Application and Process Integration

Paul Johannesson
Department of Computer and Systems Sciences, Stockholm University

Benkt Wangler
Department of Computer Science, University of Skövde

Presentation Outline

- Need for application integration
- Levels of integration
- Technologies for integration
- Message brokers and process brokers
- Research directions
Organisational functions

A function is a unit in an organisation that carries out a set of related activities. Usually, these activities require special competence or equipment.

Examples:
Marketing
Sales
Procurement
R&D

Processes

A business process is a sequence of activities that result in value for a customer

Typically resources from several functions are required to carry out a process
Stovepipe syndrome

Each IT system supports its own function

Integrated IT support
From ERP to Enterprise Systems

ERP definition

Software solution that addresses the enterprise needs taking the process view of an organisation to meet the organisational goals tightly integrating all functions of an enterprise

Customer Relationship management, CRM
Sales Force Automation, SFA
Supply Chain Management, SCM

Anatomy of an ES
From Supply Chain to Value Network

Vertical Integration

Strategic
- DSS
- DM
- OLAP

Tactical
- Data Warehouse
- ODS

Operational
- ERP
- SCM
- MES
- Process control, NC
Definition of EAI

Enterprise Application Integration (EAI) is “the unrestricted sharing of data and business processes among any connected applications and data sources in the enterprise”.

D. Linthicum

Levels of EAI

Presentation

User interface level

Application

Method level

Data level

Application interface level

Data
Middleware - Technology for EAI

Middleware is software that facilitates communication between software systems.

Types of Middleware

- RPCs (Remote Procedure Calls)
- MOM (Message Oriented Middleware)
- Distributed Objects
- Database Oriented
- TP Monitors
- Message brokers
- Process Brokers
Architectures of EAI

Point to point

Many to many

Message Translation

Source
F. name: Benkt
L. name: Wangler
Affiliation: University of Skövde, Skövde, Sweden

Target
Name: Benkt Wangler
Company: University of Skövde
City: Skövde
Country: Sweden
Intelligent Routing

Source Systems

Target Systems

Message Broker

Message Broker Services

Repository Services

Intelligent routing

Rules processing

Message Translation

Message Warehousing

Adapters
Architectures of EAI

Levels of Technology

Process Integration and Automation
Message Broker
Message Translation
Intelligent Routing
Rules Processing
RPC, MOM, ...
Messaging Services
Process Broker
Common Models for Different Stakeholders

Analysis  Design  Operations

Process Broker Services

Process Design  Process Visualisation  Process Simulation

Process Monitoring  Process Execution
Sample Tools

- Viewlocity SmartSync
- Vitria BusinessWare
- HP ChangeEngine
- Extricity Alliance Manager
- Crossworlds
- Corus

Research Directions

- Design methodology
- Process libraries
- Adaptive process management
- Moving application logic into processes
Need for Methodology

Problem:

Complex and unstructured models
Exception handling
Extensive communication
Redundancy

Solution:

Design guidelines

Methodology for Design

Order subscription process (view 1)
Methodology for Design

Process Libraries
Adaptive Process Management

Types of exceptions:
- Basic failures
- Application failures
- Expected exceptions
- Unexpected exceptions

Moving Business Logic out of Applications

- Sequencing
- Customer service selection
- Transaction integrity

Business rule represented only once simplifies change and reduces risk for inconsistency
Conclusion

Application systems need to be integrated over business processes so as to form an information systems infrastructure that seamlessly supports each process. This demands the introduction of technologies, methods, and tools to easily define and manage business process and their integration requirements.

Books

- S. Abiteboul et.al.: Data on the Web: From Relations to Semi-Structured Data and XML, Morgan Kaufmann, 1999
- D. Linthicum: Enterprise Application Integration, Addison-Weseley, 2000
- J. Morgenthal: Enterprise Application Integration with XML and Java, Prentice Hall, 2000
- R. Zahavi: Enterprise Application Integration with CORBA, John Wiley & Sons, 1999
Web sites

Resources
- EAI Journal: www.eaijournal.com
- Intelligent Enterprise: www.intelligententerprise.com

Companies
- Extricity: www.extricity.com
- HP: www.hp.com
- Viewlocity: www.viewlocity.com
- Crossworlds: www.crossworlds.com
- Vitria: www.vitria.com