Application of Process Mining Techniques for Innovation Analysis and support
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Introduction
Open Innovation paradigm [1]:
• Innovation projects results are strongly affected by intra-organization and inter-organizations collaborations
• Improving collaborative skills is a hot topic for innovation managers
Innovation as a collaborative process:
• Uncertain and unstructured
• Expert-driven
Need of systematic methodologies able to investigate and support collaborative tasks.

Objective
Discovering knowledge models on Common Collaboration Practices with the aim of supporting and improving collaborative projects.

Main issues in target scenarios
• Data retrieval: identification of suitable data sources
• Integration and synchronization of distributed and heterogeneous data
• Analysis of “spaghetti process”[3], with little or no structure

Research Approach
• Process Driven strategy
  • Information extracted from data usually collected by enterprise informative systems
  • ERP logs, emails, file versioning...
• Pattern Discovery Techniques
  • Hierarchical clustering of sub-processes.
  • Identifying the most frequent and important collaboration patterns

Methodology

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<th>Case id</th>
<th>Time stamp</th>
<th>Activity</th>
<th>Resource</th>
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</thead>
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<td>a</td>
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<td>09-01-2011/01/04</td>
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<td>Sara</td>
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<td>5</td>
<td>09-01-2011/01/05</td>
<td>a</td>
<td>Evon</td>
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1) Data collection
Collection of data regarding daily activities of a research team:
• files usually stored in enterprise IS and team members PCs
• human knowledge about informal activities not automatically stored, e.g. physical meeting

2) Data Integration
• Obtaining a single dataset containing all collaborative processes logs
• Main Steps:
  • Data Extraction
  • Data Cleaning
  • Homogenization

3) Pattern Discovery

a) Trace preprocessing to obtain corresponding process schema
b) Schema conversion into graphs structures
c) SUBDUE [2] launching to derive a lattice structure, by arranging organization practices in a hierarchy with different level of abstractions. Higher-level clusters contain the most important patterns of the domain.

Conclusion
• Identifying the most common organization collaborative practices with their relationships
• Supporting organization collaborative work management
• Exploiting information stored about actual organization collaborative tasks

References

Further Information
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