

## **INTERORGANISATIONAL WORKFLOW ARCHITECTURE**

Using e-commerce to automate inter-business processes across supply chains presents significant challenges.

- To transfer supply chains into open and interoperable market places.

### **Types of workflow applications:**

- For purchase approvals and accounting.
- To automate complex business processes between buyers and sellers (workflow processes to model buying and selling processes)
- Virtual business process
- Relevance of workflows in internetworked economy
- Virtual enterprise

A virtual business process of a virtual enterprise =  
inter-organizational workflow <sup>^</sup> =  
 it combines services of different companies (= trading community)

How to provide a mechanism whereby companies can advertise their services and how to execute a virtual process that spawns several enterprises without being managed by one physical enterprise.

Three architectures; for managing business processes:

- A> Process portal
- B> Process vortex
- C> Dynamically trading processes

A> Process portals: (peer to peer interaction) P2P

- i> Application servers
- ii> Databases

What does it:

- i> Manages data and into it needs to meet customer needs.
- ii> Workflow process support and EAI services to interface with applications, primarily within single organization.

**They support:**

- a> Data = Web Publishing
- b> Web hosting
- c> Application servers
- d> Database + transaction – oriented e-commerce
- e> Process portals = manages variety of customizable processes

**B> Process vortex** (interaction between buyers and sellers is through a third party market maker)

- 1> Provides organic support for business process
- 2> Sellers advertise their goods and services
- 3> Business processes are designed to incorporate different trading models (such as auctions → based on structural trading rules)!
- 4> Process templates for buyers to realize buying activities
- 5> Workflow processes are predominantly predefined (however processes can be customized), and they tend to evolve over a period of time.
- 6> Multi-tier SA to prevalent in implementing a vortex
- 7> Intelligent agents can be used to fully implement the market place (role of multiple coordinate agents).

### C> Dynamically trading processes:

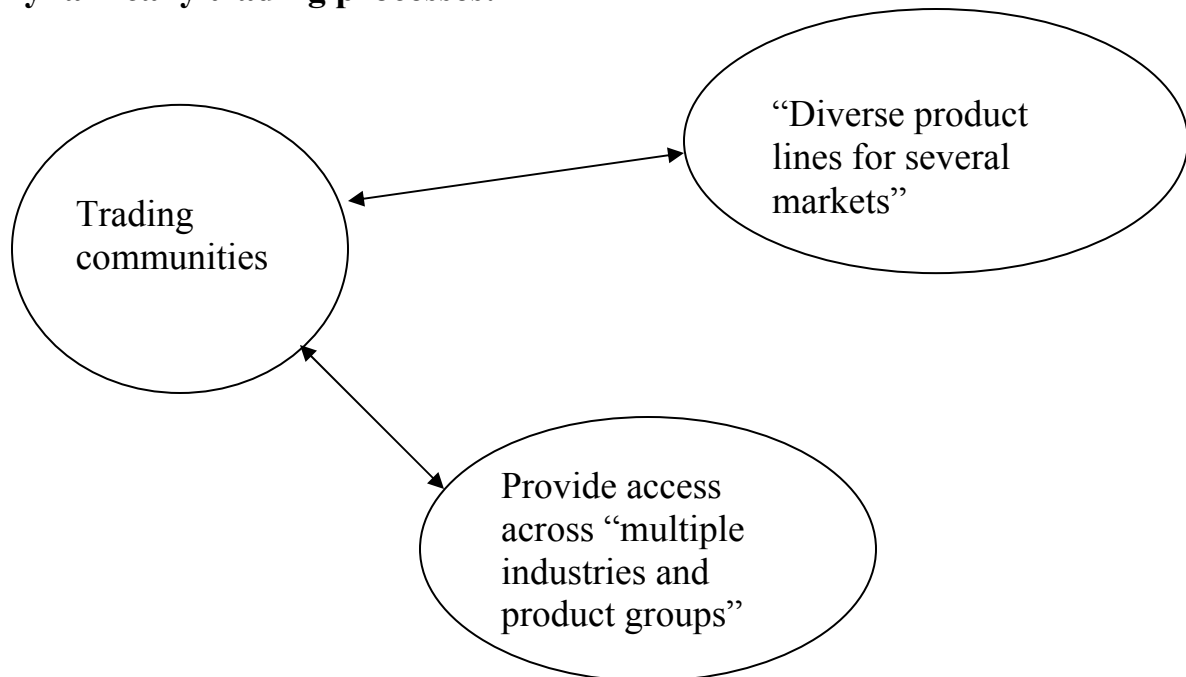


Figure 1

- Intimate concurrent interactions
- Autonomous or semi-autonomous organization that need to cooperate (organization need to be autonomous to preserve competitive business environment)
- Partial visibility to the partners

### Features

- 8> Neither business processes nor the set of possible interactions are predefined
- 9> A unique process can be dynamically constructed on a per customer basis

### Key technologies (for workflow process management)

#### 1> Workflow design:

- Perspective: process, organization, information, and operation
- Workflow process definition (workflow schemas) (task in atomic piece of work)
- Cases (instantiated workflow process definitions)

Case = execution of concrete work according to specific routing or set of business rules

- Roles (resource classes based on functional aspects)
- Groups (resource classes based on organization aspects)
- resources (humans + devices)

## Five perspectives of WMS

- a> Process perspective
- b> Organization perspective
- c> Information perspective
- d> Operation perspective
- e> Integration perspective

WMFC = Workflow Management Coalition

WMS that are based on PNs:

- COSA (includes advance scripting language)
- INCOME
- Baan ERP
- SAP R/3

Fact: Majority of WFMS use a design language that corresponds to the so called Free-Choice Petri nets

Issue: Reuse of workflow-process definition.

## Ideas:

→ Workflow templates = standard design of a common workflow process

2> Workflow analysis: (for correctness effectiveness and efficiency of business processes)

- a> Verification, (syntactic correctness; structure + dynamic), (deadlocks, livelocks), soundness.
- b> Validation, (semantic correctness)
- c> Performance (quantitative measure)

a> Verification of workflow process definition

Woflan – workflow verification tool

Uses coverability graph, linear algebraic techniques, and structural methods

b> Short term simulation: (form of a decision support system)

ExSpect → can simulate COSA workflows

ARIS → can import / export Staffware procedures

Business specs → can import / export Staffware procedures

Meta Software workflow analyzer → Visual Work Flo and FloWare

**ENACTMENT:** (service)

- 3-tier C/S architecture / Web-enabled
- Mobile agents
- Workflow as distributed / cooperating agents / objects
- Organic process support

ORB work

→ of the METEOR (EApps – commercial version)

WebWork

Wide (Workflow Intelligent and Distributed Database Environment)

European Commission / C/E architecture autonomous problem-solving agents

- Architecture: distributed cooperating objects or agents
- Agent-based Workflow management systems!