LMMS: An Approach to Support Semantic Mapping of E-R Models to HL7 Information Models

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Outline

- RESEARCH PROBLEM
- EXPERT SYSTEMS
- LABORATORY MODEL MAPPING ARCHITECTURE
- LMMS EVALUATION
- DISCUSSION AND CONCLUSIONS
- FUTURE WORK

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DISCUSSION AND CONCLUSIONS

FUTURE WORK
RESEARCH PROBLEM

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System Architect/Analyst

Software Developers

RIM, R-MIM, D-MIM
HL7 V3 Vocabulary Datatypes

HL7 V3 API
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Laboratory Model Mapping Architecture (1/4)

- Software Architecture
  - Data Access Module
  - Control Module
  - Presentation – Interface Module

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LMM Architecture (2/4)
Laboratory Model Mapping System Design (3/4)

- Knowledge Representation

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Si es una persona y atiende un paciente que tiene una historia clínica y labora dentro de un departamento de servicios asistenciales que forma parte de una empresa prestadora de servicios de salud, entonces, es un médico.

If person and attends(patient(x)) and E [(department)] → doctor

If x → y and If y → z

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LABORATORY MODEL MAPPING SYSTEM - LMMS

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LMMS EVALUATION (1/2)

Semantic Mapping Quality

Entity Relation Models

- Laboratory Information System - LIS
- Localized Message for Laboratory Orders

LMMS Mapping

- Expert System

Manual Mapping

Semantic Mapping Metrics:
- Completeness
- Validity

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## LMMS Evaluation (2/2)

### Results

<table>
<thead>
<tr>
<th>Entities</th>
<th>Completeness%</th>
<th>Validity%</th>
</tr>
</thead>
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<td>Group B</td>
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<td>Average</td>
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<td>83.94</td>
</tr>
</tbody>
</table>

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DISCUSSIONS AND CONCLUSIONS

- LMMS is an adequate mechanism to facilitate interoperability solutions in healthcare.
- The use of expert systems is a new approach to provide semantic interoperability.
- The LMMS Empirical evaluation demonstrated that the approach increases semantic quality of mappings compared to a manual mapping.
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FUTURE WORK
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• Improve the knowledge representation mechanism, due to the lack of expressivity of the semantic networks (ontologies).

• Integrate other technologies as: intelligent agents in the automatization mapping process.
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Questions?