MTAT.03.231
Business Process Management

Lecture 1 – Introduction

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Objective

• To introduce the discipline of modeling, analyzing, automating and monitoring business processes.

Related courses

• Enterprise System Integration
  • Integrating applications to automate or support business processes

• Business Analysis and Software Product Management
  • Identifying and analyzing business problems and opportunities that can be addressed via IT solutions, including business process improvement opportunities

• Business data analytics
  • Mining business process execution data (process mining)
Structure of the course

14 lecture+practice sessions covering:

- Process Identification & Modeling
- Process Analysis
- Process Redesign
- Process Automation
- Process Monitoring & Mining

Team Project
Grading

Five assignments (25 points in total)
- 8-12 hours per homework ≈ 50 hours in total

Project (25 points)
- ≈ 40 hours

Exam (50 points)
- Minimum exam score: 20 out of 50
Readings and resources

• Course material posted on course Web page
  • http://courses.cs.ut.ee/2021/bpm
• Textbook
  • Dumas, La Rosa, Mendling & Reijers: *Fundamentals of Business Process Management* (second edition), Springer 2018
• Slack workspace
  • https://ut-bpm.slack.com

*(the link to enrol in the Slack workspace was sent to you via the study information system)*
What is a Business Process?
Business processes

Assets & Partners
- Financial
- Human Resources
- Technology
- Materials

Organisation
- Function A
- Function B
- Function C

Business processes

Customers
Your turn...

- Bring menu
- Load dishwasher
- Collect laundry
- Take order
- Collect payment
- Clean kitchen surfaces
- Collect laundry
- Sweep & mop
- Present bill
- Greet & seat
- Unload dishwasher
- Serve meal
Customer arrived → Greet & seat → Take order → Bring menu → Serve meal → Present bill → Issue invoice → Customer paid

Kitchen is dirty → Load dishwasher → Clean kitchen surfaces → Brush grills → Collect laundry → Sweep & mop → Unload dishwasher → Kitchen is clean
A business process is...

*a chain of events, activities and decisions*

...involving a number of *actors and objects*,

....triggered by a *need*

and leading to an *outcome that is of value to a customer*.

Examples:

- Order-to-Cash
- Procure-to-Pay (aka Purchase-to-Pay)
- Application-to-Approval
- Issue-to-Resolution
“My washing machine doesn’t work...”

**Negative outcomes (value-reducing):**
- Fault not repaired in a timely manner
- Fault repaired but customer pays more than expected

**Positive outcomes (value-adding):**
- Fault repaired immediately with minor intervention
- Fault repaired, covered by warranty
What is Business Process Management?

And why should I care about it?
Improving Performance (Rummler’s Framework)

Business Environment
- Economy
- Regulatory
- Culture

Assets & Resources
- Financial
- Human Resources
- Technology
- Materials

Organisation
- Performance Planning
- Performance Management

Function A
- Business Process
- Business Process
- Business Process

Function B
- Business Process

Function C
- Business Process

Stakeholders
- Customers

Value

Competitors
Process performance

If you had to choose between two services, you would typically choose the one that is:

• F…
• C…
• B…
Process performance

If you had to choose between two services, you would typically choose the one that is:

• Faster
• Cheaper
• Better
Process performance

Three dimensions of process performance

• Time
• Cost
• Quality
Improving process performance

- Customer arrived
- Greet & seat
- Take order
- Bring menu
- Serve meal
- Present bill
- Issue invoice
- Customer paid
How would you improve this process?

- Outsource to Customer
- Standardize
- Eliminate Cooking
- Invest and Build
- Re-sequence
- Eliminate Waiters
- Automate
Body of principles, methods and tools to design, analyze, execute and monitor business processes, with the aim of improving their performance.
The first rule of any technology used in a business is that automation applied to an efficient operation will magnify the efficiency.

The second is that automation applied to an inefficient operation will magnify the inefficiency.”

Bill Gates
In other words…

Index Group (1982)
Why BPM

Job ad - SOFTWARE ENGINEER WITH FOCUS PROCESS DEVELOPMENT (BUSINESS PROCESS AUTOMATION)

Reference number: CVO-442707-EE  Published: 14/01/2016

Kühne + Nagel

Kühne + Nagel opened its Corporate IT Center in Tallinn August 2012, located in Tallinn district of Ülemiste City. We are almost 400 IT professionals and are still looking for more.

JAVA DEVELOPER (OUTPUT MANAGEMENT)

International Output Management System (iOPM) is used by all standard applications. It provides a solution for the generation and distribution of documents via different output channels (print, fax, email, preview, etc.).

You will become a member of the International Output Management Team (iOPM) deployed in your city. As a Java Developer you have the opportunity to develop innovative software solutions based on agile development and to design the processes in cooperation with the business side.

First you will design the processes in cooperation with the business side, code. When needed, you will participate in projects to connect the iOPM software to other applications within the company. This is an existing application package, so expect some bug fixing, refactoring and optimization. Some 3rd level support will also be needed once in a while.

Software Engineer for Mortgage Accounting

We are looking for a Software Engineer to be part of an agile team supporting Swedbank Group Accounting solutions.

About the job

You will be a part of international agile team focused on development of Swedish Mortgage Accounting systems. Our people are responsible for an end-to-end solution from analysis, design, development, test, and maintenance of our processes and services. This includes work in close collaboration with other development team members, stakeholders, and business side within processes and services.
How to go about BPM?
The BPM lifecycle

- Process identification
- Process architecture
- Process discovery
- As-is process model
- Process analysis
- Insights on weaknesses and their impact
- Process redesign
- To-be process model
- Process implementation
- Executable process model
- Process monitoring and controlling
- Conformance and performance insights
- Process analysis
- Insights on weaknesses and their impact
## Process identification steps

<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>• Enumerate main processes</td>
<td>Prioritize processes based on:</td>
</tr>
<tr>
<td>• Determine process scope</td>
<td>• Importance</td>
</tr>
<tr>
<td></td>
<td>• Health</td>
</tr>
<tr>
<td></td>
<td>• Feasibility</td>
</tr>
</tbody>
</table>

*After Davenport (1993)*
Example: process architecture

Wholesaler

Management processes

- Strategic Management
- Logistics Management
- Suppliers Management
- Warehouse Management
- Demand Management

Core processes

- Direct procurement
- Sales
- Distribution
- Marketing
- Service

Support processes

- Finance
- Indirect procurement
- IT
- HR
Prioritization (aka Process Selection)

1. **Importance**
   Which processes have greatest impact on the organization’s strategic objectives?

2. **Health (or Dysfunction)**
   Which processes are in deepest trouble?

3. **Feasibility**
   Which processes are most susceptible to successful process management?

Prioritized process portfolio

Hammer, Champy (1993)
Example: prioritized process portfolio

Financial institution

Short-term action

Feasibility
- Low
- Medium
- High

Possible

Strategic fit?
The BPM lifecycle

- Process identification
- Process architecture
- Process discovery
- Process analysis
- Process redesign
- Process implementation
- Process monitoring and controlling
- As-is process model
- To-be process model
- Executable process model
- Insights on weaknesses and their impact
- Insights on conformance and performance insights
- Conformance and performance insights
Business process model

Invoice handling example
The BPM lifecycle

1. Process identification
2. Process discovery
3. Process monitoring and controlling
4. Process implementation
5. Process redesign
6. Process analysis
7. Process architecture
8. Conformance and performance insights
9. As-is process model
10. Insights on weaknesses and their impact
11. To-be process model
12. Executable process model
Qualitative process analysis

Root-cause analysis example

Causal Factors

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Material</th>
<th>Machine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clerk</td>
<td>Clerk</td>
<td>The system does not keep</td>
</tr>
<tr>
<td></td>
<td>selected equipment with</td>
<td>the site engineer informed</td>
</tr>
<tr>
<td></td>
<td>incorrect specs</td>
<td></td>
</tr>
<tr>
<td>Inaccurate</td>
<td>Inaccurate</td>
<td></td>
</tr>
<tr>
<td>equipment description in</td>
<td>equipment description in</td>
<td></td>
</tr>
<tr>
<td>provider's catalogue</td>
<td>provider's catalogue</td>
<td></td>
</tr>
<tr>
<td>Incomplete or inaccurate</td>
<td>Clerk</td>
<td>Clerk is entirely responsible</td>
</tr>
<tr>
<td>requirements from site</td>
<td></td>
<td>for equipment selection</td>
</tr>
<tr>
<td>engineer</td>
<td>Clerk</td>
<td></td>
</tr>
<tr>
<td></td>
<td>misunderstood</td>
<td>Site engineer does not validate</td>
</tr>
<tr>
<td></td>
<td>site engineer's requirement</td>
<td>the choice of equipment</td>
</tr>
<tr>
<td>Milieu</td>
<td>Man</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Method</td>
<td></td>
</tr>
</tbody>
</table>

Issue

Equipment rejected at delivery
Quantitative process analysis

Process simulation example

- Process durations
- Process waiting times
- Process costs (EUR)
- Resource utilization %
The BPM lifecycle

1. Process identification
2. Process discovery
3. Process monitoring and controlling
4. Process implementation
5. Process redesign
6. Process analysis
7. Process architecture
8. Conformance and performance insights
9. As-is process model
10. Insights on weaknesses and their impact
11. To-be process model
12. Executable process model

Diagram:
- BPM lifecycle process flow
- Identification of processes
- Discovery and analysis of current processes
- Monitoring and controlling of processes
- Implementation of processes
- Redesign of processes
- Insights into process weaknesses
- Process architecture
- Conformance and performance metrics
Process redesign

AS-IS process model

TO-BE process model

Cost

Time

Flexibility

Quality
The BPM lifecycle

```
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<td>Insights on weaknesses and their impact</td>
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Conformance and performance insights

Executable process model

To-be process model
```

```
| Process implementation | Process redesign |

To-be process model

Insights on weaknesses and their impact
```

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40
Process implementation

- Process automation
  - Executable process design
  - IT development & configuration
    - Testing
    - ...

- Process change management
  - Job redesign
  - Training
  - Performance management plan
    - ....
The BPM lifecycle

1. **Process identification**
   - Conformance and performance insights
   - Process architecture

2. **Process discovery**
   - As-is process model

3. **Process monitoring and controlling**
   - Executable process model

4. **Process implementation**
   - To-be process model

5. **Process analysis**
   - Insights on weaknesses and their impact

6. **Process redesign**
   - To-be process model

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- **As-is process model**
- **To-be process model**
- **Conformance and performance insights**
- **Process architecture**
- **Insights on weaknesses and their impact**
Process monitoring

Dashboards, alerts & reports

Event stream → DB logs → Model-based analytics (p. mining)
Course structure

- Process identification: Week 3
- Process discovery: Weeks 2 & 4
- Process monitoring and controlling: Weeks 12-14
- Process implementation: Weeks 10-11
- Process redesign: Weeks 8-9
- Process analysis: Weeks 5-7

- Strategy
- Governance
- Culture
Further Readings & Resources

• Fundamentals of Business Process Management
  • Chapter 1 – Introduction
• Short quiz
Next Week

Process Identification

- Strategic Management
- Logistics Management
- Suppliers Management
- Warehouse Management
- Demand Management

Management processes

Core processes
- Direct procurement
- Sales
- Distribution
- Marketing
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- Finance
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- HR