Business Information and Process Modeling for E-Commerce

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Agenda

- About CECID
- Layers of E-Commerce Interactions
- Business Information Modeling
- Business Process Modeling
- Q&A
Who Are We?

- Center for E-Commerce Infrastructure Development
  - R&D center established in Jan 2002 at The University of Hong Kong

- Mission
  - We create the infrastructure and environment that allows electronic commerce to pervade large and small businesses through technology innovation, industry collaboration, and knowledge cultivation.

- Activities
  - E-commerce technology R&D
  - Local and international e-commerce standardization
  - Technology transfer...
R&D Areas

- **B2B interoperability technology**
  - reliable and secure data exchange on Internet based on XML
  - business process and information modelling
  - integrate and automate business-to-business (B2B) processes

- **Open standards: adoption and contribution**
  - Web Services, ebXML, RosettaNet
  - trading partners may use different software platforms to do e-business

- **Open source software**
  - established FreebXML.org international initiative in 2002
  - key driver for global B2B e-commerce
Layers of E-Commerce Interactions

- Standardization enables interoperability in large scale
- XML is a tool for standardization
Case Study: RosettaNet

- RosettaNet defines open e-business standards
- A common **language** for automated e-business exchange:
  - RosettaNet Dictionaries – the words
  - RosettaNet Implementation Framework (RNIF) – the grammer
  - RosettaNet Partner Interface Processes (PIPs) – the dialog
The Easy Shot…

- **Transport** is easier to achieve interoperability
  - Clearer specifications
  - Payload agnostic, and so backend data source agnostic
  - Foundation for the **process** layer to operate
The Easy Shot…?

- May not as easy as it looks like…
  - Many specifications:
    - ebXML Messaging Services, Web Services, WSRM, RNIF, AS2, HTTP, etc.
  - Interoperability initiatives:
    - WS-I, ebXML Asia Committee Interop Task Group, Drummond Group, KorBIT, NIST, etc.

- We are developing a messaging platform which supports multi-protocols – Project Corvus
Business Information Modeling

- **Who:** Business partners (both sides)
- **What:** To define a message schema for information exchange
- **Why:**
  - Generality: To *reuse* as many components in the message schema as possible
  - Specificity: To produce *specific* schema under different scenarios
Technologies

- **ISO 11179 Data Models**
  - Object inheritance

- **Core Component Technical Specification (CCTS)**
  - Harmonization & Contextualization
  - Based on ISO 11179

- **Universal Data Element Framework (UDEF)**
  - Complements CCTS by providing an ID to each component for semantic identification

- **Universal Business Language (UBL) 1.0**
  - Based on CCTS and defines message formats for Order-to-Invoice business scenarios
Universally Applicable?

- UN/CEFACT TBG17
- UBL
- UDEF

It may take years to harmonize!

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Challenges on BI Modeling

- Component reusability
  - Reuse by reference? Reuse by value?

- Message validation

- Backend integration
  - EAI
  - Message composing/parsing library
  - Data structure/Schema transformation

- Availability of modeling tool
  - Productivity tool
  - Design aiding tool
  - We are developing a BI Modeler for helping this part
Business Process Modeling

What is a business process?
- “A set of all the separate steps toward the final business goal” – Webopedia

What are the essential elements in a business process?
- Steps (Transactions) – Yes
- Relationship of steps – Yes
- Roles who involved in steps – Yes
- Transport parameters – No
- Messages to be exchanged – ??
B2B and Enterprise Application Integration (EAI)

- B2B and EAI are complementary to each other.
- EAI will facilitate the generation of messages to be exchanged in B2B business processes.
- The business processes in EAI will drive the business processes in B2B, and vice versa.
- Conclusion: We need to integrate the business processes in B2B and EAI.
Example: RosettaNet PIP – 3A1
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**Buyer**
- Need to order
- Analyze ordering needs
- Request a new quote
- Send message

**Seller**
- Receive
- Send quote
- Collect detailed information for the quote line items (fixed price / negotiated price, configurable / stand alone product, freight, tax, purchase order required)
- Can we meet the requirements of the quote request?
- Yes
- No
- Collect suitable supplier's information
- Yes
- Do we want to suggest another supplier?

**B2B**
- Receive
- Send referral

**EAI**
Representation of Business Processes

- ebXML Business Process Specification Schema (BPSS)
  - Focuses on collaboration between roles
  - For B2B business processes

- Business Process Execution Language for Web Services (BPEL4WS)
  - Focuses on declaring coordination between systems
  - For EAI business processes

- Others: BPML, BPMN, WSCL, etc.
Execution of Business Processes

- We developed TranXnet, which is an execution engine for “running” business processes.
- We believe that it is possible to represent both BPSS and BPEL4WS using a lower level language devised by us – TranXnet Execution Language (TEL)
  - BPSS -> TEL
  - BPEL4WS -> TEL
- Then, the problem of BPSS/BPEL4WS integration reduces to TEL/TEL inter-process communication.
Abstraction of Transport Parameters

Our experience:

- In most of the cases, a business process in an enterprise, once deployed, is seldom changed
- However, the transport parameters and message schema may be updated more frequently
  - E.g. relocation of servers, adding fields in messages, etc.

Therefore, TranXnet promotes abstraction of transport parameters, so that any changes in those parameters will not affect the logic in the running business process

- The “essential” part of a BP remains unchanged
Reusable Patterns

- In BI modeling, we promote reusability of data components.
- Similarly, in BP modeling, the “essential” part of a BP could be generalized and be reused as patterns.
- RosettaNet PIPs are good starting points.
- Possible underlying methodology: UMM, BCF.
- We plan to develop a BP modeler for the business analysts to design the “essential” part of BPs using patterns.
Any Other Layers?

- In Supply Chain Management (SCM)
  - Information flow – transport, data, process
  - Product flow – material, goods
  - Finance flow – $$

- EAI/CRM prepares data for information flow

- Radio Frequency Identification (RFID) is an emerging technology to track product flow
Conclusion

- Business information and business process modeling are 2 important dimensions for e-commerce interoperability
- Relevant standards are emerging and getting mature
- Useful tools should be developed to promote adoption of standards and modeling techniques
Questions?

Thank You!

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