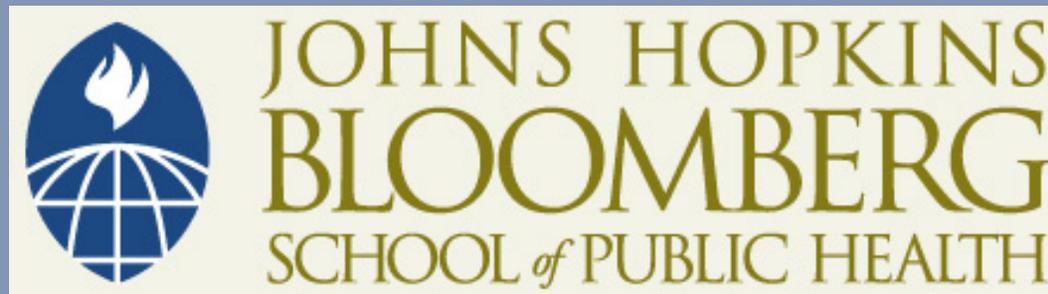


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Section B

Business Process Definitions

Describing Business Processes

- A **business process** is usually defined as a series of activities and logic that form a repeatable pattern
 - Some processes are very dynamic or ad hoc, never running the same way twice
 - Others are very well-defined and run exactly the same way every time
- Typically, companies will want to apply business process automation where it adds the most value: to a highly repeatable process with high business value
- Processes such as insurance claims handling, loan processing, or provisioning tend to fall into this category

Automating Business Processes

- **Automating business processes** saves companies time and money
 - Running these processes the same way each time ensures quality, as well as regulatory compliance through audit log tracking
- For many years, companies attempted to automate business processes using custom codes
 - It became clear over time that standardization of business process automation was needed
- Graphic modeling tools were developed for representation of business processes
 - For example, a flowchart is far better at describing the overall structure of the business process

Workflow Model (Process Model)

- Graphic modeling used for a visual representation—together with the metadata to describe the activities in the process and the business rules for the decisions in the process—is called a **workflow or process model**

Problems from First Wave of Workflow Modeling Tools

- Different ways to represent the business process
 - Different vendors used different graphic representations of the activities in a process, making it difficult for companies with more than one process engine
- Different file formats
 - Even if two modeling tools used the same graphic representation, each tool used its own proprietary file format, making it impossible to share models across different tool sets

Problems from First Wave of Workflow Modeling Tools

- Different run-time representation
 - The run-time representation of a business process was different for every process engine
 - This meant that one vendor's tool could not produce a run-time artifact for another vendor's run-time engine
- Different execution languages
 - In addition, different execution languages made interoperability difficult, unless custom code was used to bridge the two environments

Standardizing Business Processes: WS-BPEL

- OASIS, the Organization for the Advancement of Structured Information Standards, is a not-for-profit consortium of over 5000 members that drives the development, convergence and adoption of open standards
- OASIS has developed the XML standard
- OASIS has developed the Web Services Business Process Execution Language (**WS-BPEL**)—an execution language to describe the behavior of business processes in a standards-based environment
 - Processes can use Web services to invoke business functions, and the process itself can be exposed as a Web service

Standardizing Business Processes: WS-BPEL

- A Web service can be described by Web Services Definition Language (WSDL): Web services are stateless and uncorrelated
 - For example, if a conversation is needed between two systems, a simple Web service has no way to maintain state
 - And if multiple conversations are occurring at the same time, there is no way to correlate which messages belong to which conversation
- WS-BPEL solves these problems by defining the end-to-end business process
 - The process allows for stateful long-running processes between different business systems
 - The standard defines a format for an XML document
 - The language describes the syntax for the elements of a process, such as the partner links, service invocations, data variables, correlation sets, and so forth

Standardizing Business Processes: BPEL4People

- The WS-BPEL 2.0 standard does not address the business problem of how people can act as part of a business process
- However, a proposed extension to WS-BPEL called **BPEL4People** defines an approach for extending WS-BPEL to support scenarios where people are required as part of the business process
- Another aspect of BPEL4People is **WS-HumanTask**, which defines how a task for a person can be invoked as a Web service

Standardizing Business Processes: BPELJ

- In the WS-BPEL 2.0 standard, all of the steps in the business process are invocations of Web services
- There are often times when a small program is needed as part of a process
- Rather than having to create the program and expose it as a Web service, the proposed **BPELJ** extension to WS-BPEL enables a process to run Java™ code inline with the process

Standardizing Business Processes: BPMN

- The Object Management Group (OMG™) is an international, open membership, not-for-profit computer industry consortium to develop enterprise integration standards
- OMG has developed the **Business Process Modeling Notation (BPMN)** to provide a standard notation for the process diagram
 - Using such a notation ensures consistency so that no matter who created the diagram, the same icons are used to represent the same objects
- A second goal of BPMN is to define how the elements of a BPMN diagram should map to WS-BPEL

Standardizing Business Processes: XPDL

- Founded in 1993, the Workflow Management Coalition (WfMC)—the only standards organization that concentrates purely on process—developed the **XML Process Definition Language (XPDL)** to have an XML format for the storage of BPMN diagrams
- If different vendors use XPDL as their file format, they can easily exchange process models
- XPDL is complimentary to WS-BPEL; it is a file format to promote the interoperability of tools
 - It captures all of the attributes of each BPMN object and metadata, storing them in a standards-based format
 - As with WS-BPEL, XPDL allows vendors to add in their own proprietary extensions

A Business Process Development Cycle at Work

- A business analyst creates a process model using BPMN as the basis of the visual aspects of the process, ensuring consistency in notation
 - The file for the model is stored in XPDL format
- An IT specialist takes the XPDL file and imports it into a modeling tool to see the same visual representation in BPMN as the business analyst
 - The IT specialist exports the model into WS-BPEL, then adding in additional technical attributes for execution
- So:
 - BPMN is what it looks like
 - XPDL is how it is stored
 - WS-BPEL is how it is run

Example of BPMN Process Diagram

