# Modeling networked value constellations with *e³value*

e³value™

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## The take-home message …

- Before embarking on an IS development track for multi-enterprise information systems supporting IT-enabled value propositions:
- You'd better first explore the constellation of enterprises from an economic perspective
- And understand why the multi-enterprise IS is needed from the business point of view in the first place.

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## Agenda

- Block I: Value modeling (Jaap Gordijn)
  - Introduction to value network modeling
  - The *e³value* ontology and methodology
- Block II: Case study (Hans Akkermans)
  - A real-life case study on online news provisioning
  - Group activity: small case study
- Block III: Capita Selecta: Value modeling and …
  - Goal modeling (Michael Petit)
  - eService bundling and configuration (Hans Akkermans)
  - Inter-organizational control modeling (Jaap Gordijn)

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## Block I: Value modeling

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## *What* are networked value constellations…?

- "A construct where actors come together to co-produce value with each other" (Normann & Ramirez)

- Similar to: value & business webs:
  - "contributors that come together to create value for customers and wealth for their stakeholders" (Tapscott)
- Emerged due to widespread use of the Internet

- Examples:
  - Cisco Systems, Dell, but also industries such as
  - Electricity supply
  - Most Internet services such as news, market places, entertainment

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## … in Business Sciences



Tapscott's business webs

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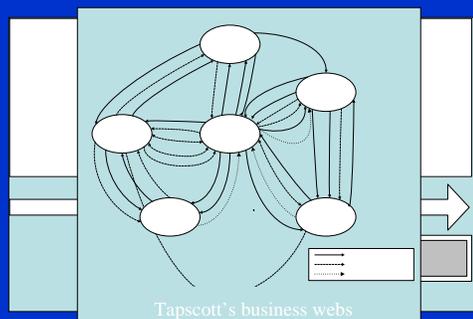
## An example: Internet radio

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## While designing constellations …

- Concerns are:
  - Multiple enterprises: in case of conflicts no central decision taking authority
  - Multiple stakeholders: often confusion about which product/service we offer with whom, long before talking about IT
  - Short timeframe: ~weeks available for designing a constellation offering a particular service (time to market)
  - Economic & technical feasibility

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## Why do we want to model value constellations (1)

- "Modeling":
  - Eliciting a constellation (under design)
    - Who are the actors (enterprises and final customers) involved?
    - What do they transfer of economic value to each other, and what do they request in return for that?
    - Why do they transfer these values?
    - What activities do they perform to produce/consume?
  - Representing a value model using an ontology and conceptual modeling techniques
  - Analyzing properties of a constellation
    - Economic sustainability for all actors
    - Technical feasibility

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## Why do we want to model value constellations (2)

- A precise and shared understanding of the constellation
- Checking common business rules:
  - For business requirements and profitability
  - e.g. "one good turn deserves another"
- Analysis of (economic) feasibility: scenarios
- Starting point for Information Systems development: *networked* value constellations
  - e.g. for assessing technical feasibility

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## What do we model in case of value constellations? (1)

- A wide range of possibilities:
  - Business processes, coordination mechanisms, information systems, trust, security, …
- But:
  - do these really explore feasible constellations from an economic value perspective? and,
  - within a reasonable timeframe?
- So:
  - Focus on economic value first
  - Introduce "separation of concerns" to reduce complexity
  - Create first understanding of and agreement about the business case

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## What do we model in case of value constellations? (2)

- A transaction economics perspective (cf. Williamsson):
  - Produce yourself or outsource
  - What do enterprises offer to their environment and what do they request in return?
  - Enabling net value flow analysis
- Abstracting away from lots of issues, but specifically from coordination & business processes and information systems

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## Hello world in e³value



## e³value modeling constructs:

- Actor
- Value Object
- Value Interface
- Value Offering
- Value Transfer
- Market Segment
- Value Activity
- Composed actor



The e³value ontology is available as UML class diagrams plus OCL constraints, as Prolog code, as RDF/Schema and as a Java implementation. Graphical tool is free for download.

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## e³value constructs (1):
## Actor

- Models an economically independent entity
- Example:
  - enterprises and end consumers
  - profit and loss responsible business units
- Graphically:
  - Rectangle + enterprise or role name



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## e³value constructs (2):
## Value object

- Is a service, a good, money, or even an experience, which is of economic value for at least one of the actors involved in a value model.
- Models things of economic value that can be observed. Note: valuation itself is subjective!
- Example:
  - Money, Music, Car, Electricity, …
- Graphically:
  - […]



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## e³value constructs (3):
## Value port

- Models provisioning or requesting value objects to or from actor's environment
- Change of ownership, or a change in rights
- Used to abstract away from internal business processes
- Example:
  - Requesting (in-port) money (a value object)
  - Offering (out-port) a good
- Graphically:



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## e³value constructs (4):
## Value offering & interface

- Value offering:
  - groups equally directed ports
  - models bundling: mixed bundling, only of value in combination, …
- Value interface:
  - groups in-going and out-going value offerings
  - models economic reciprocity
- Example:
  - Value offering: music + online access
  - Value interface: music + payment + online access + payment
- Graphically:



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## e³value constructs (5): Value transfer

- Connects two value ports with each other
- Models one or more potential trades of value objects. It shows which actors are willing to transfer value objects with each other.
- Example:
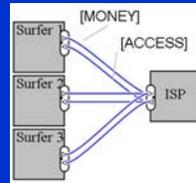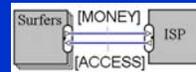  – Connection between good in-port (shopper) and payment out-port (store)

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## e³value constructs (6): Market segment

- Breaks a market (consisting of actors) into segments that share common properties
- Models that a number of actors assign economic value to objects in the same way
- Example:
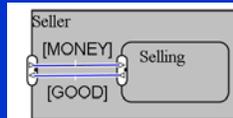  – ADSL light/heavy/business users



Surfers assign value *differently*

Surfers assign value *equally*

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## e³value constructs (7): Value activity

- Shows activities that are expected to be profitable for at least one actor
- Models decoupling of a legal entity from what it is doing
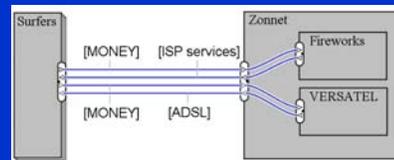- Needed to discuss "who is doing what" in a structured way
- Example:

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## e³value constructs (8): Actor composition

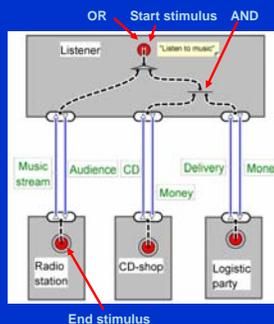- Models that actors offer something of economic value jointly as a partnership
- Not: ownership

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## e³value constructs (9): Dependency path

- Value interfaces between different actors/activities are related via value transfers
- Value interfaces of same actor/activity are related by dependency paths
- Purpose: to make value models "computable"

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## Further information on e³value (1) www.e3value.com



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## Further information on $e^3value$ (2)

- Jaap Gordijn, Eric Yu, Bas van der Raadt, "e-Service Design Using i* and *e3value* Modeling",  IEEE Software, May/June 2006, pp. 26-33.
- J. Gordijn and J.M. Akkermans, "Value based requirements engineering: Exploring innovative e-commerce idea", Requirements Engineering Journal, Vol 8, Nr 2, pp. 114-134, 2003
- J. Gordijn and J.M. Akkermans, "$e^3value$: Design and Evaluation of e-Business Models", IEEE Intelligent Systems, special issue on e-business, Vol. 16, No. 4, pp. 11-17, 2001

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