Process design & BPMS

PV207 – Business Process Management

Spring 2021

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Lecture overview

- About course
- BPM discipline
  - What is business process?
  - What is BPM?
  - What is BPM adoption?
  - Why BPM ?
  - Roles in BPM
  - Process life-cycle
  - Phases of process based development
- Business Process Management Systems (BPMS)
  - BPMS components
  - Architecture
  - Human Tasks
  - Business Rules
  - BAM
  - Existing BPMS

Course goals

- Introduce **the BPM (motivation, use cases..)**
- Explain **BPM in context of services integration**
- Deep dive in **business process modeling**
- Explain basics of **Business Analysis**
- Explain **how to adopt BPM** in organisation
- Introduce **Process Monitoring & Measurement**
- **Hands-on-experience** with BPM technologies
- Lead students to the elaboration of a simplified **end-to-end BPM project** in a **TEAM**

Course organization

Fair and equal conditions to everybody

Everything is in the course manual

https://docs.google.com/document/d/1y0hIr1VrK7s2O4fMoHayqogJ_ur6YOwmiNyJf1aAW4Q/edit#

Questions resolved by comments to the manual document (Highlight the topic, Ctrl-M;)

Important guidelines

- The course is **mandatory**, and complex
- Lectures are valuable from **knowledge** perspective
- Seminars are **mandatory**
- Build your team **first week** and work in teams
- Check schedule and instructions
- Do homeworks (or you are out ;)

- Avoid Cheating

And now on BPM

Business Process Management

Is a **Management discipline**, focused on systematic **definition**, **execution** and **measurement of processes** in organizations

Alternative defintion:

An effort to describe processes in organisation, measure results and **manage process changes** towards higher efficiency

Typical motivation for BPM:

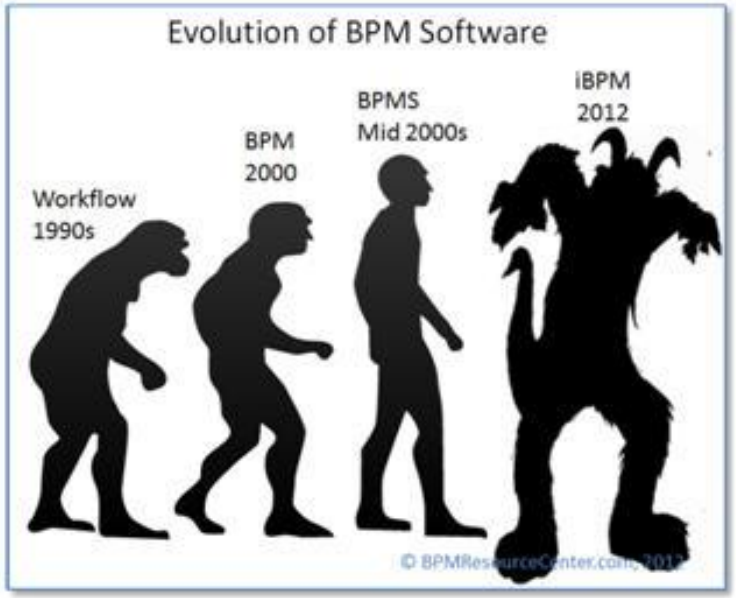
- Business **Reengineering**
  - Enterprise growth
  - Acquisitions
  - Organisational and cultural changes
- **Quality** Management & Measurement
- Legal **compliance**, certifications
- Technology for **IS development**
  - Integration
  - Agile system development

Where do we find BPM?

- Large enterprises
  - Banking,
  - Insurance Business
  - Telco
  - Retail
  - ++
- Health Care (developed countries)
- Public organisations (developed countries)
  - Courts, State administrative, Governmental organisations (ex. EU bureaucrats:)
- "Smart" SMEs
  - Smaller companies, where efficiency matters

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

History of BPM



- XX BC **Division of labour**
- Beginning of 20th century
  - Bata, Ford
- 80' – **Total Quality Management**
  - Toyota
- 80'/90' – **Workflow management**
- 90' – **Business Process Reengineering**
  - Davenport etc..
- 2002 – **Business Process Management**
  - First BPM technologies Pioneers of BPM
- 2009 ++ **AI in process mining, Social BPM**
- 2015 **Case Management, Low code apps**

Business process definition

Definition:

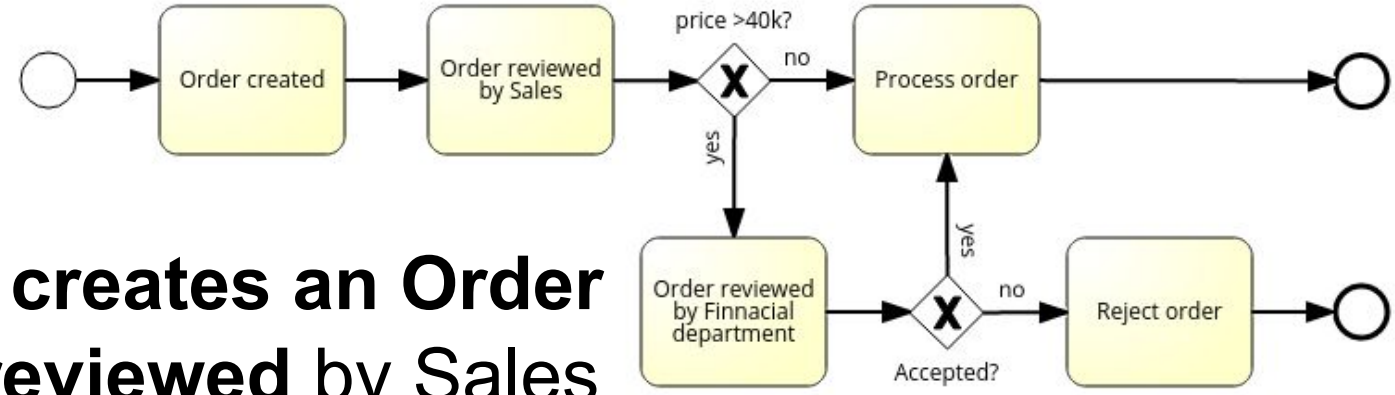
Series of logically related activities or tasks (such as planning, production, sales) performed together to produce a defined set of results.

-- Business Dictionary

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

-- PV207 / Jiří Kolář

Process Example: Order



1. Customer **creates an Order**
2. **Order is reviewed** by Sales
   - 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 Financial department
   - 2.3. Order can be rejected by the department
3. Otherwise the order is processed

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 - definition

*A **change** in target organization **towards the** establishment of a **process-driven management** model.*

*This can, but does not necessarily have to, lead to the **automation** of some processes in a **process-oriented Information Systems**.*

*Such systems can be eventually based on a **Business Process Management Suite***

BPM adoption in practice

- Organisational and management changes towards a process-oriented 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

Why to adopt BPM?

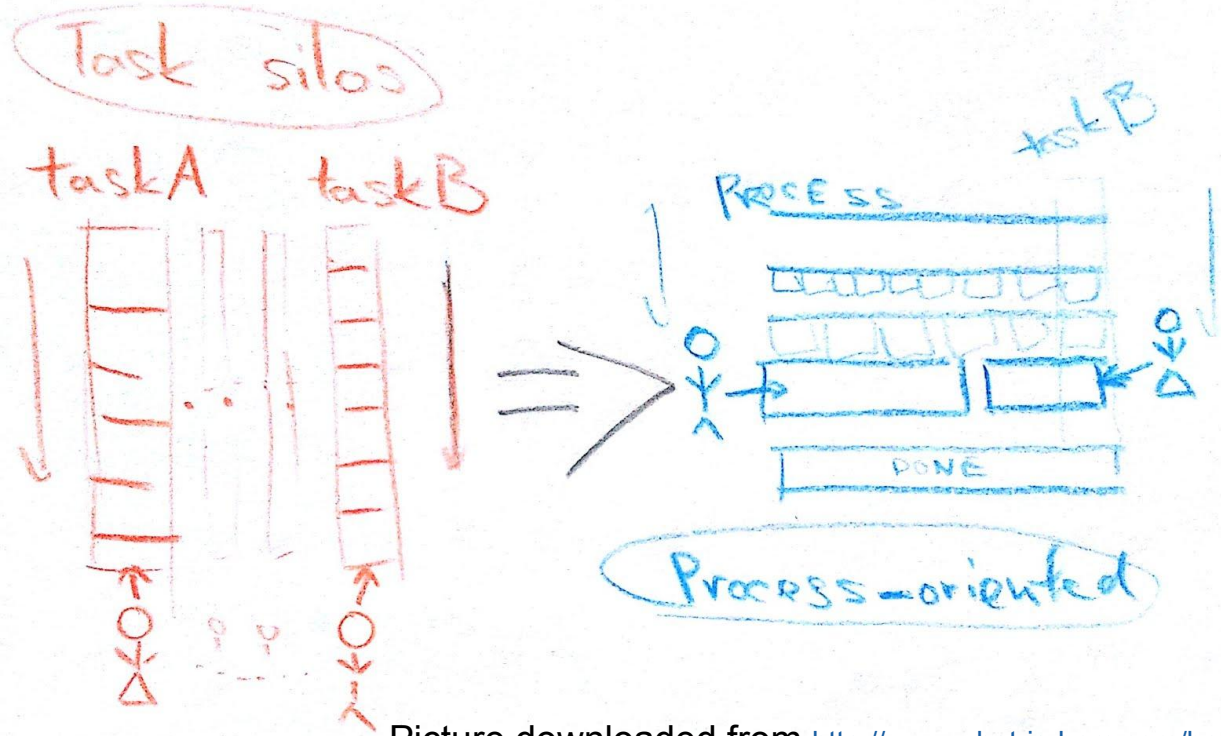
- **Know-how codification**
  - **Value** of processes as a **know-how is increasing** in today's **knowledge economy**
  - Less vulnerability caused by employee fluctuation
- Performance and costs **measurement**
- Better business-change management
  - Changes can be performed easier
  - Impact of change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

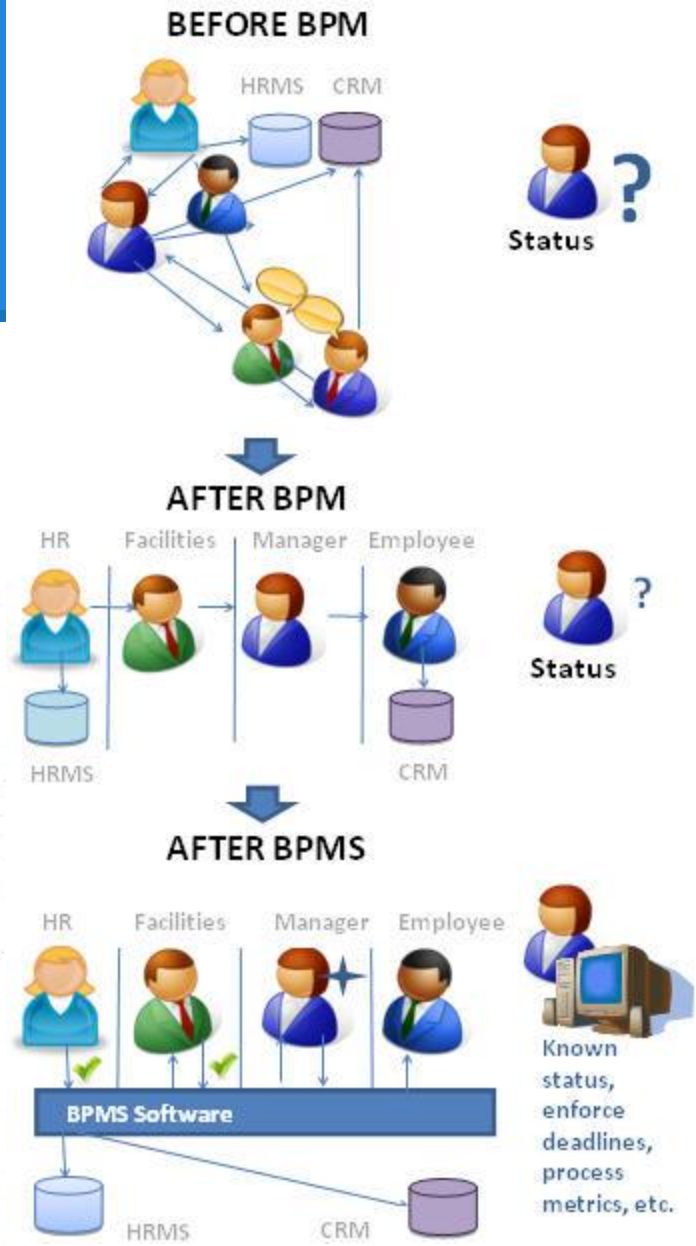
Why to adopt BPM? (cont.)

- **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 to adopt BPM?

- **Flattening** organisation's hierarchy
  - Elimination of "**silo effect**"
  - **Horizontal job character**





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

BPM adoption drawbacks :(

- **High initial costs**
  - Technologies & tools are expensive and not widely available
  - Change is always expensive
- **Change in people's mindset** is necessary (it hurts ;)
- Changes in organization structure
  - Fear of the change
  - Fear of job loss
- Agreement of all major decision-makers is crucial (not so easy)

Potential risks of BPM adoption

- **Loss of business flexibility**
  - Too high process rigidity
- Demotivated/Annoyed employees
- **High investments** in BPM solution
- Inefficient management changes
- Technological overkill
- Non-realistic process definitions

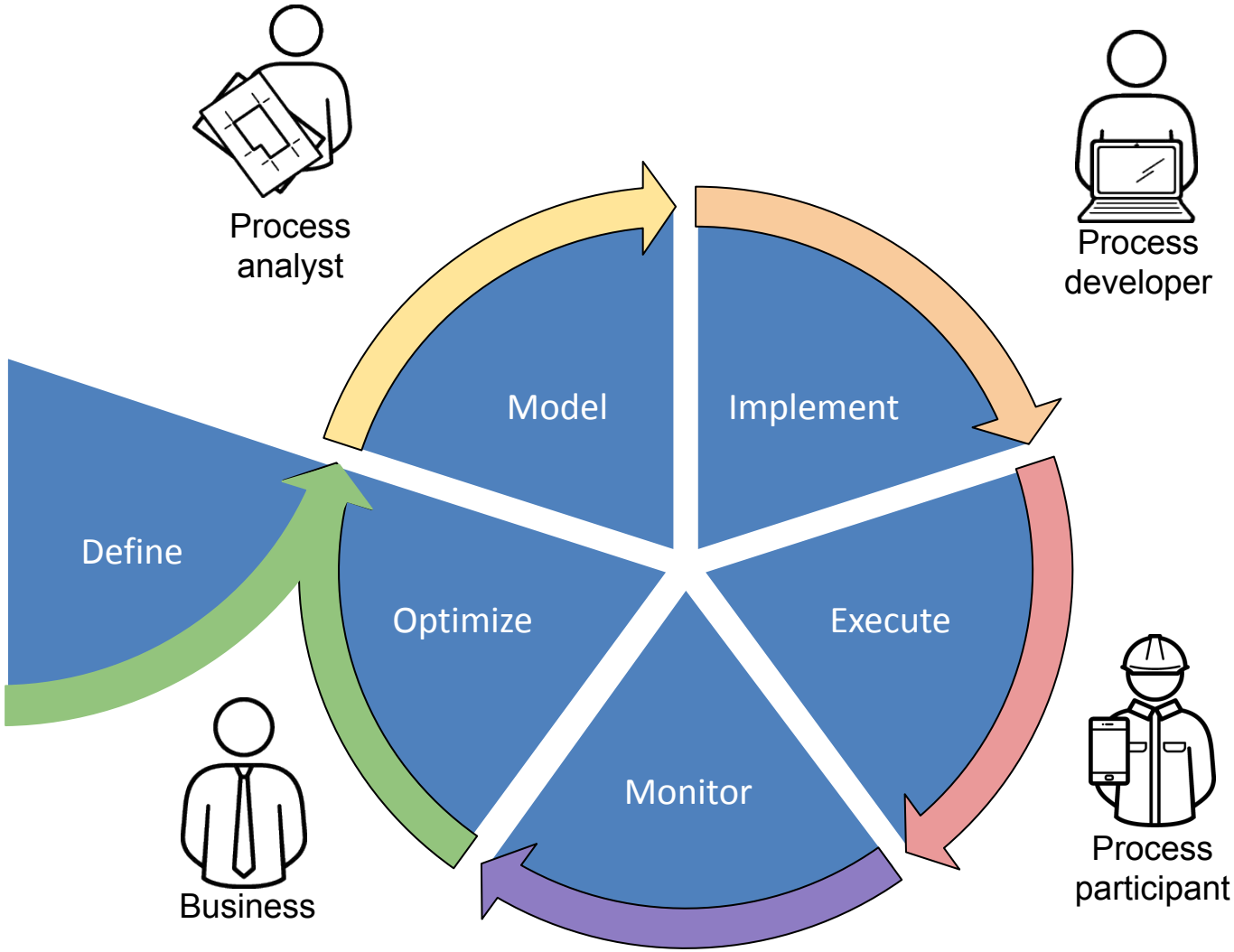
Questions?

Break 10mins

Basic roles in BPM adoption

- Organisation's stakeholders (Owners, Management, Customers, Partners etc.)
- 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 participants (Business workers)

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: DEFINE

- **Goal:** Identify/define valid and measurable processes
  - **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?

2. phase: MODEL

- Model logical structure of the process
  - Readable by all lifecycle participants
- (BPMN) Business Process Modeling Notation
  - Graphical notations
  - Portability (Standard)
  - Based on Petri-Nets formalism
- Modeling tools
  - Stand-alone modeler
  - Modeler BPMS component

3. phase: IMPLEMENT

- Implement human tasks
  - Forms, user interface
- Implement integrations
  - Connect integrated systems
  - Web services ,
  - REST
  - other service tasks
- Implement data model, data structures
  - Connect to data sources (databases)

4. phase: MONITOR

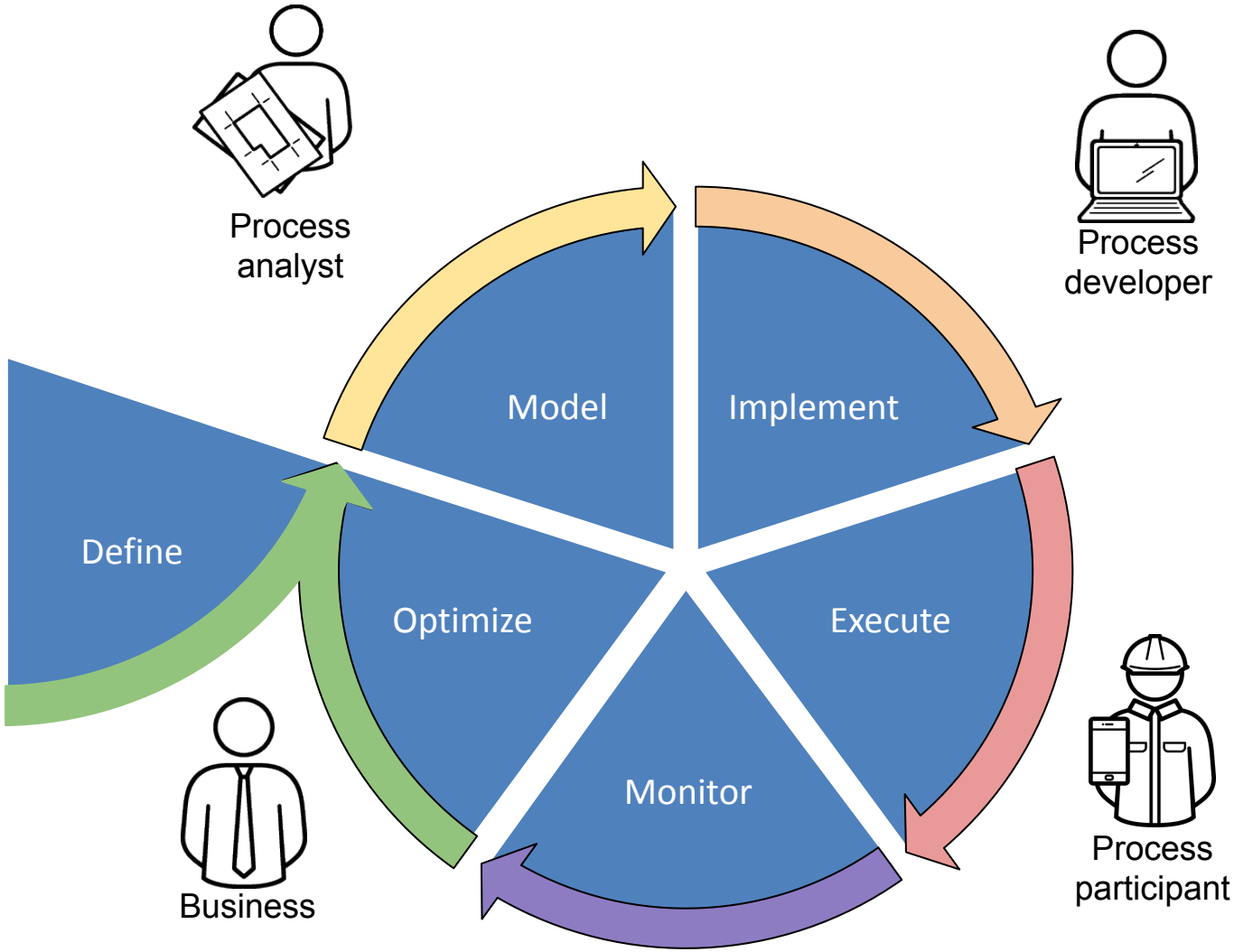
- **Reasons** for process monitoring
  - **Fault/Error detection**
  - **Performance measurement**
  - Information for **process improvement**
- **Business Activity Monitoring**
  - Real-time process monitoring
  - Measurement of process metrics
- Key Performance/Result Indicators
  - **Business performance**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

Tracking of **business goals fulfillment**

5.phase : OPTIMIZE

- 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;

BPM lifecycle



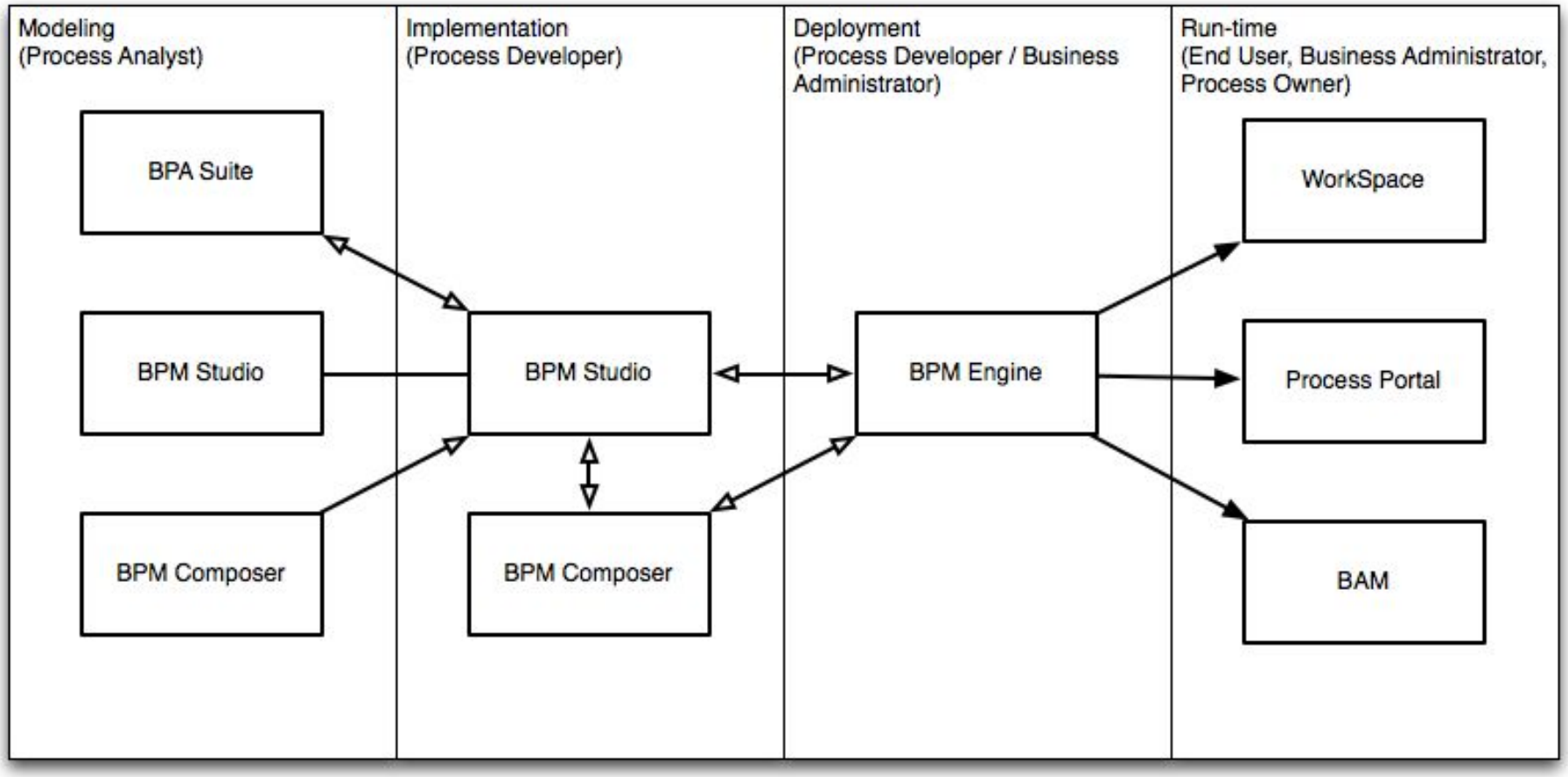
Business Process Management System

"A suite of tools and software components supporting the whole BPM lifecycle"

Usual BPMS components:

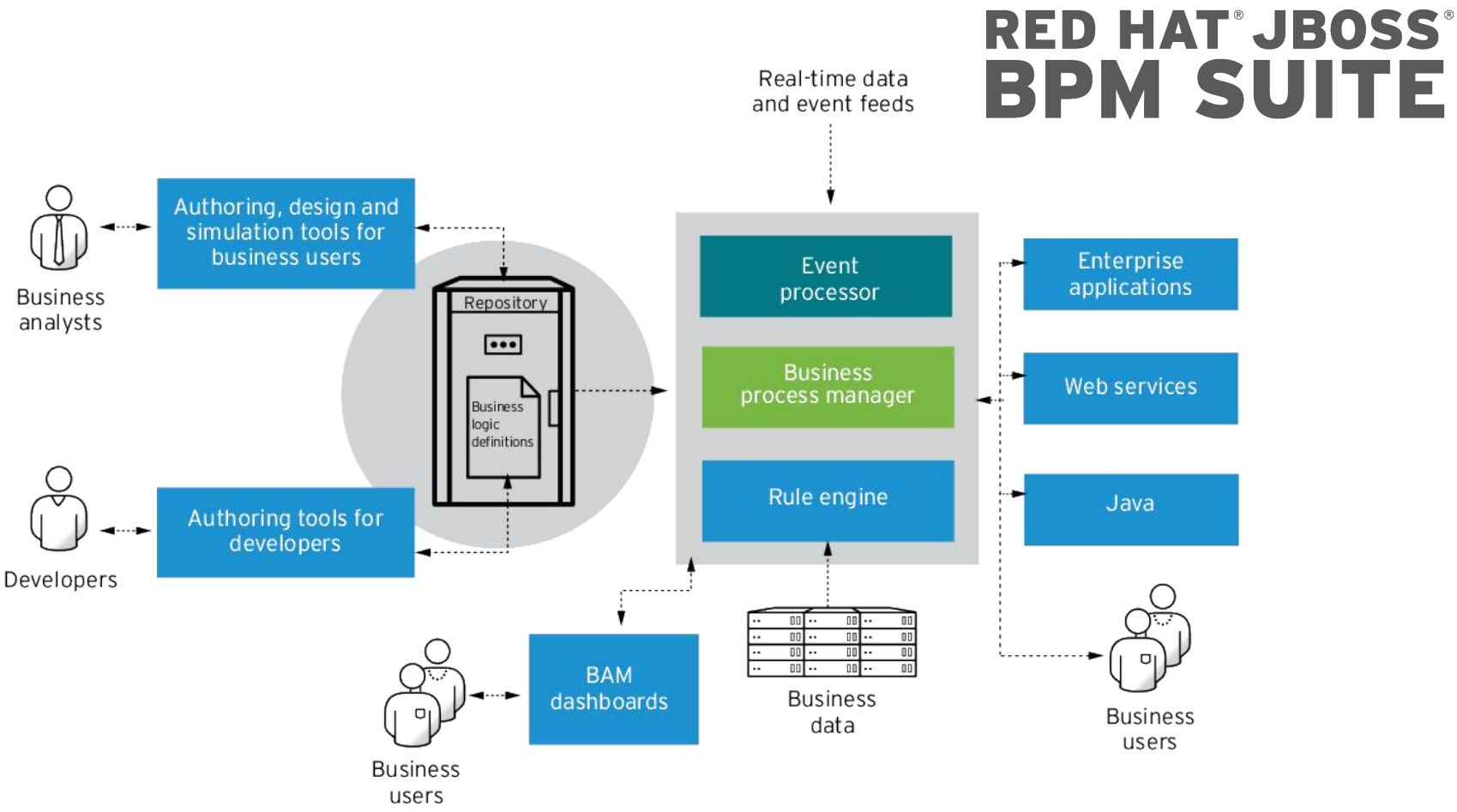
- Process modeller
- Process simulator
- Execution engine
- Process console (admin interface)
- Human tasks engine (process user interface)
- Business Rule engine
- Business activity monitoring interface

BPM lifecycle again



Picture downloaded from: http://docs.oracle.com/cd/E23943_01/user.1111/e15175/bpmug_intro_bpm_suite.htm

BPMS Architecture example



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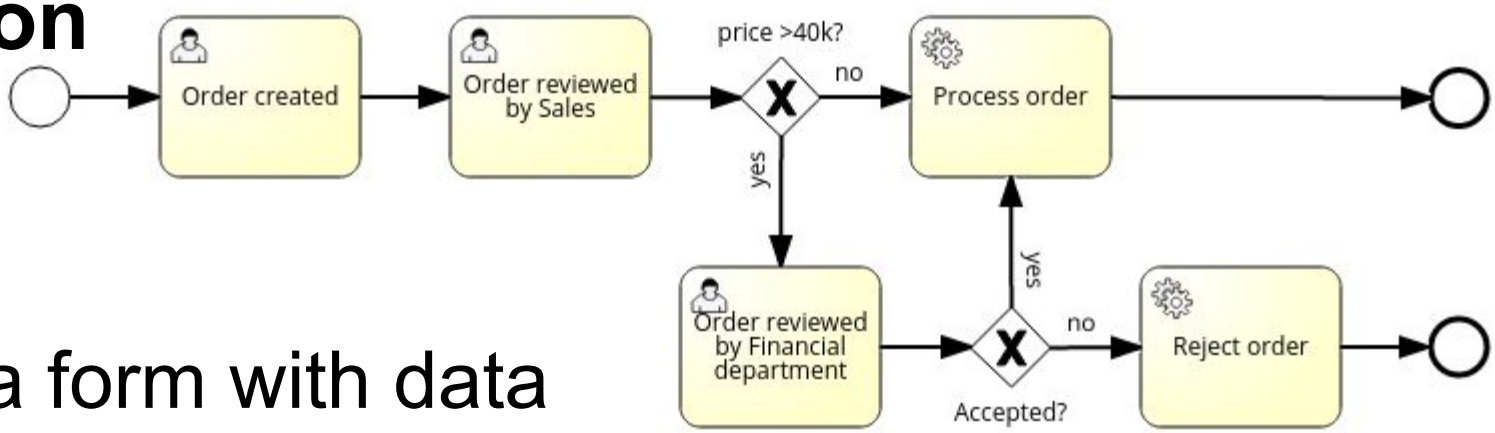
Human tasks

Process activities with necessary human interaction



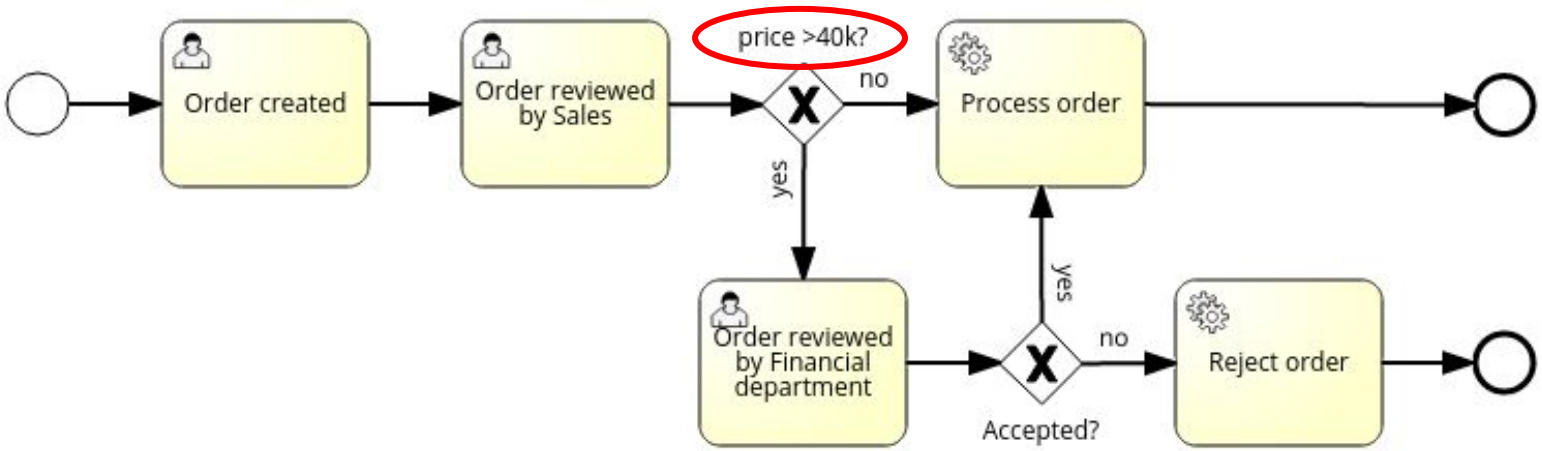
- Filling a form with data
  - Notifications, escalations, timeouts, delegation ..
- Common implementations
  - Portal style interface, Web 2.0 form frameworks
  - Proprietary BPMS vendor interfaces
- Often embeddable in other interfaces

Business Rules

- Rules **stored aside from process**
- Specific **rule language** for **evaluation**
- Evaluated by Business Rules Engine
- **Rule + Input data => Output**
- Typically IF – THEN
- **Rules types**
  - Validation rules
  - Transformation rules
- Business Rule Engine **often exposed as an API REST/Web Service**

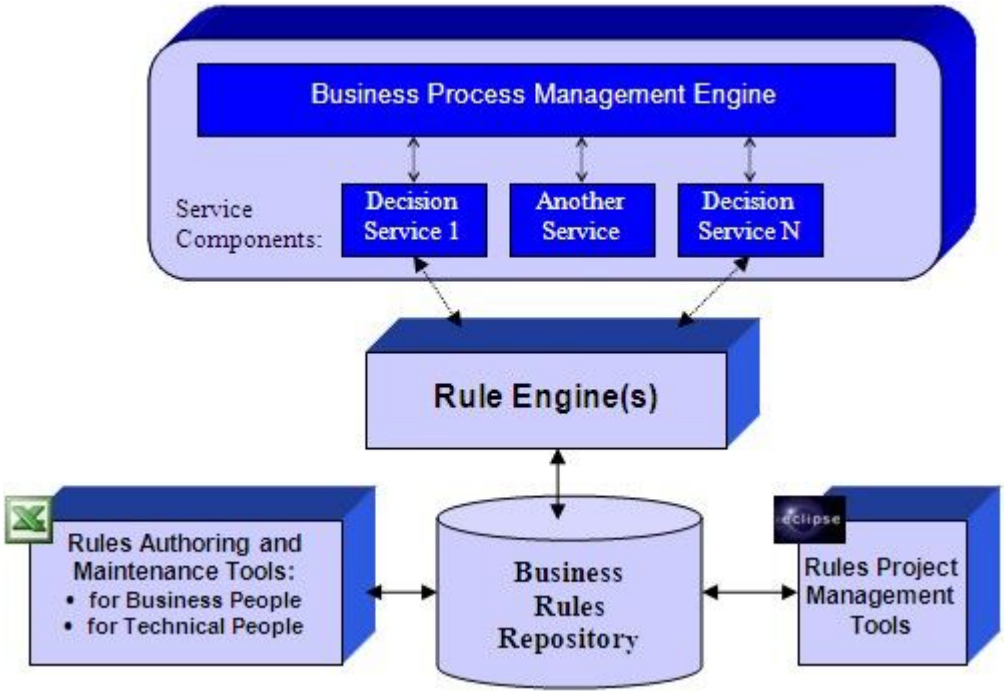
Business Rules – Example

- 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



http://openrules.com/docs/man_4.html

Business Rules example:

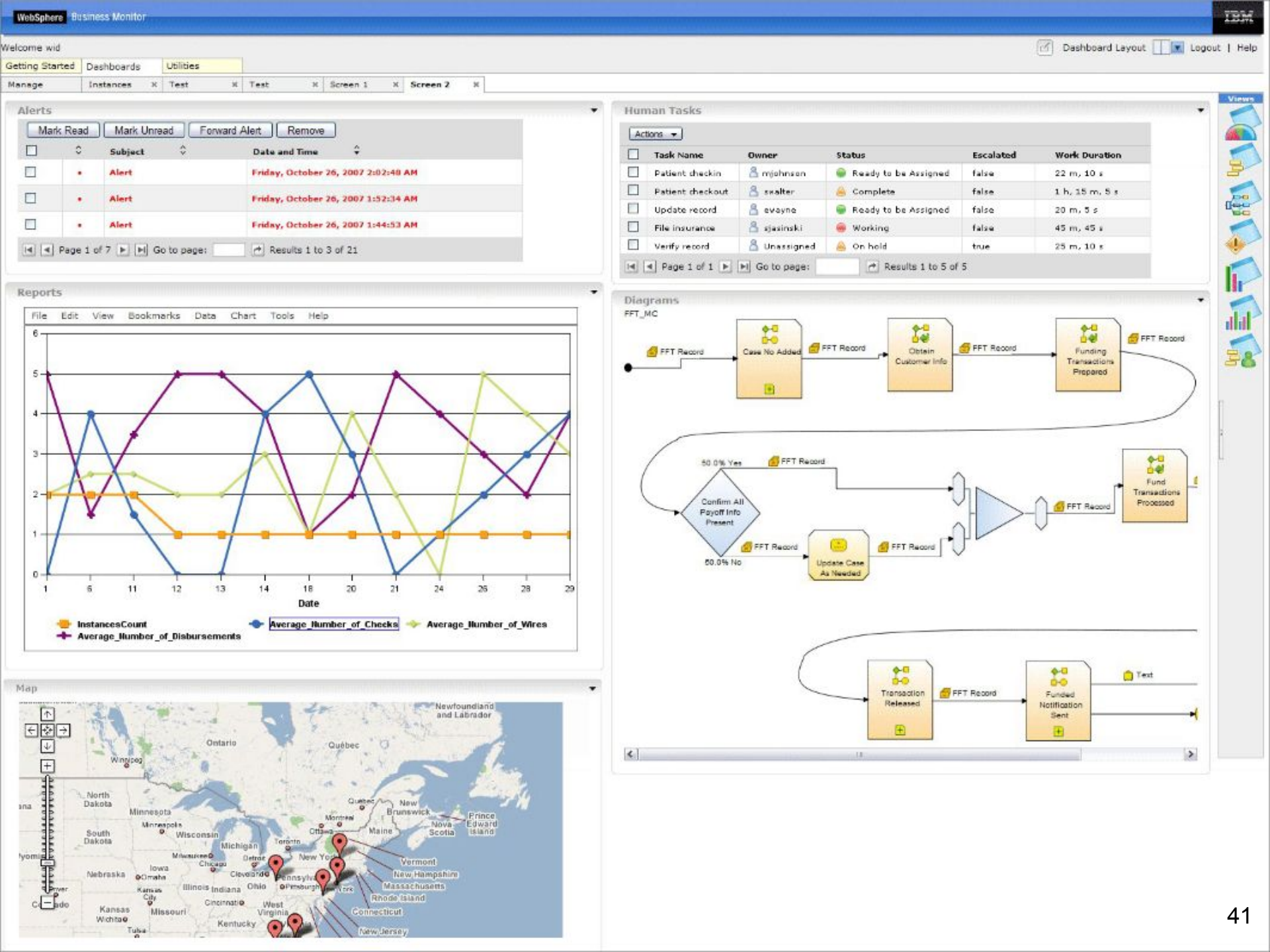
- Business object: Order
  - id – of an order
  - itemPrice – price of one item of order
  - quantity – quantity of item
- finDirDecisionNeeded – boolean identyfying if CFO's decesion is necessary
- Rule evaluation language:
  - order_price = Order(eval(quantity * itemPrice))
- Rule itself
    - WHEN 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


WebSphere Business Monitor
Welcome wid
Dashboard Layout
Logout | Help
Getting Started
Dashboards
Utilities
Manage
Instances
Test
Test
Screen 1
Screen 2
Views
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
Human Tasks
Actions
Task Name
Owner
Status
Escalated
Work Duration
Patient checkin
mjohnson
Ready to be Assigned
false
22 m, 10 s
Patient checkout
swalter
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
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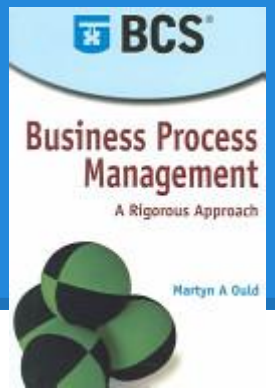
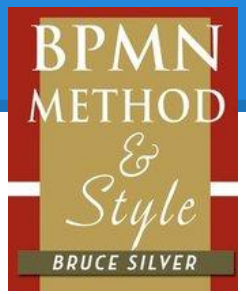
Results 1 to 5 of 5
Reports
File
Edit
View
Bookmarks
Data
Chart
Tools
Help
Date
InstancesCount
Average_Number_of_Checks
Average_Number_of_Wires
Average_Number_of_Disbursements
Diagrams
FFT_MC
FFT Record
Case No Added
Obtain Customer Info
Funding Transactions Prepared
Confirm All Payoff Info Present
50.0% Yes
50.0% No
Update Case As Needed
Fund Transactions Processed
Transaction Released
Funded Notification Sent
Text
Map
Newfoundland and Labrador
Ontario
Québec
Winnipeg
North Dakota
Minnesota
South Dakota
Wisconsin
Michigan
Nebraska
Iowa
Illinois
Indiana
Ohio
Kansas
Missouri
Kentucky
West Virginia
Pennsylvania
New York
Maine
Vermont
New Hampshire
Massachusetts
Rhode Island
Connecticut
New Jersey
New Brunswick
Nova Scotia
Prince Edward Island

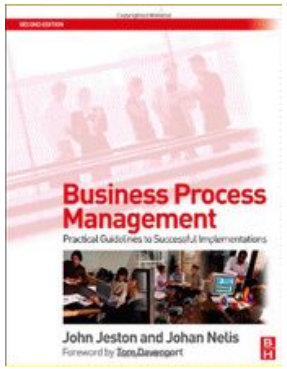
Existing BPMS products

- **Open source**
  - Red Hat Process Automation AKA jBPM
  - Activiti / Cammunda
  - PVM based
    - JBPM 3
    - Bonita
    - Orchestra
  - ApacheODE based
    - Project Levi
  - ++
- **Proprietary**
  - IBM BPM
  - Bizagi
  - Appian
  - Opentext/Metastorm
  - Pegasystems
  - Savvion
  - Signavio
  - TIBCO iProcess Suite
  - Oracle BPM suite
  - ARIS enterprise BPMS
  - ++

Extended books (beyond course border)







- BPMN method and style Bruce Silver, 2009978098236810 7
- Business Process Management: Practical Guidelines to Successful Implementations
- Business Process Management: A Rigorous Approach
- Business Process Management: Concepts, Languages, Architectures
- Essential Business Process Modeling
- Smith, H. and Fingar, P.: Business process management: the third wave
- "Schedlbauer, M.: The Art of Business Process Modeling: The Business Analyst's Guide to Process Modeling with UML and BPMN"

FIN
Questions?

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