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Application of ISO 13606 Archetypes for a HIS-LIS integration

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Efficient data exchange between a laboratory information system (LIS) and a hospital information system (HIS) requires that both information systems understand the semantic of the data and support its structure. So ISO 13606 archetypes can serve a good basis to define laboratory tests and transfer them to a hospital information system.

When a hospital information system generates an order to perform lab tests it has to follow the tests' rules. This requires that a HIS can analyze the selected tests and conclude how many specimens of which type must be taken and which additional required fields must be filled. Normally this requires implementation of an extra module for a HIS that works with external dictionaries. Several hospital information systems are capable of building user interface based on the structure of an archetype. So the goal of the paper is to present a study of an archetype based HIS – LIS data exchange.

Helix laboratory is a clinical laboratory service located in Saint-Petersburg, Russia. The laboratory uses a self-developed LIS, with a unified LOINC based dictionary.

For the project we employed a partner clinic that uses a HIS that could natively process ADL definitions of archetypes. To enable the data exchange we developed an additional module to our LIS that could import archetyped data. The archetype repository with laboratory tests definitions was organized on the laboratory site. A web service approach was used to enable communication between a HIS and a LIS. We used the ontology section of archetypes to associate laboratory test components with LOINC codes.

Laboratory tests were modeled as ISO 13606 archetypes using a LinkEHR tool. As the participating LIS and HIS supported LOINC as a nomenclature codding system, LOINC codes were added to the ontology section of each archetype to provide an unambiguous interpretation of the archetypes by information systems. We employed an ADL capable HIS system to test the approach.

The presented approach showed a high efficiency in the pilot project settings. The next step of the project will be implementation of the archetype based process of exporting results form a LIS to a HIS. Using LOINC codes in the ontology section of archetypes allowed avoiding extra effort to map clinical terms from a HIS nomenclature to LIS.

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