Strategic Modelling for Enterprise Integration

Eric Yu
University of Toronto

14th World Congress
International Federation of Automatic Control
July 5-9, 1999 Beijing China

Modelling for Enterprise Integration

• It is well-recognized that many types of modelling are required to deal with the various aspects of enterprise, e.g.,
  – activity modelling
  – function modelling
  – resource modelling
  – information modelling
  – organization modelling
• e.g., CIMOSA, GERAM,...
Towards richer organization modelling

• How do we express and reason about
  – motivations
  – rewards
  – different ways for achieving objectives
    • understanding “why”
    • opportunities and vulnerabilities

... strategic business and social relationships

Consider one very successful enterprise...

Customize Your Own Tastes at IKEA
Over 540 Combinations!

welcome to IKEA
Home Furnishings for your home

children’s IKEA
real life rooms
self-serve warehouse
getting it home

• important organizational and social aspects are missing in conventional models
Consider another very successful enterprise...

- the differences are not only in workflow, information, resources, etc.,
- but also in organizational/social and strategic relationships among (internal) organizational actors and with (external) customers, suppliers, etc.

Modelling Strategic Actor Relationships and Rationales

- **Strategic Actors**
  - have goals, beliefs, abilities, commitments
  - depend on each other for goals to be achieved, tasks to be performed, resources to be furnished
  - are semi-autonomous -- not fully knowable / controllable
Wants and Abilities

A Strategic Dependency Model
A Strategic Dependency model showing reward structure for improving performance, based on an example in [Majchrzak96].

Some strategic dependencies between IKEA and its customers
Analysis and Design Support

- opportunities and vulnerabilities
  - ability, workability, viability, believability
  - insurance, assurance, enforceability
  - node and loop analysis [Yu ICEIMT'97]
- design issues
  - raising, evaluating, justifying, settling
  - based on qualitative reasoning  
    [Chang Nixon Yu Mylopoulos, forthcoming monograph]
Sample $i^*$ representation for an actor (in Telos)

TELL Class Physician IN PositionClass
ISA ProfessionalPosition WITH
resDepends, committedTo
  fs: FeeForTreatment WITH
dependee cm:ClaimsManager end
goalDepended, commitsTo
  td: $Treated(p.injury)$ WITH
deeper p:Patient end
taskDepends, committedTo
  tm: TakeMedication(p.med) WITH
dependee p:Patient end
covers
  tp: TreatingPatient(p)
  bi: Billing(p.insurCo)
integrityConstraint
correctClaimsManager:
  $cm=p.insurCo.claimsMgr$
end
Ongoing Work

- formal knowledge representation using a conceptual modelling language Telos
- tool building - GUI, repository support
- knowledge libraries
  - strategic knowhow
  - case-based reasoning
  - patterns
- case studies
- coordination with other modelling techniques

Summary and Conclusions

- Need intentional modelling about strategic actors to deal with complex organizational, social aspects.
- Modelling ontologies may be adapted selectively from organization theories, artificial intelligence, requirements engineering, etc.
- Strategic modelling needs to be part of comprehensive framework for Enterprise Integration.

http://www.fis.utoronto.ca/~yu