

Integrated value chains

Models and challenges

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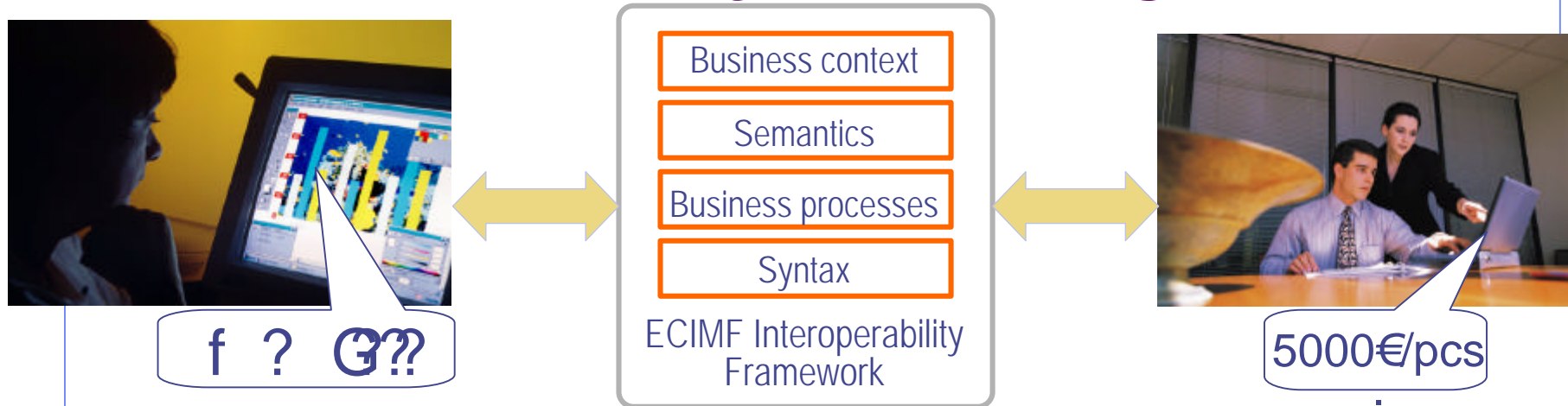


Era of Virtual Organizations?

- ◆ Virtual organization:
 - A network of heterogeneous and autonomous enterprises
 - Cooperates towards common goals
- ◆ Possible short-term and ad-hoc cooperation
 - Flexibility in choosing best offers and partners in deals
 - High quality, machine-processable information flow between partners – required for automation of business processes, and to realize cost reductions
- ◆ How far are we from the Promised Land?



Interoperability challenges



- ◆ Different business cultures
 - Across industry sectors, geographical regions, laws, communities...
- ◆ Different technical frameworks
 - Business processes, standards, implementations, back-office ...
- ◆ Standards DO help – there are just too many of them... ☹
 - Fragmented standards create larger integration costs
- ◆ Legacy systems – a permanent issue
 - New standards won't make them go away...
- ◆ ECIMF meta-framework addresses these concerns



E-Commerce Integration Meta-Framework

◆ *E-Commerce Integration Meta-Framework (ECIMF)*

- a standardization project in CEN/ISSS Workshop for Electronic Commerce
- High-level, universal aspects of interoperability in e-commerce

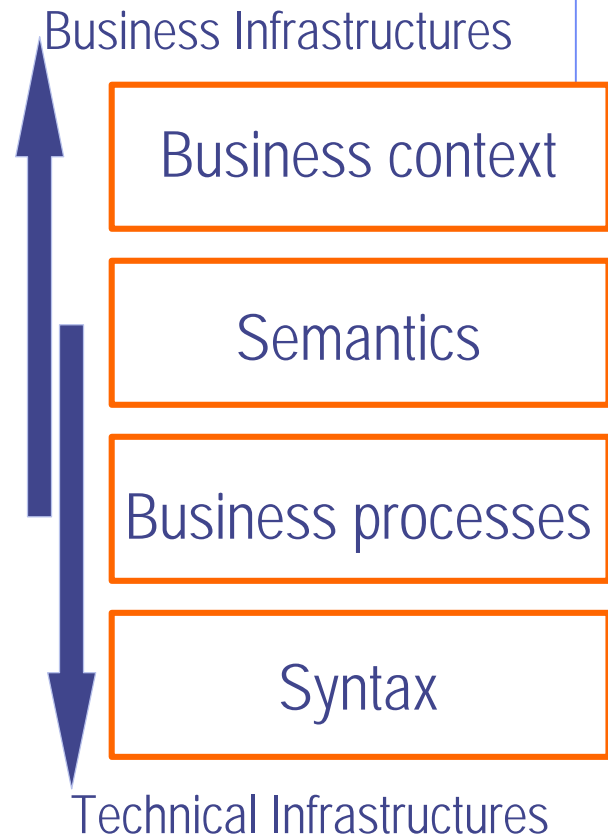
◆ Provides a general model for assessment and positioning of various system integration strategies and tools



ECIMF Interoperability model

◆ Interop. of **business infrastructures**

◆ Interop. of **technical infrastructures**

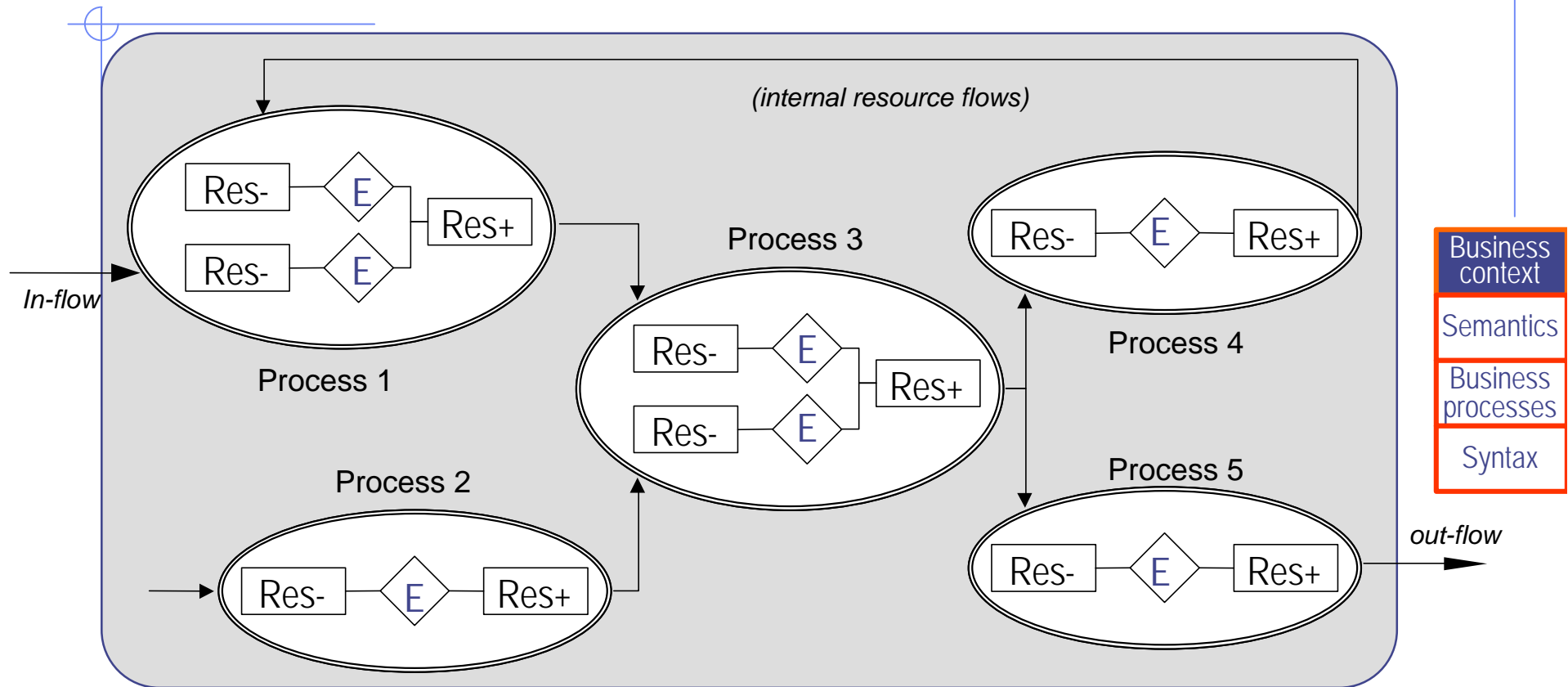


Role of Business Context

- ◆ Economic goals, business rules and legal obligations ultimately define the meaning and consequences of information exchange
- ◆ ECIMF Business Context Modeling
 - Economic aspects, based on REA
 - ◆ **R**esources: what is traded
 - ◆ **E**vents: when and how it happens
 - ◆ **A**gents: who is involved
 - ◆ Agreements & Commitments: legal aspects, transactional nature
 - Value-chain view of commerce
 - ◆ Chain of business processes
 - ◆ Flow of resources between processes



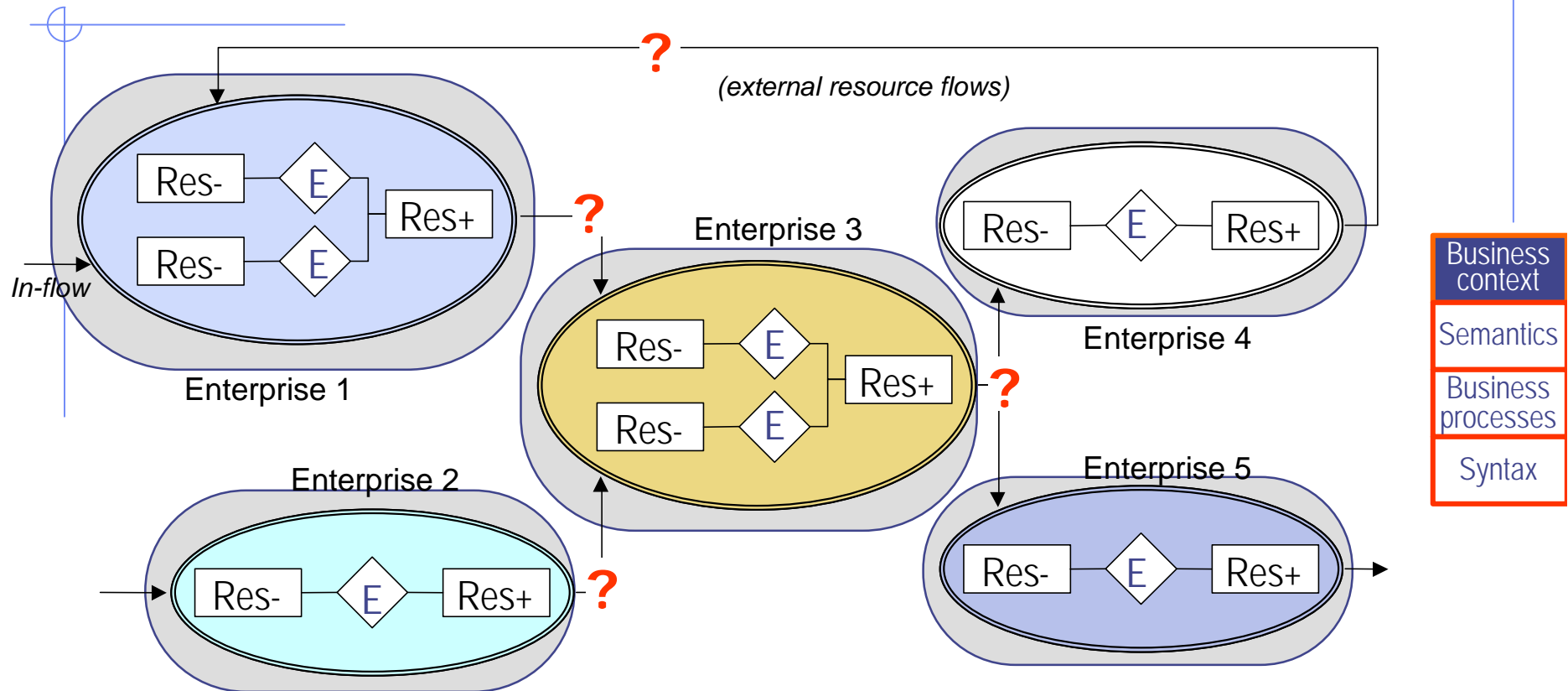
Original REA Enterprise view



- ◆ Internal value chain – flow of resources, exchanged and transformed in series of events.
- ◆ Loss / revenue is a total value of imbalanced resources



Virtual organization - REA view



- ◆ External value chain – flow of resources, exchanged and transformed in series of events, enforced by legal commitments
- ◆ Enterprises co-operate, **BUT** stick to local choices and solutions
 - Local business context adversely affects interoperability
 - Trust and security aspects limit the choice of ad-hoc partners



Business context interoperability

◆ REA models (retro-fitted to virtual organizations) help to understand interoperability issues on the value-chain level:

- Describe contractual commitments and their relationship to partners' collaborations, transactions and processes
- Identify differences in local business context
- Adopted as a central part of business models in ebXML

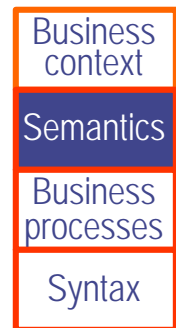
◆ Eventually, these models will be able drive a fully automatic contract formation

- **However**, to facilitate ad-hoc and short-term cooperation, **trust and security** aspects need to be addressed:
 - By quality seals
 - By formal certification of authenticity
 - By internationally recognized business rating services
 - By referrals from past and current partners

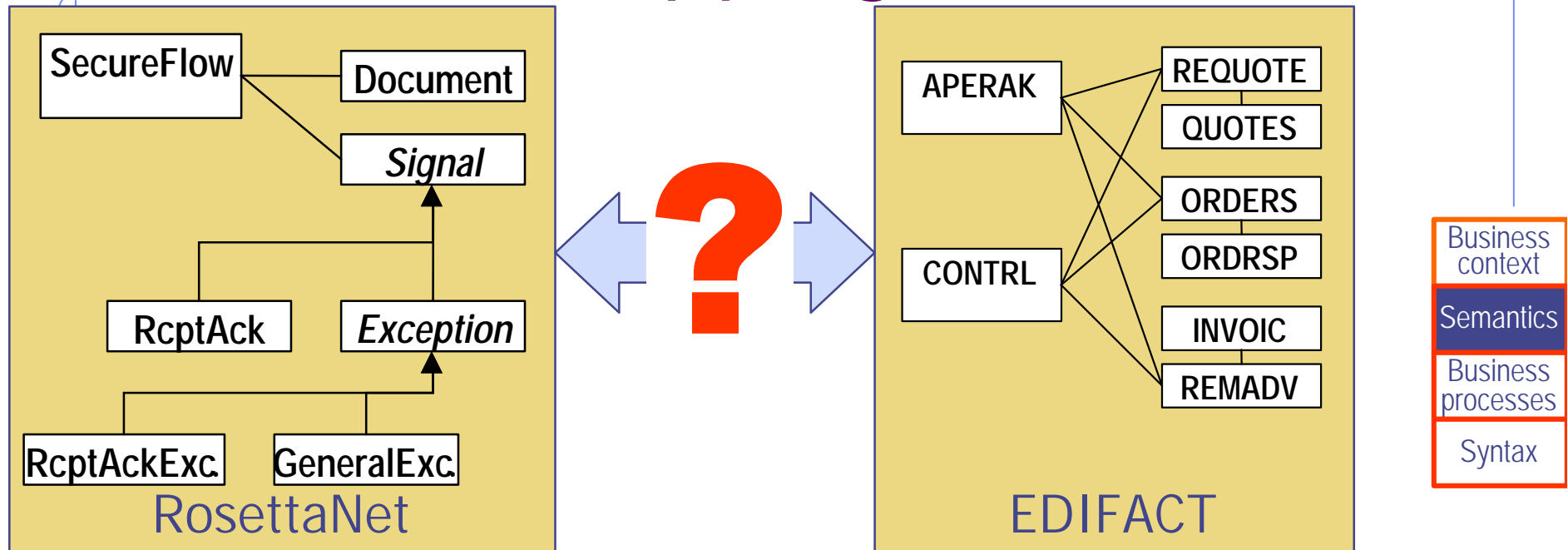


Semantic Pandora's box

- ◆ There are islands of well-defined semantics for use in e-commerce:
 - Universal classification schemas (EAN/UCC, UNSPSC ...)
 - Standard e-commerce frameworks (RosettaNet, OAGIS, ebXML, xCBL ...)
- ◆ But generally no overall unified business semantics across existing standards:
 - Similar business concepts expressed differently
 - Different semantic depth
 - Ambiguous and overlapping concepts
- ◆ This effectively **prevents** ad-hoc scenarios



Semantic mapping / translation



- ◆ Well-established older standards will linger
 - The integration problem will NOT go away any time soon, no matter what new standards come up...
- ◆ We need more effective methods of semantic mapping
 - ISO TC/154 Basic Semantic Register
 - ECIMF Semantic Mapping Tool
 - Semantic Web projects
 - BUSTER project, and others



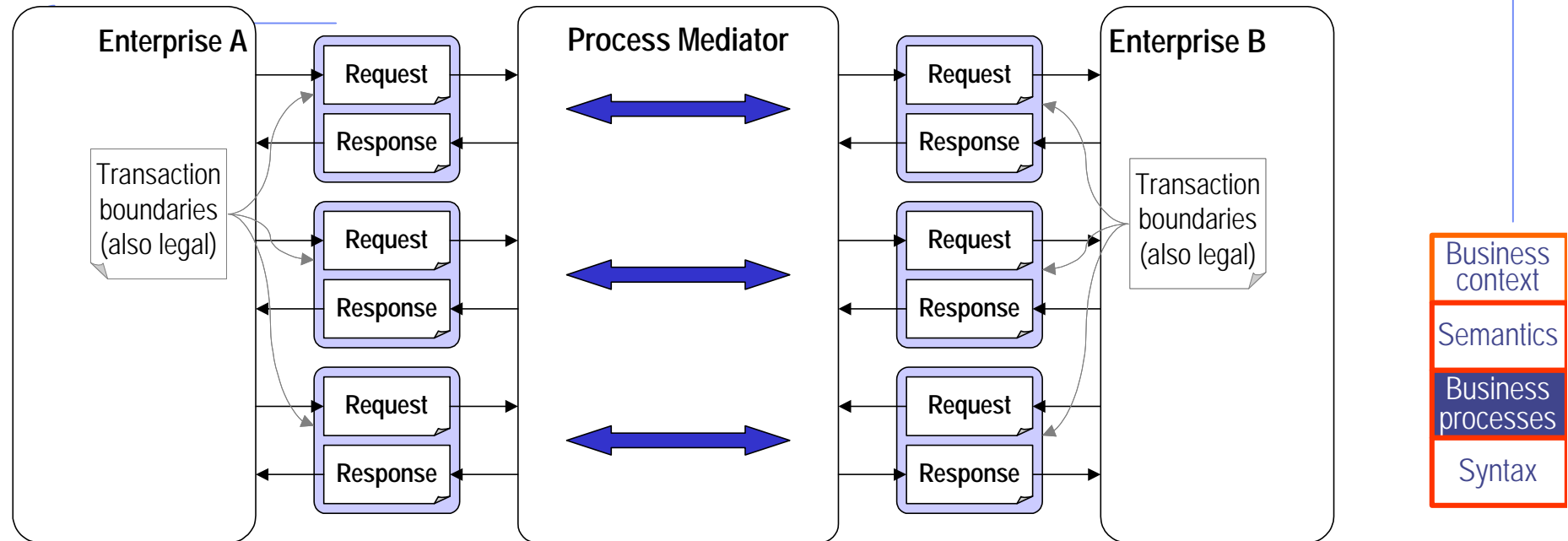
Business process integration

- ◆ Good models are being worked on
 - UN/CEFACT ebXML project
 - ◆ Second phase concentrates on a comprehensive, unified and applicable business modeling
 - ◆ There are early reference implementations
- ◆ BPSS, CPP/CPA, BPML, WSFL, WSDL, etc...
DO help
- ◆ **BUT** little is being done on process mediation
 - Assumptions made: “everyone will conform to our new model”
 - There is no agreement on how to reconcile different business process specifications, **across** different standards – ad hoc methods prevail
 - Non-trivial issues: transactions boundaries, compensation

Business context
Semantics
Business processes
Syntax



Business process mediation / brokering



- ◆ Process mediation methodology is required
 - ◆ To mediate the information / message flows
 - ◆ While preserving transaction boundaries
- ◆ “Process Broker” project at KTH/DSV, Sweden
- ◆ Much more applied research needed + standards!



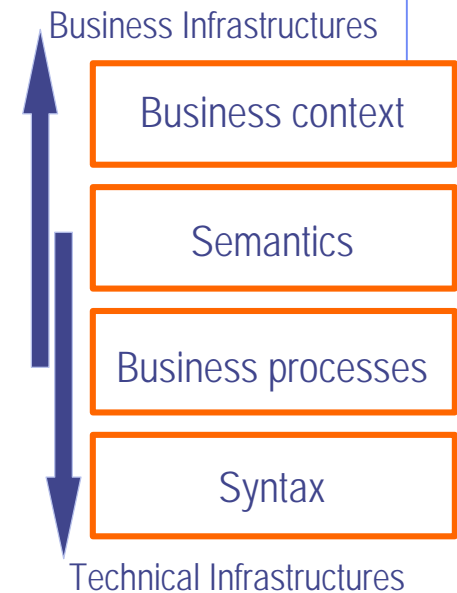
Syntax and transport-level integration

- ◆ Well known and broadly applied techniques:
 - Message format mapping and transformation
 - Usually works on message/data element levels
 - Rarely provides a model-driven approach
- ◆ Often complex, if disregards higher-level models
 - Tangle of ad-hoc, intricate rules and expressions
 - Difficult to understand and follow changing constraints coming from business process and business context levels
- ◆ Low-level specifications (SOAP, WSDL, XML-RPC, ebXML TRP, etc...) DO help
 - Especially if the underlying business and technical models are similar (e.g. within enterprise) – typical EAI
- ◆ **BUT** Often insufficient in virtual organization scenarios
 - ◆ Different and rapidly changing technical infrastructures
 - ◆ Different and rapidly changing business infrastructures
- ◆ We need more **model-driven tools** for low-level integration
 - Rapid and cost effective integration required for ad-hoc scenarios
 - Changes in models and business context should drive the low-level mapping



Conclusions

- ◆ Virtual Organizations would offer many advantages
- ◆ Ad-hoc cooperation demands rapid and cheap integration
- ◆ Integration involves more aspects than just technology
 - Integrated value-chains (role of business context, trust and security)
 - In some areas (semantics) more fundamental research is required before any progress is possible
 - Differences in business processes require mediation – non-trivial (think: failed transactions)
 - Web Services-related specifications DO help, mainly in EAI, but not so well across enterprises – too weakly bound to models
- ◆ Standards for holistic integration needed!



More information

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