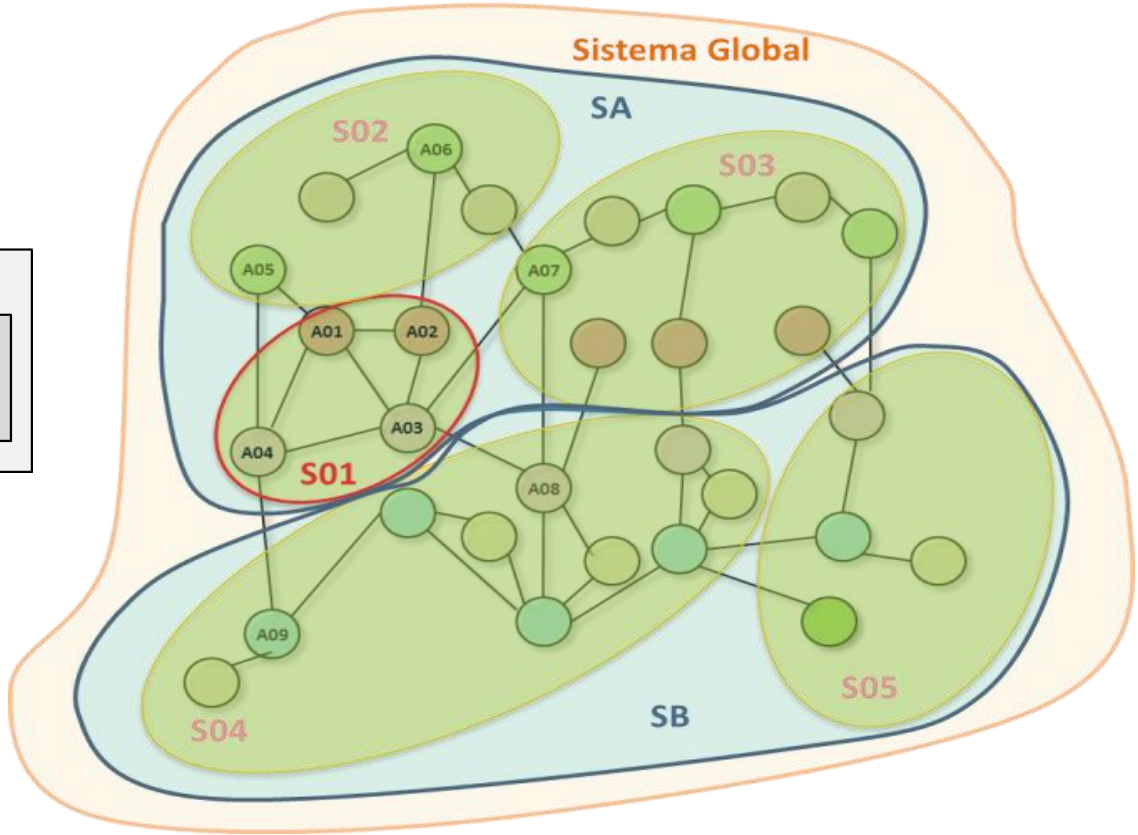
An Artifact of the Organization of type Blue

A dependency between two artifacts

BLUEPRINT OF THE ORGANIC OF A SYTEM

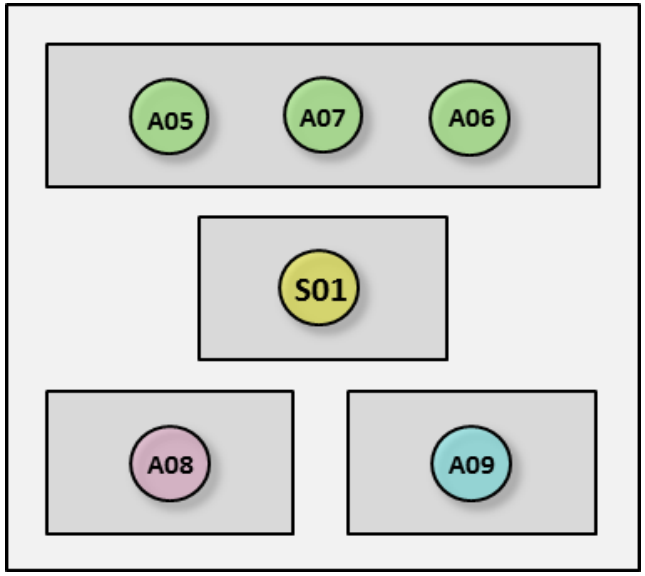
- The Organic Blueprint of a System its the structured view of its components according to some hierarchical classification

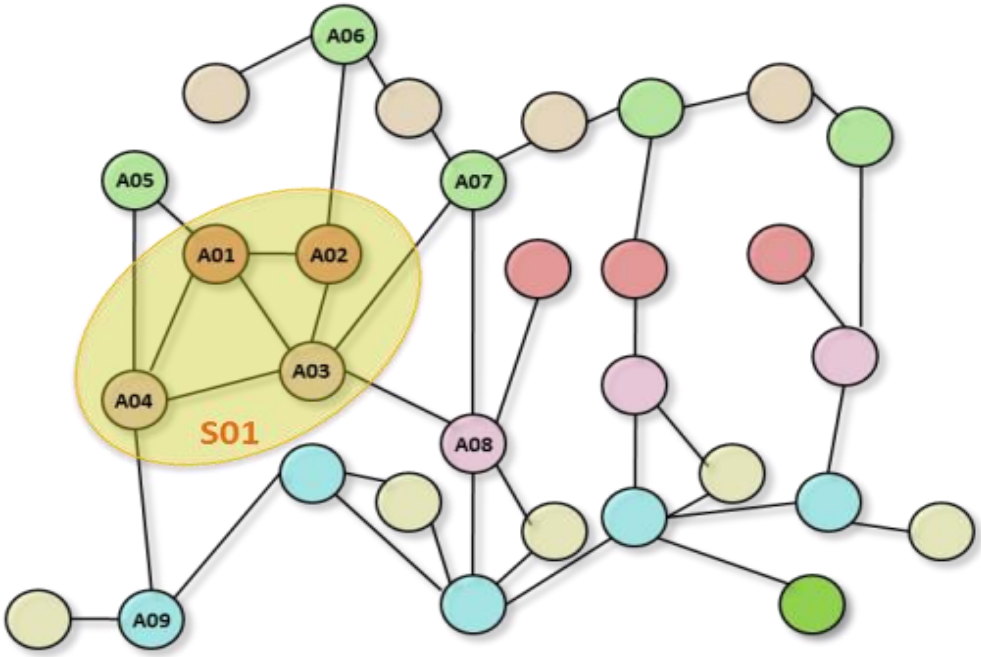




BLUEPRINT OF THE CONTEXT OF A SYTEM

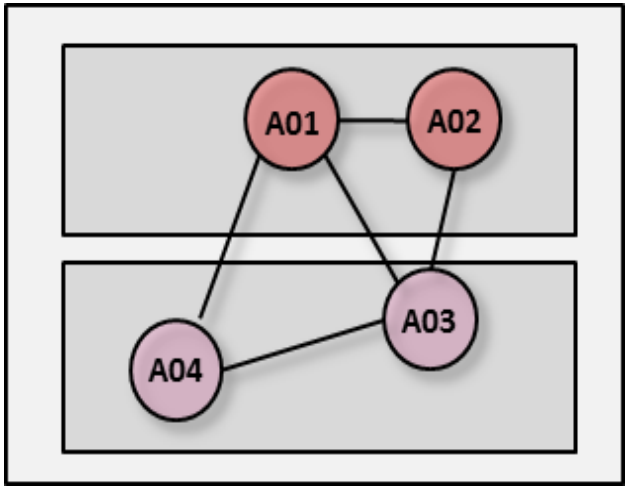
- Shows external artifacts that have dependencies with the system.

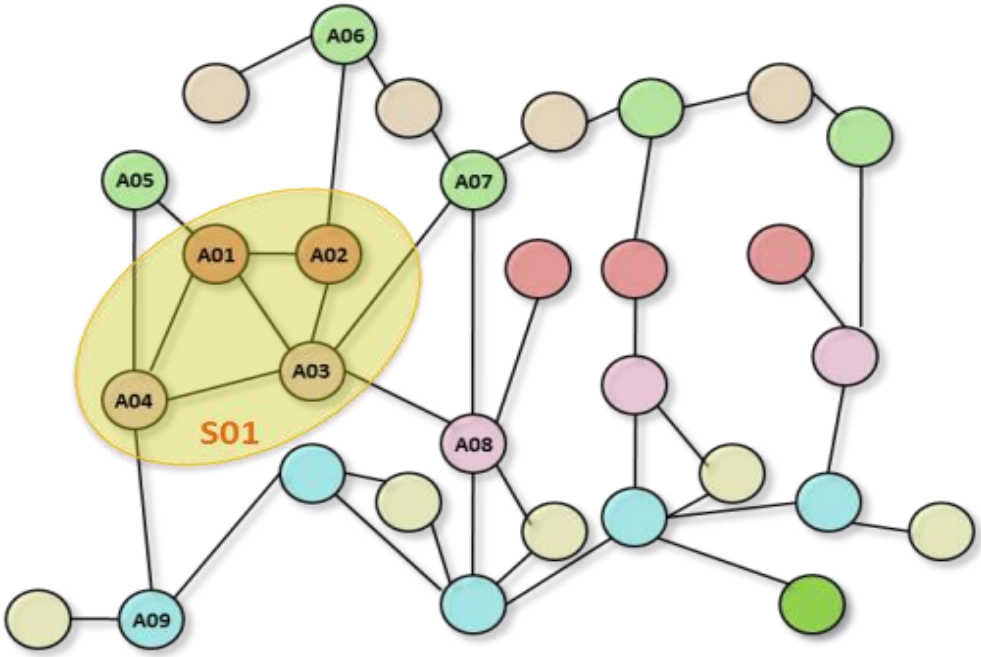




BLUEPRINT OF THE INTEGRATION OF A SYSTEM (INTERNAL INTEGRATION)

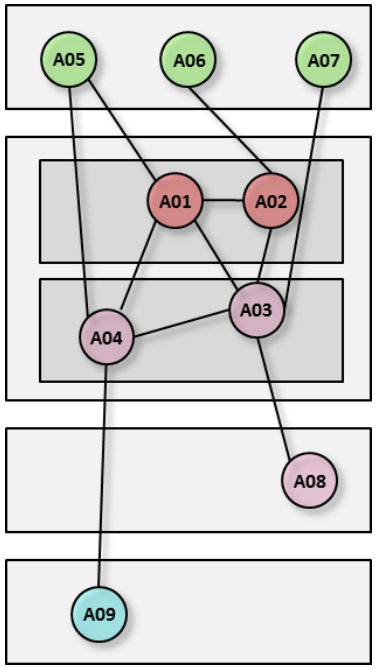
- Shows the artifacts that belong to the system and their dependencies

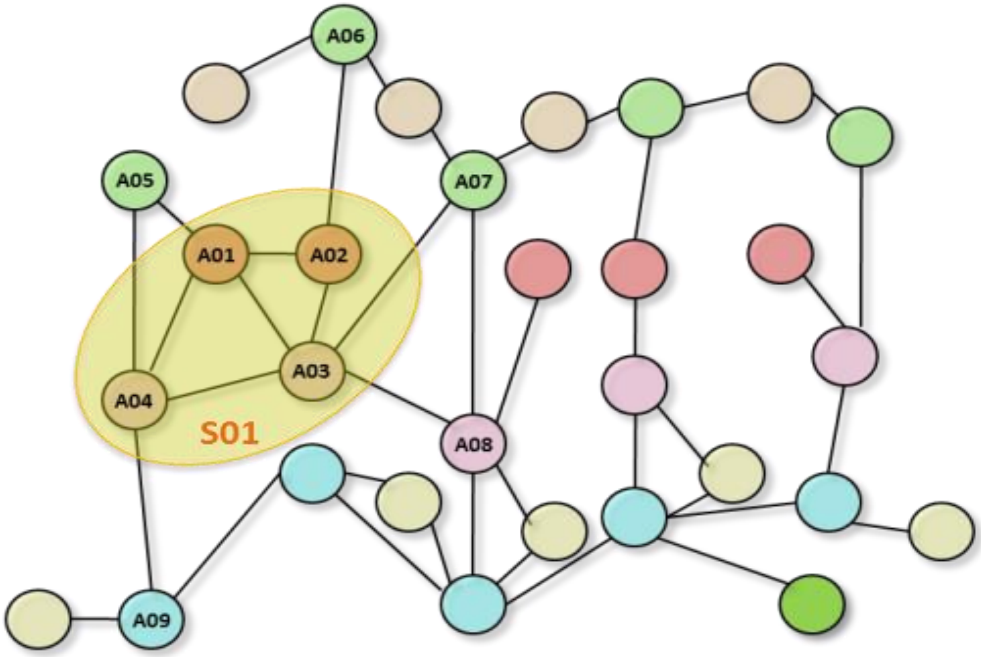




BLUEPRINT OF THE INTEGRATION OF A SYSTEM (EXTERNAL INTEGRATION)

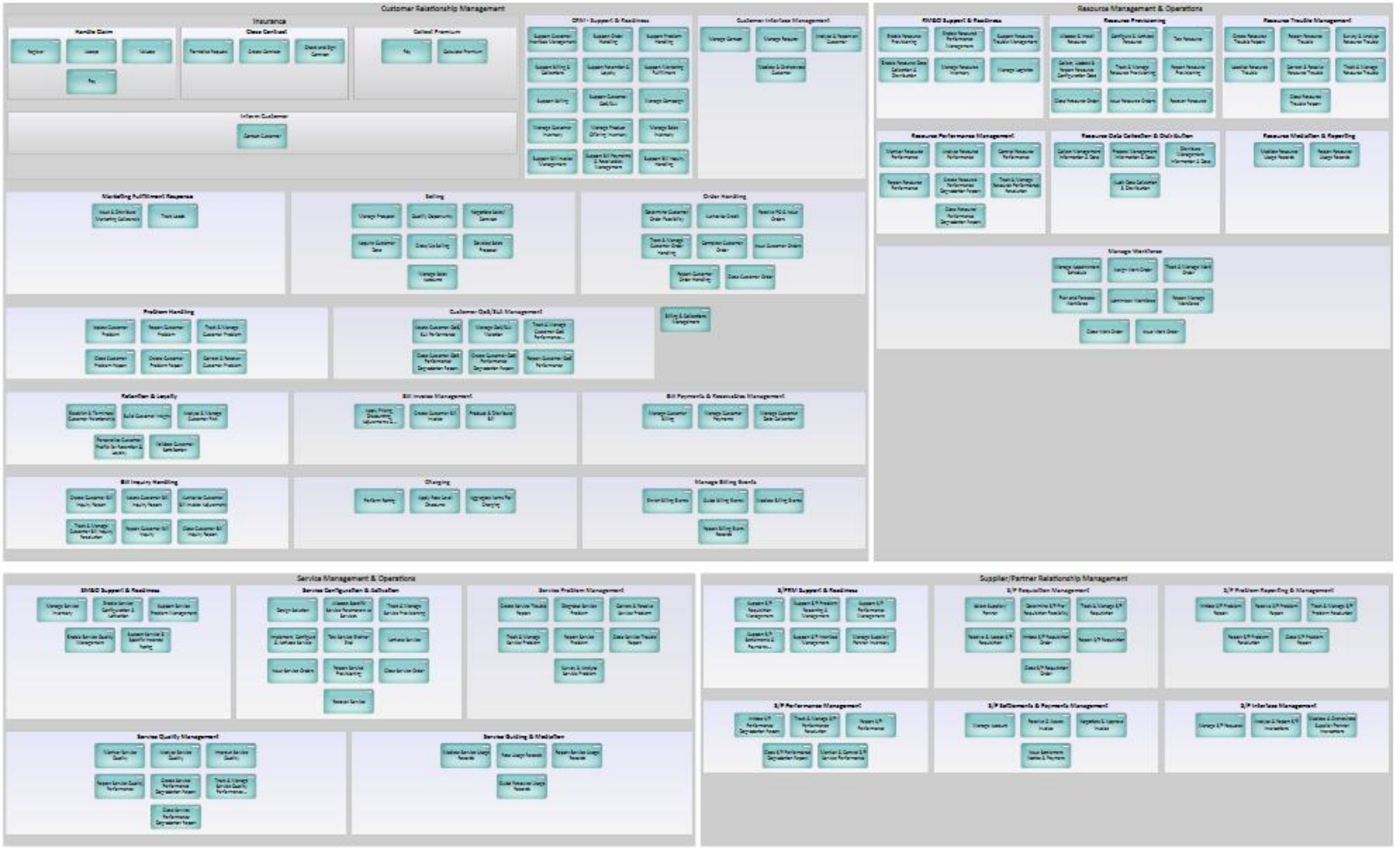
- Show the dependencies between internal artifacts and external ones.



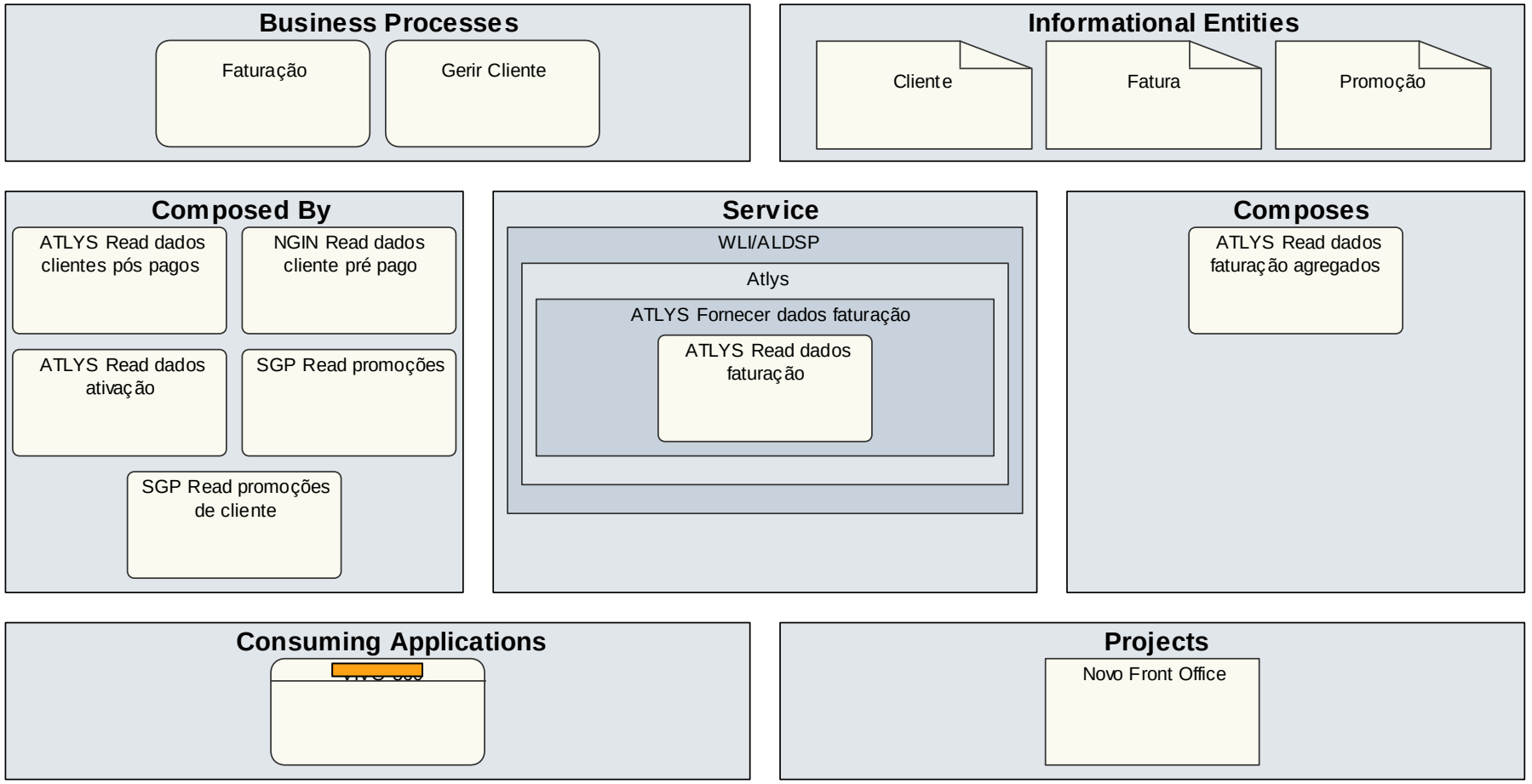


REAL EXAMPLES OF THE 5 TYPES OF BLUEPRINTS

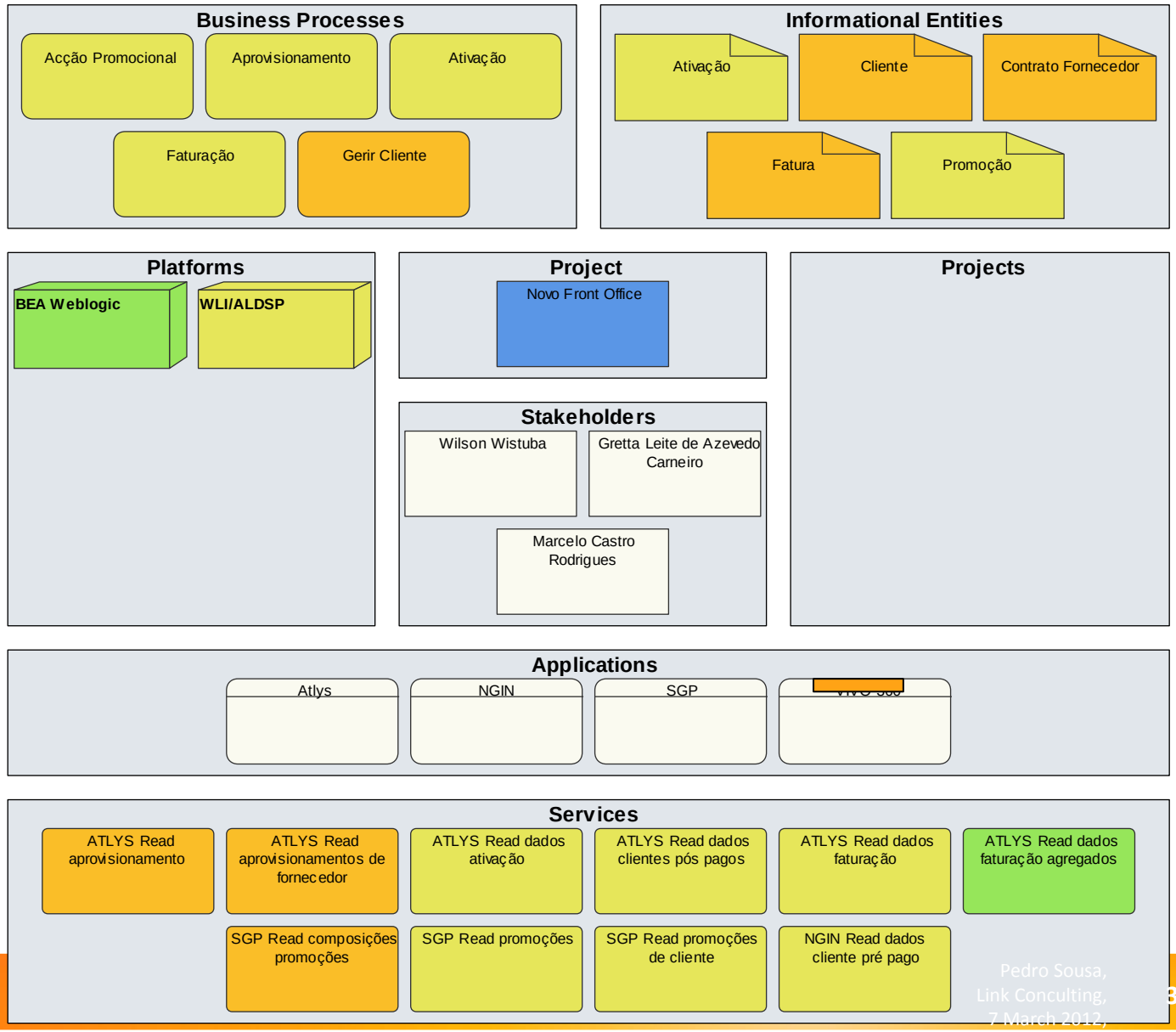
BLUEPRINT OF THE ORGANIC OF BUSINESS PROCESSES



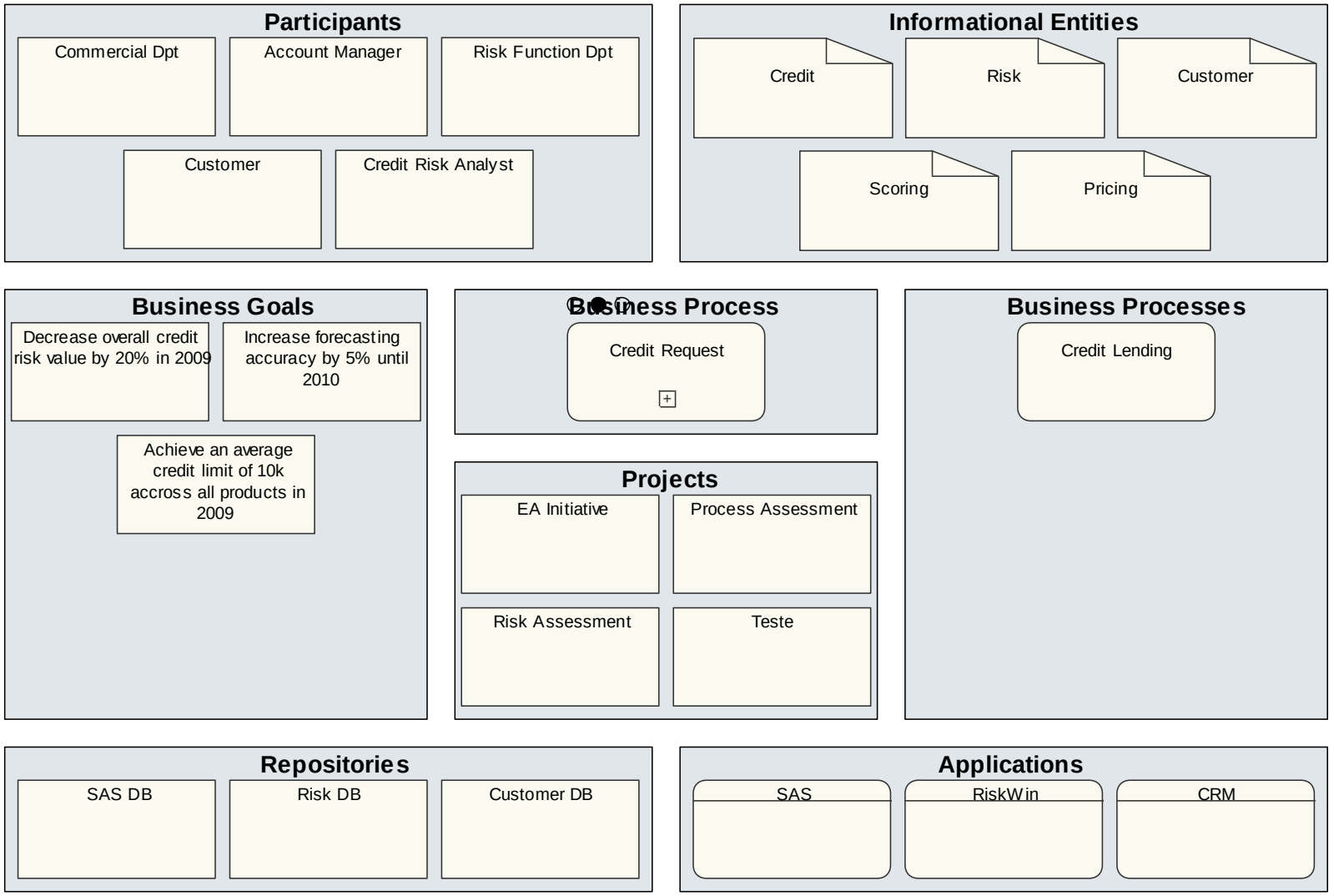
SERVICE CONTEXT BLUEPRINT



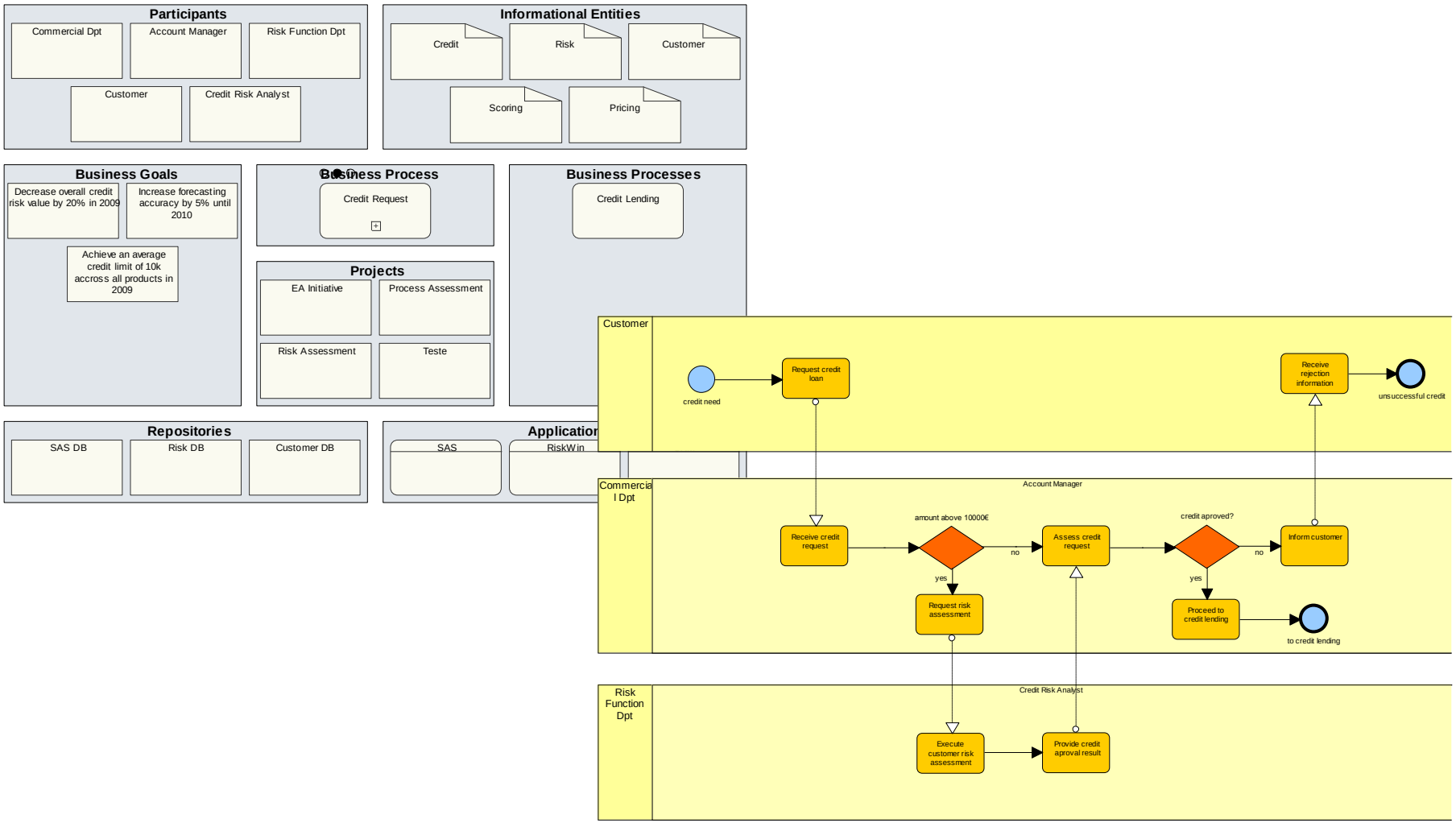
PROJECT CONTEXT BLUEPRINT



PROCESS CONTEXT BLUEPRINT



PROCESS FLOW (BPMN)



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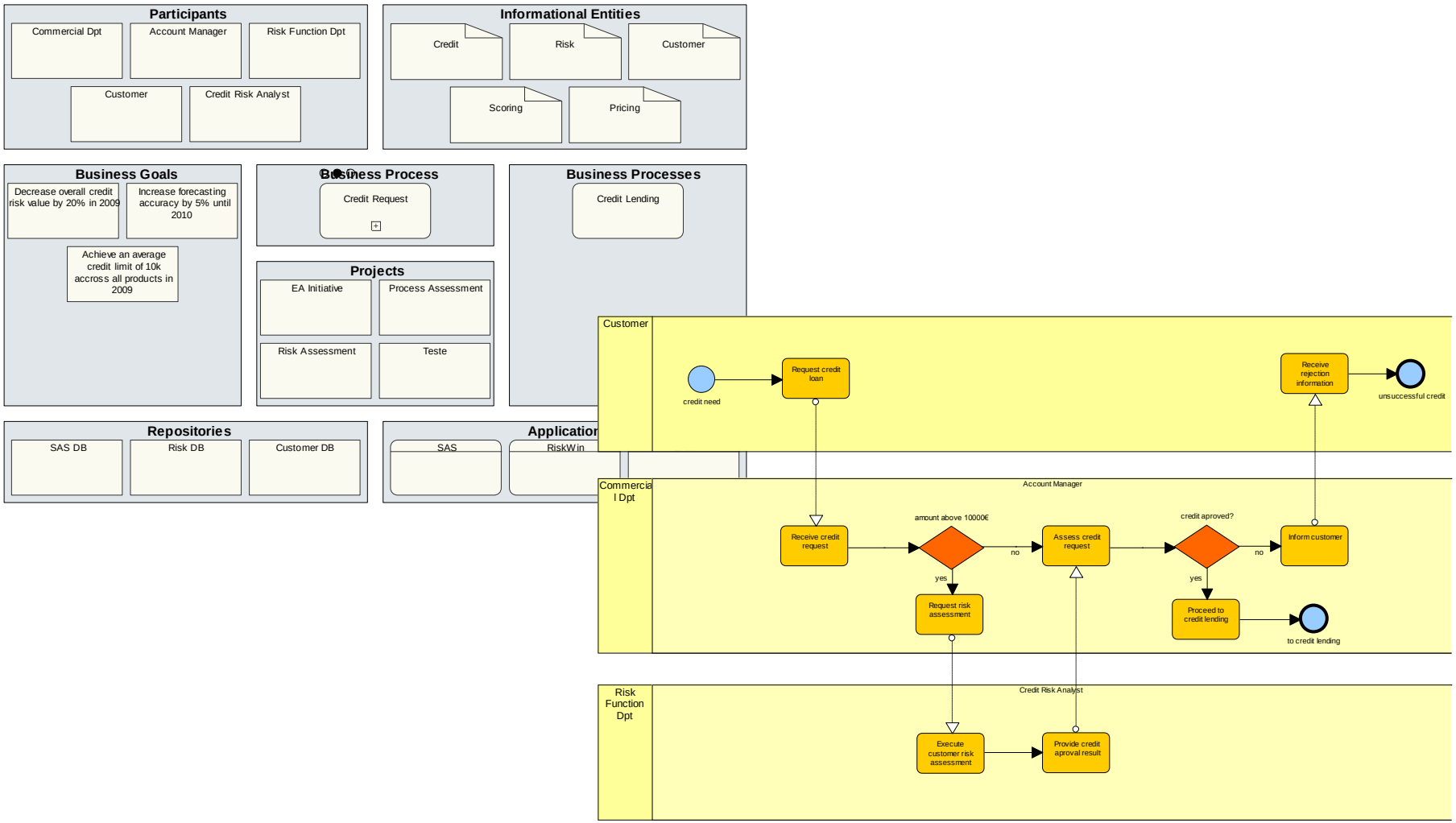
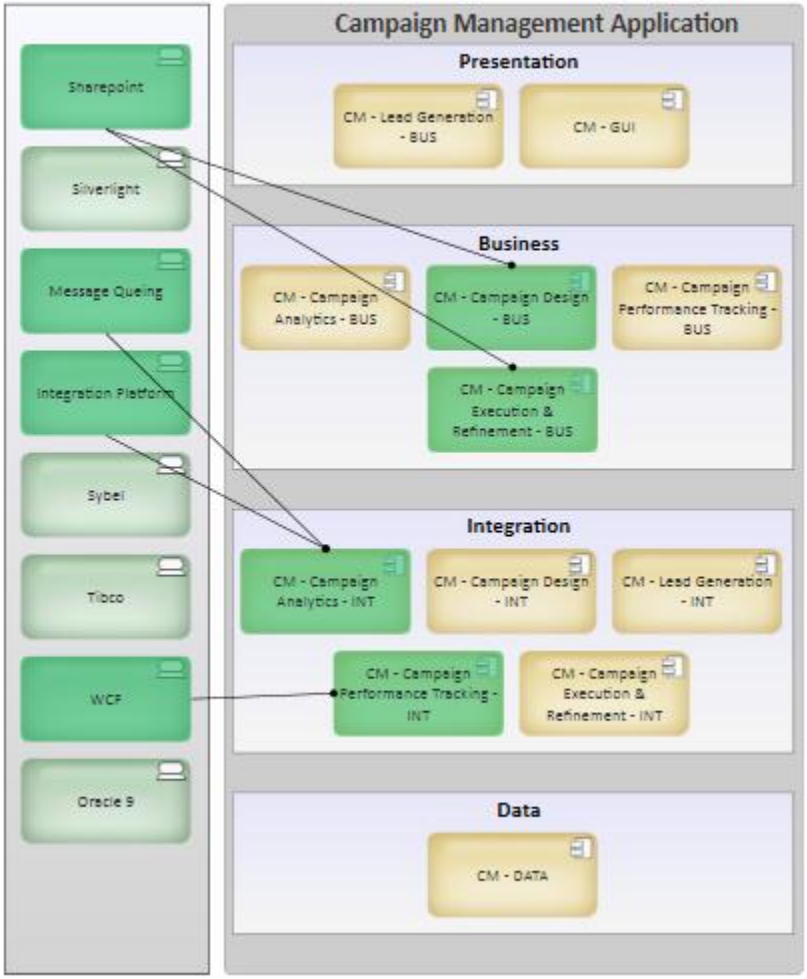
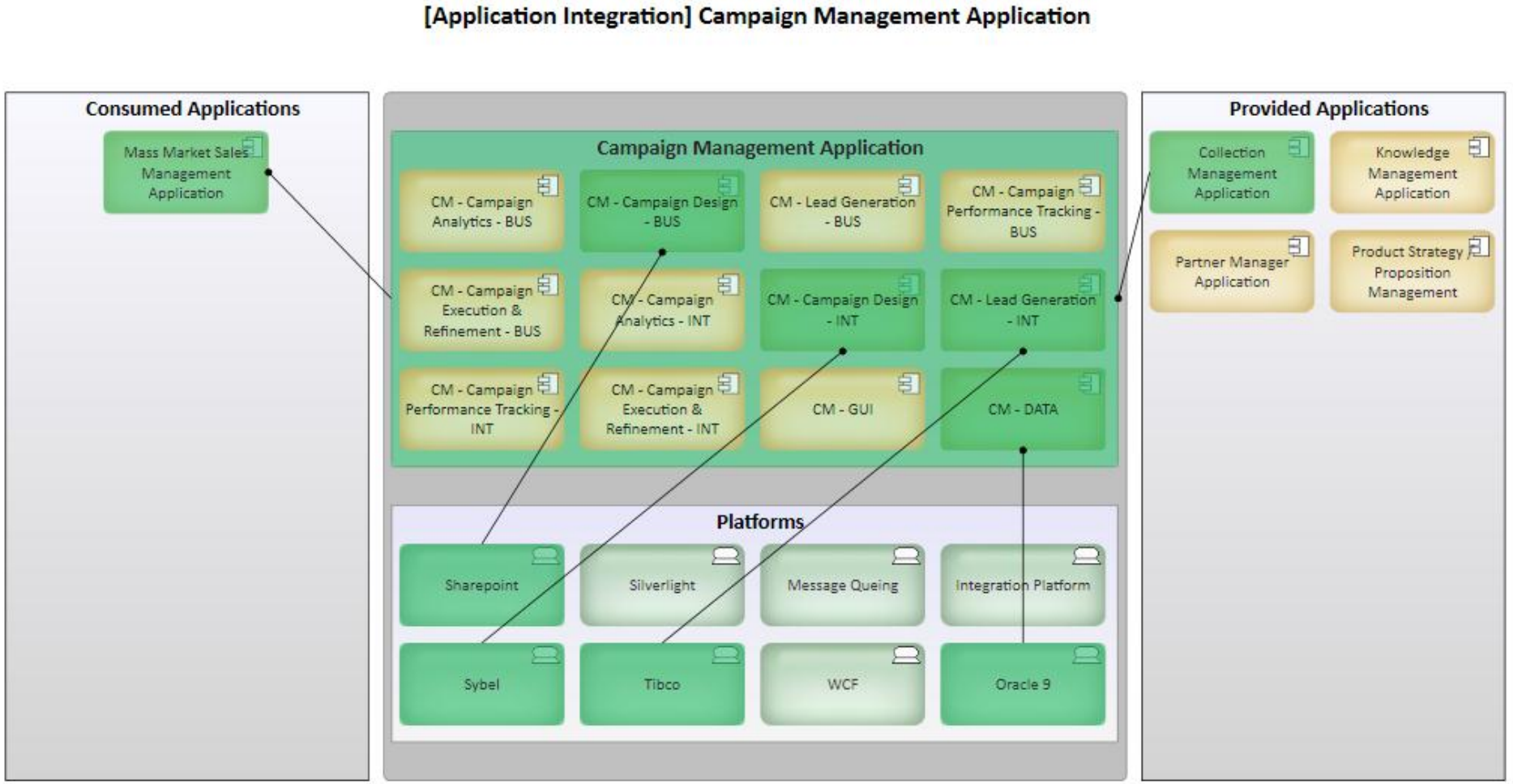


APPLICATION STRUCTURE

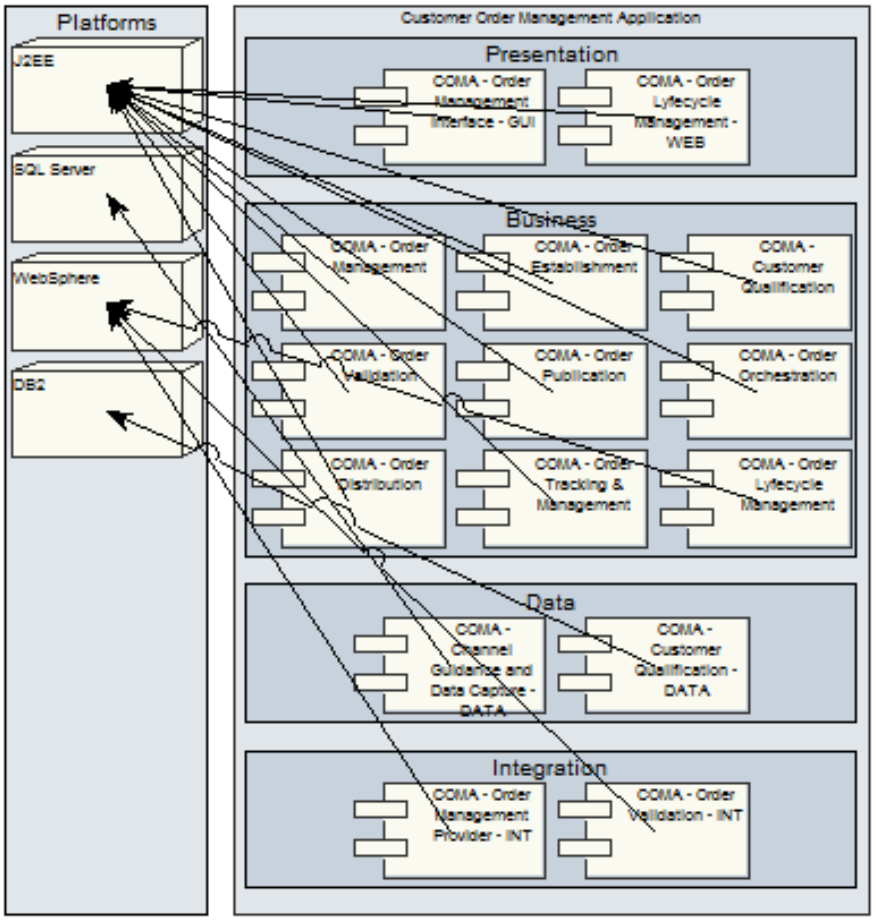
[Application Structure] Campaign Management Application



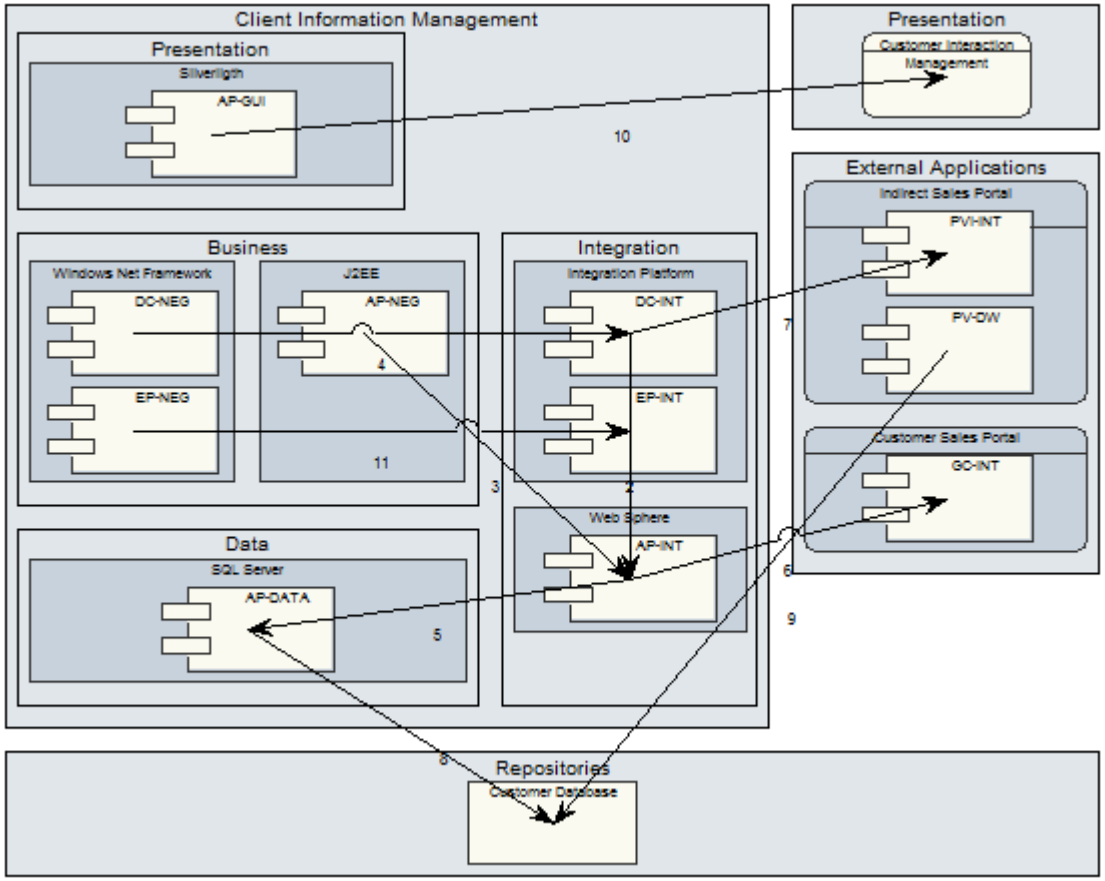
APPLICATION INTEGRATION



BLUEPRINT OF THE INTEGRATION OF A SYSTEM (INTERNAL INTEGRATION)



BLUEPRINT OF THE INTEGRATION OF A SYSTEM (EXTERNAL INTEGRATION)



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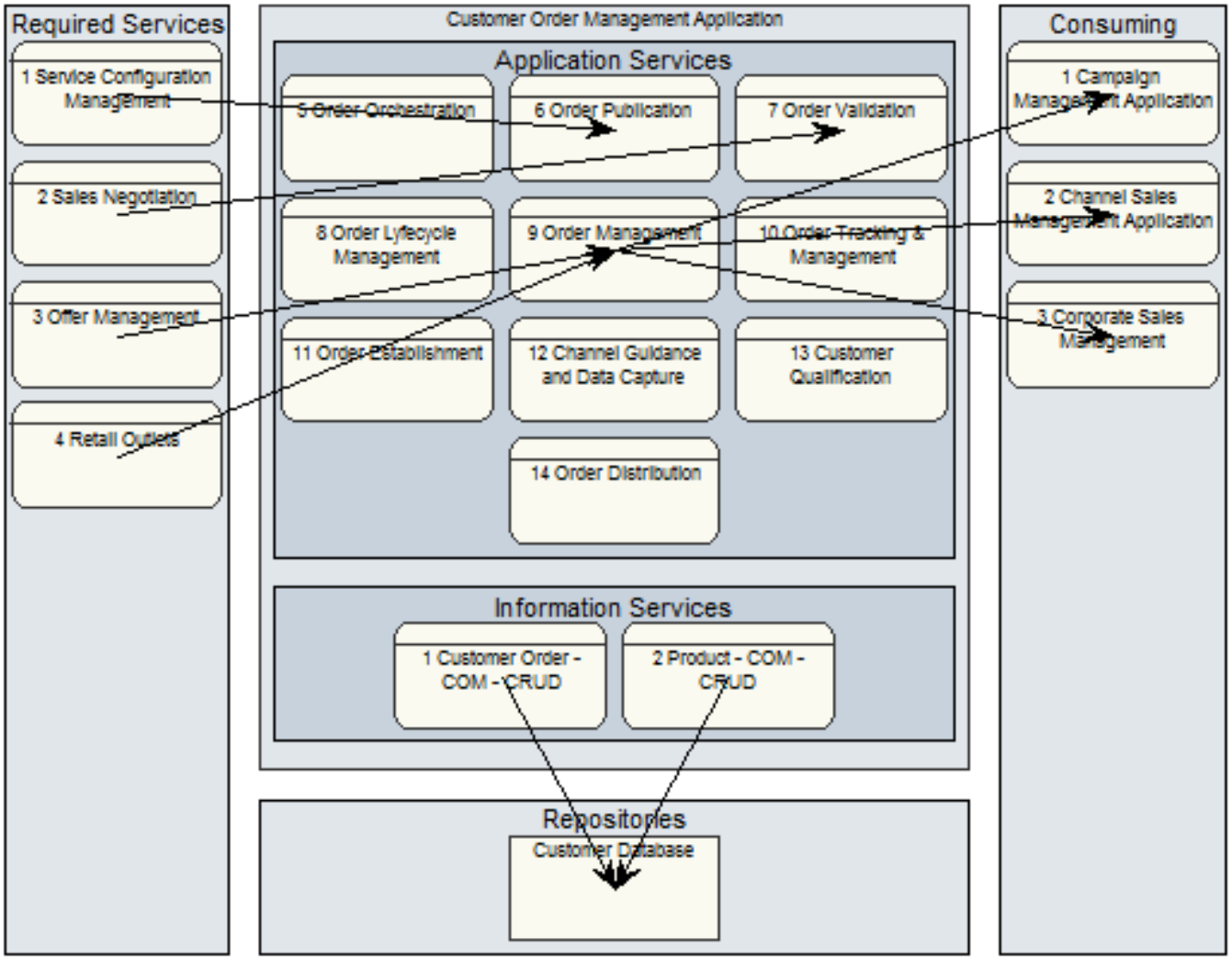
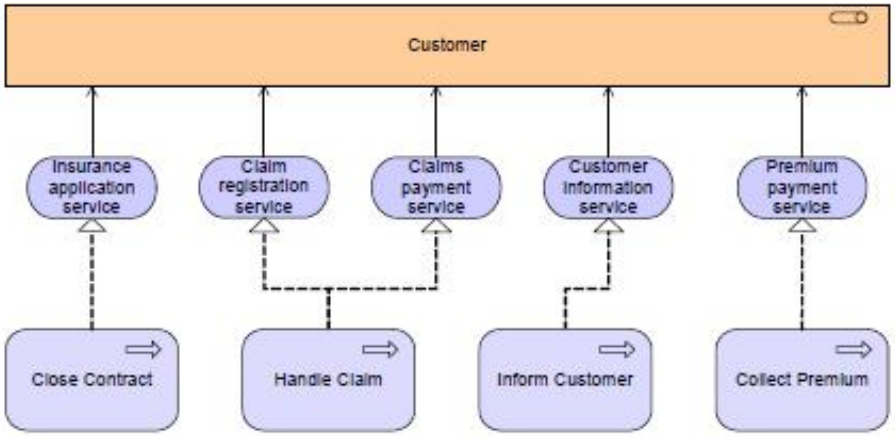
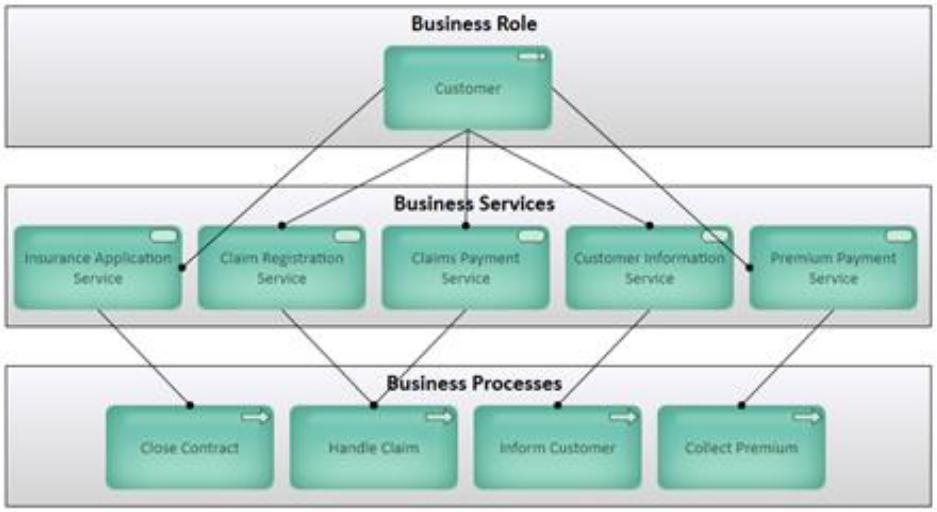


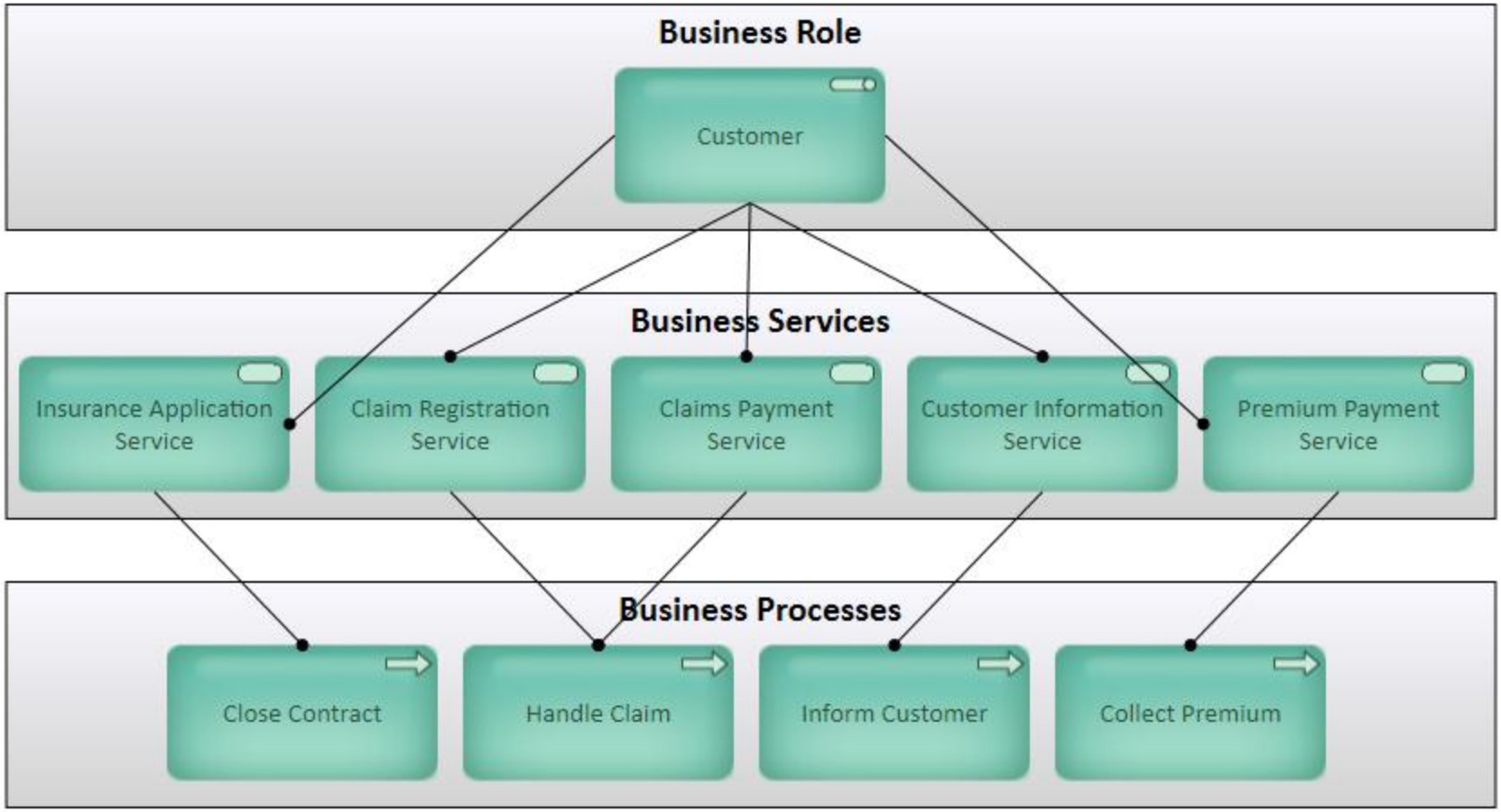
BUT WE ARE ALSO ABLE TO GENERATE MOST OF ACHIMATE VIEWS, WITH OUR “DEPENDENCY ONLY CONCEPT”

SERVICE REALIZATION VIEWPOINT

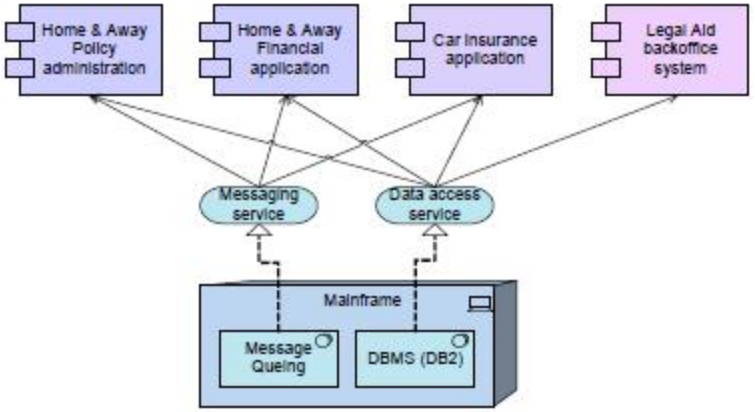


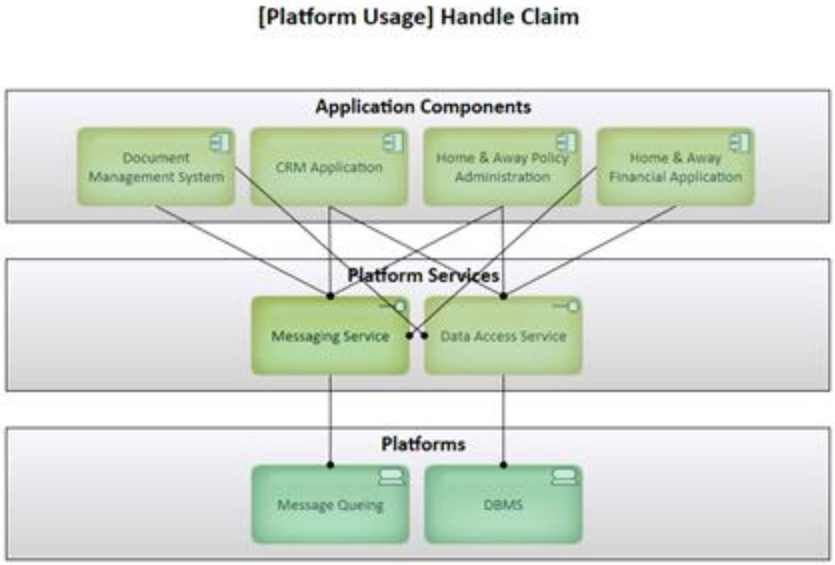


SERVICE REALIZATION VIEWPOINT

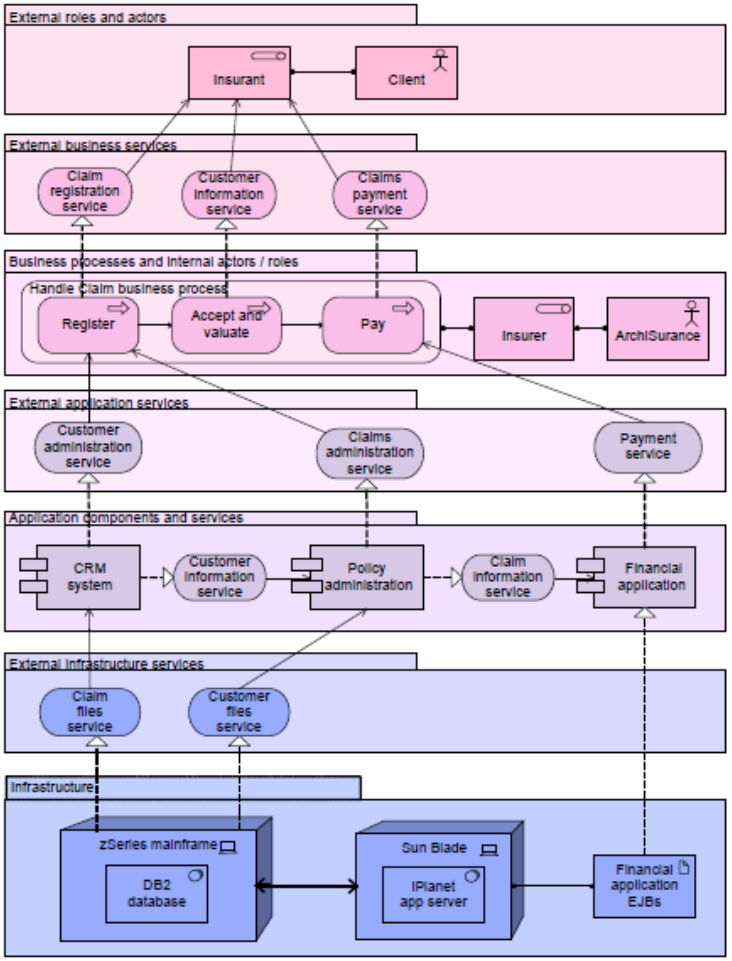


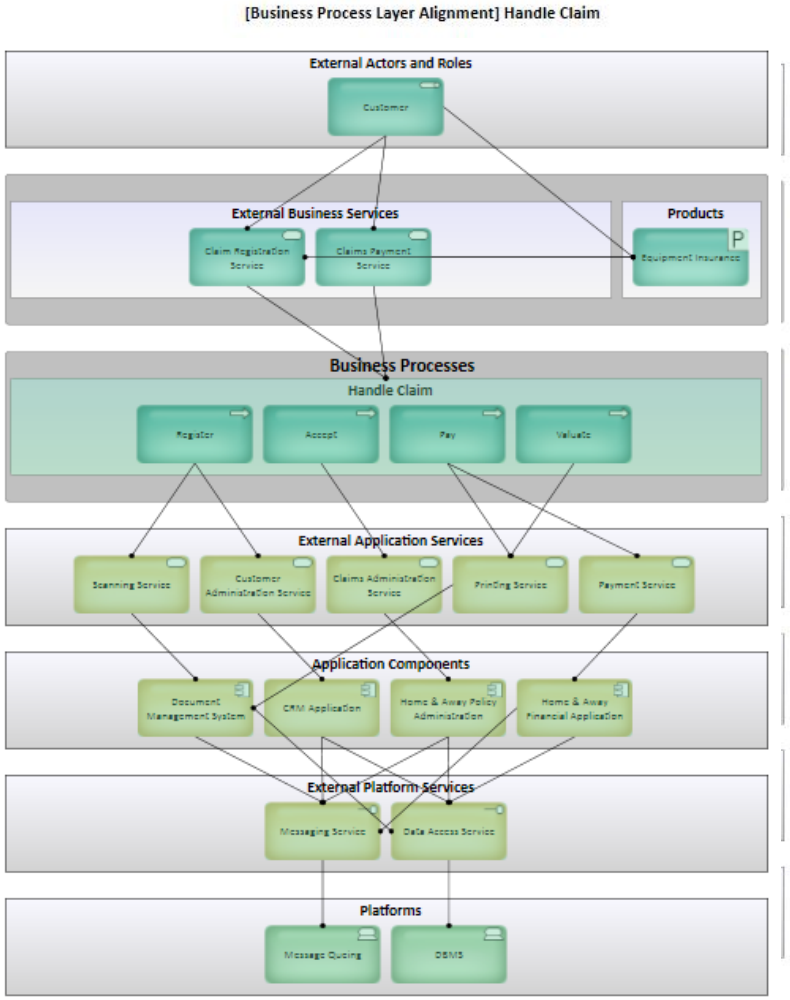
INFRASTRUCTURE USAGE VIEWPOINT (PLATFORM USAGE VIEWPOINT)



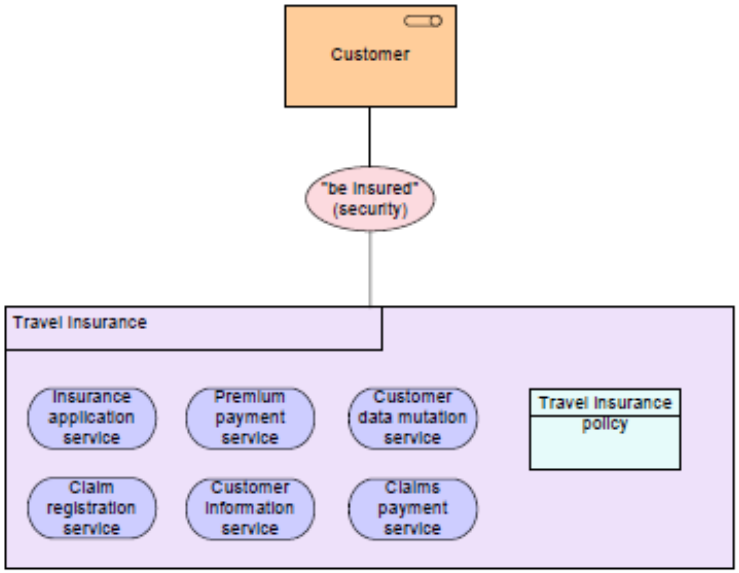


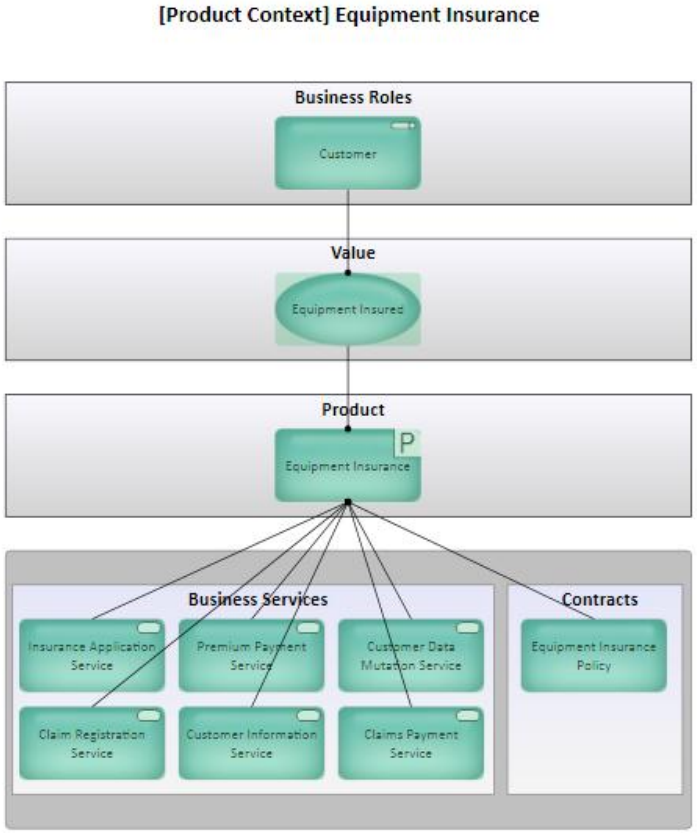
LAYERED VIEWPOINT (BUSINESS LAYER ALIGNMENT VIEWPOINT)



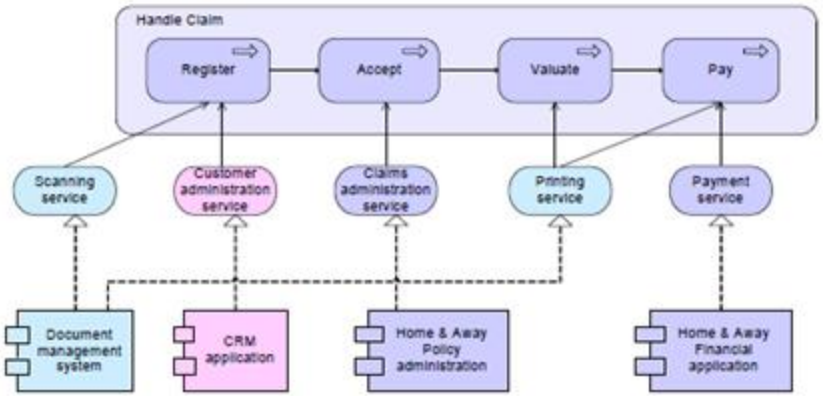


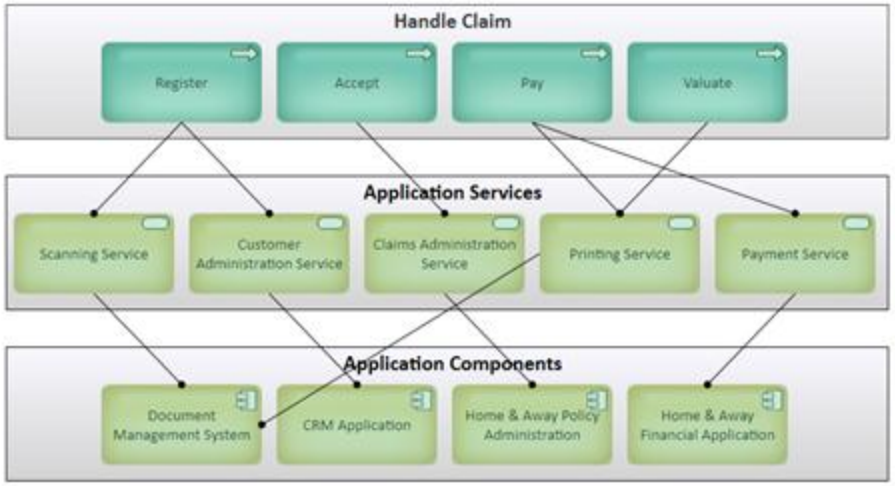
Product Context Viewpoint





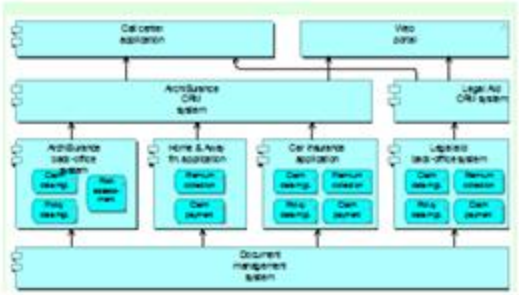
APPLICATION USAGE VIEWPOINT



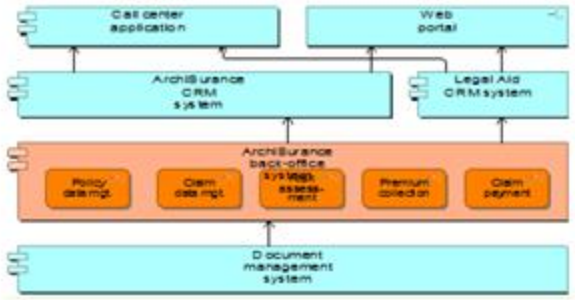


AND WHAT ABOUT THE TIME ???

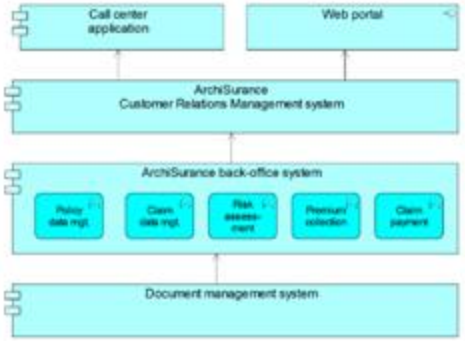
MIGRATION PLANNING IN TOGAF – APPLICATION ARCHITECTGURE (APPLICATION LAYER INTEGRATION)



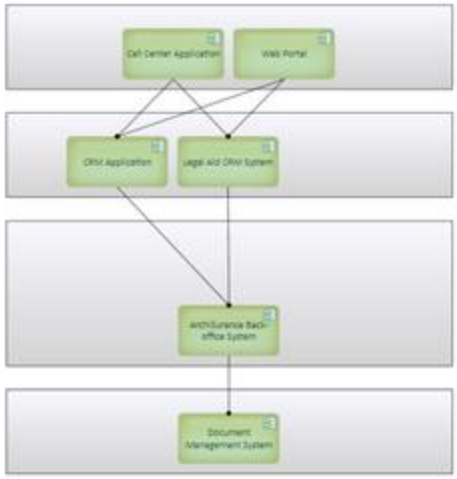
[Application Layer Integration] Document Management System

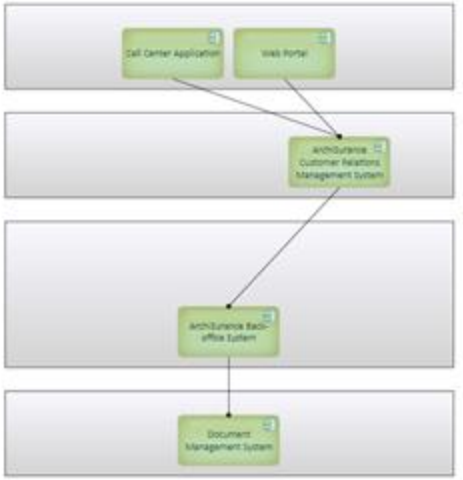


[Application Layer Integration] Document Management System

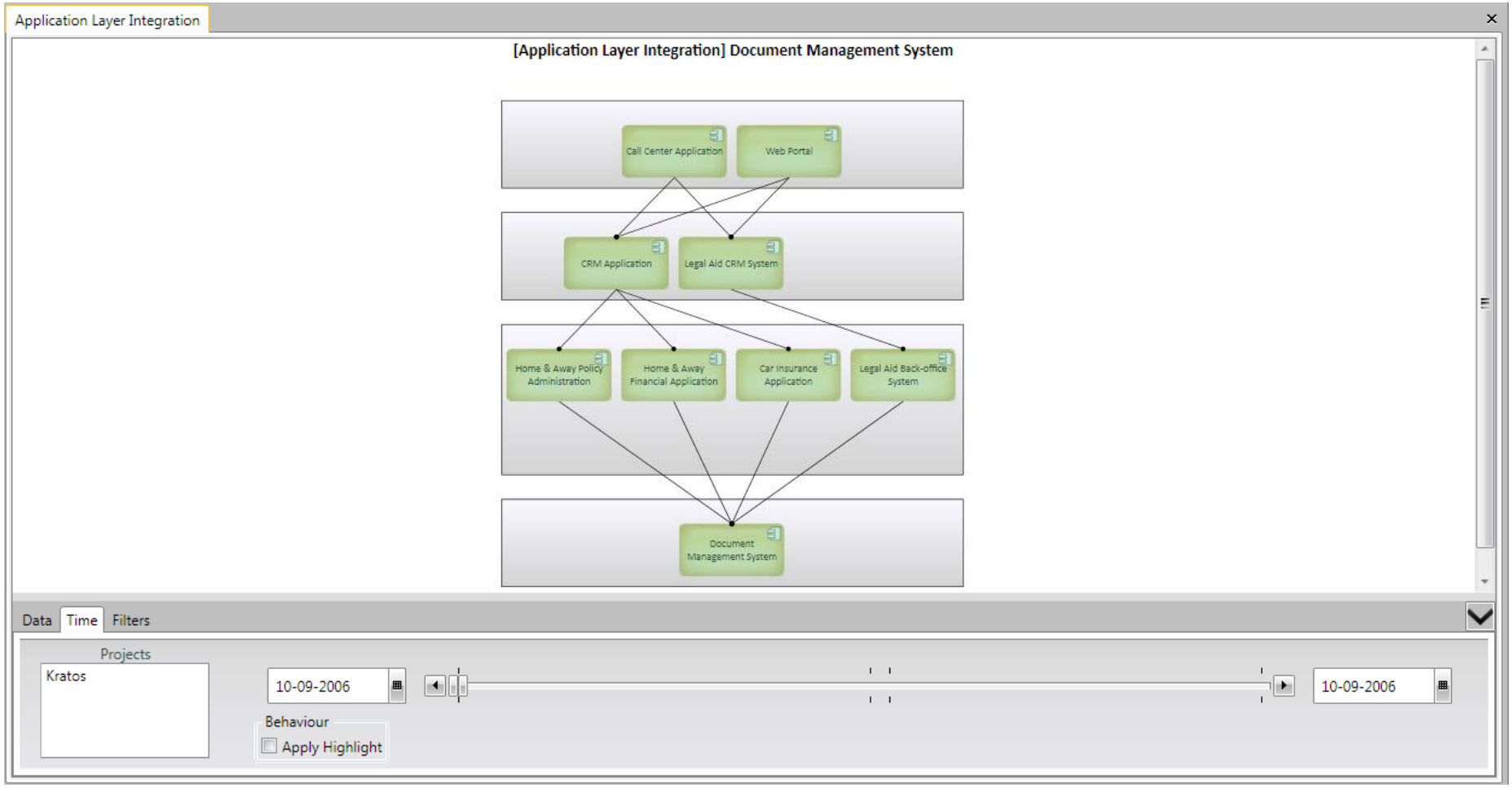


[Application Layer Integration] Document Management System

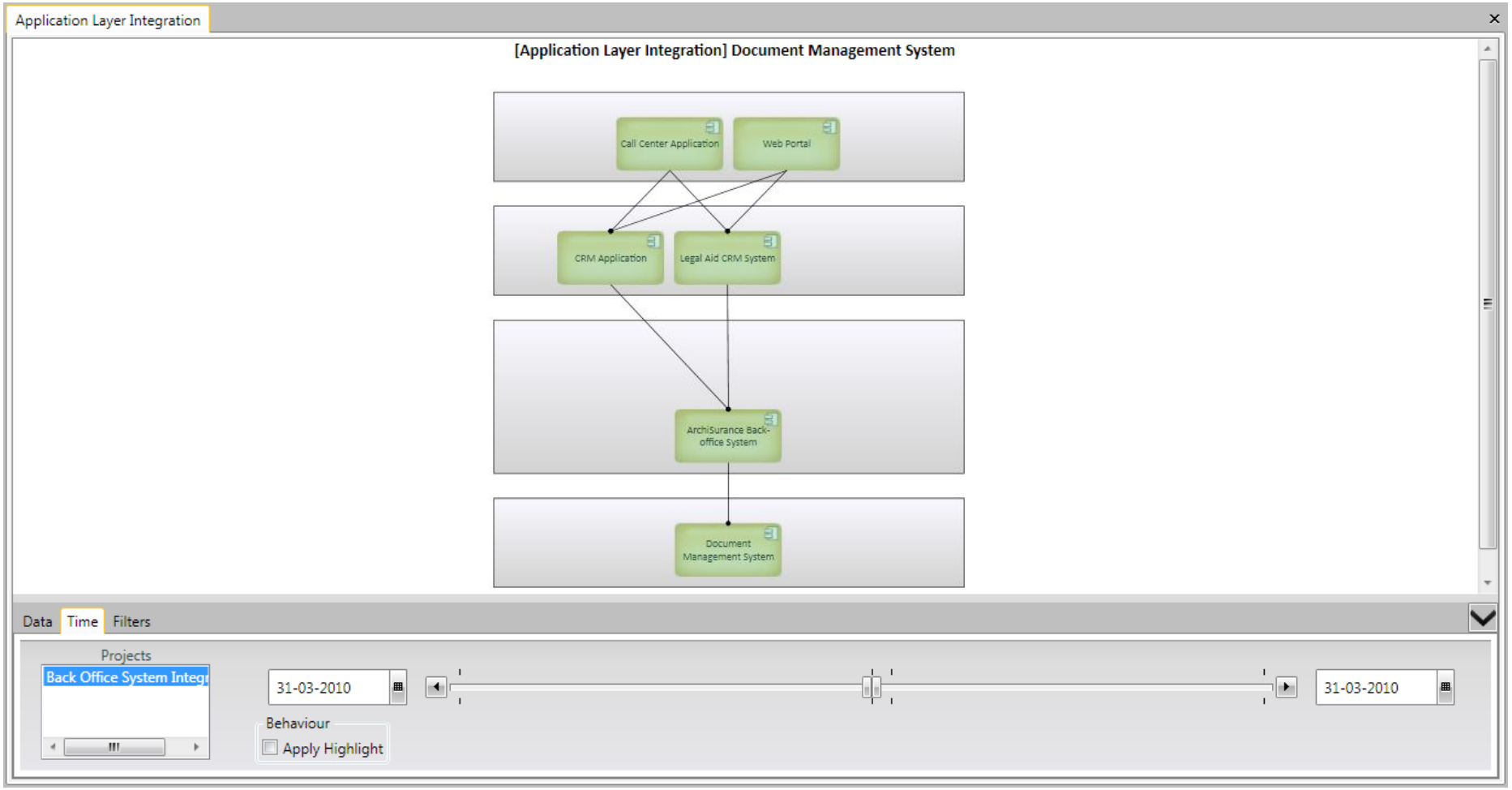




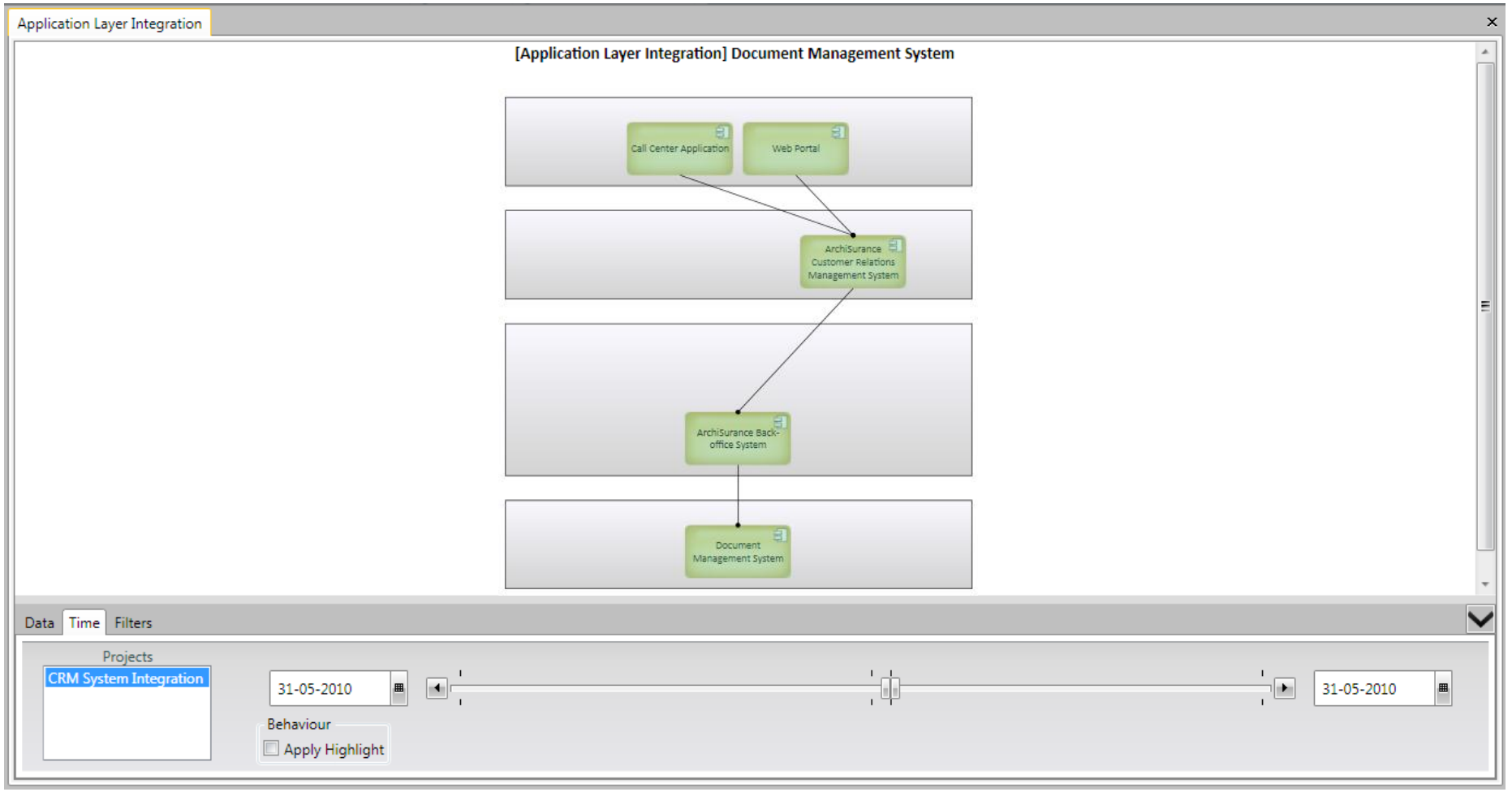
MIGRATION PLANNING – BASELINE ARCHITECTURE



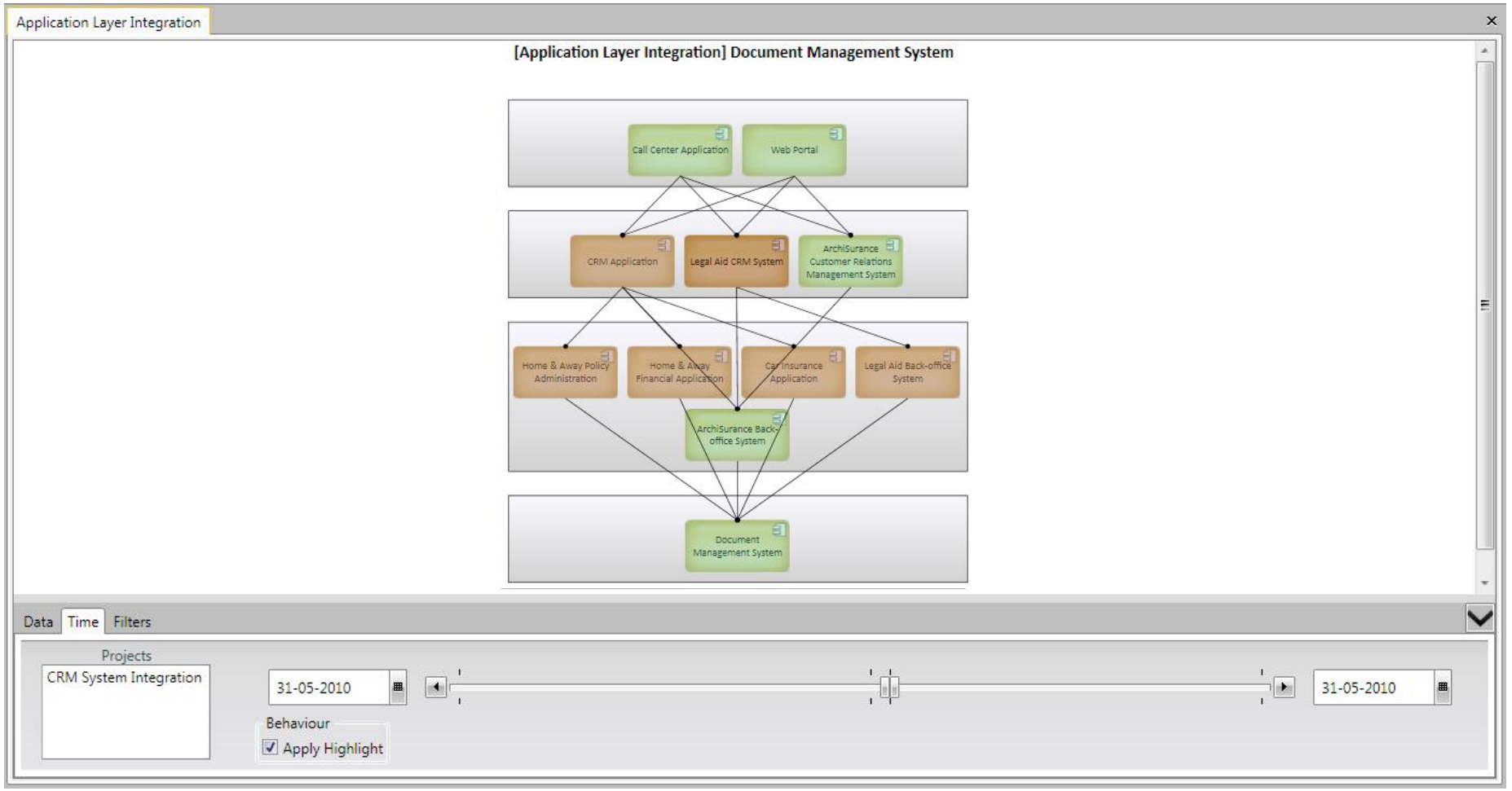
MIGRATION PLANNING – BACKOFFICE SYSTEM INTEGRATION



MIGRATION PLANNING – TARGET ARCHITECTURE



MIGRATION PLANNING – GAP ANALYSIS



CONCLUSIONS

- We presented an approach to gather information from disparate sources of information about Organization and build enterprise-wise Blueprints of the organization that:
  - Aggregate **Partial Views** into **Global Views**
  - Aggregate **Past**, **Present** and **Future** views in a continuous cartography of the organization.
  - Avoid blueprints versioning each time something changes

- This implies that information in Enterprise Architecture repository is maintained in textual format, so it can be processed, and time tagged with conception, born and dead dates, so it can be properly handled.

- Projects are a fundamental concept in Enterprise Architecture repository.

THANK YOU

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GERIMOS CONHECIMENTO, CONSIGO