EDOC 2011

15th IEEE International Enterprise Distributed Object Computing Conference

University of Helsinki, Finland

28.08.-02.09.2011

Content

- Introduction
- Some things relevant to us
  - Keynotes
  - Some Papers
  - 6th TEAR (Trends in Enterprise Architecture Research Workshop)
  - 3rd SoEA4EE (International Workshop on Service-Oriented Enterprise Architeture for Enterprise Engineering)
  - 6th VORTE & 4th EVL-BP
- Reflections

Introduction 1/2

- A series of Conferences on Distributed Enterprise Computing started from 1997
- Content
  - from 120 papers submitted (55% were reviewed by 4 people)
  - 24 full and 6 short papers were accepted to conference (20%)
  - 43 papers were forwaded to workshops from which 23 accepted
- Keynotes
  - Terry Halpin
  - Richard Hull
  - Gerd Wagner
  - Mike Papazoglou

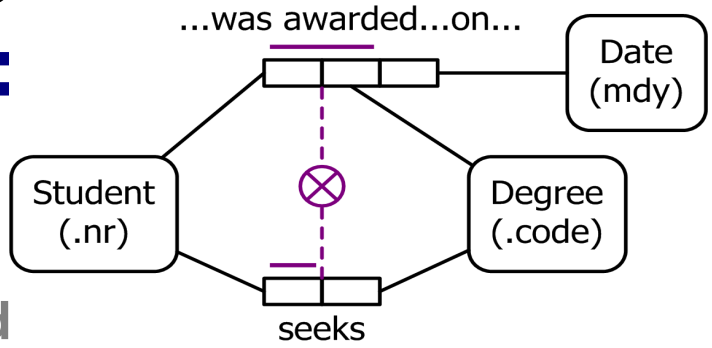
Introduction 2/2

- Distribution of papers by the themes (accepted & submitted)
  - Model-Based ... 10 of 32
  - Business Processes 8 of 28
  - Enterprise Architecture 7 of 27
  - SOA 6 of 23
  - DSLs 5 of 14
- Joint events were several workshops on related issues
  - 6th TEAR
    - Trends in Enterprise Architecture Research
  - 3rd SoEA4EE
    - Service-Oriented Enterprise Architecture for Enterprise Engineering
  - 6th VORTE
    - Vocabularies, Ontologies and Rules for the Enterprise

Keynote – Making Business Processes Compliant to Standards and Regulations

- Compliance
  - ensuring conformance to a set of prescribed and/or agreed upon norms
  - could/should be considered as opportunity to reengineer business processes
- Compliance Management
  - Prevention (identify sources, develop policies, train, communicate)
  - Detection (continuous monitoring, formal structure (internal audit))
  - Response (reaction in case of problems)
- Compliance needs
  - traceability between various business process levels and models
  - compliance requirements repository (storing all compliance rules)
  - formal specification of compliance requirements (e.g. based on linear temporal logic & deontic logic), but
  - info communicated to business specialists in natural language
- Avoid the trap of boxed IT compliance solutions!
- Usually business process are compliant but IT laggs behind

Keynote – Fact-Orientation and Conceptual Logic



- Terry Halpin → creator of ORM
- ORM is
  - a visual logic ↓ **SBVR is also fact-based**
  - fact-oriented modeling ← is attribute free = semantically stable !
  - a conceptual approach for modeling, acquiring and transforming data (with predicates of any arity – instead of binarizing)
  - a controlled natural language (for validation by verbalization)
- Main principle
  - models must be validated by domain experts, and intelligible by all business users
  - all structures must be easily populated by concrete examples
  - start data modeling from "use-cases", test with counter examples
  - constraints are visualized by connections between predicates
- Info can be modeled nto in 3, but in 4 levels
  - conceptual, logical, physical, and external (e.g. UI)
- Constraints
  - alethic – true for each state ↓ with context represented by object types
  - deontic – true only for some states (relaxed alethic constraints)

Keynote – Towards Flexible Service Interoperation using Business Artifacts

- Requirements
  - enterprise collaboration coordination framework must efficiently support variation
  - data & process are two sides of the same coin
  - allow local variations to globally unified processes ← **O**bject-**O**rientation?
- Solution
  - conceptual business entities that progress through the business processes and the milestones through which they progress
- Benefits
  - a unified end-to-end view of business operations
  - all stakeholders have a common basis for understanding
  - a holistic unified way of thinking about business
  - two-tier support for variations ← maybe **inheritance** for multiple levels?
    - FSM defines global life-cycle
    - rules specify variations
  - structure for requirements
- Difference from SOA – persisten data in “upper-middleware”
- EU funded project – Univ. of Tartu is participating!

Some Papers 1/5

- An Ontology-Based Semantics for the Motivation Extension to ArchiMate
  - representing the strategies and principles – rationale for particular architectural choices (Zachman's “Why” column)
  - new concepts
    - stakeholder, concern, assessment (outcome of the analysis of some concern), goal (end – the propositional content of an agent's intention), principle, requirement
  - using UFO as ontological theory to define formal semantics
  - ArchiMate 2.0 will contain motivation extension
  - goals could be connected to any EA element ← to configurations?
  - Future
    - incorporate service concept & deontic notions of obligation, etc.
  - Questions
    - OMG's BMM? BMM's semantics is very unclear – hard to compare
    - OMG's SBVR? We are using richer theory in social aspect

Some Papers 2/5

- Conformance Checking Unsing Cost-Based Fitness Analysis
  - analysis of process execution traces (logs) – matching traces to process model
    - every violation has associated cost
  - process mining framework was used for experiments
- Modeling Flexible Business Processes with Business Rule Patterns
  - integrating rules into processes (BPMN + R2ML = rBPMN) for
    - control flow decisions
    - data constraints
    - dynamic business process composition (selection from library)
  - executable langage with semantics defined by Petri nets
  - future – a project that uses fully rule-based approach!

Some Papers 3/5

- An Engine-Independent Framework for Business Rules Development
  - practical work in health insurance – very large sets of rules
  - allows non-production systems as targets (e.g. pure Java)!
  - supports standards PRR (+OCL) RIF, SBVR, JSR-94
- Using IT Capability Maturity Framework to Improve IT Capability and Value Creation: An Intel IT Case Study
  - IT process frameworks are concentrating on different parts of IT – organizations try to build a "frankenstein" framework out of multiple ones that have different philosophical backgrounds
  - traditional metrics of management are misleading and can put IT organization in a difficult situation
  - managing IT like a business ← should IT be managed as business, or as a part of business?
- Trust and Business Webs
  - business webs are modeled as value models with agreed trust relations, allowing trust to be calculated

Some Papers 4/5

- Declarative Business Artifact Centric Modeling of Decision and Knowledge Intensive Business Processes
  - large class business processes make complex multi-faceted decisions (contract creation, sales campaigns, ...)
  - decompose process into family of small decisions – incremental decision making by keeping track of decisions and their interrelationships
  - using business artifacts and GSM (guard-stage-milestone) model ← business entities with life-cycles
  - life-cycle stages are used as levels of abstraction for info model
- Designing a Cross-Organizational Case Management System using Dynamic Condition Response Graphs
  - imperative flow description could be very complex → describe goals declaratively
- Causality in Message-Based Contract Violations: A Temporal Logic "Whodunit"
  - linear temporal logic with quantifiers from first-order logic
  - some direct violations can be resulting from forced moves → need to find root violation

Some Papers 5/5

- ROAD4WS – Extending Apache Axis2 for Adaptive Service Compositions
  - organization externalizes all domain functionality – it is independent of functions(exists even if no role instantiated/bound)
  - relationships of roles (contracts) define what role is
  - defining processes declaratively is difficult – people think imperatively ← easier if determinism is required
- Resource and Agreement Management in Dynamic Crowdsourcing Environments
  - human-based services are defined in WSDL and integrated into business processes with automatic services
  - using WSLA – a model for SLAs
- xOWL – an Executable Modeling Language for Domain Experts
  - multiple domain-specific perspectives on the same model
- A Simple Solution for Information Sharing in Hybrid Web Servcie Composition
  - tuple space (Linda model) ← blackboard architecture style

6th VORTE Keynote – Ontologies and Rules for Enterprise Modeling and Simulation 1/3

- Foundational ontology – a formal philosophical theory about the fundamental categoriesof things existing in the world
  - objects & object types
  - events & event types
  - relationships & relationship types

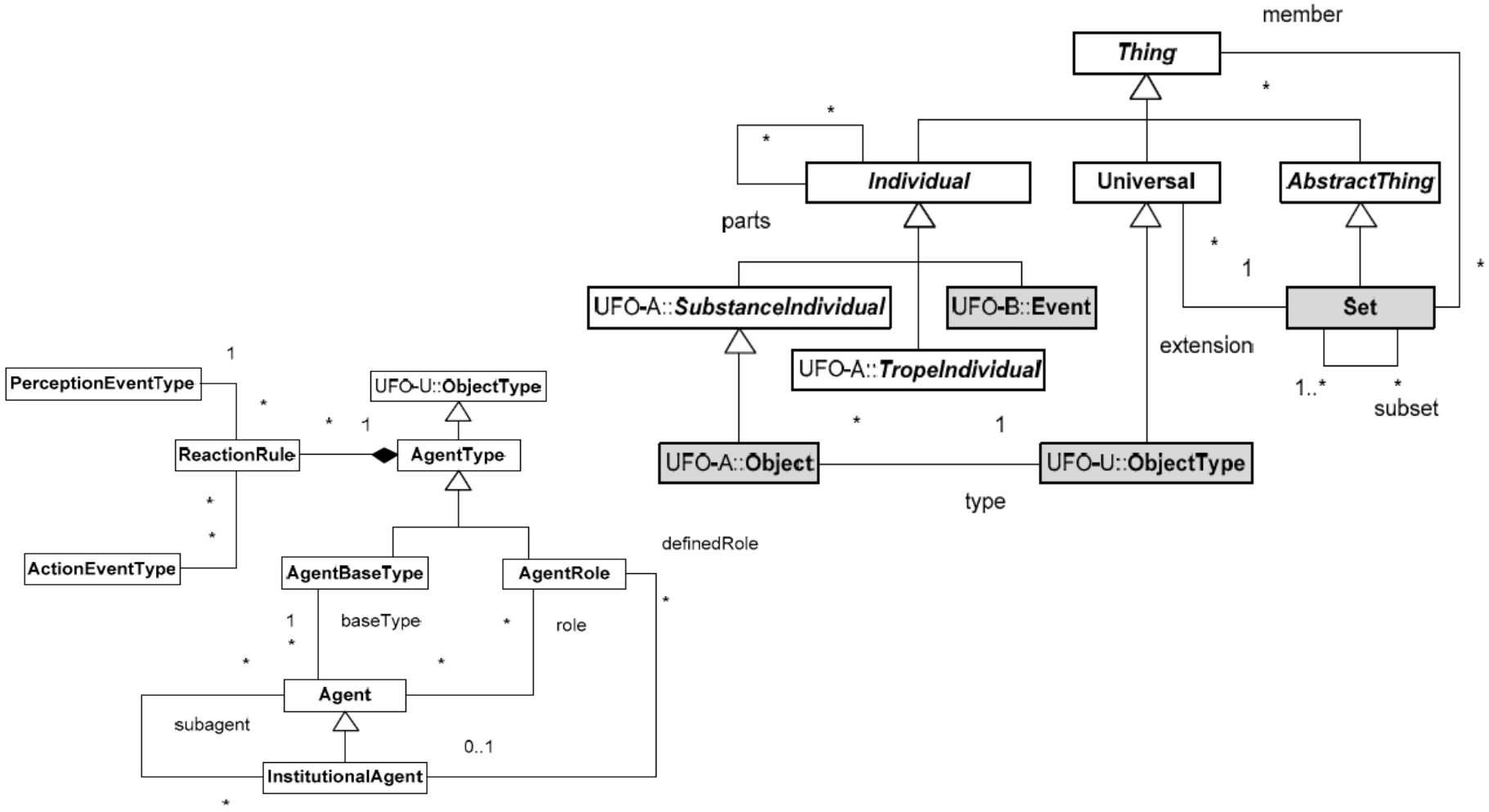
  } Aristotelian ontological square
- Unified Foundational Ontology (UFO) – stack of ontologies
  - UFO-0 – basic categories (individual, universal, abstract)
  - UFO-U – universals (types)
  - UFO-A – objects (with identity) & tropes (quantities, modes, relations)
  - UFO-B – events
  - UFO-C1 – simple agents
  - UFO-C2 – cognitive agents
  - UFO-C3 – institutional agents (organizations)
- Agents
  - are interactive objects – actors of events and bearer of beliefs
  - cognitive agents can form social systems

6th VORTE Keynote – Ontologies and Rules for Enterprise Modeling and Simulation 2/3

- Enterprise
  - a business system, which consists of agents (actors) that participate in business processes
- Problem
  - business process modeling is not well aligned with information modeling – there's no holistic view in modeling enterprise as business system
- Simulation – making executable enterprise models (DES)
  - causal laws in agents' environment are defined by *transition rules*
  - basic behavior associated with agent is defined by *reaction rules*
  - in simulation usually beliefs are taken as identical to facts
- Ontology (UFO+DESO) is used to compare simulation languages
  - language is
    - sound if every language element has an interpretation
    - complete if every ontology element has representation in the language
    - lucid iff every element of language has at most one interpretation in ontology
    - laconic iff every ontology element has only one representation in the language

6th VORTE Keynote – Ontologies and Rules for Enterprise Modeling and Simulation 3/3

- Unified Foundational Ontology (UFO)



6th TEAR Papers 1/7

- An Experts' Perspective on EA Goals, Framework Adoption and Benefit Assessment
  - most important EA Goals
    - Transparency (Holistic View!)
    - Complexity management (Holistic View!)
    - Governance / management
    - Business – IT Alignment
  - less important EA Goals
    - Agility, Innovation, Compliance (done elsewhere)
  - four clusters of organizations (primary goal & problem)
    - Understanding (Transparency, extensive modeling)
    - Engineering (Complexity Mgmt, lacking governance)
    - Managingn (Governance, communicating EA value)
    - Innovating (Alignment, focus on IT side)
  - all use customized EA approach (mostly based on TOGAF)
  - nobody measures EA (but all think that this is important)

6th TEAR Papers 2/7

- How are EA Design Principles Used
  - usually principles are in place, but usage & maintenance are missing
  - function of EA principles is to restrict deign freedom
  - if EA principles are
    - Observed, Regularly Updated & based on Business Strategy,
    - they lead to better (perceived) EA quality
- A Practical Approach to the Formulation and Use of Architecture Principles
  - drivers (source) are
    - goals & objectives, values, issues, risks, potential rewards, constriants
  - test principles on SMART
  - distinguish architecture principles from strategic principles
  - distinguish architecture principles from functional requirements
  - owners of the drivers (shareholders, top mgmt, ...) should be owners of principles
    - they should have the power top stop the offending projects (otherwise there is no need for principles)

6th TEAR Papers 3/7

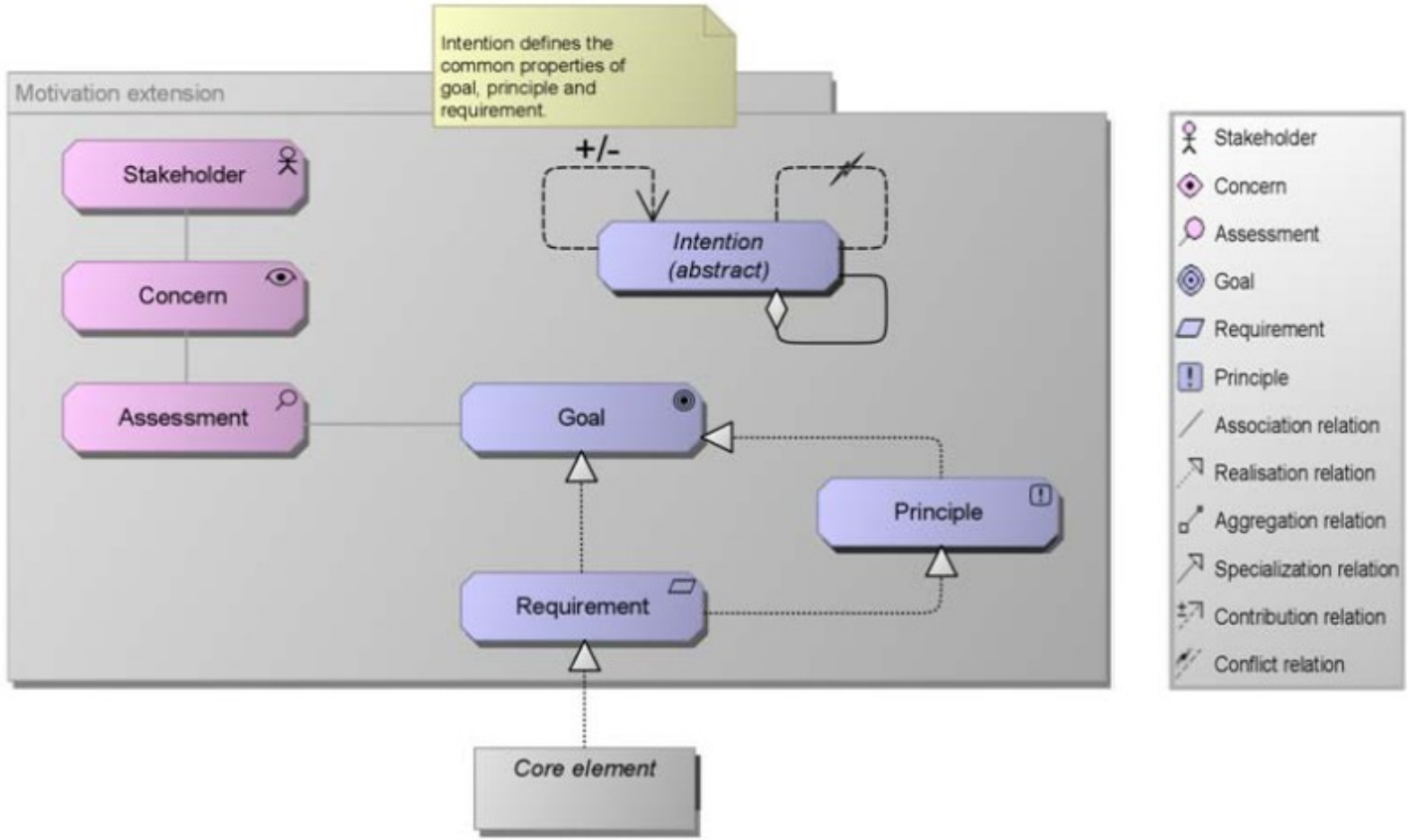
- Automation Process for EA Management
  - DW for EA
  - architecture discovery
  - compliance discovery
- Achieving EA Benefits: What Makes a Difference
  - survey of EA techniques
    - 79.6% – EA is formally approved by mgmt
    - 66.2% – choices made in EA are linked to business goals
    - 59.2% – projects are being explicitly assessed
  - survey of EA benefits
    - 74.1% – insight into complexity
    - 71.9% – clear image of desired future situation
  - there is no relation to EA benefits from the technique “EA is formally approved” !
  - finance sector shows more benefits from EA than others (lowest in government sector)
  - smaller number of project architects leads to better EA 

6th TEAR Papers 4/7

- Enterprise Description for Enhancing Local Government Transformation and Coherency
  - in Finland Ministry of Finance drives EA activities (Law of Information Management)
  - financial perspective is explicitly included into EA framework
    - Columns (of GEA/GAM)
      - Environment, Service & Customer, Information & Data, Personnel, Systems & Technology, Finance
    - Rows show organization levels, not abstraction levels
  - architecture visualizations should be automatic
    - e.g. visual road maps from textual input
- Extending the Method of Bedell for EA Valuation
  - extensions of ArchiMate – ArchiValue
    - motivation
  - extension of Bedell method (importance vs. effectiveness) of assessing IT investments
    - shared IT
    - flexible layer structure

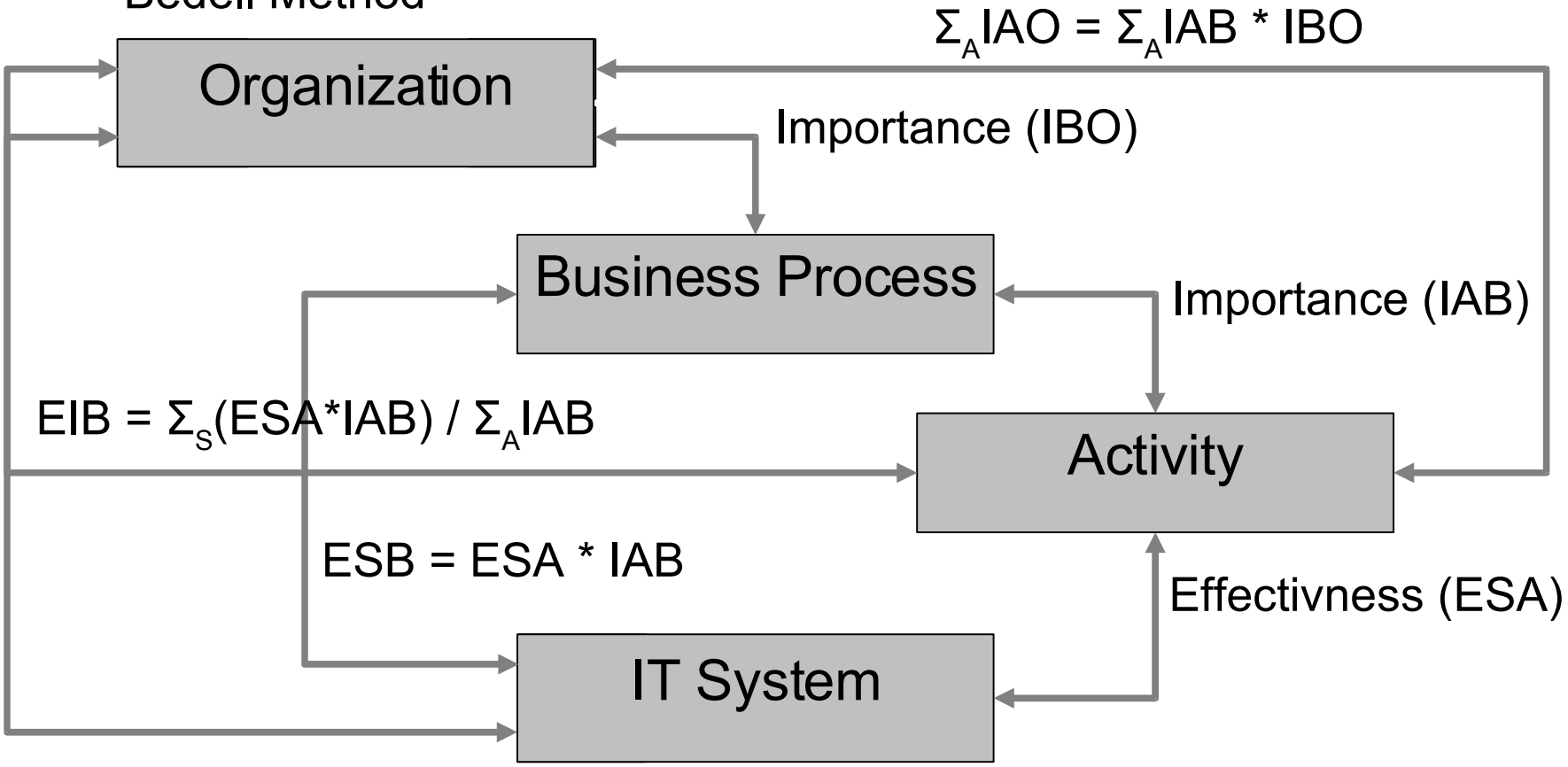
6th TEAR Papers 5/7

- Extending the Method of Bedell for EA Valuation
  - ArchiMate Motivation Extension (ArchiValue)



6th TEAR Papers 6/7

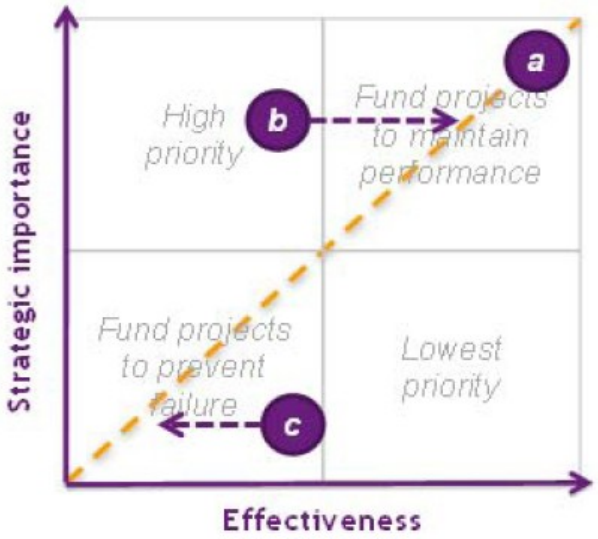
- Extending the Method of Bedell for EA Valuation
  - Bedell Method

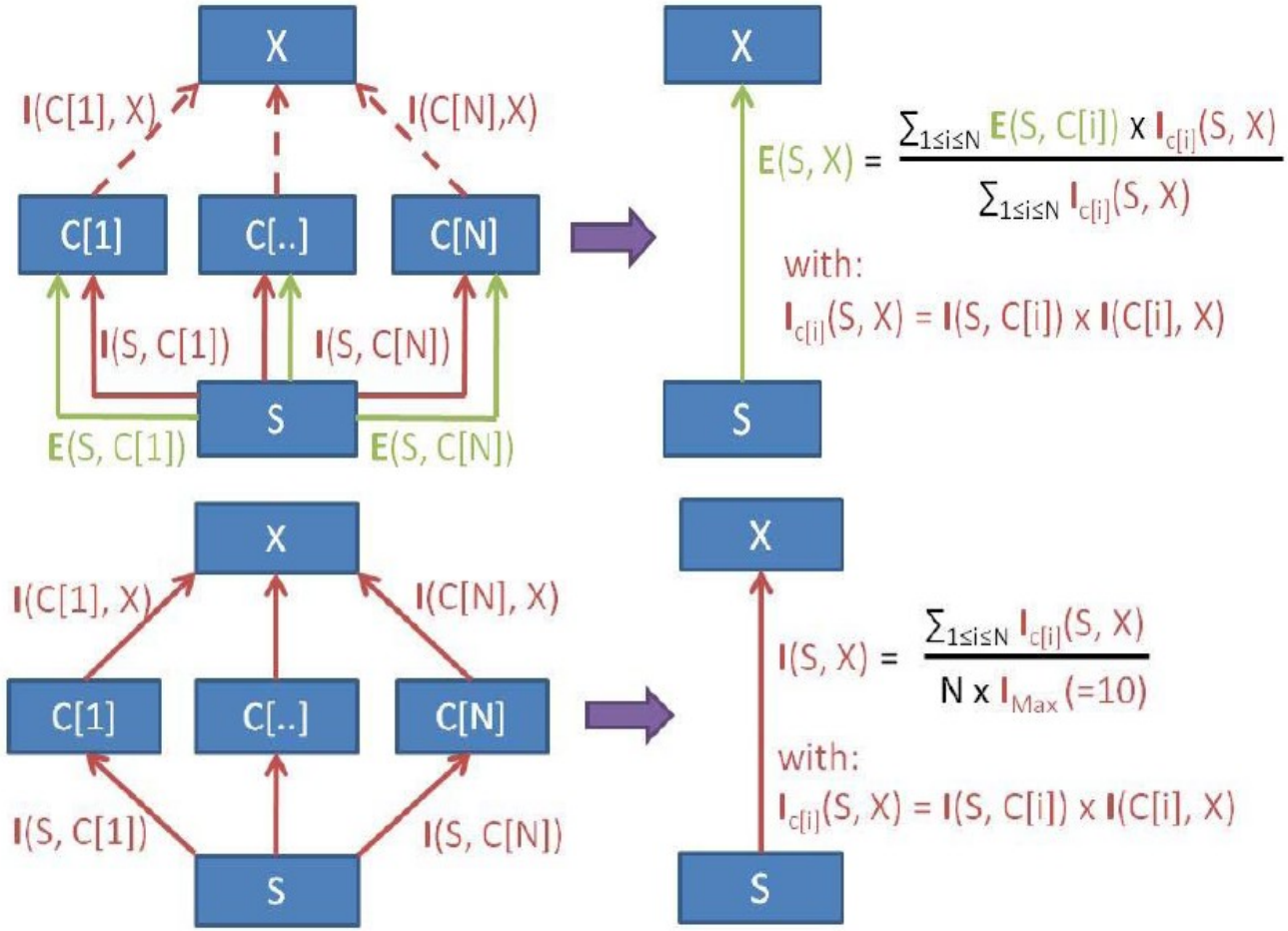


$IIO = \Sigma_B(IBO*max\Sigma_A IAB)B * \Sigma_B IBO$ ← Derived Importance to Organization

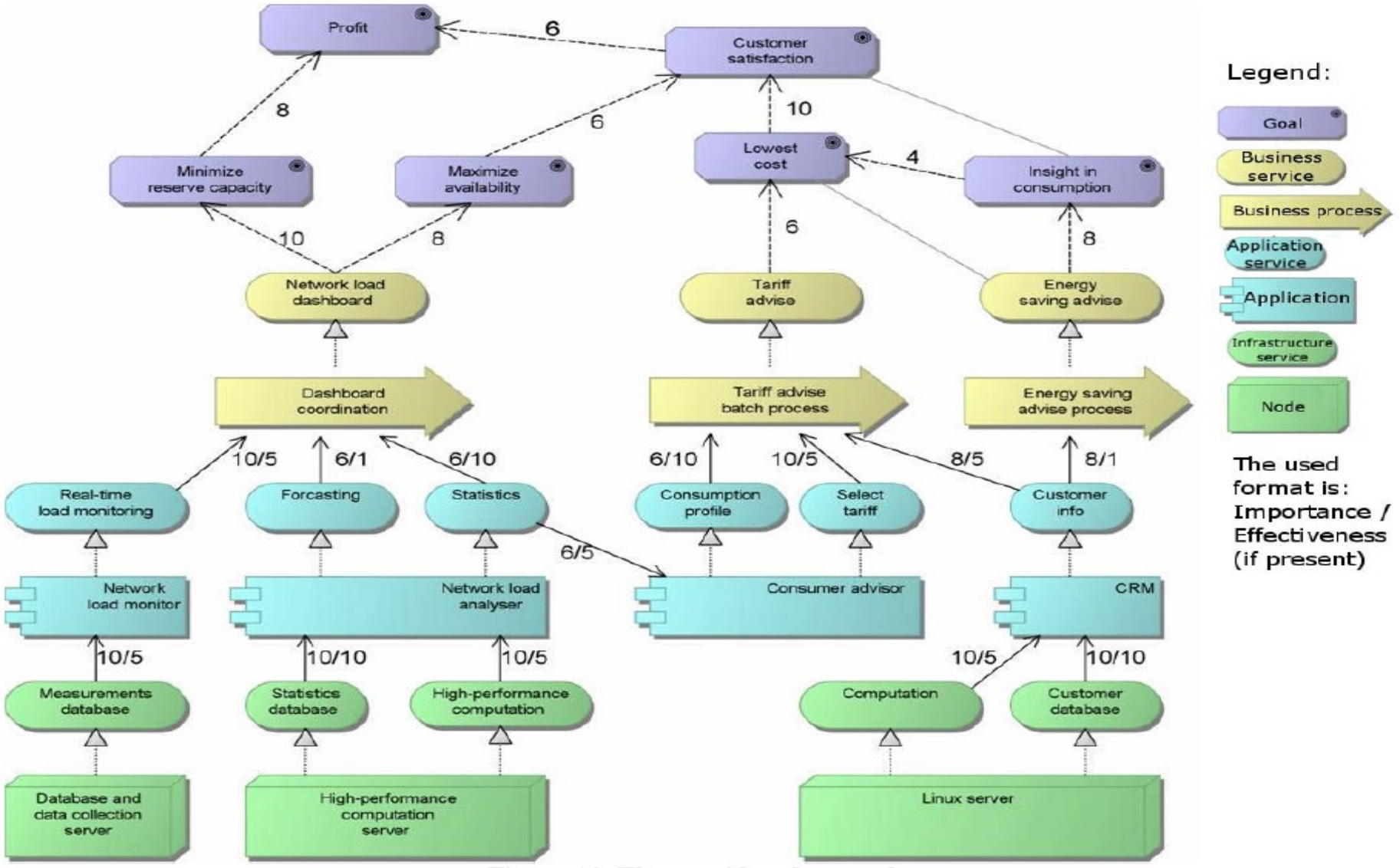
6th TEAR Papers 6/7

- Extending the Method of Bedell for EA Valuation
  - Bedell Method Extension – more complex network





6th TEAR Papers 7/7



6th TEAR Conclusions

- Trends & Targets Discussion
  - Theoretical Foundation – a Kernel Theory
    - based on Design Science or Behavioral Science
    - possibly connected to organizational theories (social & cybernetic)
  - EA(M) needs simplification & an enterprise ontology
- Reflections
  - many surveys – analysing what industry is doing, not so many new solutions to solve found problems
  - not a clear understanding of the enterprise architecture function and role in the enterprise
  - many frameworks, but none is readily usable
  - EA doesn't have to be formally approved to provide value
  - if there is a connection between EA elements (traceability), simple estimates can be calculated for assessing the value of EA
  - financial perspective should be connected to EA

3rd SoEA4EE Papers 1/2

- Healthcare Software as a Service: the Greater Paris Region Program Experiencec – the so-called “Région Sans Film” program
  - outsourcing picture archiving & communication to cloud
  - same services at lower prices
  - problems
    - directors of institutions see substantial loss of governance
    - change of service provider is nearly impossible!
- A Maturity Model for Implementing ITIL v3 in Practice
  - based on CMMI-SVC
  - very extensive questionnaire (tries to avoid auditing)
  - most organizations that had ITIL implemented were still on level 2
  - private companies achieve better results

3rd SoEA4EE Papers 2/2

- From Business Process to Component Architecture: Engineering Business to IT Alignment
  - goal: make the business artifacts present in the implementation
  - a set of service components is created based for business process, which reflects the structure of the business (process particiants) – this preserves the alignment with business
  - resulting SCA models/domains represent business capabilities
  - BPMN → IM (partitioning) → SCA
  - in future non-functional requirements will be taken into account
  - the smaller the components – the harder the evolution!
- A Service-System Based Identification of Meta-Services for Service-Oriented Enterprise Architecture
  - meta-services are services acting upon services
    - actually described configuration/administration services!
  - service systems are configurations of internal or external services and resources

4th EVL-BP Papers

- Semantically-Driven Workflow Generation using Declarative Modeling for Processes in SE
  - candidate activities and relations are modeled in the ontology
  - problem is decomposed and resulting fragments are used depending on the situation
  - workflow is composed according to te constraints
    - existence for selecting the activities
    - sequencing/succession for arranging activities
  - running process can be adapted as more information about the situation is found out
  - can be done for any complex business process

Reflections

- Connect EA elements to business principles & motivations
- Declarative definition/description of business processes → rules
- Textual modeling of concepts and data/info → DSLs
- Structure of business should be visible/recognizable in software implementation
- Fourh level of modeling → external (UI, ...)
- Good way to stay flexible is to write less code!

- Modeling business = modeling business processes (?)
- Modularization of big models is problem for both process models and for data/info models ← "goto" (e.g. unstructured flow) considered harmful!
- Old things – New names!

Thank You!

Questions?