

Service-Oriented Process

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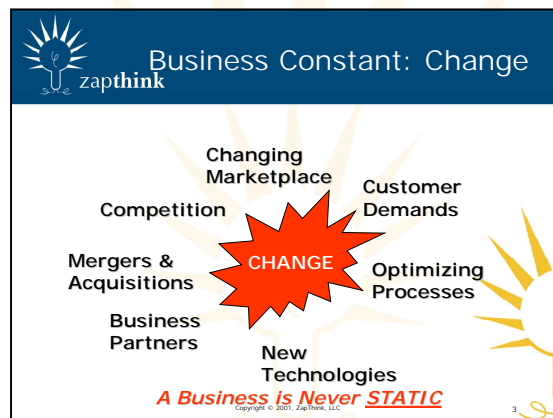
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Goal: Business Agility

- Remember this?



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Challenge: Meeting Business Requirements

Business Requirements

- Service Customers
- Manage Operations
- Increase Worker Productivity
- Communicate with market
- Ensure reliable and secure operations
- Develop new products and services
- Respond to new business drivers

IT Capabilities

- Implement CRM Systems
- Implement ERP Systems
- Manage desktop environments
- Manage server environments
- Manage email systems and web sites
- Manage network and storage operations
- Develop applications

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Business Process

The logical ordering of activities a business performs to meet a particular business goal

- A business and its business processes are inseparable
- Internal, "Private" Processes
- External, "Public" Processes
- Automated Processes
- Human Processes

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The Business Objective

- *Automated Business Collaboration*
 - Facilitating **exchange of information** between systems, organizations, and markets
 - Allowing line-of-business managers to **represent business processes**, and IT organizations to enable them
 - **Promote business agility** by allowing processes to be defined, executed, and changed as needed

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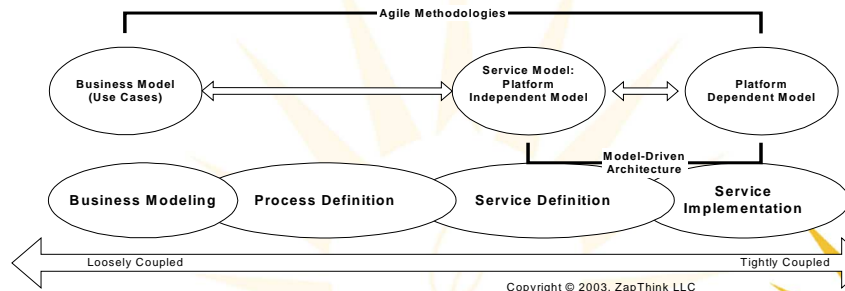
Process Mentality

- Developer Mind-set: "Bottom-Up"
 - Everything is a Service or an Interface
 - Goal: connect Services
 - Method: Use objects and App Servers
 - Problem: Too many things to connect!
- Business Mind-set: "Top-Down"
 - Everything is a Process
 - Goal: Run business efficiently: manage processes
 - Method: Use diagrams and flowcharts
 - Problem: How can you turn "shelf-ware" into software?

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Business Process as a Separate Layer



- Don't lock business process into the application!
 - Remember the days before the RDBMS?

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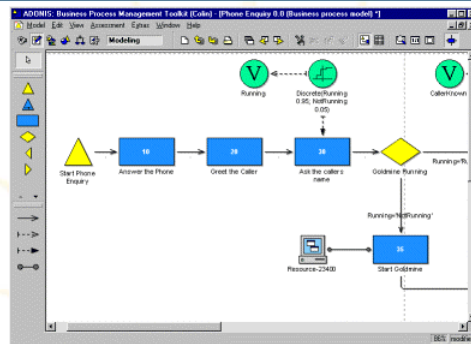
The Components of Business Process

- *Activity*
 - System or Human?
- *Role*
 - Different responses for same activity
- *Process Flow*
 - Logical ordering of activities for a business purpose
- *Process Interface*
 - Interacting with a process

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Business Process and Integration



- Executing a business process accomplishes the goals of integration...
- However, hasn't worked in the past

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Service-Oriented Process

- Processes that are *coarse-grained*: composed of Services and *exposed* as Services
- Processes that are *loosely coupled*: a change to a process flow, activity, subprocess doesn't effect other processes
- Processes that are *asynchronous*
- Processes that are dynamically discoverable

PROCESSES THAT CAN RESPOND TO CHANGE

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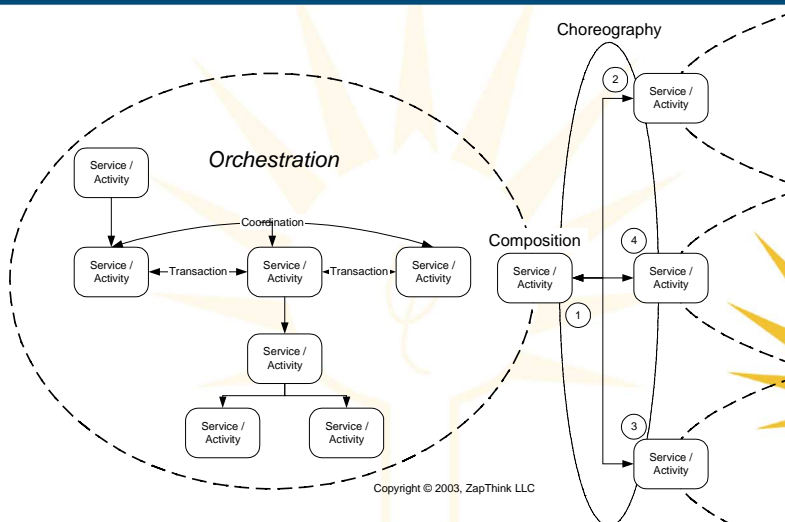
SOP Concepts

- *Composition*
 - Turning fine-grained atomic Services into coarse-grained business Services
- *Orchestration*
 - Composing Services using a logical Flow
- *Choreography*
 - Interacting between independent processes
- *Coordination*
 - Defining the relationship between two or more Services
- *Transaction*
 - A *reliable* relationship between two or more Services

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SOP Concepts





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Orchestration Standards

- Goal: Describe a Flow
- Some old ones...
 - WSFL (IBM)
 - XLANG (Microsoft)
- BPEL4WS
 - Executable Processes
 - Defining flows using programmatic “blocks”
- BPML
 - Like BPEL

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Choreography Standards

- Goal: Describe a Contract
- BPEL4WS
 - Abstract Processes
 - Subset of Executable Processes
 - Submitted to OASIS
- WSCI
 - Submitted to W3C
- e-Business Choreographies
 - ebXML BPSS
 - RosettaNet PIPs

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What about Workflow?

- Involving the Human
- Is BPEL / BPML / WSCI sufficient?
- Other Specifications
 - Wf-XML
 - XPDL
- Concept: Portals as a gateway for workflow?

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Transactions

- “ACID Transactions”
 - **A**tomtic: Executed entirely or not at all
 - **C**onsistent: State guaranteed to be valid at end of transaction
 - **I**solated: Prevents interference from concurrent transactions
 - **D**urable: State is maintained throughout the transaction
- Long-lived vs. Short-lived processes
 - Problems with Service-Oriented Process...

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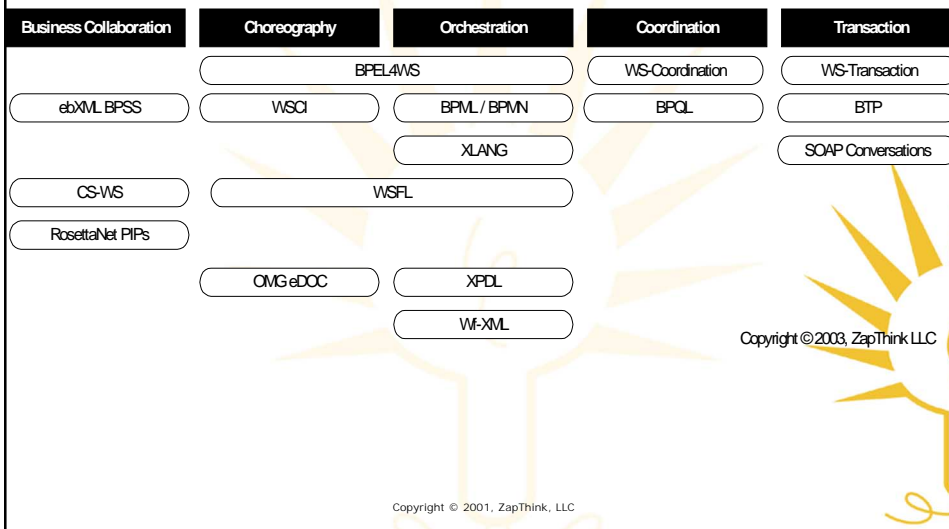
Transactions

- Compensating Transactions
 - For every action, there is an equal and opposite reaction
 - Appropriate for Service-Oriented Process?
- Which parts of ACID do you really need?

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Some Guidance...





Messaging

- Get a Message from Point A to Point B
 - *"The greatest problem in communication is the illusion that it has been accomplished." -- Daniel W. Davenport*
 - *"Communication works for those who work at it." -- John Powell*
 - *"It was impossible to get a conversation going, everybody was talking too much." -- Yogi Berra*

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Reliable Messaging

- One-step messaging is relatively easy
 - Multi-step messaging is *difficult*
- ... but for this presentation, we'll focus on just the first part – reliable messaging for single-step processes...***

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Communications Models

- Synchronous
 - Request and Response
- Asynchronous
 - Or “Message-oriented”
 - Loosely-coupled systems (sounds like XML?)
- Fire-and-Forget
 - Message is sent, but we don’t care about getting any response

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Benefits of Synchronous

- Real-time
- Efficient protocol
- The most “obvious” model
 - I ask a question
 - I wait for a response
- Problem: not all problems can be solved synchronously

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Benefits of Asynchronous

- More closely follows natural business and process logic
- Allows processing of multiple concurrent processes
- Fire and Forget a Special Case
- Challenges: more overhead, reliability issues

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Why Should Service-Oriented Architectures be Asynchronous?

- Fundamental tenet of loose coupling: not being aware of end point requirements
- Composited (virtualized) Web Services may require greater time for processing, requiring asynchrony
- B2B processes are often asynchronous
- Distributed systems can be more reliable when they are asynchronous
- Heterogeneous systems, especially those with limited bandwidth devices, function better asynchronously.
- Support human involvement in processes

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Accomplishing Reliable Messaging

- Through Protocols
 - HTTP?
 - SMTP?
 - FTP?
 - MQ?
- Through Networks
 - The EDI VAN
 - The Web Services Network
- Are we really looking at the right level?

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Reliable Processes

- Can we guarantee that an end-to-end process occurred?
- Aspects of Reliability
 - Message Acknowledgement and Retry
 - Message Persistence and Time-to-Live
 - Message Ordering
 - Message Delivery Semantics: Once, More?
 - Fault handling
 - Message intermediaries
- The Reliability Specs
 - WS-Reliability
 - WS-ReliableMessaging

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Processes: App Servers or Message Buses

- “Application Processes”
 - Connecting Services
 - Everything runs on the App Server
- “Business Processes”
 - Defining and Executing Processes
 - Activities can (and do) run everywhere
- Infrastructure choices
 - App Server: For Application Processes
 - Message Busses: For Business Processes

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Combining with Service-Oriented Management

- Achieving Loose Coupling
- Managing Atomic Services
 - Making sure the activities work!
 - Processes *are* Services
- Managing End-to-end Processes
- Keeping the abstraction in place

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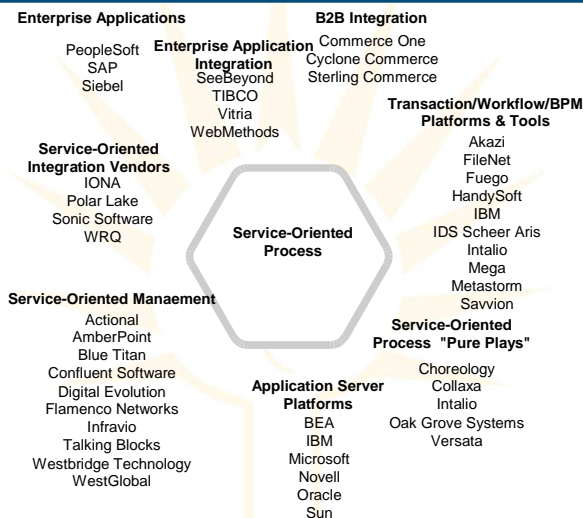
Process Management

- Business side to Process Management
 - Did this process fulfill my business goals?
 - How did this process flow compare with a different process flow?
 - How do two process instances compare?
 - What happens if I change my process?
 - What happens if I change an activity?
- Process dashboards, monitors

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Vendor Landscape



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Enterprise Applications and Process

- The problem with enterprise applications
 - Process bound to Functionality
 - High customization and integration cost
- New approach
 - Atomic Enterprise App Functionality
 - Separate Process Layer

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Portals and Process

- Portals as the corporate interface to applications
 - If applications controlled by processes, portals to interface with processes
- Portals for process definition
- Portals for process management
- Portals and Workflow

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Processes and P2P

- What happens when there is no central point of control
- Is P2P an instance of Process Choreography?
- P2P and Reliable Messaging

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Conclusion

- Conclusion:

Implementing a Process-Driven approach to Service-Oriented Architectures provides the connection between business requirements and IT capabilities that *facilitates business agility.*

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Questions & Discussion

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