From Workflow and EAI to Orchestration and Web Services

OOP 2005
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Munich, Germany: Wednesday 2005-01-26; 17:15 – 18:15
Why this talk?
Where’s the EAI Hype?

EAI stack? What is an EAI stack?
We no longer have EAI stacks!
We have web services and process orchestration
Why this talk ...

This market is 15+ years old and still unstable. How did all this evolve? Where is it headed to?
Audience check

- People from financial institutions?
  - banks, insurances?

- People interested in the big picture?
  - architects?

- People interested in web services and BPEL implementation details
  - Sorry!
WHO is serving you this today?

• a guy who is in large scale professional software development since around 1990

• somebody who has implemented a workflow system in Smalltalk in the Mid 1990ties, written an EAI book in 2002 and is being followed by the topic ever since as a solution architect in the insurance industry as he has to integrate 4 generations of workflow related technologies

• no Generali Group Logo today, as I don’t want to involve my employer in anything that was a personal opinion of mine. So please dear vendors – please leave my boss alone and refer to me if I say something which you did not agree to.
• Some History: From task flow in monolithic systems to workflow in the mid 1990ties.

• The advent of EAI: How workflow made it to the EAI stacks round 2000

• A shift in paradigms: Reducing the workforce by automating B2B and other processes – from “work”flow to orchestration engines

• The role of web-services and service oriented architectures

• Today: Platforms, Magic Quadrants and integration challenges
Late 80ties architectures e.g. in the financial industry often looked like this – per silo

**presentation**

3270 terminals

**host**

IMS/DC or CICS

DB2 or IMS/DB

**business transaction manager**

**dialog control**

**application logic**

service layer
Late 80ties: The whole application landscape consisted of several silos – either divided per function or per product cluster – front office software was scarce.
90ties: First workflow approaches evolved to improve productivity in back-offices.
HOW Overview

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How EAI was sold
The A2A Integration Case

Graphik: Gartner Research, Mario Pezzini

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What EAI and Workflow have in common

automated processes on top of several legacies (silos) and hence the term „Enterprise Application Integration“

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A prototypical EAI Stack

- process layer
- communication layer
- protocol adapter layer
- transport protocols
  - email
  - http
  - Legacies
  - others
And how such a Stack can be used in B2B Process Automation (1 of 2) …
And how such a Stack can be used in B2B Process Automation (2 of 2) …

- application A
- application B
- application C
- application D
- application E
- EAI integration server

outside world

company A
HOW
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EAI has led to a rather unnoticed shift in how people think about workflows

- a fully automated process is the default case and not an exception
- human interventions are expensive and are avoided
- humans are called in by the process instance once the process detects that it needs help
How people are „used as a service“ in a BPEL modeled process

For details see e.g. http://www-5.ibm.com/at/events/technology/pdf/P120_Staff-Support.pdf
Similar Picture – Same Story
Multi-channel Processing

dialogs
GUI

process stack
process engine
routing
adapters

server\(_1\)
business logic

server\(_n\)
business logic

task list
(a.k.a. mail basket)

is a view upon

email
scans
fax
phone calls
other events
create

use
BPEL constructs needed to support this (not common in „old fashioned“ workflows)

- **Receive**
  - Wait for a message to arrive. Optionally start a new process instance when the message arrives.

- **Reply**
  - Send a message in reply to a message that was received through a Receive.

- **Invoke**
  - Invoke a one-way or a request-response operation offered by a partner.

- **Wait**
  - Wait for a given time period or until a certain time has passed.

- **Staff**
  - Invoke an interaction with a human user.
Today’s Process Approaches can achieve horizontal AND vertical Integration.
Sample: 80 / 20 business process optimization applied using modern WF engines
Hence: What's hot, using process engines

- Electrifying existing processes
- Multi-channel (n:m)
- B2B
- Radically new processes
- A2A
- Trade room
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- Today: Platforms, Magic Quadrants and integration challenges
Trend #1: „Dark processing“ will lead to a lot of web services that need process coordination.

Automated processes on top of web services and hence the term „Enterprise Application Integration“ web service orchestration.
Trend #0: Web Service support will be part of any application platform

- like HTML (and XML)
- ever seen a separate HTML platform? But HTML is ubiquitous
- So will be Web Services
Trend #2: Hence big vendors “crack up” their software in a Service Oriented Fashion …

IBM’s on demand Operating Environment’ (odOE)
Trend #2 (contd.): At least SAP does similar things..

Source: SAP NetWeaver Präsentation at CEBIT 2004
Trend#3: There’s a standard for web service orchestration BPEL4WS

The Business Process Execution Language for Web Services is an initiative of the industry leaders BEA Systems, IBM, Microsoft, SAP AG, Siebel Systems to drive and ensure interoperability for the description and communication of business processes based on web services.

See the BPEL4WS spec e.g. at:

Find a good intro at:
Trend #5: (Bonus Trend) Watch out for a „thing called“ ESB (Enterprise Service Bus)

Source: Gartner
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• The role of web-services and service oriented architectures
• Wrap-up: Platforms, Magic Quadrants and integration challenges
There are only 4 major platform vendors left today.
They all offer their own EAI / Orchestration stack.
Microsoft, IBM, Oracle, SAP.
They all support BPEL (to a different degree).
They all also appear in the Gartner Magic Quadrant for Application Integration Technologies

Source: Gartner Document M-22-8357, 14 May 2004

The Magic Quadrant is copyrighted 2004 by Gartner, Inc. and is reused with permission. The Magic Quadrant is a graphical representation of a marketplace at and for a specific time period. It depicts Gartner's analysis of how certain vendors measure against criteria for that marketplace, as defined by Gartner. Gartner does not endorse any vendor, product or service depicted in the Magic Quadrant, and does not advise technology users to select only those vendors placed in the "Leaders" quadrant. The Magic Quadrant is intended solely as a research tool, and is not meant to be a specific guide to action. Gartner disclaims all warranties, express or implied, with respect to this research, including any warranties of merchantability or fitness for a particular purpose.
All four platforms support BPEL more or less native

Not easy to choose from ?!?! …

<table>
<thead>
<tr>
<th>Platform</th>
<th>IBM WebSphere</th>
<th>SAP NetWeaver</th>
<th>Oracle iAS</th>
<th>Microsoft BizTalk 2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>BPEL Support</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Process Engine</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Process Modeler</td>
<td>Yes</td>
<td>Yes</td>
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<td>Yes</td>
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</table>
... BUT!
Technology changes faster than enterprises adopt it. This may result in integration challenges for enterprise architects.

- Business transaction mgr. (state ~ 1990)
- Workflow tools (state ~ 1994+)
- Process layer of EAI integration servers (state ~ 2000+)
- Web service orchestration (BPEL and the like) (state ~ 2003+)

Watch it! Functional redundancy...
In Practice this Challenge looks like

channel-specific UIs

use a common middle-tier

application logic stays on mainframe computers

The nasty question is how to deal with a legacy Business Transaction Manager
And this is only one instance shown here …
Summary
The Key Messages revisited

• workflow/orchestration technology still evolves – the more generations you have in your organization, the bigger your integration challenge
  • the BPEL execution servers are not yet really proven in heavy load field work

• you cannot ignore this technology. But individual use is different and also depending on your company’s individual history

• There’s a big economic potential in reinventing “dark” business processes and making full automation the default case
Credits

• Thanks go to Manfred Troger from Gartner, Vienna branch for obtaining the permission to use the Gartner Magic Quadrant
• Thanks go to Gartner Team Guiseppe Graci, Guivanni di Guardia, Massimo Pezzini, for a series of very helpful workshops
• I would like to thank Klaus Oberhammer from IBM for the slide on IBM “On Demand” computing plus his comments and insights