Processes without Boundaries: Working in Dynamic Virtual Enterprises

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The world wants more and more from you ...
So ….

- Develop more business functions
- Hire more staff
- Extend your business processes
- Into lots of complexity and inflexibility
- ..... or ......
- Get into dynamic business networks
- Connect your business processes
- Into the World Wide World 😊
Gartner Reveals Five Business Process Management Predictions for 2010 and Beyond:

- **By 2013, dynamic BPM will be an imperative for companies seeking process efficiencies in increasingly chaotic environments.**
- **By 2014, business process networks (BPNs) will underpin 35 per cent of new multi-enterprise integration projects.**
- **Dynamic Business Process Networks will be essential in future business – and they need automated support.**
Developments in markets
Changing product characteristics

- Rapidly growing product complexity
  - Inherent complexity (television sets)
  - Hybrid products (cars, financial products)
  - Combinations of products and services
- Rapidly increasing number of varieties
  - Complex sets of customer-chosen variables
  - Up to complete mass customization (PCs: Dell)
- Rapidly shortening life-cycles
  - Quicker generation succession (cars)
  - Quick technical end-of-life (PCs)
  - Quick economical end-of-life (GSMs)
Changing producer characteristics

- Focus on core competence
  - Be (second) best in class or drop out
  - Outsource non-core processes
  - Engage in co-makerships
  - Be lean and mean
- Play on a global level
  - Collaborate around the planet
  - Offer regionally customized products
- Must be prepared to change
  - Internally – and –
  - In network collaborations
Static chain
Semi-dynamic chain
Dynamic chain
Networked suppliers
Comakership
Service outsourcing
Complex business network
Main observations (1)

• 'Process' is the magic word
• Tight linking of business functions (e.g. for demand chains)
• Required end-to-end (order to delivery) business optimization
• From function-oriented business to process-oriented business
• Within individual organizations, but increasingly across organizations
Main observations (2)

- **Vertical process coupling (client-server)**
  - delegating secondary subprocesses
  - stripping non-core competences
  - dealing with efficiency & flexibility
  - business service outsourcing
- **Horizontal process coupling (peer-to-peer)**
  - collaboratively executing main processes
  - combining core competences
  - dealing with complexity
  - co-makership
Towards DVEs: The core concepts
Market
Virtual Enterprise
Dynamic Virtual Enterprise
VE life cycle time dimension

- **Static**
  - VE life cycle not specified

- **Semi-dynamic**
  - VE life cycle specified in terms of time period or batch of client orders

- **Dynamic**
  - VE life cycle per client order

- **Ultra-dynamic**
  - Possibly multiple VE life cycles per client order
DVE life cycle

Business Order

Ultra-dynamic → Dynamic → Semi-dynamic

1          10           100         1000         10,000
Dynamic Virtual Enterprise
Dynamic Business Process Network
Towards DVEs: The practice
Status quo?

- Are process-oriented, dynamic business networks common practice?
  - No, not yet in current industrial practice
  - But in prototype phase for about a decade
- Will they be important in future practice?
  - Yes, the international market will take care of that
- So where, for example?
  - Financial industry: CoProFind (now)
CrossFlow (1): Logistics Industry

- **Service consumer:** telecom company
- **Service provider:** logistics company
- **Outsourced service:** delivery of mobile phones
CrossFlow (2): Dynamic Service Outsourcing

Dynamic Virtual Enterprise

Contracting

Invocation and Result

Monitoring and Control

Service Consumer

Service Provider
CrossFlow (3): Results

- On-the-fly, contract-based, dynamic outsourcing of business processes
- Contracting and process linking fully automatic (in the order of 1 second)
- Possible on a per-customer-order basis – even if customer orders are small
Healthcare: Teleradiology

Patient / Hospital

Clinic / Hospital

Scan Interpreter

Transcriber

Translator

Native Speaker

‘Second’ Radiologist

Finance Organization

BI Department

Tele radiology

Scan Interpretation

Transcribe

Translate

Language Verification

Second Reading

Billing

Business Intelligence
CrossWork (1): Automotive Industry
CrossWork (2): Dynamic BP network
CrossWork (3): Results

- Shortening business network setup from months to days (or even shorter?) based on semi-automatic composition
- Coordination of business processes in network through Web-based technology based on BPEL engine
Financial industry: CoProFind
Towards DVEs: The support
Automated support required for DVEs

- Collaboration gets more complex
  - Multi-party business process networks
- Collaboration changes more often
  - Maybe even on a per-customer-order basis
- We are talking about primary processes
  - You don’t want things to go wrong
- So we need automated support
  - For reasons of effectiveness
  - For reasons of efficiency
Information system functionality

- Establishment of contracts (incl. SLA/QoS)
- Enactment of contracts
- Monitoring of contracts
- Adaptation of business processes
- Linking of business processes
- Enactment of business processes
- Handling of exceptions
- Generation of management information
- *Hardly about new IT, but about new ways of using it!!*
CrossWork: architecture

- **Dec. UI**
  - Goal Decomposition
  - Products KB

- **Form. UI**
  - Team Format
  - Market KB

- **Comp. UI**
  - Process Compos.
  - Patterns KB

- **Monit. UI**
  - Global Enactm.
  - Local Enactm.

- **Legacy Integrat.**
  - WF Clnt

**front-end: DVE construction**

**back-end: DVE operation**
CrossWork: technology stack

UI Technology

BPM Technology:
- eSML
- Woflan
- XRL/Flower

MAS Technology:
- JADE

SOC Technology:
- ActiveBPEL
- BPEL
- WSDL
- BP-WS

WFM Technology:
- iPerform

Internet Technology

Bridge: XSLT

front-end

back-end
Conclusions
A demanding world ....
Demanding situations ....

- Meeting new requirements by
  - Participating in high-quality business networks
  - Dynamically selecting collaboration partners
    - Teamwork in a changing playing field
    - Functional & non-functional characteristics
  - Specifying what and how in electronic contracts
    - Effective and efficient network management
  - Dynamic coupling of business processes
    - Fine-grained synchronization in networks
Where is dynamism in collaboration going?

- frequency
- intensity

- nothing
- some things
- everything

- never
- sometimes
- always
FLEXIBILITY
It is almost never, ever over-rated.