Introduction to Business Process Modeling

Michael Havey: Essential Business Process Modeling – Chapter 1
- **Business process modeling** (BPM), sometimes called business process management, refers to the design and execution of business process.
Alphabet soup: How many of the following abbreviations are familiar to you?

- BPMN
- WS-CDL
- BPMI
- BPDM
- J2EE
- WSDL
- SOA
- BPEL
- BPQL
- HTTP
- UML
- SOAP
- OMG
- XMI
- XML
- WfMC
Important process modeling terms

- **Process definition**
  The basic algorithm or behavior of the process.

- **Process instance**
  An occurrence of a process for specific input. Each instance of the travel reservation process, for example, is tied to a specific customer’s itinerary.

- **Activity or task**
  A step in a process, such as sending a flight request to the airline.

- **Automated activity or task**
  A step in a process that is performed directly by the execution engine.

- **Manual activity or task**
  A step in a process that is meant to be performed by a human process participant.
Automated activities

- Automated activities generally fall into two categories:
  - Interaction with external systems: e.g., sending a booking request to an airline.
  - Arbitrary programmatic logic: e.g., calculating the priority of a manual task

- The external system interface requires the process runtime engine to have enterprise application integration (EAI) capabilities

- Arbitrary programming logic requires support for embedded code or the ability to call code. Fine-grained programming is best performed in a lower-level language such as Java.
The Benefits of BPM

- Formalize existing process and spot needed improvements
  - Knowledge creation and combination

- Facilitate automated, efficient process flow
  - Reduce time used by automating tasks

- Increase productivity and decrease head count

- Allow people to solve the hard problems
  - Use people where they are really needed

- Simplify regulations and compliance issue
  - Processes must be documented to prove compliance
BPM Acid Test: The Process-Oriented Application

- An application passes the BPM acid test if it is legitimately process-oriented, typically:
  - Long-running, conditions for starting and terminating
  - Persisted state
  - Sleeps most of the time, waiting for events
  - Orchestration of system and human communications

- What tasks are not (part of) processes?
Basic criteria to reduce BPM to its essential

- A good BPM *architecture* (chapter 2) is as elegant an enterprise architecture as can be.
- A good BPM *solution* is achieved by choosing the best pieces/standards.
- A good BPM *application* exhibits, or explicitly uses, industry standard patterns.
Some BPM standards

- The OASIS group’s BPEL standard
  - invokes web services and can be invoked as web service

- BPMI’s BPML and BPMN standards
  - BPMN has BPEL mapping, not BPML!

- The various W3C choreography standards

- The WfMC’s reference model (next slide)
  - architecture of workflow system with supporting tools

- The OMG’s Model-Driven Architecture (MDA) specifications

- The OASIS BPSS language
  - business-to-business (B2B) collaboration
# Roadmap

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<td>OASIS</td>
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<td>BPM’s most popular language; represents a process as XML with web services bindings</td>
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<td>Business Process Modeling Language (BPML)</td>
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<td>An XML process language similar to BPEL</td>
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<td>Business Process Modeling Notation (BPMN)</td>
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<td>Graphical language with a mapping to BPEL</td>
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<td>Workflow Reference Model</td>
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<td>A basic architectural approach to workflow/BPM</td>
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<td>Workflow API (WAPI)</td>
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<td>A functional and administrative API with definitions in C, IDL, and COM</td>
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<td>Workflow XML (WfXML)</td>
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<td>An XML language for web service-based communication between workflow runtime engines</td>
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<td>Web Services Choreography Interface (WSCI)</td>
<td>World Wide Web Consortium (W3C)</td>
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<td>A mature XML language for web services choreography, or the stateful, process-oriented interactions of web services among multiple participants</td>
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<td>Web Services Conversation Language (WSCL)</td>
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<td>Business Process Definition Metamodel (BPDM)</td>
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<td>A model for a BPM process language constructed using the Model Driven Architecture (MDA)</td>
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<tr>
<td>Business Process Runtime</td>
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<td>An MDA model for a functional and</td>
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The WfMC’s reference model
Workflow

- Workflow is the flow of work, encompassing the exchange and enrichment of information:

  The classical workflow paradigm is a river that carries the flow of work from port to port and along the way value gets added. Workflow defines the operations that must be visited along the way and what needs to be done when exceptions occur.

- Document-centric heritage
  - documents captured state and was used as a token
BPM vs. workflow

- **Message correlation vs. process ID**
  - message correlation – content of message identifies receiving process instance
  - process ID – identifies receiving process explicitly

- **Service end-points vs. central enactment engine**
  - choreography of loosely coupled services
  - monolithic and closed workflow system
Heritage

- **Formal theories for communicating processes**
  - PI calculus – life-cycle of communicating process
  - Petri-Nets – places, tokens and transitions

- **Variants of Petri-Nets are used in many domains, and have been used to model workflow language, e.g. for analysis and proofs**

- **Deep understanding of theories is not required for using BPM languages**
Summary

- A business process is the step-by-step algorithm to achieve a business objective. Business process modeling (BPM) is the study of the design and execution of processes.

- BPM is concerned only with process-oriented applications. Not all enterprise applications qualify. The process-oriented acid test of an application is whether it is long-lived and defined at a given time by its state.

- Among the benefits of BPM are the formalization of current processes and the occasion for reengineering, greater efficiency, increased productivity and decreased head count, the ability to add people to a process to resolve hard problems, and the traceability of compliance processes.