Process design & BPMS

PV207 – Business Process Management

Spring 2014   Jiří Kolář

Last lecture summary:

- Course content & goals
- Team of lecturers and tutors
- BPM intro & history
- Organization
  - Lectures & seminar-sessions organisation
  - Homework assignments
  - Continuous feedback
  - Team project
  - Evaluation and examination
- Information sources
- Questions and intentions

Lecture overview

- Processes
  - What is business process?
  - What is BPM?
  - Why BPM ?
  - Roles in BPM

  - Process life-cycle

  - Phases of process based development

- BPMS

  - BPMS components
  - Architecture

  - Human Tasks
  - Business Rules
  - BAM

  - Existing BPMS

Business process definition

Definition:

Series of logically related activities or tasks (such as planning, production, sales) performed together to produce a defined set of results.

-- Business Dictionary:

*Repeatable sequence of **logically related** activities, which contributes to fulfilment of **one or more** business objectives*

-- Jiří Kolář

Process Example: Order

1. Customer create an Order
2. Order is confirmed by CTO
 2.1. If price of the Order is lower than 40 000$, it is accepted
 2.2. If price is over 40 000$ it have to be confirmed by CFO
3. Order is processed afterwards
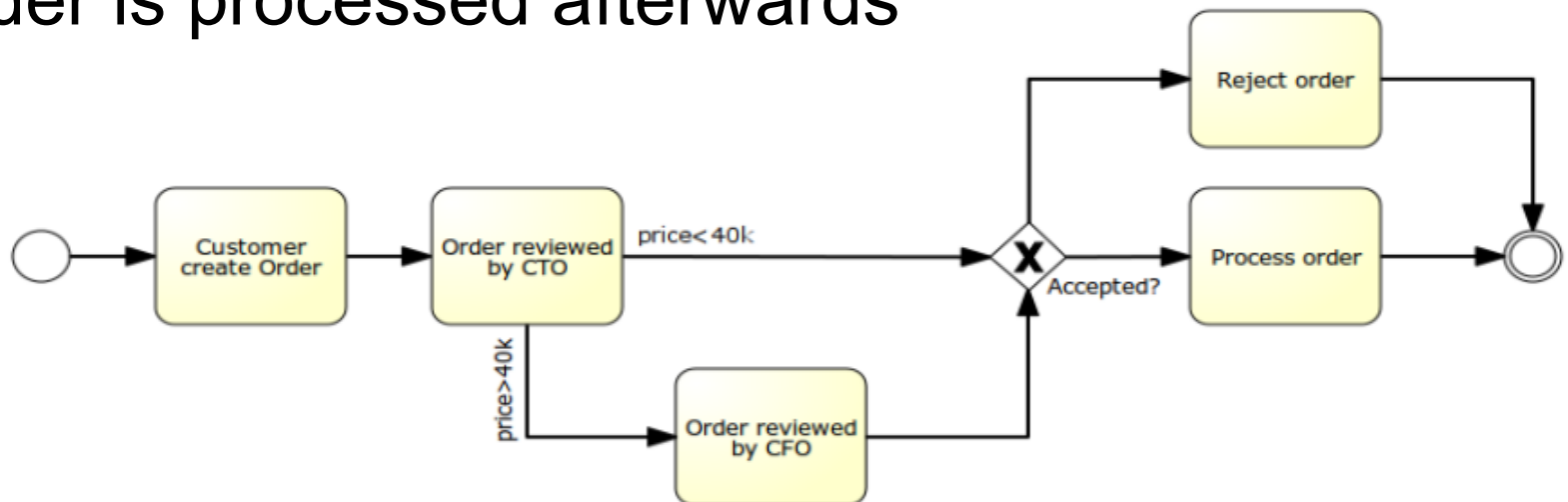
Business Process Management

Management discipline for systematic **definition**, **execution** and **measurement of processes** in organizations

Picture downloaded from http://www.what-is-bpm.com/bpm_primer/bpm_primer.html

BPM adoption

- Organisational and management changes towards BPM approach
  - Rengineering
  - Efficiency & quality measurement
  - Certifications, standards & legal compliance

- Tailoring organisation's Information Systems towards process-oriented principles
  - Business integration (direct link business <-> IT)
  - High level technologies
  - Integration of legacy systems

Business Process Management vs. Workflow Management

- Workflow ~= Business process
- **Work-flow management** = definition + management of work-flows
- **Business Process Management** = definition + execution + monitoring+ improvement of processes
  - Standardization involved

- **Workflow system** = usually a proprietary system for execution of defined sequences of activities

Why BPM?

- **Know-how codification**
  - **Value** of processes as a **know-how is increasing** in today's **knowledge economy**
  - Less vulnerability caused by employee fluctuation
- Performance and costs **measurement**
- Better business-change management
  - Changes can be performed easier
  - Impact of change can be measured
  - Important to choose good level of process rigidity
- Increased **transparency**

Why BPM? (cont.)

- **Outsourcing** and business services integration
  - Measurement of outsourced services quality
- Increase of **quality**
  - Better **error detection** and **exception handling**
  - **Detection of bottlenecks** & weak points of organisation
  - Compliance with ISO standards (2000X, 9001)
- Better organisation of work-flow /process
  - **Higher efficiency** = reduction of costs
  - **Early detection of problems**

Why BPM? (cont.)

- **Flattering** organisation's hierarchy
  - Elimination of "**silo effect**"
  - **Horizontal job character**
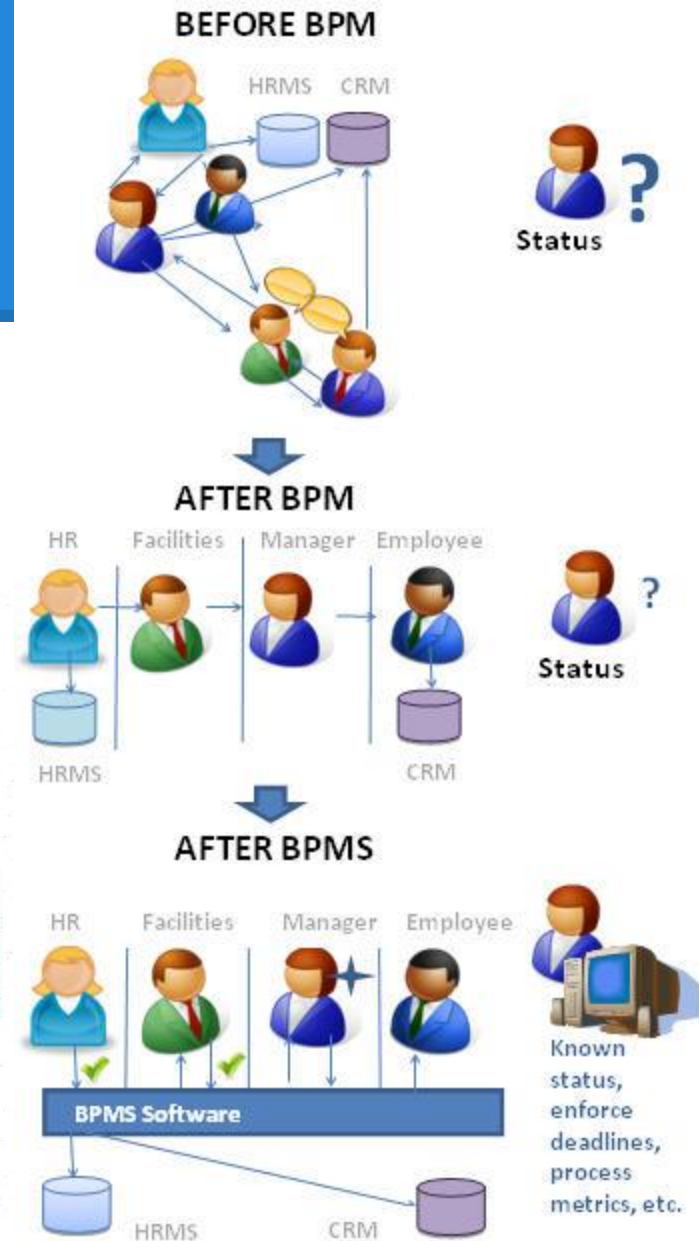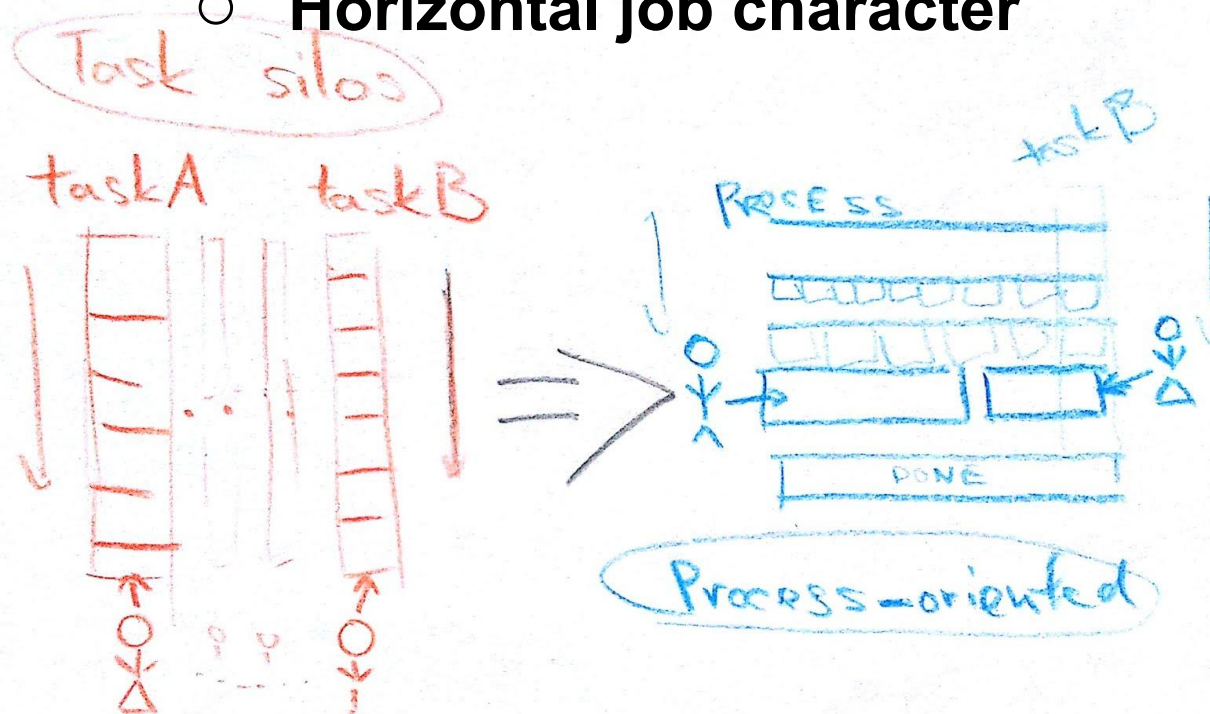
BPM disadvantages :(

- **Higher initial costs**
- **Technologies & tools** are **expensive** and not widely available
- **Change of people's mindset** is necessary
- **Changes in** organization **structure**
  - Fear of change
  - Loss of jobs
- Support of higher management is **crucial**

Potential pitfalls of BPM adoption

- **Loss of business flexibility**
  - Too high process rigidity
- Annoyed employees
- **High investments** in BPM solution
- Inefficient management changes
- Technological overkill
- Danger of wrong process definitions

Basic roles in BPM adoption

Organisation's stakeholders (Owners, Management, Customers, Partners etc.)

- ○ Everybody involved in system context
- ● Business analyst
  - ○ Identifies and define processes that fulfil goals
- ● Process specialist
  - ○ Model and implement processes, design service integration
- ● System developer (Integration specialist)
  - ○ Implements services and underlying system components

Process development

- Analysis

- Design

- Implementation
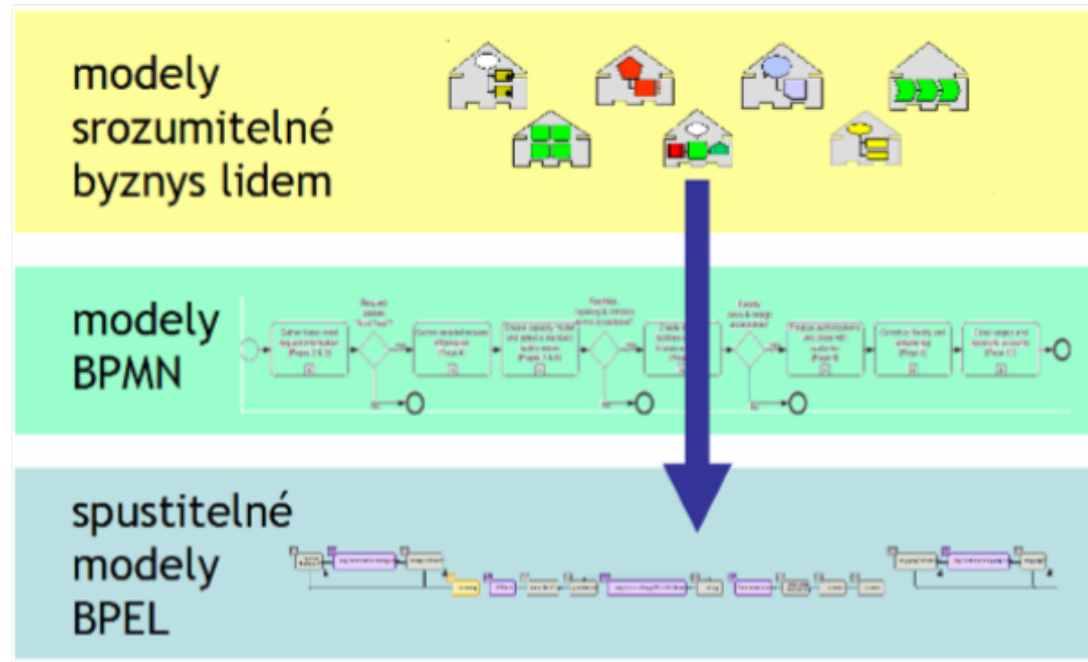
BPM lifecycle
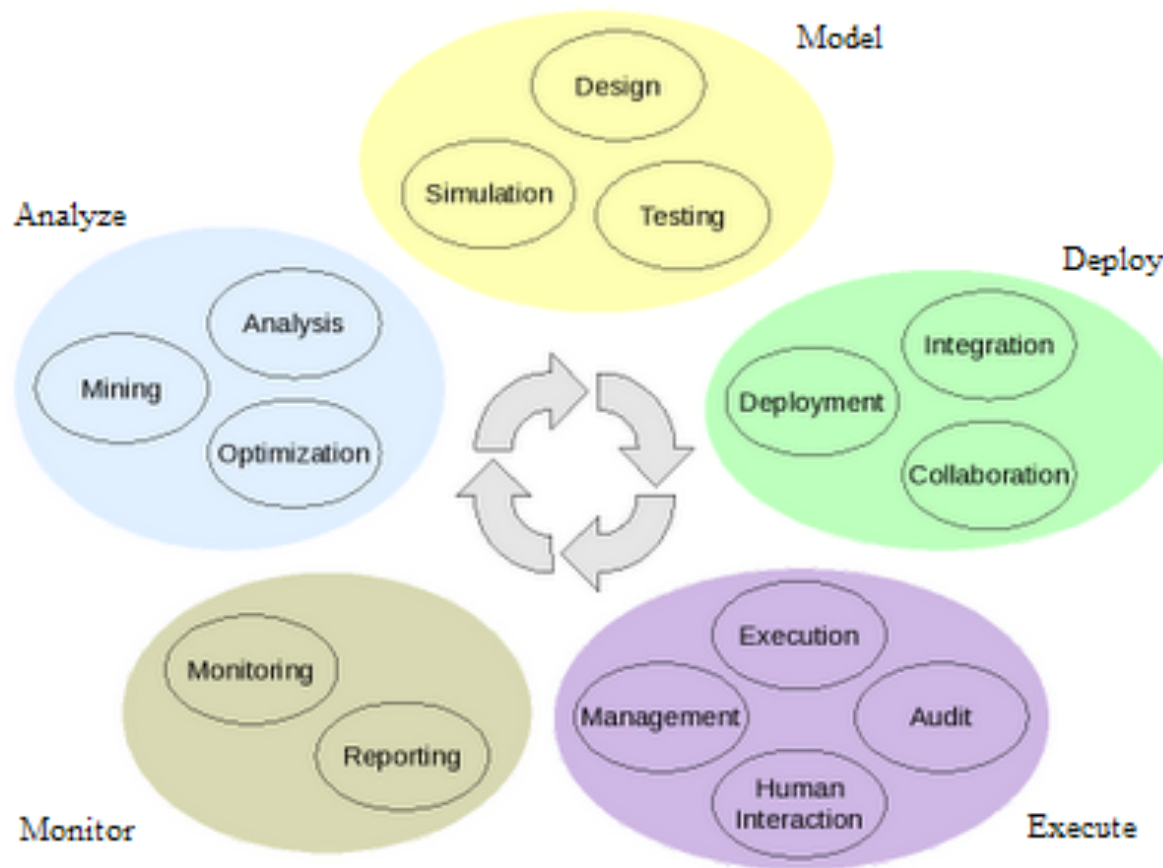
0. phase:Business analysis

- **Roles identification**
- Business **Goals definition**
- **Objectives definition**
- Identification of **existing processes**
- **Process architecture** (relationships)
- **Reengineering** of existing processes and **definition of new** ones
- **Metrics/KPI/KRI** definition (Key Performance/Result Indicators) for Goals/Objectives

1. phase: Process definition

- **Which objective** is **being fulfilled** by the process?
- What is the **value created** by the process?
- What are **Inputs and Outputs** of the process?
- Which **metrics** should be on the process?
- Who is **Process owner**?
- Which **roles** participate on process?
- **Goal:**Obtain valid and measurable processes

2. phase: Process modeling

- Model logical structure of the process
- Should be readable by all lifecycle participants
- (BPMN) Business Process Modeling Notation
  - Graphical notations
  - Portability (Standard)
  - Based on Petri-Nets formalism
- Modeling tools
  - Stand-alone
  - Part of BPMS

3. phase: Implementation

- **BPMN-executable** (Level 3)
  - BPMN execution engine
  - Services implemented
  - Human task engine
- **BPEL** (Business Process Execution Language)
  - Getting **deprecated**
  - Language for **service orchestration**
  - XML , Block language
  - BPEL skeleton (template) often generated from BPMN
- **XPDL** and other minor stuff

4. phase: Monitoring

- **Reasons** for process monitoring
  - **Fault/Error detection**
  - **Performance measurement**
  - Information for **process improvement**
- **Business Activity Monitoring**
  - Real-time process monitoring
  - Measurement of process metrics
- Key Performance/Result Indicators
  - **Business performance**
  - Derived from process metrics

Tracking of **business goals fulfillment**

5.phase : Process improvement

- Reasons:
  - Measured **gaps in performance**
  - **Changes of process** in real world
- Continuous process improvement:
  - Detection of **inefficient parts** of process
  - **Bottlenecks**, **cost inefficiency**
  - **Design and validation** of change (simulation)
  - **Process modification**
  - **Deployment** of optimised version
  - **Monitoring**
  - <> repeat until dead;

Questions?
Break 10mins

Business Process Management System

- Software suite (related SW tools)
  - modeling, execution and monitoring of processes
  - SW Tools of the process life-cycle phases
- BPMS components
  - Process modeller (OSS, commercial) **-modeling**
  - Process simulator (commercial with some exceptions)
  - Execution engine (OSS, commercial)
  - Process console (OSS, commercial)
  - Human tasks engine (commercial with exceptions)
  - Business Rule engine (few OSS, commercial)
  - Business activity monitoring (commercial).

BPMS components

Picture downloaded from http://www.what-is-bpm.com/bpm_primer/bpm_primer.html
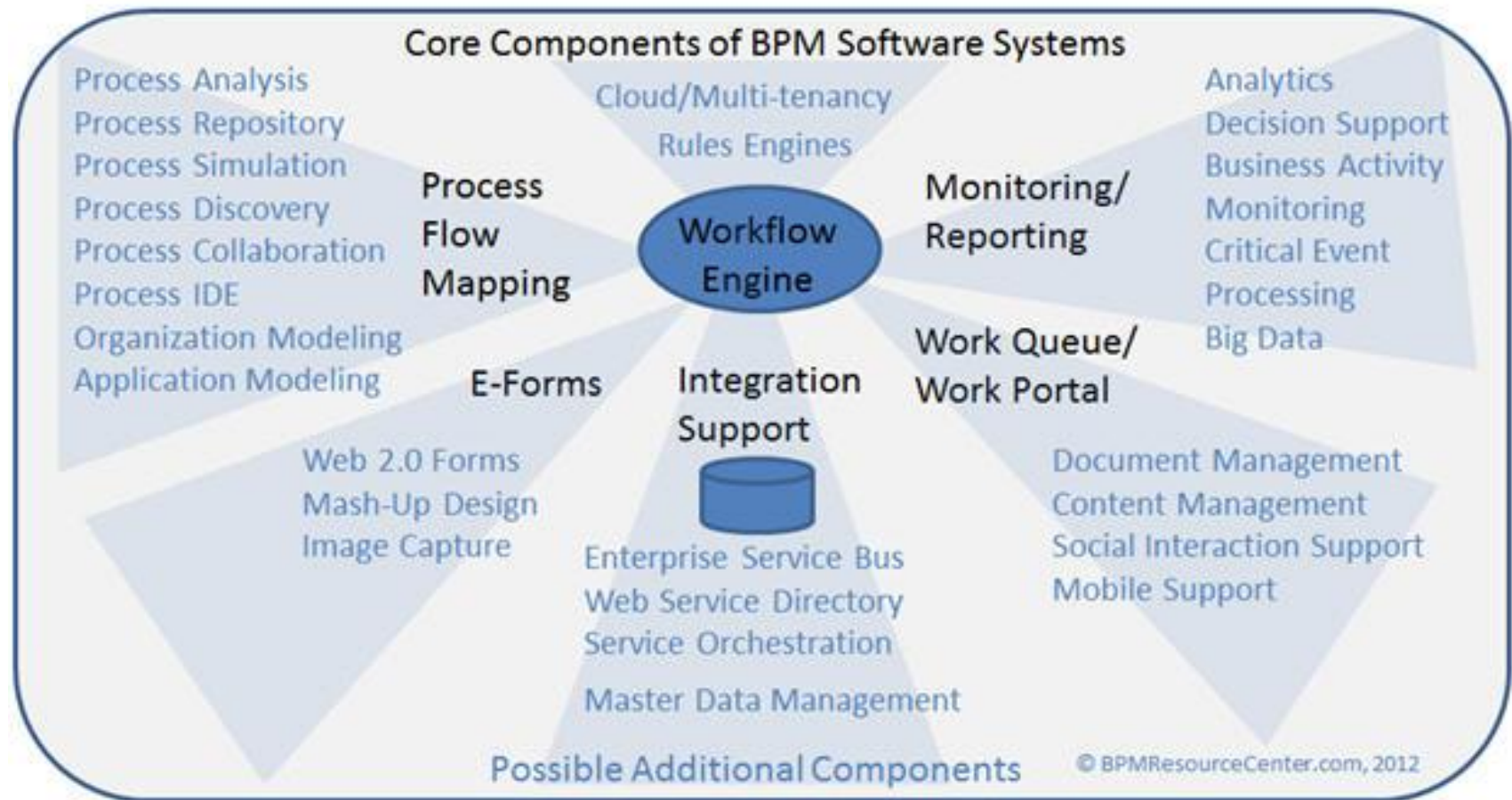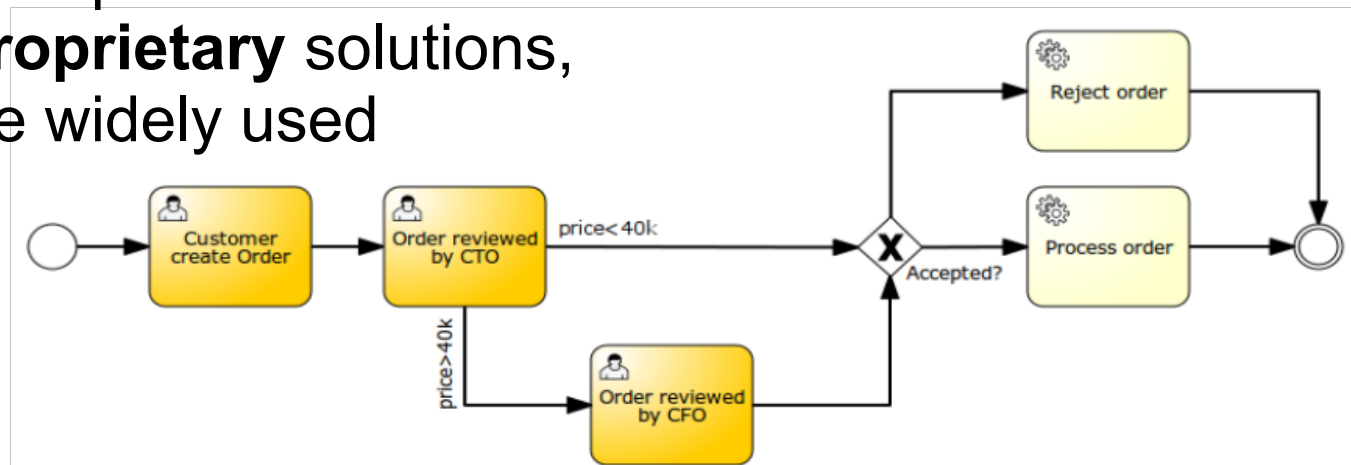
BPM lifecycle again
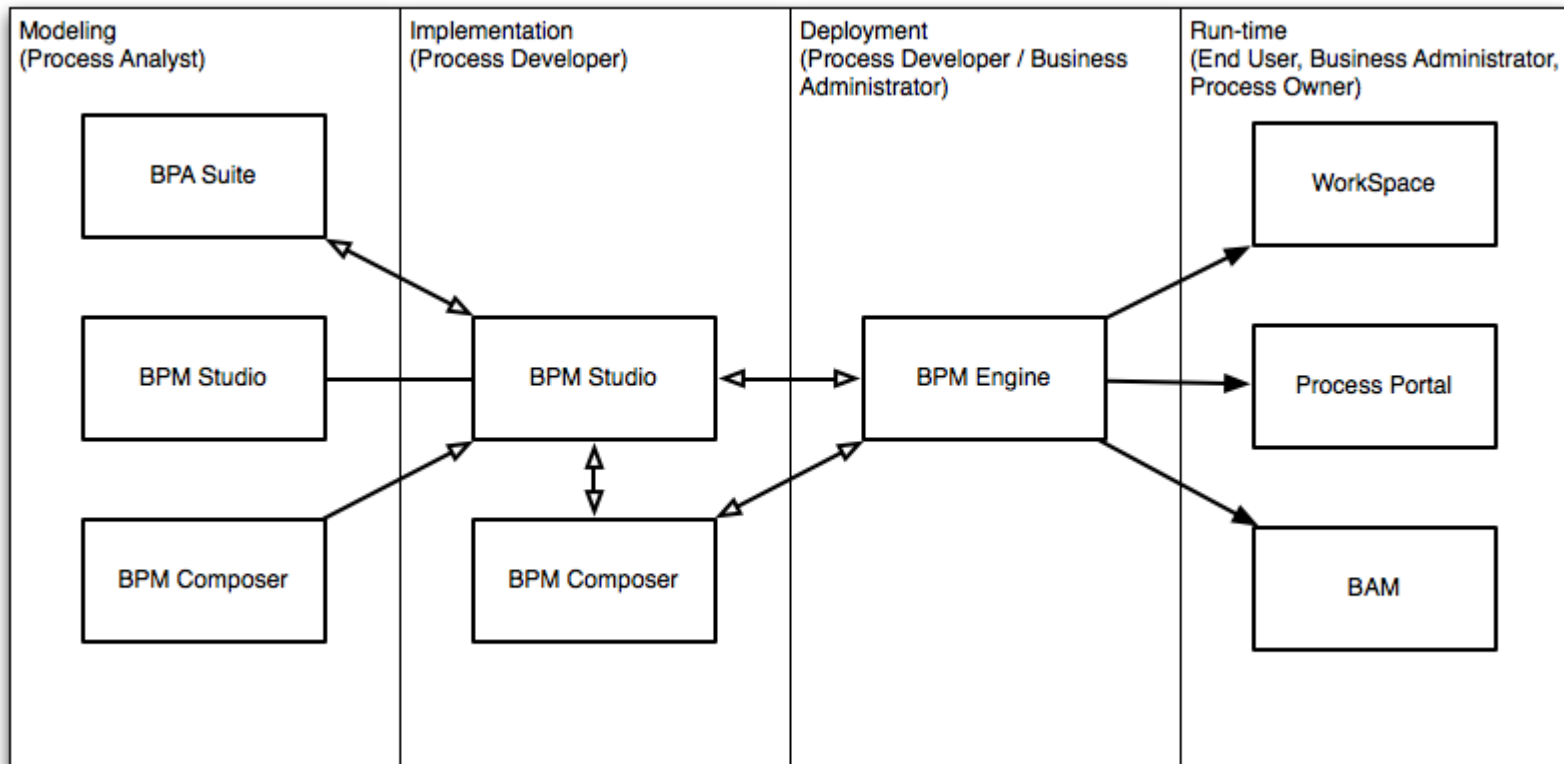
Human tasks

Human tasks = process **activities with necessary human interaction**

- Human **task engine**
  - **front-end user interface** for human tasks
  - **access control according to roles** and business objects from process
  - **mostly proprietary** solutions, portals are widely used

Human tasks

- Standards
  - **BPMN** (Level 3) define human tasks on process level
  - **BPEL4People**
  - WS-BPEL Extension for People
    - Web Services Human Task
    - Notifications, escalations, timeouts, forwarding, attachments
  - Implementation
    - Portal technologies
    - Web 2.0 form frameworks
   - Proprietary form solutions in BPMS

Business Rules

- Rules **stored aside from process**
- External **rules repositories**
  - Databases
  - XML files
  - Excel tables
- Simple scripting language for **rules evaluation**
- Rules are evaluated by Business Rules Engine
- **Rule + Input Business object => Output**

Business Rules (cont.)

- User interface for **rules management**
- Typically IF – THEN
- **Rules types**
  - Validation rules
  - Transformation rules
- Business Rulesets
- Business Rule Engine **often as a Web Service**
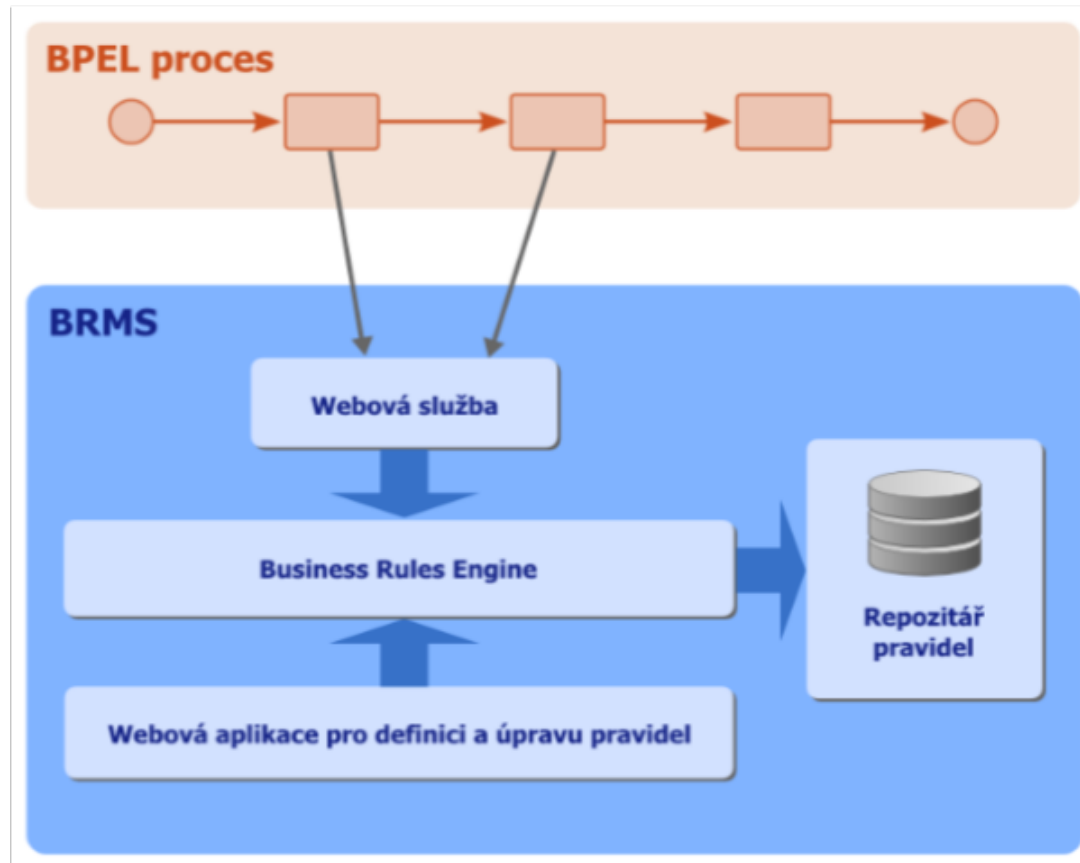
Business Rules – Example

- Rules decision in Order process:
  - Rule has **parameter (40 000$)**
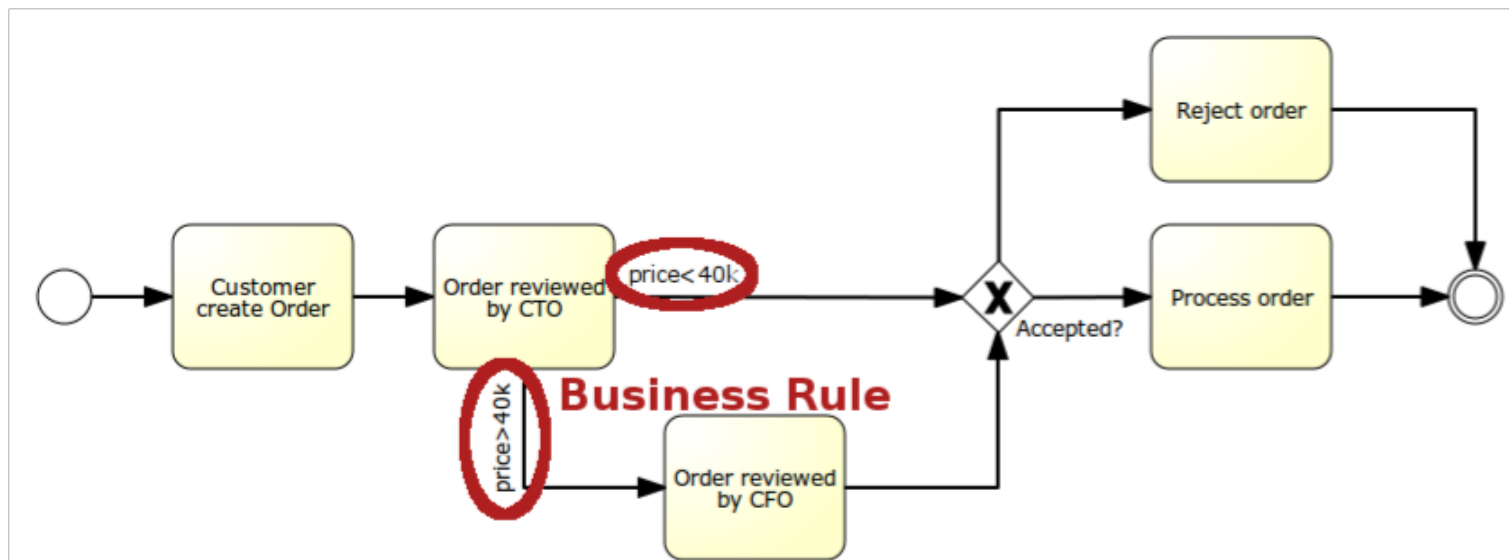
  - We **change parameter** or **replace rule**
  - Rules can be changed **dynamically**

Business Rules Management system

Business Rules example:

- Business object: Order
    - id – of an order
    - itemPrice – price of one item of order
    - quantity – quantity of item
- finDirDecisionNeeded – boolean identyfying if CFO's decesion is necessary
- Rule evaluation language:
    - Price of the order is bigger than {threshold}
    - order_price = Order(eval(quantity * itemPrice > {threshold}))
- Rule itself
    - WHEN order_price 40.000 THEN set finDirDecisionNeeded = true

Business Activity Monitoring

- Monitoring is important part of BPM lifecycle
  - Monitoring data are **inputs for process improvement**
  - **Early detection of problems**
- **Process metric examples**
  - Order processing time, Order total price, Order state
- **KPI examples**:
  - Average time of order processing per day
  - Sum of prices of all Orders for this week
  - Number of cancelled Orders this week
  - Percentage of Orders with delayed payment

Business Activity Monitoring - Dashboards

- Monitoring of process data in **real time**
- **Actions triggered** when certain metric value is reached
  - On screen, Email, SMS
    Trigger action/process
- Custom set of figures on one page
- Configurable for every user

IBM

WebSphere Business Monitor

Welcome wid

Dashboard Layout ▾ Logout | Help

Getting Started | Dashboards | Utilities

Manage | Instances ✕ | Test ✕ | Test ✕ | Screen 1 ✕ | **Screen 2** ✕

Alerts

[Mark Read] [Mark Unread] [Forward Alert] [Remove]

☐	↕	Subject	Date and Time ↕
☐	●	**Alert**	**Friday, October 26, 2007 2:02:48 AM**
☐	●	**Alert**	**Friday, October 26, 2007 1:52:34 AM**
☐	●	**Alert**	**Friday, October 26, 2007 1:44:53 AM**

|◀ ◀ Page 1 of 7 ▶ ▶| Go to page: [ ] → Results 1 to 3 of 21

Reports

File   Edit   View   Bookmarks   Data   Chart   Tools   Help

Legend:
- ■ InstancesCount
- ● Average_Number_of_Checks
- ✚ Average_Number_of_Disbursements
- ◆ Average_Number_of_Wires

X-axis: Date (1, 6, 11, 12, 13, 14, 18, 20, 21, 24, 26, 28, 29)

Map

Human Tasks

Actions ▾

☐	Task Name	Owner	Status	Escalated	Work Duration
☐	Patient checkin	👤 mjohnson	● Ready to be Assigned	false	22 m, 10 s
☐	Patient checkout	👤 sxalter	⚠ Complete	false	1 h, 15 m, 5 s
☐	Update record	👤 evayne	● Ready to be Assigned	false	20 m, 5 s
☐	File insurance	👤 sjasinski	● Working	false	45 m, 45 s
☐	Verify record	👤 Unassigned	⚠ On hold	true	25 m, 10 s

|◀ ◀ Page 1 of 1 ▶ ▶| Go to page: [ ] → Results 1 to 5 of 5

Diagrams

FFT_MC

Nodes: Case No Added — Obtain Customer Info — Funding Transactions Prepared — Confirm All Payoff Info Present (50.0% Yes / 50.0% No) — Update Case As Needed — Fund Transactions Processed — Transaction Released — Funded Notification Sent
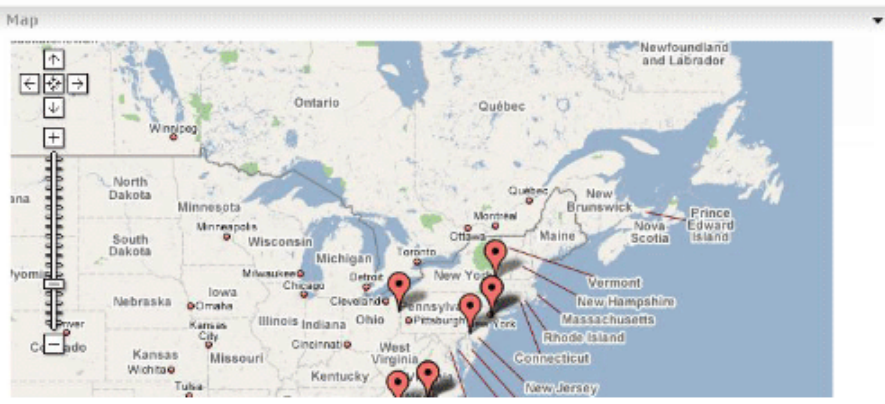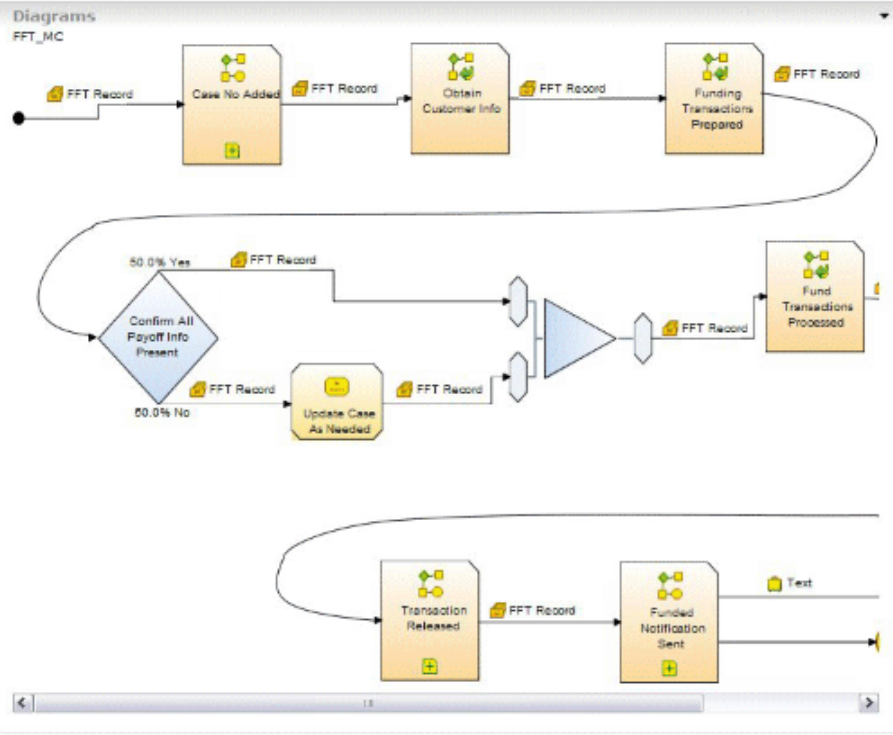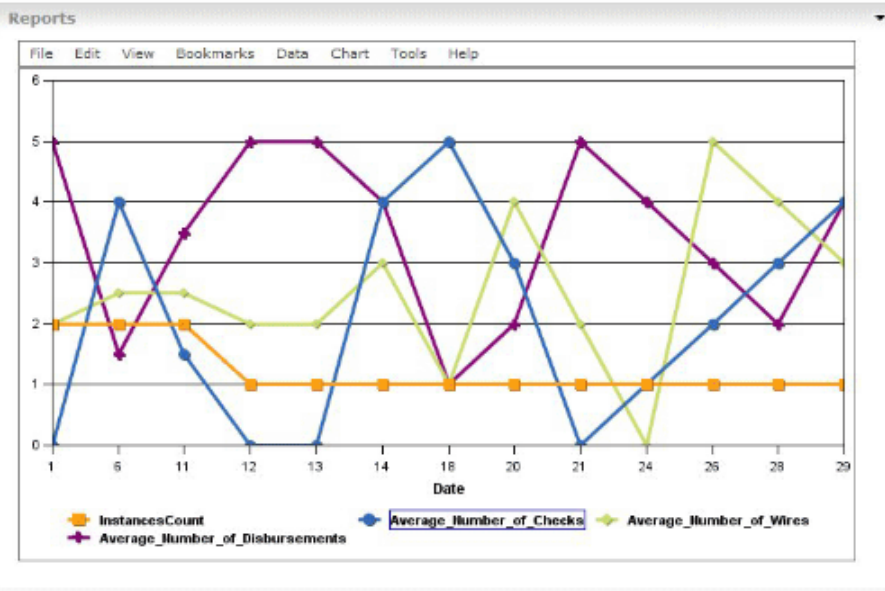
Existing BPMS products

- **Open source**
  - Activiti
  - Intalio | BPMS Community Edition
  - NetBeans+OpenESB (BPEL)
  - PVM based
    - JBPM/Drool (Jboss)
    - Bonita
    - Orchestra
  - ApacheODE based
    - Project Levi
  - ++

- **Commercial BPMS**
  - IBM Lombardi
  - Bizagi
  - Appian 6
  - Opentext/Metastorm
  - Pegasystems
  - Savvion
  - Signavio
  - TIBCO iProcess Suite
  - Oracle BPM suite
  - ARIS enterprise BPMS
  - ++

FIN
Questions?

PV207 – Business Process Management

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