ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ
ΠΑΝΕΠΙΣΤΗΜΙΟ ΚΡΗΤΗΣ

Εισαγωγή στα Δίκτυα Υπηρεσιών

Διάλεξη 2η: Service Value Networks and BPM

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Τμήμα Επιστήμης Υπολογιστών

Introduction to Service Networks
UC-01/CS-592

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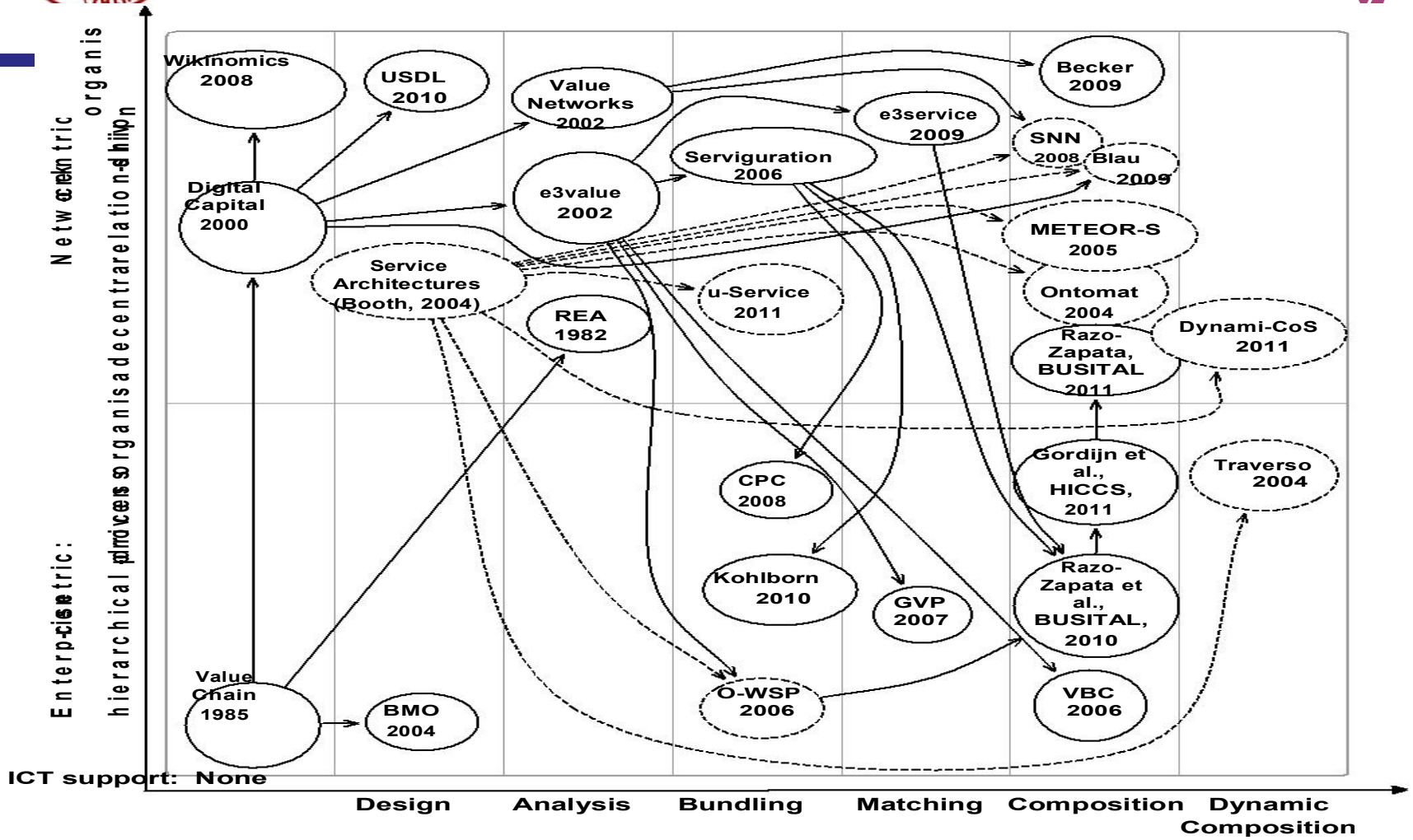
A Taxonomy of Service Network Approaches

(from "Service Value Networks", PhD Thesis,
Ivan S. Razo-Zapata, VU, 2014)



Value Network Analysis

(Verna Allee)

- Verna Allee argues that value networks are like living systems experiencing physical exchanges and interactions.
- Allee proposes a graphical representation to describe these phenomena by means of tangible and intangible deliverables.
- According to Verna Allee, three constructs are needed for representing value exchanges: participants, transactions and deliverables.
- **Participants,** graphically represented as ovals, are described as real people, they are the entities performing roles in the system. Software programs, databases or any other kind of technology are not considered as participants since they rely on people's decisions.
- **Transactions** are depicted by arrows that represent the direction of something that is happening among participants.
- **Deliverables** are the real "things" that are exchanged from one participant to another, deliverables can be either tangible or intangible and are represented as labels on top of the arrows (transactions).
- This basic representation allows to explore complex behavior inside the value networks like value creation, cost/risk analysis, patterns of exchange among others

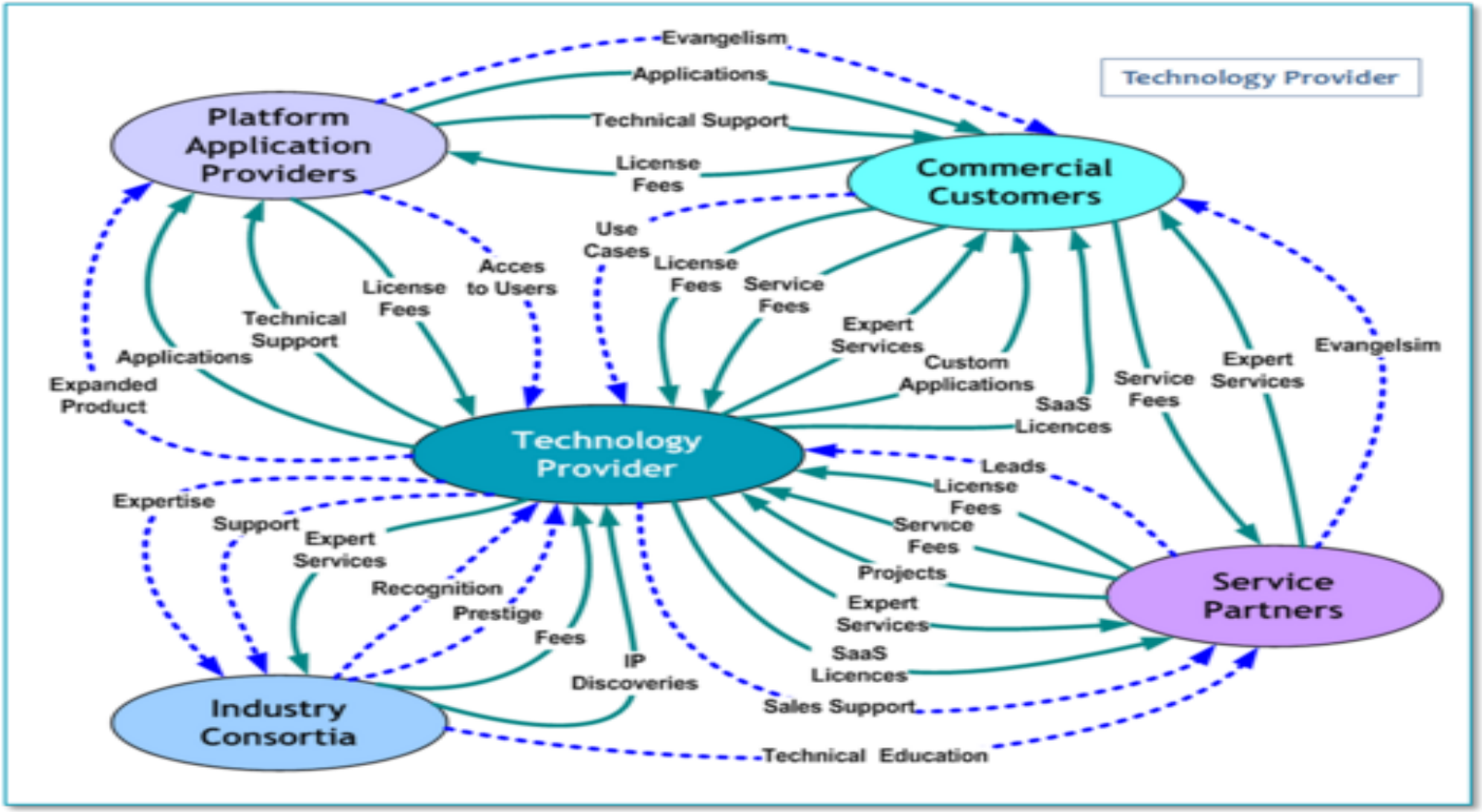
VNA Analysis
(from “Service Value Networks”, PhD Thesis, Ivan S. Razo-Zapata, VU, 2014)

Aspect	Analysis
B2C interaction	The customer is not involved
B2B relationships	Inter & intra company relationships
Network Definition	Formal definition
Visualization	Graphical representation
Orientation	Business oriented
Tool support	No information provided. Although VNA generates visuals in Microsoft PowerPoint and Visio and reports in PDF

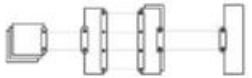
Table 2.3: VNA analysis

An example Value Network

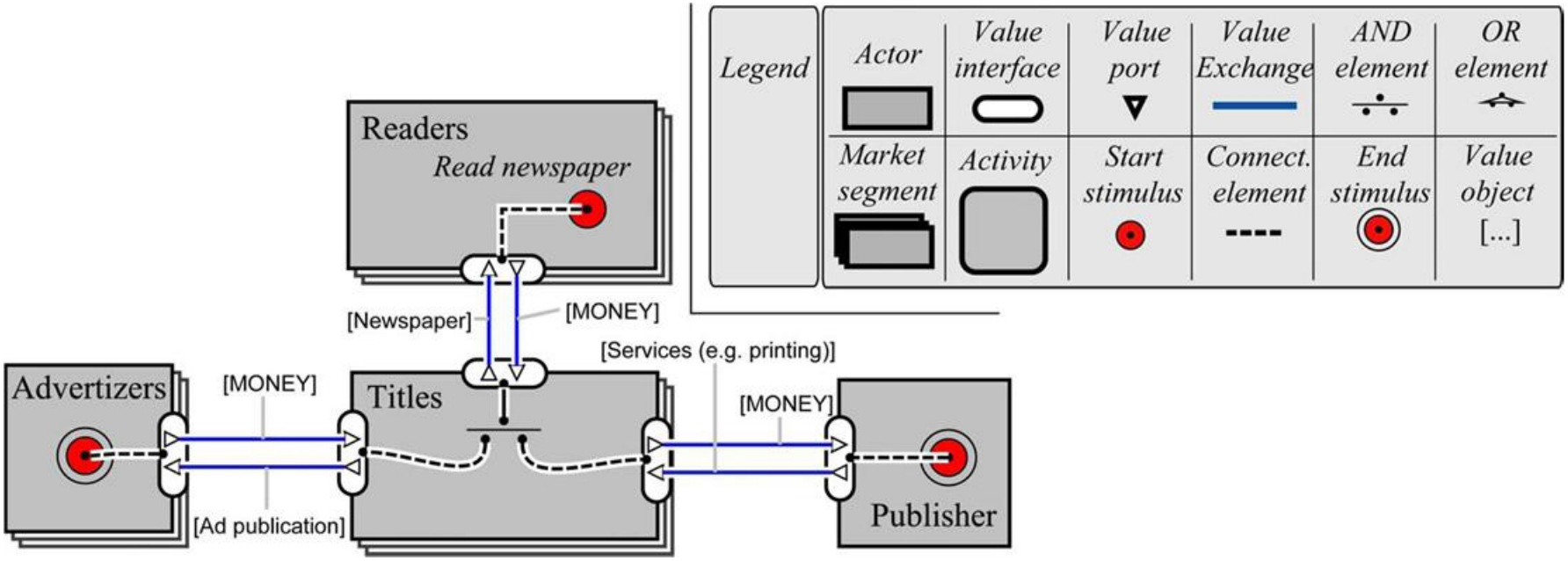
http://www.vernaallee.com/valuenetworks.html



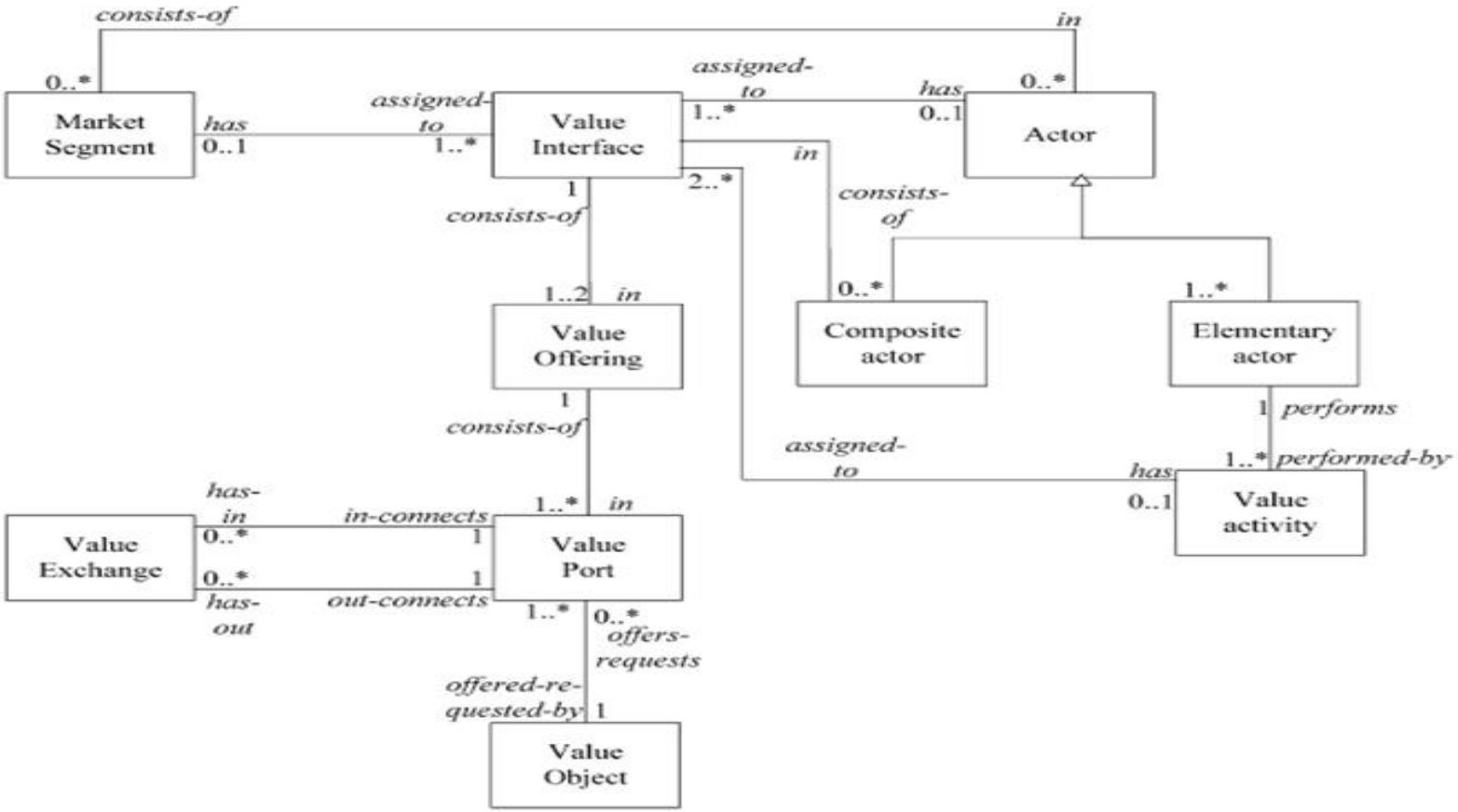
"[e3 Value Models are] designed to help define how economic value is created and exchanged within a network of actors". (Gordijn, Akkermanns, 2001)

Requirement viewpoint	Stakeholders involved	Requirement viewpoint focus	Requirement viewpoint representation
Business value viewpoint	 C*O's Marketeers Customers	 Values, actors, exchanges	 e^3–*value* ontology and UCM scenarios
Business process viewpoint	 Tactical marketeer, Operational management	 Processes, workers, information, goods, and control flows	 UML • Activity diagrams • Sequence diagrams • Interaction diagrams High-level Petri Nets
System architecture viewpoint	 IT department	 Hard/software, components, data and control flows, code organization	UML • Class diagrams • State transition diagrams • Sequence diagrams • Interaction diagrams • Deployment diagrams Architecture description languages

Actors exchange value for value — through value ports and exchange of value objects. Actors have internal events and connections — initiating value stimulus, connecting value exchanges and terminating stimulus



The Ontology
(Gordijn, Akkermanns, 2001)



The Ontology -2

Actor

An actor is an independent economic (and often legal) entity. By carrying out value activities, an actor makes a profit or increases its utility. In a sound, viable, e-business model, each actor should be capable of making a profit.

Value object

Actors exchange value objects, which are services, products, money, or even consumer experiences. A value object is valuable to one or more actors.

Value port

An actor uses a value port to show that it wants to provide or request value objects. The concept of port enables us to abstract away from the internal business processes and focus only on how external actors and other components of the e-business model can be plugged in.

Value interface

Actors have one or more value interfaces, grouping individual value ports. A value interface shows the value object an actor is willing to exchange in return for another value object through its ports. The exchange of value objects is atomic at the level of the value interface.

Value exchange

A value exchange connects two value ports with each other. It represents one or more potential trades of value objects between value ports.

The Ontology - 3

Value offering

A value offering is a set of value exchanges that shows which value objects are exchanged via value exchanges in return for other value objects. A value offering should obey the semantics of the connected value interfaces: Values are exchanged through a value interface on all its ports or on no ports at all.

Market segment

A market segment is a concept that breaks a market (consisting of actors) into segments that share common properties.3 Accordingly, our concept of market segment shows a set of actors that for one or more of their value interfaces, value objects equally.

Composite actor

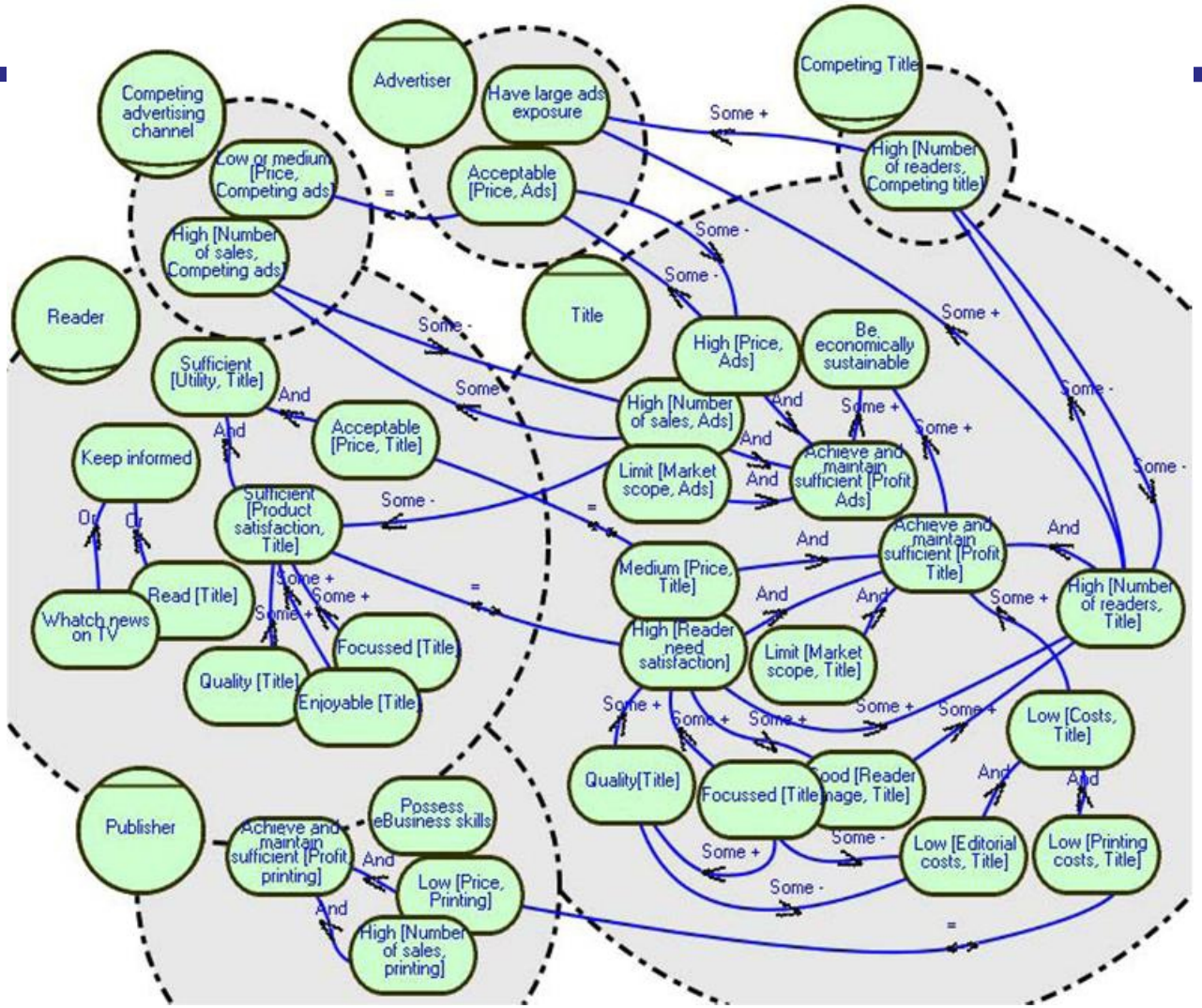
For providing a particular service, several actors might decide to work together and to offer objects of value jointly by using one value interface to their environment. We call such a partnership a composite actor.

Value activity

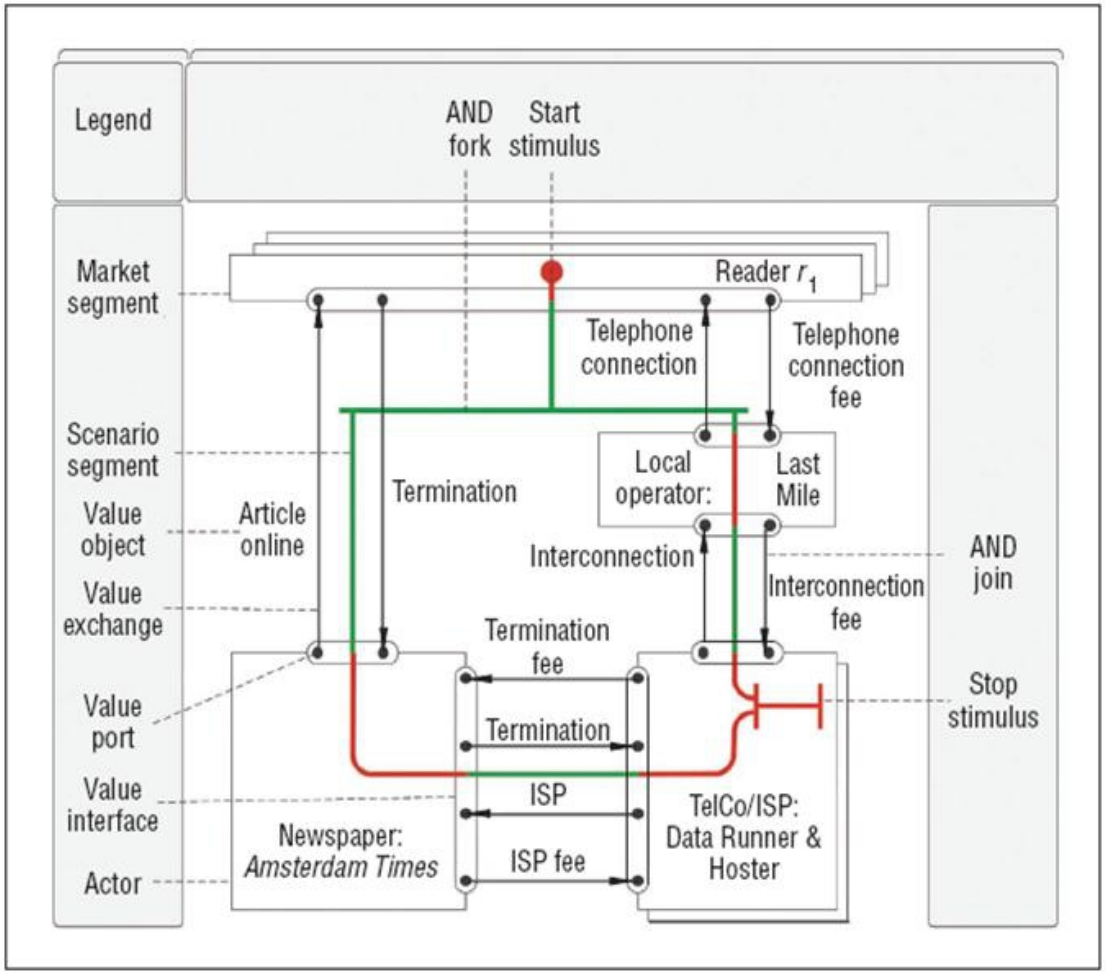
An actor performs a value activity for profit or to increase its utility. The value activity is included in the ontology to discuss and design the assignment of value activities to actors. As such, we are interested in collecting activities that can be assigned as a whole to actors. Consequently, such an activity should be profitable or increase utility.

Actors have Goals

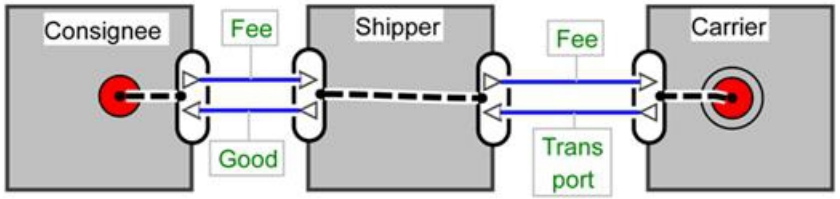
Actors have different motives and values. Goal-oriented Requirements Language (GRL) has been used to examine the logic behind to requirements of each actor.

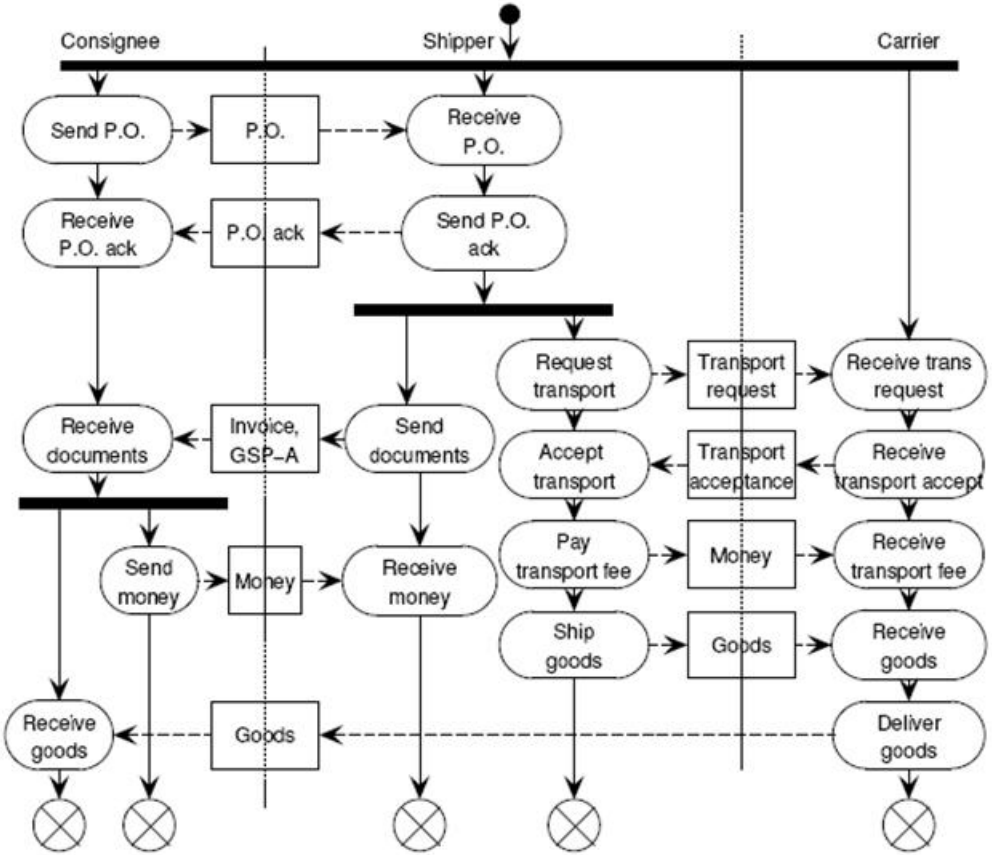


The Value viewpoint can be used for developing the Business Process viewpoint. Business process viewpoints need to be consistent (driven by?) the Business Value viewpoint.



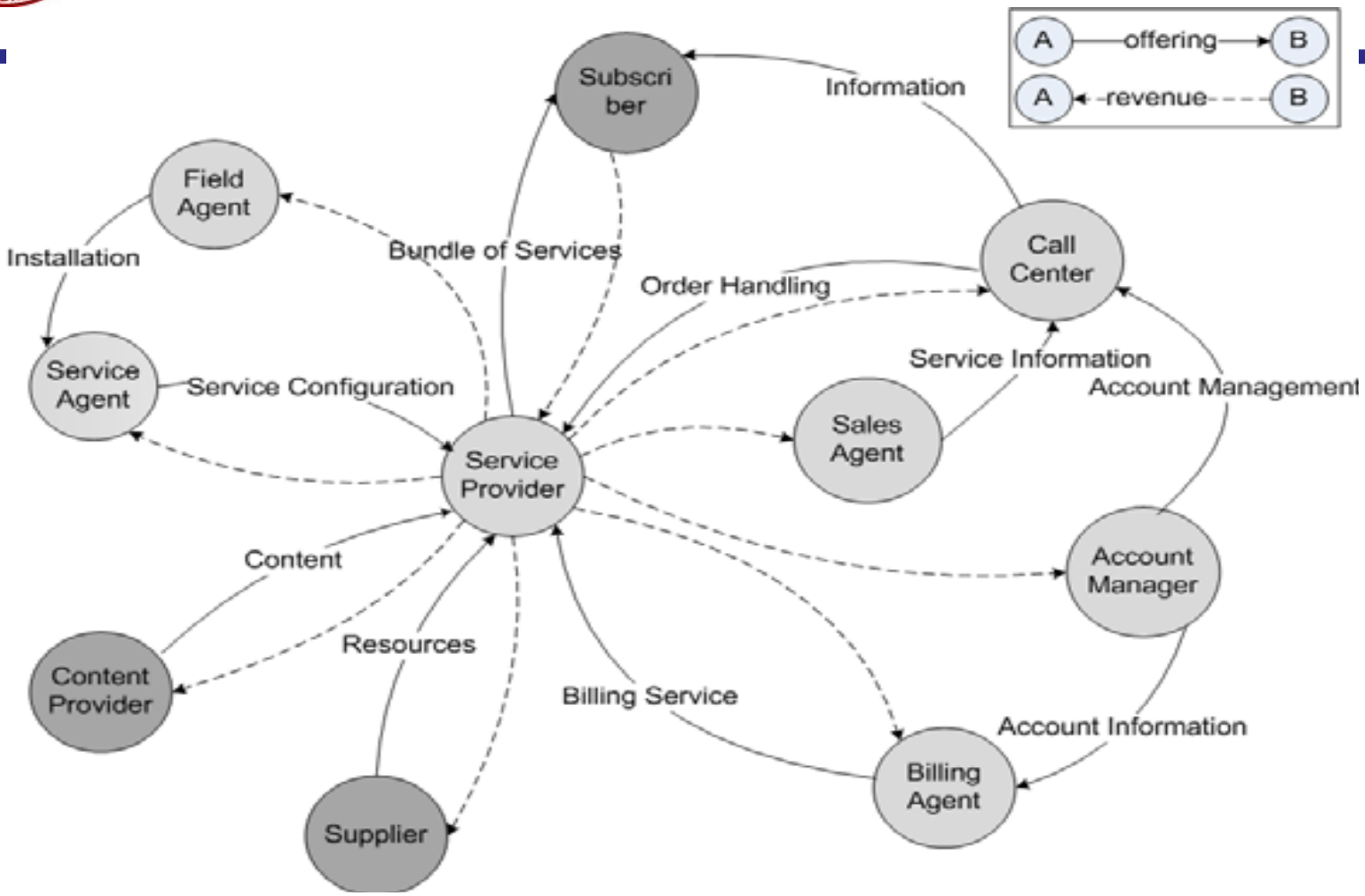
Transform Use Case Maps into Activity Diagrams





Service Network Notation (SNN)

"An Architecture for Managing the Lifecycle of Business Goals for Partners in a Service Network " M. Bitsaki, O. Danylevych, Willem-Jan van den Heuvel, G. Koutras, F. Leymann, M. Mancioppi, C. Nikolaou, M. Papazoglou



Some Clarifications...

Service Providers can provide a (capability) set of services (offerings).

Service Providers are considered to be **Business Entities** that include people, software and hardware systems and are organized with at least one **Cost Center,** where accountings books are kept for revenues, expenditures, capital assets, etc.

Even in the cases of Software-as-a-Service (SaaS), Platform-as-a-Service (PaaS) and Infrastructure-as-a-Service (IaaS), we will assume that these are associated with a Cost Center and therefore a Business Entity. Thus, we can tie operational performance objectives and SLAs, to business performance objectives.

Service Providers are usually a combination of people, and/or organizations of people (e.g. Companies, departments or Lines of Business (LOBs) within companies

More Clarifications

Service Providers are considered “active”

- If they are **people**, then they offer their **labor**, according to their **skill profile**, and play a **role** assigned to them (therefore we do not consider them as “passive” “human resources”).
- If they are organizations, then they offer their services according to their capability set (or mission).
- If they are SaaS, PaaS, then we assume they own thread(s) of control and can respond to service requests (see also agent literature).
- If they are IaaS then we assume that they are operational (“up and running”) and offer their services.

How about Resources?

A **resource** is any physical or virtual entity of **limited availability** that needs to be consumed to obtain a benefit from it. In most cases, commercial or even non-commerial factors require **resource allocation** through **resource management.** There are two types of resources; **renewable** and **non-renewable**. (Wikipedia).

Examples of resources in service systems are hardware resources (CPU, memory, disk, communication bandwidth, etc.), data sets and databases, buildings and office spaces, etc.

We will assume that a Service Provider, called **Resource Manager (RM),** provides as a service the allocation and management of the resource that the RM manages. RMs can be people or organizations or a combination of organizations and SaaS.

In the case of CPU, the RM is the CPU scheduler together with the MIS department, in the case of a building the RM is the maintenance department (or company), etc.

Atomic and Complex Service Providers

We distinguish between **Atomic Service Providers,** i.e. Service Providers who are single persons offering their labor, and Complex Service Providers who are:

- SaaS, PaaS or IaaS with their owning MIS departments
- Single Cost Centers as defined before
- Some “Business Composition” of the above as we explain next.

The Componentization of Business

IT Consulting Services companies are working with industry maps, one for each industry segment.

Each map contains a detailed map of business units, contained within various business activities, at various command & control levels.

The maps help spot units that need improvement or outsourcing or are of strategic value to the enterprise.

Next comes the SAP Business Map example for Banking.

Nested Business Entities and Service Systems

We have seen that, in large organizations, we can have nested Business Entities. Since Business Entities are also Service Providers, we can have nested Service providers and Service Systems.

We need a way to visualize and analyze them.

We also need a way to attach Key Performance Objectives (KPOs) to Business Entities (nested or not) and to Service Systems (nested or not).

We next need a way to monitor the Key Performance Indicators that correspond to the KPOs set.

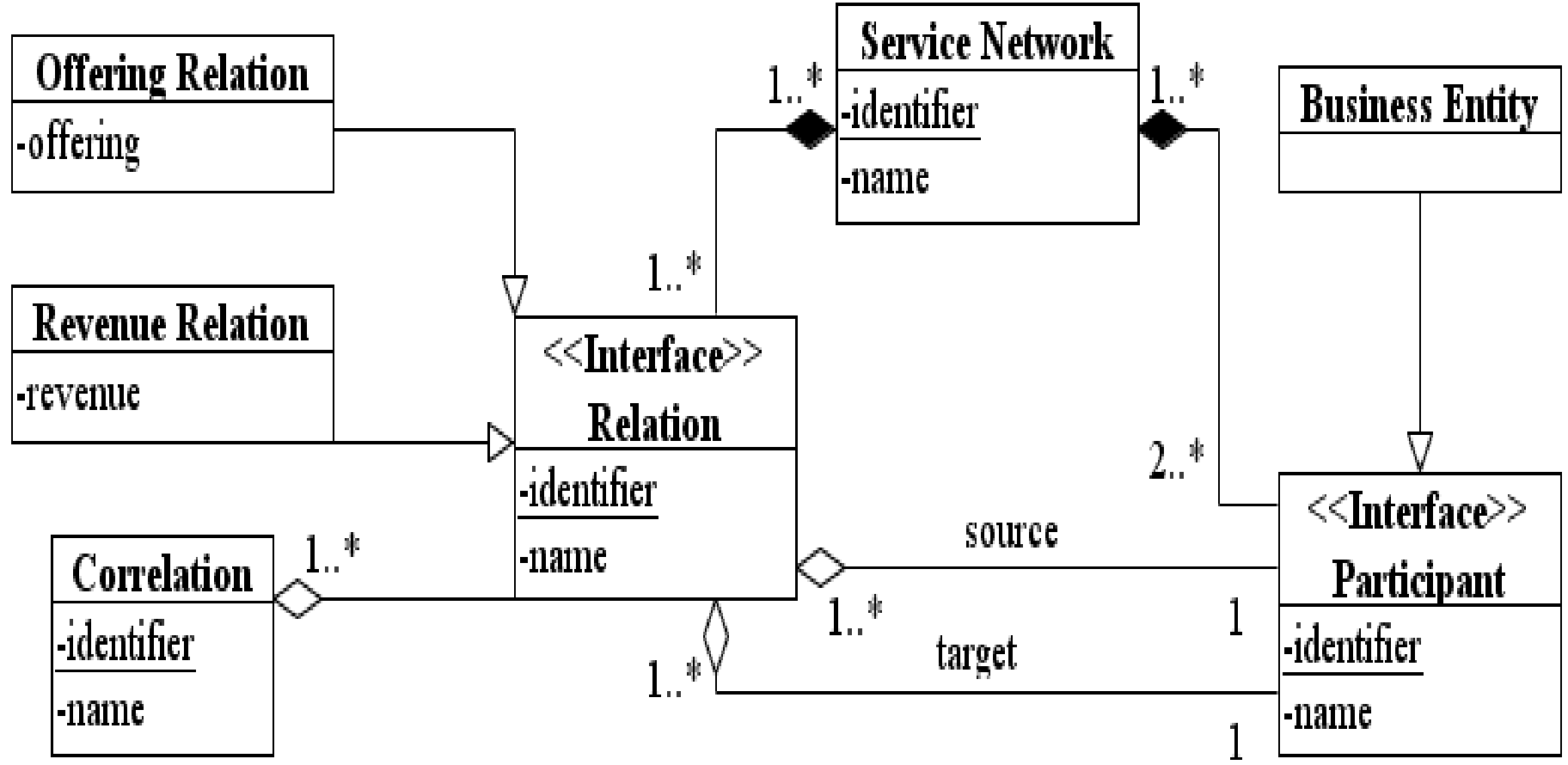
If there is divergence we need tools and methodologies to take corrective action.

How about new (emerging) Service Systems?

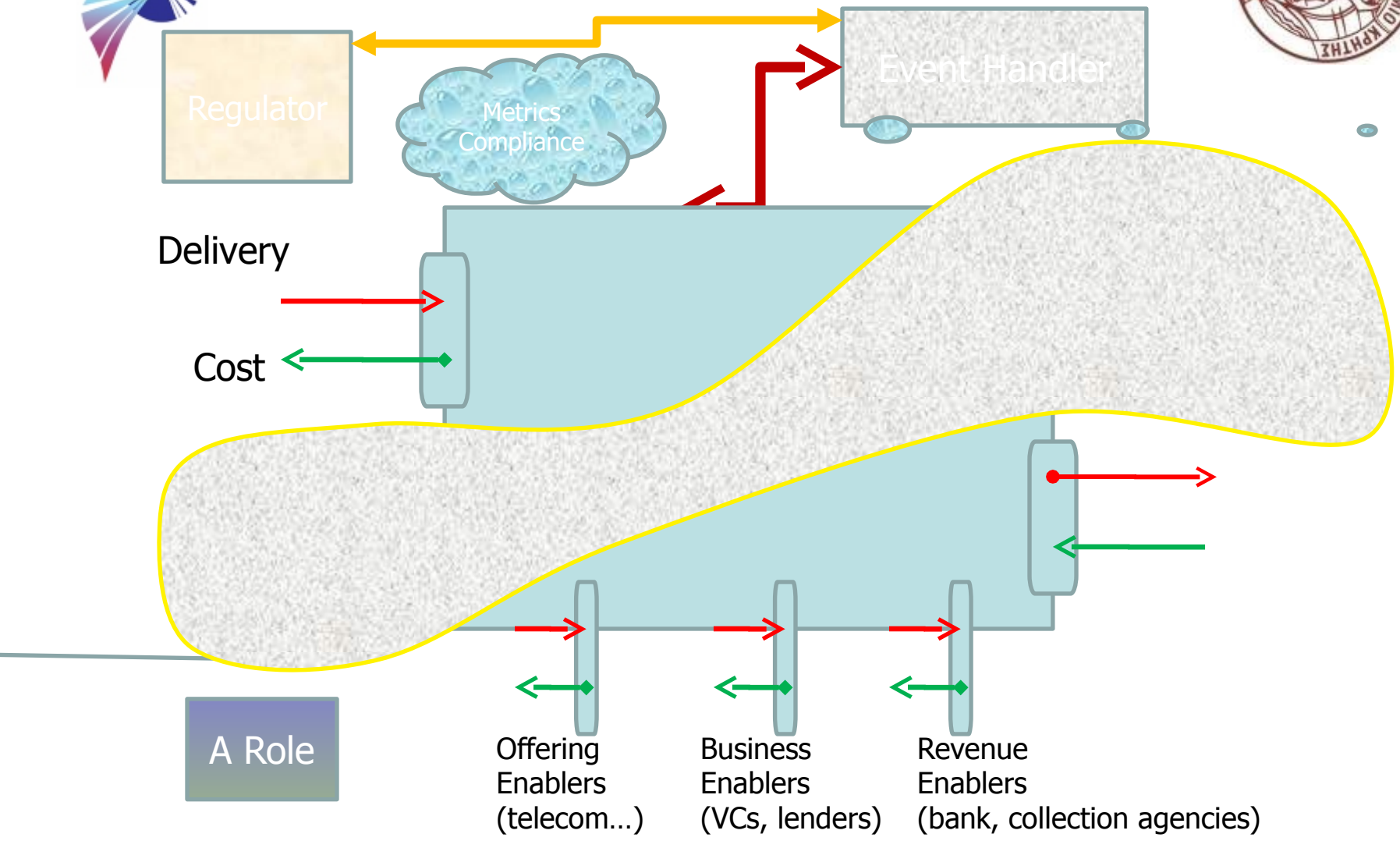
New Service Systems could emerge because:

- Business entities form an alliance to propose a new service to the marketplace. Important to:
  - analyze the proposal,
  - study what-if questions,
  - Discover services/service providers which/who could be useful (how?)
  - Mashups of web-services?
  - Compare similar service providers (how?)
  - compare with KPOs, etc.
- Emergent behavior of online services forming alliances?

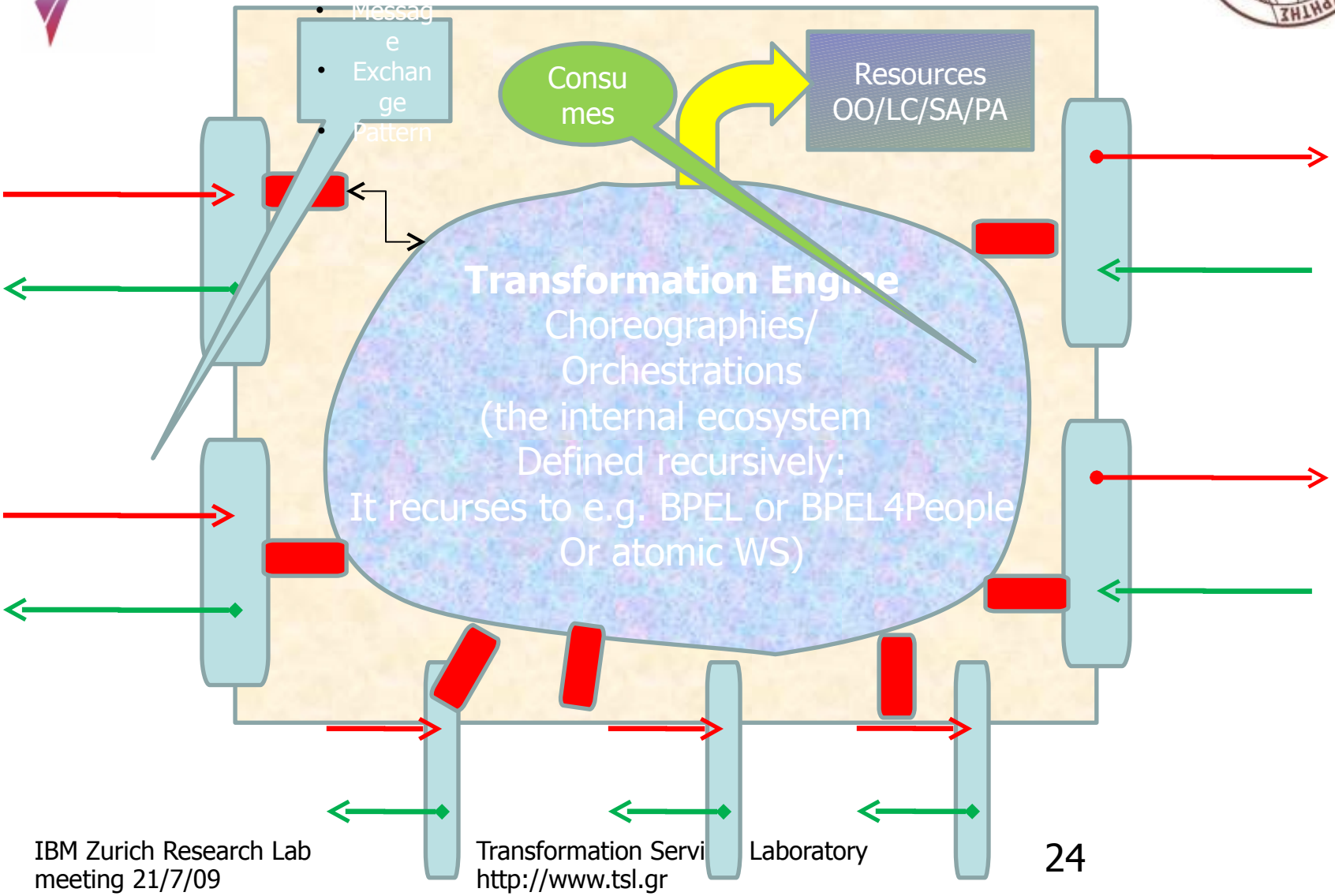
A UML Class Diagram for the SNN



A Business Entity



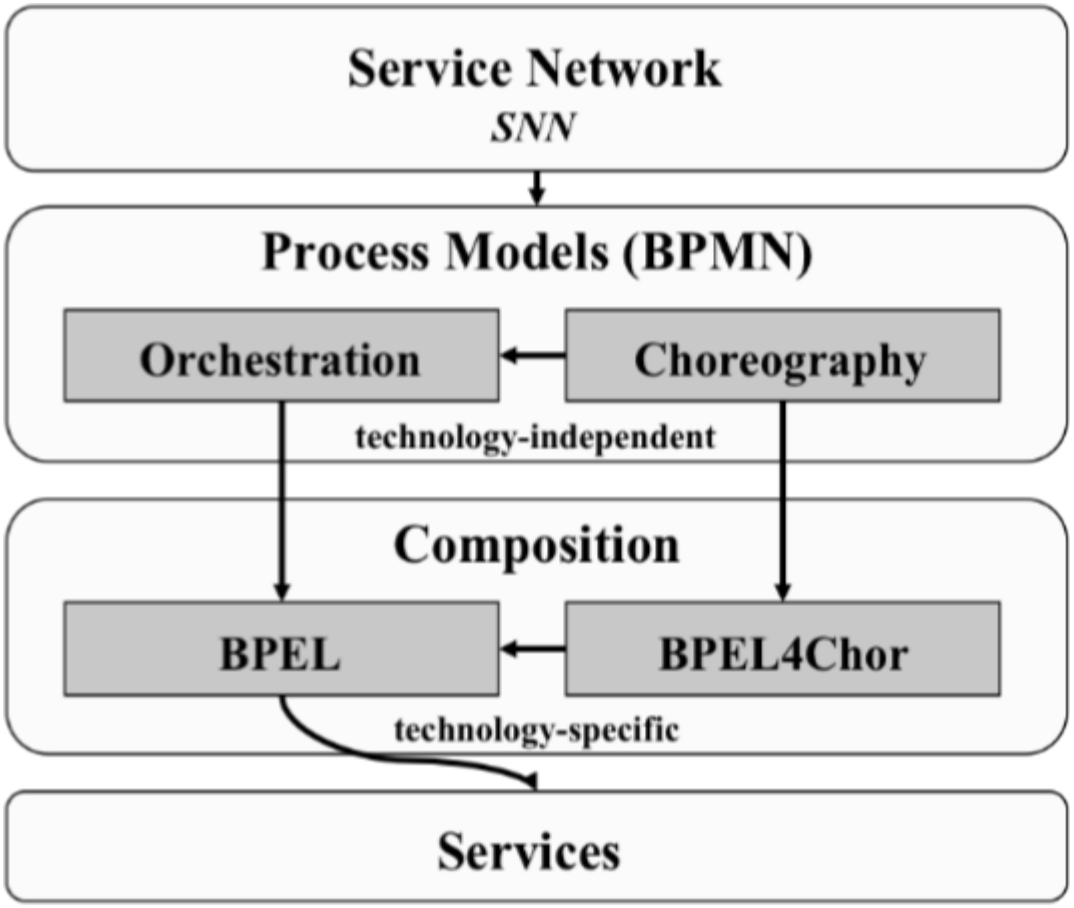
Inside a Business Entity



Analysis of SN

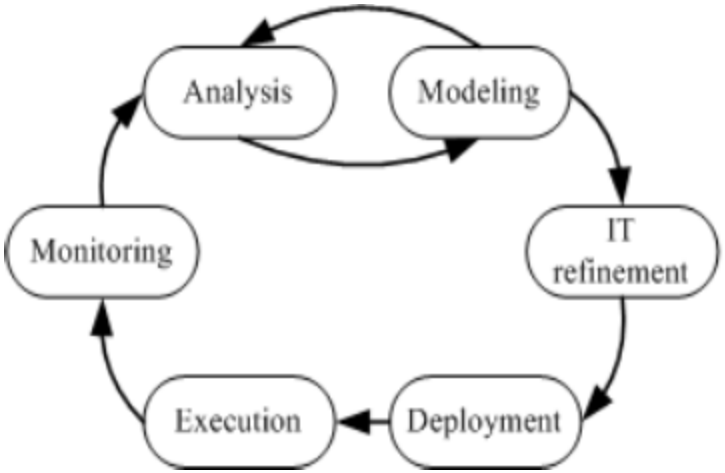
- Organizations work worldwide fostering complex relations and developing complementary skills to generate and exchange goods, services or information.
- In order to **evaluate the performance** of an organization within a service network and define business objectives as part of the firm's strategic behavior, the organization identifies specific KPIs. KPIs are connected to parameters given in SLAs and parameters given by the interacting participants. For example, the value that a participant derives from the network is a KPI and could be connected, among other factors, to the satisfaction of this participant's customers.
- Satisfaction, in turn, depends on many factors such as the service delivery time, which usually should not exceed an upper bound specified in the relevant SLA.
- To implement this service network, quite a few business processes must be deployed and operate such as: "order receipt", "order handling", "service configuration", "service installation", and "inquiries and complaint handling". These processes are distributed between several business units and business partners.

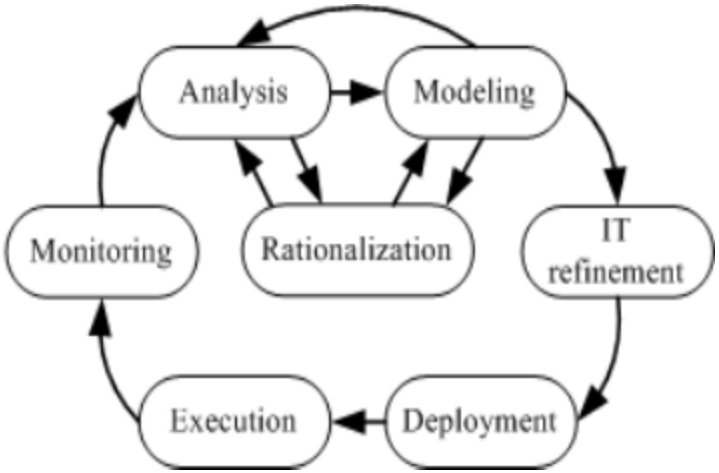
The Enhanced BPM Layering



The Enhanced BPM lifecycle

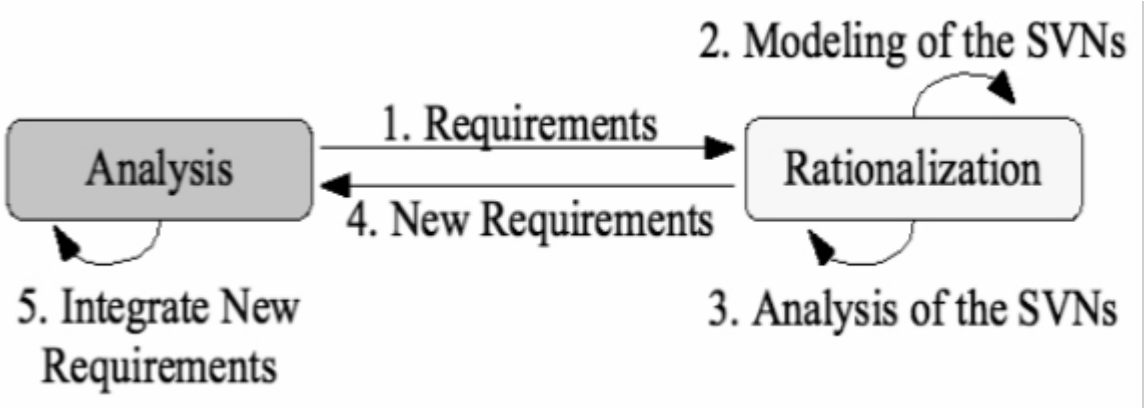
- The enhanced BPM lifecycle comprises the following phases: analysis, modeling, rationalization, IT refinement, deployment, execution and monitoring





The Enhanced BPM lifecycle

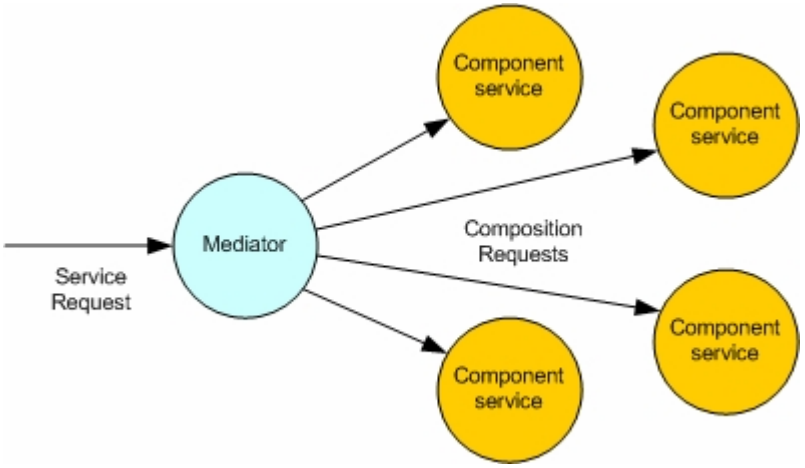
- The rationalization phase produces information which is used in the modeling or analysis phase

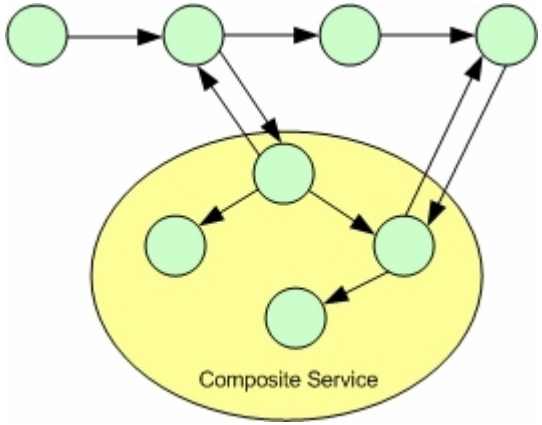


The Problem of Service Composition

(http://serviceorientation.com/soaglossary/service_composition)

- A *service composition* is an aggregate of services collectively composed to automate a particular task or business process. To qualify as a composition, at least two participating services plus one composition initiator need to be present. Otherwise, the service interaction only represents a point-to-point exchange.





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