„From a family of state based PAIS to a configurable and parameterized business process architecture“

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Goal:

pragmatic application of BPMN for specific application domains, namely master data management.

Characteristics:

• state based
• long living process instances

Here at the example of product master data management.
Application domain: Product Master Data Management

is concerned with the life-cycle of product data:

Product description of a circulation pump
Application domain:  
Product **Master Data Management**

is concerned with the life-cycle of product data:

A supplier might produce such catalogs
- for different groups of products,
- countries and
- in different languages.

the grouping of such product descriptions is denoted as an **assortment**.
Application domain: Product **Master Data Management**

→ In order to guarantee high quality of the product data

400 audits automatically test the product data / the media files

Human data editors manually check the quality of the product data.

Approved changes are taken over to the shared area
Application domain: 
Product **Master Data Management**

Key characteristic:

→ An assortment in a MDS usually has a **long lifetime**.

→ Activities are triggered by external events / state change
Scenario / Application domain: Product **Master Data Management**

Key characteristic:

→ An assortment in a MDS usually has a long lifetime.

→ Activities are triggered by external events / state change

Challenges:

• Model state centric-process with BPMN2.0

• Use BPMS for execution support

→ but avoid long running transactions!
Modeling paradigms

**activity driven**

Focus is on **activities** and there (predefined) **order** relation

→ Suitable to describe business processes, i.e set of activities that contribute towards a common business goal within a certain time.

**state driven**

Focus is on **states** and **events** which entail changes of the state.

→ Suitable to describe the **life cycle** of (possible very long living) **objects**
Challenge I:
Model state centric-process with BPMN2.0

<table>
<thead>
<tr>
<th>ID</th>
<th>BPMN element used to depict state</th>
<th>BPMN element used to model events</th>
<th>Literature</th>
</tr>
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<tbody>
<tr>
<td>A1</td>
<td>Data objects with state information</td>
<td>-</td>
<td>[13, Fig. 152], [17, p. 32]</td>
</tr>
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<td>Conditional event</td>
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Main alternatives for modeling state/event information in BPMN

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Our Solution:

States modeled with BPMN-Activities

Events modeled with BPMN-Activities
attached that entail state changes
State-Centric Operational Model (SCOM)
Challenge II:
Use BPMS for execution support
→ but avoid long running transactions!
Possible refinement of state representing activity
Challenge II: Use BPMS for execution support → but avoid long running transactions!
State Centric Process Architecture

Fig: architecture described within ArchiMate
State Centric Process Architecture

Fig: architecture described within ArchiMate
Software Produkt Line for Product Master Data Management Systems
Benefits of the proposed architecture

1. **Reuse**: The controller processes are stable, in a way that the product family of different applications that are realized with the proposed architecture share the same set of control processes.

2. **Runtime changes**: Modifications to the state automata influence the process execution at runtime. Changing the state automata other (or even new) application specific processes can be invoked.

3. **Governing of long-living objects**: Instances of the application specific processes are invoked only if a state change has taken place and a state transition is possible. Long-living transactions are avoided.
Current project

first component (traditional combustion technology) + second component (e.g. solar thermal energy and control devices) → mandatory heating label for compound heatings
Current project

Efficiency labeling for composite heating systems (according to ecodesign directive 2009/125/EC)

Industry
- E.g. members of the ARGE Neue Medien der deutschen SHK-Industrie e.V.
  - ARGE: 113 Industrial enterprises

Wholesaler
- E.g. members of the DG Haustechnik (German Association of Sanitary, Heating, Ventilation and Air Conditioning Wholesalers)
  - DG Haustechnik: 85 wholesalers with > 1,000 places of business

Project Owner
- VdZ (German Association for Energy Efficiency in Building Technologies)

Craftsmen
- E.g. members of the ZVSHK (Central Association Plumbing Heating Air Conditioning)
  - ZVSHK: representation of interest for 53,000 craft enterprises

Construction Software Provider
- E.g. members of the BVBS (Federal Association of Construction Software)
  - BVBS: 70 Enterprises with > 200,000 users

Official launch at ISH-2015: world's leading trade fair for water and energy topics
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