Defining and reconstructing clinical processes based on IHE and BPMN 2.0

Oral presentation of full paper

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Process Management in Healthcare

- **Motivation**
  - Process management in a clinical environment is based on proprietary systems
  - Processes are bounded to these systems complicating reusability and process analysis

- **Process Management System**
  - Definition and reconstruction of clinical care processes
  - Based on established standards
    - Integrating the Healthcare Enterprise (IHE) Integration Profiles
    - Business Process Model and Notation (BPMN) 2.0

- **Aim**
  - Compare, analyze and evaluate clinical processes
  - Identify high cost tasks and stays
Integrating the Healthcare Enterprise

- International initiative of healthcare professionals, IT professionals and industry
  - Coordinates the use of established standards (DICOM, HL7)
- Guarantees standardized interfaces
- Ensures interoperability between clinical information systems
- IHE is structured by integration profiles, that describe a solution for integration problems with
  - Actor: Information system or software component
  - Transaction: standardized communication between IHE actors
Process definition with BPMN 2.0

- BPMN 2.0 – an established standard
  - modeling notation and specification language
  - definition and execution of business processes
  - BPMN 2.0 process is a sequence of tasks
    - service task: associates a task with a service implementation
    - user task: assignment of a task to a user or group

- Linkage of BPMN 2.0 processes to every IHE compliant system
  - BPMN 2.0 service tasks access IHE actors

- Increases the reusability of defined processes
  - „define once, run everywhere“
  - enables performance analysis of executed processes
Reconstruction of patient’s pathway

- Reconstruction is based on IHE integration profiles
  - Patient Administration Management
    - Coordinates the exchange of patient account, encounter and location information
  - Audit Trail and Node Authentication
    - Controls and logs every access to protected health information
    - Using both integration profiles, all patient movements within a healthcare facility are stored in an audit log database
- Allows tracking the way of a patient through a healthcare facility
  - Every stay can be determined precisely from patient admission to discharge
  - Patient Transfer and the changing of attending doctors can be determined
Reconstruction of patient’s pathways

- **Reconstruction analysis**
  - Display of all visited departments including the residence time
    - Question “When was a patient where?” can be answered
  - Total time of a patient’s stay
  - Nominal-actual comparison of defined and actual pathway

<table>
<thead>
<tr>
<th></th>
<th>Total Time</th>
</tr>
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<tbody>
<tr>
<td>Max Muster</td>
<td>2h 40m</td>
</tr>
<tr>
<td>Jane Doe</td>
<td>1h 25m</td>
</tr>
<tr>
<td>John Doe</td>
<td>2h 35m</td>
</tr>
</tbody>
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![Patient Pathway Diagram](image_url)